California Environmental Protection Agency

Air Resources Board

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

Public Meeting Agenda

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
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TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO:
http://www.arb.ca.gov/lispub/comm/bclist.php

June 26, 2008
9:00 a.m.

Item #

08-6-1: Health Update: Estimating the Direct Health Effects of Temperature and Heat Waves in California

Staff from the Office of Environmental Health Hazard Assessment (OEHHA) will provide an overview of their analyses of the direct effects on increases in temperature on death and hospitalization in nine California counties, as well as an examination of potentially susceptible subgroups.

08-6-2: Public Meeting to Consider the Approval of a Grant under the Innovative Clean Air Technologies (ICAT) Program

As a follow-up to the three ICAT grants approved by the board in January 2007, the Board will consider approval of staff's recommendation of an additional grant to co-fund development and demonstration of an innovative particulate matter sensor for use in diesel vehicle emission control system on-board diagnostic applications.

08-6-3: Climate Science Update: Climate Change Impacts of Non-Kyoto Greenhouse Gases

In addition to the six substances identified in the Kyoto Protocol, there are a number of man-made pollutants, emitted primarily as combustion byproducts (both fossil fuels and biomass), that affect the climate by their significant global warming potential. This presentation by Professor Michael Prather, UC Irvine, provides an update on scientific developments on such substances and their regulatory and policy implications.

08-6-4: Report to the Board on an Initial Draft of a Plan to Reduce Greenhouse Gas Emissions in California (AB 32 Scoping Plan)

The Global Warming Solutions Act of 2006 (AB 32) requires ARB to prepare a Scoping Plan to achieve reductions in greenhouse gas emissions in California. ARB staff will present an initial draft of the AB 32 Scoping Plan for the Board's review.

08-6-5: Public Hearing to Consider Proposed Amendments to the California Consumer Products Regulation

Air Resources Board staff is proposing amendments to the Consumer Products Regulation. As proposed, the amendments would reduce volatile organic compound (VOC), greenhouse gas, and air toxics emissions. An amendment is also proposed to provide an exemption from the definition of VOC for hydrofluoroether 7200 based on its negligible photochemical reactivity with respect to formation of ground level ozone. Other amendments are proposed to clarify or simplify existing regulatory provisions.

08-6-6: Public Meeting to Consider Approval of the Western Mojave Desert 8-hour Ozone State Implementation Plan (SIP) and Approval of the Ventura 8-hour Ozone SIP

ARB staff will brief the Board on locally adopted attainment demonstration plans for the Ventura County and the Western Mojave Desert federal ozone non-attainment areas. Staff is recommending that the Board approve these plans as revisions to California's State Implementation Plan.

08-6-7: Update the Board on the Implementation of the Enhanced Vapor Recovery (EVR) Program

Staff will present an update to the Board on the implementation of the Enhanced Vapor Recovery (EVR) program, including progress towards meeting the April 1, 2009 deadline for EVR Phase II systems.

CLOSED SESSION – LITIGATION

The Board will hold a closed session as authorized by Government Code section 11126(e) to confer with, and receive advice from, its legal counsel regarding the following pending litigation:

Central Valley Chrysler-Jeep, Inc. et al. v. Goldstene, U.S. District Court (E.D. Cal. - Fresno), No. 1:04-CV-06663-AWI-GWA.

Fresno Dodge, Inc. et. al. v. California Air Resources Board and Witherspoon, Superior Court of California (Fresno County), Case No. 04CE CG03498.

General Motors Corp. et. al. v. California Air Resources Board and Witherspoon, Superior Court of California (Fresno County), Case No. 05CE CG02787.

State of California by and through Arnold Schwarzenegger, Governor of the State of California, and the California Air Resources Board v. U.S. Environmental Protection Agency and Stephen L. Johnson, Administrator, U.S. Court of Appeals (D.C. Cir.), Case No. 07-1457, filed November 8, 2007.

State of California by and through Arnold Schwarzenegger, Governor of the State of California, and the California Air Resources Board v. U.S. Environmental Protection Agency and Stephen L. Johnson, Administrator, U.S. District Court (D.C.) Case No. 07-CV-o2024-RCL, filed November 8, 2007.

State of California by and through Arnold Schwarzenegger, Governor, and the California Air Resources Board v. U.S. Environmental Protection Agency, and Stephen L. Johnson, Administrator, U.S. Court of Appeals (9th Cir.) Case No. 08-70011, filed January 2, 2008.

Green Mountain Chrysler-Plymouth-Dodge-Jeep, et al. v. Crombie , 508 F.Supp.2d 295, U.S. District Court Vermont (2007), appeal to 2nd Circuit Court of Appeals pending, Docket Nos. 07-4342-cv(L) and 07-4360-cv(CON).

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST.

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

OPEN SESSION TO PROVIDE AN OPPORTUNITY FOR MEMBERS OF THE PUBLIC TO ADDRESS THE BOARD ON SUBJECT MATTERS WITHIN THE JURISDICTION OF THE BOARD.

Although no formal Board action may be taken, the Board is allowing an opportunity to interested members of the public to address the Board on items of interest that are within the Board's jurisdiction, but that do not specifically appear on the agenda. Each person will be allowed a maximum of three minutes to ensure that everyone has a chance to speak.

TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO:
http://www.arb.ca.gov/lispub/comm/bclist.php

IF YOU HAVE ANY QUESTIONS,
PLEASE CONTACT THE CLERK OF THE BOARD
1001 I Street, 23rd Floor, Sacramento, CA 95814

(916) 322-5594
FAX: (916) 322-3928
ARB Homepage: www.arb.ca.gov

To request special accommodation or language needs, please contact the following:

- **For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services.**
- **If you are a person with limited English and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at 916-323-7053.**

THE AGENDA ITEMS LISTED ABOVE MAY BE CONSIDERED IN A DIFFERENT ORDER AT THE BOARD MEETING.

SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
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June 26, 2008
9:00 a.m.

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CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER APPROVAL OF A GRANT UNDER THE INNOVATIVE CLEAN AIR TECHNOLOGIES (ICAT) PROGRAM

The Air Resources Board (the Board or ARB) will conduct a public meeting at the time and place noted below to consider approval of a grant under the Innovative Clean Air Technologies (ICAT) program

DATE: June 26, 2008

TIME: 9:00 am

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, CA 95814

This item will be considered at an one-day meeting of the Board, which will commence at 9 a.m., June 26, 2008. Please consult the agenda for the meeting, which will be available at least 10 days before June 26, 2008, to determine the time on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

The Board's ICAT program co-funds demonstrations of new technologies that can improve air quality in California and support ARB programs while helping to stimulate the state's economy. ARB staff will recommend that the Board approve co-funding a project to support current and future emission control regulation development efforts. This project was selected because it addresses an important ARB program need, is technically sound, can reduce emissions, and can succeed commercially. The Board will consider a proposed resolution to approve co-funding for this project at its meeting.

ARB staff will present an oral presentation at the meeting. The project to be considered is the following: "Demonstration of Particulate Matter Sensor in Post-DPF Environment," submitted by Honeywell Laboratories, for a total amount not to exceed $193,223.

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written comment submissions not physically submitted at the meeting must be received **no later than 12:00 noon, June 25, 2008,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Facsimile submittal: (916) 322-3928

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require 30 copies of any written submission. Also, the ARB requests that written and e-mail statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment. Further inquiries regarding this matter should be directed to Bart Croes, Chief, Research Division, (916) 445-0753, P.O. Box 2815, Sacramento, California 95812.

CALIFORNIA AIR RESOURCES BOARD

Michael R. Scheible

for James N. Goldstene
Executive Officer

Date: June 12, 2008

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATIONS

The Air Resources Board (Board or ARB) will conduct a public hearing at the time and place noted below to consider adoption of amendments to the Regulation for Reducing Volatile Organic Compound (VOC) Emissions from Consumer Products.

DATE: June 26, 2008

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item will be considered at a two day meeting of the Board, which will commence at 9:00 a.m., June 26, 2008, and may continue at 8:30 a.m., June 27, 2008. This item may not be considered until June 27, 2008. Please consult the agenda for the meeting, which will be available at least 10 days before June 16, 2008, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disc. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to sections 94508, 94509, 94510, 94512, 94513, and 94515, title 17, California Code of Regulations.

Background:

Section 41712 of the California Health and Safety Code requires ARB to adopt regulations to achieve the maximum feasible reduction in VOC emissions from consumer products. As part of the regulatory process, ARB must determine that adequate data exist for it to adopt the regulations. ARB must also determine that the regulations are technologically and commercially feasible, and necessary to carry out the Board's responsibilities under Division 26 of the Health and Safety Code. In addition, Health and Safety Code section 41712(c) provides that no regulation shall be

adopted which requires the elimination of a product form. Section 41712 is primarily directed at attaining the State and federal ozone standards.

Pursuant to Health and Safety Code section 41712, ARB has adopted the Regulation for Reducing VOC Emissions from Consumer Products (the "Consumer Products Regulation;" title 17, CCR, sections 94507-94517.

On September 25, 2007, ARB adopted the State Strategy for California's 2007 State Implementation Plan (2007 SIP). The 2007 SIP serves as California's overall plan to provide the emission reductions necessary to meet the federal ozone standard of 0.08 parts per million averaged over eight hours. As part of the 2007 SIP, ARB has committed to an additional 30 to 40 ton per day VOC reduction from consumer products by 2014. Under the commitment, rulemakings are to occur in 2007 and 2008 with reductions occurring in the 2010 to 2012 timeframe. Further rulemakings between 2010 and 2012, with implementation dates between 2012 and 2014, are to complete the emission reduction commitment. Achieving additional VOC reductions from consumer products is an important element of the SIP and is necessary to attain State and federal air quality standards.

In 2006, Assembly Bill 32, The California Global Warming Solutions Act of 2006 (AB 32) was signed into law. This law created a comprehensive, multi-year program to reduce global warming compound emissions in California, with the overall goal of restoring emissions to 1990 levels by 2020. Assembly Bill 32 added section 1. division 25.5 (commencing with section 38500) to the Health and Safety Code.

Assembly Bill 32 additionally recognizes that immediate progress in reducing GHG emissions can and should be made. In October 2007, the ARB approved a list of early action GHG reduction measures. A subset of these early action measures was identified as Discrete Early Action Measures. Discrete Early Actions are Board adopted regulations to reduce GHG emissions, which are to be legally effective by January 1, 2010. One of the approved Discrete Early Action Measures, designated in the Early Action Report, pertains to reducing the use of compounds with high global warming potentials in consumer products. The consumer products measure is estimated to achieve an emission reduction equivalent to reducing 0.25 million metric tons of carbon dioxide per year.

Description of Proposed Regulatory Action

The proposed regulatory action would amend the existing Consumer Products Regulation by adding and modifying product category definitions and by establishing new or lower VOC limits for multiple categories. For some of the categories, separate VOC limits are specified for different product forms. All of these VOC limits, except one, are specified as percent by weight VOC. For one category, staff is proposing a grams of VOC per use limit. This mass limit is proposed for fabric softener products used in clothes dryers. An additional proposal would remove the "grandfather" clause that pertains to Personal Fragrance Products with 20 percent or less fragrance. Removing

this clause would require all Personal Fragrance Products with 20 percent or less fragrance to meet a single VOC limit. The new or modified VOC limits would become effective between December 31, 2010 and December 31, 2015. These amendments would partially fulfill the consumer products SIP commitment.

The proposed amendments would also reduce the use of compounds with high global warming potential in Pressurized Gas Duster products. These products could only use compounds with (GWP) factors below 150. As proposed, the GWP values used to determine compliance are those set forth in the Intergovernmental Panel on Climate Change, Second Assessment Report, or if applicable, the Fourth Assessment Report.

A modification to the definition of VOC is also being proposed. This modification would exclude hydrofluoroether 7200 from the definition based on its negligible impacts on ground-level ozone formation.

The proposed regulatory action would also prohibit the use of the toxic air contaminants methylene chloride, perchloroethylene, and trichloroethylene in Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, and Spot Remover. Use of methylene chloride and perchloroethylene would also be prohibited in Pressurized Gas Dusters.

In addition, a number of other modifications or clarifications are proposed. These include modifications to product date-coding requirements, product "sell-through" provisions, requirements for dilutable products, reporting requirements, and additional labeling requirements for certain specified categories. A number of minor changes are also proposed to various provisions of the regulation in order to correct errors or improve clarity.

COMPARABLE FEDERAL REGULATIONS

The U.S. Environmental Protection Agency (U.S. EPA) has promulgated a national consumer products rule under section 183(e) of the federal Clean Air Act: *National Volatile Organic Compound Emission Standards for Consumer Products.* (40 CFR Part 59, subpart C, sections 59.201 *et seq.*) The rule specifies VOC limits for a number of consumer product categories, and is similar in format to ARB's consumer products regulation. In the summer of 2006, U.S. EPA began work on amendments to their existing national consumer products rules. Their amendments are based on amendments to California's Consumer Products Regulation that occurred in 2004. In that rulemaking, VOC limits for 15 categories were adopted. U.S. EPA's amendments are expected to become effective on January 1, 2009.

Although the national regulation is similar in many aspects to the California regulation, it is less effective in reducing VOC emissions from consumer products. The U.S. EPA's rule does not regulate a number of product categories that are currently regulated under the ARB regulation. For the categories that are regulated under both rules, many of ARB's limits are more stringent than the U.S. EPA's limits. The existing national

regulation achieves a 20 percent reduction in VOC emissions, while California's existing Consumer Products Regulation has already achieved a 50 percent emission reduction in the regulated categories. Because California has unique air quality problems, we must reduce VOC emissions from all categories, including consumer products, to the maximum extent feasible, to attain the federal and State ambient air quality standards for ozone.

The U.S. EPA's rule also differs in that it applies nationwide to consumer product manufacturers, importers and distributors (but not retailers), while the ARB regulation applies to any person (including retailers) who "sells, supplies, offers for sale, or manufactures consumer products for use in the State of California." Finally, the U.S. EPA's rule has an unlimited "sell-through" period for non-complying products manufactured before the effective date of the limits, whereas California law limits the sell-through period to three years.

U.S. EPA's consumer products rule also does not prohibit the use of certain toxic air contaminants. In aggregate, ARB's consumer products regulations have prohibited the use of certain chlorinated toxic air contaminants in 63 categories, resulting in emission reductions of 13 tons per day.

There is no comparable federal regulation related to reducing GHG emissions in consumer products.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed action, which includes the rationale for the proposed amendments and a summary of the potential environmental and economic impacts of the proposal.

Copies of the ISOR and the full text of the proposed regulatory language, in strikeout/underline format to allow for comparison with the existing regulations, may be obtained from the Board's Public Information Office, Air Resources Board, 1001 I Street, Visitor and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing (May 9, 2008). These documents are also available on ARB's website listed below, or by contacting the agency contact persons listed below.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons identified below, or may be accessed on the ARB's web site listed below.

Inquiries concerning the substance of the proposed regulatory action may be directed to Ms. Carla Takemoto, Manager, Technical Evaluation Section, Stationary Source Division, at (916) 324-8028, e-mail ctakemot@arb.ca.gov, or Mr. Olufemi Olaluwoye, Air Pollution Specialist, at (916) 327-1503, e-mail oolaluwo@arb.ca.gov

Further, the agency representative and designated back-up contact persons to whom non-substantive inquiries concerning the proposed administrative action may be directed are Lori Andreoni, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-4011 or Trini Balcazar, Regulations Coordinator, (916) 445-9564. The Board staff has compiled a record for this rulemaking action, which includes all information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR, and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at http://www.arb.ca.gov/regact/2008/cp2008/cp2008.htm

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the ARB Executive Officer concerning the cost or savings necessarily incurred by public agencies and private persons and business in reasonable compliance with the proposed regulatory action are presented below.

The ARB Executive Officer has determined that the proposed regulatory action would not create costs or savings, as defined in Government Code section 11346.5(a)(5) and 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 nondiscretionary costs or savings to state or local agencies.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons and businesses. The Executive Officer has initially determined that there will be a potential cost impact on private persons or businesses directly affected as a result of the proposed regulatory action. As explained in the ISOR, the proposed amendments may have a significant adverse impact on some individual businesses but the overall statewide impacts are not expected to be significant.

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

In accordance with Government Code section 11346.3, the Executive Officer has initially determined that the proposed amendments would have minimal impacts on the creation or elimination of jobs within the State of California, minimal impacts on the creation of new businesses and the elimination of existing businesses within the State of California, and minimal impacts on the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed amendments can be found in the ISOR.

The Board's Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action would affect small businesses.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons or businesses than the proposed action.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by e-mail before the hearing. To be considered by the Board, written submissions not physically submitted at the hearing must be received no later than **12:00 noon, June 25, 2008**, and addressed to the following:

Postal mail:	Clerk of the Board Air Resources Board 1001 I Street, 23rd Floor Sacramento, California 95814
Electronic submittal:	http://www.arb.ca.gov/lispub/comm/bclist.php
Facsimile submittal:	(916) 322-3928

The Board requests but does not require that 30 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted to the ARB in sections 38501, 38510, 38560, 38560.5, 38562, 38580, 39600, 39601, 41511, and 41712 of the Health and Safety Code. This action is proposed to implement, interpret, or make specific sections 38501, 38510, 38560, 38560.5, 38562, 38580, 39600, 39601, 41511, and 41712 of the Health and Safety Code.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non-substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: 4-29-08

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs see our Web –site at www.arb.ca.gov.

California Environmental Protection Agency
Air Resources Board

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

Release Date:
May 9, 2008

State of California
AIR RESOURCES BOARD

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

To be considered by the Air Resources Board at a Public Hearing on June 26, 2008, at:

Byron Sher Auditorium
Air Resources Board, Cal/EPA Headquarters
1001 I Street
Sacramento, CA 95812

Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

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State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATION

Prepared by:

Stationary Source Division
Air Resources Board

Reviewed by:

Carla D. Takemoto, Manager, Technical Evaluation Section
David Mallory, P.E., Manager, Measures Development Section
Judy Yee, Manager, Implementation Section
Janette M. Brooks, Chief, Air Quality Measures Branch
Robert Barham, Ph.D., Assistant Chief, Stationary Source Division
Robert Fletcher, P.E., Chief, Stationary Source Division

May 9, 2008

ACKNOWLEDGMENTS

This report and the proposed amendments to the Consumer Products Regulation were developed by the following Air Resources Board staff:

Olufemi Olaluwoye (Lead)
Katherine Akins
Jeff Austin
Robert Barrera
Nicholas Berger
John Constantino
Richard Corey, M.B.A
Deborah Drechsler, Ph.D.
Barbara Fry
Steve Giorgi
Marline Hicks
Trish Johnson
Deborah Kerns, Esq.
Jennifer Kiger
Marja-Liisa Magnuson
Reza Mahdavi, Ph.D.
Nehzat Motallebi, Ph.D.
Tina Najjar
Jasmine Nguyen
Jose Saldana
Linda Smith, Ph.D.
Hien Tran, Ph.D.
Maryana Visina
Zuzana Vona
Barbara Weller, Ph.D.
Evan Wong

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State of California
AIR RESOURCES BOARD

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

Executive Summary

EXECUTIVE SUMMARY

In this rulemaking, California Air Resources Board (ARB or Board) staff is proposing amendments to the Consumer Products Regulation that are designed to reduce volatile organic compound (VOC) and air toxic emissions. The proposed amendments would also reduce the global warming potential (GWP) of greenhouse gas (GHG) compounds used in a specific product category. 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) to meet the federal ozone standard. The proposed amendment to reduce the use of compounds with high GWP is designed in accordance with the Discrete Early Action Measure requirements as set forth in the California Global Warming Solutions Act of 2006 (AB 32).

The proposed amendments would set new VOC limits for multiple product categories. When fully implemented, about 5.8 tons per day VOC emission reduction would be achieved. The proposed amendments would also set the first GWP limit for consumer products. Reductions in the use of compounds with high GWP is equivalent to reducing carbon dioxide emissions by 0.20 million metric tons (MMT CO_2e) per year. Air toxics emissions would be reduced by about 0.2 tons per day by prohibiting the use of certain chlorinated toxic air contaminants (TAC) in seven categories.

As proposed, other amendments would exempt a compound from the definition of VOC, and language modifications would clarify and improve existing regulatory provisions.

In developing the proposal, staff evaluated the economic and environmental impacts. Staff found that the proposed amendments should result in an overall environmental benefit in that exposure to ground-level ozone and TACs would be reduced. Reducing the use of compounds with high GWP would have a beneficial impact on climate change. No significant adverse environmental or economic impacts were identified.

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 Procedures Act. Appendix B contains the regulation with the proposed changes shown in underline and ~~strikeout~~ form.

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

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; disinfectants; automotive specialty products; and aerosol paints.

The Health and Safety Code sets forth ARB's authority to regulate consumer products to control VOCs and GHGs. 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. 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 standard 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. The intent of section 41712 is primarily to reduce ground-level ozone concentrations.

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

In 2006, 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. 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 additional GHG reduction of 80 percent 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.

B. EXISTING REGULATIONS

Over the last twenty years, the Board has taken numerous actions to fulfill the legislative mandate pertaining to the regulation of consumer products. Three regulations have been adopted that affect 115 consumer product categories by setting 150 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. We have also reduced exposure to TACs. Emissions of TACs have been reduced by 13 tons per day by prohibiting use of 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. 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 established in 2004. Participation in the CPRWG was open to any member of the public. The CPRWG participated in the development of the 2003 Consumer and Commercial Products Survey (2003 Survey), which serves as the basis for this proposal. The CPRWG was instrumental in the development of the 2004 and 2006 amendments, as well as these proposed amendments. Consumer product manufacturers, chemical producers, marketers, trade associations, environmental groups, air districts, and various other stakeholders, have all actively participated.

Further outreach, beyond the CPRWG, was conducted to identify and involve stakeholders in the development of the Discrete Early Action Measure for GHG reductions. For example, in February 2008, ARB conducted a survey for the Pressurized Gas Duster category to update sales and formulation data for the 2007 calendar year (ARB, 2008c).

The categories proposed for regulation in this rulemaking were deferred from consideration as part of the 2006 rulemaking. During that rulemaking, numerous issues were raised that required additional evaluation and analysis in these categories. In addition to the outreach for the 2006 rulemaking, where proposals for these categories were initially discussed, a public CPRWG meeting and a public workshop were conducted on August 29, 2007 and March 5, 2008, respectively. Prior to meetings, staff posted materials for review and comment to the CPRWG activity website.

D. EMISSIONS

Although each consumer product may seem to be a small source of emissions, the cumulative use of these products by over 37 million Californians results in significant emissions (CA DOF, 2007).

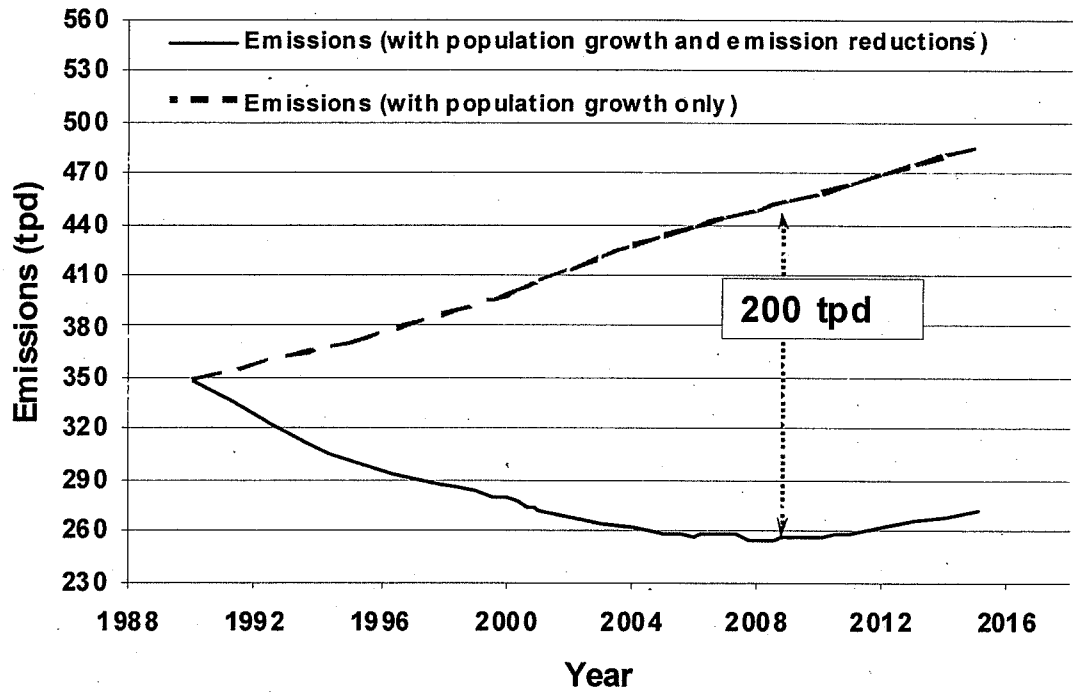
1. VOC Emissions

Consumer products are a significant source of VOC emissions in California and 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 243 tons per day, or about 12 percent of the overall VOC inventory. In this same year, consumer product emissions will comprise about 18 and 7 percent of VOC emissions in the South Coast Air Quality Management District (SCAQMD) and San Joaquin Valley Air Pollution Control District (SJVAPCD), respectively. Without further actions, consumer product emissions are expected to grow to approximately 270 tons per day in 2020, representing 14 percent of statewide VOC emissions (ARB, 2007h).

As control measures for other VOC sources (*i.e.* on-road motor vehicles) become effective, consumer product emissions become more important in the SCAQMD. In fact, it is estimated that emissions from consumer products will be the number one 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 (for e.g., mobile sources), clearly, further reductions in VOC emissions from consumer products and other VOC sources are needed, if ozone attainment is to be achieved.

Despite these projections, ARB's consumer products program is a success story. Since 1989, regulations adopted by the ARB, and subsequent amendments, have significantly reduced VOC emissions from consumer products. Absent these regulations today, consumer product emissions would likely be over 440 tons per day. Figure ES-1 shows that statewide consumer product VOC emissions will have been reduced by over 200 tons per day in 2010. However, Figure ES-1 also shows that without further actions population growth would likely reverse the trend.

Figure ES-1
Consumer Products VOC Emission Trends



The emission values in Figure ES-1 are derived from several data sources. Emissions for 1990 to 2006 are taken from the ARB Forecasted Emissions by Summary Category, 2007 Almanac (ARB, 2007h). 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 Consumer Products Amendments, emission values from the 2003 Survey and the projected emissions reductions resulting from the VOC limits approved in 2006, are reflected in the Figure.

2. Greenhouse Gas Emissions

Greenhouse gas emissions from consumer products are small relative to other sources, such as vehicle exhaust. However, the magnitude of the climate change problem justifies reductions from both large and small sources, wherever such measures are feasible and cost-effective. While staff is still in the process of developing the consumer product GHG inventory, we do know from past surveys that several compounds with high GWP are used in consumer products.

Consumer products use various GHGs, mostly as propellants. To a much lesser degree, several solvents with fairly high GWPs are used. The propellants are typically low photochemically reactive compounds that are exempt VOCs. They have been used as a reformulation strategy to reduce VOC content. Compounds of interest include

hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), hydrofluoroethers (HFEs), carbon dioxide (CO_2), and nitrous oxide (N_2O). However, the propellants HFC-134a and HFC-152a are the predominate GHGs used in consumer products today. Compressed CO_2 is also used as a propellant, but the GHG emissions are negligible compared to the emissions from HFCs. Table ES-1 shows some examples of GHGs that are used in consumer products.

Table ES-1
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, IPCC Second Assessment Report value
** 100 year timeframe, IPCC Fourth Assessment Report value

Using the values in Table ES-1, we see that the GWP for HFC-134a is approximately ten times greater than the GWP of HFC-152a and 1300 times greater than CO_2. Reductions in the use of HFC-134a are being pursued in this rulemaking.

GHG emissions data are available from a 2003 Survey of consumer products. Staff has evaluated these data for possible GHG reductions and development of new regulations for this rulemaking. In the 2006 Survey, we collected information from manufacturers of consumer products to determine the usage of compounds with high GWP in additional categories of consumer products. Staff will use the 2006 Survey data to develop the GHG inventory for consumer products, and evaluate the data for product categories where compounds with high GWP are used to determine if there is a potential to reduce their use without increasing the use of VOCs.

E. EMISSION REDUCTION MANDATES

Reduction of VOCs and GHGs are necessary to attain California's ambient air quality standards and climate change reduction goals, respectively. The role of consumer products to meet these mandates is described in this section.

1. Consumer Products and California's State Implementation Plan

In 1988, with the passing of the CCAA, the importance of controlling emissions from consumer products was set forth. To meet the federal standards, in 1994 emission reductions from consumer products became part of the California 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 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 150 VOC limits for 115 categories of consumer products (including antiperspirants and deodorants and 36 aerosol coatings categories) have been established to date. The adopted limits will achieve a 44 percent reduction in overall VOC emissions from consumer products by the year 2010.

The 2003 SIP was withdrawn, however, the remaining consumer product emission reduction commitment was incorporated into the Strategy, which 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 2014. Under the commitment, rulemakings are to occur in the 2007 to 2008 timeframe with reductions occurring between 2010 to 2012. Further rulemakings between 2010 and 2012, with implementation dates in the 2012 to 2014 timeframe, are to complete the emission reduction commitment.

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 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 intended to partially fulfill the Strategy commitment for VOC reductions from consumer products.

2. Discrete Early Action Measures and Scoping Plan

Among other things, AB 32 requires ARB to design and adopt an overall Scoping Plan, by January 1, 2009, that identifies how GHG emissions can be reduced back to 1990 levels. AB 32 additionally recognizes that immediate progress in reducing GHG emissions can and should be made. Accordingly, AB 32 required ARB to identify a list of "Discrete Early Action GHG Reduction Measures" by June 30, 2007. Discrete Early Actions are Board adopted regulations to reduce GHG emissions that become legally effective by January 1, 2010. These measures are to become part of the State's comprehensive strategy for achieving GHG reductions. Beyond the requirements of AB 32, the Governor's Executive Order EO-S-03-05 calls for an additional GHG reduction of 80 percent by 2050.

In June 2007, ARB approved a list of early action GHG reduction measures. Additions to the list were approved by the Board at its October 2007 hearing. A subset

of these early action measures was identified as "Discrete Early Action Measures." One of the approved Discrete Early Action Measures designated in the Early Action Report calls for the reduction in use of high GWP GHGs in consumer products. The measure was estimated to achieve an emissions reduction of 0.25 MMT CO_2e per year from consumer products (ARB, 2007b).

The objective of the Consumer Products Discrete Early Action Measure is to reduce the use of compounds with high GWP when alternatives are available. To achieve reductions of GHG emissions, consumer product formulations would need to be changed to reduce or eliminate the use of compounds with high GWPs. The reduction in use of compounds with high GWP in consumer products is a long-term effort. We are continuing to develop an emission inventory that will be used to evaluate reduction opportunities.

We are proposing a GWP limit for Pressurized Gas Duster products. If adopted by ARB, this will be the first GWP limit in place for consumer products. In future rulemakings, staff anticipates developing proposals for reductions of GHGs from other consumer product categories.

F. ESTIMATED EMISSIONS FROM CATEGORIES PROPOSED TO BE REGULATED

The 2003 Survey serves as the basis for the proposed amendments to reduce VOC emissions. The 2003 Survey provided staff with detailed information on the formulations of consumer products, 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 provided. Information on sales, product form, customer types, and company size and economics were also included. For this rulemaking, the 2008 emissions and reduction estimates for 2010, 2012, 2013, 2014, and 2015 were grown from 2003 sales data and the state Department of Finance's population estimates. Annual population growth factors were calculated using the 2008 State population figures and 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 categories proposed for VOC regulation contribute about 22.6 tons per day of 2008 VOC emissions.

The GHG emissions from Pressurized Gas Dusters are estimated to be 0.37 MMT CO_2e per year. This estimate is based on the results of the Pressurized Gas Duster Survey update collected in February, 2008 (ARB, 2008a).

G. SUMMARY OF PROPOSED AMENDMENTS

First of all, to reflect that the "Regulation to Reduce Volatile Organic Compounds from Consumer Products" now contains requirements for both VOC and GHG reductions, we are proposing to rename the regulation. As proposed, the regulation would be re-titled "Regulation to Reduce Emissions from Consumer Products."

Amendments are being proposed to six 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." In addition to the amendments described below, a number of non-substantive grammatical and organizational changes are also proposed. Chapter V of the Technical Support Document contains more complete information on each proposal.

1. Definitions (Section 94508)

Section 94508, "Definitions," provides all the terms used in the Consumer Products Regulation which are not self-explanatory. As shown in Table ES-2, the proposed amendments to the Consumer Products Regulation include new or revised definitions. These definitions are necessary to define categories proposed for VOC limits or greenhouse gas limits, or to improve enforceability of the Consumer Products Regulation. Note that a number of categories have been previously regulated and we are now proposing lower VOC limits. Several definitions require further clarification.

Global Warming Potential and Global Warming Potential Value: We are proposing new definitions for Global Warming Potential (GWP) and Global Warming Potential Value (GWP Value). These definitions are necessary to implement our proposal to reduce the use of compounds with high GWPs in Pressurized Gas Dusters. 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 CO_2. The GWP Value definition specifies that the IPCC Second Assessment Report (SAR) would be used to determine GWP values (IPCC, 1996). To enforce the proposal for reducing the use of compounds with high GWP, the definition would further specify 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 will be used. If there is no GWP value listed for a chemical or compound in the SAR or the FAR, then the GWP value will be assumed to be equal to the applicable GWP limit (*i.e.* the GWP limit established for specific consumer product categories), for the purpose of determining compliance with any GWP limit.

Pressurized Gas Duster Definition: Currently, the definition for Pressurized Gas Duster describes a product used to remove dust on surfaces that cannot be cleaned with a solvent. In developing the proposal for Pressurized Gas Dusters, staff became aware that there are certain niche uses of these products where flammability is a

Table ES-2
Proposed New and Modified Definitions

Previously Unregulated Categories with New VOC Limits	
Astringent/Toner Fabric Softener – Single Use Dryer Product Floor Maintenance Product Motor Vehicle Wash	Odor Remover/Eliminator Pressurized Gas Duster Tire or Wheel Cleaner Windshield Water Repellent
Previously Regulated Category with Lower Limit	
Carpet/Upholstery Cleaner Dusting Aid Fabric Protectant Floor Polish or Wax --Wood Floor Wax Glass Cleaner Multi-Purpose Lubricant Penetrant	Personal Fragrance Product (products with 20% or less Fragrance) Sealant or Caulking Compound--Chemically Curing Sealant or Caulking Compound--Non-chemically Curing Spot Remover
Other New or Modified Definitions	
Existing Product Disinfectant Fabric Refresher Global Warming Potential Global Warming Potential Value	Lubricant Metal Polish/Cleanser Not for Retail Sale Volatile Organic Compound

concern. These products rely on a non-flammable propellant with a high GWP. At the present time, no technology exists that would maintain this non-flammable aspect if these products were mandated to comply with our proposed GWP limit for this category. Therefore, we are proposing a modification to the definition for Pressurized Gas Duster to exclude products used on energized equipment as long as the Principal Display Panel specifies "Energized Equipment use only." As proposed, products so-labeled would neither be subject to the GWP limit nor the VOC limit.

Not for Retail Sale: The current regulation includes several provisions where an exemption from compliance is provided if certain criteria are met. For example, General Purpose Degreasers and Lubricants are not subject to VOC limits if they are sold exclusively to establishments which manufacture or construct good or commodities and are labeled "not for retail sale." Staff has received numerous inquiries as to what "not for retail sale" means. Therefore, staff is proposing to define this term. As proposed, Not for Retail Sale means that a product is sold exclusively to establishments that manufacture or construct goods or commodities, or are products sold to holders of commercial licenses (*e.g.* an electrician). For purposes of the regulation, "Not for Retail Sale" means the product is not sold in retail outlets or wholesale locations where household consumers may purchase it.

VOC Definition: We are proposing to modify the definition of VOC to exclude hydrofluoroether (HFE) 7200. HFE 7200 is a solvent used in precision cleaning. In a report titled "Environmental Impact Assessment of Selected Halogenated Chemicals" ARB staff determined that use of HFE 7200 has negligible impacts on ground-level ozone formation. It also has a fairly low GWP. No other adverse impacts were identified (ARB, 2008b). Therefore, to provide an additional reformulation option that could result in further VOC reductions, staff believes the exemption is appropriate.

2. Proposed Amendments to 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-3. Some of the categories are previously unregulated and others are currently regulated. For the currently regulated categories we are proposing lower VOC limits. The new or modified VOC limits would become effective between December 31, 2010 and December 31, 2015, as indicated in Table ES-3. An additional lower limit for Multi-purpose Lubricant is proposed to become effective on December 31, 2015. All of these changes would be reflected in the Table of Standards in section 94509(a). Note that in some cases different VOC limits are proposed based on product form.

Extended effective dates are proposed for categories where the proposed limits, while feasible, will require additional resources to develop complying products. This is especially true for the technology forcing second tier VOC limit proposed for the Multi-purpose Lubricant category. Table ES-3 also shows that statewide VOC emissions would be reduced by about 5.8 tons per day when all limits are fully effective. These reductions would partially fulfill the consumer products element in the Strategy. Several VOC limit proposals in Table ES-3 warrant further explanation as provided below.

a. Proposal for Fabric Softener-Single Use Dryer Product: Fabric Softener-Single Use Dryer Product is a previously unregulated category. As shown in Table ES-3, a grams of VOC per use limit is being proposed for these products, rather than a percent by weight limit. Our rationale for this proposal is described later in this subsection.

b. Proposal for Personal Fragrance Products: Staff is proposing that any Personal Fragrance Products with 20 percent or less fragrance be required to meet the existing January 1, 1999, limit of 75 percent by weight VOC limit. This would remove the so called "Grandfather" clause currently contained in subsections 94510(h) and (l). Our proposal is further described in subsection 3 of this Executive Summary.

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

Product Category		Product Form	Proposed VOC Limit (percent by weight)	2008 VOC Emissions* (tons per day)	Reductions at Effective Date (tons per day)
Astringent / Toner (non-FDA regulated) [a]		All	35	0.62	0.11
Carpet/Upholstery Cleaner[a]		Aerosol	5	0.32	0.07
		Non-aerosol	1	0.29	0.07
Dusting Aid[a]		Aerosol	17	0.27	0.08
		Non-aerosol	3	0.01	0.00
Fabric Protectant[a]		Non-aerosol	1	0.18	0.08
Fabric Softener – Single Use Dryer Product[a]		All	0.05 grams per use**	0.52	0.21
Floor Maintenance Product[a]		All	1	0.11	0.07
Floor Polish or Wax – Wood Floor Wax[a]		All	70	0.06	0.01
Glass Cleaner[b]		Aerosol	10	0.33	0.03
Motor Vehicle Wash[a]		All	0.2	0.38	0.14
Multi-purpose Lubricant – excluding solid & semisolid[c/e]		All	25[c]	4.08	2.04
			10[e]		1.27
Odor Remover/Eliminator[a]		Aerosol	25	***	0.00
		Non-aerosol	6	0.12	0.03
Penetrant[c]		All	25	0.40	0.15
Personal Fragrance Product (products with 20% or less fragrance)[d]		All	75+	10.89	0.41
Pressurized Gas Duster[a]		All	1	0	0
Sealant or Caulking Compound	Chemically Curing[b]	Non-aerosol	3	1.9	0.22
	Non-Chemically Curing[a]	Non-aerosol	1.5	0.68	0.12
Spot Remover[a]		Aerosol	15	0.76	0.24
		Non-aerosol	3	0.29	0.05
Tire or Wheel Cleaner[a]		Aerosol	8	0.01	0.00
		Non-aerosol	2	0.14	0.06
Windshield Water Repellent[a]		All	75	0.23	0.04
Total Emissions 2008		**22.61 tons per day**			
Total VOC Reductions 2015		**5.76 tons per day**			

* Survey emissions adjusted for market coverage, and grown to the 2008 calendar year
** Grams per use limit provides emissions reductions equivalent to 2.6% VOC limit, including fragrance
*** Omitted to protect confidentiality
\+ Remove "Grandfather" clauses

Effective Dates:
a: 12/31/2010
b: 12/31/2012
c: 12/31/2013
d: 12/31/2014
e: 12/31/2015

c. Proposal for Furniture Maintenance Product: Although not shown in Table ES-3, staff is proposing to reinstate the long-standing exemption for solid and paste forms of Furniture Maintenance Products. This exemption was inadvertently omitted during the 2006 rulemaking. The exemption clarifies that solid and paste forms of this type of product are not subject to the current VOC limit of three percent by weight.

Proposed Requirement for Dilutable Products: Currently, the VOC limits for products, that are to be diluted prior to use, are applied after the minimum recommended dilution. Staff has become aware of products packaged in pump spray containers that appear to be marketed as "ready-to-use" products, but are designed to be diluted by the user prior to use. Staff believes this approach to packaging may be diminishing anticipated VOC reductions, and is a potential circumvention of the intent of the regulation. Therefore, staff proposes a modification to section 94509(b)(4), clarifying that products sold in pump spray containers are required to meet the specified VOC limit prior to any minimum recommended dilution.

Date Coding Requirements: Subsections 94509 (i), (m), (n), (o) and (p) specify prohibitions on use of certain chlorinated compounds in specified categories. We are proposing to clarify the date coding requirement that must be met to qualify as a "sell-through" product. As proposed, the product would need to comply with the product dating requirements in section 94512(b).

Prohibition of Toxics from Specific Categories: To mitigate a potential adverse environmental impact, staff is proposing a new subsection (q) within section 94509 to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene in "Carpet/Upholstery Cleaner," "Fabric Protectant," "Multi-Purpose Lubricant," "Penetrant," "Sealant or Caulking Compound," and "Spot Remover."

Under the California Environmental Quality Act (CEQA), ARB is required to identify and mitigate any possible adverse environmental impacts of regulatory actions. 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 TACs. Therefore, because there are many products that comply with the proposed limits, without the use of these chlorinated solvents, prohibiting their use is appropriate to protect the public from exposure to these TACs.

In evaluating the use of these TACs, staff has become aware that certain Penetrants are designed for use on energized equipment. In these situations the products must be non-flammable as a safety precaution. To provide this non-flammable aspect, the chlorinated solvents are used. At the present time, staff is not aware of alternative solvents that can perform this function. Therefore, staff is proposing that Penetrants that include on the Principal Display Panel: "Non-flammable: For use on Energized Equipment Only," not be subject to this prohibition. They would, however, be required to meet the proposed VOC limits.

Proposal for Pressurized Gas Dusters: The reduction of GHGs in consumer products has been designated as a Discrete Early Action Measure in accordance with AB 32. One of the first consumer product emission sources identified is GHG compounds used in aerosol products. As a first step, staff is proposing, in new subsection 94509(r)(1), that Pressurized Gas Dusters shall not contain any compound that has a GWP of 150 or greater. Staff is also proposing in section 94509(r)(2) that Pressurized Gas Dusters would be provided a one-year sell-through after the effective date of the limits.

In accordance with CEQA, to ensure that the VOC content of these products does not increase as a result of reformulation to meet GWP limits, a one percent by weight VOC limit, including fragrance, is also being proposed for Pressurized Gas Dusters. The proposal would also prohibit use of the TACs, perchloroethylene and methylene chloride.

We are also proposing to specify that any chemical compounds that are present as impurities in an amount, in aggregate, of 0.1 percent by weight or less, are not subject to the GWP limit or toxics prohibition for Pressurized Gas Dusters. Some of the chemical compounds used in Pressurized Gas Dusters may contain very small quantities of contaminants. This provision would allow Pressurized Gas Dusters that contain those contaminants, present at very low levels, to comply with the regulatory provisions.

Staff has also become aware that certain Pressurized Gas Dusters are designed for use on energized equipment. In these situations the products must be non-flammable as a safety precaution. To provide this non-flammable aspect, higher GWP propellants are used. At present time, staff is not aware of alternative propellants that can perform this function. Therefore, staff is proposing that Pressurized Gas Dusters that specify on the Principal Display Panel "Energized Equipment use only" be exempt from compliance with both the VOC and GWP limit.

Requirements for Fabric Softener-Single Use Dryer Product: Staff is proposing a new subsection 94509(s) to describe the VOC content limit for Fabric Softener-Single Use Dryer Product. Rather than a percent by weight limit, a 0.05 grams of VOC per use limit is proposed. The limit is designed to provide a level playing field and to ensure that the size of the sheet substrate does not increase. In developing the limit for these products, staff determined that establishing a percent by weight limit could result in manufacturers using larger size sheets to comply. This would diminish emission reductions and potentially lead to increasing the solid waste stream. Therefore, in accordance with CEQA, the grams per use limit is proposed. The 0.05 grams of VOC limit is designed to provide emission reductions roughly equivalent to a 2.6 percent by weight VOC per use limit, including fragrance. Because the limit already accounts for the fragrance, there is no need to provide the fragrance exemption contained in section 94510(c) for these products. This modification is proposed in section 94510(c).

3. Proposed Amendments to Section 94510, Exemptions (subsections (h) and (l))

At present, Personal Fragrance Products with 20 percent or less fragrance are required to meet an 80 percent or a 75 percent by weight VOC limit, depending on when they first were introduced to the market. Products existing prior to ARB setting these two-tier limits do not need to comply with either limit. Products that were introduced between 1995 and 1999 are required to meet the 80 percent limit, but did not need to reformulate to meet the second-tier January 1, 1999, limit. Only products introduced after January 1, 1999, are required to meet the 75 percent limit. These exemptions, or "Grandfather" clauses, are contained in subsections 94510(h) and (l). Staff is proposing to remove these "Grandfather" clauses. Under this proposal, all Personal Fragrance Products with 20 percent or less fragrance would be required to meet the 75 percent limit effective December 31, 2014. The additional compliance deadline is proposed to account for the large number of products that will need to be reformulated. These proposals are contained in new subsections 94510(h)(3) and (l)(1).

4. Proposed Amendments to Section 94512, Administrative Requirements

Proposed Modification to Product Dating Requirements: Currently, section 94512(b)(1) specifies that a product must clearly display the date or code indicating the date of manufacture. We are proposing language to clarify that a sequential batch number on a product package does not satisfy the product dating requirements.

Proposed Modification to Labeling Requirements: Staff is proposing that non-aerosol Chemically Curing and Non-Chemically Curing Sealant or Caulking Compound products would be required to display the applicable regulatory category and VOC limit as a percent by weight. Because different VOC limits are proposed, staff believes this is necessary to easily distinguish between Chemically Curing and Non-Chemically Curing Sealant or Caulking Compounds for enforcement purposes. This proposal is contained in section 94512(d).

5. Proposed Amendments to Section 94513, Reporting Requirements

Staff is proposing 25 percent by weight VOC limits for Multi-purpose Lubricants and Penetrants, effective December 31, 2013. These are challenging but feasible limits within the time-frame proposed. For Multi-purpose Lubricants staff is proposing a technology forcing 10 percent second tier VOC limit, effective December 31, 2015. To ensure that manufacturers are on track, and that technology advances as expected, staff believes that manufacturers should demonstrate their progress toward meeting these limits.

As proposed in new subsection 94513(f) Multi-purpose Lubricant and Penetrant manufacturers would need to supply by March 31, 2012, detailed written updates on their research and development efforts undertaken to achieve compliance with the 25 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. A second report on reformulation to meet the 10 percent VOC limit for Multi-purpose Lubricants would be due on March 31, 2014. Sales data would be for calendar year 2013.

Should technical or commercial issues arise, or if it appears reductions could occur within a shorter timeframe, staff would develop appropriate measures to ensure air quality benefits occur as soon as possible.

6. Proposed Amendments to Section 94515, Test Methods

Staff is proposing to clarify that ARB's Method 310 be used as the analytical method to determine GWP content. This method already contains the necessary protocols to analyze for both HFC-152a and HFC-134a content.

H. COMPLIANCE WITH THE PROPOSED AMENDMENTS

Manufacturers of non-complying products will need to reformulate their products to meet the applicable VOC or GWP limits. Manufacturers have the flexibility to choose any formulation that meets the applicable limit and the reformulation options vary with each product category (see Chapter VI of the Technical Support Document). To comply with VOC limits, VOC solvents or propellants will need to be replaced, or partially replaced, with non-VOC ingredients. This may require switching to a water-based formulation, using acetone or another exempt solvent, increasing product solids, or formulating with a non-VOC 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. ARB staff has proposed VOC limits that can be met without the increased use of toxic air contaminants.

To meet the GWP limit for Pressurized Gas Duster, manufacturers of non-complying products will need to substitute a lower GWP propellant for the currently used higher GWP propellant. We expect that manufacturers will substitute HFC-152a for HFC-134a. We are also proposing a VOC limit for Pressurized Gas Duster products to ensure that VOC emissions do not increase as products reformulate. Because HFC- 152a is an exempt VOC, meeting a 1 percent VOC limit is very feasible.

Table ES-4 summarizes, for the proposed VOC limits, data related to the complying market-shares (based on sales), as well as the number of products that currently comply relative to total number of products reported.

Table ES-4
Summary of Complying Products and Complying Marketshares

Product Category		Product Form	Proposed VOC Limit (wt%)	Number of Complying Products/ Total	Complying Market Share (%)
Astringent / Toner (non-FDA regulated)		All	35	177 / 203	70
Carpet/Upholstery Cleaner		Aerosol	5	7 / 59	10
		Non-aerosol	1	54 / 117	25
Dusting Aid		Aerosol	17	13 / 41	5
		Non-aerosol	3	33 / 38	74
Fabric Protectant		Non-aerosol	1	42 / 63	95
Fabric Softener – Single Use Dryer Product		All	0.05 grams per use*	20 / 26	24
Floor Maintenance Product		All	1	57 / 98	53
Floor Polish or Wax – Wood Floor Wax		All	70	*** / 7	***
Glass Cleaner		Aerosol	10	32 / 95	37
Motor Vehicle Wash		All	0.2	311 / 366	89
Multi-purpose Lubricant – excluding solid & semisolid		All	25	38 / 176	4
		All	10	22 / 176	3
Odor Remover/Eliminator		Aerosol	25	*** / ***	100
		Non-aerosol	6	154 / 184	82
Penetrant		All	25	14 / 84	30
Personal Fragrance Product (products with 20% or less fragrance)		All	75**	679 / 1101	37
Pressurized Gas Duster		All	1	89 / 90	> 99
Sealant or Caulking Compound	Chemically Curing	Non-aerosol	3	95 / 196	23
	Non-Chemically Curing	Non-aerosol	1.5	201 / 344	76
Spot Remover		Aerosol	15	18 / 70	4
		Non-aerosol	3	231 / 261	94
Tire or Wheel Cleaner		Aerosol	8	*** / 8	***
		Non-aerosol	2	63 / 102	69
Windshield Water Repellant		All	75	*** / 30	***

Source: 2003 Consumer and Commercial Products Survey (ARB, 2004a) grown to 2008, and the 2007 Pressurized Gas Duster Survey Update

* Grams per use limit provides emissions reductions equivalent to 2.6 percent by weight VOC limit, including fragrance

** Remove "Grandfather" clauses

*** Omitted to protect confidentiality

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.

Although not shown in Tables ES-4, the complying market-share (based on sales) for the GHG limit for the Pressurized Gas Duster category is 86 percent. Moreover, 18 of 90 products currently comply with the GWP limit of 150. Based on these complying market-shares and the number of complying products, staff believes the proposed VOC and GHG limits are commercially and technologically feasible.

I. ECONOMIC IMPACTS

Staff evaluated the costs to comply with the proposed limits for potential impacts on profitability and other aspects of businesses (with particular attention to California businesses), the cost-effectiveness (CE) of the limits, and the estimated cost impacts to consumers. Chapter VII of the Technical Support Document contains a more thorough assessment of the economic impacts associated with the proposal.

CE is one measure of a regulation's efficiency in reducing a given amount of pollutant (often reported in "dollars spent per pound of pollutant reduced"). Based on our analyses, we estimate the cost-effectiveness of the proposed VOC limits is about $6.23 per pound VOC reduced. This CE is higher than most other consumer product regulations. For example, the CE of amendments proposed in 2004 and 2006 was about $2.40 and $2.35, respectively, per pound of VOC reduced, over a 10-year lifetime. However, the CE of other consumer product rulemakings has been comparable to this proposal. For example, the CE of amendments related to aerosol adhesives in 2000, was about $6.00 per pound of VOC reduced.

The CE for the proposed amendments reflects that VOC reductions from consumer products are becoming more difficult to achieve. A number of smaller emitting categories are being proposed for regulation, with resulting small reductions. Several categories are relatively costly because large numbers of products need to be reformulated to achieve fairly low VOC emission reduction totals.

It was further determined that the cost of the measure to reduce GHG from Pressurized Gas Duster products is about $450,000 over ten years, or $45,000 per year. This yields a CE of about $0.22 per metric ton of carbon dioxide equivalents. The cost is fairly low because, as described below, the raw materials used in the reformulation are considerably less expensive than those currently used.

The estimated costs were derived using methodologies previously used for the Consumer Products Regulations and Cal/EPA guidelines for conducting cost analyses for major regulations. We determined that the regulation would cost businesses and individuals about $260 million over the 10-year lifetime. Because the costs incurred by industry to comply with this rulemaking are about $26 million per year, for ten years, it is considered a major regulation. The cost estimates are based on assumptions specific to each category depending on reformulation needs. For some categories it was assumed that manufacturers would either drop certain products or undergo minor product formulation changes, and for other categories, manufacturers would undergo complete production line overhaul and equipment replacement rather than simple re-tooling.

Staff believes that the regulation cost and CE determination methodologies are quite conservative, and are thus in most cases over-estimated. There are several factors that contribute to the over estimation of costs. The mid-range cost (used to determine the overall cost and cost effectiveness of the regulation), is the average of the estimated high and low cost scenarios. The low cost scenario assumes that companies would choose the lowest cost reformulation pathway, making minor adjustments to a product's formulation, or simply eliminating higher VOC 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.

In the economic analysis, staff determined that the VOC limits for Multi-purpose Lubricants would be the most challenging and costly to comply with. Staff separately calculated the estimated costs of reformulation for each of the proposed tiers of the Multipurpose Lubricant proposal. Further, cost estimates were performed separately for aerosol and non-aerosol products respectively. The analysis shows that greater costs will be incurred during the first tier reformulation than the second tier reformulation. This results from the assumption that significant high end costs will be incurred in the first tier reformulation, but not all of these costs would necessarily be duplicated in the second tier reformulation. If major plant modifications or new equipment purchases are needed to meet either tier of the VOC limits, a manufacturer would likely choose to make these significant changes during one plant modification, rather than making significant changes more than once. In fact, certain companies may choose to reformulate only once, (i.e. reformulate to meet the second tier VOC limit before 2013.) Regardless of whether this assumption is correct, we believe that it is appropriate to assume that high end reformulation costs will be incurred during either the first tier reformulation or the second tier reformulation, but not both. Either assumption, that higher costs would be

incurred during a given tier relative to the other, would yield the same amount of total costs being incurred to meet both tiers.

Another factor that can contribute to an over-estimation of costs is the assumptions used for the raw ingredient costs of the reformulated products. For the product categories for which VOC limits are proposed, we assumed that if the raw ingredients used in the reformulated product yielded a cost savings, the cost of the ingredients necessary to meet the new VOC limit is zero. This is an appropriate, conservative assumption because there are many reformulation options. However, in the case of Pressurized Gas Dusters we assumed that reformulation would yield a raw material savings, and incorporated the decreased cost in to the overall cost estimate. We believe that this approach is appropriate because, in order to comply with the proposed GWP limit for Pressurized Gas Dusters, there is only one identified reformulation pathway, replacing HFC-134a with HFC-152a. Because HFC-152a is less expensive per pound that HFC-134a, it is appropriate that there would be a cost savings in virtually every case.

Consumers may have to pay more for some products subject to the proposed amendments, depending on the extent to which manufacturers are able and do pass along their costs to consumers. The average increase in cost per unit to the manufacturer is estimated to be about $0.03. This estimated cost increase per unit value is lower than the estimate derived for the 2006 Amendments. In that rulemaking, we found the average cost per unit increase to be about $0.17 per unit.

Based on our analysis, we expect most manufacturers to be able to absorb the added costs of the proposed regulation without an adverse impact on their profitability. However, it is likely that manufacturers would pass along some of their costs to product purchasers, thus lowering the impacts to business.

We also estimated the change in "return-on-owner's equity" (ROE) as an indicator of the proposed limits' potential impacts on business profitability. The cost to comply with the proposed regulation, through increased research and development, equipment purchase and other investment costs, is presumed to impact a business' ROE and, therefore, its profitability. Our analysis indicates the estimated change in ROE is about a 0.7 to 4.0 percent change. The average change in ROE is about 2.5 percent, relative to the current situation. A reduction of more than ten percent in profitability is considered to indicate a potential for adverse impacts.

Our ROE analysis for the proposed limits may overestimate the impact on business because it assumes that all of the costs of the proposed limits will be absorbed by manufacturers. In reality, we expect that at least some of the investment costs to comply with the proposed limits will be passed on to consumers. The analysis presumes that some cost mitigation will occur due to "technology-transfer" between product lines and from third-party manufacturers (i.e., contract fillers) who fill essentially equivalent products for a number of competing businesses.

While we expect that most businesses will be able to absorb, or pass through, the costs of the proposed amendments without significant adverse impacts on their profitability, there is the possibility that some individual businesses will be adversely affected by this regulatory action. Therefore, it is possible that the proposed amendments may have a significant adverse impact on some businesses that are not in a market position to invest monies to develop complying products, or to absorb and/or pass through the increased cost resulting from their compliance with the proposed amendments.

Based on our analysis, we do not expect the proposed amendments to have a significant impact on employment, or business creation, elimination, or expansion. We also do not expect the regulation to have a significant impact on the competitiveness of California businesses compared with those outside of California. This is because all companies that sell these products in California would have to meet the proposed requirements, whether located in California or outside of California.

The Air Resources Board (ARB) would have costs associated with adoption of the proposed amendments. Adoption of the amendments would necessitate an increase in ARB staff to properly enforce the Consumer Products Regulation. These proposed amendments are setting new limits for a number of previously unregulated categories. It has been determined that to enforce these new limits, two ARB staff will be needed. This would result in an increased cost to the State of approximately $300,000 per year.

J. ENVIRONMENTAL IMPACTS

The proposed amendments would reduce VOC and air toxic emissions. The proposed amendments would also reduce the use of compounds with high GWP in Pressurized Gas Duster products. Because of this, staff has determined that the amendments would have an overall positive impact on the environment. No significant adverse impacts were identified. We evaluated the effects of these reductions, as well as the other proposed amendments, on ground-level ozone concentrations, climate change, stratospheric ozone depletion, air toxic emissions, water quality, solid waste disposal, and energy use. A complete analysis of potential environmental impacts is contained in Chapter VIII of the Technical Support Document.

Because VOCs are ozone precursors, the VOC reduction of 5.8 tons per day would result in reductions in ozone concentrations. If we assume that the average ozone forming potential of consumer product VOC emissions is about 1.50 pounds of ozone per pound of VOC emitted (based on the MIR scale, title 17, CCR, sections 94700-94701), then we predict the resulting ozone reductions would be about 9 tons per day. No other significant positive or negative impacts were identified.

The expected reduction in use of compounds with high GWP would be equivalent to reducing 0.20 MMT of CO_2 per year. This reduction will help meet California's desire for early reductions and also assist in meeting our 2020 target. All technologically

feasible cost-effective reductions need to be pursued to meet the requirements of AB 32. Because we are proposing to establish a VOC limit for Pressurized Gas Dusters, no increase in VOC emissions will occur. No increased use of TACs would occur because the proposal would also prohibit use of methylene chloride and perchloroethylene. Related to solid waste, reformulated products are potentially more efficient than existing products, so a reduction in the solid waste stream should occur (DuPont and Falcon, 2004). No other significant positive or negative impacts were identified.

The proposal would also prohibit the use of the TAC solvents methylene chloride, perchloroethylene, and trichloroethylene in six categories (except in certain niche applications where non-flammable products are needed). Exposure to these air toxics would be reduced by about 0.2 tons per day. The prohibition is proposed as a mitigation measure under CEQA. The prohibition would ensure that manufacturers will not switch to using these solvents as a reformulation option. However, it is likely that this could lead to a very slight increase in VOC emissions because products currently formulated with these TAC compounds would have to replace them—likely with VOC ingredients. Staff has determined that the reduction in exposure to these carcinogens outweighs the very small potential increase in VOC emissions. No other significant positive or negative impacts were identified.

The proposal to exempt HFE 7200 from the definition of VOC should have an overall benefit in reducing VOC emissions and stratospheric ozone depleting emissions. HFE 7200 could be a suitable substitute for some VOCs, and can be used to replace stratospheric ozone depleting compounds such as HCFC-141b. No other significant positive or negative impacts were identified.

Related to solid waste and energy impact, no significant impacts were identified. However, it has been suggested that end-use consumers of Fabric Softener-Single Use Dryer Products may begin using more than a single sheet per drying cycle, or may switch to using the liquid product form. This could result in more dryer sheets being land-filled, and/or increased transportation costs because of the differential in weight between liquid and dryer sheet products. However, no data were provided to support these claims. As is always done, we intend to monitor product sales trends to ensure that unintended consequences of establishing the proposed VOC limit do not occur.

Other language and definitional changes proposed should have an overall positive impact because these provisions are designed to aid in enforcing the regulation.

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, GHG and TAC emissions from the consumer product categories proposed for regulation.

K. FUTURE PLANS

Future activities include continued review of the 2006 Consumer 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 reduction commitments in the Strategy and as a Discrete Early Action Measure under AB 32. Work is also ongoing to assess the most feasible approach to regulating Paint and Lacquer Thinner, and evaluating exposure to TACs used in Nail Coatings.

The Strategy also includes a longer term commitment to assess innovative measures to further reduce VOC emissions from consumer products.

L. RECOMMENDATION

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

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Appendix A

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

Technical Support Document

I. INTRODUCTION

A. OVERVIEW

In this rulemaking, California Air Resources Board (ARB or Board) staff is proposing amendments to the California Consumer Products Regulation. The amendments are designed to reduce volatile organic compound (VOC) and air toxic emissions. The amendments would also reduce the use of compounds with high global warming potential (GWP) in consumer 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 product reduction commitment contained in the State Strategy for California's 2007 State Implementation Plan. The proposed amendment to reduce the use of high GWP compounds is designed in accordance with the Discrete Early Action Measure requirements set forth in the California Global Warming Solutions Act of 2006 (AB 32).

As proposed, other amendments would exclude a compound from the definition of VOC, language modifications would clarify and improve existing regulatory provisions, and use of toxic air contaminants (TACs) in seven categories would be prohibited. The toxics prohibition is a mitigation measure, as required by the California Environmental Quality Act (CEQA), to ensure that certain TACs are not used as products are reformulated to meet new limits.

This Technical Support Document, Appendix A, presents 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 Regulation. The proposed amendments can be found in Appendix B of this document. Appendix E provides a complete list of the acronyms used in this ISOR.

Included in this Technical Support Document is the following information:

- background information on the consumer products program related to the control of VOC and greenhouse gas (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 environmental and expected economic impacts from 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 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 both of the following:

- the regulations are necessary to attain State and federal ambient air quality standards; and
- the regulations are 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; polishes; floor finishes; 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 and commercial 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 are to be identified and regulations 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 additional GHG reduction of 80 percent 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 115 consumer product categories by setting 150 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 TACs. 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. These five 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 in 2004 and 2006 (ARB, 2004b; ARB, 2006a). 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)

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 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, and quantified. 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.

1994 California State Implementation Plan for Ozone

On November 15, 1994, the 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.

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 attainment of 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, and are summarized below.

- Measure CONS-1: Set New Consumer Products Limits for 2006.

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.

- Measure CONS-2: Set New Consumer Products Limits for 2008-2010.

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.

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 (U.S. EPA, 2004). 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 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). This is a comprehensive Strategy designed to attain federal air quality standards through technologically feasible, cost effective, and far reaching measures. 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.

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 by 30 to 40 tons per day by 2014. To achieve this

commitment, rulemakings are to be initiated in the 2007 to 2008 timeframe with limits becoming effective between 2010 and 2012. These actions are to be followed with additional rulemakings in the 2010 to 2012 timeframe. Reductions are to occur between 2012 and 2014 (ARB, 2007d).

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 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 approaches include the purchase of VOC emission credits; and funding of special projects to reduce emissions or accelerate reductions from pollution sources outside of the consumer products industry.

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. 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 rulemaking is to be effective on May 27, 2008. These changes will improve both public health protection and the protection of sensitive trees and plants. Because California's eight-hour air quality standard for ozone is lower still, additional measures beyond those to meet the federal standard will be needed.

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. These measures require ARB to identify and adopt regulations to reduce GHG emissions. These early actions are to be enforceable by January 1, 2010. Reduction of compounds with high GWP used in consumer products has been designated as a Discrete Early Action Measure. Therefore, as a Discrete Early Action 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 CO_2 equivalents (this metric is described in Chapter IV) or more, if feasible.

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.; see the September 11, 1998, Federal Register, Vol. 63, No. 176, pages 48819-48847)." (U.S. EPA, 1998). This action set national VOC emission standards for 24 categories of consumer products. The rule 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 rule does not preclude states from adopting more stringent regulations.

In the summer of 2006 U.S. EPA began work on amendments to their existing national consumer products rules. Their amendments are based on California's CONS-1 (2004 Consumer Products Regulation Amendments) categories and limits. The amendments are expected to become effective on January 1, 2009.

U.S. EPA has also recently promulgated a national rule for aerosol coatings (spray paints) based on ARB's Aerosol Coatings Regulation. This is a reactivity-based regulation. The national aerosol coatings rule will become effective on January 1, 2009. (U.S. EPA, 2007).

Although the national consumer products rule is similar in many aspects to the California regulation, it is less effective in reducing VOC emissions from consumer products. The national regulations are generally less stringent than ARB's and apply to fewer categories. The existing national consumer products rule achieves a 20 percent reduction in VOC emissions, while California's existing consumer products and aerosol coatings regulations have already achieved a 50 percent reduction in the regulated categories. The federal regulation also does not prohibit use of any toxic compounds.

The California Consumer Products Regulation has prohibited use of certain toxic compounds in 63 categories, resulting in a reduction of toxic compound emissions of 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.

There are no national consumer products rules related to reducing GHG emissions.

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II. DEVELOPMENT OF PROPOSED AMENDMENTS

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

A. PUBLIC PROCESS FOR DEVELOPING PROPOSED LIMITS

In this Chapter, we describe our process to involve the public in developing the proposed amendments, and the staff's evaluation of emission reduction strategies. In order to involve the public, the Consumer Products Regulation Workgroup (CPRWG), was established 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 2003 Consumer and Commercial Products Survey (2003 Survey), which serves as the basis for this proposal. The CPRWG was also instrumental in the development of the 2004 and 2006 amendments, as well as these proposed amendments.

Further outreach, beyond the CPRWG, was conducted to identify and involve stakeholders in the development of the Discrete Early Action Measure for greenhouse gas reductions. As part of the process, in February 2008, ARB conducted a survey update for the Pressurized Gas Duster category. The intent of the survey update was to evaluate propellant technology and to update sales data for the 2007 calendar year. The survey was conducted in response to comments from stakeholders that indicated the market for Pressurized Gas Dusters had changed since our 2003 Survey.

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

- Adhesives and Sealants Council
- Alliance for Responsible Atmospheric Policy
- American Beauty Association
- American Chemistry Council
- Automotive Aftermarket Industry Association
- Automotive Specialty Products Association
- California Fire Chief Association
- California Grocers Association
- California Healthy Nail Salon Collaborative
- California League of Food Processors
- Coalition for Clean Air
- Consumer Specialty Products Association
- Cosmetic, Toiletry, and Fragrance Association (now known as Personal Care Products Council)
- Environmental Working Group

- Fire District Association of California
- Fragrance Materials Association
- Institute for Research and Technical Assistance
- International Sanitary Supply Association
- Motor & Equipment Manufacturers Association
- National Aerosol Association
- National Paint and Coatings Association
- Soap and Detergent Association
- 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 organizations, which received information throughout the development of the proposed amendments. We have established an electronic list serve, which has over 1,300 subscribers, to allow subscribers to receive pertinent information. We also have a public website for the 2008 Consumer Products Regulatory Work Group Activity.

Among other things, these amendments address categories that were deferred from the 2006 rulemaking as a result of input from stakeholders. Numerous issues were raised that required additional evaluation and analysis in these categories. In addition to the outreach for the 2006 rulemaking, a public CPRWG meeting and an additional public workshop were conducted on August 29, 2007 and March 5, 2008, respectively, to develop this proposal.

On August 23, 2007, staff posted the first proposal for the 2008 Consumer Products Regulation Amendments to the CPRWG activity website. These proposals were discussed at the CPRWG meeting on August 29, 2007. 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.

On January 11, 2008, staff posted a revised table of proposed limits, for further review and comment. This proposal reflected some modifications based on comments received at the August 2007 CPRWG meeting.

A public workshop for this rulemaking was held on March 5, 2008. Materials describing the proposals were posted to the website on February 29, 2008. At the workshop, staff described proposals for modifications to the Consumer Products Regulation. These included the proposed definitions and volatile organic compound (VOC) limits, the toxics prohibition proposal, a Discrete Early Action greenhouse gas Measure (GHG), and a proposal to exclude a compound from the VOC definition.

To solicit additional information and comments, staff held numerous individual meetings, and teleconferences, with stakeholders. At several of these meetings, requested by industry associations, industry representatives presented technical information related to reformulation of products for which VOC and GHG limits are proposed. Staff also reviewed survey data, performed shelf surveys, 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 the review of the 2003 Survey. The 2003 Survey collected information on about 250 categories of consumer products. These 250 categories comprise about two-thirds of the overall consumer products emissions inventory, or about 160 tons per day. Over 915 companies responded to the 2003 Survey with information on over 26,000 products (ARB, 2004a). The 2003 Survey, in conjunction with the recently conducted 2006 survey, and the 2007 Pressurized Gas Duster Survey Update, conducted in 2008 (ARB, 2008c), are 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 (see Chapter I, Section C. Background).

The focus of the 2003 Survey was primarily on categories where an opportunity for emission reductions was identified. After the 2003 Survey data were compiled, staff prioritized product categories for possible regulation. This process began with the elimination of categories where staff believed no viable opportunity for reduction existed at the current time. As a result of this process, staff initially identified 61 product categories for potential emission reduction opportunities which included 21 previously unregulated categories. As a result, in 2006, lower VOC limits were set for 13 previously regulated categories and new VOC limits were set for 3 categories.

In this same timeframe, staff postponed consideration of some product categories to provide adequate time to evaluate the feasibility of VOC reductions and/or time to address technical issues. In addition, staff revised emission estimates to address product mis-categorization, products that were already regulated under local air district rules, and reporting errors. The categories that are the subject of this rulemaking were primarily those that were postponed in the 2006 rulemaking. Further evaluation of the 2003 Survey data indicated that it was also possible to reduce the use of compounds with high GWPs in Pressurized Gas Dusters.

During the workgroup and workshop process, staff presented specific proposals and alternatives to the public for consideration. The proposed amendments were developed based on the 2003 Survey results, as well as the results from the 2007 Pressurized Gas Duster Survey Update conducted in early 2008.

Staff also identified an additional VOC emission reduction possibility. In March 2008, a final report by ARB staff recommended that a VOC exemption be granted for hydrofluoroether 7200 (HFE 7200). To the extent this compound is used to replace VOCs, providing an exemption will result in additional VOC emission reductions.

In developing the proposed amendments, staff reorganized survey categories based on similarities in product function or other criteria. Staff further developed the proposed VOC and GHG limits for product categories based on technical information provided by interested parties and staff's research efforts. Staff made some modifications 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. Staff identified three alternative approaches to the current proposal: "No Action," "Set Different Limits," and "Set Limits for Different Categories."

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 commitment, and failing to make progress in reducing the use of high-GWP compounds in consumer products (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 on business.

Alternative Two – Set Different Limits

As was discussed in section B above, staff thoroughly evaluated each category for which a limit is proposed. Staff proposed limits based on low emitting technologies reported in the 2003 Survey. Stakeholders provided additional information pertinent to the categories and, in some cases, proposed alternative limits. Staff evaluated all comments and determined the most feasible limit 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 and the Discrete Early Action Measures to reduce GHGs.

Alternative Three – Set Limits for Different Categories

Staff carefully reviewed the 2003 Survey data to select categories where reductions were feasible. Considering all available information, staff determined that at

this time, for certain categories, limits would not achieve significant reductions, or could not be set such that it could be demonstrated that the limits were commercially or technologically feasible without further investigation. Examples of categories where further investigation is needed include Air Fresheners, Nail Coatings, and Paint and Lacquer Thinners.

Related to GHG reductions, the Pressurized Gas Duster category presented the best opportunity for reductions. We have the best available data to set the proposed GWP limit for Pressurized Gas Dusters.

For this current action, staff is proposing new or lower VOC limits for multiple categories and a GWP limit for one category that would achieve the maximum feasible reductions, and partially fulfill ARB's commitments. It should be noted that ARB has already set VOC limits for 115 product categories, with 150 VOC limits, achieving a 50 percent reduction in VOC emissions from the regulated categories.

We also note that categories surveyed in the 2006 Consumer and Commercial Products Survey will be evaluated and additional opportunities for further reductions in VOCs and GHGs may be identified.

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2. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

III. STATUTORY REQUIREMENTS FOR EMISSION REDUCTIONS

In this Chapter, we describe State law requirements related to setting volatile organic compound (VOC) and Global Warming Potential (GWP) limits, and how our proposals meet these criteria. We also provide the information related to complying products and complying marketshares which indicate the limits are commercially and technologically feasible in 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 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 related to our rationale of why the proposed VOC limits are commercially and technologically feasible. During the early development of consumer product regulations, ARB staff established guidelines in setting the limits to ensure that these statutory criteria were met. These guidelines and statutory criteria were followed in developing the proposed amendments.

Section C describes the terms "technologically feasible" and "commercially feasible," as they relate to VOC reductions.

B. GHG 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 requires ARB to identify a list of Early Action Greenhouse Gas Reduction Measures by June 30, 2007. A subset of these has been identified as Discrete Early Action Measures. These actions are to be adopted and legally enforceable (approved by Office of Administrative Law) by January 1, 2010. Reduction of compounds with high GWP that are used in consumer products is designated as one of the approved early actions.

In developing regulations to meet GHG reduction goals, in accordance with section 38562, certain criteria are to be met. 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. Section D describes the criteria to be met in developing GHG reductions.

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 majority of 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. Staff believes 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, staff made an effort, 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, GHGs, or ozone-depleting compounds.

General reformulation options include addition of water with co-solvents, development of emulsion products, use of low vapor pressure (LVP)-VOC solvents, use of non-VOC propellants, and use of exempt solvents.

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, staff has 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 VOCs in their products. It is expected that when a product 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.

Every currently marketed product has some unique features that differentiate it 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 (e.g. fast "muscle" cars), 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. REQUIREMENTS OF AB 32

AB 32 requires that ARB adopt regulations by January 1, 2010 to achieve the maximum technologically feasible and cost-effective reductions in GHGs. Among other things, the reductions must be real, permanent, quantifiable, verifiable, and enforceable. ARB is also required to adopt rules and regulations in an open, public process. In developing regulations to meet GHG reduction goals, in accordance with section 38562, certain criteria are to be met. These criteria are summarized here with our assessment as to why the proposed regulatory action meets them, or is not specifically applicable.

In this rulemaking, we are proposing to regulate the GHG content for one category, Pressurized Gas Dusters. These products are used to clean computer parts and other sensitive electronics. Below is a discussion of why we believe that this rulemaking meets the requirements of State law.

1. The State Board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reduction from sources or categories of sources.

The proposal to reduce the potency of GHG emissions from Pressurized Gas Dusters was developed in consultation with affected parties in an open, public process through a public workshop and several individual consultation meetings. See Chapter II, Development of Proposed Amendments, for a description of the public process.

2. Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.

The Pressurized Gas Dusters proposed limit was set to maximize emission reductions uniformly through out the State, while minimizing costs. All manufacturers of Pressurized Gas Dusters, intended for sale in California, are required to meet the specified emission limit. No manufacturer or retailer would be allowed to sell non-complying products in California, therefore no user anywhere in California should be able to purchase non-complying products. Reductions in the potency of emissions will track with sales of Pressurized Gas Dusters. Therefore, as Pressurized Gas Dusters are used throughout the State, reductions would occur throughout the State. Greater reductions will likely occur in population centers.

The cost-effectiveness (CE) of the proposed limit is about $0.22 per metric ton of carbon dioxide equivalents. See Chapter VII, Economic Impacts, for the detailed description.

The emission limit yields the maximum technically feasible reduction in the potency of GHG. As set forth in Chapter VI, Description of Product Categories, Section B, Greenhouse Gas Categories, further reductions from this category were determined not to be technologically and commercially feasible.

Nothing in the regulation discourages early action to reduce GHG emissions. In fact, many manufacturers have reduced the potency of GHG emissions over the last ten years by reformulating products to contain compounds with lower GWP. We expect this trend to continue prior to the effective date of the proposed emission limit. In addition to setting an effective date for the GWP limit, we are limiting to one year, the time product manufactured before the effective date can be sold. Once the sell-through period is over, the old product must be removed from store shelves.

3. Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

Use of consumer products is ubiquitous; no disproportionate localized impacts are expected. Greater reductions would occur in population centers, where more people reside. Compliance with this proposal will not require manufacturing plant changes that could cause a localized emission impact. Therefore, residents living near a plant producing or using Pressurized Gas Dusters, whether low-income or not, would not be disproportionately impacted.

4. Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.

This requirement is not applicable to this proposed rulemaking.

5. Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.

GHG limits from consumer products will be set only for categories where there would be no significant increase in the use of criteria pollutants or toxic air contaminants. For Pressurized Gas Dusters specifically, to prevent any possible increase in the emissions of criteria pollutants, a VOC limit of 1 percent by weight, including fragrance, is proposed. This VOC limit proposal will prevent manufacturers from replacing high GWP compounds with hydrocarbon propellants. While hydrocarbon propellants have low GWP, and would meet the GWP limit of 150, they contribute to the formation of ground-level ozone. In addition, a prohibition on the use of the toxic chlorinated compounds Methylene Chloride (MeCl) and Perchloroethylene (Perc) is proposed for Pressurized Gas Dusters. This prohibition will prevent manufacturers from using MeCl and Perc in Pressurized Gas Duster products. While unlikely, manufacturers could choose to use MeCl and/or Perc in Pressurized Gas Dusters because they are good solvents, have relatively low GWP, and are exempt as VOCs. The 1 percent VOC limit, and the prohibition of the use of MeCl and Perc, is consistent with the requirements under California Environmental Quality Act (CEQA). CEQA requires that adverse impacts from adopting regulations be mitigated. See Chapter VIII, Environmental Impacts, for a more detailed description.

6. Consider cost-effectiveness of these regulations.

The CE of the proposed limit is about $0.22 per metric ton of carbon dioxide equivalents. See Chapter VII, Economic Impacts, for the detailed description.

7. Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.

The proposed emission limit for Pressurized Gas Dusters is not expected to cause any adverse impacts to society or the environment. California will benefit from the reduction of GHG emissions. As discussed in the response to criterion five above, the proposal will not cause an increase in VOC or toxic air contaminant emissions. See Chapter VIII, Environmental Impacts, for a detailed description. In addition, no increase in the solid waste stream is anticipated. Reformulated products will be at least as effective as non-complying products. Packaging and the number of cans used should not increase.

8. Minimize the administrative burden of implementing and complying with these regulations.

The administrative burden of complying with the proposed emission limit to manufacturers and marketers is minimal. Product reformulation will require replacing one propellant with another, and should be fairly straight-forward. The proposal has very few administrative requirements. Affected products would be required to include on the label or can a date, or date code, indicating date of manufacture. No recordkeeping or product registration would be required. However, certain Pressurized Gas Dusters products may need to modify their product labels. The proposed modified definition for Pressurized Gas Dusters includes an exemption for products that are labeled to be used "exclusively on energized equipment." To qualify for the exemption from the GWP and VOC limits, the product label must contain specific language. For existing products used on energized equipment that do not contain the language, administrative and other costs may be incurred in changing the labels.

9. Minimize leakage.

Leakage is not expected as a result of the proposed emission limitation for Pressurized Gas Dusters. Leakage occurs when an emission limit set by the State causes manufacturing or other activities to be displaced outside of California. If leakage were to occur, emissions, jobs and other economic benefits to California would be lost. The emission benefits of the proposed limit track with sales of Pressurized Gas Dusters. In addition, the proposed emission limit for Pressurized Gas Dusters requires that all products manufactured for sale in California comply with the limit regardless of where they are manufactured. Therefore, there would not be a situation where a manufacturing plant inside the State would be at a competitive disadvantage compared to plants located outside of the State.

10. Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases.

The projected reductions that will be achieved through implementation of the proposed limit are equivalent to reducing about 0.20 million metric tons of carbon dioxide equivalent per year. While this reduction may appear somewhat modest, when the reduction is considered in conjunction with anticipated future GHG reductions from consumer products, and current and future reductions from other categories, the total reductions could become quite significant. The consumer products category encompasses hundreds of categories. When each is considered alone they are relatively small emitters, but with regard to GHG emissions the aggregate emissions may become more important. This situation necessitates achieving relatively small reductions from a large number of categories to achieve significant overall reductions.

11. The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board.

The emissions and emission reductions for Pressurized Gas Dusters were calculated based on data submitted by manufacturers and marketers of the affected products. The data were submitted in accordance with State law and were certified by an officer of each company that submitted the data. The GHG emissions and reductions were calculated based on GWP values defined by the Intergovernmental Panel on Climate Change 1995: Second Assessment Report (IPCC, 1996). The Consumer Products Regulation specifies the date upon which the proposed emission limit would become effective and further specifies how the emission limit is to be enforced. Further, the regulation specifies the test methods used to determine if products comply with the applicable emission standards. Finally, the regulation requires that products subject to emission limits must be dated or date coded. The date of manufacture enables enforcement personnel to ascertain if a product is subject to the applicable emission limit, based on the limit effective date. Once the amendments to the Consumer Products Regulation are approved by the Office of Administrative Law, the proposed emission limit will become State law. Based on the above, upon the effective date of the proposed emission limit, the reductions become real, permanent, quantifiable, verifiable, and enforceable.

12. For regulations.... ....the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.

While many manufacturers have shifted from HFC-134a to HFC-152a resulting in a reduction in emission potency, HFC-134a products remain on the market. Therefore, the emission reductions, realized by requiring that most of the remaining Pressurized Gas Dusters reformulate, are new and would not have occurred in the absence of the proposed limit. The proposed emission limit for Pressurized Gas Dusters is the first emission limitation affecting the product category. No other existing State, federal or other requirements, specific to products sold in California, affecting emissions of GHG from Pressurized Gas Dusters exist. We are aware of requirements affecting GHG emissions from Pressurized Gas Dusters products sold in the state of Wisconsin, but those requirements do not affect products sold in California.

13. If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.

This requirement is not specifically applicable to the proposed emission limit for Pressurized Gas Dusters. The emission limit for Pressurized Gas Dusters is in fact a direct emission limit. There are no proposals for any market based or other "flexibility-based" compliance options for the proposed emission limit.

14. The state board shall rely upon the best available economic and scientific information and its assessment of existing and projected technological capabilities when adopting the regulations required by the law.

ARB staff used the best available economic and scientific information available to develop the proposed emission limit for Pressurized Gas Dusters. The description in this Section B documents that the proposal was developed in accordance with AB 32 requirements. Chapter VII, Economic Impacts, contains a detailed description of the economic impact of the proposed emission limit. In addition, a rigorous technological assessment of Pressurized Gas Dusters was performed. See the detailed technical discussion in Chapter VI, Description of Product Categories, Section B, Categories for Which a Greenhouse Gas Limit is Proposed, Subsection 1, Pressurized Gas Duster.

E. COMPLIANCE WITH THE PROPOSED AMENDMENTS

Manufacturers of non-complying products will need to reformulate their products to meet the applicable VOC or GWP limits. Manufacturers have the flexibility to choose any formulation that meets the applicable limit and the reformulation options vary with each product category (see Chapter VI of the Technical Support Document). To comply with VOC limits, VOC solvents or propellants will need to be replaced, or partially replaced, with non-VOC ingredients. This may require switching to a water-based formulation, using acetone or another exempt solvent, increasing product solids, or formulating with a non-VOC 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. ARB staff has proposed VOC limits that can be met without the increased use of toxic air contaminants.

To meet the GWP limit for Pressurized Gas Duster, manufacturers of non-complying products will need to substitute a lower GWP propellant for the currently used higher GWP propellant. We expect that manufacturers will substitute HFC-152a for HFC-134a. We are also proposing a VOC limit for Pressurized Gas Duster products to ensure that VOC emissions do not increase as products reformulate. Because HFC- 152a is an exempt VOC meeting a 1 percent VOC limit is very feasible.

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 that currently comply relative to total number of products reported.

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.

Table III-1 shows that the complying marketshares (except where confidential) range from 3 to 100 percent. Generally, in those categories where the complying marketshare is low, more time is provided to comply with the limit.

Although not shown in Table III-1, 86 percent of reported products (based on sales) comply with the GWP limit for the Pressurized Gas Duster category. Moreover, 18 of 90 products currently comply with the GWP limit of 150. Based on these complying marketshares and the number of complying products, staff believes the proposed VOC and GHG limits are commercially and technologically feasible.

Table III-1
Summary of Complying Products and Complying Marketshares

Product Category		Product Form	Proposed VOC Limit (weight %)	Number of Complying Products/ Total	Complying Market Share (%)
Astringent / Toner (non-FDA regulated)		All	35	177 / 203	70
Carpet/Upholstery Cleaner		Aerosol	5	7 / 59	10
		Non-aerosol	1	54 / 117	25
Dusting Aid		Aerosol	17	13 / 41	5
		Non-aerosol	3	33 / 38	74
Fabric Protectant		Non-aerosol	1	42 / 63	95
Fabric Softener – Single Use Dryer Product		All	0.05 grams per use*	20 / 26	24
Floor Maintenance Product		All	1	57 / 98	53
Floor Polish or Wax – Wood Floor Wax		All	70	*** / 7	***
Glass Cleaner		Aerosol	10	32 / 95	37
Motor Vehicle Wash		All	0.2	311 / 366	89
Multi-purpose Lubricant – excluding solid & semisolid		All	25	38 / 176	4
		All	10	22 / 176	3
Odor Remover/Eliminator		Aerosol	25	*** / ***	100
		Non-aerosol	6	154 / 184	82
Penetrant		All	25	14 / 84	30
Personal Fragrance Product (products with 20% or less fragrance)		All	75**	679 / 1101	37
Pressurized Gas Duster		All	1	89 / 90	> 99
Sealant or Caulking Compound	Chemically Curing	Non-aerosol	3	95 / 196	23
	Non-Chemically Curing	Non-aerosol	1.5	201 / 344	76
Spot Remover		Aerosol	15	18 / 70	4
		Non-aerosol	3	231 / 261	94
Tire or Wheel Cleaner		Aerosol	8	*** / 8	***
		Non-aerosol	2	63 / 102	69
Windshield Water Repellant		All	75	*** / 30	***

Source: 2003 Consumer and Commercial Products Survey (ARB, 2004a) grown to 2008, and the 2007 Pressurized Gas Duster Survey Update

* Grams per use limit provides emissions reductions equivalent to 2.6 percent by weight VOC limit, including fragrance

** Remove "Grandfather" clauses

*** Omitted to protect confidentiality

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2 Intergovernmental Panel on Climate Change. Climate Change 1995, The Science of Climate Change; Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change. J.T. Houghton, L.G. Meira Filho, B.A. Callander, N. Harris, A. Kattenberg, and K. Maskell, eds. Cambridge University Press. Cambridge, U.K. (IPCC, 1996)

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 AND AMBIENT AIR QUALITY STANDARDS

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.

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.

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 respiratory function of humans and animals. Human health studies show that short-term exposure to ozone injures the lung (ARB, 2005, 2000a; U.S. EPA, 2006). 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, 2005). 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 2001-03, premature deaths from ozone exposure in California are estimated at 630 (ARB, 2005). 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, 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. 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

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 10 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; Schwartz *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; Schwartz *et al.*, 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 increased work loss 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 suggesting that air pollution may have greater effects in children than in adults. This may be because they inhale more $PM_{2.5}$ 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 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; *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 0.070 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 12, 2008. The 2007 SIP demonstrates attainment with the previous standard of 0.08ppm.

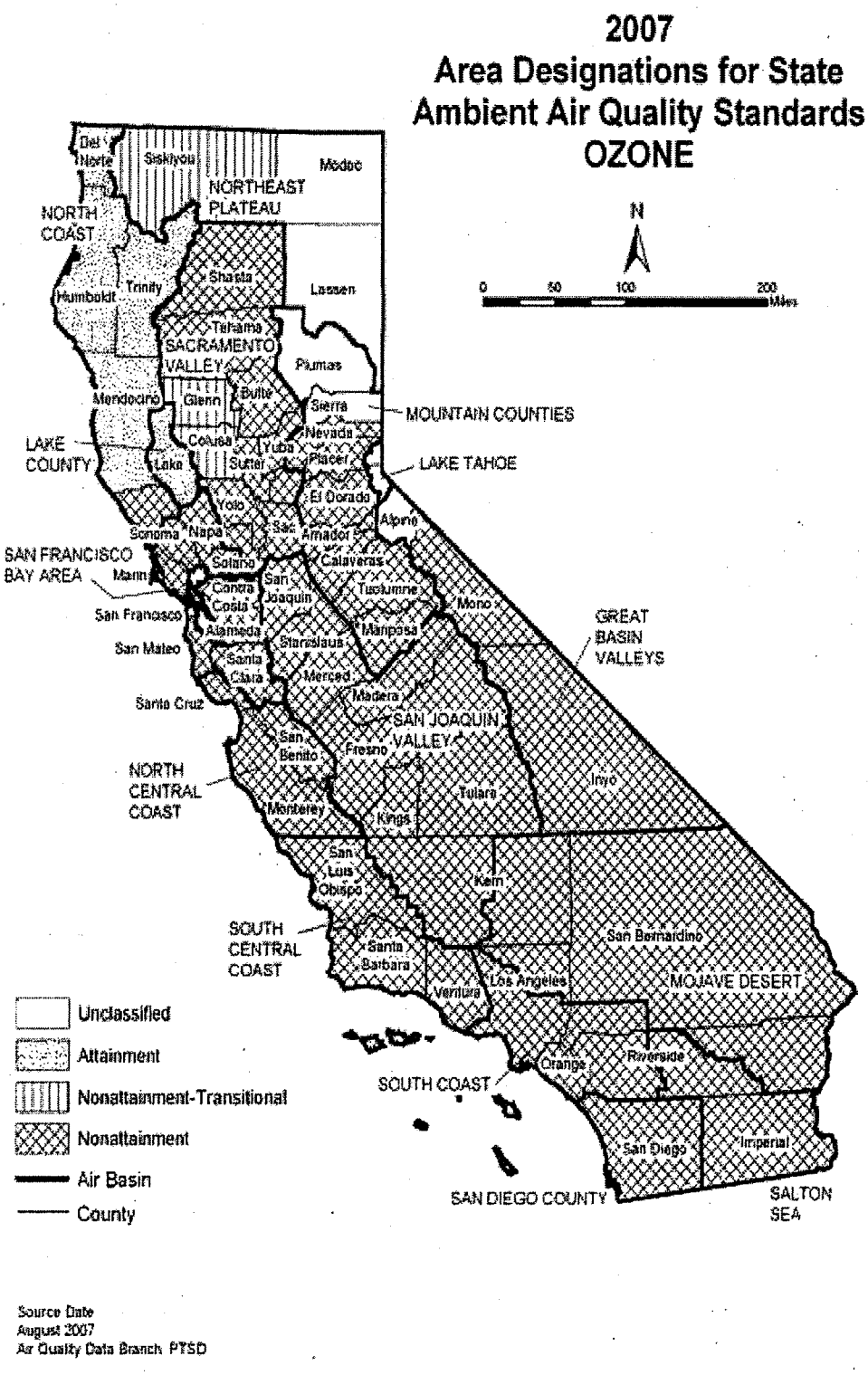
Table IV-1 reflects the newly revised national eight-hour standard for ozone of 0.075 ppm, which was promulgated on March 12, 2008. The U.S. EPA's rescission of its one-hour ozone standard is also reflected (U.S. EPA, 1997). Despite these revisions to the national standards, Table IV-1 clearly shows 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.

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 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 will meet the 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.

Figure IV-1


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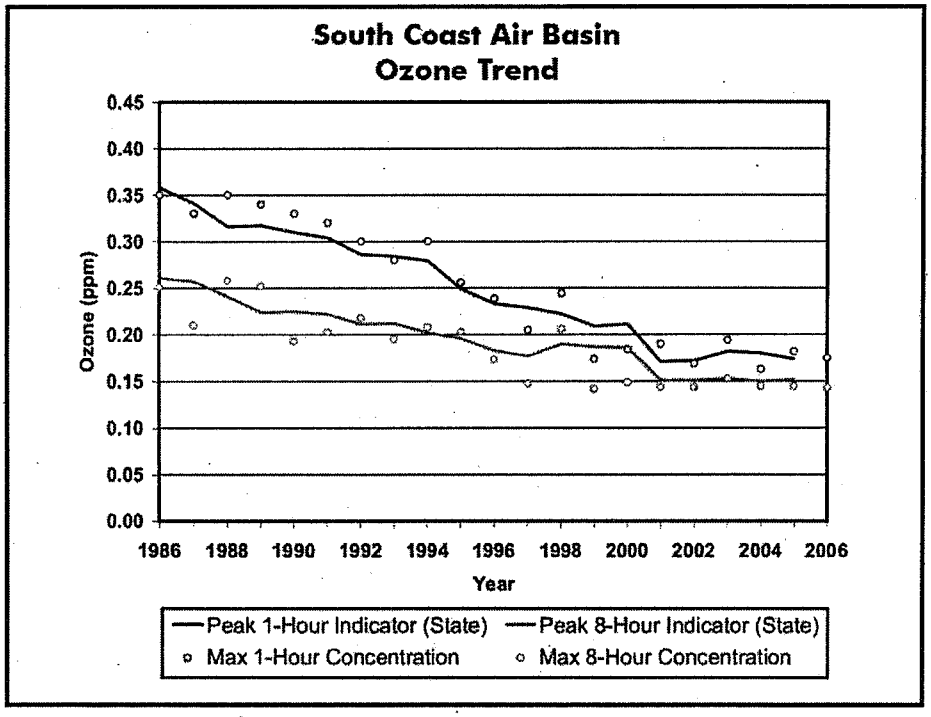
100
200
Miles
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Shasta
Lassen
Humboldt
Trinity
Tehama
SACRAMENTO VALLEY
Plumas
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
Nevada
Colusa
Yuba
Placer
LAKE COUNTY
Lake
Sutter
LAKE TAHOE
El Dorado
Yolo
Alpine
Sonoma
Napa
Amador
SAN FRANCISCO BAY AREA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

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 show an overall steady decline, as seen in Figure IV-2. The 2005 three-year average of the maximum eight-hour concentration is almost 41 percent lower than 1985. 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, 2007g).

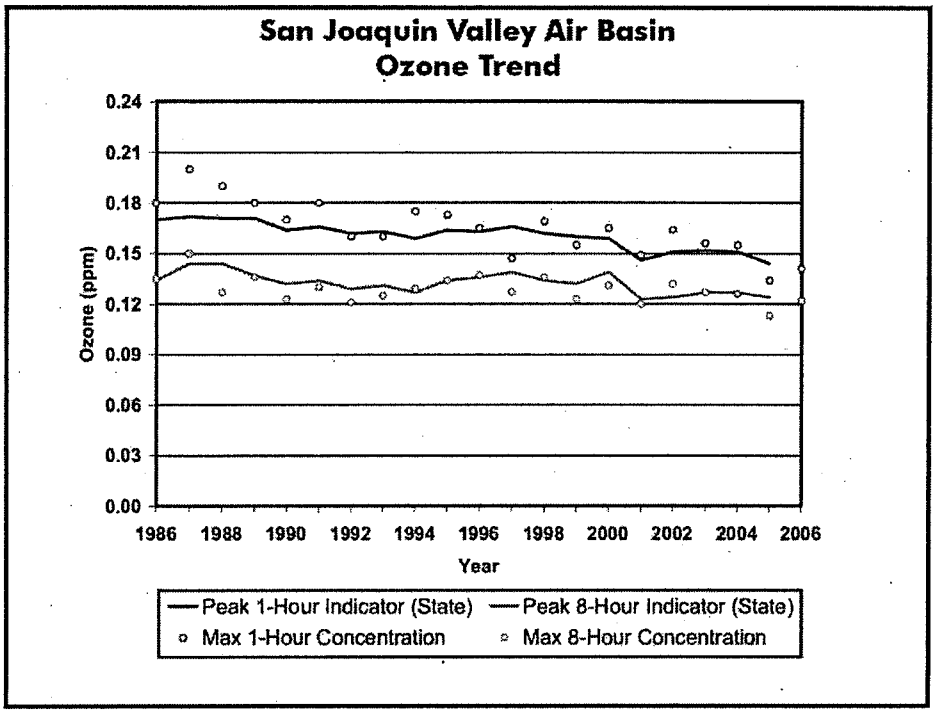
Figure IV-2
South Coast Air Basin Ozone Trend



Source: ARB 2007 Almanac

The ozone problem in the San Joaquin Valley ranks among the most severe in the State. Peak levels have not declined as much as the number of days that standards are exceeded. From 1985 to 2004, the maximum peak eight-hour indicator decreased only two percent. The number of national eight-hour standard exceedance days has been quite variable over the years. This variability is due, in part, to the influence of meteorology as well as changes to the monitoring network. The monitoring network was not as extensive during the 1980's as it has been during the last 14 years. For this reason, the period between 1990 to 2005 provides a better indication of trends. During this period, there has been an eight percent decrease in the three-year average of the number of exceedance days of the national eight-hour standard (ARB, 2007g). Figure IV-3 shows the ozone trend between years 1986 and 2006.

Figure IV-3
San Joaquin Valley Air Basin Ozone Trend



Source: ARB 2007 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.

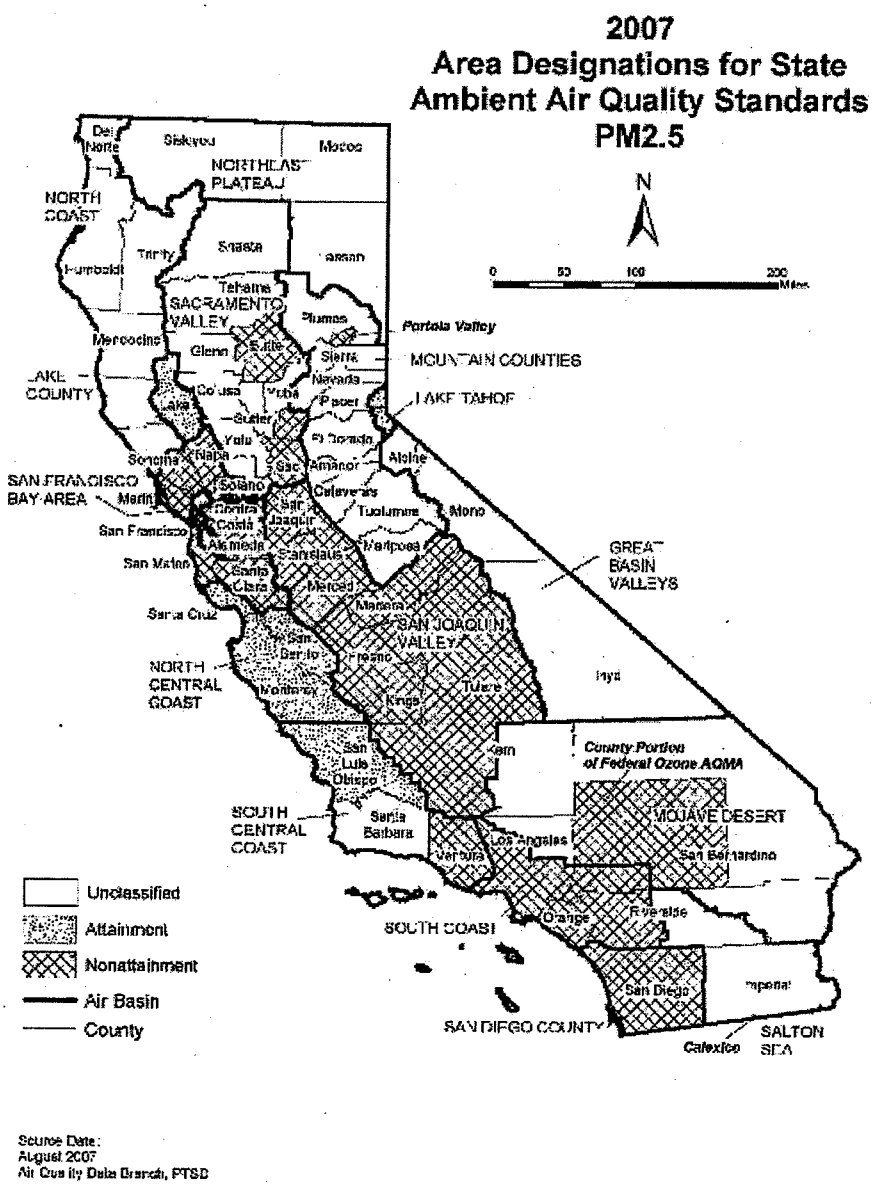
5. Area Designations for California Ambient Air $PM_{2.5}$ Standard

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.

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), the San Joaquin Valley Air Pollution Control District (SJVAPCD), the Bay Area Air Quality Management District, the Sacramento Air Quality Management District, the combined cities of Yuba City/Marysville, 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 SCAQMD SIP was approved by the Board in September, 2007 and it was submitted to U.S. EPA in November, 2007. The $PM_{2.5}$ SIP for SJVAPCD is expected to be considered at the May Board meeting.

Figure IV-4



B. THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

Scientists have concluded that the evidence is overwhelming that the planet is warming from the higher concentration of greenhouse gases in the atmosphere. Although greenhouse gases (GHG) are naturally occurring, the steep increase in these heat-trapping gases since the Industrial Revolution leaves very little doubt that human activity is to blame for these recent climate change trends. The fact that GHGs remain in the atmosphere for a very long time, and that man-made emissions of GHGs are continuing to increase, mean that the world will continue to warm in the centuries ahead. This warming, or climate change, is a global problem. Clearly, no single state or country can single-handedly solve the problem. However, California is stepping forward to do its part. To address the problem, Assembly Bill 32, the California Global Warming Solutions Act of 2006 (AB 32), was signed into law by the Governor in September 2006. By enacting this Legislation, the legislature declared:

> "Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."

This legislation is codified in the California Health and Safety Code, commencing with section 38500. Beyond the AB 32 requirements the Governor's Executive Order EO-S-03-05 calls for an additional 80 percent reduction in GHG emissions by 2050.

While carbon dioxide (CO_2) is the GHG emitted in the largest quantity, other 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. 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. 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), HFCs, perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Changes in the atmospheric abundance of GHGs alter the energy balance of the climate system. These changes are expressed in terms of radiative forcing. While CO_2 is the largest contributor to radiative forcing, methane, halocarbon, N_2O, and other species also contribute to climate change.

Controlling multiple substances that jointly contribute to climate warming requires some method to compare the effects of the different gases because the physical properties (climate warming impact and persistence in the atmosphere) of the GHGs are very different. The current solution to this problem is the calculation made by the Intergovernmental Panel on Climate Change (IPCC), known as Global Warming Potentials (GWP) (IPCC, 2007; IPCC, 1996). The basic idea is to calculate the cumulative climate warming over a specified time span resulting from one unit mass of the GHG emitted. The estimates of GWPs have extensively been reviewed by many climate scientists around the world. The IPCC is constantly evaluating GWP values and the assessment is generally updated every 6 years.

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 the upcoming Scoping Plan.

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.

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. 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 greenhouse gas 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. For consumer products, as mentioned earlier, direct emissions of HFCs are the primary concern. HCFCs, HFEs, CO_2, and N_2O are also compounds of interest.

2. Predicted Climate Change Impacts

Global average temperatures have risen both on land and in the oceans, with observable impacts already occurring. Scientists predict that if the increase in GHG emissions continues unabated, temperatures will rise by as much as 10 degrees Fahrenheit by the end of this century (Pew, 2006). It is impossible to predict exactly how climate change will affect California's ecosystems and economy in the future. However, the expected physical changes will impact California's public health, economy and ecology. There are many areas of concern.

One area of considerable concern is the effect of climate change on California's water supply. During the winter, in our mountains, snow accumulates in a deep pack, preserving much of California's water supply. If winter temperatures are warmer however, more precipitation will fall as rain, decreasing the size of the snowpack. Heavier rainfall in the winter could bring increased flooding. Less spring runoff from a smaller snowpack will reduce the amount of water available for hydroelectric power production and agricultural irrigation. Evidence of this problem already exists. Throughout the 20th century, annual April to July spring runoff in the Sierra Nevada has been decreasing, with water runoff declining by about ten percent over the last 100 years.

Another predicted outcome of climate change is a rise in sea level. California has already experienced a 3 to 8 inch rise in the last century. If the trend continues, large populations living along California's coast will face serious consequences such as flooding of low-lying property, loss of coastal wetlands, erosion of cliffs and beaches, saltwater contamination of drinking water, and damage to roads and bridges.

Air quality will also be exacerbated by increasing temperatures. Higher temperatures, strong sunlight, and stable air masses could lead to increased concentrations of ground-level ozone.

Climate change could impact California agriculture by increasing demand for irrigation to meet higher evaporative demand, while supply will become less reliable due to declining snowpack in the mountains. Climate change will also put our forests at greater risk for fire and disease (ARB, 2003).

3. Discrete Early Action Plan and Scoping Plan

Among other things, AB 32 requires ARB to design and adopt an overall Scoping Plan, by January 1, 2009, that identifies how GHG emissions can be reduced back to 1990 levels by 2020. AB 32 additionally recognizes that immediate progress in reducing GHG emissions can and should be made. Accordingly, AB 32 required ARB to identify a list of "discrete early action GHG reduction measures" by June 30, 2007. Discrete Early Actions are Board adopted regulations to reduce GHG emissions which are legally effective by January 1, 2010. These measures are to become part of the State's comprehensive strategy for achieving GHG reductions.

In June 2007, the ARB approved a list of early action GHG reduction measures. Additions to the list were approved by the Board at its October 2007 hearing. A subset of these early action measures was identified as discrete early action measures. One of the approved Discrete Early Action Measures designated in the Early Action Report calls for the reduction in use of compounds with high GWP in consumer products. The measure is estimated to achieve an emission reduction of 0.25 MMT CO_2e per year from consumer products (ARB, 2007b).

The objective of the consumer products Discrete Early Action measure is to reduce the impact of compounds with high GWPs when alternatives are available. Consumer product formulations may be required to reduce or eliminate the use of GHGs with high GWPs. The primary compounds of interest are HFCs. These compounds have direct impacts on global warming. As mentioned previously, VOCs have an indirect effect on increasing temperatures, in that they participate in reactions leading to the formation of ground level ozone. Therefore, our VOC reduction strategies for consumer products will also reduce the impact of consumer products' emissions on climate change.

The reduction in use of compounds with high GWPs in consumer products is a long-term effort. We are continuing to develop an emission inventory. Thus, we are unable to quantify what the overall total GWP emission reduction will be at this time. As we move forward, evaluate product categories, and identify areas where emission reductions are possible, we will quantify additional emission reductions as GWP limits are adopted. However, we expect to achieve the estimated reduction of 0.25 MMT CO_2e per year through this and subsequent rulemakings.

In this rulemaking, we are making our initial proposal to reduce GHGs in consumer products. We are proposing a GWP limit for Pressurized Gas Duster products. If adopted by ARB, this will be the first GWP standard in place for consumer products in California. ARB staff estimates the reduction from this measure to be equivalent to reducing 0.20 MMT CO_2 per year.

C. IMPORTANCE OF REGULATING CONSUMER PRODUCTS

As described in Section A and Section B of this Chapter, consumer products emissions contribute to the formation of ground level ozone, $PM_{2.5}$, and climate change. In this section, we provide information on the importance of regulating these 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 37 million Californians results in significant emissions (CA 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.

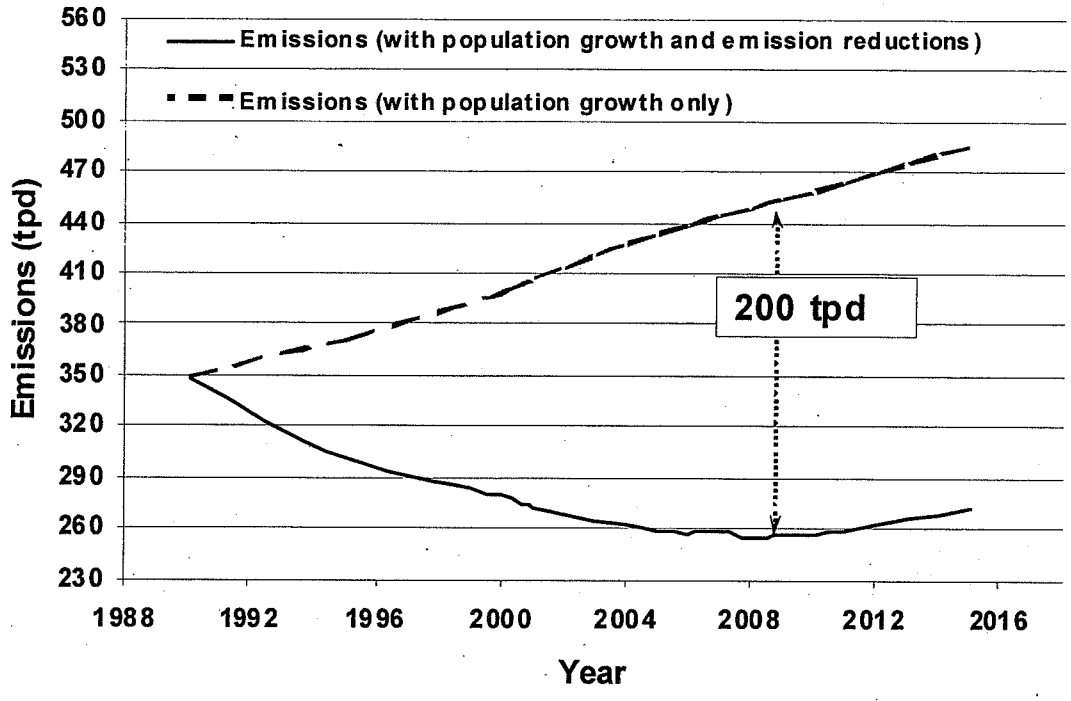
As evidence of the magnitude of consumer product VOC emissions, it is estimated that in 2010 consumer products emissions will be approximately 243 tons per day, or about 12 percent of the overall VOC inventory. In this same year, consumer product emissions will comprise about 18 and 7 percent of VOC emissions in the SCAQMD and SJVAPCD, respectively. Without further actions, consumer product emissions are expected to grow to approximately 270 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. In fact, it is estimated that emissions from consumer products will be the number one source of VOC emissions in the South Coast AQMD in 2020. However, using the maximum incremental reactivity (MIR) scale (see title 17, CCR section 94700-94701) as the basis for comparison, 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 is a success story. Since 1989, regulations adopted by the ARB, along with numerous amendments to the regulations, have significantly reduced VOC emissions from consumer products. Absent these regulations today, consumer product emissions would likely be over 440 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 2006 emissions are taken from the ARB Forecasted Emissions by Summary Category, 2007 Almanac (ARB 2007h). 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 Consumer Products Amendments, emission values from the 2003 Survey and the projected emissions reductions resulting from the VOC limits approved in 2006, are reflected in Figure IV-5.

Figure IV-5
Consumer Products VOC Emission Trends



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 (CA DOF, 2007). Therefore, ARB must continue its commitment to pursue additional technologically and commercially feasible reductions in consumer products emissions.

In 1988, with the passing of the California Clean Air Act (CCAA), the importance of controlling emissions from consumer products was set forth. To meet California ambient air quality standards the CCAA added section 41712 to the Health and Safety Code. This section requires that ARB adopt regulations to achieve the maximum feasible reduction in VOCs emitted by consumer products. As part of the regulatory process, ARB must determine that adequate data exist to adopt the regulations. ARB must also determine that the regulations are technologically and commercially feasible, necessary, and do not eliminate any product form.

To meet the federal standards, in 1994 emission reductions from consumer products became part of the California State Implementation Plan (SIP) for ozone. 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 2003, 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 150 VOC limits for 115 categories of consumer products (including antiperspirants and deodorants and 36 aerosol coatings categories) have been established to date. The adopted limits will achieve a 44 percent reduction in overall VOC emissions from consumer products by the year 2010.

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 national 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 ton per day VOC reduction from consumer products by 2014. As planned, rulemakings are to occur between 2007 and 2008 with reductions occurring in the 2010 to 2012 timeframe. Further rulemakings between 2010 and 2012, with implementation dates between 2012 to 2014, are to complete the emission reduction commitment (ARB, 2007d). This will continue ARB's commitment to reduce VOC emissions from consumer products. As previously mentioned, consumer products are expected 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 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 credits; and funding of special projects to reduce emissions or accelerate reductions from pollution sources outside of the consumer products industry.

Because significant further VOC 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 to 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 intended to partially fulfill the 2007 Strategy commitment for VOC reductions from consumer products.

2. Greenhouse Gas Emissions

We acknowledge that the GHG contribution of consumer products is modest relative to other sources, such as vehicle exhaust. However, the severity of the problem 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.

Consumer products use various GHGs, mostly as propellants. To a much lesser degree, several solvents with fairly high GWPs are used. These compounds are typically low photochemically reactive compounds that are non-VOCs and have been used as a reformulation strategy to reduce VOC content. 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. Reductions of HFC-134a are being pursued in this rulemaking.

GHG emissions data are available from the 2003 Survey of consumer products. Staff has evaluated these data for possible GHG reductions and development of new regulations for this rulemaking. Additionally, in the 2006 Survey, we surveyed manufacturers of consumer products to determine the usage of compounds with high

GWP in several more categories of consumer products (ARB, 2007f). Staff will use the 2006 survey data to develop the GHG inventory for consumer products, and evaluate the 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.

Because reductions are necessary to slow climate change, the reductions from the amendments proposed in this report are necessary. The California Global Warming Solutions Act of 2006, by specifying adoption of Discrete Early Action Measures in Health and Safety Code section 38560, shows that the California Legislature intended progress toward reducing GHGs be made as quickly as possible. Because GHG reductions from consumer products have been designated as a Discrete Early Action Measure, to comply with State law, the proposed amendment to reduce the use of compounds with high GWP is necessary.

D. ESTIMATED EMISSIONS FROM CATEGORIES PROPOSED TO BE REGULATED

1. 2003 Consumer and Commercial Products Survey

The 2003 Consumer and Commercial Products Survey (2003 Survey) was mailed to over 5,000 companies in November 2004 (Appendix D). Data received from the 2003 Survey formed the basis for the emissions used in this rulemaking. A complete discussion of the extensive survey process is found in Chapter IV of "The Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation" released on September 29, 2006 (the 2006 Amendments).

In summary, the 2003 Survey provided staff with detailed information on the formulations of consumer products, including complete speciation of VOCs, low vapor pressure VOC (LVP-VOC) solvents, and key exempt ingredients (ARB, 2004a). 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.

ARB provided extensive summaries to industry detailing the aggregate sales, VOC speciation, VOC tonnage, and other key information. Summary tables were also provided (certain specific data were omitted to protect confidential information) detailing VOC content, product form, LVP-VOC content, and other information. The results of the 2003 Survey were discussed at workgroup meetings, and input from industry was used to correct inaccuracies in the data. For this rulemaking, the 2008 emissions and reduction estimates in the years when the limits become effective (2010-2015) were grown from 2003 sales data and the State Department of Finance's population estimates. Annual population growth factors were calculated using the 2008 State population figures and 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 2003 Survey had adequate representation of the available 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 and the wide range of VOC content reported for products in the categories slated for regulation. The Pressurized Gas Duster Survey update, conducted in early 2008 for 2007 sales, also provided the best data for use in GHG proposal (ARB, 2008c).

In developing these proposals, staff worked extensively with stakeholders on each category proposed for regulation. In meetings with members of industry and other interested stakeholders, extensive discussions on the types of technologies used in each category were discussed. Numerous product labels and associated literature for each category were analyzed. Category information was also obtained from trade journals, Internet sites, textbooks, patents, and directly from manufacturers.

2. Emission Estimates for Categories

The total emissions from the categories proposed for regulation are estimated to be about 22.6 tons per day in 2008. Table IV-3 summarizes these emissions, as well as the anticipated VOC reduction when the proposed limits become effective.

If adopted, once all limits become effective, the VOC emission reductions will be approximately 5.8 tons per day.

3. Greenhouse Gas Emissions

Development of the proposed amendment to reduce the use of compounds with high GWP began with the GHG emissions data available from the 2003 Survey of consumer products. Staff evaluated these data for possible GHG reductions and development of new regulations for this rulemaking.

Based on these data it appeared that a GWP limit for Pressurized Gas Dusters was feasible. During the public process of developing the proposed GWP limit, staff held meetings and teleconferences to solicit information and comments from industry associations and industry representatives. At this time, industry representatives alerted ARB staff that significant changes in the gas duster market had occurred since 2003. In response, staff conducted the Pressurized Gas Duster Survey Update to collect updated data (ARB, 2008c). The GHG emissions from the Pressurized Gas Dusters for 2003 and 2007 were estimated using reported information from the 2003 Consumer Products Survey and from the Pressurized Gas Duster Survey Update gathered during February 2008 for 2007 sales. Information from both surveys is shown in Table IV-4.

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

Product Category		Product Form	Proposed VOC Limit (percent by weight)	2008 VOC Emissions* (tons per day)	Reductions at Effective Date (tons per day)
Astringent / Toner (non-FDA regulated) [a]		All	35	0.62	0.11
Carpet/Upholstery Cleaner[a]		Aerosol	5	0.32	0.07
		Non-aerosol	1	0.29	0.07
Dusting Aid[a]		Aerosol	17	0.27	0.08
		Non-aerosol	3	0.01	0.00
Fabric Protectant[a]		Non-aerosol	1	0.18	0.08
Fabric Softener – Single Use Dryer Product[a]		All	0.05 grams per use**	0.52	0.21
Floor Maintenance Product[a]		All	1	0.11	0.07
Floor Polish or Wax – Wood Floor Wax[a]		All	70	0.06	0.01
Glass Cleaner[b]		Aerosol	10	0.33	0.03
Motor Vehicle Wash[a]		All	0.2	0.38	0.14
Multi-purpose Lubricant – excluding solid & semisolid[c/e]		All	25[c]	4.08	2.04
			10[e]		1.27
Odor Remover/Eliminator[a]		Aerosol	25	***	0.00
		Non-aerosol	6	0.12	0.03
Penetrant[c]		All	25	0.40	0.15
Personal Fragrance Product (products with 20% or less fragrance) [d]		All	75+	10.89	0.41
Pressurized Gas Duster[a]		All	1	0	0
Sealant or Caulking Compound	Chemically Curing[b]	Non-aerosol	3	1.91	0.22
	Non-Chemically Curing[a]	Non-aerosol	1.5	0.68	0.12
Spot Remover[a]		Aerosol	15	0.76	0.24
		Non-aerosol	3	0.29	0.05
Tire or Wheel Cleaner[a]		Aerosol	8	0.01	0.00
		Non-aerosol	2	0.14	0.06
Windshield Water Repellent[a]		All	75	0.23	0.04
Total Emissions 2008		**22.61 tons per day**			
Total VOC Reductions 2015		**5.76 tons per day**			

* Survey emissions adjusted for market coverage, and grown to the 2008 calendar year
** Grams per use limit provides emissions reductions equivalent to 2.6% VOC limit, including fragrance
*** Omitted to protect confidentiality
\+ Remove "Grandfather" clauses

Effective Dates:
a: 12/31/2010
b: 12/31/2012
c: 12/31/2013
d: 12/31/2014
e: 12/31/2015

Table IV-4
Pressurized Gas Duster

Survey Data	Product Form	Number of Products	2008 Category Sales (lbs/day)	2008 Adjusted GHG Emissions (CO_2e lbs/day)	2008 Adjusted GHG Emissions (CO_2e MMT/year)
2003	**Aerosol**	39	3,657	2,242,171	0.37
2007	**Aerosol**	90	7,292	2,179,855	0.36

Pressurized Gas Dusters have a sales-weighted average GHG content of over 99 percent by weight. As shown in Table IV-4, 39 duster products were reported for 2003 with adjusted sales of 3,657 pounds per day for 2008, and estimated GHG emissions of about 0.37 MMT CO_2e per year in California. Additionally, as shown in the table, 90 duster products were reported for 2007 with adjusted sales of 7,292 pounds per day for 2008, and estimated GHG emissions of about 0.36 MMT CO_2e per year.

Manufacturers of Pressurized Gas Dusters have been proactive in taking actions to reduce GHG emissions from gas dusters. Prior to 2003, where feasible, industry leaders voluntarily shifted away from using HFC-134a as the propellant in gas dusters to using HFC-152a (CSPA, 2008). These changes were captured and quantified in the 2007 Pressurized Gas Duster Survey Update. This is why the 2008 adjusted GHG emissions, shown above, have not increased proportionate to the category sales, which have nearly doubled. (For more details on the Pressurized Gas Duster proposal see Chapter VI).

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V. PROPOSED AMENDMENTS TO THE CONSUMER PRODUCTS REGULATION

In this Chapter, we provide a plain English description of the proposed amendments to the California Regulation for Reducing Volatile Organic Compound (VOC) Emissions from Consumer Products 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 (Consumer Products Regulation).

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 noncontrolling "plain English" summary of the regulation be made available to the public. The proposed amendments to the Consumer Products Regulation can be found in Appendix B.

First of all, the current title of the regulation, "Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products," implies that the intent of the regulation is solely to reduce VOC emissions from consumer products. In this rulemaking, however, we are proposing to add requirements related to climate change. To clarify that the regulation now specifies requirements to reduce VOCs and greenhouse gases (GHG), we are proposing to change the title of the regulation to "Regulation for Reducing Emissions from Consumer Products." Additionally, amendments are being proposed to six 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." These amendments are discussed below in detail.

In the sections below, we describe the proposed amendments and the rationale for them. The proposal includes the addition and modification of numerous definitions, a change in the definition of VOC to exclude a hydrofluoroether, new and lower VOC limits for multiple categories, and several changes to clarify existing sections of the Consumer Products Regulation. In addition, we are proposing to prohibit use of certain toxic compounds in several product categories. Our proposal also includes a provision to restrict the use of compounds with high global warming potential (GWP) in Pressurized Gas Duster products. A more detailed discussion of the existing regulatory requirements are referred to at the end of this Chapter (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 or revised definitions. These definitions are necessary to define categories proposed for VOC limits or GWP limits, or to improve enforceability of the Regulation.

Table V-1 lists proposed new definitions that are needed for product categories proposed for regulation. Because of the proposed definitional changes, section 94508(a) would also be reorganized to reflect proper alphabetical order. Chapter VI, contains a detailed discussion related to the proposal for each category.

Table V-1
New Definitions Proposed for Addition

Chemically Curing Sealant or Caulking Compound	Non-Chemically Curing Sealant or Caulking Compound
Fabric Softener – Single Use Dryer Product	Not for Retail Sale
Floor Maintenance Product	Odor Remover/Eliminator
Global Warming Potential	Tire or Wheel Cleaner
Global Warming Potential Value	Windshield Water Repellant
Motor Vehicle Wash	

Several of these definitions warrant a further description.

Global Warming Potential and Global Warming Potential Value

Of particular note, we are proposing new definitions for GWP and GWP Value. These definitions are necessary to implement our proposal to reduce the use of compounds with high GWPs used in Pressurized Gas Dusters. We are proposing to use 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. 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. To enforce our proposal to reduce the use of compounds with high GWPs in Pressurized Gas Duster, 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. 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 limit (i.e. the GWP limit established for specific consumer product categories).

Not for Retail Sale

We are also proposing to clarify what is meant by "not for retail sale." The current regulation includes several provisions where an exemption from compliance is provided if certain criteria are met. For example, General Purpose Degreasers and Lubricants are not subject to VOC limits if they are sold exclusively to establishments which manufacture or construct good or commodities, and are labeled "not for retail sale." Staff has received numerous inquiries as to what "not for retail sale" means, therefore, staff is proposing to define this term. As proposed, "Not for Retail Sale" means that a product is sold exclusively to establishments that manufacture or construct

goods or commodities, or are products sold to holders of commercial licenses (*e.g.* an electrician). For purposes of the regulation, "Not for Retail Sale" means the product is not sold in retail outlets or wholesale locations where household consumers may purchase them.

Table V-2, contains the list of existing definitions that are proposed to be modified. These changes are necessary to improve clarity, improve enforceability, or to describe the types of products that are excluded from another category definition.

Table V-2
Existing Definitions Proposed for Modification

Air Freshener	Lubricant
Astringent/Toner	Metal Polish/Cleanser
Carpet/Upholstery Cleaner	Multi-Purpose Dry Lubricant
Disinfectant	Multi-Purpose Lubricant
Dusting Aid	Penetrant
Existing Product	Personal Fragrance Product
Fabric Protectant	Pressurized Gas Duster
Fabric Refresher	Sealant or Caulking Compound
Floor Polish or Wax – Wood Floor Wax	Spot Remover
Glass Cleaner	Volatile Organic Compound

Two of the definitions listed in Table V-2 that are proposed for modification warrant a further description.

VOC Definition

As noted above, we are proposing to modify the definition of VOC to exclude hydrofluoroether (HFE) 7200. HFE 7200 is a solvent used in precision cleaning. In a report titled "Environmental Impact Assessment of Selected Halogenated Chemicals," ARB staff determined that use of HFE 7200 has negligible impacts on ground-level ozone formation. It also has a fairly low GWP. No other adverse impacts were identified (ARB, 2008b). Therefore, to provide an additional reformulation option that could result in further VOC reductions, staff believes the exemption is appropriate.

Pressurized Gas Duster Definition

Currently, the definition for Pressurized Gas Duster describes a product used to remove dust on surfaces that cannot be cleaned with a solvent. In developing the proposal for Pressurized Gas Dusters, staff became aware that there are certain niche uses of these products where flammability is a concern. These products are formulated with a non-flammable propellant with a high GWP. At present time, no technology exists that would maintain this non-flammable aspect if these products were mandated to comply with our proposed GWP limit for this category. Therefore, staff is proposing a modification to the definition for Pressurized Gas Duster to exclude products used on

energized equipment as long as the Principal Display Panel specifies "Energized Equipment use only." As proposed, products so-labeled would neither be subject to the GWP limit nor the VOC limit.

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-3. Some of the categories are previously unregulated and others are currently regulated. For the currently regulated categories we are proposing lower VOC limits. The new or modified VOC limits would become effective between December 31, 2010 and December 31, 2015, as indicated in Table V-3. Note that in some cases different VOC limits are proposed based on product form. All of these changes would be reflected in the Table of Standards in section 94509(a). Several of the proposed VOC limits warrant additional explanation.

Proposal for Fabric Softener-Single Use Dryer Product

Fabric Softener-Single Use Dryer Product is a previously unregulated category. As shown in Table V-3, a grams of VOC per use limit is being proposed for these products, rather than a percent by weight limit. Our rationale for this proposal is described in section 2 below.

Proposal for Personal Fragrance Products

Staff is proposing that Personal Fragrance Products with 20 percent or less fragrance would be required to meet the existing January 1, 1999, limit of 75 percent by weight VOC. This would remove the so-called "Grandfather" clauses currently contained in subsections 94510(h) and (l). The reader if referred to Section C below for more information on this proposal.

Proposal for Furniture Maintenance Product

Although not shown in Table V-3, staff is proposing to reinstate the long-standing exemption for solid and paste forms of Furniture Maintenance Products. This exemption was inadvertently omitted during the 2006 rulemaking. The exemption clarifies that solid and paste forms of this type of product are not subject to the current VOC limit of three percent by weight.

Table V-3
Proposed VOC Limit, Product Forms, and Effective Dates

Product Category	Product Form	Proposed VOC Limit (wt%)	Effective Date
Astringent/Toner	All	35	12/31/10
Carpet/Upholstery Cleaner	Aerosol	5	12/31/10
	Non-aerosol	1	
Dusting Aid	Aerosol	17	12/31/10
	Non-aerosol	3	
Fabric Protectant	Non-aerosol	1	12/31/10
Fabric Softener – Single Use Dryer Product	All	0.05 grams per use	12/31/10
Floor Maintenance Product	All	1	12/31/10
Floor Polish or Wax (Wood Floor Wax)	All	70	12/31/10
Glass Cleaner	Aerosol	10	12/31/12
Motor Vehicle Wash	All	0.2	12/31/10
Multi-Purpose Lubricant	All*	25	12/31/13
	All*	10	12/31/15
Odor Remover/Eliminator	Aerosol	25	12/31/10
	Non-aerosol	6	
Penetrant	All	25	12/31/13
Personal Fragrance Product (products with 20% or less fragrance)	All	75**	12/31/14
Pressurized Gas Duster	Aerosol	1	12/31/10
Chemically Curing Sealant or Caulking Compound	Non-aerosol	3	12/31/12
Non-Chemically Curing Sealant or Caulking Compound	Non-aerosol	1.5	12/31/10
Spot Remover	Aerosol	15	12/31/10
	Non-aerosol	3	
Tire or Wheel Cleaner	Aerosol	8	12/31/10
	Non-aerosol	2	
Windshield Water Repellent	All	75	12/31/10

* Excluding solid and semisolid

** Remove "Grandfather" clauses

2. Other Proposed Amendments to section 94509

The following proposals pertain to other subsections of section 94509.

Proposed Requirement for Dilutable Products - Section 94509(b)(4)

Currently, section 94509(b) in the Consumer Products Regulation states that any product that is designed to be diluted prior to use is subject to the VOC limits specified in section 94509(a) after the product has been diluted. Staff has become aware of products packaged in pump spray containers that appear to be marketed as "ready-to-use" products, but are designed to be diluted by the user prior to use. Staff believes this approach to packaging may be diminishing anticipated VOC reductions, and is a potential circumvention of the intent of the regulation. Therefore, staff is proposing a modification to section 94509(b)(4), clarifying that the VOC limit for products sold in pump spray containers is applied prior to any minimum suggested dilution.

Date Coding Requirements – Section 94509 (i), (m), (n), (o) and (p)

Subsections 94509 (i), (m), (n), (o) and (p) specify prohibitions on use of certain chlorinated compounds in specified categories. We are proposing to clarify the date coding requirement that must be met to qualify as a "sell-through" product. As proposed, the product would need to comply with the product dating requirements beginning in section 94512(b).

Prohibition of Toxics from Specific Categories - Section 94509(q)

To mitigate a potential adverse environmental impact, staff is proposing a new subsection (q) within section 94509 to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene in "Carpet/Upholstery Cleaner," "Fabric Protectant," "Multi-Purpose Lubricant," "Penetrants," "Sealant or Caulking Compound," and "Spot Remover."

Under the California Environmental Quality Act (CEQA), ARB is required to identify and mitigate any possible adverse environmental impacts of regulatory actions. 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 (TAC). Therefore, because there are many products that comply with the proposed limits, none of which contain chlorinated solvents, prohibiting their use is appropriate to reduce the public's exposure to these TACs.

Staff is also proposing, in new subsection 94509(q)(2), language to describe the sell-through period and date coding requirements for the products listed above. It is being proposed that any of these products manufactured before December 31, 2010, can be sold, supplied, or offered for sale until December 31, 2013, as long as they comply with the date coding requirements beginning in section 94512(b).

Language for the notification requirements of the suppliers of the products listed above is being proposed in new subsection 94509(q)(3). This section requires that the seller must notify the purchaser of the sell-through period described in 94509(q)(2) only if the product is being sold or supplied to a distributor or retailer, and the product is being sold or supplied on or after June 30, 2013.

New subsection 94509(q)(4) is being proposed to establish that the requirements of 94509(q)(1) and 94509(q)(3) do not apply to products that contain methylene chloride, perchloroethylene, or trichloroethylene present as an impurity, or in amounts equal or less than 0.01 percent by weight.

In evaluating the use of these TACs, staff has become aware that certain Penetrants are designed for use on energized equipment. In these situations, the products must be non-flammable as a safety precaution. To provide this non-flammable aspect, the chlorinated solvents are used. At present time, staff is not aware of alternative solvents that can perform this function. Therefore, staff is proposing that Penetrants labeled "Non-flammable: For use on Energized Equipment Only" not be subject to this prohibition. This language would have to be displayed on the Principal Display Panel. Thee products would, however, be required to meet the proposed VOC limits.

Proposal for Pressurized Gas Dusters - Section 94509(r)

The reduction of GHGs from consumer products has been designated as a Discrete Early Action Measure in accordance with The California Global Warming Solutions Act of 2006. The emission reduction estimated for Consumer Products is 0.25 million metric tons of carbon dioxide equivalents (MMT CO_2e) per year. One of the first emission sources that has been identified is compounds used in aerosol products. As a first step, staff is proposing, in new subsection 94509(r)(1), that Pressurized Gas Dusters could not contain a chemical compound that has a Global Warming Potential of 150 or greater.

In accordance with CEQA, to ensure that the VOC content of these products do not increase as a result of reformulation to meet GWP limits, a one percent by weight VOC limit is also being proposed for Pressurized Gas Dusters. As a further mitigation measure, we are also proposing that Pressurized Gas Dusters could not contain the VOC exempt compounds methylene chloride or perchloroethylene. While reformulating with these TACs is unlikely, we believe prohibiting their use is prudent to ensure that there is no increase in exposure to these TACs.

Staff is also proposing in section 94509(r)(2) that Pressurized Gas Dusters manufactured before the effective date of the limit can be sold, supplied, or offered for sale until December 31, 2011, as long as the product complies with the product dating requirements beginning in section 94512(b).

Section 94509(r)(3) is being proposed to specify that any seller or supplier of Pressurized Gas Dusters must notify a purchaser of the product that the sell-through period ends on December 31, 2011. However, this notice must only be given if the product is being sold to a distributor or retailer, and the product is sold or supplied on or after June 30, 2011.

Section 94509(r)(4) is being proposed to specify that the fragrance exemption does not apply to Pressurized Gas Dusters. This proposal ensures that even with fragrance, the total VOCs in a Pressurized Gas Duster will not exceed one percent by weight. This is consistent with requirements under CEQA, as discussed above, to ensure that VOC emissions do not increase as a result of the proposed regulation.

Finally, Section 94509(r)(5) is being proposed to specify that any chemical compounds that are present as impurities in an amount, in aggregate, of 0.1 percent by weight or less, are not subject to the GWP limit or toxics prohibition for Pressurized Gas Dusters. Some of the chemical compounds used in Pressurized Gas Dusters may contain very small quantities of contaminants. This provision allows Pressurized Gas Dusters that contain those contaminants, present at very low levels, to comply with the regulatory provisions.

Staff has also become aware that certain Pressurized Gas Dusters are designed for use on energized equipment. In these situations the products must be non-flammable as a safety precaution. To provide this non-flammable aspect, propellants with high GWPs are used. At present time, staff is not aware of alternative propellants that can perform this function. Therefore, staff is proposing that Pressurized Gas Dusters that specify on the Principal Display Panel "Energized Equipment use only." be exempt from both the VOC and GWP limits.

Requirements for Fabric Softener – Single Use Dryer Product – Section 94509(s)

Staff is proposing a new subsection 94509(s) to describe the VOC content limit for Fabric Softener-Single Use Dryer Product. These products are typically made by applying liquid materials to a non-woven sheet substrate. Rather than a percent by weight limit, a 0.05 grams of VOC per use limit is proposed. The limit is designed to provide a level playing field and to ensure that the size of each dryer sheet does not increase. In developing the limit for these products, staff determined that establishing a percent by weight limit could result in the use of larger sheets to comply. This would diminish emission reductions and potentially lead to increasing the solid waste stream. Therefore, in accordance with CEQA requirements to mitigate potential environmental impacts, the grams per sheet limit is proposed. The 0.05 grams per use VOC limit is designed to provide a VOC reduction equivalent to that which would be achieved by setting a 2.6 percent by weight VOC limit (including 2 percent for fragrance). Because the limit already accounts for the fragrance, there is no need to provide the fragrance exemption contained in section 94510(c) for these products. This modification is proposed in section 94510(c).

C. EXEMPTIONS (SECTION 94510 (h) and (l))

At present, Personal Fragrance Products with 20 percent or less fragrance are required to meet an 80 percent by weight or a 75 percent by weight VOC limit, depending on when they first were introduced to the market. Products existing prior to setting these limits do not need to comply with either limit. Products that were introduced between 1995 and 1999 were required to meet the 80 percent by weight VOC limit, but were not required to reformulate to meet the January 1, 1999, limit. Only products introduced after January 1, 1999, are required to meet the 75 percent by weight VOC limit. These provisions are contained in subsections 94509(h) and (l). Staff is proposing to remove these "Grandfather" clauses. Under this proposal, all Personal Fragrance Products with 20 percent or less fragrance would be required to meet the 75 percent by weight VOC limit effective on December 31, 2014. These proposals are contained in new subsections 94510(h)(3) and (l)(1).

D. ADMINISTRATIVE REQUIREMENTS (SECTION 94512)

Proposed Modification to Product Dating Requirements – Section 94512(b)(1)

Currently, section 94512(b)(1) specifies that a product must clearly display the date or code indicating the date of manufacture. We are proposing language to clarify that a sequential batch number on a product package does not satisfy the product dating requirements.

Proposed Modification to Labeling Requirements – Section 94512(d)

Staff is proposing that non-aerosol Chemically Curing and Non-Chemically Curing Sealant or Caulking Compound products comply with additional labeling requirements specified in section 94512(d). Because different VOC limits are proposed, staff believes this is necessary to easily distinguish between Chemically Curing Sealant or Caulking Compound and Non-Chemically Curing Sealant or Caulking Compound. Section 94512(d) requires products to display the applicable regulatory category and VOC limit as a percent by weight. The information must be clearly visible. These provisions will improve enforceability.

E. REPORTING REQUIREMENTS (SECTION 94513)

Staff is proposing a 25 percent by weight VOC limit for Multi-purpose Lubricants and Penetrants, effective December 31, 2013. These are challenging but feasible limits within the time-frame proposed. For Multi-purpose Lubricants staff is proposing a technology forcing 10 percent second tier VOC limit, effective December 31, 2015. To ensure that manufacturers are on track, and that technology advances as expected, staff believes that manufacturers should demonstrate their progress toward meeting these limits.

Therefore, as proposed in new subsection 94513(f) Multi-purpose Lubricant and Penetrant manufacturers would need to supply detailed written updates on their research and development efforts undertaken to achieve compliance with the VOC limits. 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, the hardware evaluated, and the cost of reformulation efforts. The first report would be due on March 31, 2012, and would provide data for the 2011 calendar year. For Multi-purpose Lubricants, a second report would be due on March 31, 2014, and would provide data for the 2013 calendar year.

Should technical or commercial issues arise, or if it appears reductions could occur within a shorter timeframe, staff would develop appropriate measures to ensure air quality benefits occur as soon as possible.

F. TEST METHODS (SECTION 94515)

Staff is proposing to clarify that ARB's Method 310 be used as the analytical method to determine GWP content. This method already contains the necessary protocols to analyze for both HFC-152a and HFC-134a content.

REFERENCES

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2. 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)

3. Air Resources Board. Initial Statement of Reasons for 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)

4. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Mid-term Measures II. September 10, 1999. (ARB, 1999)

5. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures I. June 6, 1997. (ARB, 1997b)

6. Air Resources Board. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Phase II – Technical Support Document. October, 1991. (ARB, 1991a)

7. Air Resources Board. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Technical Support Document. August, 1990. (ARB, 1990c)

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
- if applicable, a discussion of outstanding issues associated with the proposal.

Chapter VI is divided into two parts. Section A includes descriptions of the product categories for which VOC limits are proposed. The product categories in Section A are in alphabetical order. Section B describes the product category for which a greenhouse gas (GHG) limit is proposed.

A. CATEGORIES FOR WHICH VOC LIMITS ARE PROPOSED

1. Astringent/Toner

Product Category Description:

The Astringent/Toner category consists of products which are designed or labeled to be applied to skin for the purpose of cleaning and tightening pores. For this rulemaking, only those Astringents/Toners not regulated by the Food and Drug Administration (FDA) are included. These products may also exfoliate, refresh, remove excess dirt, oil, impurities, and/or prepare the skin for moisturizing. While most Astringents/Toners are liquid products, there are also products sold in the form of substrate-impregnated pads. Astringent/Toner does not include any hand, face, or body cleaner or soap product, Medicated Astringent/Medicated Toner, Personal Fragrance Product, cold cream, lotion or Antiperspirant. Medicated Astringent/Medicated Toner means any product regulated as a drug by the FDA which is applied to the skin for the purpose of cleaning or tightening pores. In accordance with FDA rules, Medicated Astringents/Medicated Toners must be labeled such that the active ingredients in the product are identified.

Astringent/Toner is a previously unregulated category. Table VI-1 below summarizes the sales and emissions from Astringents/Toners based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 5,910 pounds per day.

Table VI-1
Astringent/Toner*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms	203	5,910	1,240

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

As indicated, 203 different branded Astringents/Toners were sold in California in 2003 by 73 companies. Astringent/Toner VOC emissions, adjusted to 2008, are about 1,240 pounds per day, or 0.62 tons per day, in California. Although not shown in Table VI-1, the sales-weighted average VOC content for this category is about 21 percent by weight.

Product Use and Marketing:

Astringents/Toners are used by both health professionals and household consumers to eliminate oil, decrease pore size, and/or remove dirt remaining on skin after cleansing. They may also exfoliate, refresh, tighten, and prepare the skin for moisturizing. Typically, the Astringent/Toner is dispensed onto a cotton ball or pad and the moistened cotton is wiped across clean and dry skin. The product is not rinsed but allowed to dry/evaporate off the skin. Many products recommend the use of a moisturizer once the Astringent/Toner has dried (Cote, 2006).

Astringents/Toners are sold in a variety of retail outlets including grocery stores, drug stores, beauty supply stores, discount stores, and department stores. Astringents/Toners are also available for purchase over the Internet. Examples of additional terms for Astringents/Toners include but are not limited to, skin tonic, freshener, refresher, and/or a clarifying lotion. The most common Astringent/Toner size is eight fluid ounces, although some companies offer smaller and larger sizes.

Product Formulation:

The VOC content of products in this category ranges from 0 to 60 percent by weight, with a sales-weighted average of 21 percent by weight. Astringents/Toners utilize ingredients that will dissolve excess oil and readily evaporate. These products typically contain water, low vapor pressure volatile organic compounds (LVP-VOC), fragrance and either ethanol, isopropyl alcohol, and/or witch hazel.

Proposed VOC Limit and Compliance:

As shown in Table VI-2 below, the proposed VOC limit for Astringent/Toner, is 35 percent by weight, effective December 31, 2010. Using emissions adjusted to 2010,

the proposed limit would result in an estimated emission reduction of 220 pounds per day, or about 0.11 tons per day.

Table VI-2 also shows that 70 percent of the market currently complies with the proposed 35 percent VOC limit.

Table VI-2
Astringent/Toner Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
All Forms	35	177	70	215	220

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

As shown in Table VI-2, at the time of the 2003 Survey, over two-thirds of the market complied with the proposed VOC limit of 35 percent by weight. Most of these products comply by using slightly lower amounts of alcohol or volatile organic ingredients. We believe manufacturers will be able to comply by using the same ingredients that are being used today.

The proposed 35 percent VOC limit is designed to maintain efficacy among the variety of Astringent/Toner products currently available. Staff has information that indicates a 2:1 part water to alcohol ratio may be necessary for some products used on oily skin. This ratio of water to alcohol is needed for the Astringent/Toner to effectively dissolve sebum on oily skin (Idelle, 2008).

Staff has determined that reformulation to the proposed limit is technically feasible. The majority of products in this category are already low VOC, and there are many effective non-VOC alternatives available for substitution. Numerous products with VOC content below 35 percent are already available and well-accepted by consumers. Reformulation options that can be used by manufacturers to meet the proposed limit include reducing the level of alcohol and increasing the amount of water, LVP-VOCs, and/or exempted VOCs.

Issues:

a. **Issue:** The full range of products that contain all levels of VOCs is necessary to maintain efficacy, and provide consumers with all options for skin treatment.

Response: All of the products within this category make similar claims on the label, including those containing 35 percent or less VOC.

b. **Issue:** Manufacturers will change their non-medicated products to medicated allowing the use of the full range of VOCs.

Response: Staff disagrees. The cost to change a non-medicated product to medicated is considerable because of U.S. Food and Drug Administration requirements. These requirements would necessitate a change in formulation, the use of specific active ingredients such as salicylic acid, labeling modifications, and extensive record keeping.

c. **Issue:** Any VOC limit on these products will negatively impact public health.

Response: As required in the California Health and Safety Code, we have consulted with staff at California Department of Public Health (DPH) with the specifics of our proposal. DPH staff do not oppose a VOC limit for non-medicated Astringents/Toners.

d. **Issue:** Adequate sebum removal occurs with a two parts water to one part alcohol (by weight) ratio.

Response: Staff acknowledges and as a result is proposing a 35 percent VOC limit to accommodate products using alcohol to address oily skin.

e. **Issue:** Setting a low VOC limit will eliminate some needed products.

Response: Staff disagrees. We believe all necessary functions of an Astringent/Toner can be met at a VOC level of 35 percent or less. In addition, 70 percent of the market already meets this limit which shows both technological and commercial feasibility with the proposed limit.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Cote, Ryan. How to Use an Astringent Skin Toner in Your Skin Care Routine. http://ezinearticles.com/?How-to-Use-an-Astringent-Skin-Toner-in-Your-Skin-Care-Routine&id=360826 (April 8, 2008). (Cote, 2006)

3. Idelle Labs. Telephone Conversation with ARB Staff. March 20, 2008. (Idelle, 2008)

2. Carpet/Upholstery Cleaner

Product Category Description:

Carpet/Upholstery Cleaner products are used for routine cleaning of soils on carpet and/or upholstery in homes, businesses, institutions, and vehicles. Typical fabrics include wool; cotton; nylon; and other carpet, rug, furniture, and automotive interior synthetic fibers. The category includes cleaning products with or without fabric protectant claims. Carpet/Upholstery Cleaner does not include Spot Removers, used for removing localized spots and stains; vinyl or leather cleaners; or products for exclusive use at industrial facilities engaged in furniture or carpet manufacture (i.e. industrial cleaners used only in production of carpet or furniture). The category also does not include Dry Cleaning Fluids (ARB, 1997b).

While there are three existing subcategories based on product form, each with a different VOC standard, only two VOC standards are being proposed for regulatory changes at this time: aerosol products and ready-to-use (RTU) non-aerosol products. The third VOC standard, applicable to dilutable non-aerosol products, is being retained at the current limit of 0.1 percent VOC (based on minimum dilution concentration). However, the proposal to clarify the category definition would apply to all product forms.

Carpet/Upholstery Cleaners were regulated under Midterm Measures I of the Consumer Products Regulation approved on July 24, 1997, and a description of the products is also included in the staff report for that rulemaking (ARB, 1997b). At that time, the Board adopted a 7 percent VOC limit for aerosol products, a 0.1 percent VOC limit for dilutable non-aerosol products, and a 3 percent VOC limit for RTU non-aerosol products. The adopted limits became effective January 1, 2001.

As discussed, the Carpet/Upholstery Cleaner category is intended to include products for routine cleaning of carpets/upholstery. The category does not include Spot Remover products for localized spots and stains.

Table VI-3 below summarizes the sales and emissions from Carpet/Upholstery Cleaners, based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 26,788 pounds per day.

Table VI-3
Carpet/Upholstery Cleaner*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	59	9,376	651
Non-Aerosol	117	17,412	583
Total	**176**	**26,788**	**1,234**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

As shown in Table VI-3, estimated VOC emissions are about 1,234 pounds per day, or about 0.61 tons per day, in California. The sales-weighted average VOC content of the aerosol and non-aerosol products reported in the 2003 Survey was approximately 7 and 3 percent by weight, respectively.

Product Use and Marketing:

Aerosol products for carpets and rugs typically use an invertible aerosol container for downward spray application. The dispensed liquid or foam is left on the carpet or rug for several minutes to penetrate and loosen dirt, with or without agitation. To lift and remove the dirt, the area is either wiped with cloth (damp or dry, depending on the product) before the treated area is dry, or allowed to dry and then brushed or vacuumed. Products for upholstery are used in a similar manner.

The RTU non-aerosol products include not-to-be-diluted liquids, solids, and gel/semisolids. The liquids may be dispensed by mechanical spray (trigger or hand-pump-pressurized tank) and used in a manner similar to aerosols. The solids and gel/semisolids are granular or powder products applied to carpeting, brushed or agitated, and then vacuumed. Some products are used for pre-cleaning sections of carpeting, such as traffic lanes, prior to main cleaning such as by hot-water extraction.

Carpet/Upholstery Cleaners are used by household consumers, janitors, professional carpet/upholstery cleaners, and auto detailers in homes, businesses, institutions, and vehicles. Aerosol products are typically used by household consumers, while the RTU non-aerosol products are used by both household and commercial/institutional users.

Carpet/Upholstery Cleaners are available in general merchandise stores, super markets, auto parts stores, hardware stores, janitorial and maintenance supply warehouses, and over the Internet.

Product Formulation:

Aerosol products may contain 4 to 7 percent hydrocarbon propellant, VOC solvent cleaners, surfactants, emulsifiers, various inorganic and LVP-VOC ingredients, fragrance, ingredients to protect the metal aerosol container (corrosion inhibitors), and water. The VOC ingredients include glycol ethers (such as 2-butoxyethanol), alcohol, and hydrocarbon distillates. Some products use LVP-VOC glycol ethers. Many products contain surfactant cleaners (which are generally LVP-VOCs). When fabric protection is claimed, the product contains a polymer to be left behind on the fabric. Other propellants include carbon dioxide, dimethyl ether, and nitrous oxide (N_2O). The very low-VOC products are generally surfactant-based, and VOC levels largely reflect only the hydrocarbon propellants.

While the RTU non-aerosol products show a greater variety of formulations and ingredients, there are some similarities to the aerosol products when considering there is no propellant. The VOC ingredients may include glycol ethers (such as 2-butoxyethanol), alcohol, hydrocarbon distillates, and d-limonene. Some products use LVP-VOC glycol ether or LVP-VOC hydrocarbon solvents. Surfactants are common; sodium lauryl sulfate is typical. Some products are shampoos, formulated to remove particles and inorganic contaminants, and may address oily dirt to some extent as well. The few that reported solid (powder or granular) and gel/semisolid products in this subcategory showed varied formulations.

Proposed VOC Limit and Compliance:

The proposed VOC limits for Carpet/Upholstery Cleaner are 5 percent VOC by weight for aerosol products, and 1 percent VOC for RTU non-aerosol products, effective December 31, 2010. As shown in Table VI-4, using emissions adjusted to 2010, the proposed limits will result in an estimated emission reduction of 302 pounds per day, or about 0.15 tons per day.

Table VI-4 also shows that about 10 percent of the market for aerosol products, and 25 percent of the RTU non-aerosol market, currently comply with the proposed VOC limits.

The proposed 5 percent VOC limit for aerosol products would allow approximately 1 to 2 percent VOC cleaning solvent, along with 3 to 4 percent VOC hydrocarbon propellant, in water-based formulations. The VOC may be glycol ethers such as 2-butoxyethanol, alcohol, or hydrocarbon solvent. Another option is use of non-VOC propellants, such as N_2O, to enable up to 5 percent VOC cleaning solvent. A third option is to use up to 5 percent VOC hydrocarbon propellant, and rely on LVP-VOC surfactant cleaners, LVP-VOC solvent cleaners such as glycol ethers, and inorganic cleaners.

Table VI-4
Carpet/Upholstery Cleaner Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Aerosol	5	7	10	147	150
Non-Aerosol	1	54	25	149	152
Total	--------	61	---------	**296**	**302**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

The proposed 1 percent VOC limit for RTU non-aerosol products is intended to enable up to 1 percent VOC cleaning solvent. Many products are already below 1 percent VOC. As with aerosol products, the main cleaning ingredients are LVP-VOC surfactant or LVP-VOC glycol ethers.

The 2003 survey data show very limited use of perchloroethylene (an exempt chlorinated compound) and trichloroethylene (a VOC chlorinated compound) in this category. While ARB staff believes these toxic air contaminants are not likely to be used as cleaning solvents in the future reformulated products, ARB staff is proposing that perchloroethylene, trichloroethylene, and methylene chloride be prohibited in Carpet/Upholstery Cleaners. This prohibition is proposed to ensure that manufacturers do not choose to reformulate with toxic chlorinated solvents in response to the lower VOC limits. Staff has determined that currently available formulation technologies do not contain perchloroethylene, trichloroethylene, or methylene chloride, thus they are not needed to comply with the proposed standard. See Chapter VIII for a discussion of the health effects of perchloroethylene, trichloroethylene, and methylene chloride.

Issues:

a. **Issue:** The sales-weighted average (SWA) for Carpet/Upholstery Cleaner (non-aerosol-RTU), complying market share, and tons per day VOC reduction do not appear consistent.

Response: The SWA includes high-VOC sell-through and non-complying products, some with VOC content considerably above the 3 percent VOC limit in effect in 2003. However, the emission reduction must be corrected to avoid double-counting reductions associated with a prior rulemaking, and to not overestimate the emission reduction from the current rulemaking. The correction is done by lowering all high-VOC products above the limit, down to the 3 percent VOC limit in effect in 2003. This makes the uncorrected SWA appear

inconsistently high, compared with the corrected VOC reduction. Also, there were substantial sales of low-VOC products complying with the proposed 1 percent VOC level, and hence well below the 3 percent VOC limit in effect in 2003. This additionally makes the SWA appear inconsistently high compared with the relatively high complying market share with the 1 percent VOC proposed limit.

b. **Issue:** Lowering of the VOC limit for aerosol Carpet/Upholstery Cleaner to 5 percent by weight could impact the feasibility of foaming products to not leave soil-attracting residues. A lowering of the VOC limit could also adversely impact the ability of the propellant to empty the can. As such, we suggest the VOC limit be set no lower than 6 percent by weight.

Response: The 2003 survey data show several aerosol foaming products, using conventional hydrocarbon propellants, complying with the proposed 5 percent VOC limit for aerosol products. Also, we do not expect the concentration of LVP-VOC cleaners, in reformulated products, to be high enough to cause residue problems. Regarding propellant use, a few reported products contained only 3.0 to 3.5 percent VOC propellant. We therefore believe there would be no problem with either soil-attracting residues or with emptying the aerosol container.

c. **Issue:** Non-VOC propellants such as HFC-152a are not suitable for foaming aerosol products, because the non-VOC propellants lack the solubility of conventional hydrocarbon propellants, needed for adequate foam generation.

Response: As discussed above, the 2003 survey data show several foaming products, using conventional hydrocarbon propellants, complying with the proposed 5 percent VOC limit for aerosol products. We believe the use of non-VOC propellants, such as HFC-152a, is generally not necessary, so there should be no problem with foam generation.

d. **Issue:** For Carpet/Upholstery Cleaner (non-aerosol-RTU), any lowering of the current 3 percent VOC limit could impact the feasibility of products to not leave soil-attracting residues.

Response: The 2003 survey data show that many RTU non-aerosol products comprising 25 percent market share already comply with the proposed 1 percent VOC limit. Therefore, we believe there should be no problem with soil-attracting residues.

e. **Issue:** Some products listed as Carpet/Upholstery Cleaner (non-aerosol-RTU) may actually be Spot Removers, which do not belong with Carpet/Upholstery Cleaners.

Response: Generally, products are categorized as reported by the marketer, and if clearly mis-categorized, with adjustments by ARB staff. Some product

names and label claims may be inconsistent. If a product is both a Spot Remover and a Carpet/Upholstery Cleaner, we would consider the product a Carpet/Upholstery Cleaner if label directions recommend broad-area (non-localized) use of the product.

f. **Issue:** Precleaner liquid and powder products are not Carpet/Upholstery Cleaner - non-aerosol RTU products.

Response: These products already fall into the definition of Carpet and Upholstery Cleaner in section 94508(a)(26) of the Consumer Products Regulation. As non-aerosol RTU products, they have been subject to the currently effective 3 percent VOC limit since January 1, 2001.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures I. June 6, 1997. (ARB, 1997b)

3. Dusting Aid

Product Category Description:

Dusting Aid means a product designed to assist in removing dust and other soils from floors and other surfaces without leaving a wax or silicone-based coating. Dusting Aids do not include Pressurized Gas Duster Products, or Furniture Maintenance Products, which are regulated as separate categories.

The Board adopted standards limiting the VOC content of Dusting Aids in January of 1992 as part of Phase II of the consumer products rulemaking. Two tiers of standards were adopted for aerosol products. The first tier set a VOC limit of 35 percent by weight, effective on January 1, 1995. The VOC limit was reduced to 25 percent by weight, effective January 1, 1997. In addition, the Board adopted a 7 percent VOC limit for non-aerosol Dusting Aids, effective January 1, 1995, (ARB, 1991a).

Table VI-5 below summarizes sales and VOC emissions from Dusting Aids based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 3,108 pounds per day.

Table VI-5
Dusting Aid*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	41	2451	565
Non-aerosol	38	657	13
Total	**79**	**3108**	**578**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated VOC emissions from the entire category are 578 pounds per day, or about 0.29 tons per day. As shown in Table VI-5, aerosol Dusting Aids account for 79 percent of the total category emissions. Aerosol Dusting Aids have a sales-weighted average VOC content of about 23 percent by weight. The non-aerosol products, which include liquids, liquid impregnated wipes, and pump sprays, have a sales-weighted average VOC content of approximately 21 percent.

Product Use and Marketing:

Dusting Aids are products that assist in removing dust and other soils from floors and other surfaces without leaving a wax or silicone based coating. The product is applied to dust mops, dust cloths, or feather dusters to increase the ability of the mop head or cloth to attract and hold dust particles, lint, pet dander, hair, and dirt. These products are used on furniture, molding, window blinds, ceiling fans, window frames and sills, radiators, woodwork, floors and any other surface where dust collects. Dusting Aids are also used as a filter dressing for heating and cooling systems to attract dust, dirt, lint, and pollen to keep it from entering the system. Some products may also be labeled to remove fingerprints, allergens, smudges, or oil-based stains from surfaces such as wood paneling, cabinets, furniture, or floors.

Dusting Aids contain oils or cationic quaternary ammonium compounds that attract negatively charged dust to the cloth or mop head. To prevent leaving a slippery residue on floors, some products recommend that the product be applied to the mop head the day prior to use. This cure time allows the product to penetrate and diffuse throughout the dust mop strands. For wood surfaces, Dusting Aids are marketed to be used between polishes to remove surface dullness.

While there is some overlap in the functions provided by Furniture Maintenance Products and Dusting Aids, the categories can be distinguished. Dusting Aids are primarily used for dusting, including dusting of furniture and floors, without leaving a wax or silicone-based coating. Furniture Maintenance Products are used primarily to polish furniture, leaving a wax or silicone-based protective coating. Although some Furniture

Maintenance Products may be used to dust furniture, they are not used for dusting floors, because they would leave a slippery residue.

Product Formulation:

Dusting Aids typically contain water, LVP-VOCs, VOCs, hydrocarbon propellants (in aerosols), and small amounts of other agents such as emulsifiers, dust attractants and fragrances (ARB, 2004a). The active ingredients used to lift and absorb dust particles can be a light hydrocarbon oil, orange oil, or a cationic quaternary ammonium compound.

The solvents used in Dusting Aids include water; hydrocarbons, such as odorless mineral spirits or petroleum distillates; LVP-VOCs such as glycol ethers; or volatile methyl siloxanes. Aerosol products typically contain hydrocarbon propellants such as propane and isobutane.

Proposed VOC Limit and Compliance:

The proposed VOC limit for aerosol Dusting Aids is 17 percent by weight, effective December 31, 2010. The proposed VOC limit for non-aerosol Dusting Aids is 3 percent by weight, effective December 31, 2010. As shown in Table VI-6, the proposed limits will result in an estimated VOC reduction of 155 pounds per day, or about 0.08 tons per day. The proposed 3 percent by weight VOC limit for non-aerosol products is not expected to achieve reductions in VOC emissions. Requiring further reductions was not cost-effective. The limits are designed to be consistent with those for Furniture Maintenance Products.

Table VI-6 also shows that about 5 percent of the market currently complies with the proposed 17 percent VOC limit for aerosol Dusting Aids. For non-aerosol Dusting Aids, 77 percent of the market complies with the proposed 3 percent VOC limit.

As described in the Product Use and Marketing section, there is some overlap in the functions provided by Furniture Maintenance Products and Dusting Aids. Because of the similarity in formulation and function, we expect that the technology used in Furniture Maintenance Products can be transferred for use in Dusting Aids. Reformulation options include the use of LVP-VOC hydrocarbons, LVP-VOC glycol ethers, and water.

Table VI-6
Dusting Aid Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Aerosol	17	13	5	151	155
Non-aerosol	3	33	77	0	0
Total	------	**46**	------	**151**	**155**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Air Resources Board. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Phase II – Technical Support Document. October, 1991. (ARB, 1991a)

4. Fabric Protectant (non-aerosol)

Product Category Description:

Fabric Protectants are applied to fabric substrates to protect the surface from dirt, soil, and other contaminants, and from stains that may result. While some products also provide water repellency, Fabric Protectants are used specifically to protect against dirt, soil, or stains. Products which solely provide water repellency (i.e. water-proofing protection), without any claim for dirt, soil, or stain protection, are considered Waterproofer products, and are not included in the Fabric Protectant category. Typically, Waterproofer products are silicone-based, while some Fabric Protectant products (notably the aerosols) are fluoropolymer-based (ARB, 1991a).

Fabric Protectants were regulated under Phase II of the Consumer Products Regulation adopted in January 1992, and a description of the product category is also included in the staff report for that rulemaking (ARB, 1991a). At that time, the Board approved the staff recommendation of a 75 percent VOC limit for all product forms effective January 1, 1995, along with a 60 percent VOC limit for all product forms subsequently effective January 1, 1997. The 60 percent VOC limit for all product forms remains in effect.

The current proposal for a specifying a lower VOC limit pertains only to the non-aerosol products, for reasons discussed later. Table VI-7 below summarizes the sales and emissions from ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 5,517 pounds per day.

Table VI-7
Fabric Protectant*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Non-Aerosol	63	5,517	366

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated VOC emissions of non-aerosol Fabric Protectants are 366 pounds per day, or about 0.18 tons per day. Although not shown, the sales-weighted average VOC content for this category is 5 percent by weight.

Product Use and Marketing:

Fabric Protectants are used by household consumers and outdoor recreational enthusiasts; as well as commercial and professional workers for clothing care, upholstery care, carpet care, and automotive interior care. Fabric Protectants may be used for household fabric articles such as bed covers, quilts, craft, and vehicle upholstery. Fabric Protectants are also used on the fabric tops of convertible automobiles.

Non-aerosol products are typically applied by mechanical spray on clean fabric articles, and left to dry. A resin film, usually very thin and often invisible, is formed and left behind on the fabric fibers. Occasional re-application may be needed to maintain protection (ARB, 1991a).

Fabric Protectants are sold in general merchandise stores, supermarkets, hardware stores, recreational equipment stores, auto parts stores, janitorial and maintenance supply warehouses, and over the Internet.

Product Formulation:

The non-aerosol products are liquid, mechanical-spray-applied products, some sold as dilutables (i.e. concentrates). Most formulations are water-based with low levels of VOCs. Typical VOCs include glycol ethers and alcohol. Non-VOC products represented approximately 42 percent of the non-aerosol sales. The sales-weighted average VOC content of the products reported in the 2003 Survey was 5 percent by weight.

Proposed VOC Limit and Compliance:

The proposed VOC limit for non-aerosol products is 1 percent VOC by weight, effective December 31, 2010. As shown in Table VI-8, using emissions adjusted to 2010, the proposed limit will result in an estimated emission reduction of 163 pounds per day, or about 0.08 tons per day. Table VI-8 also shows that about 95 percent of the non-aerosol market currently complies with the proposed 1 percent VOC limit.

Table VI-8
Fabric Protectant Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Non-Aerosol	1	42	95	159	163

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

The proposed 1 percent VOC limit is intended to allow for complying water-based formulations. As discussed above, the 2003 survey data showed many non-aerosol products are water-based and already are low or non-VOC.

The 2003 survey data show very limited use of perchloroethylene (an exempt chlorinated compound) and trichloroethylene (a VOC chlorinated compound) in this category. While it is not likely these toxic air contaminants will be used as cleaning solvents in the future reformulated products, ARB staff is proposing that perchloroethylene, trichloroethylene, and methylene chloride be prohibited from use in Fabric Protectant products. This prohibition is proposed to ensure that manufacturers do not choose to reformulate with toxic chlorinated solvents in response to the lower VOC limits. Staff has determined that currently available formulation technologies do not contain perchloroethylene, trichloroethylene, or methylene chloride, thus they are not needed to comply with the proposed standard. See Chapter VIII for a discussion of the health effects of perchloroethylene, trichloroethylene, and methylene chloride.

Issues:

a. **Issue:** The proposed 1 percent VOC limit for non-aerosol Fabric Protectants may be feasible for some types of products, but not others.

Response: The commenter did not identify which types of products for which the proposal may not be feasible. A review of labels for products that comply with the proposed standard shows a variety of claims, demonstrating the proposal is feasible for many types of products. No specific claims were found

on the labels of non-complying products that could not also be found on the labels of complying products. In addition, the large complying market share for the non-aerosol products suggests that the proposal is feasible.

b. **Issue:** The proposed VOC limit for aerosol products is not feasible for products labeled for use on upholstery.

Response: Regarding the aerosol products, ARB staff believes that survey year 2003 was likely within the transition period during which industry conducted research and development and phased in replacement products using new chemical technologies, following the phase-out of the perfluorooctanyl chemistry products at the end of 2000 (3M, 2007; 3M, 2000a; 3M, 2000b; U.S. EPA 2000). Also, five years have passed since the 2003 survey, so current products may be the result of several transitional changes. Therefore, products marketed now may be substantially different in terms of product formulations, sales, and possible VOC emission reductions, compared with the products in the 2003 survey. Staff therefore plans to defer proposing a VOC standard for aerosol Fabric Protectants and intends to re-survey the aerosol products to obtain more representative data. Staff will reconsider the VOC limit for aerosol products in a future rulemaking, assuming that the phase-in of new technologies has largely been accomplished.

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6. United States Environmental Protection Agency. Memo from Charles Auer to Barbara Leczynski, Mary Dominiak, Frank Kover, Ward Penberthy, and Karen Lannon. Subject: Phaseout of PFOS. May 16, 2000. (U.S. EPA, 2000)

5. Fabric Softener – Single Use Dryer Product

Product Category Description:

Fabric Softener – Single Use Dryer Product is 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 non-woven 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 and multiple use dryer-added products.

These products are often sold in packages of as little as 20 sheets to as many as 200 sheets per box and are available in both scented and unscented varieties. A product brand may have more than one fragrance variant. Based on the shelf survey conducted by ARB staff in 2006 and Internet searches, the majority of dryer-added fabric softener products are sold as single use sheets but are also available to consumers in multiple use products such as packets, sachets, blocks and dryer balls. However, the Fabric Softener – Single Use Dryer Product category only applies to single use products.

Fabric Softener – Single Use Dryer Product is a previously unregulated category. Table VI-9 below summarizes the sales and emissions from products in the Fabric Softener – Single Use Dryer Product category based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 26,804 pounds per day.

Table VI-9
Fabric Softener--Single Use Dryer Product *

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms+	26	26,804	1,037

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Only the amount of product impregnated on a sheet reported. The mass of the sheet is not included.

As shown in Table VI-9, products in the Fabric Softener – Single Use Dryer Product category have estimated VOC emissions of about 1,037 pounds per day, or about 0.52 tons per day, in California. Although not shown, the SWA-VOC content for this category is about 4 percent by weight (including all fragrance but excludes the sheet) or about 0.08 grams of VOC per sheet.

Product Use and Marketing:

Fabric softener products can often be found as liquid and sheet products. According to the Soap and Detergent Association (SDA), 86 percent of households use a fabric softener product; with 40 percent preferring a dryer-added sheet product, 21 percent using a washer-added product, and 25 percent using both (SDA, 2006b). Dryer-added products are used to treat laundered fabrics in the clothes dryer. These products claim to soften clothes and eliminate static cling, or add a fresh scent. To impart softness refers to a "quality of the fabric in which its "hand" or feel to the touch is smooth, pliable and fluffy, as distinguished from coarse or scratchy" (US Patent, 2005). The term static cling refers to the "tendency of articles of clothing to adhere to one another after being dried in clothes dryer as a result of static electrical charges created on the surface of the fabric" (US Patent, 2005).

The dryer-added and washer-added products provide the same softening and anti-static benefits. The dryer-added sheet products are perceived to be more convenient to use, being added into the clothes dryer as opposed to the washer rinse cycle. Dryer-added sheet products are generally sold as single use products. Single use and multiple use products refers to "the number of drying cycles in which the fabric treatment composition can be used and release an effective amount of a fabric treatment agent to fabric that is being dried during the operation of a dryer (US Patent, 2007)." Typically, one sheet is used per drying cycle, with larger/atypical loads requiring up to two sheets per drying cycle. While dryer-added fabric softener products are more commonly used, liquid fabric softeners added to the clothes washer are more effective at softening clothes. This is because the wash water allows the softening ingredients to more easily penetrate into the fabric (SDA, 2006b).

Both scented and unscented fabric softener products are marketed. According to the U.S. National Academy of Sciences, "15 percent of the U.S. population is hypersensitive to chemicals, including fragrances" (Clements, 2006). In order to meet market demand, companies have responded with unscented products.

Fabric softener products are typically found in both household and commercial settings. They are available to consumers through national and private store label brands, with the national brands owning a large share of the market. Most fabric softener products are available for purchase in grocery stores, diversified pharmacies, warehouses, superstores, laundromats, and from Internet companies.

Product Formulation:

Products in the Fabric Softener – Single Use Dryer Product category are formulated with cationic and nonionic softening agents, used to soften fabric and control static cling; water, used as a perfume carrier; fragrances, for aesthetic appeal; and/or inorganic materials such as preservatives, effective in "preventing biological degradation of the composition and substrate" (US Patent, 2005). These ingredients are typically impregnated on a non-woven sheet of synthetic fabric, and released by the heat and direct contact with the fabrics during the tumbling action of the clothes dryer.

Dryer-added fabric softener products contain the same types of cationic compounds as those found in the washer-added fabric softener products, however, the dryer-added products contain alkyl sulfate salts instead of chloride salts (SDA, 2006a). The active ingredient consists of cationic fabric softening agents, known as quaternary ammonium compounds, used to impart softness to laundered fabrics. One side of the quaternary molecule contains a positively charged atom that binds to the negatively charged fabrics. The other side of the molecule consists of a long chain fatty material that leaves a coating on the fabric, making the fabric soft and controlling static cling (Kozen, 2006). Dryer-added fabric softener products may also contain long chain fatty based hydrocarbon nonionic molecules. "These nonionics have no positive charge but are effective in the dryer where deposition depends mostly on physical contact" (SDA, 2006a).

Along with its cationic and nonionic ingredients, dryer-added fabric softener products may also contain fragrances in their formulation. Data reported in the 2003 Survey shows that the VOC ingredients found in dryer-added fabric softener products are mostly attributed to fragrances, with fragrance ranging from zero to 8 percent by weight (ARB, 2004a). According to the Fragrance Material Association (FMA), there are approximately 2,500 individual fragrance materials currently available, with mixtures of these materials containing as many as 50 to 300 individual chemical entities (FMA, 2006). These fragrance materials may be naturally derived or synthetic, having a floral, woody or citrus scent. Because of the vast combination of mixtures to work with, companies are able to offer fabric softener products with different types of scents.

Proposed VOC Limit and Compliance:

The proposed VOC limit for products in the Fabric Softener-Single Use Dryer Product category is 0.05 grams of VOC per use. Staff believes, and some industry stakeholders have agreed, that the proposed gram of VOC per use limit, instead of a percent by weight VOC limit, is more appropriate for this category as it would provide a level playing field and ensure that the size of the sheet substrate does not increase (SDA, 2008a). This proposed limit includes all VOCs in the product, including fragrance.

Staff's proposal for grams of VOC per use limit would provide a level playing field as manufacturers apply varying amounts of liquid to the sheet substrate and the VOC content on the sheet substrate may not be the same as the formulation of the liquid applied to the sheet during manufacture. As indicated by manufacturers, some of the water or fragrance in the liquid formulation could be driven off during the drying process. Also, a liquid with a lower VOC weight percent that is applied to the sheet in a large quantity could deposit more VOC on the sheet compared to a higher VOC weight percent liquid that is applied in a smaller quantity.

The grams of VOC per use limit is designed to ensure that the size of the sheet substrate does not increase. In developing the limit for these products, staff determined that establishing a VOC percent by weight limit could result in manufacturers using larger size sheets to comply. This would diminish emissions reductions and potentially lead to increasing the solid waste stream. Therefore, to mitigate this potential and in accordance with the California Environmental Quality Act (CEQA), the grams of VOC per use limit is proposed.

The 0.05 grams of VOC per use limit provides emission reductions equivalent to setting a 2.6 percent by weight VOC limit (including fragrance). Because the limit already accounts for the fragrance, there is no need for the fragrance exemption provided in section 94510(c) for these products (ARB, 2007a). This modification is proposed in section 94510(c).

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. "Minimum recommended use" does 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.

As shown in Table VI-10, using adjusted 2010 emissions, the proposed limit would result in an estimated emission reduction of 414 pounds per day, or about

0.21 tons per day. Table VI-10 also shows that 24 percent of the market currently complies with the proposed 0.05 grams of VOC per use limit. This limit would become effective December 31, 2010.

Table VI-10
Fabric Softener – Single Use Dryer Product Proposal*

Product Form	Proposed Grams of VOC per Use Limit	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
All Forms++	0.05	20	24	404	414

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey emissions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Survey emissions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

++ Only the amount of product impregnated on a sheet reported. The mass of the sheet is not included.

In proposing this limit, we find that 24 percent of the market (20 out of 26 products, both scented and unscented) complies with the proposed 0.05 grams of VOC per use limit (ARB, 2004a). The proposed limit will not require a change to the active ingredients or in the amount of active ingredients used in the formulation of the product. The active ingredients, LVP-VOCs, are not considered when determining compliance with the proposed limit, per the exemption provided in section 94510(d) (ARB, 2007a).

As described above, the main ingredients found in dryer-added fabric softener products are cationic and nonionic softening agents also known as quaternary ammonium compounds, water, fragrances and inorganics. The active ingredients used are LVP-VOCs. The primary VOC ingredient in this category is the fragrance, which currently ranges from zero to 8 percent by weight (ARB, 2004a). Staff believes fragrance is the VOC ingredient most likely to be reduced in the reformulation of a product. Reformulation under the grams of VOC per use strategy would only require manufacturers to reduce the amount of fragrance while keeping the active ingredients the same.

Although fragrances provide an important attribute for many customers, fragrances do not contribute to the primary function of softening fabric. Manufacturers should not have significant difficulty reformulating their products to meet the proposed limit of 0.05 grams of VOC per use. As indicated by the 2003 Survey, only a small number of companies would have to reformulate to meet this limit. Private label companies would not have to reformulate, but only request that their formulators use existing formulations which currently meet the proposed limit.

Issues:

a. **Issue:** ARB has proposed a new category (Fabric Softener – Single Use Dryer Product) and definition that go substantially beyond the category covered by the 2003 Consumer Product Survey. ARB surveyed for all the "sheet" form of dryer products and did not include "packets, sachets, and dryer balls."

Response: The CARB 2003 Consumer Products Survey not only surveyed for "Dryer Sheets" but "Other Laundry Products," "In-Dryer Fabric Care" and "Fabric Softener." All dryer-added products that were sold in California in 2003 should have been reported in one of these four categories. Dryer-added products are available not only as sheets, but in other forms. However, staff's proposal only applies to singe use dryer products.

b. **Issue:** The products reported in this category of the survey all appear to soften fabric. Although they may provide other benefits in terms of fabric care, their primary purpose is softening. Inclusion of products that "prevent static cling, reduce wrinkles, reduce drying time, [and] make ironing easier" would be inappropriate since it would capture products on the market now or in the future that are designed with these primary purposes and may not, as the category name implies, soften fabrics.

Response: Based on staff evaluation of the product labels submitted by manufacturers, a large percent of products surveyed made claims of both softening as well as controlling static cling. ARB staff revised the definition as suggested by SDA but retained the anti-static property as this claim is often seen on the labels of most fabric softener products.

c. **Issue:** Fragrance is a very desirable quality for consumers who use fabric softener sheets. If the amount of fragrance per softener sheet is reduced, consumers will use more to compensate. This will result in less emissions reduction achieved. There will be a significant impact on the environment from increased solid waste and shipping-related energy and air emissions.

Response: While acknowledging that some consumers may increase their usage of fabric softener sheets in response to reduced fragrance, ARB staff does not believe that the proposed regulation will significantly increase consumer usage. No data were provided to support this claim. Consumer use data provided by SDA indicate that 80 percent of consumers use one sheet or less per drying cycle (SDA, 2008b). Increasing usage to two sheets would translate to added cost that many consumers may not be willing to pay. In addition, using two sheets would deposit more softening ingredients on the fabric and customers may notice a different "feel" to the fabrics. However, staff will use its periodic surveys to monitor product sales and take appropriate action if any unanticipated increased usage is occurring.

d. **Issue:** The low market share, 24 percent, for existing products complying with the proposed 0.05 grams of VOC per use limit indicates that this limit is not technologically and commercially feasible. If sales of unscented products were excluded, then the complying market share is even lower. Customers will find that reformulated products will not meet their needs and switch to liquid fabric softener products. These products are heavier than dryer sheet products and are packaged in bulky plastic containers. This will result in a significant impact on the environment from increased solid waste and shipping-related energy and air emissions.

Response: Staff disagrees. No data were provided to support this claim. The 24 percent complying market share, with 20 complying products out of 26 products, indicates that the proposed 0.05 grams of VOC per use limit is technologically and commercially feasible. However, staff intends to monitor product sales through periodic surveys, as is always done, to ensure that unintended consequences of establishing the proposed VOC limit does not occur.

e. **Issue:** The up to 2 percent by weight fragrance exemption per section 94510(c) should be provided to Fabric Softener-Single Use Dryer Product. It sets a bad precedent to treat Fabric Softener-Single Use Dryer Product differently from other regulated product categories.

Response: The softening and anti-static active ingredients in fabric softeners are LVP-VOCs. Fragrance, therefore, is the primary ingredient restrained by the proposed 0.05 grams VOC per use limit. The 0.05 grams of VOC per use limit provides emission reductions equivalent to setting a 2.6 percent by weight limit including fragrance (or a 0.6 percent by weight limit with the fragrance exemption in section 94510(c)). Because the proposed limit already accounts for the fragrance, there is no need for the fragrance exemption in section 94510(c).

f. **Issue:** Manufacturers will have to consider increasing the sheet sizes. This will result in less emissions reduction achieved. There will be a significant impact on the environment from increased solid waste and shipping-related energy and air emissions. (This comment is in reference to an earlier staff proposal for a percent by weight limit).

Response: Staff believes that the existing corporate environmental policies will not favor the option of increasing sheet size. In addition, staff's proposal for a grams of VOC per use limit, instead of a percent by weight limit, mitigates the potential for increases in sheet sizes.

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10. United States Patent 7250393B2. Fabric Treatment Compositions and Methods for Treating Fabric in a Dryer. July 31, 2007. (US Patent, 2007)

11. United States Patent, 20050020475. Fabric Softener System and Method for use in Clothes Dryer. January 27, 2005. (US Patent, 2005)

6. Floor Maintenance Product

Product Category Description:

The Floor Maintenance Product category consists of products that are labeled as Spray Buff products as well as products labeled as maintainers and restorers. Products

in this category are designed or labeled to restore, maintain, or enhance a previously applied floor finish. Spray Buff products are designed or labeled to be used in conjunction with a floor buffing machine and special pad. Floor maintainers or restorers are designed or labeled to be applied with a mop and burnished with a floor buffing machine. Though the application methods for these two types of products differ, their formulations are similar. This category does not include floor polish products, products designed solely for the purpose of cleaning, or products designed specifically for the use on marble floors.

Floor Maintenance Products are a previously unregulated category. Table VI-11 below summarizes the sales and emissions from Floor Maintenance Products based on the results of ARB's 2003 Survey (ARB, 2004a). Floor Maintenance Products have estimated VOC emissions of 194 pounds per day, or about 0.1 tons per day in California.

Table VI-11
Floor Maintenance Product*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms	98	3,540	194

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

As shown in Table VI-11, this category contains 98 products with sales of 3,540 pounds per day. Although not shown, the sales-weighted average VOC content is about 5 percent by weight.

Product Use and Marketing:

Floor Maintenance Products are primarily used by commercial/institutional users and are designed for use on finishes previously applied to resilient and non-resilient floors. These products are able to remove traffic damage, soils, and reduce maintenance costs by extending the time between topcoating and stripping the previous finish (Rohm and Haas, 2006). The process may take place in the presence of pedestrian traffic resulting in minimum floor down-time (Rohm and Haas, 2006).

Products labeled as Spray Buffs are applied to a clean and dry floor surface. The user or machine will spray the product in a small area of the floor, avoiding excess application or allowing the product to puddle. The final step is then to buff the product using a buffer or burnishing machine.

Products labeled as floor maintainers or restorers are usually applied to a clean and dry floor surface with a mop in a thin, even layer, avoiding using excess product or

allowing the product to puddle. The user allows the product to dry (usually about 20 minutes) before burnishing or buffing with a machine.

Floor Maintenance Products are sold to commercial and industrial establishments. They can be found at janitorial stores, the Internet, as well as through manufacturers' and distributors' sales representatives.

Product Formulation:

Floor Maintenance Products are primarily composed of water and polymer solids. Other ingredients include coalescent aids and other modifiers (such as levelers, plasticizers, viscosity modifiers, etc.) that optimize product properties. The coalescent aids are typically volatile glycol ethers that help the polymer solids form a smooth continuous coating over the floor surface.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Floor Maintenance Products is 1 percent by weight, effective December 31, 2010. As shown in Table VI-12, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 142 pounds per day, or about 0.07 tons per day, by 2010. Table VI-12 also shows that 53 percent of the market currently complies with the proposed 1 percent VOC limit.

Table VI-12
Floor Maintenance Product Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
All Forms	1	57	53	140	142

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

There are reformulation options available that make reductions in VOC content technologically and commercially feasible. We expect manufacturers of noncompliant products to reformulate similarly to the compliant products. We also expect the technology used to reformulate floor polish for resilient and non-resilient floors may be used to reformulate Floor Maintenance Products. A 1 percent VOC limit was set for Resilient and Non-Resilient Floor Polish products in 2006. Reformulation options that can be used to meet the proposed limit include the use of water, LVP-VOC hydrocarbon solvents, LVP-VOC glycol ethers, as well as non-VOC alternatives available for substitution.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Rohm and Haas. Presentation to ARB staff. June 2006 (Rohm and Haas, 2006)

7. Floor Polish or Wax: Wood Floor Wax

Product Category Description:

Floor Polish or Wax is divided into three subcategories: products for Resilient Flooring Material, products for Nonresilient Flooring Material, and Wood Floor Wax. Floor Polish or Wax products for Resilient and Nonresilient floors were regulated as part of the 2006 Amendments. The proposal described here relates to Wood Floor Wax products only.

Wood Floor Wax products are designed or labeled for use solely on wood floors. These products are designed to polish, protect, wax, condition, protect, temporarily seal, or otherwise enhance floor surfaces by leaving a protective finish that is designed or labeled to be periodically replenished. This category does not include Floor Maintenance Products, Floor Wax Strippers, or coatings subject to architectural coatings regulations. Wood Floor Wax products that claim to "clean and wax" or "clean and polish" are Wood Cleaner products.

Floor Polish or Wax products were first regulated under Phase I of the Consumer Products Regulation adopted in October of 1990, and a description of these products is also included in the staff report for that rulemaking (ARB, 1990b). At that time, the Board adopted a 90 percent VOC limit for products used on wood floors, effective on January 1, 1994.

Table VI-13 below summarizes the sales and emissions reported for Wood Floor Wax products, based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 136 pounds per day.

As shown in Table VI-13, Wood Floor Wax products have estimated VOC emissions of 112 pounds per day, or about 0.06 tons per day in California in 2008. Although not shown, the sales-weighted average VOC content is about 82 percent by weight.

Table VI-13
Floor Polish or Wax: Wood Floor Wax*

Product Form:	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms	7	136	112

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Product Use and Marketing:

Wood Floor Wax is used by general consumers, as well as commercial and institutional customers. Commercial and institutional products account for the majority of reported products and total sales.

These products are historically designed to provide a temporary, water resistant seal to a finished or unfinished wood floor. Unfinished wood flooring material is becoming increasingly rare as evidenced by small sales in this category. Today they are being replaced with factory sealed wood flooring material. Generally anhydrous wax-based products (such as a paste wax) are used on unsealed wood floors, whereas a wax-based, but not necessarily anhydrous product is used on sealed wood floors. Because there is a potential for "side-bonding" or water damage if water-based products are used on an unsealed wood floor, anhydrous products are still needed (Owens, 2006).

Wood Floor Wax products are generally applied with a sponge or cloth to a dry floor, and are then rubbed into the wood in a circular motion and allowed to dry. Depending on the manufacturer recommendations, the final step may then be to buff the finish to a shine using a buffer or burnishing machine, or to polish by hand with a clean cloth.

Wood Floor Wax products are sold to household consumers, commercial, and industrial establishments. They can be found at janitorial stores, supermarkets, warehouse and hardware stores, and the Internet, as well as through manufacturers' and distributors' sales representatives.

Product Formulation:

Wood Floor Waxes typically contain a suspension of natural wax such as carnauba or montan or other polymer in a hydrocarbon solvent such as mineral spirits. A solid form of Wood Floor Wax is generally composed of approximately 70 percent solids (wax) and 30 percent hydrocarbon solvent or LVP-VOC solvent. A liquid form of wood floor wax is generally composed of a mixture of water, a polymer solid, and an LVP-VOC solvent.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Wood Floor Wax products is 70 percent by weight, effective December 31, 2010. As shown in Table VI-2, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 24 pounds per day, or about 0.012 tons per day in 2010.

Table VI-14 does not show the number of complying products or complying marketshare due to data confidentiality.

Table VI-14
Floor Polish or Wax: Wood Floor Wax Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
All Forms	70	***	***	22	24

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

Reformulation options for Wood Floor Wax products include the substitution of hydrocarbon solvents with LVP-VOC solvents. Manufacturers may also develop a polymer technology that requires less VOC solvent. A minimal number of product reformulations are anticipated, as the market for these products is small and is anticipated to continue to decrease.

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3. Owens, Joseph M. Presentation to ARB staff. August, 2006. (Owens, 2006)

8. Glass Cleaner – aerosol

Product Category Description:

Glass Cleaners are specialty cleaning products designed primarily for cleaning surfaces made of glass such as windows, mirrors, glass tabletops, and computer screens. However, the Glass Cleaner category does not include products designed solely for the purpose of cleaning optical materials used in eyeglasses, photographic equipment, scientific equipment and photocopying machines. Products marketed as "glass and surface cleaner" are not included in this category; they are regulated as General Purpose Cleaner.

Glass Cleaners were first regulated under "Phase I" of the Consumer Products Regulation adopted in October of 1990, and a description of these products is also included in the staff report for that rulemaking (ARB, 1990b). At that time, the Board adopted a 12 percent VOC limit for these products which was effective on January 1, 1993. Although past regulatory actions resulted in significant emission reductions, we believe that technology now exists to further reduce VOC emissions from the aerosol product form. Therefore, we are proposing to amend the regulation to reduce the VOC content limit for aerosol Glass Cleaners to 10 percent by weight VOC.

Table VI-15 below summarizes the sales and emissions from aerosol Glass Cleaners based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 6,087 pounds per day.

Table VI-15
Glass Cleaner – aerosol*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	95	6087	663

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated VOC emissions are 663 pounds per day, or about 0.33 tons per day. Although not shown, the sales-weighted average VOC content for this category is about 11 percent.

Product Use and Marketing:

Aerosol Glass Cleaners are used by household, institutional and industrial users for cleaning surfaces made primarily of glass and may have additional claims for cleaning surfaces such as chrome and plastic which require a "non-streaking" cleaning performance – leaving no non-volatile residues which show up readily on such surfaces.

They are marketed towards automotive, household, office, institutional, professional and other specialty uses.

These products can be purchased through many sales outlets including grocery stores, discount stores, wholesalers, mass merchandisers, hardware stores, automotive parts stores, warehouse stores and home centers. These products are labeled primarily for use on glass. If the product makes a "multi-surface" claim on the front panel, it is categorized as a General Purpose Cleaner.

Product Formulation:

Glass Cleaners are typically formulated with a high water content. Short carbon chain alcohols (such as isopropyl alcohol or ethyl alcohol) and/or glycol ethers are used to dissolve oily soils. Trace amounts of surfactant are included to emulsify oily soils. The surfactant also creates a layer of foam which forms on the sprayed surface. This allows the product to cling to the surface making the cleaning agents more effective and preventing run-off while the user wipes the surface clean. Trace amounts of a suitable inorganic material prevent corrosion in the can. Fragrance imparts a pleasant odor into the air and contributes to the overall aesthetic of the product. It can also mask the solvent and ammonia odor, if present. Non-volatiles, also known as residuals, are left behind on the surface after the rest of the product evaporates and can contribute to streaking, and are, therefore, kept to a minimum in the formulation. All of the products reported in the 2003 Survey are propelled by hydrocarbon propellants, typically in the 4 to 5 percent by weight range.

Proposed VOC Limit and Compliance

The proposed VOC limit for aerosol Glass Cleaners is 10 percent by weight, effective December 31, 2012. As shown in Table VI-16, using adjusted 2012 emissions, the proposed limit will result in an estimated emission reduction of 65 pounds per day, or about 0.03 tons per day. Table VI-16 also shows that 37 percent of the market currently complies with the proposed 10 percent VOC limit.

Table VI-16
Glass Cleaner – aerosol Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2012 Emission Reductions (lbs/day)+
Aerosol	10	32	37	62	65

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey emissions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Survey emissions adjusted for complete market coverage and grown, by population, to 2012 (see Chapter IV, Emissions).

The proposed standard for aerosol Glass Cleaner was established after review of the 2003 survey data, consultation with industry representatives, review of available literature materials, and analysis of the technological and commercial feasibility of the standard.

As shown in Table VI-16, over a third of the market currently meets the proposed 10 percent VOC limit. These complying products are using a combination of alcohol and glycol ether solvents, and hydrocarbon propellant in order to reach the proposed 10 percent VOC level.

For most aerosol Glass Cleaners, the reformulation will involve replacing some of the VOC solvent and/or propellant with water. Many products at, or below, the 10 percent VOC level already claim to clean glass while leaving the surface streak-free. Besides products categorized as Glass Cleaner, there is a substantial market volume of products making equivalent claims in addition to cleaning claims for other hard surfaces.

Reformulated products, while effective, may have different attributes than the consumer is used to for some products. Staff believes this will require extensive test marketing before bringing the reformulated product to market. For these reasons, staff believes more time for compliance is warranted.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Air Resources Board. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Technical Support Document. August, 1990. (ARB, 1990b)

9. Motor Vehicle Wash

Product Category Description:

Motor Vehicle Wash means a product designed or labeled to wash, wash and wax, wash and shine, or wash and/or clean the exterior surfaces 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, and vehicle dealers and repair shops, as well as products intended for household use. Motor Vehicle Wash does not include Bug and Tar Remover, Glass Cleaner, Engine Degreaser, Brake Cleaner, Tire or Wheel Cleaner, and products labeled exclusively for use on locomotives or aircraft.

Motor Vehicle Wash is a previously unregulated category. Table VI-I7 below summarizes the sales and emissions from Motor Vehicle Wash based on the results of

ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 53,680 pounds per day.

Table VI-17
Motor Vehicle Wash*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms	366	53,680	752

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated VOC emissions are 752 pounds per day, or about 0.38 tons per day. Motor Vehicle Wash, while primarily marketed as liquid, can also be found in non-aerosol product forms such as solid, foam/mousse, mist/dispersed spray, and post-foaming gel. No aerosol products were reported in the 2003 Survey (ARB, 2004a). Although not shown, the sales-weighted average VOC content for this category is approximately 1 percent by weight.

Product Use and Marketing:

Motor Vehicle Wash products are sold to household or "do-it-yourself" consumers, commercial, and industrial establishments. They are to be used on the exterior surfaces of motor vehicles such as automobiles, vans, sport utility vehicles (SUV), motorcycles, commercial trucks and trailers, noncommercial trucks, service vehicles, and recreational vehicles. These products are used to safely remove dirt, grime, and other road soils from a variety of material surfaces including, but not limited to, painted metal, vinyl, and metallic trim. In some instances, the product cleans the vehicle and leaves a shine or wax finish in a single step. These one-step products are unlike wax products, which must be applied separately to a clean vehicle surface. Both "wash and shine" and "wash and wax" products are able to be applied to a dirty vehicle surface.

For the "do-it-yourself" consumers, Motor Vehicle Wash products are available in, but not limited to, retail outlets such as supermarkets, diversified pharmacies, home improvement stores, auto supply stores, super stores, and specialty stores. Auto dealers, repair shops, catalog sales, and the Internet are additional marketing locations. For commercial and industrial businesses, products are available from manufacturers and/or distributors, warehouses, as well as the Internet and retail outlets.

The majority of Motor Vehicle Wash products are sold as liquid concentrates and must be diluted prior to use. A typical dilution would be one ounce of Motor Vehicle Wash to one gallon of clean water. Directions for product use indicate that the water should be cool, and the solution should be applied to a cool surface with soft material. The directions also often direct consumers to wash vehicles from the top down and

rinse after the wash is applied. Using a terry cloth towel or other material such as a chamois to remove water is recommended.

Concentrated Motor Vehicle Wash products that are used in commercial establishments, such as car wash or auto detailing businesses, may be used in proportioning units through which the concentrate passes in order to achieve the proper dilution ratio. An example of a commercial dilution ratio can be 1 part product to 300 to 500 parts water. After the wash cycle, vehicles are rinsed. Depending on the properties of the concentrate or other additives, vehicles may air dry or need to be dried either mechanically or by hand to avoid spotting.

Product Formulation:

Motor Vehicle Wash products are primarily very near-zero VOC water-based formulations. Surfactants are the active ingredient of the products in this category. These surfactants are typically detergents and comprise the LVP-VOC portion of the product. Typical formulations include water and a small amount of LVP-VOCs, or water and a small amount of inorganics, or water and both LVP-VOCs and inorganics. The VOCs used in this category include small amounts of 2-butoxyethanol and isopropyl alcohol.

Proposed VOC Limit and Compliance:

The proposed limit for Motor Vehicle Wash is 0.2 percent VOC by weight, effective December 31, 2010. The proposed limit is applicable to both ready-to-use and dilutable products. The limit applies to diluted products after the minimum dilution is made. As shown in Table VI-18, using adjusted 2010 emissions, the proposed limit will result in an estimated reduction of 284 pounds per day, or about 0.14 tons per day. Table VI-18 also shows that 89 percent of the market currently complies with the proposed 0.2 percent VOC limit.

Table VI-18
Motor Vehicle Wash Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
All Forms	0.2	311	89	276	284

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

Reformulation options that could be used by manufacturers to meet the proposed limit include the use of water and LVP-VOC hydrocarbon solvents; water and

inorganics; or water in combination with both LVP-VOC solvents and inorganics. Because there are many viable non-VOC alternatives available for substitution, we believe the proposed limit is commercially and technologically feasible.

Issues:

a. **Issue:** Wash-and-wax should be removed from the definition as it is a different product "type" from wash and cleaner.

   Response: Staff maintains that motor vehicle "wash and wax" products and "wash and shine" products should be included in the definition because these products are marketed as vehicle washes and are formulated similarly. Both Motor Vehicle Wash ingredients and wax or shine ingredients are combined in the product and labeled to be applied to vehicles in the same manner as other Motor Vehicle Wash products. They are usually applied to dirty surfaces, unlike waxes which must be applied to clean surfaces. Retail outlets from supermarkets to superstores and auto supply stores, for example, stock and feature "wash and wax" and "wash and shine" products with other Motor Vehicle Wash products and not with vehicle wax products.

b. **Issue:** Industry only assumed one product "type" (i.e., wash only products) when responding to the 2003 Consumer Products Survey and the data may not be available to support meeting the criteria for this new category.

   Response: Industry did not assume only one motor vehicle wash and cleaner product type when responding to the 2003 Consumer Products Survey. Twenty-five companies responded with 38 products that are either wash and wax or wash and shine which they identified as belonging in the vehicle wash category along with the other 300-plus products that were reported in the category. After considering dilution ratios, most of these products already comply with the proposed 0.2 percent VOC by weight limit.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

10. Multi-purpose Lubricant

Product Category Description:

Multi-purpose Lubricants are lubricant products designed for general purpose lubrication, or lubricants labeled for use in a wide variety of applications. This category includes products that are labeled for household use and for institutional and industrial use (for example, use by mechanics, professional contractors, and manufacturing

facilities). This category includes products that are simply labeled as "lubricants;" multi-functional products that provide light duty lubrication; products labeled as aerosol spray greases; and liquid or aerosol products containing heavier base oils. This category includes multi-functional Multi-purpose Lubricants, which may also make claims to function as demoisturants, penetrants, and rust preventatives.

This category does not include specialty lubricant products, such as products labeled only for use on chains, even if the label specifies use on different types of chains. As defined in the Consumer Products Regulation, Multi-purpose Dry Lubricants, Penetrants, and Silicone-based Multi-purpose Lubricants are excluded from the Multi-purpose Lubricant category. The Multi-purpose Lubricant category also excludes lubricant products that are (1) sold exclusively to establishments which manufacture or construct goods or commodities, and are (2) labeled "not for retail sale." Automotive power steering fluids, lubricant 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, and products for use on the human body or animals are excluded from this category as well. Multi-purpose Lubricant products that are marketed in solid and semisolid-forms, as defined in the Consumer Products Regulation, are excluded from this category.

Multi-purpose Lubricants were first regulated under "Midterm Measures I" of the Consumer Products Regulation approved in July of 1997, and a description of these products is also included in the staff report for that rulemaking (ARB, 1997b). At that time, the Board adopted a 50 percent by weight VOC limit for these products which became effective on January 1, 2003.

Table VI-19 below summarizes the sales and emissions from Multi-purpose Lubricants based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 16,337 pounds per day.

Table VI-19
Multi-purpose Lubricant*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	146	11,568	5,784
Liquid	30	4,769	2,384
Total	**176**	**16,337**	**8,168**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a); Includes products containing exempt chlorinated solvents.

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated 2008 VOC emissions for Multi-purpose Lubricants are 8,168 pounds per day, or about 4.08 tons per day in California. Table VI-19 shows the lubricant products separated into aerosol and liquid forms, with the aerosol form dominating the market in both sales and emissions. According to our data, the sales-weighted average VOC content for this category is about 48 percent by weight.

Product Use and Marketing:

Multi-purpose Lubricants are used by household, institutional, and industrial users. Household consumers use multi-purpose lubricants on a variety of objects, including door hinges, bicycle chains, garage door tracks, window tracks, camping and sporting equipment, gardening tools, locks and firearms. Institutional and industrial consumers use Multi-purpose Lubricant products on the above mentioned items, as well as on more specialized equipment such as conveyors, open gears, electrical equipment, nuts, bolts, cables, and machinery.

Some Multi-purpose Lubricants are designed to deposit a heavier coating that provides lubricity under higher loads. These products include aerosol spray greases, such as "white lithium grease;" liquid or aerosol lubricants containing heavier base oils; and lubricants that provide extra protection against corrosion.

The Multi-purpose Lubricant category includes multi-functional products that are typically designed to provide a light lubricant film that penetrates surfaces, displaces water and inhibits rust and corrosion (ARB, 2004a). They are more often used for light duty lubrication, or for use as a penetrant, demoisturant, or for corrosion prevention. Typical applications include lubrication of locks or sliding mechanisms.

Multi-purpose Lubricants for household use are sold in various retail venues such as hardware stores, supermarkets, do-it-yourself home building supply stores, on the Internet, and everywhere automotive supplies are sold. Products may also be sold to institutional users through distributors.

Product Formulation:

Multi-purpose Lubricants provide lubrication through use of base oils. These base oils are typically various grades of petroleum oils or greases. In some cases, synthetic oils are used. The balance of the product is usually a hydrocarbon solvent which may be a VOC, a LVP-VOC, or a mixture of VOC and LVP-VOC hydrocarbon solvents. A small number of products use chlorinated solvents. The propellant, in aerosol products, is either a liquefied petroleum gas or carbon dioxide. After the product is sprayed, the solvent and propellant evaporate away, leaving a coating of oil or grease. Liquid products are typically comprised of pure base oils, or base oils thinned in any of the solvents used in aerosol products.

The oils or greases used in aerosol Multi-purpose Lubricants constitute approximately 15 to 40 percent of the formulation by weight (ARB, 2004a). The base

oils, are generally chosen based on their viscosity and typically consist of highly refined aliphatic or naphthenic hydrocarbon mixtures. Some Multi-purpose Lubricants, such as aerosol spray greases, use synthetic oils in their formulations (ARB, 2004a).

The solvents used in Multi-purpose Lubricants comprise 35 to 90 percent of aerosol formulations. Various grades of petroleum distillates are used. VOC solvents used include heptanes, hexanes, toluene, trichloroethylene, and glycol ethers. LVP-VOC hydrocarbon solvents are also used.

The propellants used in aerosol Multi-purpose Lubricants are either liquefied petroleum gases (propane, isobutane, normal butane), or carbon dioxide. Liquefied petroleum gases constitute approximately 20 to 30 percent of the product weight, compared to 2 to 3 percent when carbon dioxide is used.

Specialized extreme pressure additives may also be added in small amounts to Multi-purpose Lubricant formulations to enhance the ability of the base oil to protect surfaces under high load conditions. These specialized additives include graphite, Teflon (polytetrafluoroethylene), and "moly" (molybdenum disulfide). Multi-purpose Lubricants that contain these additives are not considered Multi-purpose Dry Lubricants.

Multi-purpose Dry Lubricants provide lubricity solely through use of graphite, molybdenum disulfide, or polytetrafluoroethylene or closely related fluoropolymer. Multi-purpose Dry Lubricants do not contain oils. The proposed amendments include a modification to the Multi-purpose Dry Lubricant definition. The proposed modification clarifies that lubricity is provided solely by these compounds. The modification is intended to clearly distinguish these products from Multi-purpose Lubricants.

Corrosion inhibitors may also be added to Multi-purpose Lubricant formulations to prevent corrosion on the coated surfaces. These compounds generally make up a small percentage of the overall lubricant formulation and they may consist of organic acids, esters, amino acid derivatives, and various alkaline compounds.

Aerosol spray greases (i.e. white lithium grease, or red grease) are Multi-purpose Lubricants made up of oils which are thickened with a "metal soap," such as lithium hydroxystearate) or a gelling agent, such as silica or clay.

Proposed VOC Limit and Compliance:

We are proposing two tiers of VOC limits for Multi-purpose Lubricants. The first tier VOC limit for Multi-purpose Lubricants is 25 percent by weight for both aerosol and liquid forms, effective December 31, 2013. As shown in Table VI-20, using adjusted 2003 emissions, the proposed limit will result in an estimated VOC emission reduction of 4,084 pounds per day, or about 2 tons per day, in 2013. A technology-forcing second tier VOC limit of 10 percent VOC by weight, effective December 31, 2015, is also proposed. As shown in Table VI-20, the 10 percent limit would reduce emissions by

2,545 pounds per day, or about 1.3 tons per day. When fully effective, these two limits would reduce emissions from Multi-purpose Lubricants by about 3.3 tons per day.

Table VI-20 also shows that 38 products, representing approximately 4 percent of the total Multi-purpose Lubricant market, currently comply with the proposed 25 percent VOC limit. Table VI-20 also shows that 22 products, representing 3 percent of the market currently comply with the proposed 10 percent limit. Only those products complying without the use of methylene chloride, perchloroethylene, and trichloroethylene, are included in the complying market share data. The complying products include both aerosol and liquid Multi-purpose Lubricants for household, commercial and institutional use.

Table VI-20
Multi-purpose Lubricant Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	Emission Reductions (lbs/day)+
Aerosol	25	27	3	2,748	2,924
	10	11	2	1,677	1,827
Liquid	25	11	6	1,090	1,160
	10	11	6	659	718
Total	**25**	**38**	**4**	**3,838**	**4,084**
	10	**22**	**3**	**2,336**	**2,545**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).
** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).
\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2013 for the 25% VOC limit; and to 2015 for the 10% VOC limit (see Chapter IV, Emissions).

The proposed VOC limits are designed to restrict the use of VOCs in Multi-purpose Lubricant formulations. Reformulation options include adding more base oil to the formulation; replacing some of the VOC solvents with LVP-VOC solvents; and using carbon dioxide as an alternative to liquefied gas hydrocarbon propellants.

We believe that the small complying market shares demonstrate that the VOC limits are feasible, but challenging - especially for aerosols. Therefore, staff is proposing extended effective dates for the limits. As proposed, the compliance date to meet the 25 percent limit is December 31, 2013. The 10 percent limit is proposed to become effective on December 31, 2015. The second tier technology-forcing limit of 10 percent is designed to encourage manufacturers to explore emerging technologies. Staff's research indicates that use of materials such as soy-based products provide a partial path forward. However, maintaining many other attributes of Multi-purpose Lubricants will require extensive research and development.

While the reformulation options may appear straight-forward, maintaining existing lubricity and evaporative characteristics will be challenging. As mentioned earlier, Multi-purpose Lubricants may also function as demoisturants, penetrants, and rust inhibitors. Research to find additives for corrosion protection and to maintain the products' penetrating ability will be required. Utilizing emerging technologies in an aerosol product also presents challenges. Many reformulated products, while effective, may have different attributes than the consumer is used to. Staff believes this will lead to extensive test marketing before bringing the reformulated products to the market. For these reasons, staff believes additional time is needed to successfully reformulate and bring products into the market.

The Institute for Research and Technical Assistance (IRTA)conducted lubricant research in 2004 and 2006 with a focus on finding alternatives to high VOC petroleum-based and chlorinated oils. The alternatives that IRTA tested, and demonstrated in the industrial setting during the two projects, were water-based and vegetable-based products. Some businesses have been using these products as cutting oils or for honing, machining, or stamping (IRTA, 2006; IRTA, 2004). These operations are not typical consumer uses. We also note the products used were not aerosols, which household consumers prefer. Nevertheless, we believe, given more time, that Multi-purpose Lubricant products, including aerosols, could be formulated to lower VOC levels.

While staff believes that technologies are progressing to allow for Multi-purpose Lubricants at VOC content levels of 25 percent and, in the future 10 percent, staff intends to work with industry to assess progress as compliance dates near. To that end, staff is proposing two technology assessments. To ensure that manufacturers are on track, and that technology advances as expected, staff believes that manufacturers should demonstrate their progress toward meeting these limits.

As proposed in new subsection 94513(f) Multi-purpose Lubricant manufacturers would need to supply detailed written updates on their research and development efforts undertaken to achieve compliance with the VOC limits. 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, the hardware evaluated, and the cost of reformulation efforts. The first report would be due on March 31, 2012, and would provide data for the 2011 calendar year. A second report would be due on March 31, 2014, and would provide data for the 2013 calendar year.

Because our data show compliance can be achieved without the use of methylene chloride, perchloroethylene, and trichloroethylene we are proposing to prohibit the use of these TACs from the Multi-purpose Lubricant category effective December 31, 2010. Methylene chloride and perchloroethylene are exempt VOC solvents. Therefore, without the prohibition, their use could increase as products reformulate to comply. Trichloroethylene is a VOC, and its use would likely decrease to

meet the proposed limit. However, other solvents are available that make its use unnecessary. Prohibiting these three TACs will lead to approximately 0.01 tons per day of toxic compound emission reductions from this category. The health effects associated with exposure to perchloroethylene, methylene chloride and trichloroethylene, are summarized in Chapter VIII, Environmental Impacts.

Issues:

a. **Issue:** This limit should be set at 10 percent or lower based on findings in the Institute for Research and Technical Assistance (IRTA) lubricant research summary.

   Response: ARB staff agrees, but believes that additional time is necessary to successfully reformulate complying products. Staff is proposing that Multi-purpose Lubricants meet a 10 percent by weight VOC limit effective December 31, 2015. We believe that lubricant research conducted by IRTA is useful data for manufacturers to evaluate as they develop complying products. However, there are some limitations. Staff reviewed the lubricant studies conducted by IRTA in 2004 and 2006 (IRTA, 2006; IRTA, 2004). It is unclear whether the products tested would work well in various household consumer applications. Typical household consumers use multi-purpose lubricants for a host of lubrication needs, as well as for penetration, water displacement, and rust inhibition. IRTA studies focused on commercial manufacturing and repair operations with specific lubricating needs. Additionally, IRTA did not test any aerosol lubricant products. Our data show that consumers prefer aerosol products for their general lubrication needs.

b. **Issue:** We believe it may be technologically and commercially feasible to reformulate Multi-Purpose Lubricants to a 25 percent VOC limit by December 31, 2014. However, the Automotive Specialty Products Association (ASPA) asserts that the ARB must commit to conducting a thorough assessment for this product category in 2010, 2012 and 2013 to determine the commercial and technological feasibility of the 25 percent VOC limit, if requested by our industry.

   Response: Staff agrees in part. We have evaluated technology and are proposing that products meet a 25 percent VOC limit by December 31, 2013, and a technology-forcing limit of 10 percent by December 31, 2015. We also agree that technology reviews are appropriate, and are proposing two as described earlier.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures I. June 6, 1997. (ARB, 1997b)

3. Institute for Research and Technical Assistance. Assessment, Development and Demonstration of Alternatives to VOC-emitting Lubricants, Vanishing Oils and Rust Inhibitors. August, 2006. (IRTA, 2006)

4. Institute for Research and Technical Assistance. Alternatives to VOC Emitting Petroleum Based Lubricants and Chlorinated Paraffin Lubricants: Minimizing the Health and Environmental Consequences. November, 2004. (IRTA, 2004)

11. Odor Eliminator/Remover

Product Category Description:

Odor Eliminator/Remover 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 Eliminator/Remover 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. Odor Eliminator/Remover is used in household, automotive, institutional and commercial settings to counteract unpleasant odors. These products may employ bacterial cultures, enzymes or anti-bacterial chemical active ingredients to counteract odor causing substances. Use of Odor Eliminator/Remover, Air Fresheners and Fabric Refreshers may result in similar outcomes such as freshening air or removing odors. Odor Eliminators/Removers are distinguished from Air Fresheners, which are released directly to the air, and Fabric Refreshers, which are applied to fabric or other soft surfaces.

Odor Eliminators/Removers are a previously unregulated category. Table VI-21 below summarizes the sales and emissions from Odor Eliminator/Remover based on the results of ARB's 2003 Survey (ARB, 2004a). Category sales are 7,034 pounds per day, or about 3.5 tons per day, adjusted for complete market coverage and grown by population, to 2008.

Table VI-21
Odor Eliminator/Remover*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	< 5	***	***
Liquid	184	7034	247
Total	**> 184**	***	***

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

*** Data not shown due to confidentiality.

Estimated VOC emissions (grown, by population, to 2008) are 247 pounds per day, or about 0.12 tons per day. Because there were less than five aerosol products reported in the survey, the sales data are not shown to protect data confidentiality. The sales-weighted average VOC content for liquid products as packaged is 3.5 percent and 2.2 percent as diluted.

Product Use and Marketing:

Odor Eliminator/Remover products are used on hard surfaces in household, automotive, institutional, and commercial settings to eliminate, neutralize, remove, encapsulate, inhibit, control, destroy and/or counteract odor. The household products are generally available through retailers, while the institutional and commercial products are sold via wholesalers through distribution channels or direct sales.

Household Odor Eliminators/Removers are used on hard surfaces to treat bathroom and kitchen odors, closets, basements, floor mats, drawers, odors from ventilation systems, pet odors, cat litter odors, garbage odors, smoke, and odors caused by moisture. These products are generally applied as needed with the user controlling the amount of product used (ARB, 2004a).

Automotive Odor Eliminator/Remover products are used to eliminate musty odors due to mildew formation in the persistently damp surfaces of automobile air conditioning vents and ducts (ARB, 2004a).

Odor Eliminators/Removers used on hard surfaces in institutional and commercial settings control odors from bathrooms, laundry areas, food preparation areas and specific industries such as diaper services (ARB, 2004a). Odor Eliminator/Remover products used in commercial settings are used to control garbage odors from trash compactors/dumpsters; mold and mildew and waste in bathrooms; body odor and mold and mildew in locker rooms; odors in air ducts and pipelines; odors in transportation settings such as airplanes and buses and odors in remediation services (ARB, 2004a).

Product Formulation:

The VOC content of products in the liquid category ranges from 0 to about 53 percent by weight as diluted. Fragrance oils constitute from 0 to 53 percent of the product's weight as diluted. They produce the product's scent. Although fragrance oils are VOCs by definition, the Consumer Products Regulation allows an exemption of up to two percent by weight of the product, as long as the vapor pressure of the fragrance and other functional components of the fragrance are less than 2 millimeters mercury (mm Hg) at 20 degrees Celsius.

Emulsifiers are used in the product formulation to aid the mixing of the fragrance oil in the water phase by creating a homogeneous liquid. Because the desired emulsions are oil-in-water, surfactants with higher hydrophilic-lipophilic balance values are more suitable in oil-in-water formulations.

Active ingredients include bacterial cultures, enzymes, or chemical agents which are used to inactivate odor causing molecules.

Proposed VOC Limit and Compliance:

The proposed VOC limit for liquid Odor Eliminator/Remover is 6 percent by weight, effective December 31, 2010. As shown in Table VI-22, using adjusted 2010 emissions, the proposed limits will result in an estimated emission reduction of 50 pounds per day, or about 0.03 tons per day. Table VI-22 also shows that 82 percent of the market currently complies with the proposed 6 percent VOC limit for liquid Odor Eliminator/Remover products. The proposed limit for aerosol Odor Eliminator/Remover is 25 percent VOC by weight. The aerosol products reported in the survey comply with the 25 percent limit.

Table VI-22
Odor Eliminator/Remover Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Aerosol	25	< 5	100	0	0
Liquid	6	154	82	49	50
Total	-------	**> 154**	-------	**49**	**50**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

Generally, reformulation to the 6 percent VOC level will involve replacing some of the VOC solvent and/or fragrance with water keeping the active "odor eliminating" ingredient constant, or possibly increasing it as appropriate.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

12. Penetrant

Product Category Description:

Penetrants are lubricant products designed and labeled primarily to loosen metal parts that have bonded together due to rusting, oxidation, or other causes. This category does not include Multi-purpose Lubricants that claim to have penetrating qualities, but are not labeled primarily to loosen bonded parts. Penetrants that are (1) sold exclusively to establishments which manufacture or construct goods or commodities, and are (2) labeled "not for retail sale" are also excluded from this category.

Penetrants were first regulated under "Midterm Measures I" of the Consumer Products Regulation approved in July of 1997, and a description of these products is also included in the staff report for that rulemaking (ARB, 1997b). At that time, the Board adopted a 50 percent by weight VOC limit for these products, which became effective on January 1, 2003.

Table VI-23 below summarizes the sales and emissions from Penetrants based on the results of ARB's 2003 Survey. The data have been grown to the 2008 calendar year. Total category sales are about 2,021 pounds per day.

Table VI-23
Penetrant*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	68	1,709	714
Liquid	16	312	79
Total	**84**	**2,021**	**793**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a); Includes products containing chlorinated compounds.

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated 2008 VOC emissions for Penetrants are 793 pounds per day, or about 0.4 tons per day, in California. Table VI-23 shows the Penetrant products separated into aerosol and liquid forms, with the aerosol form dominating the market in both sales and emissions. According to our data, the sales-weighted average for this category is 38 percent VOC by weight.

Product Use and Marketing:

Penetrants are used by household, institutional and industrial users to loosen immovable parts such as rusted pipe fittings, automotive parts, and nuts and bolts. Some product labels instruct the user to tap extremely rusted parts after spraying to set up vibrations that assist in the penetration of the product (ARB, 2004a). Some Penetrants claim to have lubricating properties and many claim corrosion protection (ARB, 2004a).

Penetrants are sold in hardware stores, automotive parts stores, by specialty retailers, by mass merchandisers, and on the Internet. Penetrants are also sold to industrial or institutional users through distributors that serve these customers, or directly to large customers.

Product Formulation:

Penetrant formulations are similar to Multi-purpose Lubricants in that they contain lubricating oils, solvents, and, in some cases, extreme pressure additives, such as a fluoropolymer, or molybdenum disulfide. Penetrants are typically comprised of light petroleum oils that vary in range from 10 to 40 percent. Liquefied petroleum gas, carbon dioxide, or nitrogen gas act as propellants for the aerosol products. The balance of the product formulation is comprised of various hydrocarbon solvents. A few Penetrants contain chlorinated solvents, such as methylene chloride, perchloroethylene, and trichloroethylene. Some contain synthetic oils; vegetable oils; and others utilize water-based formulations (ARB, 2004a).

Penetrants contain a balance of solvents and oils in order to achieve both low viscosity and low surface tension. According to the 2003 Survey, some of the VOC solvents used in Penetrants include various grades of petroleum distillates such as kerosene (VOC portion), mineral spirits and trichloroethylene. A variety of LVP-VOC solvents used in Penetrants include hydrocarbon solvents and fatty acid methyl esters. Water is also used.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Penetrants is 25 percent by weight for both aerosol and liquid forms, effective December 31, 2013. As shown in Table VI-24, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 305 pounds per day, or about 0.15 tons per day, in 2013.

Table VI-24 also shows that 14 products, representing about 30 percent of the total Penetrant market share, currently comply with the proposed 25 percent VOC limit. Only those products complying without the use of methylene chloride, perchloroethylene, and trichloroethylene are included in the complying market share data. The complying products include both aerosol and liquid Penetrants for household, commercial and institutional use.

Table VI-24
Penetrant Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emissions Reductions (lbs/day)**	2013 Emissions Reductions (lbs/day)+
Aerosol	25	9	28	255	271
Liquid	25	5	36	32	34
Total		**14**	**30**	**287**	**305**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).
** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).
\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2012 (see Chapter IV, Emissions).

Penetrants that already comply with the proposed VOC limit are using a combination of LVP-VOC solvents, VOC solvents, oils, and various additives. Reformulation options include adding more oil to the formulation; replacing some of the VOC solvents with LVP-VOC solvents, or water; and using non-VOC alternatives to liquefied gas propellants, such as carbon dioxide. Reformulation may also require use of less viscous oils. Different solvents may be used to reduce the overall viscosity of some Penetrant formulations.

Because Penetrants are closely related to Multi-purpose Lubricants in formulation and their uses, the VOC limits and effective dates for these two categories have historically tracked. For this reason, the reformulation efforts for Penetrants are similar to Multi-purpose Lubricants in that research to find the correct balance of oils, solvents and additives without sacrificing the products' penetrating ability will be required. Therefore, the proposed effective date for the VOC limit for Penetrants is December 31, 2013.

While staff believes that technologies are progressing to allow for Penetrant products at a VOC content level of 25 percent staff intends to work with industry to assess progress as the compliance date nears. To that end, staff is proposing a technology assessment. To ensure that manufacturers are on track, and that technology advances as expected, staff believes that manufacturers should demonstrate their progress toward meeting the limit.

As proposed in new subsection 94513(f) Penetrant product manufacturers would need to supply detailed written updates on their research and development efforts undertaken to achieve compliance with the VOC limits. The reports would include sales and formulation data for products, as well as detailed information on the raw materials evaluated for use, 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, the hardware evaluated, and the cost of reformulation efforts. The report would be due on March 31, 2012, and would provide data for the 2011 calendar year. Should technical or commercial issues arise, or if it appears reductions could occur within a shorter timeframe, staff would develop appropriate measures to ensure air quality benefits occur as soon as possible.

Because our data show compliance can be achieved without the use of methylene chloride, perchloroethylene, and trichloroethylene, we are proposing to prohibit the use of these TACs from the Penetrant category, effective December 31, 2010. Methylene chloride and perchloroethylene are exempt VOC solvents. Therefore, without the prohibition, their use could increase as products reformulate to comply. Trichloroethylene is a VOC, and its use would likely decrease to meet the proposed limit. However, other solvents are available that make its use unnecessary. Prohibiting these three TACs will lead to approximately 0.01 tons per day of toxic compound emission reductions from this category. The health effects associated with exposure to perchloroethylene, methylene chloride and trichloroethylene, are summarized in Chapter VIII, Environmental Impacts.

We have received information that suggests usage of non-flammable solvents in Penetrants is necessary in situations where Penetrants are used on energized equipment, near heat, flame, or other ignition sources. Staff agrees. Applying Penetrants to energized equipment may pose a safety risk. However, at the present time, use of chlorinated solvents is the only option for these applications.

Therefore, because of toxicity concerns, we are proposing to prohibit the use of perchloroethylene, methylene chloride, and trichloroethylene in Penetrants. However, we believe there is a small niche use for non-flammable products. Therefore, we are also proposing that Penetrants labeled as non-flammable and for use on energized equipment not be subject to the prohibition. To account for this specialized use, but to restrict the use of TACs to the extent possible, we are proposing that to qualify for the exemption from the toxic prohibition, Penetrants would have to include on the product's Principal Display Panel: "Non-flammable and only for use where equipment is energized." This proposal is set forth in new section 94509(q) of the Consumer Products Regulation.

Issues:

a. **Issue:** This limit should be set at 10 percent or lower based on findings in the Institute for Research and Technical Assistance (IRTA) lubricant research summary.

Response: ARB staff disagrees. Staff reviewed the studies conducted by IRTA in 2004 and 2006 (IRTA, 2006; IRTA, 2004). The focus was on lubrication rather than penetration, therefore it is unclear whether the products tested would work well in various penetrant applications. However, as noted above, we are proposing a technology review in 2012 to assess progress and to determine if future further VOC reductions are feasible.

b. **Issue:** We believe it may be technologically and commercially feasible to reformulate Penetrants to a 25 percent VOC limit by December 31, 2014. However, Automotive Specialty Products Association (ASPA) asserts that the ARB must commit to conducting a thorough assessment for this product category in 2010, 2012 and 2013 to determine the commercial and technological feasibility of the 25 percent VOC limit, if requested by our industry.

Response: Staff agrees in part. We have evaluated technology and are proposing that products meet the 25 percent VOC limit by December 31, 2013. We also agree that a technology review is appropriate, and are proposing one in 2012 as described earlier.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures I. June 6, 1997. (ARB, 1997b)

3. Institute for Research and Technical Assistance. Assessment, Development and Demonstration of Alternatives to VOC-emitting Lubricants, Vanishing Oils and Rust Inhibitors. August, 2006. (IRTA, 2006)

4. Institute for Research and Technical Assistance. Alternatives to VOC Emitting Petroleum Based Lubricants and Chlorinated Paraffin Lubricants: Minimizing the Health and Environmental Consequences. November, 2004. (IRTA, 2004)

13. Personal Fragrance Product (products with 20 percent or less fragrance)

Product Category Description:

Personal Fragrance Product is currently defined as any product which is applied to the human body or clothing for the primary purpose of adding a scent or masking a malodor, including cologne, perfume, aftershave, and toilet water. 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 used primarily to alleviate skin conditions such as dryness and irritations; (E) products designed exclusively for use on human genitalia; (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.

Staff is proposing to add clarifying language to the definition to indicate that Personal Fragrance Product includes, but is not limited to, lotions, powders, body mists, and body sprays.

Personal Fragrance Products were regulated under "Phase II" of the Consumer Products Regulation adopted in January of 1992, and a description of these products is also included in the staff report for that rulemaking (ARB, 1991a). However, instead of the product forms and standards described in that staff report, the Board divided the category into two subcategories, based on fragrance content, and adopted two tiers of VOC limits for each subcategory. Products with 20 percent or less fragrance were required to meet a VOC limit of 80 percent by weight, effective in 1995. A future lower limit of 75 percent by weight became effective in 1999. Products with more than 20 percent fragrance were required to meet a VOC limit of 70 percent by weight, effective in 1995. A lower limit of 65 percent became effective in 1999 (ARB, 1992).

However, an exemption from compliance with the initial VOC limit was adopted for existing products, and products "in development" on or before April 1, 1992, provided that such products were registered with ARB prior to July 1, 1993, and were sold in California before January 1, 1994. The regulation was further amended to specify (section 94510(l)) that the January 1, 1999 VOC limits do not apply to products which were sold in California prior to January 1, 1999 (ARB, 2007a). The overall effect of these two exemptions ("Grandfather" clauses) has meant that products in existence prior to 1992 were not reformulated to comply with VOC limits, and products subject to the 1995 first tier limit did not have to reformulate to meet the second tier 1999 VOC limits. Only products introduced after 1999 have been required to meet the second tier limits (ARB, 1992).

In addition, section 94510(j) of the Consumer Product Regulation specifies that the VOC standards specified in section 94509(a) do not apply to any VOC which is a fragrance in a Personal Fragrance Product (ARB, 2007a).

The Personal Fragrance Product category (products with 20 percent or less fragrance) is one of the larger emissions sources within the personal fragrance category. The proposal for this rulemaking affects only those Personal Fragrance Products with 20 percent or less fragrance. Table VI-25 below summarizes the sales and emissions from Personal Fragrance Products with 20 percent or less fragrance, based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 26,905 pounds per day.

Table VI-25
Personal Fragrance Product (products with 20 percent or less fragrance)*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms	1101	26,905	21,809

* Based on 2003 Consumer and Commercial Products Survey. (ARB, 2004a)

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

This category includes all product forms and includes, but is not limited to, colognes, perfumes, aftershaves, toilet waters, lotions, powders, body mists, and body sprays. Personal Fragrance Product (products with 20 percent or less fragrance) have estimated VOC emissions of 21,809 pounds per day , or about 10.9 tons per day, in California. Although not shown in Table VI-25, the sales-weighted average VOC content for this category is about 81 percent by weight including fragrance and about 76 percent by weight excluding fragrance.

Product Use and Marketing:

Personal Fragrance Products (products with 20 percent or less fragrance) are used by both men and women to impart a fragrance or scent. The concentration of fragrance oil found in different products can vary widely. Perfumes, toilet waters, colognes, and aftershaves make up the largest segment of the personal fragrance market. Perfumes, colognes, and toilet waters are generally more concentrated in fragrance, than body sprays or aftershaves, and are used in smaller quantities. In general, perfumes are the most expensive and concentrated, followed by toilet waters (or eau de toilettes), and colognes (or eau de colognes) (ARB, 1991a). Perfumes are typically used in small quantities and are intended for "spot" or "pulse point" application. Colognes and toilet waters are the most common fragrance form and are intended for "everyday" use (ARB, 1991a). These products are typically less concentrated and are used more liberally.

Personal Fragrance Products are typically sold in retail stores, department stores, and diversified drug stores, but are also available to consumers for purchase from discount warehouses, Internet companies, home sales, and catalog sales. It is estimated that sales of women's fragrances are approximately twice as much as sales of men's fragrance products (PCPC, 2006).

Product Formulation:

The main ingredients found in Personal Fragrance Products (products with 20 percent or less fragrance) are denatured alcohol (ethanol), fragrances, and water. Aerosol products also contain VOC propellants such as n-Butane, propane, isobutane, and/or the non-VOC propellant, HFC-152a. It should be noted that denatured alcohol often contains 5 to 7 percent water and that any VOC which is a fragrance in a Personal Fragrance Product is exempt from the VOC limits. Ethanol is the primary VOC ingredient in this category and is most likely to be the VOC ingredient that is reduced in the reformulation of a product.

The majority of Personal Fragrance Products (products with 20 percent or less fragrance) contain fragrance oil dissolved in ethanol and, to a lesser degree, water. Small amounts of other ingredients may also be included, such as preservatives, colorants, and agents used to prevent photodegradation or oxidation of fragrance ingredients (ARB, 1991a).

Proposed VOC Limit and Compliance:

Staff is not proposing to lower existing VOC limits for Personal Fragrance Product (products with 20 percent or less fragrance), but instead is proposing to eliminate the "Grandfather" clauses for this category. This would require that all products, new and existing, be subject to the same VOC standard, namely 75 percent by weight.

Based on the 2003 Survey, products within a signature line contain varying amounts of ethanol and fragrance, but continue to be labeled and sold under the same signature line as the same scent (ARB, 2004a). This is an indication that reformulation is possible, while preserving a signature scent. Companies with products covered under the "Grandfather" clauses may have been operating with a competitive advantage since 1995, having avoided the cost of reformulation, consumer testing, and marketing. This proposal will require companies to reformulate their products to meet the 75 percent by weight VOC limit, regardless of when they were first sold in California.

As shown in Table V-26 below, 679 products comply with the 75 percent by weight VOC standard; indicating that products can be reformulated to comply with the standard. The complying products account for about 37 percent of the market.

Removing the "Grandfather" clauses will result in an estimated emission reduction of 824 pounds per day, or 0.41 tons per day, using emissions adjusted to 2014. If adopted, the removal of the "Grandfather" clauses would become effective December 31, 2014. We are proposing to extend the effective date until December 31, 2014 because of the large number of products that would need to be reformulated.

Table VI-26
Personal Fragrance Product (products with 20 percent or less fragrance) Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2014 Emission Reductions (lbs/day)+
All Forms	75 (Remove "Grandfather" clauses)	679	37	765	824

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2014 (see Chapter IV, Emissions).

Compliance with the Standard:

Removing the exemption for existing products will subject both new and existing Personal Fragrance Products (products with 20 percent or less fragrance) to a 75 percent by weight VOC standard. Reformulation options could include reducing ethanol content, adding water, making adjustments to fragrance components that can tolerate higher levels of water, and, if applicable, replacing VOC propellants with non-VOC propellants.

The most straightforward method of reformulating Personal Fragrance Products (products with 20 percent or less fragrance) is to replace some of the alcohol with water or some other non-VOC ingredients. Simple replacement, as industry has pointed out, may lead to an altered fragrance due to some of the fragrance oil ingredients "coming out of solution." However, emulsion technology or fragrance modification may be utilized to minimize fragrance alteration (ARB, 1991a).

Reformulation options also include adjustments to the fragrance oil components to allow for higher water content. For example, fractional distillation of the polar compounds, in some essential oils, would yield water-soluble extracts retaining the same fragrance as their essential oil even though they may differ greatly in chemical nature. Examples would include the distilled aromatic waters from rose, witch hazel, yarrow, orange flowers, chamomile, balm mint and linden (ARB, 1991a). One study reported that by lowering the quantities of crystalline materials such as vanillin, coumarin, and heliotropin and using resins such as oak moss and Mousse de Chene sparingly, fragrance solubility in aerosol products can be increased (ARB, 1991a).

Another reformulation option for aerosol products could include adjusting propellant. For example, the amount of VOC propellant could be adjusted or VOC propellant could be blended with non-VOC propellant, such as HFC-152a. However, we do not expect such propellant blending to occur as the limit is feasible without the use of HFC-152a, a more expensive propellant. Although hydrocarbon propellants function

also as solvents in aerosol formulations, they are poor solvents for some fragrance constituents. According to an article in "Cosmetics and Toiletries," hydrocarbon propellants are poor solvents for many of the polar constituents of perfume oils (ARB, 1991a). We conclude, for the reasons given, above, that it is unlikely propellant adjustments will result in fragrance alterations.

Issues:

a. **Issue:** Reducing the alcohol content of personal fragrance products will result in some fragrance components precipitating out of solution, resulting in an altered fragrance.

   Response: While simple replacement of alcohol with water may result in some fragrance components precipitating out, emulsifying agents may be used to prevent this. In addition, certain fragrance oil components are more compatible with water. By properly selecting the components from these fragrance oils, a formulator can create a scent that can tolerate high levels of water. According to the 1991 and 2003 ARB Consumer Products Surveys, many aftershave products with water content ranging from 10 to 90 percent have been identified. Colognes with 1 to 90 percent water content and perfumes with zero to 10 percent water content have also been identified.

b. **Issue:** The proposed VOC restrictions will hinder the creative process of developing a fragrance by limiting the choice of fragrance oils.

   Response: According to the 2003 Survey, there are over 670 products that comply with the existing 75 percent by weight VOC limit. ARB staff has identified complying colognes and perfumes from a number of the fragrance families, including, but not limited to the following: musk, floral, chypre, aldehydic, tobacco and leather, spicy, and oriental. This indicates that manufacturers will not be limited to a narrow range of scent types. In addition, the staff has identified a number of technologies that can be used to comply with the VOC standards in the regulation without necessarily limiting manufacturers to fewer fragrance oils. We are confident the creative abilities of perfumers and manufacturers will allow development of products that meet consumers' needs and reduce VOC emissions.

c. **Issue:** The Personal Care Products Council has provided ARB staff with a two-tiered proposal for consideration. Products between 75 to 80 percent by weight VOC would be subject to a VOC limit of 75 percent by weight. Products above 80 percent by weight VOC would be reformulated to a VOC limit of 80 percent by weight. In addition, industry requests a lengthier compliance period of 5 years.

   Response: Companies with products covered under the "Grandfather" clauses may have been operating with a competitive advantage since 1995, when the first-tier VOC limit of 80 percent by weight became effective. In order to level the

playing field for all stakeholders, staff is proposing a single VOC standard. However, staff is proposing an extended future effective date of December 31, 2014, to provide sufficient time for companies to reformulate and conduct consumer testing of the hundreds of currently "grandfathered" products.

REFERENCES

1. Air Resources Board. The California Consumer Products Regulations. December, 2007. (ARB, 2007a)

2. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

3. Air Resources Board. Final Statement of Reasons for Rulemaking, Public Hearing to Consider the Adoption of Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products - Phase II. January 9, 1992. (ARB, 1992)

4. Air Resources Board. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II – Technical Support Document. October, 1991. (ARB, 1991a)

5. Personal Care Products Council (formerly known as Cosmetic, Toiletry and Fragrance Association). Presentation to ARB staff. July 26, 2006. (PCPC, 2006)

14. Sealant or Caulking Compound

Product Category Description:

Sealant or Caulking Compound is any product with adhesive properties that is designed to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces, including threaded pipe sealants and gasket makers. 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.

"Removable caulking compounds" means a compound which temporarily seals windows or doors for three to six month time intervals. "Clear/paintable/water resistant 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 and caulking products, packaged in aerosol and non-aerosol forms, were first regulated statewide under the "Midterm Measures II" of the Consumer Products Regulation, adopted in October of 1999, and a description of these products is also included in the staff report for that rulemaking (ARB, 1999). At that time, the Board adopted a single VOC limit of 4 percent by weight for all forms of these products, which became effective on December 31, 2002. We believe technology now exists to further reduce the VOC content limit for non-aerosol Sealant or Caulking Compound products. For this current rulemaking, staff is proposing to change the category name from Sealant and Caulking Compound to Sealant or Caulking Compound. In addition, staff has proposed to subcategorize the category into Non-Chemically Curing Sealant or Caulking Compound and Chemically Curing Sealant or Caulking Compound with different proposed VOC limits for non-aerosol products in these two subcategories. Other minor clarifications in the definition are also proposed, such as clarifying that the Sealant or Caulking Compound definition includes threaded pipe sealants and gasket makers.

We are proposing to divide the non-aerosol products into two subcategories based on the formulation technologies used. A Chemically Curing Sealant or Caulking Compound is defined as any Sealant or Caulking Compound which achieves its final composition and physical form through a catalyst-driven chemical reaction. The reaction causes a change in chemical structure, and leads to the release of chemical by-products. 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. Non-Chemically Curing Sealant or Caulking Compound means any Sealant or Caulking Compound which is not a Chemically Curing Sealant or Caulking Compound.

Staff is proposing to add clarifying language that the Sealant or Caulking Compound definition includes pipe thread sealants and gasket makers as these products are designed to fill, seal, waterproof or weatherproof gaps or joints between two surfaces. Staff has made a number of product reviews, at the request of manufacturers, and determined that such products are subject to the Consumer Products Regulation requirements for Sealant or Caulking Compounds.

While Sealant or Caulking Compound products come in several forms, ten to eleven fluid ounce disposable cartridges that fit in half-barrel caulking guns are the most common. Smaller squeeze tubes are also available. Sealant or Caulking Compound products vary in their ability to adhere to different materials and in their resilience, durability, cost, and ease of clean-up. Some products have special properties, such as mildew resistance, high flexibility, temperature resistance, abrasion resistance, paintability, and the ability to self-level.

By definition, the proposal affects products that consist of 16 fluid ounces or less and weigh one pound or less. The local air districts in California regulate the use of large size (greater than 16 fluid ounces or one pound) and industrial-use sealants and caulks. Following is a list of local air districts and their corresponding currently applicable Sealant or Caulking Compound regulations:

- Bay Area AQMD, Rule 8-51, Adhesives and Sealant Products;
- Sacramento Metropolitan AQMD, Rule 460, Adhesives and Sealants;
- Santa Barbara County APCD, Rule 353, Adhesives and Sealants;
- Shasta County APCD, Rule 3-32, Adhesives and Sealants;
- South Coast AQMD, Rule 1168, Adhesive and Sealant Applications;
- Tehama County APCD, Rule 4-40, Adhesives and Sealants; and
- Ventura County APCD, Rule 74.20, Adhesives and Sealants.

Table VI-27 summarizes the sales and emissions from Sealant or Caulking Compound products based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 141,927 pounds per day.

Estimated combined VOC emissions from the non-aerosol Sealant or Caulking Compound category are 5,168 pounds per day, or about 2.6 tons per day, in California. Although not shown in Table VI-27, the sales-weighted average VOC content was about 2 percent by weight for the non-aerosol products in the Non-Chemically Curing Sealant or Caulking Compound subcategory, and about 7 percent by weight for the non-aerosol products in the Chemically Curing Sealant or Caulking Compound subcategory, according to the 2003 Survey. The sales-weighted average VOC content values for the two subcategories were based on the group of products that also included sell-through products with VOC content above the current VOC limit of 4 percent for the category. Due to the impact of sell-through products with higher VOC content, the calculated values for the sales-weighted average are greater than what they would be with all products reformulated to meet the current VOC limit.

Product Use and Marketing:

Non-aerosol Sealant or Caulking Compound products are used to prevent air infiltration, heat loss, water penetration, insect entry, or to improve appearance while being flexible and resistant to substrate movement. These products are also used to prevent the passage of a liquid or gas between two surfaces, while being flexible and resistant to substrate movement.

Non-aerosol Sealant or Caulking Compound products are used extensively in the construction, remodeling, and maintenance of houses and other structures in order to further weatherize and protect the structure. There are many different types and uses for sealants and caulks, including: exterior sealants and caulks; all-purpose indoor/outdoor sealant and caulks; removable sealant and caulks; roof repair sealants

Table VI-27
Sealant or Caulking Compound (non-aerosol)*

Product Subcategory	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Non-Chemically Curing Sealant or Caulking Compound (non-aerosol)	344	83,915	1,354
Chemically Curing Sealant or Caulking Compound (non-aerosol)	196	58,012	3,814
Total	**540**	**141,927**	**5,168**

* Based on 2003 Consumer and Commercial Products Survey. (ARB, 2004a)

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

and caulks; elastomeric sealant and caulks; high temperature sealants and caulks; waterproof (submerged) sealant and caulks; gasket makers; and pipe thread sealants. These products are used for filling gaps and cracks in a foundation; around windows and doors; vents; faucets; pipes; wiring; electrical and utility boxes; outlets; ceiling fixtures; drains; bathtubs; tiles; air conditioners; ceiling and wall joints; chimneys; and other uses.

The market offers Chemically Curing Sealant or Caulking Compound products and Non-Chemically Curing Sealant or Caulking Compound products. Chemically curing products undergo a chemical reaction in the presence of a catalyst leading to a change in chemical structure, such as cross-linking of a polymer, as part of the curing process. Non-chemically curing products do not participate in such chemical reactions. The curing actually occurs through a physical change by water or solvent evaporation.

Non-Chemically Curing Sealant or Caulking Compound (non-aerosol):

Non-Chemically Curing Sealant or Caulking Compound non-aerosol products do not cure through a chemical reaction. The curing results from solvent evaporation. Some of the basic types of sealants and caulks on the market today include acrylic latex caulks, solvent-based synthetic rubber products, butyl caulks, and oil-based sealants and caulks. Some non-chemically curing sealants and caulks use the terms "siliconized" or "polyurethane acrylic product" but they do not chemically cure.

Acrylic latex caulks are often chosen for general use because of their low price, durability, convenience, low odor, low toxicity, and effectiveness on both inside and outside surfaces. These compounds remain durable and flexible after they have been applied, and are not affected by the sun's ultraviolet (UV) rays, alkali surfaces, or water. According to product labels, acrylic latex sealants will also adhere well to concrete, ceramic tile, paint, wood, sheet rock, plaster, bricks, plastic, and glass. However, they

are not recommended for use in extreme temperatures, continuously damp areas, or for high-movement areas (ARB, 1999).

Siliconized latex caulks have some of the performance characteristics of silicone-based chemically curing caulks. Silicone is added to latex for increased durability, better adhesion, and increased flexibility. Application is easy, clean-up is with water, and the cost is lower than pure silicone caulks. This caulk is paintable and comes in a variety of colors. Cure time is between 12-24 hours and the caulk should not be exposed to water in this period of time (ARB, 1999).

Solvent-based synthetic rubber sealants and caulks also claim to adhere well to most surfaces and can be applied under harsh weather conditions. They have an ability to recover, stretch and are paintable with water-based paints. These products are more prone to shrinkage and are flammable until they cure. They are also higher in VOC content (Pontolilo, 2004).

Butyl caulks are used to seal exterior metal and masonry surfaces. They are solvent-based with a life expectancy of 2 to 5 years. Although butyl caulks can be painted, they usually take 3 to 7 days to dry. Purported advantages of butyl caulks include their relatively low cost, good water resistance, and good adhesion without primers. Disadvantages may include limited joint movement tolerance, a tendency for shrinkage, and difficulty in forming a neat bead. However, butyl caulks will not become brittle and have good resiliency. Clean up can be difficult because they require special chemical solutions (ARB, 1999).

Oil-based sealants and caulks are usually inexpensive, low durability caulks composed of drying oils, such as linseed oil, and fillers. The oils slowly dry out and the caulk could show significant hardening and cracking within a year. They also can discolor and stain the surface to which they are applied when the surface is not primed (ARB, 1999).

Chemically Curing Sealant or Caulking Compound (non-aerosol):

Chemically Curing Sealant or Caulking Compound non-aerosol products include, but are not limited to, products that utilize silicone, polyurethane, silyl-terminated polyether and silyl-terminated polyurethane reactive chemistries. Products based on these reactive chemistries cure by absorbing atmospheric moisture.

Products with silicone chemical cure have a wide variety of performance characteristics. Silicone sealants and caulks have very little shrinkage, high flexibility, and are available both in clear and pigmented formula. According to manufacturers, these products are chosen by many consumers for their long term durability and UV resistance. As stated on product labels, silicone sealants and caulks are good for joints that move extensively, will perform at very low and high temperatures, and have a fast cure rate. These products are formulated for most substrates and are claimed to be good for adhesion to nonporous surfaces, such as glass, metal, ceramic tile and

porcelain. However, most silicone-based compounds cannot be painted and tear easily (Pontolilo, 2004).

Products utilizing polyurethane chemical cure claim to have versatile properties and are used in a wide range of commercial applications. Product labels indicate that they are flexible, can be painted and can adhere to most surfaces. In addition, these products have good chemical resistance. Consumers have a choice of non-sagging or self-leveling formulas (HPI, 2008). Polyurethanes are able to fill larger cracks because they expand when curing and can act as both an insulation and air barrier. However, polyurethanes must be protected from UV radiation (ARB, 1999).

Modified silicone polymer sealants are relatively new products that offer the benefits of water-based, silicone and polyurethane sealants. These products are also more expensive. According to product labels, modified silicone polymer sealants and caulks can be applied in extreme temperatures, are watertight almost immediately, are very durable and adhere well to most substrate materials. Modified silicone polymers include silyl-terminated polyether products. These products claim to be flexible, paintable, quick curing and do not shrink. They are also low in VOC content (Pontolilo, 2004). Silyl-terminated polyurethane products are purported to have several distinct advantages over conventional polyurethanes. These products show improved adhesion to glass, UV stability and weatherability (O'Connor, 2004).

Sealants and caulks are sold in hardware stores, home supply stores, paint stores, hobby and craft stores, and by mass merchandisers. Sealants are also sold to industrial or institutional users through distributors or through direct sales by the manufacturer.

Product Formulation:

Sealant or Caulking Compound products generally have low solvent levels, high concentrations of fillers, and are thick and nonpourable.

Non-Chemically Curing Sealant or Caulking Compound (non-aerosol):

Non-Chemically Curing Sealant or Caulking Compound non-aerosol products are either water-based or solvent-based. One of the advantages of water-based caulking compounds is that they can be cleaned up with water prior to curing. Solvent-based compounds must be cleaned up with solvents. Each type of sealant or caulking compound formulation offers its own particular strength and weakness depending on how it is used. Many products are formulated to meet the performance requirements described in American Society for Testing and Materials (ASTM) C-920, the "Standard Specification for Elastomeric Joint Sealants."

A typical formulation might consist of the following:

1. **Polymer** – Polymer is the most important contributing factor to sealant or caulk performance. It provides elastomeric and adhesive properties. Different types of resins

include oil-based, butyl, solvent-based acrylic, block copolymer, polyvinyl acetate and water-based acrylic polymers (ARB, 1999).

2. **Plasticizer** – Plasticizers improve sealant flexibility, extrudability of uncured product, and can reduce cost. The plasticizer must be compatible with the polymer system being used. As the plasticizer content increases, adhesion decreases. Types of plasticizers include phthalates, benzoate, and epoxidized oils (ARB, 1999).

3. **Filler** – Fillers provide reinforcement to the product, can reduce product raw material cost, add desired color to the product, and can impart sag or slump resistance. Types of fillers include calcium carbonate (chalk), aluminum silicate (clay), magnesium silicate (talc), fumed silica, cellulosic fiber, organic clays, titanium dioxide, carbon blacks, and metal oxides (ARB, 1999).

4. **Specialty Additives** – Additives are used to improve and enhance specific aspects of the sealant or caulk such as weatherability, adhesion, package stability, and cure rate. Examples of specialty additives are adhesion promoters, UV absorbers, biocides, pigments, and waterborne additives. Adhesion promoters, such as organotitanates and silane coupling agents, provide adhesion to specific substrates. UV absorbers, which include hindered amines and benzotriazoles, provide long term stability of the cured product and eliminate surface cracking, chalking, or discoloration. Finally, waterborne additives, such as freeze thaw stabilizers, are used to preserve the integrity of latex particles. Examples of common waterborne additives are: ethylene glycol, propylene glycol, urea, and isopropanol (ARB, 1999). Biocides are added to provide antimicrobial protection, which is especially important in sealants or caulks used in the kitchen and bathroom, where water and mildew are common (Pontolilo, 2004).

5. **Diluents** – Diluents reduce the viscosity and aid in the application of the sealant or caulk. For water-based formulations, water is the primary diluent, however, some VOC co-solvents are used including: acetates (acetic acid, butyl acetate, vinyl acetate, etc.), alcohols (ethanol, methanol, isopropanol, etc.), and glycols (ethylene glycol, propylene glycol, diethylene glycol methyl ether, etc.). Diluents used in solvent-based formulations include: mineral spirits, hexane, stoddard solvent, toluene, and xylene. Manufacturers limit the amount of diluents to control shrinkage resulting from the evaporation of the diluent during curing (ARB, 1999). A few products reported in the 2003 Survey contain perchloroethylene, an exempt VOC solvent.

Chemically Curing Sealant or Caulking Compound (non-aerosol):

Chemically Curing Sealant or Caulking Compound non-aerosol products participate in a chemical reaction. The reaction usually involves the formation of new internal bonds and results in a change in the chemical structure of the product, such as cross-linking of a polymer. As compounds undergo cross-linking reactions as part of the curing process, products become more stable and chemical by-products are released.

Chemically curing products that utilize silicone, polyurethane, or modified silicone polyether reactive chemistries react in the presence of moisture. Similar to non-chemically curing products, chemically curing products also contain fillers, polymers, plasticizers and specialty additives. These products also contain catalysts and cross-linkers. Catalysts are used to initiate the reaction, and examples include peroxides, tertiary amines, and compounds based on nickel, tin, or platinum (ARB, 1999). Cross-linkers are involved in the actual cross-linking once the cure reaction is initiated.

Silicone sealants contain siloxane polymers and plasticizers. Most of these are based on polydimethylsiloxane. Depending on whether the formula is based on an acetoxy, neutral or basic cure type, cross-linkers involved can be acetoxy, oxime or alcohol. Consequently, groups released during the reaction would include an acetic acid, an oxime, such as 2-oximobutane, or amine, such as cyclohexylamine, depending on the cure type (Macco, 2006).

Polyurethane cure reaction is based on the cross-linking of isocyanates and an alcohol (polyol) during cure. Some common isocyanates used in a formula include toluene diisocyanate, isophorone diisocyanate and hexamethylene diisocyanate (Macco, 2006).

Products that are based on silyl-terminated polyethers are very similar to silicone sealants and caulks with acidic cure. They differ in the types of cross-linker functional groups, leading to the release of an alcohol during the reaction, such as methanol, ethanol or propanol, instead of an acid (Macco, 2006). Silyl-terminated polyurethanes contain urethane prepolymers, prepared from the reaction of a diisocyante and a conventional polyol, that are end-capped with an organo-functional silane. Silyl-terminated polyurethane sealants have been prepared with varying isocyanates, polyol, and silanes (O'Connor, 2004).

Proposed VOC Limit and Compliance:

The proposed VOC limit for the Non-Chemically Curing Sealant or Caulking Compound non-aerosol subcategory is 1.5 percent by weight, effective December 31, 2010. The proposed VOC limit for the Chemically Curing Sealant or Caulking Compound non-aerosol subcategory is 3 percent by weight, effective December 31, 2012.

As shown in Table VI-28a, using emissions adjusted to 2010, the proposed limit will result in an estimated emission reduction of 246 pounds per day, or about 0.12 tons per day, for the Non-Chemically Curing Sealant or Caulking Compound non-aerosol subcategory.

Table VI-28a
Non-Chemically Curing Sealant or Caulking Compound (non-aerosol) Subcategory Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Non-aerosol	1.5	201	76	240	246

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

Complying products in the Non-Chemically Curing Sealant or Caulking Compound non-aerosol subcategory include water-based and solvent-based technologies. Only those products complying without the use of perchloroethylene are included in the complying market share data. Most of the complying products are water-based formulations. Reformulation options include switching from solvent-based formulations to water-based formulations, using alternative LVP-VOC solvents or a combination of VOC and LVP- VOC solvents. These alternative ingredients are already being used in many products.

As shown in Table VI-28b, using emissions adjusted to 2012, the proposed limit will result in an estimated emission reduction of 446 pounds per day, or about 0.22 tons per day, for the Chemically Curing Sealant or Caulking Compound non-aerosol subcategory.

Table VI-28b
Chemically Curing Sealant or Caulking Compound (non-aerosol) Subcategory Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2012 Emission Reductions (lbs/day)+
Non-aerosol	3	95	23	420	446

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2012 (see Chapter IV, Emissions).

Non-complying products in the Chemically Curing Sealant or Caulking Compound non-aerosol subcategory may reformulate by lowering the amount of VOC solvents, using alternative LVP-VOC solvents or a combination of both. Where the essential formulation components involved in the chemical cure reaction contribute to

VOC content themselves or lead to the formation and release of VOC compounds as by-products of the cure, products may reformulate by slightly reducing the levels of VOC cross-linkers or other VOC ingredients and increasing the levels of non-VOC ingredients, such as fillers, non-VOC polymers and resins, and other additives.

In some cases, reformulation efforts will involve modification of the existing resins/polymers or development of new resins for some of the reactive chemistries. Currently, the market resin supply is somewhat uncertain. Resins are not developed specifically for sealants and caulks because it is a small market. Hence, manufacturers have to select from those available and test different resins and combinations. Because of this, staff believes an extended effective date is warranted. The Chemically Curing Sealant or Caulking Compound non-aerosol subcategory would be given until December 31, 2012, to comply with the proposed VOC limit. This extra time should give manufacturers the time required for research and development efforts to work with resin and polymer reactive chemistry systems to develop a complying formula.

Staff is also proposing in section 92412(d) additional labeling requirements for non-aerosol Sealant or Caulking Compound. The product category as specified in section 94509(a), or an abbreviation of the category, and the applicable VOC standard shall be displayed. This requirement is to facilitate enforcement of the applicable standards for Chemically Curing and Non-Chemically Curing products.

Aerosol Sealant or Caulking Compound products continue to be subject to the 4 percent VOC by weight limit, effective December 31, 2002. Our data show that there are existing compliant Chemically Curing and Non-Chemically Curing aerosol products.

Because our data for both aerosol and non-aerosol products show compliance can be achieved without the use of methylene chloride, perchloroethylene, and trichloroethylene, we are proposing to prohibit the use of these TACs from the Sealant or Caulking Compound category, effective December 31, 2010. Methylene chloride and perchloroethylene are exempt VOC solvents. Therefore, without the prohibition, their use could increase as products reformulate to comply. Trichloroethylene is a VOC, and its use would likely decrease to meet the proposed limit. However, other solvents are available that make its use unnecessary. Prohibiting these three TACs will lead to approximately 0.12 tons per day of toxic compound emission reductions from this category. The health effects associated with exposure to perchloroethylene, methylene chloride and trichloroethylene, are summarized in Chapter VIII, Environmental Impacts.

Issues:

a. **Issue:** Non-Chemically Curing Sealants or Caulks serve a wide range of applications, including many specialty uses and substrates. The VOC standard should allow for the whole range of general use and specialty applications.

   Response: Analysis of 2003 Survey data indicates that 76 percent of the market complies with the proposal for the Non-Chemically Curing Sealant or Caulking

Compound non-aerosol subcategory. Many of these products can be applied to a varied range of substrates, including many specialty use applications. Staff believes, and some industry stakeholders have agreed, that the proposed VOC standard allows for a wide range of general and specialty use product applications.

b. **Issue:** The lower VOC limit proposed for Non-Chemically Curing Sealant or Caulking Compound products will have a negative effect on product performance, causing the market to shift to the use of Chemically Curing Sealant or Caulking Compound products, which have a higher VOC standard.

Response: As stated in response to the first issue, staff believes that the proposed VOC limit for Non-Chemically Curing Sealant or Caulking Compound non-aerosol products will accommodate a wide range of product applications. In addition, there are existing products that meet the definition of the Chemically Curing Sealant or Caulking Compound non-aerosol subcategory that are low in VOC content. These products claim to perform well under extreme weather conditions and can be used for many applications.

c. **Issue**: Staff is adding pipe thread sealants and gasket makers to the definition of Sealant or Caulking Compound. Pipe thread sealants and gasket makers were not included in the original proposal to regulate Sealant or Caulking Compounds and should not be added to the definition.

Response: Staff is making a clarification that the Sealant or Caulking Compound category definition does include pipe thread sealants and gasket makers as these products are designed to fill, seal, waterproof or weatherproof gaps or joints between two surfaces. Staff has made a number of product reviews, at the request of manufacturers, and determined that such products are subject to the Consumer Products Regulation requirements for sealant or caulking compounds. A number of chemically curing and non-chemically curing pipe thread sealants and gasket makers were reported in the 2003 Survey, with complying products existing in both subcategories.

d. **Issue**: The proposed lower VOC limits will eliminate the aerosol product form.

Response: Staff's proposal sets lower VOC limits for non-aerosol products only. The current VOC limit of 4 percent by weight for the Sealant or Caulking Compound category is applicable to all product forms and will continue to be applicable to aerosol forms. The 2003 Survey indicates that there are products utilizing aerosol technologies available on the market, in both the Chemically Curing and Non-Chemically Curing Sealant or Caulking Compound non-aerosol subcategories that comply with the existing 4 percent by weight VOC limit.

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15. Spot Removers

Product Category Description:

Spot Removers are used to remove localized spots or stains on articles such as carpets, rugs, upholstery, drapes, or clothing. Subsequent laundering is not required to achieve stain removal. Spots and stains include visible contamination from spills and other mishaps. The distinction between Spot Removers and related cleaning products, such as Carpet/Upholstery Cleaner, is that Spot Removers are "on-demand" products for local treatment/cleaning of areas with heavier dirt or stains, while the cleaning products are for general cleaning of the majority of, or an entire article, after routine accumulation of contaminants over time. Generally, Spot Removers use more powerful cleaning ingredients than Carpet/Upholstery Cleaners. Some products are intended for specific types of soils. Spot Removers do not include products that treat spots and stains on clothes or other fabrics that need subsequent laundering (machine or hand

wash) to remove the stain. Such products are included in the category of Laundry Prewash.

Spot Removers include products designed to remove tough, localized stains, such as grease, oil, oxidized oil (old, dried-out), tar, dry paint spots (latex, oil-based, enamels), blood, urine, vomit, feces, most foods, make-up, crayon, lipstick, nail polish, floor waxes, rust, or ink. A product may be intended for one type of stain, or for several. While the cause and contamination in some spots/stains may be known such that an appropriate type of Spot Remover is chosen, others may be of unknown origin. "Unknown" spots and stains may be treated by "universal" Spot Removers intended for several types of contamination, or by "trial-and-error" with a series of different Spot Removers, each for a different type of spot/stain. For treating localized odor contamination, Spot Removers may use biologically-derived odor destroying ingredients (e.g. enzymes or live bacterial culture).

Spot Removers were regulated under "Mid-term Measures 1" of the Consumer Products Regulation approved on July 24, 1997, and a description of these products is also included in the staff report for that rulemaking (ARB, 1997b). At that time, the Board adopted, as staff had recommended, a VOC limit of 25 percent by weight for aerosol products, and a VOC limit of 8 percent by weight for non-aerosol products. Both VOC limits became effective January 1, 2001.

The Spot Remover category does not include Dry Cleaning Fluid. Dry Cleaning Fluid includes non-aqueous liquid products used exclusively on fabrics labeled "for dry clean only" or on "S-coded" fabrics specified by the Joint Industry Fabric Standards Committee to be cleaned only with water-free spot cleaning products.

Also historically, the category excluded Multi-purpose Solvents, which are defined as organic liquid products with no VOC limit. However, the 2006 Consumer Products Regulation amendments (ARB, 2006a; ARB, 2007e) to section 94508(a) modified requirements. Multi-purpose Solvent products manufactured on or after January 1, 2008, with multiple-use claims, are subject to the Spot Remover VOC limit if the product label includes a claim for spot or stain removal from fabric surfaces. The product would also be subject to the "most-restrictive-limit" provisions of section 94512(a).

Table VI-29 below summarizes the sales and emissions from Spot Remover products based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are 42,308 pounds per day.

As shown in Table VI-29, Spot Remover products are sold in both the aerosol and non-aerosol forms, with estimated VOC emissions of 2,105 pounds per day, or about 1.05 tons per day, in California. Although not shown, the sales-weighted average VOC content of the aerosol and non-aerosol products are about 22 and 2 percent by weight, respectively.

Table VI-29
Spot Remover*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	70	6,910	1,520
Non-Aerosol	361	35,398	585
Total	**431**	**42,308**	**2,105**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Product Use and Marketing:

Spot Removers are used by household consumers for cleaning localized spots, stains, and soiled areas on fabric articles in homes and vehicles. Spot Removers are also used by commercial/institutional professionals such as janitors; carpet, furniture, drapery, and laundry workers; commercial detailers of automotive interiors; workers in health care facilities; and remediation specialists for fabric articles in buildings after fire/smoke damage.

Spot Removers are applied by aerosol spray, mechanical sprayer, bottle dispenser, or special applicator, to the affected area, and left to soak to release/treat the spot or stain in the fibers. The area is then blotted with a dry cloth or scrubbing cap to lift and remove the contaminants from the substrate. Sometimes repeat application is needed to adequately remove the spot or stain. The area may be dampened with water from a clean cloth, and blotted with a dry cloth to dilute and remove residual cleaner. The area is then allowed to dry (ARB, 1997b).

Both Spot Removers and Laundry Pre-wash products claim to treat or remove localized spots. However, the products differ in that Laundry Pre-wash products contain instructions for treating stains on articles prior to laundering, while Spot Removers do not.

The Spot Remover category is currently regulated as "aerosol" and "non-aerosol" products with different VOC limits. Spot Removers are sold in general merchandise, hardware, drug stores, supermarkets, automotive parts stores, janitorial and maintenance supply warehouses, and over the Internet. Some products are packaged as kits containing products formulated for different types of spots or stains (ARB, 1997b).

Product Formulation:

Spot Removers are generally water-based products containing ingredients such as glycol ethers, isopropyl alcohol, surfactants, enzymes, and various inorganic cleaning compounds. Ingredients vary depending on the types of spots and stains,

although many products are formulated for general use to address several types of stains. A common ingredient is 2-butoxyethanol (also called ethylene glycol monobutyl ether) which is used to treat many solvent-based and water-based stains. Other glycol ethers are also used, some of which are VOCs, but others are LVP-VOCs and are thus, slower drying.

Typically, products complying with the current 25 percent VOC limit for aerosols, may contain zero to 20 percent VOC cleaners such as VOC glycol ethers, alcohol, or other organic compounds such as surfactants, and 5 to 10 percent hydrocarbon propellant. Surfactants or enzymes, typically classified as LVP-VOCs, may be part of the formulation to clean soils, including oily spots and stains. Enzymes and other biologically-derived ingredients, such as non-pathogenic bacterial cultures may be used to address odor, grease, and other organic contamination. Some products use oxygen compounds (e.g. bleach) to clean stains. With non-VOC propellants such as HFC-152a, products may contain up to 25 percent VOC cleaning ingredients under the current VOC limit. Some products rely on surfactants, containing minimal or no VOCs, for removal of various contaminants including oil and grease. Inorganic ingredients may be used as cleaners, or to enhance the cleaning effectiveness of surfactants.

The non-aerosol products are generally liquids applied by trigger sprayer, hand-pump-pressurized tank sprayer, or bottle dispenser. Low-VOC products are typically water-based and may include LVP-VOC cleaners, such as surfactants and LVP-VOC glycol ethers, and inorganic ingredients. Some products for commercial/institutional use are sold in dilutable (i.e. concentrated) liquid form.

Specialized products also exist in this category. For example, products containing mainly acid or bleach (inorganic and thus zero-VOC) are used to remove rust and certain water-based stains.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Spot Remover is 15 percent by weight for aerosols and 3 percent by weight for non-aerosols, effective December 31, 2010. As shown in Table VI-30, using emissions adjusted to 2010, the proposed limits for the category will result in an estimated emission reduction of 573 pounds per day, or about 0.29 tons per day statewide.

Table VI-30 also shows that about 4 percent of the aerosol market currently complies with the proposed 15 percent VOC limit, and 94 percent of the non-aerosol market complies with the 3 percent VOC limit.

Table VI-30
Spot Remover Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Aerosol	15	18	4	468	479
Non-Aerosol	3	231	94	91	94
Total	-----	**249**	-----	**559**	**573**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

The proposed 15 percent VOC limit for aerosol products is intended to allow both sufficient VOC solvent for removing grease or oil-type spots and stains, and sufficient hydrocarbon propellant for adequate spray performance. Products may be formulated to contain LVP-VOCs and non-VOC ingredients such as surfactants, enzymes, live bacterial cultures, inorganic compounds, or exempt compounds.

Alternative formulations with non-VOC propellant would enable up to 15 percent VOC solvent ingredients, with the addition of non-VOC ingredients as discussed above. Non-VOC propellants available include compressed carbon dioxide.

A reformulation option is limited use of acetone (a VOC exempt compound). Because it is an aggressive solvent that may damage common materials, acetone may have limited applications for certain fabrics with nearby surfaces vulnerable to over-spray. Acetone is not suitable for use on acetate, triacetate, and modacrylic fabrics, and must be used away from plastic or wood finishes. Acetone, as well as certain other organic and hydrocarbon solvents, may have limited use with carpets and rugs with vulnerable backing material. Because of its fast drying characteristics, acetone in a formulation may be used to supplement and partially offset the slower drying characteristics of LVP-VOC ingredients.

Regarding non-aerosol products, the VOC proposal would allow up to 3 percent VOC cleaning solvent. The balance would be primarily water with small amounts of LVP-VOC solvents, acetone, surfactants, enzymes, live bacterial cultures, inorganic compounds, or other exempt compounds.

The few products with perchloroethylene (an exempt chlorinated compound and thus non-VOC) are aerosols and generally low-VOC. However, the combined sales of these products were minimal and are not portrayed in the complying market share. The 15 percent VOC proposal is minimally affected by the presence or absence of the perchloroethylene products in the data. The 2003 Survey data show very limited use of

perchloroethylene and trichloroethylene (a VOC chlorinated compound) in this category. While ARB staff believes these toxic air contaminants are not likely to be used as cleaning solvents in the future reformulated products, ARB staff is proposing that perchloroethylene, trichloroethylene, and methylene chloride be prohibited in the Spot Remover category. This prohibition is proposed to ensure that manufacturers do not choose to reformulate with toxic chlorinated solvents in response to the lower VOC limits. Staff has determined that currently available formulation technologies that do not contain perchloroethylene, trichloroethylene, or methylene chloride are readily available and thus they are not needed to comply with the proposed standard. See Chapter VIII for a discussion of the health effects of perchloroethylene, trichloroethylene, and methylene chloride.

To update and strengthen regulatory requirements, the Multi-purpose Solvent exclusion in the definition is proposed to be eliminated. This revision would make the requirements for Spot Remover consistent with the adopted 2006 update for Multi-purpose Solvent. Also, when a product is subject to more than one VOC limit, the most restrictive limit would apply, in accordance with section 94512(a).

A new exclusion for aerosol gum remover products is proposed for the category definition. A literal interpretation of the current Spot Remover definition may include aerosol gum removers, since gum contamination on fabric may be considered "spots." Since the formulation and method of operation of aerosol gum removers are very different from typical Spot Removers, staff believes it is not appropriate to include aerosol gum removers in this category. Aerosol gum remover products, will be evaluated for regulation in the future.

Issues:

a. **Issue:** VOC solvents are needed to remove oil-based stains such as lipstick, nail polish, ink, tar, oxidized oils (old, dried-out), dry paint spots (latex, oil-based, enamels), floor waxes, and crayon. LVP-VOC solvents do not work well because they do not evaporate quickly and are very sticky. The resulting sticky residues attract more soil. The cleaning of fabrics is different than the cleaning of hard surfaces, which can be easily wiped off for faster drying.

   Response: When LVP-VOC solvent cleaners are used, the extent of the slower drying time will depend on the amount used, how thoroughly residual cleaners are diluted and removed, and how crucial the longer drying time is. Products already exist with LVP-VOC solvent cleaners, as indicated by the 2003 Survey, that comply with the proposed VOC limits. For products that will need reformulation, greater use of a wet cloth for diluting residual cleaners, and more thorough blotting with dry absorbent cloth, may be appropriate. Increased caution and customer education by product marketers, to avoid product-over-use and encourage appropriate drying procedures and proper article return-to-service, should address the concerns with LVP-VOCs.

b. **Issue:** This category includes a broad range of products for a variety of fabrics and soils. Reported products include many based on non-VOC ingredients, such as bleach, hydrogen peroxide, acid, or surfactant, which are appropriate for some types of soils. Hydrogen peroxide, hypochlorite, and certain enzymes can not be used on all types of fabrics due to possible damage to fabrics. There is a wide range of VOC levels, which reflect the variety of intended uses. In some cases, higher VOC levels are needed to remove difficult stains and soils.

Response: We have considered the functions of low-VOC products and inorganic ingredients for particular types of spots and stains, as well as the advantages and limitations. We are also aware that many complying products make universal spot removing claims, some not needing VOC solvents. High VOC products may create emissions without a cleaning benefit when treating spots and stains that do not need VOC solvents. Our proposal addresses both those products for specific spot removal, and products for general spot removal. Regarding damage to fabrics, the product marketer should determine the type of product for the type of spots and stains to be addressed for different fabrics and articles, and to provide appropriate label warnings. Label instructions now commonly suggest that the customer test the Spot Remover on an inconspicuous location on the fabric before fully using it.

c. **Issue:** Products containing perchloroethylene (an exempt compound) in the 2003 Survey data provide a false impression of the extent of low-VOC products. These products should be removed from the data, since use of perchloroethylene, a toxic air contaminant, should not be considered a realistic reformulation option to lower VOC content in this category.
Response: We agree that perchloroethylene products should not be relied on as a basis to lower VOC limits. We also believe that these products should not be marketed in the future because of air toxics concerns. However, the amount of product sales in 2003 with this compound was low and minimally affected the complying market share or the basis of our proposal, as discussed above. We have also reviewed the survey data with and without the perchloroethylene-containing products, and have presented the 2003 Survey results with the products included since that was the historical reality at the time. We believe there is no misrepresentation of the survey results as shown.

d. **Issue:** Products with label claims for general carpet cleaning, in addition to localized cleaning, should be move from the Spot Remover category to the Carpet/Upholstery Cleaner category.

Response: To a certain extent, we agree that products should be considered in one product category or another. If a product is labeled clearly as Carpet/Upholstery Cleaner with only incidental use as Spot Remover, we would agree. However, a product label may have several equally important recommend uses, and thus fall under more than one category. For regulatory development purposes, a product as labeled may be appropriately considered in more than

one categories for review, depending on the wording of the various category definitions and the product label, although the regulatory emission reduction should be counted for only one category. We also consider the category identified by the marketer, since the marketer is most familiar with the product and has the first opportunity to categorize the product when submitting the survey. Please note that data review is separate from any enforcement evaluation for individual products.

e. **Issue:** ARB should regulate non-aerosol Spot Removers used by dry cleaning establishments. Water-based and soy-based alternative Spot Removers are available alternatives to the currently used and more toxic perchloroethylene and trichloroethylene-based Spot Removers. Alternative Spot Removers perform well and are less costly.

Response: While currently available data are encouraging for spot removal for water-tolerant or water-washable articles, data are currently lacking on suitable low-VOC, non-chlorinated, Spot Remover products for dry-clean-only fabrics. ARB staff intends to reevaluate the "dry-clean-only" exclusion in the Spot Remover definition, when more data become available regarding the suitability of low-VOC, non-chlorinated products for use on dry-clean-only fabrics. However, with products for other types of fabric (i.e. water-tolerant or water-washable), the exclusion does not apply, and hence the proposed VOC limits would apply to Spot Remover products labeled for general spot removal (i.e. suitable for water-tolerant or water-washable fabrics) that may be used in dry cleaning establishments.

REFERENCES

1. Air Resources Board. Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Responses -- Public Hearing to Consider Adoption of Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation - Scheduled for Consideration November 17, 2006 - Agenda Item No. 06-10-8. Submitted to Office of Administrative Law on September 26, 2007. (ARB, 2007e)

2. 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)

3. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

4. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures I. June 6, 1997. (ARB, 1997b)

5. Institute for Research and Technical Assistance. Spotting Chemicals: Alternatives to Perchloroethylene and Trichloroethylene in the Textile Cleaning Industry. Prepared by Katy Wolf and Mike Morris for Cal/EPA's Department of Toxic Substances Control and U.S. Environmental Protection Agency Region IX. January 2007. (IRTA, 2007)

6. Institute for Research and Technical Assistance. Evaluation of New and Emerging Technologies for Textile Cleaning. Prepared by Michael Morris and Dr. Katy Wolf for Air Resources Board and Cal/EPA (Agreement Number 02-408), and U.S. Environmental Protection Agency. August, 2005. (IRTA, 2005)

16. Tire or Wheel Cleaner

Product Category Description:

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 or large vehicle washing stations, vehicle dealers and repair shops as well as products intended for household consumer use. Tire or Wheel Cleaners include aerosol products as well as non-aerosol products, which can be found in both dilutable and ready-to-use forms. Tire or Wheel Cleaners do not include products identified as Rubber/Vinyl Protectant and Motor Vehicle Wash.

Tire or Wheel Cleaner is a previously unregulated category. Table VI-31 below summarizes the sales and emissions from Tire or Wheel Cleaners based on the results of ARB's 2003 Survey (ARB, 2004a). The data have been grown to the 2008 calendar year. Total category sales are about 9,829 pounds per day.

Table VI-31
Tire or Wheel Cleaner*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
Aerosol	8	189	17
Non-aerosol	102	9,640	278
Total	**110**	**9,829**	**295**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

Estimated VOC emissions are 295 pounds per day, or about 0.15 tons per day. As shown in Table VI-31, non-aerosol Tire or Wheel Cleaner products dominate the marketplace. Although not shown in the table, aerosol Tire or Wheel Cleaners have a

sales-weighted average of about 8 percent by weight VOC, while the non-aerosol products have a sales-weighted average of 2 percent by weight VOC.

Product Use and Marketing:

Tire or Wheel Cleaners are used by both commercial businesses and "do-it-yourself" consumers. For the "do-it-yourself" consumers, tire cleaners, wheel cleaners, and combination tire and wheel cleaners are available in, but not limited to, retail outlets such as supermarkets, diversified pharmacies, home improvement stores, auto supply stores, super stores, and specialty stores. Auto dealers, catalog sales, and the Internet are additional marketing locations. For commercial businesses, products are available from manufacturers and/or distributors, and warehouses as well as retail outlets.

Tire or Wheel Cleaners are normally designed to be sprayed onto the part and then washed or wiped off. The majority of the products in this category are non-aerosol products that are designed to be applied either by pump spray or diluted with water before use. Tire or Wheel Cleaner products claim to remove dirt, debris, and other soils from the surfaces of tires, wheels, or both. Most wheel cleaners claim to be available for use on all wheel surfaces, including chrome and aluminum. Tire cleaners claim to be usable on either regular tires or specifically on whitewall tires.

Product Formulation:

Tire or Wheel Cleaners are water-based products containing glycol ethers, alcohols, VOC and LVP-VOC hydrocarbon solvents, and inorganic compounds. The glycol ethers, VOC solvents, and alcohols make up the majority of the product's VOC content and act as the active ingredients. The inorganics and LVP-VOC solvents are normally surfactants to aid in cleaning. The aerosol products normally use a small amount of hydrocarbon propellant.

Proposed VOC limit and Compliance:

The proposed VOC limits for aerosol and non-aerosol Tire or Wheel Cleaner are 8 and 2 percent VOC by weight, respectively, effective December 31, 2010. As shown in Table VI-32 using adjusted emissions, the proposed limits will result in an estimated reduction of 130 pounds per day, or about 0.06 tons per day.

Table VI-32 also shows that 69 percent of the non-aerosol market currently complies with the proposed VOC limit. The percent of the market that currently complies with the proposed aerosol limit of 8 percent VOC is small and therefore treated as confidential.

Table VI-32
Tire or Wheel Cleaner Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
Aerosol	8	***	***	2	2
Non-aerosol	2	63	69	126	128
Total	—	—	—	**128**	**130**

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

Most of the non-complying products are already formulated close to the proposed limits, so the proposed effective date is feasible. The few manufacturers that would have to reformulate should be able to meet the proposed limits by increasing the product's water and/or LVP-VOC content.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

17. Windshield Water Repellent

Product Category Description:

Windshield Water Repellents are products designed or labeled exclusively to repel water from motor vehicle windshields and other exterior glass surfaces. These products claim to improve driving visibility during inclement weather by repelling rain, sleet and snow. Windshield Water Repellents do not include Automotive Windshield Washer Fluid. Automotive Windshield Washer Fluids are designed, or labeled, to clean glass surfaces, while Windshield Water Repellents are applied to surfaces that have already been cleaned.

Windshield Water Repellent is a previously unregulated category. Table VI-33 below summarizes the sales and emissions from Windshield Water Repellent based on the results of ARB's 2003 Survey (ARB, 2004a). The emissions have been grown to the 2008 calendar year. Total category sales are about 538 pounds per day.

Table VI-33
Windshield Water Repellent*

Product Form	Number of Products	2008 Category Sales (lbs/day)**	2008 Adjusted VOC Emissions (lbs/day)**
All Forms	30	538	462

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Survey data adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

As shown in Table VI-33, Windshield Water Repellent products have estimated VOC emissions of 462 pounds per day, or about 0.23 tons per day, in California. Although not shown, Windshield Water Repellent has a sales-weighted average VOC content of about 86 percent.

Product Use and Marketing:

Windshield Water Repellents are used by both commercial businesses and "do-it-yourself" consumers. For the "do-it-yourself" consumers, Windshield Water Repellents are available in, but not limited to, retail outlets such as supermarkets, diversified pharmacies, home improvement stores, auto supply stores, super stores, and specialty stores. Auto dealers, catalog sales, and the Internet are additional marketing locations. Products for commercial businesses are available from manufacturers and/or distributors, and warehouses, as well as retail outlets. Windshield Water Repellents are sometimes applied to glass surfaces by the original equipment manufacturer.

Windshield Water Repellent products are sprayed, or rubbed, onto clean, exterior windshields and other glass surfaces to provide a water repellent coating. This coating repels rain by producing a high water contact angle such that bead droplets form and roll down the surface, instead of sticking to the glass, leaving the windshield clear (CSPA, 2006). This is especially useful during the more hazardous weather conditions that contribute to lowered visibility.

Product Formulation:

Windshield Water Repellents have essential performance needs. They must provide a static, high, contact angle. Water should bead and roll down the windshield, rather than leave a droplet trail, and it must function with the current windshield wiper. Use of the product must not result in abrasion, streaking, or haze on the glass, due to the product's use, as these instances would reduce visibility, thereby becoming a potential consumer safety issue.

To provide this function, Windshield Water Repellents are typically formulated with alcohols and inorganics. The alcohols provide solvency for the inorganic coating, normally a surfactant, so that it can be readily applied onto the surface of the windshield

or other automotive glass surfaces. Alcohol-based products with a silicone catalyst dominate the market. Some products were also found to contain LVP-VOC compounds, as well as VOC propellants.

Available technologies include silicone with an acid catalyst, organo-silanes, silicone functionalized surfactants, carnauba wax, silicone emulsion, diamond-like carbon coatings, and hydrophobic treated nano-particulates (CSPA, 2006).

Proposed VOC Limit and Compliance:

The proposed VOC limit for Windshield Water Repellent is 75 percent, by weight, effective December 31, 2010. As shown in Table VI-34, using adjusted emissions, the proposed limit will result in an estimated emission reduction of 84 pounds per day, or about 0.04 tons per day.

Table VI-34 also shows that the percent of the market that currently complies with the proposed 75 percent VOC limit is small and therefore treated as confidential.

Table VI-34
Windshield Water Repellent Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2008 Emission Reductions (lbs/day)**	2010 Emission Reductions (lbs/day)+
All Forms	75	***	***	83	84

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2004a).

** Emission reductions adjusted for complete market coverage and grown, by population, to 2008 (see Chapter IV, Emissions).

\+ Emission reductions adjusted for complete market coverage and grown, by population, to 2010 (see Chapter IV, Emissions).

Water-based technology, for Windshield Water Repellent, is being researched by manufacturers. However, at present time, further development is necessary. We believe that technology is advancing that would allow lower VOC products in the future. The proposed 75 percent VOC limit is set as low as current technology allows. Staff believes manufacturers will be able to use current LVP-VOC technology to formulate effective products while developing the technology to implement more LVP-VOC solvent use as well as water-based technology.

Issues:

a. **Issue:** The effective date for the limit should be extended until 2012 to allow adequate time for reformulation.

Response: Staff believes that the current effective date of 2010 is sufficient time to allow for reformulation to meet the proposed 75 percent VOC limit and make

complying products available in the marketplace. We also note that in a 2006 presentation industry indicated that a 75 percent VOC limit was feasible.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2004a)

2. Consumer Specialty Products Association. CSPA Automotive and Solvent Products Technical Seminar for ARB Staff. July 13, 2006. (CSPA, 2006)

B. CATEGORIES FOR WHICH A GREENHOUSE GAS LIMIT IS PROPOSED

1. Pressurized Gas Duster

Product Category Description:

Pressurized Gas Duster is a product designed to remove foreign particles such as dust, dirt, lint, and other particles from sensitive equipment and materials, solely by the means of mass air or gas flow. Pressurized Gas Dusters are distinguished from Electronic Cleaners which remove foreign particles primarily by means of a solvent.

The Board first defined Pressurized Gas Duster in the 2004 rulemaking (ARB, 2004b). However, at that time, no VOC standard for Pressurized Gas Duster was established.

In this rulemaking, we are proposing to limit the global warming potential (GWP) of compounds used in Pressurized Gas Dusters. To implement this proposal, we are proposing to add definitions for "Global Warming Potential" and "Global Warming Potential Value." These definitions are necessary to implement our proposal to reduce the potency of greenhouse gas emissions from Pressurized Gas Dusters. 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 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. To enforce our proposal to reduce greenhouse gas emissions from Pressurized Gas Duster, 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. 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 GWP applicable standard.

As defined by the Intergovernmental Panel on Climate Change 1995: Second Assessment Report (IPCC, 1996), the GWP of a greenhouse gas (GHG) is defined as 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. The standard units of measurement used to express the emissions of a GHG are million metric tons of carbon dioxide equivalent (MMT CO_2e) per year.

The global warming potential (GWP) of products in this category is high due to the use of hydrofluorocarbon-134a (HFC-134a) and hydrofluorocarbon-152a (HFC-152a). HFC-152a has a GWP of 140, which is one hundred and forty times greater than the GWP of carbon dioxide (CO_2). HFC-134a has a GWP of 1300, which is approximately ten times greater than the GWP of HFC-152a and 1300 times greater than CO_2 (IPCC, 1996; IPCC, 2007).

We are also proposing to modify the definition for Pressurized Gas Duster to exclude electronic cleaners, electrical cleaners, or energized electrical cleaners. However, we are proposing to add an exemption to the definition for the niche uses where non-flammable dusters are needed. HFC-134a is a non-flammable propellant, whereas HFC-152a is moderately flammable. The proposed exemption is for non-flammable 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. In addition, the product's "Principal Display Panel" must clearly contain the statement: "Energized Equipment use only." Additionally, to ensure that there are no increases in VOC or air toxics emissions, as a result of the proposed GWP limit, staff is proposing a 1 percent by weight VOC standard and a prohibition on the use of perchloroethylene and methylene chloride as mitigation measures as required by the California Environmental Quality Act (CEQA).

The GHG emission reductions from the Pressurized Gas Dusters were estimated using reported information from the 2003 Consumer Products Survey and the 2007 Pressurized Gas Duster Survey Update gathered during February 2008. During the public process of developing the proposed GWP limit, staff held numerous meetings and teleconferences to solicit information and comments from industry associations and industry representatives. At that time, industry representatives advised ARB staff that changes in the gas duster market had occurred since 2003. In response, staff conducted the 2007 Pressurized Gas Duster Survey Update to collect updated information.

The emissions and reduction estimates for 2010 and 2020 were grown from 2007 sales data and the state Department of Finance's population estimates. Annual population growth factors were calculated using the 2007 state population figures and the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008d). It was assumed that without the proposed GWP limit for Pressurized Gas Dusters, the annual sales would grow proportionate to population growth. Staff used GWP values from the IPCC Climate Change 1995; The Science of Climate Change (IPCC, 1996) for calculating the CO_2 equivalent emissions and CO_2 equivalent reductions for this category of products.

Table VI-35 below summarizes the 2003 and 2007 sales and GHG emissions from Pressurized Gas Dusters based on the results of ARB's 2003 Survey (ARB, 2004a) and the 2007 Pressurized Gas Duster Survey Update (ARB, 2008c).

As shown in Table VI-35, 39 duster products were reported for 2003 with adjusted sales of 3,657 pounds per day for 2008. Although not shown on the table, Pressurized Gas Dusters had a sales-weighted average GHG content of over 99 percent by weight, with estimated GHG emissions of 2,242,171 CO_2e pounds per day, or about 0.37 MMT CO_2e per year in California.

Table VI-35
Pressurized Gas Duster

Survey Data	Product Form	Number of Products	2008 Category Sales (lbs/day)	2008 Adjusted GHG Emissions (CO_2e lbs/day)+
2003*	Aerosol	39	3,657	2,242,171
2007**	Aerosol	90	7,292	2,179,855

* Based on 2003 Consumer and Commercial Products Survey. (ARB, 2004a)
** Based on 2007 Pressurized Gas Duster Survey Update. (ARB, 2008c)
\+ Survey emissions adjusted for complete market coverage (see Chapter IV, Emissions).

Additionally, as shown in Table VI-35, 90 duster products were reported for 2007 with adjusted sales of 7,292 pounds per day for 2008. Although not shown in the table, the sales-weighted average GHG content is over 99 percent by weight, and the estimated adjusted GHG emissions are 2,179,855 CO_2e pounds per day, or about 0.36 MMT CO_2e per year.

Prior to 2003, industry leaders voluntarily shifted away from using HFC-134a as the propellant in gas dusters to using HFC-152a (CSPA, 2008). Changes in the market between 2003 and 2007 were captured in the 2007 Pressurized Gas Duster Survey Update (ARB, 2008c). In 2003, HFC-134a gas dusters made up approximately 41 percent of the market. The updated sales information shows that HFC-134a gas dusters were approximately 14 percent of the market in 2007, while HFC-152a gas dusters made up 85 percent of the market. This is why the 2008 adjusted GHG emissions have not increased proportionate to the category sales, which have nearly doubled. The potency of GHG emissions from this category have been decreasing with the increased use of HFC-152a.

Product Use and Marketing:

Pressurized Gas Dusters are aerosol sprays that produce a burst of pressurized gas that is used to remove dust, dirt, lint and other particles from a surface. Pressurized Gas Dusters differ from products such as "Electronic Cleaners" as they do not use liquids or solvents to remove dirt or grease.

These products are used in applications where no-touch, moisture-free, precision cleaning is needed, or in cleaning applications of hard to reach, hidden spots, in equipment and delicate instruments and their housings.

Pressurized Gas Dusters are used by "do-it-yourself" consumers, technicians, and professional engineers. These products are used in applications such as cleaning computers and other internal workings of equipment and delicate instruments, in addition to the surface of delicate materials such as photographic lenses, photographs, film, and negatives that require no-touch, moisture-free cleaning. They are often marketed as no residue, moisture-free, ultra pure or filtered to 0.2 micrometers, and plastics safe.

These products are labeled for cleaning delicate equipment such as: electronic, photographic and office equipment; laboratory equipment and medical devices; audio and video equipment; computer keyboards and printers, the inside of computer housings, copiers and TVs; disc drives, and tape heads of cassette players. These products are also used to clean delicate materials such as: photographs, photographic film, negatives, and slides; audio and video cartridges and cassettes, and other types of surfaces that cannot be cleaned with solvents. These products are sometimes labeled "For Industrial and Institutional Use Only."

Pressurized Gas Dusters are sold in computer and electronic stores, mass market chain-stores, warehouse club stores, office supply stores, hardware stores, scientific or laboratory supply catalogs, and on the Internet.

Product Formulation:

Pressurized Gas Dusters are composed of 99 – 100 percent propellant. The propellant is typically a hydrofluorocarbon (HFC): HFC-134a or HFC-152a. A few products are composed of a blend of hydrocarbon propellants or a blend of hydrocarbon propellants, HFC-134a, and dimethyl ether (DME). Some formulations may contain a bittering agent (to prevent product misuse), or other additives at trace concentrations.

The GWP for products in this category is high due to the use of HFC-134a and HFC-152a. As mentioned previously, HFC-152a has a GWP of 140, which is one hundred and forty times greater than the GWP of carbon dioxide (CO_2). HFC-134a has a GWP of 1300, which is approximately ten times greater than the GWP of HFC-152a and 1300 times greater than CO_2 (IPCC, 1996; IPCC, 2007).

Proposed GWP Limit and Compliance:

We are proposing a GWP limit of 150 for any chemical compound used in Pressurized Gas Duster products, effective December, 31, 2010. The GWP limit does not apply to any chemicals present as contaminants, which, in aggregate, are

0.1 percent by weight or less. The proposed GWP limit for Pressurized Gas Dusters is designed to be equivalent to reducing 0.20 MMT CO_2e per year, effective December 31, 2010, with HFC-134a emissions reductions of approximately 0.23 MMT CO_2e per year by 2020. The reductions in 2020 are important because AB 32 requires a reduction of GHG emissions equal to the 1990 baseline level in California by the year 2020.

We expect that compliance with the proposed limit will be achieved by substituting HFC-152a with a GWP of 140 for the HFC-134a propellant with a GWP of 1300. Pressurized Gas Dusters formulated with HFC-152a already exist on the market today.

As shown in Table VI-36a using adjusted 2007 emissions, we expect an estimated emission reduction of 1,198,574 CO_2e pounds per day, or about 0.20 MMT CO_2e tons per year, by 2010. The GWP limit was set at 150 rather than 140 because it is anticipated that GWP values may change as the "state-of-the-science" evolves. The GWP of HFC-152a (140) was used to estimate emission reductions.

Table VI-36a below shows the emission reductions from the GWP limit of 150 for this category, and that about 86 percent of the market currently complies with the limit.

Table VI-36a
Pressurized Gas Duster GHG Proposal

Survey Data	Proposed GWP Limit	Complying Products	Complying Market Share (%)	2010 Emission Reductions (CO_2e lbs/day)+	2020 Emission Reductions (CO_2e lbs/day)+
2003*	150	7/39	59	1,776,263	2,007,387
2007**	150	18/90	86	1,198,574	1,348,396

* Based on 2003 Consumer and Commercial Products Survey. (ARB, 2004a)
** Based on 2007 Pressurized Gas Duster Survey Update. (ARB, 2008c)
\+ Survey emissions adjusted for complete market coverage (see Chapter IV, Emissions).
Note: Emission reductions have been adjusted from 2003 to 2008 using a population growth factor.

Reformulation options that could be used by manufacturers to meet the proposed limit include the use of 100 percent HFC-152a. We are aware of some compressed CO_2 duster products available on the Internet. Staff initially considered a technology forcing, second tier lower limit of 10 for Pressurized Gas Dusters, effective December 31, 2015, based on CO_2 technology and new lower GWP refrigerant technology. However, after further investigation and discussions with manufacturers, staff believes that CO_2 (compressed gas) dusters are a different product than Pressurized Gas Dusters that use liquefied propellant. Dusters using CO_2, as they exist today, are not a commercially competitive product (DuPont & Falcon, 2004).

We are also aware of new lower GWP refrigerants in development. Indications are that these new refrigerants may have very low GWPs. The newly emerging

refrigerants are in the process of under going toxicity and safety testing, and the results are not yet available. The VOC status of these new refrigerants and their applicability for use as propellants in consumer products, particularly Pressurized Gas Dusters, is unknown at this time. Staff intends to work with Pressurized Gas Duster manufacturers, and other stakeholders to monitor new technologies and conduct a technical assessment of low-GWP propellants that might be appropriate for Pressurized Gas Dusters in the future.

Proposed VOC Limit and Compliance:

We are also proposing a 1 percent by weight VOC limit, effective December 31, 2010. The limit is designed to prevent the use of hydrocarbon propellants, and other VOCs, as products are reformulated to meet the 150 GWP limit. Hydrocarbon propellants (butane, propane, isobutane) may have lower GWPs, but contribute to the formation of ground-level ozone. As proposed, the VOC limit would also apply to any added fragrance. We believe the limit is feasible even if a small amount of fragrance is added. Therefore, we are proposing, in section 94510(c), that Pressurized Gas Dusters do not qualify for the two percent by weight fragrance exemption. The 1 percent limit is designed as a CEQA mitigation measure to prevent VOC emission increases. From the standpoint of cleaning shots and total cleaning force available per container and potential environmental impact, HFC-152a is more efficient than HFC-134a or CO_2 (DuPont & Falcon, 2004). As shown in Table VI-36b, using 2008 VOC emissions, the proposed limit will result in an estimated emission reduction of 1.0 pound per day, or about 0.0005 tons per day.

Table VI-36b also shows that more than 99 percent of the market currently complies with the proposed 1 percent VOC limit.

Table VI-36b
Pressurized Gas Duster VOC Proposal

Survey Data	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	2010 Emission Reductions (lbs/day)**
2007**	1.0	89/90	>99	1.0

** Based on 2007 Pressurized Gas Duster Survey Update. (ARB, 2008c)
+ Survey emissions adjusted for complete market coverage (see Chapter IV, Emissions).

We expect products to be able to comply with both the VOC and GWP limits using HFC-152a. HFC-152a is negligibly reactive with respect to ozone formation and has been excluded from the definition of VOC. While ARB staff believes toxic air contaminants are not likely to be used in future reformulated products, ARB staff is proposing that perchloroethylene and methylene chloride be prohibited in the Pressurized Gas Duster category. This prohibition is proposed to ensure that manufacturers do not choose to reformulate with toxic chlorinated solvents in response to the new VOC and GWP limits. The prohibition does not apply to any chemicals

present as contaminants, which, in aggregate, are 0.1 percent by weight or less. Staff has determined that currently available formulation technologies that do not contain perchloroethylene or methylene chloride are readily available and thus they are not needed to comply with the proposed standard. See Chapter VIII for a discussion of the health effects of perchloroethylene and methylene chloride.

Issues:

a. **Issue:** Industry recommends a narrow exclusion in the definition, for products that are completely nonflammable.

   Response: The proposed modification to the definition of Pressurized Gas Duster includes a narrow exemption for products that are 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. In addition, the "Principal Display Panel" must clearly contain the statement: "Energized Equipment use only." [Title 17, CCR, Section 94508(a)(118)]

b. **Issue:** Industry recommends that the GWP values contained in the IPCC 4th Assessment Report from 2007 be adopted, and that these GWP values be included in the regulation as a table.

   Response: Staff acknowledges the comment. ARB's policy is to use the IPCC: 1995 Second Assessment Report (IPCC, 1996) GWP values where they exist for a specific compound. If there is no SAR value, the 2007 Fourth Assessment Report (IPCC, 2007) GWP value shall be used. In the case where neither the SAR nor the FAR contain a GWP value for the specific compound, then the GWP value is assumed to be equal to the emission standard. These values are used to be consistent with other statewide and national Greenhouse Gas inventories (ARB, 2007c).

c. **Issue:** Industry urges ARB to provide stable values over time while allowing updating as new materials are developed and new GWP values develop.

   Response: See response to Issue #2 above.

d. **Issue:** Industry urges ARB to ensure the proposed regulation (i.e., Table of GWPs) states clearly that compounds not listed as having a GWP value shall be considered to have a GWP value of 0.

   Response: See response to Issue #2 above.

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VII. ECONOMIC IMPACTS

A. INTRODUCTION

This Chapter provides our analysis of the estimated economic impacts we predict from implementation of the proposed VOC limits, one global warming potential (GWP) limit, and other proposed amendments to the regulation. In general, economic impact analyses are inherently imprecise by nature, 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 subject to the proposed limits might encounter. Individual companies may experience different impacts than projected.

The overall impacts are first summarized in Section B. A description of specific aspects of the economic impacts then follows in the sections listed below:

- **C.** Economic Impacts Analysis on California Businesses, Consumers, and Employment;
- **D.** Analysis of Potential Impacts to California State or Local Agencies;
- **E.** Analysis of the Cost-Effectiveness (CE) of the Proposed Limits;
- **F.** Analysis of the Impacts to Raw Materials Cost;
- **G.** Analysis of the Combined Impacts on Per-Unit Cost from Recurring and Nonrecurring Costs;
- **H.** Other Possible Economic Impacts from Proposed Amendments; and
- **I.** Mitigation of Potential Impacts through Additional Regulatory Flexibility.

It is important to note that we conducted this economic impacts analysis 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 four major consumer products rulemakings, the "Mid-Term Measures" regulations adopted by the Board in 1997, 1999, and in the 2004 and 2006 amendments to the regulation (ARB, 1997b; ARB, 1999; ARB, 2004b; ARB, 2006a). However, we have used updated methodologies to determine the high cost estimates for nonrecurring costs as was done in the 2004 and 2006 amendments (ARB, 2004b; ARB, 2006a). We have determined a likely high cost scenario specific to each category. See Section G of this Chapter for a detailed description of the nonrecurring cost determination methodology.

B. SUMMARY OF FINDINGS

Overall, most affected businesses will be able to absorb the costs (or will likely pass through some of the costs to the consumer) of the proposed limits and requirements with no significant adverse impacts on their profitability. This finding is indicated by the staff's estimated change in "return on owner's equity" (ROE) analysis. The analysis found that the overall change in ROE ranges from a low of 0.7 percent to a high of about 4.0 percent, with an average change in ROE of about 2.5 percent. However, 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 the compliance dates. Such extensions may provide sufficient time to minimize the cost impacts to these businesses. Because the proposed measures would not significantly alter the profitability of most businesses, we do not expect a noticeable change in employment; business creation, elimination or expansion; and business competitiveness in California. We also found no significant adverse economic impacts to any local or State agencies.

Our analysis shows that the CE of the proposed amendments is higher than other existing VOC ARB regulatory programs. This is not surprising given that many categories proposed for regulation are smaller, in terms of emissions, and therefore, smaller emissions reductions result. We estimate the total overall CE of the proposed VOC limits and other requirements to be about $6.23 per pound of VOC reduced. We have also determined the CE of the proposed GHG limit relative to reducing carbon dioxide emissions. We estimate the CE of the proposed GHG limit for Pressurized Gas Dusters to be $0.22 per metric ton of CO_2 equivalent (MT CO_2e) reduced.

We estimate that the total cost incurred by industry to comply with this regulation is about $26 million per year for 10 years. These cost estimates are based on assumptions specific to each category depending on reformulation needs, and represent the mid-range of the cost estimates. Staff believes the mid-range costs are the most likely to be incurred by industry to comply with the proposed limits. For some categories, it was assumed that manufacturers would either drop certain products or undergo minor product formulation changes, and for other categories manufacturers would undergo complete production line overhaul and equipment replacement rather than simple re-tooling.

One way to estimate the potential change in cost to produce a product is to determine the change in raw materials cost, which generally has the biggest influence on product cost for most product categories. Our analysis indicates that reformulations to comply with the proposed limits can result in raw material changes ranging from negligible cost (net savings or no cost) up to a cost increase of about $0.63 per unit. The value of $0.63 represents the maximum, worst case, per-unit cost increase. This range compares favorably to the change in per unit cost projected for the Phase I and II, the Mid-Term Measures I and II regulations and the 2004 and 2006 Amendments. The analysis assumed the present cost for raw materials; these costs may be lower or

higher at the time of the limit effective date depending on the formulations chosen by manufacturers and the future price of raw materials. To the extent that the projected cost savings or increases are ultimately passed on to the consumer, the actual retail price of products after the proposed limits become effective may be higher or lower than suggested by this analysis.

Even if all annualized nonrecurring costs (research and development, capital equipment purchases, etc.) and recurring raw material cost increases are factored into the affected products manufacturing costs, the potential increase in production per-unit costs are comparable to previous ARB consumer product rulemakings. The estimated per-unit cost increases from both annualized nonrecurring and annual recurring costs range from negligible cost (net savings or no cost) to about $2.05 per unit. The value of $2.05 represents the maximum, worst case, per-unit cost increase for a product which is typically packaged in a one gallon container. When averaged over the total number of unit sales in California of noncomplying products, (those that need to reformulate) the product weighted average cost increase is about $0.20 per unit. As noted before, these per unit cost increases compare favorably to the change in per unit cost projected for previous ARB consumer product rulemakings.

Staff believes that the regulation cost and CE determination methodologies are quite conservative, and are thus in most cases, over-estimated. There are several factors that contribute to the over estimation of costs. The mid-range cost, (used to determine the overall cost and cost effectiveness of the regulation) is the average of the estimated high and low cost scenarios. The low cost scenario assumes that companies would choose the lowest cost reformulation pathway, making minor adjustments to a product's formulation, or simply eliminating higher VOC 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.

In the economic analysis, staff assumed that the VOC limits for Multi-purpose Lubricants would be the most challenging and costly to comply with. Staff separately calculated the estimated costs of reformulation for each of the proposed tiers of the Multi-purpose Lubricant proposal. Further, cost estimates were performed separately for aerosol and non-aerosol products respectively. The analysis shows that greater costs will be incurred during the first tier reformulation than the second tier reformulation. This results from the assumption that significant high end costs will be incurred in the first tier reformulation, but not all of these costs would necessarily be duplicated in the second tier reformulation. If major plant modifications or new equipment purchases are needed to meet either tier of the VOC limits, a manufacturer would likely choose to make these significant changes during one plant modification, rather than making significant more than once. In fact, certain companies may choose to reformulate only once, (i.e. reformulate to meet the second tier VOC limit before 2013.) Regardless of whether this assumption is correct, we believe that it is appropriate to assume that high end reformulation costs will be incurred during either

the first tier reformulation or the second tier reformulation, but not both. Either assumption, that higher costs would be incurred during a given tier relative to the other, would yield the same amount of total costs being incurred to meet both tiers.

Another factor that can contribute to an over estimation of costs are the assumptions used for the raw ingredient costs. For the product categories for which VOC limits are proposed, we assumed that if the raw ingredients used in the reformulated product yielded a cost savings, the cost of the raw ingredients necessary to meet the new VOC limit is zero. This is a conservative assumption because for most product categories, there is more than one reformulation option. However, it is possible that a given manufacturer will choose more expensive ingredients to preserve certain specific product attributes.

However, in the case of Pressurized Gas Dusters we assumed that reformulation would yield a raw ingredient savings, and incorporated the decreased cost into the overall cost estimate. We believe that this approach is appropriate because in order to comply with the proposed GWP limit for Pressurized Gas Dusters, there is only one identified reformulation pathway, replacing HFC-134a with HFC-152a. Because HFC-152a is less expensive per pound that HFC-134a, it is appropriate that there would be a cost savings in virtually every case. Therefore, for Pressurized Gas Dusters, instead of assuming that the raw material cost is zero, the raw material cost savings was subtracted from the anticipated equipment and research and development costs of reformulation.

C. ECONOMIC IMPACTS ANALYSIS ON CALIFORNIA BUSINESSES, CONSUMERS, AND EMPLOYMENT

1. Legal Requirements

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.

Also, 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 nondiscretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

2. Potential Impact on California Businesses

Overall, most affected businesses will be able to absorb the costs of the proposed measures with no significant adverse impacts on their profitability. It is likely that all cost will not be absorbed by businesses, by passing a portion through to

consumers. However, 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 Subsection I of this Chapter). Because the change on the return on owners' equity (ROE) has been determined to be quite low, the proposed measures would not significantly alter the profitability of most businesses. Further, we do not expect a noticeable change in employment; business creation, elimination or expansion; and business competitiveness in California.

a. Return on Owners' Equity

This portion of the economic impacts analysis is based on a comparison of the 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, 2006-2007), the ARB's 2003 Consumer and Commercial Products Survey (2003 Survey), and the staff's CE analysis discussed later in this Chapter.

b. 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 the 2003 Survey, there are about 300 companies that market the affected products in California. These companies manufacture, market, and distribute a broad range of solvent, adhesive, household, and personal care products, including an estimated total of 2,366 complying and 1,535 noncomplying products (based on reported figures). Of the companies manufacturing these products, about 60 firms (mostly medium- or small-sized firms) are located in California.

These 300 companies fall primarily into 5 North American Industry Classification System codes (NAICS). A list of these industries which we have been able to identify is provided in Table VII-1. As shown in Table VII-1, the industries with the most noncomplying products fall under the NAICS for Lubricant Manufacturing; Adhesive Manufacturing; Polish and Other Sanitation Good Manufacturing, Toilet Preparation

Manufacturing and All Other Miscellaneous Chemical Product and Preparation Manufacturing.

Table VII-1
Industries with Businesses Potentially Affected by the Proposed Limits

NAICS*	Industry	Number of Product Categories*	Number of Noncompliant Products**	Includes:
324191	Lubricant Manufacturing	2	226	Multi-Purpose Lubricant – excluding solid & semisolid; Penetrant
325520	Adhesive Manufacturing	2	271	Sealant or Caulking Compound – Chemically Curing; Sealant or Caulking Compound – Non-Chemically Curing
325612	Polish & Other Sanitation Good Manufacturing	10	637	Carpet/Upholstery Cleaner; Dusting Aid; Fabric Protectant; Fabric Softener – Single Use Dryer Product; Floor Maintenance Product; Floor Polish or Wax; Glass Cleaner; Odor Remover/Eliminator; Pressurized Gas Duster; Spot Remover
325620	Toilet Preparation Manufacturing	2	498	Astringent/Toner (non-FDA regulated); Personal Fragrance Product – 20% or less fragrance
325998	All Other Miscellaneous Chemical Product & Preparation Manufacturing	3	140	Motor Vehicle Wash; Tire or Wheel Cleaner; Windshield Water Repellent

*As reported in the 2003 Consumer and Commercial Products Survey. (ARB, 2004a)
** Some noncomplying products may relate to more than one NAICS code. Number of products may be different than those indicated in Table VII-5, due to calculations based on representative product size.

c. Study Approach

This study covers 5 industries with at least 300 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 2003 Survey respondents.
(2) A range of compliance costs were estimated for each affected product category. The mid-range cost 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 an affected industry.
(4) Estimated cost was adjusted for federal and State taxes.
(5) The Return on Owner's equity (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. 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.

A reduction of more than 10 percent in profitability 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 (ARB,1990c; ARB, 1991a; ARB, 1995; ARB, 1997b; ARB, 1999; ARB, 2004b; and ARB, 2006a). This threshold is consistent with the thresholds used by the U.S. EPA.

d. Assumptions

This study uses 2004-2006 Dun and Bradstreet financial data for a nationwide typical business in each affected industry except for Toilet Preparation Manufacturing and All Other Miscellaneous Chemical Product and Preparation manufacturing where 2005 and 2004-2005 Dun and Bradstreet financial data were used, respectively, due to lack of complete financial data. These data were used to calculate the ROEs before and after the subtraction of the compliance costs for a typical business in each industry listed in Table VII-1. 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, staff believes these assumptions are reasonable for most businesses at least in the short run; however, they may not be applicable to all businesses.

e. Results

Typical California businesses are affected by the proposed new limits to the extent that the implementation of these requirements would change their profitability. Based on our assessment of the proposed limits' CE (see Subsection E of this Chapter), we estimate the per-business compliance costs to range from about $1,700 (low cost for typical Penetrant manufacturer) to about $54,000 per year (high cost for typical Multi-Purpose Lubricant manufacturer) as shown in Table VII-2. Table VII-7 also shows total mid-range, per product cost of about $14,000 per year.

Table VII-2
Estimated Total Impacts to Businesses from Both Annualized Nonrecurring and Annual Recurring Costs

Table VII-2. Estimated Total Impacts to Businesses from Both Annualized Non-Recurring and Annual Recurring Costs

Category	* Estimated # Products Non-Compliant	Number of Companies with Noncompliant Products in Each Product Category	Estimated Annual Costs, Dollars Per Year (includes Recurring and Nonrecurring) For a Typical Business in the Product Category			For All Businesses in the Product Category		
			Low Cost	High Cost	Mid Cost	Low Cost	High Cost	Mid Cost
Adhesives								
Chemically Curing Sealant or Caulking	112	30	$22,507	$54,479	$38,493	$675,207	$6,101,648	$3,388,428
Non-chemically Curing Sealant or Caulking	159	37	$7,419	$23,678	$15,548	$274,486	$3,764,857	$2,019,671
Total	271	67				$949,693	$9,866,505	$5,408,099
Automotive								
Motor Vehicle Wash	61	26	$4,856	$7,089	$5,973	$126,263	$432,425	$279,344
Windshield Water Repellant	30	8	$6,296	$6,296	$6,296	$50,371	$188,891	$119,631
Tire or Wheel Cleaner								
Aerosol	6	5	$2,037	$2,104	$2,070	$10,184	$12,623	$11,404
Non-aerosol	43	18	$4,011	$4,011	$4,011	$72,198	$172,474	$122,336
Total	140	57				$259,015	$806,413	$532,714
Household Care								
Carpet/Upholstery Cleaner								
Aerosol	58	34	$4,357	$27,956	$16,157	$148,133	$1,621,475	$884,804
Non-aerosol	70	40	$4,470	$11,629	$8,049	$178,781	$814,034	$496,408
Dusting Aid								
Aerosol	32	19	$4,302	$7,448	$5,875	$81,729	$238,335	$160,032
Non-aerosol	10	8	$3,193	$5,528	$4,360	$25,540	$55,278	$40,409
Fabric Protectant (non-aerosol)	23	16	$3,671	$5,947	$4,759	$58,742	$134,482	$96,612
Fabric Softener (single use dryer product)	7	4	$4,470	$5,877	$5,173	$17,878	$41,136	$29,507
Floor Maintenance Product (Spray Buff)	46	30	$3,916	$6,128	$5,022	$117,485	$281,891	$199,688
Floor Polish or Wax (Wood Floor Wax)	6	3	$11,912	$35,790	$23,851	$35,735	$214,741	$125,238
Glass Cleaner (aerosol)	70	56	$3,193	$9,755	$6,474	$178,781	$682,845	$430,813
Multi-Purpose Lubricant								
Aerosol - Tier 1	122	60	$5,284	$54,288	$29,786	$317,051	$6,623,117	$3,470,084
Aerosol - Tier 2	144	62	$3,350	$29,989	$16,670	$207,727	$4,318,431	$2,263,079
Non-aerosol - Tier 1	19	10	$4,836	$45,426	$25,131	$48,361	$863,095	$455,728
Non-aerosol - Tier 2	20	10	$4,586	$12,581	$8,583	$45,855	$251,618	$148,737
Odor Remover/Eliminator (non-aerosol)	33	27	$1,619	$11,070	$6,344	$43,702	$365,311	$204,507
Penetrant								
Aerosol	50	32	$2,993	$40,128	$21,561	$95,776	$2,006,411	$1,051,093
Non-aerosol	12	10	$1,703	$27,470	$14,586	$17,027	$329,638	$173,333
Pressurized Gas Duster	80	20	-$1,441	$10,216	$4,388	-$115,269	$204,321	$44,526
Spot Remover								
Aerosol	58	41	$3,613	$23,284	$13,448	$148,133	$1,350,459	$749,296
Non-aerosol	144	56	$6,567	$17,088	$11,828	$367,778	$2,460,613	$1,414,196
Total	1004	538				$2,018,946	$22,857,231	$12,438,089
Personal Care								
Astringent/Toner (Non-FDA regulated)	29	15	$3,378	$14,402	$9,190	$59,665	$417,653	$238,659
Personal Fragrance Product								
Aerosol	16	3	$10,973	$10,973	$10,973	$32,918	$175,565	$104,242
Non-aerosol	453	62	$15,032	$30,929	$22,980	$932,003	$14,010,634	$7,471,319
Total	498	80				$1,024,587	$14,603,852	$7,814,219
Grand Total	1913	742				$4,252,241	$48,134,001	$26,193,121

* Estimated number of non-compliant products is calculated based on sales and representative product size. As such, the values are different from the number of products reported in the 2003 Survey.

Using ROE to measure profitability, we found that the average ROE of sample businesses in affected industries declined by about 2.5 percent as shown in Table VII-3. This represents a minor change in the average profitability of typical businesses in California.

Table VII-3
Changes in Return on Owner's Equity (ROEs) for Typical Businesses in Affected Industries

NAICS*	Industry	% Change in ROE
324191	Lubricant Manufacturing	2.8
325520	Adhesive Manufacturing	4.0
325612	Polish & Other Sanitation Good Manufacturing	2.8
325620	Toilet Preparation Manufacturing	2.4
325998	All Other Miscellaneous Chemical Product & Preparation Manufacturing	0.7
Average		**2.5**

Note: Changes in ROE mean change or difference; all changes in ROEs shown are negative (i.e., shows a decline in profitability).

As shown in Table VII-3, the projected change in profitability of typical businesses in the 5 affected industries varies by industry sector. Within the NAICS shown, the predicted change (decline) in profitability of a typical business ranged from a high of about 4.0 percent to a low of 0.7 percent. This variation in the impact of the proposed measures can be attributed primarily to two factors. First, some businesses incur higher costs due to the type of products or the number of noncompliant products they manufacture or market. For instance, the estimated annualized costs for typical businesses in each affected industry ranged from a high of approximately $35,000 to a low of about $5,000. These values are a product weighted average cost of the respective annualized costs for all products. Second, the performance of businesses may differ from year to year. Hence, the financial data used may not be representative of an average-year performance for some businesses.

The potential impacts to businesses' ROEs may be overestimated for the following reasons. First, annualized costs of compliance are estimated using, in part, the current prices of raw materials. Raw material prices usually tend to rise as oil prices increase, but tend to fall as higher demand for these materials induces economy of scale production in the long run. Second, affected businesses would not absorb all of the increase in their costs of doing business. They may be able to either pass some of the cost on to consumers in the form of higher prices, reduce their costs, or do both.

In this analysis, as in 2004 and 2006, we allocated nonrecurring reformulation costs only to the noncomplying products.

3. Potential Impact on Business Creation, Elimination or Expansion

The proposed measures would have no noticeable impact on the status of California businesses. This is because the reformulation costs are not expected to impose a significant impact on the profitability of businesses in California. However, some small businesses with little or no margin of profitability 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.

4. 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 measures 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 justifiable 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 Subsection H).

5. Potential Impact on California Consumers

The potential impact of the proposed measures on consumers depends upon the ability of affected businesses to pass on the cost increases to consumers. In the short run, 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 in the short run. In the long run, however, if businesses are unable to bring down their costs of doing business they will likely pass their cost increases on to consumers.

To estimate the price increase, we adjusted per unit compliance costs for each affected industry by its profit margin as provided by Dun and Bradstreet. Assuming affected industries will pass on the entire compliance costs to consumers in terms of higher prices, we estimate the average price of a product would increase by about $0.03 per unit. Product price increases, however, would vary from industry to industry. They would range from a low of $0.01 per unit of the products sold by the Personal

Care Products Industry to a high of about $0.05 per unit of the products sold by Household Care Products.

The proposed measures 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 nearly every proposed limit, there are already complying products that represent significant market share in many of their respective categories. 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 Impact on California Employment

The proposed measures are not expected to cause a noticeable change in California employment and payroll. According to the U.S. Department of Commerce, California employment in industries affected by the proposed measures was 13,885 in 2005, as shown in Table VII-4, or about 9.7 percent of national employment in the affected industries. This represents less than 1 percent of manufacturing employment in California. These employees working in the 458 establishments generated about $667 million in payroll, or about 9.4 percent of national payroll in the affected industries. This also accounts for less than 1 percent of the total California manufacturing payroll in 2005.

D. ANALYSIS OF POTENTIAL IMPACTS TO CALIFORNIA STATE OR LOCAL AGENCIES

We have identified two State agencies that could/or would be impacted. The California Prison Industry Authority (PIA) manufactures and markets consumer products for use in State service. This is the only State agency we are aware of that makes consumer products. The PIA manufactures a drain maintainer, which could be subject to the proposed six percent limit for non-aerosol Odor Remover/Eliminator. This product, if subject, would meet the proposed new limit for Odor Removers/Eliminators. The PIA also sells bar soaps, powder bleaches, liquid glass cleaners, liquid multipurpose cleaner and degreasers, floor finishes, and liquid and powder detergents (PIA, 2008). The proposed measures do not affect these categories and, as such, will not have an impact on the PIA.

Table VII-4
California Employment and Payroll in Affected Industries

NAICS	Number of Employees		Payroll	
	California	CA Share as % of US	California (million in 2005$)	CA Share as % of US
324191	720	5.4	39,807	5.5
325520	2,452	11.9	130,584	12.4
325612	1,081	6.0	44,846	5.2
325620	7,542	13.3	346,387	13.2
325998	2,090	5.9	105,257	5.9
Total	13,885	9.7	666,881	9.4

Source: (U.S. Census, 2005)

The Air Resources Board (ARB) would have costs associated with adoption of the proposed amendments. Adoption of the amendments would necessitate an increase in ARB staff to properly enforce the Consumer Products Regulation. These proposed amendments are setting new limits for a number of previously unregulated categories. It has been determined that to enforce these new limits, two ARB staff will be needed. This would result in an increased cost to the State of approximately $300,000 per year.

E. ANALYSIS OF THE COST-EFFECTIVENESS (CE) OF THE PROPOSED LIMITS

1. Introduction

In the following analysis, 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 or a metric ton of CO_2e relative to other existing regulatory programs. To do this, we applied a well-established methodology for converting compliance costs, both nonrecurring and recurring, to an annual basis. We then report the ratio of the annualized costs to the annual emission reductions in terms of "dollars (to be) spent per pound of VOC reduced or metric ton of CO_2e reduced in the case of Pressurized Gas Duster. For perspective, we compare the estimated cost-effectiveness of the proposed limits to the cost-effectiveness of other ARB regulations and control measures.

2. Methodology

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 or metric tons). Annual costs include annualized nonrecurring fixed costs (e.g., total research and development (R&D), product and consumer testing, equipment purchases/modifications, etc.) and annual recurring costs (e.g., raw materials, labeling, packaging, etc.).

We annualized nonrecurring fixed costs using the Capital Recovery Method, as recommended under guidelines issued by the California Environmental Protection Agency (Cal/EPA). Using this method, we multiply the estimated total fixed costs to comply with the limits 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. We then sum the annualized fixed costs with the annual recurring costs and divide that sum by the annual emission reductions to calculate the cost-effectiveness of the regulation, as shown by the following general equation:

Cost-Effectiveness (1)

$$= \frac{\text{(Annualized Fixed Costs) + (Annual Recurring Cost)}}{\text{(Annual Mass Reduction in VOC)}}$$

where:

$$\text{Annualized Fixed Costs} = \text{(Fixed Costs)} \times \frac{i(1+i)^n}{(1+i)^n - 1} \quad (2)$$

$i(1+i)^n/((1+i)^n-1)$	=	Capital Recovery Factor (CRF)
i	=	discount interest rate over project horizon, %
n	=	number of years in project horizon
Fixed Costs	=	total nonrecurring cost per product category
	=	(Nonrecurring Cost per Product) x (Total Noncompliant Products in the Category)

As shown by the raw materials cost analyses in Appendix D, a convenient method for estimating the annual recurring cost portion of overall cost-effectiveness is to separate Equation (1) into two fractions, one for the nonrecurring costs and one for the recurring costs. It can then be shown that the CE fraction for recurring costs can be simplified and calculated as follows:

$$\text{Annual Recurring Costs CE} = \frac{(\text{Compliant Materials Cost}) - (\text{Baseline Materials Cost})}{(\text{Baseline VOC Content}) - (\text{Compliant VOC Content})} \quad (3)$$

where,

Baseline Materials Cost	=	cost of raw materials for product before reformulation to the proposed limit $/lb product
Baseline VOC Content	=	product VOC weight fraction before reformulation to limit, lb VOC/lb product
Compliant Materials Cost	=	cost of raw materials for compliant product, $/lb product
Compliant VOC Content	=	product VOC weight fraction of compliant product, lb VOC/lb product.

In the case of Pressurized Gas Duster, the calculations are similar except that in place of VOC content, product GWP value content is used. To use Equation (3), staff determined typical VOC or GWP value content of both compliant and noncompliant products in each of the product categories/subcategories, based on sales data and the speciated formulations as reported by manufacturers in the ARB's 2003 Survey. To the extent feasible, staff determined the detailed formulations that most closely reflect the "typical" compliant and noncompliant VOC or GWP value contents. These formulations, in turn, were designated as compliant and baseline formulations, respectively (See Appendix D).

For most ingredients, we used the most recent, distributor-level bulk prices from the *ICIS Chemical Business* web site (ICIS, 2008). Costs for other ingredients were obtained from discussions with chemical suppliers, or from web searches of analytical grade chemicals. All of these data sources were used to calculate the baseline and compliant material costs based on these designated formulations shown in Appendix D. Inorganic compounds were assigned a low and high cost of $0.09 and $0.91 per pound based on the costs found of the most common inorganic compounds found in the product categories. Other 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). These analyses are shown in Appendix D and discussed in more detail in "Analysis of Impacts to Raw Materials Cost" later in this section.

We used a very similar methodology to determine the CE of the proposal to reduce the potency of greenhouse gas emissions from Pressurized Gas Dusters, as described above. Instead of evaluating costs relative to VOC reductions, for Pressurized Gas Dusters we evaluated the costs of reducing GHG emissions equivalent to reducing a metric ton of carbon dioxide.

3. Assumptions

We calculated the CE with an assumed project horizon of 10 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 CE analyses of air pollution regulations, including previous consumer product rulemakings. Based on these assumptions, the Capital Recovery Factor (CRF) is 0.16275.

For this rulemaking, we assumed products reformulated to meet the proposed limits will be marketed throughout the U.S. by national marketers (ARB, 1997b). We earlier determined that businesses generally formulate for, and distribute to the entire nation, products compliant with our regulations rather than incurring the additional cost of setting up a California specific product distribution system. We believe the same strategy will be employed by companies subject to the proposed new limits. We, therefore, assumed in the Midterm II analysis in 1999 that, for the annualized fixed cost portion of Equation (1), it was appropriate to use the fixed cost for national production divided by the national emission reductions.

However, an alternative but equivalent approach, which we used in the 2004 and 2006 analyses, and in this analysis, is to report the California-apportioned (by population) annualized fixed cost divided by the California-apportioned emission reductions. To illustrate, a manufacturer may need to install $10 million worth of equipment to produce its national sales volume of products compliant with the proposed limits. However, if the company were to produce a California and 49-state product, the company may only need to install $1 million worth of equipment to produce unit sales sufficient for the smaller California market. Using this alternative approach, we discounted the total fixed costs for producing national sales volumes by the California-apportionment factor (i.e., the current ratio of California to U.S. population, or 12.5 percent (CA DOF, 2007)), which we then divided by the California-only emission reductions. It is important to note that, while both of the approaches described above -- the national marketing and California-only approaches -- reach the same conclusion, they do so for different reasons as discussed above.

For the annual recurring costs, we assumed compliant reformulations would result in cost changes as a result of changes in a product's raw materials and their associated prices. Changes in packaging, labeling, distribution and other recurring costs were assumed to be negligible relative to baseline levels of these costs. This assumption is based on our previous regulatory experiences. To illustrate, in 1996, we conducted a comprehensive technical assessment of the 55 percent by weight VOC hairspray limit, which required extensive reformulations to existing products (ARB, 1997c). The hairspray limit is generally considered to be among the most challenging of the consumer product limits; it likely resulted in more changes to the regulated product, relative to pre-regulatory products, than any other VOC limit. However, our assessment found that changes to recurring costs other than hairspray raw material costs were expected to be negligible (ARB, 1997c). Based on this finding and because the

proposed new limits are designed to preserve product forms, we believe our assumptions regarding the recurring costs are reasonable.

4. Results

A review of relevant technical literature and industry trade journals provided little information that we could use to estimate 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. We have received significant comments regarding our assumptions for fixed costs from specific interested parties. We worked with these industry representatives to obtain new, updated, substantiated fixed cost data. The information we received generally confirms our cost assumptions to be correct. We therefore developed estimates for the nonrecurring costs based on analogous costs reported by ARB staff for the Phase II consumer products rulemaking (*Id*, Appendix D1). The Phase II nonrecurring costs are applicable for this analysis since they were based on staff's detailed estimates of labor, research and development, equipment purchase, and other costs involved in product reformulations for generic household, automotive, and personal care categories, all of which are impacted by proposed limits. This is the same approach we used for the 1997 Mid-Term Measures rulemaking, the 1999 Mid-Term Measures II rulemaking, and the 2004 and 2006 rulemakings.

The Phase II nonrecurring investment costs, reported in 1991 dollars, were adjusted to 2007 dollars using a well-established method of ratioing chemical engineering plant cost indices as follows (Peters and Timmerhaus, 1980):

$$\text{Non - Recurring Costs (in 2007 dollars)} = \frac{\text{Non} - \text{Recurring Costs (in 1991 dollars)}}{10} \times \frac{\text{C.E. 2007 Index}}{\text{C.E. 1991 Index}} \quad (4)$$

where,

CE 2007 index = 2007 Chemical Engineering Plant Cost Index = 525.0 (*Chemical Engineering*, April 2008).

CE 1991 index = 1991 Chemical Engineering Plant Cost Index = 361.3 (*Chemical Engineering*, April 1997).

We believe the original Phase II cost estimates were beneficial at the time of the rulemaking for predicting the costs to comply with those limits. However, it was discovered during Midterm II that these original cost estimates grossly overestimated the true nonrecurring costs for Phase II by a factor of ten (ARB, 1999, op cit. at Vol II, Chapter VII, Page 211). We therefore estimated the nonrecurring costs for the proposed new limits by adjusting the Phase II estimates to be consistent as shown in Equation (4).

Table VII-5 shows our estimates for per-product and total annualized nonrecurring costs for each of the product categories/subcategories subject to the proposed limits.

As shown, we project a per-product annualized nonrecurring cost ranging from a low of about $8,000 to a high of about $243,000. With 1,535 noncompliant products that would need to be reformulated, the overall total annualized fixed cost to industry is projected to range from about $4 million to just about $16 million dollars per year, with a general breakdown of this range as follows: automotive care products (2 percent), household care products (72 percent), personal care products (16 percent) and adhesives (10 percent).

Our analysis shows that the CE of the proposed requirements is higher than the CE of other rulemakings for consumer products or the Suggested Control Measure for Architectural and Industrial Maintenance Coatings. We estimate the total overall CE of the initial proposed limits and other requirements to be about $6.23 per pound of VOC reduced, and about $0.22 per metric ton of CO_2 equivalent reduced.

It should be noted that a contributing factor to the total average cost per pound of VOC reduced is that the VOC emission reductions achieved from some of the proposed limits specific to individual categories may be quite low. A limit may have been set largely as a cap, with the few reductions being achieved resulting in a few VOC reductions and a low CE. While the costs incurred by manufacturers to reformulate small categories is not excessive, when those costs are apportioned to a relatively small emission reduction, the CE may appear low (high cost per pound of VOC reduced). Therefore, when presenting the overall CE of the proposal, one should consider the effect of relatively low CE in some categories.

Table VII-5
Estimated Total Nonrecurring Fixed Costs to Comply with Proposed Limits

Table VII-5. Estimated Total Annualized Non-Recurring Fixed Cost to Comply with Proposed Standards

Category	Proposed Limit	Market Covered (% covered by 2003 Survey)	Market Adj. Factor	Estimated # Products Non-compliant* (A)	Estimated Total One-Time Cost to Reformulate Per Product (dollars) Low (B0)	High (B1)	Estimated Annualized Cost to Reformulate Product (dollars per year) Low (B2=B0x CRF)	High (B3=B1x CRF)	Estimated Annualized Fixed Cost to Reformulate All Non-Compliant Products (dollars per year) Low (AxB2)	High (AxB3)
Adhesives										
Chemically Curing Sealant or Caulking	3	90	1.11	112	$10,608	$34,293	$1,726	$5,581	$193,349	$625,072
Non-chemically Curing Sealant or Caulking	1.5	90	1.11	159	$10,608	$33,857	$1,726	$5,510	$274,486	$876,099
			Sum	271					$467,834	$1,501,171
Automotive										
Motor Vehicle Wash	0.2	90	1.11	61	$10,317	$10,317	$1,679	$1,679	$102,421	$102,421
Windshield Water Repellant	75	90	1.11	30	$10,317	$10,317	$1,679	$1,679	$50,371	$50,371
Tire or Wheel Cleaner										
Aerosol	8	90	1.11	6	$10,317	$10,317	$1,679	$1,679	$10,074	$10,074
Non-aerosol	2	90	1.11	43	$10,317	$10,317	$1,679	$1,679	$72,198	$72,198
			Sum	140					$235,064	$235,064
Household Care										
Carpet/Upholstery Cleaner										
Aerosol	5	90	1.11	58	$15,693	$100,699	$2,554	$16,388	$148,133	$950,520
Non-aerosol	1	90	1.11	70	$15,693	$40,832	$2,554	$6,645	$178,781	$465,162
Dusting Aid										
Aerosol	17	90	1.11	32	$15,693	$27,173	$2,554	$4,422	$81,729	$141,511
Non-aerosol	3	90	1.11	10	$15,693	$27,173	$2,554	$4,422	$25,540	$44,222
Fabric Protectant (non-aerosol)	1	90	1.11	23	$15,693	$24,393	$2,554	$4,068	$58,742	$93,553
Fabric Softener (single use dryer product)	2.5	90	1.11	7	$15,693	$20,634	$2,554	$3,358	$17,878	$23,506
Floor Maintenance Product (Spray Buff)	1	90	1.11	46	$15,693	$24,557	$2,554	$3,997	$117,485	$183,842
Floor Polish or Wax (Wood Floor Wax)	70	90	1.11	6	$15,693	$63,936	$2,554	$10,405	$15,324	$62,432
Glass Cleaner (aerosol)	10	90	1.11	70	$15,693	$47,952	$2,554	$7,804	$178,781	$546,276
Multi-Purpose Lubricant										
Aerosol - Tier 1	25	90	1.11	122	$15,403	$164,053	$2,507	$26,699	$305,820	$3,257,270
Aerosol - Tier 2	10	90	1.11	144	$8,864	$79,338	$1,443	$12,912	$207,727	$1,859,324
Non-aerosol - Tier 1	25	90	1.11	19	$11,043	$146,907	$1,797	$23,908	$34,148	$454,260
Non-aerosol - Tier 2	10	90	1.11	20	$7,556	$38,652	$1,230	$6,290	$24,594	$125,809
Odor Remover/Eliminator (non-aerosol)	6	90	1.11	33	$8,137	$55,653	$1,324	$9,057	$43,702	$298,891
Penetrant										
Aerosol	25	90	1.11	50	$11,770	$157,805	$1,916	$25,682	$95,776	$1,284,103
Non-aerosol	25	90	1.11	12	$8,719	$140,659	$1,419	$22,892	$17,027	$274,699
Pressurized Gas Duster	150**	90	1.11	80	$15,693	$38,652	$2,554	$6,290	$204,321	$503,236
Spot Remover										
Aerosol	15	90	1.11	58	$15,693	$101,135	$2,554	$16,459	$148,133	$954,635
Non-aerosol	3	90	1.11	144	$15,693	$40,832	$2,554	$6,645	$367,778	$956,905
			Sum	1004					$2,271,420	$12,490,157
Personal Care										
Astringent/Toner (Non-FDA regulated)	35	90	1.11	29	$12,642	$45,772	$2,057	$7,449	$59,665	$216,027
Personal Fragrance Product										
Aerosol	75	90	1.11	16	$12,642	$12,642	$2,057	$2,057	$32,918	$32,918
Non-aerosol	75	90	1.11	453	$12,642	$26,010	$2,057	$4,233	$932,003	$1,917,570
			Sum	498					$1,024,587	$2,166,516

2007 Chemical Engineering Plant Cost Index =	525	(Final 12/07)	Discount Rate	10.00%	Grand Annual Total (dollars per year)
1991 Chemical Engineering Plant Cost Index =	361.3	(Final 1991)	Project Horizon, yrs	10	$3,998,905 $16,382,908
* # Noncompliant Products = Market Adj. x (# Noncompliant Products in Survey)			Cost Recovery Factor	0.16275	
** Gw/P limit					

Table VII-6 shows a comparison of the CE for the proposed limits relative to other ARB consumer product regulations and control measures. As expected, costs for the proposed amendments are higher than other recent consumer products measures. These higher costs can be attributed to regulating smaller emitting and/or more challenging categories than in the past.

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

Regulation/Control Measure	Cost-Effectiveness (Dollars per Pound VOC Reduced)
2008 Amendments	$6.23
2006 Amendments[1]	$2.35
2004 Amendments[1]	$2.01 to $2.34
Aerosol Adhesives[2]	$6.00
Architectural and Industrial Maintenance Coatings[3]	$1.12

1 Categories where reduction of toxic air contaminant emissions occurred were included (ARB, 2004b; ARB, 2006a).
2 ARB, 2000c.
3 Suggested Control Measure, developed with the California Air Pollution Control Officers Association (ARB, 2007i).

F. ANALYSIS OF THE IMPACTS TO RAW MATERIALS COST

1. Introduction

As part of the economic impact analysis, we evaluated the expected cost impacts from the proposed limits on raw material costs. As stated previously, the raw material costs generally constitute the major portion of the compliance costs for most categories. However, evaluating the impacts to raw material costs provides only an indicator of possible impacts to the retail prices of the affected products (assuming the cost impacts are passed on partially or fully to consumers). 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.

2. Methodology

As discussed previously, staff determined the formulations which most closely reflect the "typical" compliant and noncompliant VOC contents. These formulations, in turn, were designated as compliant and non-compliant formulations, respectively.

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. Sources of cost information were used for selected ingredients as discussed previously. Other than compounds specifically requested, the 2003 Survey did not ask for specific ingredient details for exempt, fragrance, some low vapor pressure VOCs, and inorganic compounds. 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, 1997b), with the exception of fragrance which was assumed to have a default low and high cost of $5.00 and $10.00 per pound respectively. However, inorganic compounds tend to be less expensive and using the default low and high cost would not give an accurate representation of inorganic compound cost. Therefore inorganic compounds were assigned a low and high cost of $0.09 and $0.91 per pound based on the costs found of the most common inorganic compounds found in the product categories. These analyses and the formulations evaluated (with individual weight fractions and unit prices per pound) are shown as cost spreadsheets in Appendix D. While these formulations may not reflect the exact composition of existing noncompliant products and compliant products that will be marketed, we believe they are reasonably representative for the purposes of this analysis.

3. Assumptions

As noted previously, we assumed changes in packaging, labeling, distribution and other recurring costs to be negligible relative to baseline levels of these costs (ARB, 1997b. The most likely pathway for reformulation was assumed for noncompliant products. Despite this assumption, alternative formulations may allow lower-cost compliant products than shown in our analysis.

4. Results

As shown in Table VII-7, the anticipated raw materials cost changes range from no cost (net savings or no cost) to about $0.63 increase per unit (for Floor Polish or Wax – Wood Floor Wax).

Table VII-7
Estimated Impacts to Raw Materials Cost Per Unit

Category	Estimated Raw Material Costs, $/Unit of Product				Cost Difference from Baseline Pre-Reg	
	Baseline Pre-Regulatory		Compliant		to Low	to High
	Low (A0)	High (B0)	Low (A1)	High (B1)	(A1)-(A0)	(B1)-(B0)
Adhesives						
Chemically Curing Sealant or Caulking	1.41	3.13	1.44	3.18	0.03	0.05
Non-chemically Curing Sealant or Caulking	0.59	1.47	0.57	1.43	0.00	0.00
Automotive						
Motor Vehicle Wash	1.53	3.02	1.55	3.09	0.02	0.07
Windshield Water Repellant	0.46	0.61	0.38	0.52	0.00	0.00
Tire or Wheel Cleaner						
Aerosol	0.10	0.13	0.10	0.15	0.00	0.02
Non-aerosol	0.09	0.11	0.07	0.08	0.00	0.00
Household Care						
Carpet/Upholstery Cleaner						
Aerosol	0.11	0.14	0.07	0.10	0.00	0.00
Non-aerosol	0.57	0.81	0.48	0.67	0.00	0.00
Dusting Aid						
Aerosol	2.25	4.27	1.45	2.68	0.00	0.00
Non-aerosol	2.63	5.21	2.62	5.12	0.00	0.00
Fabric Protectant (non-aerosol)	2.10	3.79	0.74	1.38	0.00	0.00
Fabric Softener (single use dryer product)	0.43	0.86	0.43	0.86	0.00	0.00
Floor Maintenance Product (Spray Buff)	7.93	14.85	7.47	14.19	0.00	0.00
Floor Polish or Wax (Wood Floor Wax)	1.14	2.02	1.41	2.65	0.27	0.63
Glass Cleaner (aerosol)	0.11	0.15	0.09	0.13	0.00	0.00

Table VII-7. Estimated Impacts to Raw Materials Cost Per Unit

Table VII-7
Estimated Impacts to Raw Materials Cost Per Unit (continued)

Table VII-7. Estimated Impacts to Raw Materials Cost Per Unit (continued)

Category	Estimated Raw Material Costs, $/Unit of Product				Cost Difference from	
	Baseline Pre-Regulatory		Compliant		to Low	to High
	Low (A0)	High (B0)	Low (A1)	High (B1)	(A1)-(A0)	(B1)-(B0)
Household Care						
Multi-Purpose Lubricant						
Aerosol - Tier 1	0.29	0.43	0.29	0.42	0.00	0.00
Aerosol - Tier 2	0.29	0.42	0.26	0.36	0.00	0.00
Non-aerosol - Tier 1	3.62	5.10	3.68	4.94	0.00	0.06
Non-aerosol - Tier 2	3.68	4.94	3.72	4.86	0.00	0.04
Odor Remover/Eliminator (non-aerosol)	2.09	3.47	1.56	2.51	0.00	0.00
Penetrant						
Aerosol	0.45	0.66	0.41	0.56	0.00	0.00
Non-aerosol	3.97	5.26	3.96	5.07	0.00	0.00
Pressurized Gas Duster	1.25	2.19	1.12	1.14	0.00	0.00
Spot Remover						
Aerosol	0.32	0.44	0.24	0.33	0.00	0.00
Non-aerosol	0.76	1.21	0.63	0.89	0.00	0.00
Personal Care						
Astringent/Toner (Non-FDA regulated)	0.13	0.16	0.12	0.15	0.00	0.00
Personal Fragrance Product						
Aerosol	0.20	0.39	0.20	0.39	0.00	0.00
Non-aerosol	0.25	0.50	0.24	0.49	0.00	0.00
					Min Increase	0.00
					Max Increase	0.63

Table VII-8 shows a comparison of the impacts to raw materials cost under the proposed limits relative to those of other ARB consumer product regulations.

Table VII-8
Comparison of Raw Materials Cost Impacts for the Proposed Limits and Other ARB Consumer Product Regulations (unadjusted dollars)

Regulation	Cost Impacts (Dollars per Unit of Product)
2008 Amendments	$0.00 to $0.63
2006 Amendments[1]	$0.00 to $0.44
2004 Amendments[2]	$0.00 to $0.77
Mid-Term Measures II[3]	$0.00 to $0.25
Aerosol Adhesives[4]	$0.00 to $0.60
Architectural and Industrial Maintenance Coatings[5]	$0.00 to $4.40

1. (ARB, 2006a)
2. (ARB, 2004b)
3. (ARB, 1999)
4. (ARB, 2000c)
5. Suggested Control Measure, developed with the California Air Pollution Control Officers Association (ARB, 2007i)

G. ANALYSIS OF THE COMBINED IMPACTS ON PER-UNIT COST FROM RECURRING AND NONRECURRING COSTS

1. Introduction

In this analysis, we evaluated the combined impacts of both recurring (i.e., raw materials costs) and nonrecurring costs from the proposed limits on per-unit costs. Although the raw material costs generally constitute the major portion of the compliance costs, in some categories, the nonrecurring (fixed) cost was the major contributor. In performing this analysis, we used the fixed costs, raw material costs, assumptions, and other facts discussed previously.

2. Methodology

Nonrecurring Costs

Historically, staff has considered a variety of costs in its calculations to determine the costs of complying with proposed VOC limits affecting consumer products. In the 1991 Phase II Consumer Products Rulemaking, staff developed a methodology to determine nonrecurring reformulation costs (non-raw material costs) for proposed VOC limits. These costs were broken down by each process needed for reformulation to occur (ARB, 1991a). It was subsequently determined through a thorough cost analysis

of the reformulations that was done to comply with the 55 percent by weight VOC limit for hairspray, that these costs were overestimated by a factor of 10. It was widely believed that the 55 percent by weight VOC limit for hairspray represented the most aggressive, challenging, and expensive reformulation that had been required by the Consumer Products Regulations. Therefore, subsequent cost analyses grew the factors by the Chemical Engineering Plant Cost Index then divided these reformulation factors by 10 (see Section C, Equation (4)).

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, a test of "reasonableness" was applied to determine if this was a likely approach to take or if the event had a high probability of occurring. Results were also compared to data provided by other agencies and industry to verify that the numbers are "reasonable." Significant input regarding reformulation costs have been provided by industry representatives. In all cases, 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.

To estimate nonrecurring cost numbers, the staff considered two cost estimate approaches for each product category, one for low cost, and one for high cost, with a different set of assumptions for each approach. To further refine the analyses, the product categories proposed for regulation were grouped under "adhesives," "automotive," "household care," and "personal care" to better reflect the impact on each category.

3. Approach

For a systematic approach to the cost analysis, the entire time from 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. 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.

After the personnel costs were determined, 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 putting it on the market.

4. Assumptions

The 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. In reviewing the 2003 Survey, staff found that many of the products which would technically be noncomplying are within a couple of percentage points of VOC weight from being in compliance with the standard. These products may require only minor modification to their current formulation 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 noncomplying products. In many cases, relatively low costs would be incurred where these companies could increase sales and distribution of complying products and discontinue noncomplying 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.

For the high cost approach, each category was analyzed individually to determine which of the elements, discussed above, 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 (Tire or Wheel Cleaner, Motor Vehicle Wash).

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, with household products 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.

Therefore, staff has considered only nonrecurring costs that are likely to occur on a per category basis. 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.

5. Results

As shown in Table VII-9, the combined fixed and raw material cost changes to per-unit production costs ranged from no cost increase (net savings or no cost for various categories) to about $2.05 per unit (for 1 gallon of non-aerosol Penetrant). Averaged over all of the noncomplying products affected by the proposed limits and other requirements, the product-weighted average cost increase is about $0.20 per unit.

H. OTHER POSSIBLE ECONOMIC IMPACTS FROM PROPOSED AMENDMENTS

Beyond the VOC and GHG 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.

Some products that do not need to reformulate, because they already comply with the VOC limits, may need to relabel because of other proposed changes to the regulation.

Table VII-9
Estimated Per-Unit Cost Increases from Both Annualized Nonrecurring and Annual Recurring Costs

Table VII-9. Estimated Per-Unit Cost Increases from Both Annualized Non-Recurring and Annual Recurring Costs

Category	Sales-Wtd Average VOC Content, %	Estimated VOC Emissions, tons/day	Typical Unit Weight Ounces	Complying Market Share	Estimated Non-complying Unit Sales Per Day in Calif.	Estimated Per Unit Production Cost Increase						Total Increase
						Annualized Nonrecurring Low Cost/Unit	Annualized Nonrecurring High Cost/Unit	Annual Recurring Low Cost/Unit	Annual Recurring High Cost/Unit	Total Increase Low/Unit	Total Increase High/Unit	Total Increase Mid/Unit
	(A)	(B)	(C)		(D)	(E1)	(E2)	(F1)	(F2)	G1=(E1+F1)	G2=(E2 + F2)	(G1+G2)/2
Adhesives												
Chemically Curing Sealant or Caulking	7	1.88	13.5	22.5	49,338	$0.00	$0.00	0.03	0.05	$0.03	$0.05	$0.04
Non-chemically Curing Sealant or Caulking	2	0.67	13.5	76.3	18,820	$0.00	$0.02	0.00	0.00	$0.00	$0.02	$0.01
Automotive												
Motor Vehicle Wash	1	0.38	64.0	89.0	2,090	$0.02	$0.02	0.00	0.00	$0.02	$0.02	$0.02
Windshield Water Repellant	86	0.23	16.0	***	503	$0.03	$0.03	0.00	0.00	$0.03	$0.03	$0.03
Tire or Wheel Cleaner												
Aerosol	8	0.01	12.0	***	53	$0.06	$0.06	0.00	0.00	$0.06	$0.06	$0.06
Non-aerosol	2	0.13	16.0	69.0	4,030	$0.01	$0.01	0.00	0.00	$0.01	$0.01	$0.01
Household Care												
Carpet/Upholstery Cleaner												
Aerosol	7	0.32	18.0	10.0	7,314	$0.01	$0.04	0.00	0.00	$0.01	$0.04	$0.03
Non-aerosol	3	0.29	138.0	25.0	1,881	$0.04	$0.09	0.00	0.00	$0.04	$0.09	$0.06
Dusting Aid												
Aerosol	23	0.27	17.0	5.3	2,093	$0.01	$0.02	0.00	0.00	$0.01	$0.02	$0.02
Non-aerosol	2	0.01	33.0	74.0	126	$0.07	$0.12	0.00	0.00	$0.07	$0.12	$0.09
Fabric Protectant (non-aerosol)	5	0.18	138.0	95.0	42	$0.47	$0.75	0.00	0.00	$0.47	$0.75	$0.61
Fabric Softener (single use dryer product)	4	0.52	2.0	24.0	158,080	$0.00	$0.00	0.27	0.63	$0.27	$0.63	$0.45
Floor Maintenance Product (Spray Buff)	5	0.11	132.0	53.4	248	$0.16	$0.25	0.00	0.00	$0.16	$0.25	$0.20
Floor Polish or Wax (Wood Floor Wax)	82	0.06	16.0	***	136	$0.04	$0.15	0.00	0.00	$0.04	$0.15	$0.10
Glass Cleaner (aerosol)	11	0.33	16.0	37.0	3,780	$0.02	$0.05	0.00	0.00	$0.02	$0.05	$0.03
Multi-Purpose Lubricant												
Aerosol - Tier 1	48	3.19	8.0	2.8	25,839	$0.00	$0.04	0.00	0.00	$0.00	$0.04	$0.02
Aerosol - Tier 2	25	1.84	8.0	1.7	28,940	$0.00	$0.02	0.00	0.00	$0.00	$0.02	$0.01
Non-aerosol - Tier 1	48	1.31	110.0	5.9	747	$0.02	$0.20	0.00	0.06	$0.02	$0.26	$0.14
Non-aerosol - Tier 2	25	0.76	110.0	5.9	832	$0.01	$0.05	0.00	0.04	$0.01	$0.09	$0.05
Odor Remover/Eliminator (non-aerosol)	2.2	0.12	130.0	82.2	239	$0.06	$0.42	0.00	0.00	$0.06	$0.42	$0.24
Penetrant												
Aerosol	41	0.34	12.0	28.0	1,592	$0.02	$0.27	0.00	0.00	$0.02	$0.27	$0.14
Non-aerosol	25	0.06	110.0	36.0	45	$0.13	$2.05	0.00	0.00	$0.13	$2.05	$1.09
Pressurized Gas Duster	300*	1014**	10.0	86.0	1,967	$0.03	$0.09	0.00	0.00	$0.03	$0.09	$0.06
Spot Remover												
Aerosol	22	0.76	18.0	4.0	5,896	$0.01	$0.05	0.00	0.00	$0.01	$0.05	$0.03
Non-aerosol	2	0.29	138.0	94.0	202	$0.61	$1.59	0.00	0.00	$0.61	$1.59	$1.10
Personal Care												
Astringent/Toner (Non-FDA regulated)	21	0.62	8.0	70.0	3,543	$0.01	$0.02	0.00	0.00	$0.01	$0.02	$0.01
Personal Fragrance Product												
Aerosol	81	0.16	3.5	35.0	1,174	$0.01	$0.01	0.00	0.00	$0.01	$0.01	$0.01
Non-aerosol	81	10.73	3.5	37.0	76,302	$0.00	$0.01	0.00	0.00	$0.00	$0.01	$0.01

*GWP

** Metric tons CO_2 e per day.

***Omitted to protect confidentiality.

We expect that businesses will benefit economically from the exemption of HFE 7200 from the definition of VOC, because it could offer more formulation flexibility.

There may be minimal reformulation costs incurred by those very few companies that use chlorinated solvents in those categories for which staff has proposed to prohibit the toxic compounds.

I. 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 specified in section 94509, 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 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 "overcomply" with some reformulations in order to offset the "undercompliance" 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, three manufacturers have implemented approved ACP averaging programs, reducing VOC emissions by about 4.9 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 their 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. It should be noted that because the IPP and ACP provisions apply to VOC only, manufacturers of Pressurized Gas Dusters would not have the opportunity to use the provisions to address GWP limits.

According to previous staff 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 the proposed limits in the ACP regulation may increase the level of competition for some products and may 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 compounds (VOC) and air toxic emissions. The amendments would also reduce the use of greenhouse gas (GHG) compounds with high global warming potential (GWP) used in consumer products.

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 and reduce exposure to ground-level ozone and air toxics. No significant adverse impacts were identified. However, several measures are proposed to mitigate the potential for adverse impacts to occur. In making these determinations, we evaluated how the proposed amendments would impact ground-level ozone concentrations, particulate matter (particularly secondary organic aerosols), climate change, stratospheric ozone depletion, air toxic emission exposure, water quality, solid waste, and energy use.

Staff has conducted a qualitative health risk assessment that concludes that because VOCs are ozone precursors, public health is further protected by reducing VOC emissions. Staff has also determined that ambient air and personal exposures to perchloroethylene (Perc), methylene chloride (MeCl), and trichloroethylene (TCE) will be reduced by prohibiting the use of these chlorinated toxic air contaminants (TAC).

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.

A. LEGAL REQUIREMENTS APPLICABLE TO THE ANALYSIS

The 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. Before we present our analysis of the environmental impacts, for ease of the reader the proposed amendments are summarized in Part B.

B. SUMMARY OF PROPOSED AMENDMENTS

1. Proposed VOC Standards

Staff is proposing to establish new or lower VOC limits for multiple categories. These limits would reduce VOC emissions by about 5.8 tons per day when fully effective. The proposed amendments to reduce VOC emissions would partially fulfill the consumer product reduction commitment contained in the 2007 Strategy to meet the federal ozone standard.

2. Proposed Greenhouse Gas Measure

We are proposing an amendment to reduce the use of GHG with high GWP in Pressurized Gas Duster products. Pressurized Gas Duster products would not be allowed to contain a compound that has a GWP of 150 or greater. This proposal would essentially eliminate use of hydrofluorocarbon (HFC) 134a in this category. In 2010, we anticipate that this measure would achieve a reduction equivalent to reducing of 0.20 million metric tons of carbon dioxide (CO_2) per year.

To ensure that the VOC content of these products does not increase as a result of reformulation to meet the GWP limit, a 1 percent by weight, including fragrance, VOC limit is also being proposed for Pressurized Gas Duster products. To mitigate potential exposure to air toxics, we are also proposing to prohibit use of MeCl and Perc in this category.

3. Proposed VOC Exemption

Staff is proposing that the definition of VOC be modified to exclude two isomers of hydrofluoroether (HFE) 7200. In a report titled "Environmental Impact Assessment of Selected Halogenated Chemicals," (ARB, 2008b) ARB staff determined that use of HFE-7200 has negligible impacts on ground-level ozone formation. Staff believes that exemption of this negligibly reactive compound would provide additional reformulation flexibility.

4. Proposed Toxics Prohibition

Staff is also proposing a measure to reduce emissions of three TACs in the categories proposed for VOC regulation where they are, or could potentially, be used. The proposed prohibition on the use of Perc, MeCl, and TCE in six categories would result in a reduction of about 0.20 tons per day when fully effective.

5. Proposed Definitions and Clarifying Language

Staff is also proposing additional language modifications. These modifications include clarifying language for the product date coding requirement, requirements for dilutable products sold in pump spray containers, toxic compound prohibitions, and additional requirements for categories such as Fabric Softener – Single Use Dryer Product, Personal Fragrance Product with 20 percent or less fragrance, and Sealant or Caulking Compound. Other proposals include the correction of a drafting error in the Table of Standards regarding Furniture Maintenance Product. The long-standing exemption for solid/paste wax forms would be reinstated.

C. SUMMARY OF IMPACTS ON ATMOSPHERIC PROCESSES

In this section, we evaluate the impacts on atmospheric processes. The evaluation includes our assessment on whether the proposed amendments would have a positive, negative, or no impact 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 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 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, of this Technical Support Document.

a. Proposed VOC Standards

The proposed amendments are designed to reduce VOC emissions by about 5.8 tons per day when fully effective. Reducing these ozone precursor emissions will result in a positive environmental impact by lowering the concentrations of ground-level ozone in the atmosphere. If we assume that the average ozone forming potential of consumer product VOC emissions is about 1.50 pounds of ozone per pound of VOC emitted (based on the maximum incremental reactivity (MIR) scale, see title 17, CCR, sections 94700-94701), then we would predict the resulting ozone reductions would be about 9 tons per day. The categories proposed for regulation and the corresponding VOC emission reductions are shown in Table VIII-1.

b. Proposed Greenhouse Gas Measure

The proposed GHG measure would have no impact on ground-level ozone concentrations. This is because the proposal essentially requires replacing HFC-134a with HFC-152a. Both HFC-134a and HFC-152a are excluded from the definition of VOC due to negligible photochemical reactivity with respect to ozone. However, to ensure VOC emissions do not increase, as a mitigation measure, staff is proposing to set a 1 percent by weight VOC limit to prevent VOC increases as products reformulate.

c. Proposed VOC Exemption

The exemption of HFE-7200 will likely have a positive impact on ground-level ozone concentrations. Whenever this negligibly reactive compound replaces more reactive VOCs the result will be a reduction in ground-level ozone concentrations. Replacing HFE-7200 for similarly unreactive compounds, such as MeCl, Perc, and hydrochlorofluorocarbon (HCFC) 141b, should have no impact on ground-level ozone concentrations.

d. Proposed Toxics Prohibition

In accordance with CEQA, we are proposing a mitigation measure to ensure that emissions of Perc, MeCl, and TCE do not increase when products are reformulated. As such, we are proposing to prohibit the use of these TACs in Carpet/Upholstery Cleaners; Fabric Protectants; Multi-Purpose Lubricants; Penetrants; Sealant or Caulking Compounds; and Spot Removers. The prohibition of these three solvents is necessary, particularly for MeCl and Perc because they are also exempt VOCs. However, this proposal to prohibit the use of Perc, MeCl, and TCE in these six categories could result in a slight increase in VOC emissions. Products containing these TACs may have to reformulate using VOC solvents. Staff, therefore, evaluated the potential for VOC emission increases resulting from this proposal.

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

Product Category		Product Form	Proposed VOC Limit (percent by weight)	2008 VOC Emissions* (tons per day)	Reductions at Effective Date (tons per day)
Astringent/Toner (non-FDA regulated)[a]		All	35	0.62	0.11
Carpet/Upholstery Cleaner[a]		Aerosol	5	0.32	0.07
		Non-aerosol	1	0.29	0.07
Dusting Aid[a]		Aerosol	17	0.27	0.08
		Non-aerosol	3	0.01	0.00
Fabric Protectant[a]		Non-aerosol	1	0.18	0.08
Fabric Softener – Single Use Dryer Product[a]		All	0.05 grams per use**	0.52	0.21
Floor Maintenance Product[a]		All	1	0.11	0.07
Floor Polish or Wax – Wood Floor Wax[a]		All	70	0.06	0.01
Glass Cleaner[b]		Aerosol	10	0.33	0.03
Motor Vehicle Wash[a]		All	0.2	0.38	0.14
Multi-purpose Lubricant – excluding solid & semisolid[c/e]		All	25[c]	4.08	2.04
			10[e]		1.27
Odor Remover/Eliminator[a]		Aerosol	25	***	0.00
		Non-aerosol	6	0.12	0.03
Penetrant[c]		All	25	0.40	0.15
Personal Fragrance Product (products with 20% or less fragrance)[d]		All	75+	10.89	0.41
Pressurized Gas Duster[a]		All	1	0	0
Sealant or Caulking Compound	Chemically Curing[b]	Non-aerosol	3	1.9	0.22
	Non-Chemically Curing[a]	Non-aerosol	1.5	0.68	0.12
Spot Remover[a]		Aerosol	15	0.76	0.24
		Non-aerosol	3	0.29	0.05
Tire or Wheel Cleaner[a]		Aerosol	8	0.01	0.00
		Non-aerosol	2	0.14	0.06
Windshield Water Repellent[a]		All	75	0.23	0.04
Total Emissions 2008		**22.61 tons per day**			
Total Reductions 2015		**5.76 tons per day**			

* Survey emissions adjusted for market coverage, and grown to the 2008 calendar year
** Grams per use limit provides emissions reductions equivalent to 2.6% VOC limit, including fragrance
*** Omitted to protect confidentiality
\+ Remove "Grandfather" clauses

Effective Dates:
a: 12/31/2010
b: 12/31/2012
c: 12/31/2013
d: 12/31/2014
e: 12/31/2015

The emissions of chlorinated solvents in these categories is about 0.20 tons per day. If we assume that these solvents are replaced one-to-one with VOC solvents, then the increase in VOC emissions would be no more than 0.20 tons per day. We expect VOC increases will be less because other reformulation options are available. Note, however, that TCE is a VOC. This is a neutral impact because VOC would replace VOC. Although no aerosol or non-aerosol Fabric Protectant products currently contain any of these chlorinated solvents, this category is included in the proposed prohibition to prevent use in reformulations. The 5.8 tons per day VOC reduction already accounts for the increase of VOC emissions due to the toxics prohibition proposal. Staff believes the potential slight increase in VOC emissions is out-weighed by the benefit of reducing exposure to these probable human carcinogens.

e. Proposed Definitions and Clarifying Language

We expect no impact or a slight benefit on ground-level ozone concentrations resulting from the proposed changes to definitions and language change proposals. Currently, the Consumer Products Regulation states that any product that is designed to be diluted prior to use is subject to the VOC limits after the product has been diluted. Staff has become aware of products packaged in pump spray containers that appear to be marketed as "ready-to-use" products, but are designed to be diluted by the consumer prior to use. Staff believes this approach to packaging may be diminishing VOC reductions, and is a potential circumvention of the intent of the regulation.

Therefore, the proposal to apply the VOC limit for dilutable products sold in pump spray containers, prior to the minimum recommended dilution, could provide a slight benefit. It is likely these products are used undiluted, resulting in higher VOC emissions than allowed by the VOC limit. The other language changes add clarity and do not impact emissions.

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 ozone formation and SOA formation of a VOC. Because of this relationship, the proposed amendments may also affect the SOA formation potential of consumer products. The analysis of the impact on SOA formation resulting from implementing the proposed VOC limits 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. Proposed VOC Standards

The analysis of the potential impact on PM formation from the proposed VOC limits assumes that to meet the proposed limits will require replacing 5.8 tons per day of VOCs for 5.8 tons per day of non-VOC ingredients or exempt VOCs. To meet the proposed VOC limits, manufacturers generally have five reformulation options: use of exempt VOCs, such as acetone or methyl acetate; use of LVP-VOC solvents; use of water; increasing 'solids' content; or use of non-VOC propellants. Substitution for VOCs with water, higher solids content, or non-VOC propellants would likely result in a small reduction in SOA formation. The most 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.

To the extent manufacturers may reduce overall VOC content but formulate with stronger solvents could result in increased SOA formation. This is because the commonly used stronger solvents are aromatic compounds, such as xylenes and toluene, which are known to have higher SOA potentials than other commonly used VOCs. On the other hand, if product reformulation involves the substitution of an aromatic by a non-aromatic species, the SOA formation potential of the product is likely to be reduced. If VOC aromatics are replaced with LVP-VOC aromatic compounds, a decrease in SOA potential should also occur. However, substitution of LVP-VOC

alkane or aromatic compounds for smaller low molecular weight alkanes could result in a slight SOA increase (Grosjean, 1992).

Because we can not predict how manufacturers will choose to reformulate, we can not fully evaluate the potential for increased 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 will not be a significant adverse impact. Additionally, any reformulations that result in increased SOA would likely be offset by reformulations resulting in lower SOA. We will continue to monitor implementation of the regulation and reassess the impacts as more data become available.

b. Proposed Greenhouse Gas Measure

Because this proposal essentially requires the replacement of one compound for another – each with two carbon atoms – we expect the proposal to have no impact on $PM_{2.5}$ concentrations or SOA.

c. Proposed VOC Exemption

As mentioned above, SOA is generally formed from oxidation of compounds with six or more carbon atoms. We do not expect HFE-7200 to increase SOA concentrations because HFE-7200 is comprised of two isomers, each with four carbon atoms.

d. Proposed Toxics Prohibition

The proposal to prohibit TACs in six categories should have no or negligible impacts on SOA formation because replacements for these TACs (alkanes or exempt compounds) are not known to have strong SOA formation potentials. Prohibiting use of Perc and MeCl in Pressurized Gas Duster products also should have no impact.

e. Proposed Definitions and Clarifying Language

Because proposed language changes and definitions generally only clarify or provide descriptions, we expect no impact on $PM_{2.5}$ or SOA.

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 CO_2 is the largest contributor to radiative forcing, methane, halocarbon, 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 CH_4, 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. VOCs, CO_2, HFCs, HFEs, and HCFCs 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, 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 of VOCs is, however, still poorly quantified and requires the use of global three-dimensional chemical transport models.

Even though VOCs have direct effects, they are considered as GHGs 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. A further narrative on climate change and expected impacts is included in Chapter IV of this Technical Support Document.

a. Proposed VOC Standards

As just described, VOCs are considered GHGs because of their role in 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 reduce consumer product's impacts on climate change. While we expect an overall positive impact, two reformulation options may lead to very slight increases in GHG emissions. These are discussed below.

To meet the proposed VOC limits to a limited extent, CO_2 may replace hydrocarbon propellants in some products. The 2003 Survey data indicate that CO_2 is already used in certain consumer products considered for regulation, including Multi-Purpose Lubricants, and Penetrants. In these categories, CO_2 use is likely to increase as manufacturers reformulate to meet the lower proposed VOC limits. In other categories with aerosol product forms, CO_2 may also be a reformulation pathway. Even though CO_2 has a direct effect on climate change, co-benefits are expected to the extent that CO_2 replaces VOC propellants in consumer products. Specifically, less ozone and methane will be formed, thus lowering the population's exposure to a pollutant with serious health effects. Further, the contribution of CO_2 to global warming is likely less than that of the VOC being replaced. In addition, most CO_2 used as a propellant is a recycled by-product of existing processes and, therefore, does not increase global warming from a lifecycle standpoint (ARB, 1999).

Another reformulation path for some aerosol product manufacturers may be to replace some or all the typical hydrocarbon propellants with HFC-152a or HFC-134a. These compounds are exempt VOCs. We do not predict increased usage of HFC-134a due to its higher GWP, and because its use is not recommended except in certain specific uses. In consumer products, HFC-134a is generally used when flammability is a concern.

Staff believes that for the Spot Remover category under consideration for regulation, HFC-152a may be a potential reformulation option. If all VOC propellants in these categories were replaced with HFC-152a, total emissions of HFC-152a would be 0.17 tons per day. This represents a worst-case scenario. Staff believes usage would be considerably less because of raw material cost and because other reformulation options are available.

Also, when cost considerations are factored in (HFC-152a is about $1.80 per pound, HFC-134a is $3.50 versus VOC propellants at $1.00 per pound), it is anticipated that manufacturers will use as little HFC-152a as possible, or none at all, when reformulating their aerosol products. ARB staff does not expect the price of HFCs to change appreciably in the near future, thus a significant increase in use is not anticipated.

Based on the foregoing, while there is a slight potential for a very small increase in the emissions of HFC-152a, the proposed VOC limits will likely more than offset this impact by reducing concentrations of ground-level ozone.

b. Proposed Greenhouse Gas Measure

The proposal to reduce the use of compounds with high GWP in Pressurized Gas Dusters will have an overall beneficial impact on climate change. As proposed, the GWP limit for Pressurized Gas Dusters would require products using HFC-134a to reformulate with HFC-152a. This reformulation would be equivalent to reducing 0.20 MMT CO_2 per year, effective December 31, 2010.

c. Proposed VOC Exemption

HFE-7200 is a solvent proposed for exemption from the VOC definition based on its photochemical reactivity. It has a relatively low GWP of 59 based on the FAR values. Its main use is in precision cleaning, and its use will likely be limited to applications where HCFC-141b is, or has been, used. Because it is a stratospheric ozone depleting compound, HCFC-141b production is no longer allowed. However, use of existing stockpiles is allowed. In addition to depleting stratospheric ozone concentrations, HCFC-141b is also a fairly potent global warming compound with a FAR GWP value of 725. HFE-7200 is purported as an all or partial replacement for HCFC-141b in that it provides mild cleaning ability and reduces flammability. In the short-term, to the extent HFE-7200 is used to replace HCFC-141b, a reduction in the potency of GHG emissions is expected. This is a direct emission benefit related to

climate change. To the extent HFE-7200 replaces VOCs in various consumer product categories, there will be a small increase in direct GHG emissions. This will likely be offset by the indirect benefit of reduced ground-level ozone concentrations.

A longer term potential benefit may also be expected. Precision cleaning products where flammability is a concern generally rely on use of the propellant HFC-134a, a potent global warming gas. Because of the ability to reduce flammability, as well as its solubility with CO_2, in the future, it is possible that use of HFE-7200 in combination with CO_2 as a propellant, could lead to further limiting the use of HFC-134a (Werner, 2008).

d. Proposed Toxics Prohibition

The prohibition on the use of Perc, MeCl, and TCE will likely have a negligible to positive impact on GHG emissions. If VOCs are used to replace these TACs, because VOCs play a role in both direct and indirect impacts on global warming, this would lead to a very slight increase in global warming emissions. We believe the reduced exposure to these TACs out-weighs this potential increase.

e. Proposed Definitions and Clarifying Language

Clarifying language and proposed definition changes should have no impact on global warming.

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), hydrochlorofluorocarbons (HCFCs), and 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 create 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 part 40, Code of Federal Regulations, 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 VOCs will have 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.

b. Proposed Greenhouse Gas Measure

The proposed GHG measure will have no impact on stratospheric ozone depletion. Neither HFC-134a nor HFC-152a contribute to stratospheric ozone depletion. This is mainly because these compounds do not contain chlorine. Therefore, substituting HFC-152a for HFC-134a in Pressurized Gas Dusters has no impact. Additionally, these compounds have relatively short atmospheric lifetimes. Both compounds contain hydrogen which makes them susceptible to hydroxyl radical attack in the troposphere.

c. Proposed VOC Exemption

Use of HFE-7200 would be a positive impact if it replaces HCFC-141b, a known stratospheric ozone depleting compound. HFE-7200 itself is not an ozone depleting compound because it does not contain chlorine. In addition, because the compound contains hydrogen it may be susceptible to hydroxyl radical attack in the troposphere.

d. Proposed Toxics Prohibition

The proposed prohibition on the use of Perc, MeCl, and TCE will likely have a negligible impact on stratospheric ozone depletion. In order to comply with this prohibition, VOCs may replace these TACs in reformulated products. If this occurs, VOCs are not stratospheric ozone depleting compounds. Additionally, manufacturers are precluded from reformulating with stratospheric ozone depleting compounds because provisions in the regulation already prohibit use of various stratospheric ozone depleting compounds (94509(e)).

e. Proposed Definitions and Clarifying Language

Clarifying language and proposed definition changes will 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 virtue of the containers and the towelettes or "wipes" used to deliver the product. Therefore, we evaluated the potential impacts of the proposed amendments on the solid waste stream.

a. Proposed VOC Standards

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. We also designed the VOC limit for Fabric Softener – Single Use Dryer Product so that the waste stream will not be adversely impacted by increasing sheet size to comply. To mitigate the potential for solid waste impacts from this category, staff is proposing a VOC standard based on grams of VOC per use (typically a single dryer sheet per load), as opposed to a percent by weight VOC limit.

It has been suggested that end-use consumers of Fabric Softeners – Single Use Dryer Products may begin using more than a single dryer sheet per load of laundry. The contention is that the reformulated dryer sheet products will be perceived to be inadequate, because of the reductions in fragrance. No data were provided to support this claim. Moreover, this suggestion implies that the consumer will essentially begin doubling the cost per load of clothes dried. This is highly unlikely. Absent data, staff has determined this potential increased use to be unfounded. It has also been suggested that the end-use consumers will switch use to liquid products which are packaged in bulkier plastic containers. Again, no data were provided to support this claim. However, we intend to monitor product sales trends through periodic surveys, as is always done, to ensure that unintended consequences of establishing the proposed VOC limit do not occur.

b. Proposed Greenhouse Gas Measure

We expect that the GHG proposal could result in reducing the solid waste stream. This is because data show that Pressurized Gas Duster products that use HFC-152a typically get more uses per can than products that use HFC-134a (Dupont & Falcon, 2004). We also note that no significant changes in packaging will be needed to reformulate with HFC-152a.

c. Proposed VOC Exemption

The proposed VOC exemption should have no solid waste impacts because we expect HFE-7200 to replace VOCs on a one-to-one basis. No new or additional packaging should be needed.

d. Proposed Toxics Prohibition

The proposed TAC prohibition should have no impact because the compounds used to replace Perc, MeCl, and TCE (VOCs or exempt compounds) require no different packaging, or additional packaging.

e. Proposed Definitions and Clarifying Language

By specifying that VOC content be determined prior to the minimum dilution, for products intended for dilution, but sold in ready-to-use pump sprays should reduce the amount of solid waste. If products are used as is, without making the dilution, the number of uses per container would be greatly reduced, compared to if the product were properly diluted. The overall result, without this provision, would be that more containers would be landfilled.

2. Impacts of Proposed Amendments on Water Quality

Because of how consumer products are used 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. As products reformulate 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. If exempt compounds replace VOCs in reformulated products, there should be no impact. This is because as far as water chemistry is concerned, VOCs and VOC exempt compounds are similar compounds. It is also true that many VOCs are biodegraded as they pass through the waste water stream.

b. Proposed Greenhouse Gas Measure

The proposal to reduce the use of compounds with high GWP in Pressurized Gas Duster products will have no impact on water quality. Both HFC-134a and HFC-152a have an air fate and are not likely to enter the water.

c. Proposed VOC Exemption

Use of HFE-7200 is expected to have no impact or a slightly beneficial impact on water quality. HFE-7200 is volatile, and based on its intended use, emissions have an air fate. However, there may be a slight benefit to sanitation districts resulting from the potential decrease in the amount of chlorinated solvents reaching water treatment facilities if HFE-7200 is used in place of Perc, MeCl, or TCE in products (ARB, 2008b).

d. Proposed Toxics Prohibition

Current use of Perc, MeCl, and TCE in Carpet/Upholstery Cleaner; Fabric Protectant; Multi-Purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover is not expected to have an impact on water quality. This is because as used, these solvents have an air fate. However, the proposed prohibition of Perc, MeCl, and TCE from these six categories may prevent an increase in the amount of chlorinated solvents reaching storm drains, and waste water treatment plants if these products are misused or improperly discarded. As a result of this proposal, TAC emissions will be reduced by about 0.20 tons per day in 2010.

e. Proposed Definitions and Clarifying Language

Because the proposed language changes and definitions generally only clarify or provide descriptions, we expect no impacts on water quality.

3. Impacts of Proposed Amendments on Energy

We do not expect the proposed amendments to result in an increase in energy use because production and shipment of the reformulated products will be similar to existing products.

It has been suggested that end-use consumers of Fabric Softeners – Single Use Dryer Products may shift use to liquid products. The contention is that the reformulated dryer sheet products will be perceived to be inadequate, related to potential reductions in fragrance. If this were to occur, fuel usage could increase as products are transported, due to the weight differential between Fabric Softeners – Single Use Dryer Products and liquid products. No data were provided to support this claim. Absent data, we believe the concern with this potential switch is unfounded. Moreover, other data show that consumers favor the use of Fabric Softeners – Single Use Dryer Products (SDA, 2006a). However, we intend to monitor product sales trends through periodic surveys, as is always done, to ensure that unintended consequences of establishing the proposed VOC limit do not occur.

E. ANALYSIS OF REASONABLY FORESEEABLE MITIGATION MEASURES

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 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.

We also found that the GHG measure could result in increased VOC emissions as products are reformulated to comply with the GWP limit. A mitigation measure is proposed to address this potential.

In evaluating proposed VOC reduction opportunities for Fabric Softener – Single Use Dryer Product we considered, as is typically done, a percent by weight VOC limit. However, we determined using this approach could result in simply increasing the sheet size to comply. Therefore, the gram of VOC per use limit is designed as a mitigation measure to address this potential impact on the solid waste stream.

1. Proposed Mitigation Measure Related to Establishing VOC Limits

Staff believes that specific mitigation measures are necessary to restrict the use of three chlorinated solvents, Perc, MeCl, and TCE because of their potential to cause cancer. Two of these TACs used in some consumer products, MeCl, and Perc, are specifically exempted from the VOC definition (section 94508 of the Regulation) in recognition of their very low ozone-forming capability. Thus, the potential exists that to meet VOC limits, manufacturers could reformulate using these exempt VOC TACs leading to an adverse impact. Trichloroethylene is regulated as a VOC, such that its use should not increase as products reformulate to meet VOC limits. However, because it is a probable human carcinogen, we are proposing a specific mitigation measure to address its use. Below, we provide some general information on toxicity, and the usage of Perc, MeCl, and TCE. Further information on these chemicals is

included in "The Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation," released September 29, 2006.

Presented in Table VIII-2 are pollutant-specific health effects values developed for Perc, MeCl, and TCE to characterize the relationship between a person's exposure to these TACs and the incidence or occurrence of an adverse health effect. Unit risk factors (URF), cancer potency factors, and reference exposure levels (RELs) are shown in Table VIII-2. Also included in Table VIII-2 are the non-cancer acute and chronic toxicological endpoints for Perc, MeCl, and TCE.

Table VIII-2
Pollutant-Specific Health Effects Values Used for Determining Potential Health Impacts [1]

Compound	Cancer Unit Risk Factor $(\mu g/m^3)^{-1}$	Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Non-cancer Reference Exposure Levels ($\mu g/m^3$)		Toxicological Endpoints	
			Acute	Chronic	Acute	Chronic
Perchloroethylene (Perc)	5.9 E-6	2.1 E-02	20,000	35	central nervous system; eye & respiratory irritation	kidney; alimentary system (liver)
Methylene Chloride (MeCl)	1.0 E-6	3.5 E-03	14,000	400	central nervous system	cardiovascular system; nervous system;
Trichloroethylene (TCE)	2.0 E-6	7.0 E-03	None	600	none	nervous system; eyes

[1] Health effects values and toxicological endpoints were obtained from the following three sources: (OEHHA, 2005a; OEHHA, 2005b; OEHHA, 2000)

A URF is defined as the estimated upper-confidence limit (usually 95 percent) probability of a person contracting cancer as a result of constant exposure to a concentration of $1 \mu g/m^3$ over a 70-year lifetime. In other words, using the URF for Perc as an example, which is 5.9×10^{-6} (microgram per cubic meter)$^{-1}$ or $(\mu g/m^3)^{-1}$, the potential excess cancer risk for a person continuously exposed over a 70-year lifetime to $1 \mu g/m^3$ of Perc is estimated to be no greater than 5.9 chances per 1 million exposed people (ARB, 2000c).

A cancer potency factor is the toxicity criterion, or health guidance value used for carcinogens, to describe the potential risk of developing cancer per unit of average daily dose over a 70-year lifetime. Cancer potency values are expressed as the upper bound probability of developing cancer assuming continuous lifetime exposure to a substance at a dose of one milligram per kilogram of body weight, and are expressed in units of $(mg/kg\text{-}day)^{-1}$. The derivation of inhalation cancer potency factors takes into account

the available information on pharmacokinetics and on the mechanism of carcinogenic action. These values are generally the 95 percent upper confidence limits on the dose-response slope. It is a more accurate measure of a person's chance of developing cancer than is the URF because it considers breathing rate and weight of the individual.

A REL is used as an indicator of potential non-cancer adverse health effects and is defined as a concentration level at or below which no adverse health effects are anticipated. RELs are designed to protect the most sensitive individuals in the population by including safety factors in their development and can be created for both acute and chronic exposures. An acute exposure is defined as one or a series of short-term exposures generally lasting less than 24 hours. Consistent with risk guidelines, a 1-hour exposure is used to determine acute non-cancer impacts. Chronic exposure is defined as long-term exposure usually lasting from one year to a lifetime. Generally, hazard indices of less than 1.0 are not considered to be a concern to public health. A hazard index is the ratio of the modeled concentration for a toxic pollutant and the reference exposure level for that pollutant (ARB, 2000d). A further discussion of the health effects that may result from exposure to Perc, MeCl, and TCE follows.

a. Perchloroethylene

i. Health Impacts from Exposure to Perchloroethylene

Exposure to Perc may result in both cancer and non-cancer health effects. The probable route of human exposure to Perc is inhalation (ARB, 1997a). Table VIII-2 presents the current health effects values that are used for determining the potential health impacts.

Perc is a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified Perc as a TAC in October 1991 (ARB, 1991b). The State of California under Proposition 65 listed Perc as a carcinogen in April 1988 (OEHHA, 2006).

Short-term (acute) and long-term (chronic) exposure to Perc may result in non-cancer health effects. Acute toxic health effects resulting from short term exposure to high levels of Perc may include headaches, dizziness, rapid heartbeat, and irritation or burns on the skin, eyes, or respiratory tract. Massive acute doses can induce central nervous system depression resulting in respiratory failure. Chronic exposure to lower Perc concentration levels may result in dizziness, impaired judgement and perception, and damage to the liver and kidneys (ARB, 2000d).

ii. Sources and Emissions of Perchlororethylene

Perc is currently used in Carpet/Upholstery Cleaner; Multi-Purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover product. Perc is not currently used in any Fabric Protectant products. If Perc is not prohibited from use in these categories, it could conceivably be used as an avenue for compliance with the

proposed lower VOC limits, increasing human exposure. Emissions of Perc in these categories are expected to grow to 0.19 tons per day by 2010.

b. Methylene Chloride

i. Health Impacts from Exposure to Methylene Chloride

Exposure to MeCl (also known as dichloromethane) may result in both cancer and non-cancer health effects. The probable route of human exposure to MeCl is inhalation (ARB, 1997). Table VIII-2 presents the current health effects values that are used to determine potential health impacts.

MeCl is either a possible or probable human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified MeCl as a TAC in July 1989 (ARB, 1989b. The State of California under Proposition 65 listed MeCl as a carcinogen in April 1988 (OEHHA, 2006).

Short-term (acute) and long-term (chronic) exposure to MeCl may result in non-cancer health effects. MeCl vapor is irritating to the eyes, respiratory tract, and skin. It is also a central nervous system depressant including decreased visual and auditory functions and may cause headache, nausea, and vomiting. Acute toxic health effects resulting from short term exposure to high levels of MeCl may include pulmonary edema, cardiac arrhythmias, and loss of consciousness. Chronic exposure can lead to bone marrow, hepatic, and renal toxicity. MeCl is metabolized by the liver with resultant carboxyhemoglobin formation (ARB, 1997a).

ii. Sources and Emissions of Methylene Chloride

MeCl is currently used in Multi-Purpose Lubricant; and Penetrant products. MeCl is not currently used in Carpet/Upholstery Cleaner; Fabric Protectant; or Sealant or Caulking Compound products. If its use is not prohibited in these categories, MeCl could conceivably be used as an avenue for compliance with the proposed lower VOC limit, increasing human exposure. Emissions of MeCl are expected to grow to 0.01 tons per day by 2010.

c. Trichloroethylene

i. Health Impacts from Exposure to Trichloroethylene

Exposure to TCE may result in both cancer and non-cancer health effects. The probable routes of human exposure to TCE are inhalation and ingestion (ARB, 1997a). Table VIII-2 presents the current health effects values that are used to determine potential health impacts.

TCE is a probable human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified TCE as a TAC

in October 1990 (ARB, 1990d. The State of California under Proposition 65 listed TCE as a carcinogen in April, 1988 (OEHHA, 2006).

Short-term (acute) and long-term (chronic) exposure to TCE may result in non-cancer health effects. TCE is a central nervous system depressant. It is mildly irritating to the eyes and respiratory tract. Occupational exposure to TCE has resulted in nausea, headache, loss of appetite, weakness, dizziness, ataxia, and tremors. Acute exposures to high concentrations have caused irreversible cardiac arrhythmias, nerve and liver damage and death. Chronic exposure to TCE has also been shown to cause respiratory irritation, renal toxicity, and immune system depression. Alcohol consumption in humans increases the toxicity of TCE and causes "degreaser's flush," which are red blotches on the skin (ARB, 1997a).

ii. Sources and Emissions of Trichloroethylene

TCE is currently used in Carpet/Upholstery Cleaner; Multi-Purpose Lubricant; Penetrant; and Spot Remover. TCE is not currently used in Fabric Protectant products and Sealant or Caulking Compound products. TCE is regulated as a VOC, such that its use should not increase as products reformulate to meet VOC limits. However, because TCE is a probable human carcinogen, we are proposing to prohibit its use in these categories. In 2010, this proposal will reduce emissions of TCE by 0.02 tons per day.

d. Proposed Toxics Prohibition

In this rulemaking, staff is proposing to prohibit the use of Perc, MeCl, and TCE in Carpet/Upholstery Cleaner; Fabric Protectant; Multi-purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover products. This proposal is based on data suggesting that there would be potential excess cancer cases resulting from their use. In proposing this prohibition we are relying on previous work conducted by ARB staff.

Specifically we are relying on two previous rulemakings. To review the complete analyses relied upon to propose these prohibitions, the reader is referred to the following two documents:

1. Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities. March 10, 2000. (ARB, 2000d).

2. 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).

In the above listed rulemakings, staff found that use of these chlorinated compounds posed an unnecessary health hazard. As detailed in the March 10, 2000, report, modeling results showed the potential for increased cases of cancer. Because many alternative products were available, the ARB, in 2000, prohibited the use of Perc, MeCl, and TCE in General Purpose Degreasers designed for automotive use, Engine Degreasers, Brake Cleaners, and Carburetor or Fuel-injection Air Intake Cleaners. The 2004 report provided the rationale for prohibiting the use of these three chlorinated solvents in Adhesive Removers, Contact Adhesives, Electrical Cleaners, Electronic Cleaners, Footwear or Leather Care Product, Graffiti Removers, and General Purpose Degreasers. In total, not including this rulemaking, ARB has prohibited the use of Perc, MeCl, and TCE in 62 categories.

Staff has determined that the proposed prohibition is necessary to mitigate potential adverse impacts that would result from implementing VOC limits for these categories, and to ensure a level playing field among all products.

The proposed prohibition of chlorinated solvents in Carpet/Upholstery Cleaner; Fabric Protectant; Multi-Purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover is being proposed as a mitigation measure under CEQA (Public Resources Code section 2100 *et seq.*). An alternative basis for the prohibition, however, is the authority granted the ARB to control toxic air contaminants (TACs) under Health and Safety Code section 39665 *et seq.* This section E, comprises the "needs assessment" report for the prohibition on chlorinated solvents, as specified in Health and Safety Code section 39665.

Additional information to support the proposed prohibition on use of Perc, MeCl, and TCE in Carpet/Upholstery Cleaner; Fabric Protectant; Multi-Purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover are contained in other documents and within other chapters of this Technical Support Document. Information regarding sources of these TACs (sources of emissions other than what is discussed in this Chapter) and atmospheric persistence has already been presented in the Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities, March 10, 2000, (ARB, 2000d). The reader is referred to this document for further information.

In each category, staff has determined that alternative compounds are available to successfully formulate or reformulate products. More detailed information on alternative products and chemicals that can be used as replacements to Perc, MeCl, and TCE is contained in sections contained in Chapter VI that are specific to these product categories. Costs for reformulating and cost effectiveness of the proposal are contained in Chapter VII of this report.

In the federal Clean Air Act Amendments of 1990, the United States Environmental Protection Agency (U.S. EPA) identified Perc, MeCl, and TCE as

hazardous air pollutants (HAPs) because evidence indicated the substances may have adverse effects on human health or the environment. As of the writing of this report, the U.S. EPA has not promulgated a comparable NESHAP control measure specifically for consumer products containing Perc, MeCl, or TCE. The U.S. EPA has adopted NESHAP standards which control emissions of these HAPs from other sources. These other measures are described in the ATCM for AMR facilities (ARB, 2000d).

To summarize, staff finds that the proposed prohibition on use of Perc, MeCl, and TCE in Carpet/Upholstery Cleaner; Fabric Protectant; Multi-Purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover products is necessary to reduce exposure and the health risk associated with use of these compounds. Without control, emissions of Perc, MeCl, and TCE from these six categories would be just over 0.20 tons per day in 2010. Staff has identified that there is a 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 best available control technology in instances where no safe exposure threshold is known.

2. Proposed Mitigation Measures Related to Greenhouse Gas Emissions

Staff is proposing, in new subsection 94509(r)(1), that Pressurized Gas Duster products shall not contain a compound that has a GWP of 150 or greater.

In accordance with CEQA, to ensure that the VOC content of these products does not increase as a result of reformulation to meet GWP limits, a 1 percent by weight, including fragrance, VOC limit is also being proposed for Pressurized Gas Dusters. Also to ensure VOC exempt TAC solvents are not used, staff is proposing to prohibit use of Perc and MeCl in Pressurized Gas Duster products.

3. Proposed Mitigation Measure Related to Fabric Softeners – Single Use Dryer Product

Staff is proposing a new subsection 94509(s) to describe the VOC content limit for Fabric Softener – Single Use Dryer Product. Rather than a percent by weight limit, a 0.05 gram of VOC per use limit is proposed. The limit is designed to ensure that the size of each dryer sheet does not increase. In developing the limit for these products, staff determined that establishing a percent by weight limit could result in product reformulation using larger sheets to comply. This would diminish emissions reductions and potentially lead to increasing the solid waste stream. Therefore, in accordance with CEQA, the gram of VOC per use limit is proposed.

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 detail 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 that would result from reducing VOC emissions, if the staff's proposal were to be adopted, is not quantified in this report. However, qualitatively, we are able to conclude that reducing VOC emissions, because of their role as ozone precursors, will result in incremental improvement of the public's health – whether it be 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 5.8 tons per day. The impacts of our proposal on SOA formation are not clear, although we do not expect a disbenefit.

We are better able to assess the reduced health risk associated with prohibiting the use of the chlorinated solvents Perc, MeCl, and TCE in Carpet/Upholstery Cleaner; Fabric Protectant; Multi-Purpose Lubricant; Penetrant; Sealant or Caulking Compound; and Spot Remover products. Overall, the proposed amendments would prevent chlorinated solvent emissions by about 0.20 tons per day annually in 2010. It should also be noted that the scenarios analyzed to determine increased cancer risk evaluated concentrations in the outdoor air. It is likely that, in indoor environments, workers' and other end-users' chances of increased cancers would be higher from use of products containing these chlorinated solvents.

In summary, our health risk analysis shows that, by achieving these VOC reductions, the proposed amendments would reduce health risks posed by ground-level ozone by slightly lowering ambient concentrations. We predict that almost nine less tons per day of ozone would be formed. Moreover, exposure to probable carcinogens would be reduced by prohibiting the use of chlorinated TACs.

G. ALTERNATIVE MEANS OF COMPLIANCE

Two alternative means of compliance with the Regulation have been developed. A current compliance alternative for manufacturers of consumer products is the Alternative Control Plan (ACP). The ACP Regulation, title 17, California Code of Regulations, sections 94540-94555, is a voluntary emissions averaging program. Under the ACP, an overall limit on the VOC content of emissions from each individual product 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 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 specified in title 17, California Code of Regulations, section 94511. This provision allows a manufacturer to formulate products that exceed the mass-based limit specified in the 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 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 and, as such their use is not focused in a particular area leading to a potential "hot spot." Generally, use of consumer products 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, as well as from the prohibition on use of chlorinated solvents that are TACs, and the reduction in potency of GHGs.

Some manufacturers of Astringent/Toner products assert that regulation of these products would adversely affect individuals who cannot afford professional dermatological care. They also contend that higher VOC-containing products may be necessary for people of certain ethnicities to prevent scarring and/or increased pigmentation. ARB staff disagrees with these assertions. We have evaluated the claims and directions on the labels of Astringent/Toner products and researched sales prices of products *via* in-store shelf surveys and on the Internet. We found that complying products that make all Astringent/Toner functional claims are readily available over-the-counter in a variety of retail outlets. Purchase of these products does not require a medical prescription, and these products are not priced differently. Moreover, we have not found or been presented with any data that support these claims. Therefore, we do not believe that the regulation of Astringent/Toner would adversely or disproportionately impact people of any given age, race, culture, or income.

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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 VOC, air toxic and greenhouse gas emissions from consumer products. As always, our rulemaking activities will be conducted in an open, public process, allowing for stakeholder input. Major activities are summarized below.

A. CONSUMER PRODUCT EMISSIONS REDUCTION COMMITMENTS IN THE 2007 STATE IMPLEMENTATION PLAN (SIP)

In the recently adopted SIP, the State Strategy for California's 2007 State Implementation Plan, ARB committed to achieving a further 30 to 40 tons per day VOC emission reduction from consumer products. Measures are to be 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 VOC reductions proposed in this rulemaking are a first step toward meeting these commitments. As described below in section C, the 2006 Consumer Products Survey data will serve as the basis for identifying and evaluating additional categories for emission reduction opportunities. If feasible, additional proposals would be brought before the Board for consideration in late 2008 or early 2009.

B. GREENHOUSE GAS REDUCTIONS FROM CONSUMER PRODUCTS

As specified in The California Global Warming Solutions Act of 2006 (AB 32), Discrete Early Action Measures are to be adopted and implemented by 2010. Greenhouse gas reductions from consumer products has 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, included in this rulemaking achieves approximately 0.20 MMT CO_2e per year. We expect data collected from the 2006 Consumer Products Survey to provide information on other categories where greenhouse gas reductions are technologically feasible and cost-effective to implement. Additional reduction strategies will be proposed for Board consideration in late 2008 or early 2009.

C. REVIEW AND COMPILATION OF THE 2006 CONSUMER PRODUCTS SURVEY

Staff is continuing review of data from the 2006 Consumer Products Survey. 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, cleaning products, lubricants, pesticides, and others. Some categories were specifically surveyed to evaluate the use of greenhouse gases. This includes hobby,

sporting and party products. Over 500 surveys have been received. We expect to release non-confidential data summaries in summer 2008. These data will serve as the basis for additional VOC and greenhouse gas reduction proposals.

D. PAINT AND LACQUER THINNER WORKPLAN

Data collected in the 2003 Consumer and Commercial Products Survey (2003 Survey) showed Paint and Lacquer Thinner VOC emissions of about 14 tons per day, if grown to 2010 using population estimates. Based on available research, and regulations in place in the South Coast Air Quality Management District (AQMD), in 2007 ARB staff proposed a 3 percent by weight VOC limit for Paint and Lacquer Thinner products. These products and their emissions are not part of the consumer product emission inventory, even though they do meet the definition of "consumer product." Thus, reductions achieved are not creditable toward the consumer product emission reduction commitment, but are creditable toward the State's overall SIP commitments.

In response to this proposal, some stakeholders identified a number of technical feasibility issues related to this proposal. Other stakeholders continue to assert that the 3 percent limit is feasible for all applications. ARB staff's assessment, at present time, is that a 3 percent VOC limit may be feasible for a wide variety of applications, but there are remaining end-uses of Paint and Lacquer Thinner where a higher VOC content may be necessary. To address the issues raised, ARB is developing a document which outlines all stakeholder issues and comments. This document will be reviewed by stakeholders and a workgroup meeting to discuss and resolve concerns would be scheduled for summer 2008. The goal of this process is to set the lowest VOC limit that is commercially and technologically feasible, but ensure that Paint and Lacquer Thinners remain available if there are coatings where thinning may still be necessary. If all issues are resolved, we will propose a VOC control strategy as part of the next rulemaking.

E. NAIL COATINGS WORKPLAN

Staff has been evaluating the feasibility of VOC emission reductions from various nail coating products. Our evaluation, to date, indicates that a reactivity-based control strategy may provide the better regulatory strategy to achieve ozone reductions from this category. However, this work has been postponed until such time as the newly revised maximum incremental reactivity scale has been peer-reviewed. As part of this process, stakeholders have raised concerns regarding the use of the toxic compounds xylenes, toluene, dibutyl phthalate, and formaldehyde. We are actively evaluating these concerns to determine if use of these compounds in nail coatings poses a health hazard in the outdoor ambient air. We are developing modeling scenarios to model 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 a health hazard in outdoor ambient air be identified, ARB would evaluate mitigation strategies under our authority to reduce air toxic emissions. The goal of this work is to achieve the maximum

feasible reduction from these products and, if necessary, mitigate toxic air pollutant exposures. We expect to propose a regulatory strategy for nail coatings as part of the next rulemaking.

F. INNOVATIVE EMISSION REDUCTION STRATEGIES

The 2007 SIP acknowledges that further emission reductions from consumer products may not be feasible using conventional approaches. Staff intends to work with stakeholders to explore alternative market-based mechanisms to encourage the development, distribution, and purchase of cleaner, very low, or zero-emitting products.

We also intend to evaluate other approaches if these market-based mechanisms cannot produce meaningful emission reductions. These approaches include the purchase of ROG (VOC) credits, funding special projects to reduce emissions, or accelerate reductions from pollution sources outside the consumer products source category. Emission reductions achieved through these mechanisms would be creditable toward the overall consumer product reduction commitment.

Appendix B

Proposed Amendments to the Regulation for Reducing Emissions from Consumer Products

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

Proposed Amendments to the
REGULATION FOR REDUCING ~~VOLATILE ORGANIC COMPOUND~~ 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 Removers" 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 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 ~~consumer~~ 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) "ASTM" means the American Society for Testing and Materials.

(14) "Astringent/Toner" means any product ~~not regulated as a drug by the United States Food and Drug Administration (FDA) which is~~ 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," ~~"Personal Fragrance Product,"~~ cold cream, lotion, ~~or~~ antiperspirant, or any Astringent/Toner product regulated as a drug by the United States Food and Drug Administration (FDA).

(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.

(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.

(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.

(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 Compounds," 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.

(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 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.

(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 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.

(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."

(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.

(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.

(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.

(25) "Carburetor or Fuel-Injection Air Intake Cleaners" 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 Cleaners" 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.

(26) "Carpet ~~and~~ /Upholstery Cleaner" means a cleaning product designed or labeled for the purpose of eliminating dirt ~~and~~ or stains on rugs, carpeting, ~~and the interior of motor vehicles and/or on household furniture~~ or objects upholstered or covered with fabrics such as wool, cotton, nylon or other synthetic fabrics. "Carpet ~~and~~/ Upholstery Cleaner" includes, but is not limited to, products used on household furniture, the interior of motor vehicles, and products that make ~~f~~"Fabric ~~p~~Protectant" claims. "Carpet ~~and~~/ Upholstery Cleaner" does not include ~~"General Purpose Cleaners,"~~ "Spot Removers," vinyl or leather cleaners, ~~d~~"Dry ~~c~~Cleaning ~~f~~Fluids," or products designed exclusively for use at industrial facilities engaged in furniture or carpet manufacturing.

(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.

(28) "Colorant" means any pigment or coloring material used in a consumer product for an aesthetic effect, or to dramatize an ingredient.

(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."

(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.

(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.

(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.

(33) "Contact Adhesive - General Purpose" means any contact adhesive that is not a "Contact Adhesive - Special Purpose."

(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.

(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.

(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.

(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).

(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.

(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 human 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.

(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.

(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.

(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~~/and~~ 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."

(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.

(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."

(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.

(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."

(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."

(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.

(49) "Executive Officer" means the Executive Officer of the Air Resources Board, or his or her delegate.

(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) ~~the effective date of the "2006 Amendments" (i.e., 30 days after the "2006 Amendments" rulemaking action is approved by the Office of Administrative Law)~~ 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) [effective date], 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.

(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).

(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~~/and~~ Upholstery Cleaner," "Footwear or Leather Care Product," "Spot Remover," or "Disinfectant," or products labeled for application to both fabric and human skin.

(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.

(54)~~(53)~~ "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."

(55)~~(54)~~ "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.

(56)~~(55)~~ "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.

(57)~~(56)~~ "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.

(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, or products designed or labeled exclusively for use on marble floors.

(59)~~(57)~~ "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 "~~spray buff products~~Floor Maintenance Products," "Floor Wax Strippers", ~~products designed or labeled for unfinished wood floors~~, 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 products 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."

(60)~~(58)~~ "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.

(61)~~(59)~~ "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.

(62)~~(60)~~ "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.

(63)~~(61)~~ "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.

(64)~~(62)~~ "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°C, the sole purpose of which is to impart an odor or scent, or to counteract a malodor.

(65)~~(63)~~ "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 Aids," "Wood Cleaners," and products designed solely for the purpose of cleaning, or products designed to leave a permanent finish such as stains, sanding sealers and lacquers.

(66)~~(64)~~ "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.

(67)~~(65)~~ "Gel" means a colloid in which the disperse phase has combined with the continuous phase to produce a semisolid material, such as jelly.

(68)~~(66)~~ "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).

(69)~~(67)~~ "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.

(70)~~(68)~~ "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.

(71)~~(69)~~ "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."

(72)~~(70)~~ "Glass Cleaner" means a cleaning product designed or labeled primarily for cleaning surfaces made of glass. "Glass ~~c~~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.

(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.

(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.

(75)~~(71)~~ "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."

(76)~~(72)~~ "Hair Mousse" means a hairstyling foam designed to facilitate styling of a coiffure and provide limited holding power.

(77)~~(73)~~ "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.

(78)~~(74)~~ "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.

(79)~~(75)~~ "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 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.

(80)~~(76)~~ "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.

(81)~~(77)~~ "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."

(82)~~(78)~~ "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.

(83)~~(79)~~ "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.

(84)~~(80)~~ "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.

(85)~~(81)~~ "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.

(86)~~(82)~~ "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.

(87)~~(83)~~ "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.

(88)~~(84)~~ "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.

(89)~~(85)~~ "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.

(90)~~(86)~~ "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.

(91)~~(87)~~ "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 Insecticides" may claim to kill insects or other arthropods.

(92)~~(88)~~ "Liquid" means a substance or mixture of substances which is capable of a visually detectable flow as determined under ASTM D-4359-90. "Liquid" does not include powders or other materials that are composed entirely of solid particles.

(93)~~(89)~~ "Lubricant" means a product ~~designed to~~ that reduces friction, heat, noise, or wear between moving parts, or ~~to~~ 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."

(94)~~(90)~~ "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°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°C, as determined by ARB Method 310; or

(D) is the weight percent of a chemical "mixture" that boils above 216°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."

(95)~~(91)~~ "Manufacturer" means any person who imports, manufactures, assembles, produces, packages, repackages, or relabels a consumer product.

(96)~~(92)~~ "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 Products," "Astringent/Toner," cold cream, lotion, antiperspirants, or products that must be purchased with a doctor's prescription.

(97)~~(93)~~ "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 W~~w~~heel ~~c~~Cleaner," "Paint Remover or Stripper," products designed and labeled exclusively for automotive and marine detailing, or products designed for use in degreasing tanks.

(98)~~(94)~~ "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.

(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.

(100)~~(95)~~ "Multi-purpose Dry Lubricant" means any lubricant which is: (A) designed ~~and~~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.

(101)~~(96)~~ "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 Lubricants," "Penetrants," or "Silicone-based Multi-Purpose Lubricants."

(102)~~(97)~~ "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" includes (A) products that do not display specific use instructions on the product container or packaging, (B) products that do not specify an end-use function or application on the product container or packaging, and (C) 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. "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.

(103)~~(98)~~ "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.

(104)~~(99)~~ "Nail Polish Remover" means a product designed to remove nail polish and coatings from fingernails or toenails.

(105)~~(100)~~ "Non-Carbon Containing Compound" means any compound which does not contain any carbon atoms.

(106)~~(101)~~ "Non-Selective Terrestrial Herbicide" means a terrestrial herbicide product that is toxic to plants without regard to species.

(107) "Not for Retail Sale" means a product sold exclusively to establishments that manufacture, or construct, goods or commodities, or are sold exclusively to holders of commercial licenses, such as an electrician. For the purpose of this regulation, products labeled "Not for Retail Sale" means the products are not sold in retail outlets or wholesale locations where household consumers may purchase products.

(108) "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."

(109)~~(102)~~ "Oven Cleaner" means any cleaning product designed or labeled to clean and to remove dried or baked on food deposits from oven walls.

(110)~~(103)~~ "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.

(111)~~(104)~~ "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 Solvents," paint brush cleaners, products designed and labeled exclusively as "Graffiti Removers," and hand cleaner products that claim to remove paints and other related coatings from skin.

(112)~~(105)~~ "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.

(113)~~(106)~~ "Penetrant" means a lubricant designed ~~and~~ or labeled primarily to loosen metal parts that have bonded together due to rusting, oxidation, or other causes.

"Penetrant" does not include "Multi-purpose Lubricants" that claim to have penetrating qualities, but are not labeled primarily to loosen bonded parts.

(114)~~(107)~~ "Person" shall have the same meaning as defined in Health and Safety Code Section 39047.

(115)~~(108)~~ "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, ~~and~~ 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 for use on human genitalia; (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.

(116)~~(109)~~ "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.

(117)~~(110)~~ "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."

(118)~~(111)~~ "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."

(119)~~(112)~~ "Product Brand Name" means the name of the product exactly as it appears on the principal display panel of the product.

(120)~~(113)~~ "Product Category" means the applicable category which best describes the product as listed in this Section 94508.

(121)~~(114)~~ "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

(122)~~(115)~~ "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.

(123)~~(116)~~ "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.

(124)~~(117)~~ "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.

(125)~~(118)~~"Restricted Materials" means pesticides established as restricted materials under Title 3, California Code of Regulations, section 6400.

(126)~~(119)~~"Retailer" means any person who sells, supplies, or offers consumer products for sale directly to consumers.

(127)~~(120)~~"Retail Outlet" means any establishment at which consumer products are sold, supplied, or offered for sale directly to consumers.

(128)~~(121)~~"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).

(129)~~(122)~~"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.

(130)~~(123)~~"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 Cleaners," "Glass Cleaners," "General Purpose Cleaners," "Toilet/Urinal Care Products," "Metal Polishes," "Carpet Cleaners," or "Fabric Refreshers" that may also make sanitizing or anti-microbial claims on the label.

(131)~~(124)~~"Sealant ~~and~~ 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" includes threaded pipe sealants and gasket makers. "Sealant ~~and~~ 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 ~~and~~ 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~~,~~:

"~~r~~Removable caulking compounds" means a compound which temporarily seals windows or doors for three to six month time intervals~~.~~, ~~and~~

"~~c~~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 chemically 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."

(132)~~(125)~~ "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.

(133)~~(126)~~"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."

(134)~~(127)~~ "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."

(135)~~(128)~~"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.

(136)~~(129)~~ "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.

(137)~~(130)~~ "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.

(138)~~(131)~~ "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 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° F.

(139)~~(132)~~ "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, ~~and~~or clothing, that does not require subsequent laundering to achieve stain removal. "Spot Remover" does not include "Dry Cleaning Fluid," "Laundry Prewash," ~~or "Multi-purpose Solvent."~~ or aerosol products labeled solely for gum removal.

(140)~~(133)~~ "Spray Buff Product" means a product designed to restore a worn floor finish in conjunction with a floor buffing machine and special pad.

(141)~~(134)~~"Table B Compound" means any carbon-containing compound listed as an exception to the definition of VOC in Section 94508.

(142)~~(135)~~"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."

(143)~~(136)~~"Terrestrial" means to live on or grow from land.

(144) "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.

(145)~~(137)~~"Tire Sealant and Inflator" means any pressurized product that is designed to temporarily inflate and seal a leaking tire.

(146)~~(138)~~"Toilet/Urinal Care Product" means any product designed or labeled to clean and/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."

(147)~~(139)~~"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.

(148)~~(140)~~"Type B Propellent" means any halocarbon which is used as a propellent including chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs).

(149)~~(141)~~ "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).

(150)~~(142)~~ "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.

(151)~~(143)~~"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.

(152)~~(144)~~"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).

(153)~~(145)~~"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).

(154)~~(146)~~"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.

(155)~~(147)~~"Waterproofer" means a product designed and labeled exclusively to repel water from fabric or leather substrates. "Waterproofer" does not include "Fabric Protectants."

(156)~~(148)~~"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.

(157)~~(149)~~"Web Spray Adhesive" means any aerosol adhesive which is not a "Mist Spray Adhesive" or "Special Purpose Spray Adhesive."

(158) "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."

(159)~~(150)~~"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.

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 Removers*:~~ ~~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 removers.]~~		
Adhesives *: __~~a~~Aerosol**	1/1/95	75
__Mist Spray Adhesives**	1/1/2002	65
__Web Spray Adhesives**	1/1/2002	55
__Special Purpose Spray Adhesives** ___Mounting, Automotive Engine Compartment,		

__and Flexible Vinyl Adhesives	1/1/2002	70
___Polystyrene Foam and Automobile Headliner __Adhesives	1/1/2002	65
___Polyolefin and Laminate Repair/Edgebanding __Adhesives	1/1/2002	60
[**See 94509(i), 94512(d), and 94513(d) for additional requirements that apply to aerosol adhesives.]		
__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 Adhesives.]		
__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 Adhesives.]		
__gGeneral pPurpose	1/1/95	10
* See section 94510(i) for an exemption that applies to adhesives sold in containers of one fluid ounce or less. **See section 94509(k) for the effective date of the VOC limit for certain types of "Construction, Panel, and Floor Covering Adhesives."		
Adhesive Removers*:		
__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 aAdhesive rRemovers.]		
Aerosol Cooking Sprays	1/1/95	18

Air Fresheners*:		
Double Phase Aerosols	1/1/93 12/31/2004	30 25
Single Phase Aerosols	1/1/93 1/1/96	70 30
Dual Purpose Air Fresheners/Disinfectant aerosols	1/1/94	60
liquid/pump sprays	1/1/93	18
solids/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 Fresheners.]		
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 Compounds	1/1/2005	17
Automotive Wax/Polish/Sealant/Glaze:		
all other forms	1/1/2005	15
hard paste waxes	1/1/2005	45
instant detailers	1/1/2001	3

Automotive Windshield Washer Fluids: Type "A" areas*	1/1/93 12/31/2008	35 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 Fluids.		
* 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 Cleaners*: aerosols	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 Cleaners.]		
Brake Cleaners	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 Cleaners ***	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 Cleaners.		

Carpet ~~and~~ /Upholstery Cleaner*:		
aerosols	1/1/2001 12/31/2010	7 5
non-aerosols (dilutables)	1/1/2001	0.1
non-aerosols (ready-to-use)	1/1/2001 12/31/2010	3 1
[*See section 94509(g) for additional requirements that apply to Carpet/Upholstery Cleaner]		
Charcoal Lighter Material	See Section 94509(h)	
Disinfectant:		
aerosol	12/31/2008	70
non-aerosol	12/31/2008	1
Dusting Aids:		
aerosol	1/1/95 1/1/97 12/31/2010	35 25 17
non-aerosol ~~all other forms~~	1/1/95 12/31/2010	7 3
Electrical Cleaner*	12/31/2006	45
[*See sections 94509(n) and 94512(d) for additional requirements that apply to Electrical Cleaners.]		
Electronic Cleaner*	12/31/2007	75
[*See sections 94509(m) and 94512(d) for additional requirements that apply to Electronic Cleaners.]		
Engine Degreasers:	1/1/93 1/1/96	75 50
aerosols	12/31/2004 12/31/2010	35 10
non-aerosols	12/31/2004	5

Fabric Protectant* aerosol	1/1/95 1/1/97	75 60
non-aerosol	1/1/95 1/1/97 12/31/2010	75 60 1
[*See section 94509(q) for additional requirements that apply to Fabric Protectant]		
Fabric Refresher: aerosol	12/31/2006	15
~~N~~non-aerosol	12/31/2006	6
~~Fabric Protectants~~	~~1/1/95~~ ~~1/1/97~~	~~75~~ ~~60~~
Fabric Softener – Single Use Dryer Product	See Section 94509(s)	
Floor Maintenance Product	12/31/2010	1
Floor Polish~~es~~ or Wax~~es~~: Resilient Flooring Materials~~s~~	1/1/94 12/31/2010	7 1
Nonresilient Flooring Materials~~s~~	1/1/94 12/31/2010	10 1
Wood Floor Wax	1/1/94 12/31/2010	90 70
Floor Wax Stripper: non-aerosol~~s~~	See Section 94509(j)	
Footwear or Leather Care Product*: aerosol	12/31/2006	75
solid	12/31/2006	55
all other forms	12/31/2006	15
[*See section 94509(m) for additional requirements that apply to Footwear or Leather Care Products.]		
Furniture Maintenance Products: aerosol~~s~~	1/1/94 12/31/2004	25 17
all other forms (except solid/paste forms)	1/1/94	7
non-aerosol (except solid/paste forms)	12/31/2008	3

General Purpose Cleaners*: aerosols and non-aerosols aerosols non-aerosols [*See section 94509(p) for additional requirements that apply to General Purpose Cleaners.]	1/1/94 12/31/2008 12/31/2004	10 8 4
General Purpose Degreasers*: aerosols non-aerosols [*See section 94509(m) for additional requirements that apply to General Purpose Degreasers.]	1/1/2002 12/31/2008 12/31/2010 12/31/2004	50 20 10 4
Glass Cleaners: aerosols non-aerosols	1/1/93 12/31/2012 1/1/93 1/1/96 12/31/2004	12 10 8 6 4
Graffiti Remover*: aerosols non-aerosols [*See section 94509(n) for additional requirements that apply to Graffiti Removers.]	12/31/2006 12/31/2006	50 30
Hair Mousses	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 Gels	1/1/94	6
Hair Styling Product: aerosols and pump sprays all other forms	12/31/2006 12/31/2006	6 2
Heavy-duty Hand Cleaners or Soap	1/1/2005	8
Insect Repellents: Aaerosols	1/1/94	65

Insecticides*:		
Crawling Bug Insecticide (all forms):	1/1/95 1/1/98	40 20
~~aerosol Crawling Bug Insecticide~~ aerosol	12/31/2004	15
Flea and Tick Insecticide	1/1/95	25
Flying Bug Insecticide (all forms):	1/1/95	35
~~aerosols~~	12/31/2003	25
F~~f~~oggers	1/1/95	45
Lawn and Garden Insecticide (all forms)	1/1/95	20
~~non-aerosol Lawn and Garden Insecticide~~ non-aerosol	12/31/2003	3
Wasp and Hornet Insecticide	1/1/2005	40
* See sections 94510(g)(1) and 94510(k) for exemptions that apply to certain insecticides.		
Laundry Prewash: aerosols/solids	1/1/94	22
all other forms	1/1/94	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	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
Nail Polish Removers	1/1/94 1/1/96 12/31/2004 12/31/2007	85 75 0 1
Non-selective Terrestrial Herbicide: non-aerosols	1/1/2002	3

Odor Remover/Eliminator aerosol	12/31/2010	25
non-aerosol	12/31/2010	6
Oven Cleaners*: aerosols/pump sprays	1/1/93	8
liquid	1/1/93	5
non-aerosol (including pump sprays and liquids)	12/31/2008	1
[*See section 94509(p) for additional requirements that apply to Oven Cleaners.]		
Paint Remover or Stripper	1/1/2005	50
Penetrant*	1/1/2003 12/31/2013	50 25
[*See section 94509(q) and 94513(f) for additional requirements that apply to Penetrant]		
Personal Fragrance Products*: products with 20% or less fragrance	1/1/95 1/1/99	80 75
products with more than 20% fragrance	1/1/95 1/1/99	70 65
* See sections 94510(h), 94510(j), and 94510(l) for exemptions and requirements that apply to Personal Fragrance Product.		
Pressurized Gas Duster*	12/31/2010	1
[*See section 94509(r) and 94510(c) for additional provisions that apply to Pressurized Gas Duster]		
Rubber /Vinyl Protectant: aerosols	1/1/2005	10
non-aerosols	1/1/2003	3
Sanitizer: aerosol	12/31/2008	70
non-aerosol	12/31/2008	1

Sealants and or Caulking Compounds* all forms	12/31/2002	4
Chemically Curing non-aerosol	12/31/2012	3
Non-chemically Curing non-aerosol	12/31/2010	1.5
[*See sections 94509(q) and 94512(d) for additional requirements that apply to Sealant or Caulking Compound]		
Shaving Creams	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*: aerosols	1/1/2001 12/31/2010	25 15
non-aerosols	1/1/2001 12/31/2010	8 3
[*See section 94509(q) for additional requirements that apply to Spot Remover]		
Temporary Hair Color: Aaerosol	12/31/2010	55
Tire or Wheel Cleaner aerosol	12/31/2010	8
non-aerosol	12/31/2010	2
Tire Sealants and Inflators	12/31/2002	20
Toilet/Urinal Care Product:* aerosol	12/31/2006	10
non-aerosol	12/31/2006	3
[* See section 94509(o) for additional requirements that apply to Toilet/Urinal Care Products]		
Undercoating: aerosols	1/1/2002	40
Windshield Water Repellent	12/31/2010	75

Wood Cleaner: aerosol	12/31/2006	17
non-aerosol	12/31/2006	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 Fluids (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 Fluids (Dilutable)" 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;

(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 Products" 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)~~(27)~~:

(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)~~(90)~~ 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)~~(131)~~, 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)~~(131)~~ 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.~~ complies with the product dating requirements in section 94512(b).

(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)~~(20)~~.

(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.~~ 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(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.~~ 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(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 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.~~ complies with the product dating requirements in section 94512(b).

(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 ~~container or package displays the date on which the product was manufactured, or a code indicating such date.~~ 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).

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, tThe 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) Th e 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, t~~T~~he 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), t~~T~~he 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).

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 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, 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. <u>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.</u>

(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 Adhesives, Adhesive Removers, Electronic Cleaner, Electrical Cleaner, Energized Electrical Cleaner, ~~and~~ Contact Adhesives, 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, ~~and~~ 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):

(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.

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) ~~(47)~~, 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), the entire product label, and any other information that the Executive Officer may specify; 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), the entire product label, and any other information that the Executive Officer may specify; 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.

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) *Situatio ns 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 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 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°C, the compound or mixture is an LVP-VOC. If the boiling point is less than 216°C, then the weight percent of the mixture which boils above 216°C is an LVP-VOC. The Executive Officer will use the nearest 5 percent distillation cut that is greater than 216°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 requirements of Title 17, CCR, section 94508(a)(94)~~(90)~~(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, which is incorporated by reference herein.

(d) Compliance determinations for charcoal lighter material products. Tes ing to determine compliance with the certification requirements for charcoal lighter mate ial 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, which is incorporated by reference herein.

(f) Fragrance cont ent 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.

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.

Appendix C

Summary of Consumer Products Regulatory Actions

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
6/16/89	Consumer Products Control Plan.	N/A	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	Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	2/27/91	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.	N/A	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	Regulation for Reducing VOC Emissions from Consumer Products - Phase I.	10/21/91	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	Adoption of Amendments to the Regulation for Reducing VOC Emissions from Consumer Products - Phase II.	1/6/93	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	Adoption of the Alternative Control Plan Regulation for Consumer Products.	9/9/95	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	Approval of the California State Implementation Plan for Ozone.	2/14/95	N/A	Board approval of Ozone SIP which includes consumer products element comprised of near, midterm, and long term measures.

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
3/23/95	Regulation for Reducing VOC Emissions from Aerosol Coating Products and Amendments to the Alternative Control (ACP) Plan.	1/8/96	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.
9/28/95	Amendments to the California Regulations for Reducing VOC Emissions from Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products.	2/29/96	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	Amendments to the California Regulations for Reducing VOC Emissions from Consumer Products and Aerosol Coating Products.	11/18/97	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	Amendments Pertaining to Hairspray in the California Consumer Products Regulation.	8/24/98	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.

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
7/24/97	Amendments to the Consumer Products Regulation, Mid-term Measures I.	7/1/98	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	Amendments to the Aerosol Coating Products, the Antiperspirants and Deodorants Regulation, and the Consumer Products Regulation.	6/24/99	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.
10/28/99	Amendments to the Consumer Products Regulation, Mid-term Measures II.	11/19/2000	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	Amendments to the Consumer Products Regulation relating to Aerosol Adhesives.	5/18/2001	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.

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
6/22/2000	Consumer Products Relating to Aerosol Coating Products, Proposed Tables of Maximum Incremental Reactivity (MIR) Values, and Amendments to Method 310.	7/18/2001	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	Amendments to the Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	4/24/2001	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	Amendments to the Consumer Products, Test Method 310, Antiperspirants and Deodorants, Aerosol Coating Products, and an Airborne Toxic Control Measure (ATCM) for Para-Dichlorobenzene	7/20/2005	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.

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
11/16/2006	Amendments to the Aerosol Coating Products Regulation and the Consumer Products Regulation	12/08/2007	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.

Appendix D

Summary of Ingredient Reformulation Costs

Low Cost

Category: Chemically Curing Sealant or Caulking Compound
Subcategory:

Average Unit

Typical noncomp: 4 Size 13.50 wt oz
Proposed Limit: 3

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon solvent	0.540	4.00	0.02	3.00	0.02
Inorganics	0.090	50.00	0.05	50.00	0.05
Non-Solvent LVP-VOC*	3.500	46.00	1.61	47.00	1.65
*resins					
SUM		100.00		100.00	

Total Cost, $/pound	1.68	1.71
% Cost Diff. Relative to Current Product		1.77
Total Cost, $/Unit	1.41	1.44
Recurring Costs C.E., $/lb VOC Reduced		2.96

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 13.50 ounce

High Cost

Category: Chemically Curing Sealant or Caulking Compound
Subcategory:

Average Unit

Typical noncomp: 4 Size 13.50 wt oz
Proposed Limit: 3

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon solvent	0.800	4.00	0.03	3.00	0.02
Inorganics	0.910	50.00	0.46	50.00	0.46
Non-Solvent LVP-VOC*	7.000	46.00	3.22	47.00	3.29
*resins					
SUM		100.00		100.00	

Total Cost, $/pound	3.71	3.77
% Cost Diff. Relative to Current Product		1.67
Total Cost, $/Unit	3.13	3.18
Recurring Costs C.E., $/lb VOC Reduced		6.20

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 13.50 ounce

Low Cost

Category: Non-Chemically Curing Sealant or Caulking Compound
Subcategory:

Typical noncomp: 4
Proposed Limit: 1.5

Average Unit Size 13.50 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon solvent	0.540	4.00	0.02	1.50	0.01
Ethylene Glycol	0.620	1.00	0.01	1.00	0.01
Non-Solvent LVP-VOC*	3.500	18.00	0.63	17.50	0.61
Inorganics	0.090	49.00	0.04	50.00	0.05
Water	0.002	28.00	0.00	30.00	0.00
*resins					
SUM		100.00		100.00	

Total Cost, $/pound	0.70	0.67
% Cost Diff. Relative to Current Product		-4.28
Total Cost, $/Unit	0.59	0.57
Recurring Costs C.E., $/lb VOC Reduced		-1.20

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 13.50 ounce

High Cost

Category: Non-Chemically Curing Sealant or Caulking Compound
Subcategory:

Typical noncomp: 4
Proposed Limit: 1.5

Average Unit Size 13.50 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon solvent	0.800	4.00	0.03	1.50	0.01
Ethylene Glycol	0.640	1.00	0.01	1.00	0.01
Non-Solvent LVP-VOC*	7.000	18.00	1.26	17.50	1.23
Inorganics	0.910	49.00	0.45	50.00	0.46
Water	0.002	28.00	0.00	30.00	0.00
*resins					
SUM		100.00		100.00	

Total Cost, $/pound	1.74	1.70
% Cost Diff. Relative to Current Product		-2.63
Total Cost, $/Unit	1.47	1.43
Recurring Costs C.E., $/lb VOC Reduced		-1.83

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 13.50 ounce

Low Cost

Category: Motor Vehicle Wash
Subcategory: Liquid

Typical noncomp: 2.5
Proposed Limit: 0.2

Average Unit Size 64.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	85.00	0.00	85.00	0.00
Non-solvent LVP	3.500	10.00	0.35	10.00	0.35
Inorganic	0.090	2.50	0.00	2.00	0.00
2-Butoxyethanol	1.150	2.50	0.03	0.00	0.00
LVP-Glycol Ether	1.150	0.00	0.00	3.00	0.03
	SUM	100.00		100.00	

Total Cost, $/pound	0.38	0.39
% Cost Diff. Relative to Current Product		1.38
Total Cost, $/Unit	1.53	1.55
Recurring Costs C.E., $/lb VOC Reduced		0.23

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 64.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Motor Vehicle Wash
Subcategory: Liquid

Typical noncomp: 2.5
Proposed Limit: 0.2

Average Unit Size 64.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	85.00	0.00	85.00	0.00
Non-solvent LVP	7.000	10.00	0.70	10.00	0.70
Inorganic	0.910	2.50	0.02	2.00	0.02
2-Butoxyethanol	1.200	2.50	0.03	0.00	0.00
LVP-Glycol Ether	1.760	0.00	0.00	3.00	0.05
	SUM	100.00		100.00	

Total Cost, $/pound	0.75	0.77
% Cost Diff. Relative to Current Product		2.42
Total Cost, $/Unit	3.02	3.09
Recurring Costs C.E., $/lb VOC Reduced		0.79

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 64.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Windshield Water Repellant
Subcategory: Liquid

Typical noncomp: 90
Proposed Limit: 75

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.457	75.00	0.34	65.00	0.30
Isopropyl Alcohol	0.720	15.00	0.11	10.00	0.07
Inorganic	0.090	10.00	0.01	10.00	0.01
Water	0.002	0.00	0.00	15.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.46	0.38
% Cost Diff. Relative to Current Product		-17.71
Total Cost, $/Unit	0.46	0.38
Recurring Costs C.E., $/lb VOC Reduced		-0.54

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 16.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Windshield Water Repellant
Subcategory: Liquid

Typical noncomp: 90
Proposed Limit: 75

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.510	75.00	0.38	65.00	0.33
Isopropyl Alcohol	0.940	15.00	0.14	10.00	0.09
Inorganic	0.910	10.00	0.09	10.00	0.09
Water	0.002	0.00	0.00	15.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.61	0.52
% Cost Diff. Relative to Current Product		-15.90
Total Cost, $/Unit	0.61	0.52
Recurring Costs C.E., $/lb VOC Reduced		-0.65

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 16.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Tire/Wheel Cleaner
Subcategory: Aerosol

Typical noncomp: 14
Proposed Limit: 8

Average Unit Size 12.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	85.00	0.00	85.00	0.00
HC Propellant	0.700	8.00	0.06	6.00	0.04
VOC Glycol Ether	1.150	6.00	0.07	2.00	0.02
Inorganic	0.090	1.00	0.00	1.00	0.00
LVP-Glycol Ether	1.150	0.00	0.00	6.00	0.07
	SUM	100.00		100.00	
	Total Cost, $/pound		0.13		0.14
	% Cost Diff. Relative to Current Product				7.05
	Total Cost, $/Unit		0.10		0.10
	Recurring Costs C.E., $/lb VOC Reduced				0.15

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 12.00 ounce

High Cost

Category: Tire/Wheel Cleaner
Subcategory: Aerosol

Typical noncomp: 14
Proposed Limit: 8

Average Unit Size 12.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	85.00	0.00	85.00	0.00
HC Propellant	1.050	8.00	0.08	6.00	0.06
VOC Glycol Ether	1.200	6.00	0.07	2.00	0.02
Inorganic	0.910	1.00	0.01	1.00	0.01
LVP-Glycol Ether	1.760	0.00	0.00	6.00	0.11
	SUM	100.00		100.00	
	Total Cost, $/pound		0.17		0.20
	% Cost Diff. Relative to Current Product				21.94
	Total Cost, $/Unit		0.13		0.15
	Recurring Costs C.E., $/lb VOC Reduced				0.61

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 12.00 ounce

Low Cost

Category: Tire/Wheel Cleaner
Subcategory: non-aerosol

Typical noncomp: 5
Proposed Limit: 2

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	89.00	0.00	91.00	0.00
LVP solvent	0.680	5.00	0.03	6.00	0.04
VOC Glycol Ether	1.150	5.00	0.06	2.00	0.02
Inorganic	0.090	1.00	0.00	1.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound 0.09 0.07

% Cost Diff. Relative to Current Product -29.37

Total Cost, $/Unit 0.09 0.07

Recurring Costs C.E., $/lb VOC Reduced -0.92

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 16.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Tire/Wheel Cleaner
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 2

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	89.00	0.00	91.00	0.00
LVP solvent	0.760	5.00	0.04	6.00	0.05
VOC Glycol Ether	1.200	5.00	0.06	2.00	0.02
Inorganic	0.910	1.00	0.01	1.00	0.01
SUM		100.00		100.00	

Total Cost, $/pound 0.11 0.08

% Cost Diff. Relative to Current Product -26.05

Total Cost, $/Unit 0.11 0.08

Recurring Costs C.E., $/lb VOC Reduced -0.12

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 16.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Carpet/Upholstery Cleaner
Subcategory: Aerosol

Typical noncomp: 7
Proposed Limit: 5

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.150	2.00	0.02	1.00	0.01
HC Propellant	0.700	5.00	0.04	4.00	0.03
Inorganics	0.090	1.00	0.00	1.00	0.00
Solvent LVP	0.680	5.00	0.03	3.00	0.02
Water	0.002	87.00	0.00	91.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.09	0.06
% Cost Diff. Relative to Current Product		-33.83
Total Cost, $/Unit	0.11	0.07
Recurring Costs C.E., $/lb VOC Reduced		-1.60

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 18.00 ounce

High Cost

Category: Carpet/Upholstery Cleaner
Subcategory: Aerosol

Typical noncomp: 7
Proposed Limit: 5

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.200	2.00	0.02	1.00	0.01
HC Propellant	1.050	5.00	0.05	4.00	0.04
Inorganics	0.910	1.00	0.01	1.00	0.01
Solvent LVP	0.760	5.00	0.04	3.00	0.02
Water	0.002	87.00	0.00	91.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.13	0.09
% Cost Diff. Relative to Current Product		-30.01
Total Cost, $/Unit	0.14	0.10
Recurring Costs C.E., $/lb VOC Reduced		-1.88

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 18.00 ounce

Low Cost

Category: Carpet/Upholstery Cleaner
Subcategory: non-aerosol

Typical noncomp: 3
Proposed Limit: 1

Average Unit Size 138.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Isopropyl Alcohol	0.720	3.00	0.02	0.00	0.00
Solvent LVP	0.680	6.00	0.04	6.00	0.04
Inorganic	0.090	2.00	0.00	2.00	0.00
Water	0.002	89.00	0.00	91.00	0.00
2-Butoxyethanol	1.150	0.00	0.00	1.00	0.01
SUM		100.00		100.00	
Total Cost, $/pound			0.07		0.06
% Cost Diff. Relative to Current Product					-15.25
Total Cost, $/Unit			0.57		0.48
Recurring Costs C.E., $/lb VOC Reduced					-0.50

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 138.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Carpet/Upholstery Cleaner
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 1

Average Unit Size 138.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Isopropyl Alcohol	0.940	3.00	0.03	0.00	0.00
Solvent LVP	0.760	6.00	0.05	6.00	0.05
Inorganic	0.910	2.00	0.02	2.00	0.02
Water	0.002	89.00	0.00	91.00	0.00
2-Butoxyethanol	1.200	0.00	0.00	1.00	0.01
SUM		100.00		100.00	
Total Cost, $/pound			0.09		0.08
% Cost Diff. Relative to Current Product					-17.23
Total Cost, $/Unit			0.81		0.67
Recurring Costs C.E., $/lb VOC Reduced					-0.06

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 138.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Dusting Aid
Subcategory: Aerosol

Typical noncomp: 25
Proposed Limit: 17

Average Unit Size 17.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	0.700	15.00	0.11	10.00	0.07
HC Solvent	0.540	9.00	0.05	7.00	0.04
LVP Solvent	0.680	24.00	0.16	25.00	0.17
Inorganic	0.090	1.00	0.00	1.00	0.00
Fragrance	5.000	1.00	0.05	0.50	0.03
Non-solvent LVP	3.500	50	1.75	6.5	0.23
CO2	0.270			0	0.00
Water	0.002			50	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	2.12	0.53
% Cost Diff. Relative to Current Product		-74.87
Total Cost, $/Unit	2.25	0.57
Recurring Costs C.E., $/lb VOC Reduced		-19.82

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 17.00 ounce

High Cost

Category: Dusting Aid
Subcategory: Aerosol

Typical noncomp: 25
Proposed Limit: 17

Average Unit Size 17.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	1.050	15.00	0.16	10.00	0.11
HC Solvent	0.800	9.00	0.07	7.00	0.06
LVP Solvent	0.760	24.00	0.18	25.00	0.19
Inorganic	0.910	1.00	0.01	1.00	0.01
Fragrance	10.000	1.00	0.10	0.50	0.05
Non-solvent LVP	7.000	50	3.50	6.5	0.46
CO2	0.270			0	0.00
Water	0.002			50	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	4.02	0.87
% Cost Diff. Relative to Current Product		-78.46
Total Cost, $/Unit	4.27	0.92
Recurring Costs C.E., $/lb VOC Reduced		-39.44

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 17.00 ounce

Low Cost

Category: Dusting Aid
Subcategory: non-aerosol

Typical noncomp: 7
Proposed Limit: 3

Average Unit Size 33.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Solvent	0.540	6.80	0.04	2.80	0.02
Non-solvent LVP	3.500	35.00	1.23	34.00	1.19
Fragrance	5.000	0.20	0.01	0.20	0.01
Exempt	3.500	0.00	0.00	0.00	0.00
VMS	3.500	0.00	0.00	0.00	0.00
Water	0.002	58.00	0.00	55.00	0.00
Hydrocarbon LVP	0.680	0	0.00	8	0.05
	SUM	100.00		100.00	

Total Cost, $/pound	1.27	1.27
% Cost Diff. Relative to Current Product		-0.18
Total Cost, $/Unit	2.63	2.62
Recurring Costs C.E., $/lb VOC Reduced		-0.06

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 33.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Dusting Aid
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 3

Average Unit Size 33.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Solvent	0.800	6.80	0.05	2.80	0.02
Non-solvent LVP	7.000	35.00	2.45	34.00	2.38
Fragrance	10.000	0.20	0.02	0.20	0.02
Exempt	7.000	0.00	0.00	0.00	0.00
VMS	7.000	0.00	0.00	0.00	0.00
Water	0.002	58.00	0.00	55.00	0.00
Hydrocarbon LVP	0.760	0	0.00	8	0.06
	SUM	100.00		100.00	

Total Cost, $/pound	2.53	2.48
% Cost Diff. Relative to Current Product		-1.63
Total Cost, $/Unit	5.21	5.12
Recurring Costs C.E., $/lb VOC Reduced		-0.18

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 33.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Fabric Protectant
Subcategory: non-aerosol

Typical noncomp: 5
Proposed Limit: 1

Average Unit Size 138.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Dipropylene Glycol Methyl	1.340	5.00	0.07	1.00	0.01
Non-solvent LVP	3.500	5.00	0.18	2.00	0.07
Water	0.002	90.00	0.00	97.00	0.00
SUM		100.00		100.00	
Total Cost, $/pound			0.24		0.09
% Cost Diff. Relative to Current Product					-65.00
Total Cost, $/Unit			2.10		0.74
Recurring Costs C.E., $/lb VOC Reduced					-3.96

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 138.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Fabric Protectant
Subcategory: non-aerosol

Typical noncomp: 5
Proposed Limit: 1

Average Unit Size 138.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Dipropylene Glycol Methyl	1.760	5.00	0.09	1.00	0.02
Non-solvent LVP	7.000	5.00	0.35	2.00	0.14
Water	0.002	90.00	0.00	97.00	0.00
SUM		100.00		100.00	
Total Cost, $/pound			0.44		0.16
% Cost Diff. Relative to Current Product					-63.72
Total Cost, $/Unit			3.79		1.38
Recurring Costs C.E., $/lb VOC Reduced					-7.01

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 138.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Fabric Softener-Dryer Product
Subcategory: Non-aerosol

Typical noncomp: 3.5
Proposed Limit: 2.5
(including fragrance)

Average Unit Size: 2.00 wt oz*
0.05 oz/sheet
40 sheets

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Fragrance	5.000	3.50	0.18	2.50	0.13
Inorganics	0.09	2.00	0.00	2.00	0.00
Water	0.002	1.50	0.00	1.50	0.00
Exempts and non-solvent LVPs	3.500	93.00	3.26	94.00	3.29
SUM		100.00		100.00	

Total Cost, $/pound	3.43	3.42
% Cost Diff. Relative to Current Product		-0.44
Total Cost, $/Unit	0.43	0.43
Recurring Costs C.E., $/lb VOC Reduced		-1.50

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 2.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category
*40 sheets with 0.05 ounces per sheet

High Cost

Category: Fabric Softener-Dryer Product
Subcategory: Non-aerosol

Typical noncomp: 3.5
Proposed Limit: 2.5

Average Unit Size: 2.00 wt oz*
0.05 oz/sheet
40 sheets

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Fragrance	10.000	3.50	0.35	2.50	0.25
Inorganics	0.91	2.00	0.02	2.00	0.02
W ter	0.002	1.50	0.00	1.50	0.00
Exempts and non-solvent LVPs	7	93.00	6.51	94.00	6.58
SUM		100.00		100.00	

Total Cost, $/pound	6.88	6.85
% Cost Diff. Relative to Current Product		-0.44
Total Cost, $/Unit	0.86	0.86
Recurring Costs C.E., $/lb VOC Reduced		-3.00

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 2.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Floor maintenance
Subcategory: Liquid

Typical noncomp: 7
Proposed Limit: 1

Average Unit Size 132.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	65.00	0.00	69.00	0.00
Dipropylene Glycol Methyl	1.340	7.00	0.09	1.00	0.01
Diethylene Glycol Monoeth	1.230	5.00	0.06	7.00	0.09
Non-solvent LVP	3.500	23.00	0.81	23.00	0.81
SUM		100.00		100.00	
Total Cost, $/pound			0.96		0.91
% Cost Diff. Relative to Current Product					-5.79
Total Cost, $/Unit			7.93		7.47
Recurring Costs C.E., $/lb VOC Reduced					-0.93

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 132.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Floor maintenance
Subcategory: Liquid

Typical noncomp: 7
Proposed Limit: 1

Average Unit Size 132.00 fl oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	65.00	0.00	69.00	0.00
Dipropylene Glycol Methyl	1.760	7.00	0.12	1.00	0.02
Diethylene Glycol Monoeth	1.300	5.00	0.07	7.00	0.09
Non-solvent LVP	7.000	23.00	1.61	23.00	1.61
SUM		100.00		100.00	
Total Cost, $/pound			1.80		1.72
% Cost Diff. Relative to Current Product					-4.42
Total Cost, $/Unit			14.85		14.19
Recurring Costs C.E., $/lb VOC Reduced					-1.33

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 132.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Wood Floor Wax
Subcategory: Waxes

Typical noncomp: 75
Proposed Limit: 70

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Mineral Spirits	0.540	75.00	0.41	70.00	0.38
Non-solvent LVP	3.500	25.00	0.88	30.00	1.05
SUM		100.00		100.00	

Total Cost, $/pound	1.28	1.43
% Cost Diff. Relative to Current Product		11.56
Total Cost, $/Unit	1.28	1.43
Recurring Costs C.E., $/lb VOC Reduced		2.96

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 16.00 ounce

High Cost

Category: Wood Floor Wax
Subcategory: Waxes

Typical noncomp: 75
Proposed Limit: 70

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Mineral Spirits	0.800	75.00	0.60	70.00	0.56
Non-solvent LVP	7.000	25.00	1.75	30.00	2.10
SUM		100.00		100.00	

Total Cost, $/pound	2.35	2.66
% Cost Diff. Relative to Current Product		13.19
Total Cost, $/Unit	2.35	2.66
Recurring Costs C.E., $/lb VOC Reduced		6.20

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 16.00 ounce

Low Cost

Category: Wood Floor Wax
Subcategory: Liquids

Typical noncomp: 90
Proposed Limit: 70

Average Unit Size 19.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Mineral Spirits	0.540	90.00	0.49	0.00	0.00
Water	0.002	0.00	0.00	60.00	0.00
Diethylene Glycol monoett	1.230	0.00	0.00	10.00	0.12
Non-solvent LVP	3.500	10.00	0.35	30.00	1.05
SUM		100.00		100.00	

Total Cost, $/pound 0.84 1.17

% Cost Diff. Relative to Current Product 40.45

Total Cost, $/Unit 0.99 1.39

Recurring Costs C.E., $/lb VOC Reduced 1.69

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 19.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Wood Floor Wax
Subcategory: Liquids

Typical noncomp: 90
Proposed Limit: 70

Average Unit Size 19.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Mineral Spirits	0.800	90.00	0.72	0.00	0.00
Water	0.002	0.00	0.00	60.00	0.00
Diethylene Glycol monoett	1.300	0.00	0.00	10.00	0.13
Non-solvent LVP	7.000	10.00	0.70	30.00	2.10
SUM		100.00		100.00	

Total Cost, $/pound 1.42 2.23

% Cost Diff. Relative to Current Product 57.13

Total Cost, $/Unit 1.69 2.65

Recurring Costs C.E., $/lb VOC Reduced 4.06

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 19.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Glass Cleaner
Subcategory: Aerosol

Typical noncomp: 12
Proposed Limit: 10

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	87.70	0.00	89.70	0.00
2-Butoxyethanol	1.150	3.50	0.04	3.00	0.03
Isopropyl Alcohol	0.720	3.50	0.03	3.00	0.02
Non-solvent LVP	3.500	0.10	0.00	0.10	0.00
Inorganic	0.090	0.10	0.00	0.10	0.00
Fragrance	5.000	0.10	0.01	0.10	0.01
HC Propellant	0.700	5.00	0.04	4.00	0.03
	SUM	100.00		100.00	

Total Cost, $/pound 0.11 0.09

% Cost Diff. Relative to Current Product -14.72

Total Cost, $/Unit 0.11 0.09

Recurring Costs C.E., $/lb VOC Reduced -0.82

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 16.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Glass Cleaner
Subcategory: Aerosol

Typical noncomp: 12
Proposed Limit: 10

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	87.70	0.00	89.70	0.00
2-Butoxyethanol	1.200	3.50	0.04	3.00	0.04
Isopropyl Alcohol	0.940	3.50	0.03	3.00	0.03
Non-solvent LVP	7.000	0.10	0.01	0.10	0.01
Inorganic	0.910	0.10	0.00	0.10	0.00
Fragrance	10.000	0.10	0.01	0.10	0.01
HC Propellant	1.050	5.00	0.05	4.00	0.04
	SUM	100.00		100.00	

Total Cost, $/pound 0.15 0.13

% Cost Diff. Relative to Current Product -14.39

Total Cost, $/Unit 0.15 0.13

Recurring Costs C.E., $/lb VOC Reduced -1.06

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 16.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Multi-purpose Lubricant - TIER I
Subcategory: Aerosol

Typical noncomp: 50 Average Unit Size 8. 0 wt oz
Proposed Limit: 25

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	0.700	28.00	0.20	22.00	0.15
Petroleum base oil	0.404	28.00	0.11	35.00	0.14
LVP solvent	0.680	19.00	0.13	35.00	0.24
Mineral Spirits	0.540	22.00	0.12	3.00	0.02
Corrosion inhibitor	0.500	3.00	0.02	5.00	0.03
SUM		100.00		100.00	

Total Cost, $/pound	0.57	0.57
% Cost Diff. Relative to Current Product		0.43
Total Cost, $/Unit	0.29	0.29
Recurring Costs C.E., $/lb VOC Reduced		0.01

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 8.00 ounce

High Cost

Category: Multi-purpose Lubricant - TIER I
Subcategory: Aerosol

Typical noncomp: 50 Average Unit Size 8.00 wt oz
Proposed Limit: 25

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	1.050	28.00	0.29	22.00	0.23
Petroleum base oil	0.632	28.00	0.18	35.00	0.22
LVP solvent	0.760	19.00	0.14	35.00	0.27
Mineral Spirits	0.800	22.00	0.18	3.00	0.02
Corrosion inhibitor	2.000	3.00	0.06	5.00	0.10
SUM		100.00		100.00	

Total Cost, $/pound	0.85	0.84
% Cost Diff. Relative to Current Product		-1.08
Total Cost, $/Unit	0.43	0.42
Recurring Costs C.E., $/lb VOC Reduced		-0.04

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 8.00 ounce

Low Cost

Category: Multi-purpose Lubricant - TIER I
Subcategory: non-aerosol

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 110.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Petroleum base oil	0.404	30.00	0.12	40.00	0.16
LVP solvent	0.680	20.00	0.14	35.00	0.24
Mineral Spirits	0.540	50.00	0.27	25.00	0.14
SUM		100.00		100.00	

Total Cost, $/pound	0.53	0.53
% Cost Diff. Relative to Current Product		1.40
Total Cost, $/Unit	3.62	3.68
Recurring Costs C.E., $/lb VOC Reduced		0.03

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 110.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Multi-purpose Lubricant - TIER I
Subcategory: non-aerosol

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 110.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Petroleum base oil	0.632	30.00	0.19	40.00	0.25
LVP solvent	0.760	20.00	0.15	35.00	0.27
Mineral Spirits	0.800	50.00	0.40	25.00	0.20
SUM		100.00		100.00	

Total Cost, $/pound	0.74	0.72
% Cost Diff. Relative to Current Product		-3.07
Total Cost, $/Unit	5.10	4.94
Recurring Costs C.E., $/lb VOC Reduced		-0.09

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 110.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Multi-purpose Lubricant - TIER II
Subcategory: Aerosol

Typical noncomp: 25 Average Unit Size 8.00 wt oz
Proposed Limit: 10

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	0.700	22.00	0.15	0.00	0.00
Petroleum base oil	0.404	35.00	0.14	47.00	0.19
LVP solvent	0.680	35.00	0.24	37.50	0.26
Mineral Spirits	0.540	3.00	0.02	10.00	0.05
Corrosion inhibitor	0.500	5.00	0.03	3.00	0.02
CO2 Propellant	0.270	0		2.5	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.57	0.52
% Cost Diff. Relative to Current Product		-9.39
Total Cost, $/Unit	0.29	0.26
Recurring Costs C.E., $/lb VOC Reduced		-0.36

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 8.00 ounce

High Cost

Category: Multi-purpose Lubricant - TIER II
Subcategory: Aerosol

Typical noncomp: 25 Average Unit Size 8.00 wt oz
Proposed Limit: 10

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	1.050	22.00	0.23	0.00	0.00
Petroleum base oil	0.632	35.00	0.22	47.00	0.30
LVP solvent	0.760	35.00	0.27	37.50	0.29
Mineral Spirits	0.800	3.00	0.02	10.00	0.08
Corrosion inhibitor	2.000	5.00	0.10	3.00	0.06
CO2 Propellant	0.270	0		2.5	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.84	0.73
% Cost Diff. Relative to Current Product		-13.47
Total Cost, $/Unit	0.42	0.36
Recurring Costs C.E., $/lb VOC Reduced		-0.76

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 8.00 ounce

Low Cost

Category: Multi-purpose Lubricant - TIER II
Subcategory: non-aerosol

Typical noncomp: 25
Proposed Limit: 10

Average Unit Size 110.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Petroleum base oil	0.404	40.00	0.16	45.00	0.18
LVP solvent	0.680	35.00	0.24	45.00	0.31
Mineral Spirits	0.540	25.00	0.14	10.00	0.05
SUM		100.00		100.00	

Total Cost, $/pound	0.53	0.54
% Cost Diff. Relative to Current Product		1.35
Total Cost, $/Unit	3.68	3.72
Recurring Costs C.E., $/lb VOC Reduced		0.05

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 110.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Multi-purpose Lubricant - TIER II
Subcategory: non-aerosol

Typical noncomp: 25
Proposed Limit: 10

Average Unit Size 110.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Petroleum base oil	0.632	40.00	0.25	45.00	0.28
LVP solvent	0.760	35.00	0.27	45.00	0.34
Mineral Spirits	0.800	25.00	0.20	10.00	0.08
SUM		100.00		100.00	

Total Cost, $/pound	0.72	0.71
% Cost Diff. Relative to Current Product		-1.73
Total Cost, $/Unit	4.94	4.86
Recurring Costs C.E., $/lb VOC Reduced		-0.08

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 110.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Odor Eliminator/Remover
Subcategory: non-aerosol

Typical noncomp: 9
Proposed Limit: 6

Average Unit Size 130.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	83.50	0.00	86.50	0.00
Isopropyl Alcohol	0.720	5.00	0.04	3.00	0.02
VOC Glycol Ether	1.150	3.00	0.03	3.00	0.03
Solvent LVP	0.680	5.00	0.03	5.00	0.03
Fragrance	5.000	3.00	0.15	2.00	0.10
Inorganics	0.09	0.5	0.00	0.5	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.26	0.19
% Cost Diff. Relative to Current Product		-25.07
Total Cost, $/Unit	2.09	1.56
Recurring Costs C.E., $/lb VOC Reduced		-2.14

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 130.00 ounce

High Cost

Category: Odor Eliminator/Remover
Subcategory: non-aerosol

Typical noncomp: 9
Proposed Limit: 6

Average Unit Size 130.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	83.50	0.00	86.50	0.00
Isopropyl Alcohol	0.940	5.00	0.05	3.00	0.03
VOC Glycol Ether	1.200	3.00	0.04	3.00	0.04
Solvent LVP	0.760	5.00	0.04	5.00	0.04
Fragrance	10.000	3.00	0.30	2.00	0.20
Inorganics	0.91	0.5	0.00	0.5	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.43	0.31
% Cost Diff. Relative to Current Product		-27.79
Total Cost, $/Unit	3.47	2.51
Recurring Costs C.E., $/lb VOC Reduced		-3.96

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 130.00 ounce

Low Cost

Category: Penetrant
Subcategory: Aerosol

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 12.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC propellant	0.700	20.00	0.14	0.00	0.00
Petroleum base oil	0.404	13.00	0.05	29.00	0.12
LVP Solvent	0.680	32.00	0.22	41.00	0.28
Hydrocarbon solvent	0.540	30.00	0.16	25.00	0.14
Corrosion inhibitor	0.500	5.00	0.03	2.00	0.01
CO2 Propellant	0.270	0	0.00	3	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.60	0.55
% Cost Diff. Relative to Current Product		-8.05
Total Cost, $/Unit	0.45	0.41
Recurring Costs C.E., $/lb VOC Reduced		-0.19

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 12.00 ounce

High Cost

Category: Penetrant
Subcategory: Aerosol

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 12.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC propellant	1.050	20.00	0.21	0.00	0.00
Petroleum base oil	0.632	13.00	0.08	29.00	0.18
LVP Solvent	0.760	32.00	0.24	41.00	0.31
Hydrocarbon solvent	0.800	30.00	0.24	25.00	0.20
Corrosion inhibitor	2.000	5.00	0.10	2.00	0.04
CO2 Propellant	0.270	0	0.00	3	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.88	0.74
% Cost Diff. Relative to Current Product		-15.12
Total Cost, $/Unit	0.66	0.56
Recurring Costs C.E., $/lb VOC Reduced		-0.53

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 12.00 ounce

Low Cost

Category: Penetrant
Subcategory: non-aerosol

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 110.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Petroleum base oil	0.404	12.00	0.05	25.00	0.10
LVP solvent	0.680	38.00	0.26	50.00	0.34
HC solvent	0.540	50.00	0.27	25.00	0.14
SUM		100.00		100.00	

Total Cost, $/pound	0.58	0.58
% Cost Diff. Relative to Current Product		-0.15
Total Cost, $/Unit	3.97	3.96
Recurring Costs C.E., $/lb VOC Reduced		0.00

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 110.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Penetrant
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 25

Average Unit Size 110.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Petroleum base oil	0.632	12.00	0.08	25.00	0.16
LVP solvent	0.760	38.00	0.29	50.00	0.38
HC solvent	0.800	50.00	0.40	25.00	0.20
SUM		100.00		100.00	

Total Cost, $/pound	0.76	0.74
% Cost Diff. Relative to Current Product		-3.48
Total Cost, $/Unit	5.26	5.07
Recurring Costs C.E., $/lb VOC Reduced		-2.66

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 110.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Pressurized Gas Duster
Subcategory: aerosol

Typical noncomp: 1
Proposed Limit: 1

Average Unit Size 10.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HFC-134a	2.000	100.00	2.00	0.00	0.00
HFC-152a	1.770	0.00	0.00	99.00	1.75
Bittering Agent	3.500	0.00	0.00	1.00	0.04
SUM		100.00		100.00	

Total Cost, $/pound 2.00 1.79

% Cost Diff. Relative to Current Product -10.64

Total Cost, $/Unit 1.25 1.12

Recurring Costs C.E., $/metric ton CO_2e Reduced 0.00

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 10.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Pressurized Gas Duster
Subcategory: aerosol

Typical noncomp: 1
Proposed Limit: 1

Average Unit Size 10.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HFC-134a	3.500	100.00	3.50	0.00	0.00
HFC-152a	1.770	0.00	0.00	99.00	1.75
Bittering Agent	7.000	0.00	0.00	1.00	0.07
SUM		100.00		100.00	

Total Cost, $/pound 3.50 1.82

% Cost Diff. Relative to Current Product -47.93

Total Cost, $/Unit 2.19 1.14

Recurring Costs C.E., $/metric ton CO2e Reduced -2.66

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 10.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Spot Remover
Subcategory: Aerosol

Typical noncomp: 25
Proposed Limit: 15

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	0.700	10.00	0.07	5.00	0.04
2-Butoxyethanol	1.150	10.00	0.12	5.00	0.06
Isopropyl Alcohol	0.720	5.00	0.04	5.00	0.04
LVP Glycol Ether	1.150	5.00	0.06	5.00	0.06
Solvent LVP	0.680	1.00	0.01	3.00	0.02
Inorganics	0.090	2	0.00	2	0.00
Water	0.002	67	0.00	75	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.29	0.21
% Cost Diff. Relative to Current Product		-27.30
Total Cost, $/Unit	0.32	0.24
Recurring Costs C.E., $/lb VOC Reduced		-0.79

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 18.00 ounce

High Cost

Category: Spot Remover
Subcategory: Aerosol

Typical noncomp: 25
Proposed Limit: 15

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
HC Propellant	1.050	10.00	0.11	5.00	0.05
2-Butoxyethanol	1.200	10.00	0.12	5.00	0.06
Isopropyl Alcohol	0.940	5.00	0.05	5.00	0.05
LVP Glycol Ether	1.760	5.00	0.09	5.00	0.09
Solvent LVP	0.760	1.00	0.01	3.00	0.02
Inorganics	0.910	2	0.02	2	0.02
Water	0.002	67	0.00	75	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.39	0.29
% Cost Diff. Relative to Current Product		-25.09
Total Cost, $/Unit	0.44	0.33
Recurring Costs C.E., $/lb VOC Reduced		-0.97

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 18.00 ounce

Low Cost

Category: Spot Remover
Subcategory: non-aerosol

Typical noncomp: 8
Proposed Limit: 3

Average Unit Size 138.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.150	4.00	0.05	3.00	0.03
Isopropyl Alcohol	0.720	4.00	0.03	0.00	0.00
Solvent LVP	0.680	1.00	0.01	5.00	0.03
Inorganics	0.090	5.00	0.00	3.00	0.00
Water	0.002	86.00	0.00	89.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.09	0.07
% Cost Diff. Relative to Current Product		-16.90
Total Cost, $/Unit	0.76	0.63
Recurring Costs C.E., $/lb VOC Reduced		-0.30

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 138.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Spot Remover
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 3

Average Unit Size 138.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.200	4.00	0.05	3.00	0.04
Isopropyl Alcohol	0.940	4.00	0.04	0.00	0.00
Solvent LVP	0.760	1.00	0.01	5.00	0.04
Inorganics	0.910	5.00	0.05	3.00	0.03
Water	0.002	86.00	0.00	89.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.14	0.10
% Cost Diff. Relative to Current Product		-26.59
Total Cost, $/Unit	1.21	0.89
Recurring Costs C.E., $/lb VOC Reduced		-0.16

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 138.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Astringents & Toner
Subcategory: liquid

Average Unit Size 8.00 wt oz

Typical noncomp: 48.5
Proposed Limit: 35

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.457	48.50	0.22	33.00	0.15
Solvent LVP	0.680	1.00	0.01	1.00	0.01
Water	0.002	49.00	0.00	57.00	0.00
Fragrance	5.000	0.50	0.03	0.50	0.03
LVP Glycols	0.620	1.00	0.00	8.50	0.05
SUM		100.00		100.00	

Total Cost, $/pound	0.25	0.24
% Cost Diff. Relative to Current Product		-7.06
Total Cost, $/Unit	0.13	0.12
Recurring Costs C.E., $/lb VOC Reduced		-0.13

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 8.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Astringents & Toner
Subcategory: liquid

Average Unit Size 8.00 wt oz

Typical noncomp: 48.5
Proposed Limit: 35

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.510	48.50	0.25	33.00	0.17
Solvent LVP	0.760	1.00	0.01	1.00	0.01
Water	0.002	49.00	0.00	57.00	0.00
Fragrance	10.000	0.50	0.05	0.50	0.05
LVP Glycols	0.960	1.00	0.01	8.50	0.08
SUM		100.00		100.00	

Total Cost, $/pound	0.32	0.31
% Cost Diff. Relative to Current Product		-2.18
Total Cost, $/Unit	0.16	0.15
Recurring Costs C.E., $/lb VOC Reduced		-0.05

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 8.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Low Cost

Category: Personal Fragrance
Subcategory: Aerosol

Typical noncomp: 80
Proposed Limit: 75

Average Unit Size 3.50 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Non-solvent LVP	3.500	7.00	0.25	9.00	0.32
Alcohol	0.457	50.00	0.23	50.00	0.23
HC Propellant	0.700	30.00	0.21	25.00	0.18
Fragrance	5.000	5.00	0.25	4.00	0.20
Inorganics	0.090	2.00	0.00	2.00	0.00
Water	0.002	6	0.00	10	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.94	0.92
% Cost Diff. Relative to Current Product		-1.60
Total Cost, $/Unit	0.20	0.20
Recurring Costs C.E., $/lb VOC Reduced		-0.30

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 3.50 ounce

High Cost

Category: Personal Fragrance
Subcategory: Aerosol

Typical noncomp: 80
Proposed Limit: 75

Average Unit Size 3.50 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Non-solvent LVP	7.000	7.00	0.49	9.00	0.63
Alcohol	0.940	50.00	0.47	50.00	0.47
HC Propellant	1.050	30.00	0.32	25.00	0.26
Fragrance	10.000	5.00	0.50	4.00	0.40
Inorganics	0.910	2.00	0.02	2.00	0.02
Water	0.002	6	0.00	10	0.00
SUM		100.00		100.00	

Total Cost, $/pound	1.79	1.78
% Cost Diff. Relative to Current Product		-0.69
Total Cost, $/Unit	0.39	0.39
Recurring Costs C.E., $/lb VOC Reduced		-0.25

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 3.50 ounce

Low Cost

Category: Personal Fragrance
Subcategory: non-aerosol

Typical noncomp: 80
Proposed Limit: 75

Average Unit Size 3.50 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Non-solvent LVP	3.500	0.50	0.02	0.50	0.02
Alcohol	0.457	80.00	0.37	75.00	0.34
Fragrance	5.000	15.00	0.75	15.00	0.75
Inorganics	0.090	0.50	0.00	0.50	0.00
Water	0.002	4.00	0.00	9.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	1.13	1.11
% Cost Diff. Relative to Current Product		-2.01
Total Cost, $/Unit	0.25	0.24
Recurring Costs C.E., $/lb VOC Reduced		-0.46

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 3.50 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Personal Fragrance
Subcategory: non-aerosol

Typical noncomp: 80
Proposed Limit: 75

Average Unit Size 3.50 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Non-solvent LVP	7.000	0.50	0.04	0.50	0.04
Alcohol	0.940	80.00	0.75	75.00	0.71
Fragrance	10.000	15.00	1.50	15.00	1.50
Inorganics	0.910	0.50	0.00	0.50	0.00
Water	0.002	4.00	0.00	9.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	2.29	2.24
% Cost Diff. Relative to Current Product		-2.05
Total Cost, $/Unit	0.50	0.49
Recurring Costs C.E., $/lb VOC Reduced		-0.94

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 3.50 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

Appendix E

Acronyms Used in This Report

Acronyms Used in This Report

2003 Survey	2003 Consumer & Commercial Products Survey
AB	Assembly Bill
ACP	Alternative Control Plan
Act	California Clean Air Act
APA	Administrative Procedures Act
ARB	Air Resources Board
Board	Air Resources Board
Cal/EPA	California Environmental Protection Agency
CCAA	California Clean Air Act
CCR	California Code of Regulations
CE	Cost-effectiveness
CEQA	The California Environmental Quality Act
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalents
CPRWG	Consumer Products Regulation Workgroup
CRF	Capitol Recovery Factor
et seq.	et sequens; following
FAR	Fourth Assessment Report
FMA	Fragrance Materials Association
GHG	Greenhouse Gas
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HFE	Hydrofluoroether
IPCC	Intergovernmental Panel on Climate Change
IPP	Innovative Product Provision
kg	Kilogram

LVP-VOC	Low Vapor Pressure Volatile Organic Compound
MeCl	Methylene Chloride
MIR	Maximum Incremental Reactivity
MMT CO_2e	Million metric tons of Carbon Dioxide equivalents
MT CO_2e	Metric tons of Carbon Dioxide equivalents
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
op. cit.	opere citato; from the cited work
Perc	Perchloroethylene
PFC	Perfluorocarbon
PIA	Prison Industry Authority
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter 2.5 micrometers in diameter
ppm	Parts Per Million
REL	Recommended Exposure Limit
ROE	Return On Owner's Equity
RTU	Ready To Use
SAR	Second Assessment Report
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
Strategy	State Strategy for California's 2007 State Implementation Plan
SUV	Sport Utility Vehicle
TAC	Toxic Air Contaminant
TCE	Trichloroethylene
URF	Unit Risk Factor
U.S. EPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile Organic Compound

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER THE APPROVAL OF THE 2008 VENTURA COUNTY AND WESTERN MOJAVE DESERT 8-HOUR OZONE ATTAINMENT PLANS

The Air Resources Board (the Board or ARB) will conduct a public hearing at the time and place noted below to consider the approval of the 2008 Ventura County and Western Mojave Desert 8-Hour Ozone Attainment Plans. If adopted, ARB will submit these plans to the United States Environmental Protection Agency for approval as revisions to the California State Implementation Plan.

DATE: June 26, 2008

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This item will be considered at a one-day meeting of the Board, which will commence at 9:00 a.m., Thursday, June 26, 2008. Please consult the agenda for the meeting, which will be available at least 10 days before June 26, 2008, to determine the order in which the items will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at 916-323-7053.

Background

The federal Clean Air Act (the Act) establishes planning requirements for areas that exceed the health-based National Ambient Air Quality Standards. These nonattainment areas must develop a State Implementation Plan (SIP) that demonstrates how they will attain the standards by specified dates. In July 1997, the United States Environmental Protection Agency (U.S. EPA) promulgated a new 8-hour ozone standard for ground-level ozone. Ventura County and the Western Mojave Desert are among the 8-hour ozone nonattainment areas in California. The Western Mojave Desert area as defined by U.S. EPA includes the desert portion of Los Angeles County, which is under the jurisdiction of the Antelope Valley Air Quality Management District, and the

southwestern portion of San Bernardino County, which is under the jurisdiction of the Mojave Desert Air Quality Management District.

U.S. EPA classified the Ventura County and the Western Mojave Desert as moderate 8-hour ozone non-attainment areas, with an attainment deadline of 2010. The Ventura County Air Pollution Control District has requested re-classification to "serious." On May 13, 2008, the Ventura County Air Pollution District adopted a plan demonstrating attainment by the serious attainment deadline of 2013. The Mojave Desert and Antelope Valley local air districts have requested re-classification of the Western Mojave Desert to "severe-17." On May 20, 2008, the Antelope Valley Air Quality Management District adopted a plan demonstrating attainment by the severe-17 attainment deadline of 2021. On June 9, 2008, the Mojave Desert Air Quality Management District adopted a plan also demonstrating attainment by the severe-17 attainment deadline of 2021. Each plan includes air quality modeling and weight of evidence analyses supporting the reclassification request and the attainment demonstration, as well as the control strategy, conformity budgets and reasonable further progress (RFP) demonstrations required by the Act.

The Ventura and Western Mojave Desert planning areas are downwind of the South Coast Air Basin. ARB staff analysis indicates that ozone and ozone precursors transported from the South Coast Air Basin contribute to high ozone levels in these downwind areas during the summer ozone season. Air quality modeling indicates that emission reductions in the South Coast Air Basin are needed to ensure attainment in both the Ventura and Western Mojave Desert areas. The State has submitted SIP revisions for the South Coast Air Basin that include commitments to achieve the emission reductions needed to attain the PM2.5 standard in 2014, and the ozone standard in 2023. Attainment and RFP demonstrations for both Ventura and the Western Mojave Desert rely in part on reductions projected to occur in the South Coast Air Basin as a result of existing control programs, as provided for in U.S. EPA guidance, but are not dependent on new strategies identified in the 2007 South Coast Air Quality Management Plan or the 2007 State Strategy.

Proposed Action

ARB staff has reviewed both the Ventura County and Western Mojave Desert proposed 2008 Plans. Staff concurs that the Ventura County plan demonstrates attainment of the 8-hour ozone standard by June 2013. Staff also concurs that the Western Mojave Desert plan demonstrates attainment of the 8-hour ozone standard by June 2021. ARB staff recommends that the Board approve the locally adopted 2008 Ventura County and Western Mojave Desert 8-Hour Ozone Attainment Plans, and directs the Executive Officer to submit the plans to the U.S. EPA as revisions to the California SIP.

ARB staff will present a written Staff Report at the meeting. Copies of the report may be obtained from the Board's Public Information Office, 1001 "I" Street, 1st Floor, Environmental Services Center, Sacramento, CA 95814, (916) 322-2990, on June 12, 2008. The report may also be obtained from ARB's internet site at

http://www.arb.ca.gov/planning/sip/sip.htm.

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by email before the meeting. To be considered by the Board, written comments submissions not physically submitted at the meeting must be received **no later than 12:00 noon, Wednesday, June 25, 2008,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Facsimile submittal: (916) 322-3928

The Board requests, but does not require 30 copies of any written submission. Also, ARB requests that written and email statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment. Further inquiries regarding this matter should be directed to Ms. Andrea Juarez, Air Pollution Specialist, (916) 324-2821, 1001 "I" Street, P.O. Box 2815, Sacramento, California 95812, or via email at ajuarez@arb.ca.gov.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: June 12, 2008

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website at www.arb.ca.gov.

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER A REPORT ON PROGRESS TOWARDS THE APRIL 2009 DEADLINE FOR ENHANCED VAPOR RECOVERY PHASE II SYSTEMS

The Air Resources Board (Board or ARB) will conduct a public meeting at the time and place noted below to consider a staff update on the implementation of the Enhanced Vapor Recovery (EVR) program, including progress towards meeting the April 1, 2009, deadline for installation of EVR Phase II systems.

DATE: June 26, 2008

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, CA 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., June 26, 2008, and may continue at 8:30 a.m., June 27, 2008. This item may not be considered until June 27, 2008. Please consult the agenda for the meeting, which will be available at least 10 days before June 26, 2008, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

The EVR program requires gasoline dispensing facilities (GDF) to upgrade vapor recovery equipment to meet several technology-forcing standards. The EVR requirements are being phased in from 2001 to 2010. The next EVR upgrade for Phase II vapor recovery, which affects approximately 12,000 GDFs, must be completed by April 1, 2009. Several GDF operators and gasoline marketers' associations have requested an extension of the April 2009 compliance date. In response to the requested extension, ARB staff has determined that sufficient EVR equipment and contractors are available to meet the deadline and has recommended that the deadline be maintained.

The ARB staff's written findings are presented in a report: "Progress Towards April 2009 Deadline for Enhanced Vapor Recovery Phase II Systems." Copies of the report

may be obtained from the Board's Public Information Office, 1001 "I" Street, 1st Floor, Environmental Services Center, Sacramento, CA 95814, (916) 322-2990. The report may also be obtained from ARB's internet site at http://www.arb.ca.gov/vapor/vapor.htm.

At the Board meeting, ARB staff will summarize the written report's findings in an oral presentation to the Board. Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, June 25, 2008,** and addressed to the following:

Postal mail:	Clerk of the Board, Air Resources Board 1001 I Street, Sacramento, California 95814
Electronic submittal:	http://www.arb.ca.gov/lispub/comm/bclist.php
Facsimile submittal:	(916) 322-3928

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require 30 copies of any written submission. Also, the ARB requests that written and e-mail statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment. Further inquiries regarding this matter should be directed to Cindy Castronovo, Staff Air Pollution Specialist, at (916) 322-8957 or ccastron@arb.ca.gov.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: June 5, 2008

State of California
California Environmental Protection Agency

AIR RESOURCES BOARD

STAFF REPORT

PROGRESS TOWARDS APRIL 2009 DEADLINE FOR ENHANCED VAPOR RECOVERY PHASE II SYSTEMS

APRIL 2008

Prepared by Monitoring and Laboratory Division

This report has been reviewed by the staff of the California Air Resources Board. Publication does not signify that the contents necessarily reflect the views and policies of the Air Resources Board.

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APPENDICES

1. August 30, 2007, and February 28, 2008 letters from Jay McKeeman of California Independent Oil Marketers Association (CIOMA) to Mary Nichols, ARB Chairman

2. Advisory 373: Enhanced Vapor Recovery (EVR) Update and Penalties for April 2009 Deadline

3. November 12, 2007, letter from Doug Quetin, President of California Air Pollution Control Officers Association (CAPCOA) to James Goldstene, ARB Executive Officer

4. November 15, 2007, letter from William Spurgeon of Shell Oil Products US to Mary Nichols, ARB Chairman

5. March 26, 2008, letter from William Loscutoff, Chief, ARB Monitoring and Laboratory Division to All Local Air District Air Pollution Control Officers

6. Form to Report that Vapor Recovery System or Installer is Not Available to Meet Rule or Construction Deadline for this Gasoline Dispensing Facility

7. EVR Brochure: Enhanced Vapor Recovery (EVR) and the April 2009 Phase II Deadline

8. Contract No. 07-528: Final Report from Norm Covell

9. Contract No. 07-529: Final Report from Mel Knight

10. February 20, 2008, letter from James Goldstene, ARB Executive Officer to All Local Air District Air Pollution Control Officers

EXECUTIVE SUMMARY

The Enhanced Vapor Recovery (EVR) program requires gasoline dispensing facilities (GDFs) to upgrade equipment to meet several technology-forcing standards. The EVR regulations were adopted in March 2000 and are identified as a required measure in the 1999 settlement of a lawsuit challenging implementation of the 1994 State Implementation Plan (SIP). Emission reductions from EVR vapor recovery systems will total 372 tons/day of reactive organic gases (ROG) statewide once fully implemented.

The EVR requirements are being phased in from 2001 to 2010. Two major equipment upgrades occurred in 2005 and 2006. The next EVR upgrade for Phase II vapor recovery affecting approximately 12,000 GDFs must be completed by April 1, 2009. This report discusses progress made so far in implementing EVR Phase II, as well as potential barriers towards compliance with the April 2009 deadline.

Several GDF operators and gasoline marketers' associations have requested an extension of the April 2009 compliance date. Staff's analysis indicates that EVR equipment and contractor resources are available now to meet the deadline.

Staff recommends holding firm on the April 1, 2009 deadline. This status report discusses ARB staff and air district efforts already in place to expedite implementation as well as recommended actions for the next 11 months.

I. OVERVIEW

A. Introduction

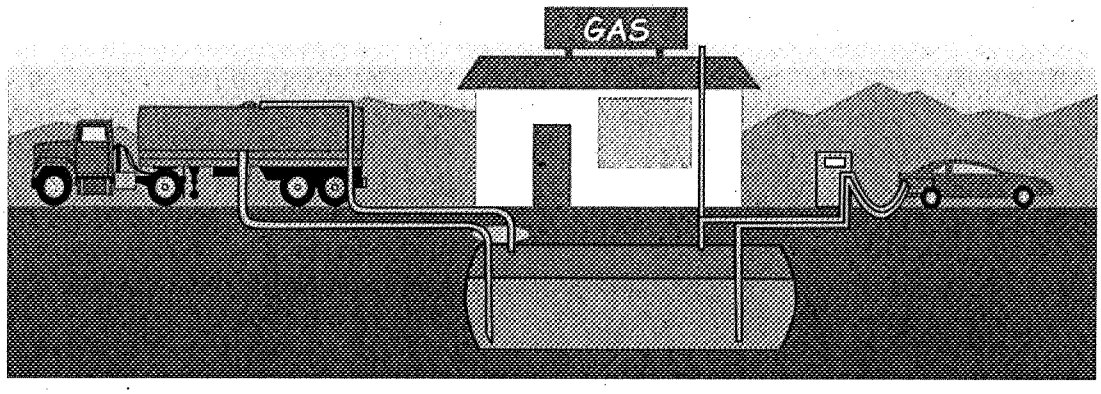
In March of 2000, the Air Resources Board (ARB or Board) approved the Enhanced Vapor Recovery (EVR) regulation amendments. The regulations established new standards for vapor recovery systems to reduce emissions during storage and transfer of gasoline at gasoline dispensing facilities (GDFs or service stations). The EVR requirements are being phased in from 2001 to 2010.

This report provides staff's assessment of progress toward meeting the Phase II EVR deadline of April 1, 2009. This update was requested by ARB Chairman Mary Nichols in response to several letters from gasoline marketers and associations in summer and fall of 2007 requesting a delay in the compliance date. An example is the letter from Jay McKeeman of the California Independent Oil Marketers Association dated August 30, 2007 (Appendix 1).

B. Vapor Recovery at Service Stations

Gasoline vapor emissions are controlled during two types of gasoline transfer. Phase I vapor recovery collects vapors when a tanker truck fills the service station's underground tank. Phase II vapor recovery collects vapors during vehicle refueling. Phase I and Phase II vapor recovery equipment also help control emissions from gasoline storage at service stations. Phase I and Phase II vapor recovery systems have been installed in most California GDFs for over 20 years. Systems that have not been certified to the meet the EVR standards are referred to as "pre-EVR" vapor recovery systems.

Figure 1
Phase I and Phase II Vapor Recovery



Phase I Phase II

The ARB and districts have shared implementation of the vapor recovery program since the 1970s. ARB staff certifies prototype Phase I and Phase II vapor recovery systems installed at operating station test sites. District rules and state law require that only ARB-certified systems be installed. District staff issues permits to service stations and requires the vapor recovery system to be tested upon installation. District staff also conducts regular inspections to check that these systems are operating as certified.

The vapor recovery requirements affect a multitude of stakeholders. These include the vapor recovery equipment manufacturers, gasoline marketers who purchase this equipment, contractors who install and maintain vapor recovery systems and air pollution control districts who enforce vapor recovery rules. In addition, California-certified systems are required by most other states and many countries.

C. Enhanced Vapor Recovery Regulation

Petroleum marketing operations are one of the largest stationary source categories of reactive organic gases (ROG) emissions. Pre-EVR vapor recovery systems are responsible for 347 tons/day of 2010 ROG emission reductions statewide. The EVR amendments to the vapor recovery program provide additional emission reductions of 25 tons/day for a total of 372 tons/day. This translates into gasoline savings of 120,000 gallons/day and cost savings of $420,000/day (assuming gasoline price of $3.50 per gallon).

In addition to emission reductions, EVR provides the following benefits:

a. Improved equipment reliability due to more stringent certification tests.
b. "Dripless nozzles" that reduce spillage by more than 50 percent.
c. Control of fugitive emissions during gasoline storage.
d. Compatibility with vapor recovery systems on newer vehicles (ORVR).
e. Vapor recovery system monitoring via in-station diagnostics (ISD).

D. Past EVR Deadlines

The EVR requirements are being phased in over several years, and have already resulted in two equipment upgrades of service station equipment.

1. Phase I Upgrade

All stations (except those in ozone attainment areas) were required to upgrade to EVR Phase I systems by April 2005. The equipment involved in the Phase I EVR modifications were the fittings where the cargo tanks connect to the station's underground storage tank (UST), as well as the vent valve on the UST vent pipe. These components were already present for the pre-EVR systems, and thus the

Phase I EVR upgrades involved installing EVR versions of these components. The cost for the Phase I upgrade was typically around $6,000.

2. Onboard Refueling Vapor Recovery (ORVR) Compatibility Upgrade

The federal Clean Air Act Amendments included provisions to install vapor recovery systems on vehicles. ORVR systems initiated in the 1998 vehicle model year, and were phased-in for most gasoline powered vehicles by the 2006 model year. In an ORVR vehicle, refueling vapor emissions are captured on the vehicle carbon canister, rather than being routed through the fillneck to the vapor recovery nozzle. ARB field studies conducted in 1999 verified that fueling ORVR vehicles with certain types of Phase II vapor recovery systems would lead to excess emissions. One of the primary EVR standards requires EVR Phase II systems to be "compatible" or cause no excess emissions when fueling ORVR vehicles.

In November 2004, the Board approved extensions to the ORVR compatibility deadlines. The reason for more time was to wait for certification of a Phase II system that met all of the EVR Phase II requirements, not just the ORVR compatibility standard. This would avoid the need to upgrade Phase II systems twice.

Although one EVR Phase II system was certified in May 2005, very few GDFs installed the EVR Phase II system to meet ORVR compatibility deadlines. Most GDF operators chose to do the "two-step" upgrade, and wait to see what other EVR Phase II systems might be certified before the April 2009 deadline.

Almost all GDFs complied by switching from an "assist" system which has a vapor pump in each dispenser to a pre-EVR "balance" Phase II system, which does not have a dispenser vapor pump. The October 1, 2004 staff report for the November 2004 ORVR compatibility schedule amendments estimated equipment and installation costs to convert a six dispenser non-compatible assist system to a compatible pre-EVR balance system to be $16,000. Staff estimated a second upgrade of the pre-EVR balance system to meet EVR Phase II and ISD in the range of $22,800 to $34,800. Thus the total cost of two upgrades was estimated to be $38,800 to $50,800. The one-step upgrade to an EVR Phase II and ISD system was estimated at $40,700.

After the completion of the ORVR compatibility upgrade, about 90% of the GDFs in California were operating with a pre-EVR balance system.

II. EVR PHASE II IMPLEMENTATION STATUS

The final phase of EVR requires that most stations upgrade to EVR Phase II systems by April 2009 and in-station diagnostics (ISD) by September 2009. The EVR Phase II upgrade requires different gasoline dispenser equipment and

installation of a pressure management device. ISD installation involves placement of sensors in the dispensers and conduit to the monitor console. Lower-throughput stations have until September 2010 to install ISD. Staff expects most stations subject to ISD requirements will install ISD at the same time as the EVR Phase II upgrade to avoid two cycles of permitting and minimize costs.

For the last several years, staff has estimated that there are 13,000 GDFs subject to EVR Phase II vapor recovery. More recent data collected from the air districts shows this number to be about 12,000. The number of GDFs subject to EVR Phase II in each district is provided in Table 1.

Table 1
Number of Gasoline Dispensing Facilities Subject to EVR Phase II Requirements

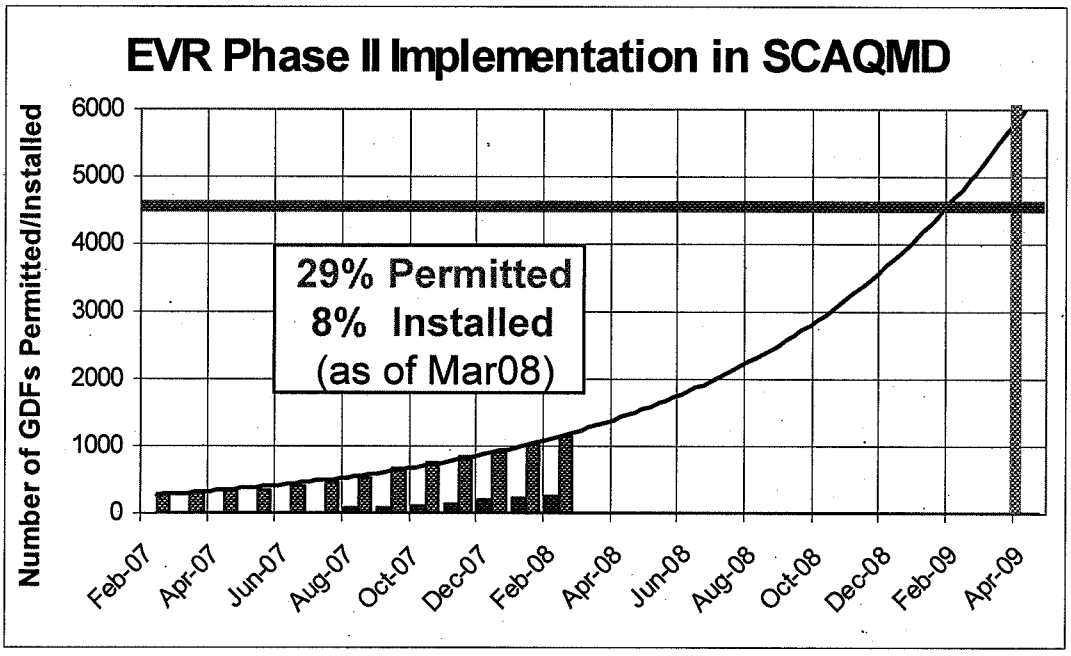
Air District	Number of GDFs	Percentage
So. Coast	4500	39.1%
Bay Area	2078	18.1%
San Joaquin	1828	15.9%
San Diego	843	7.3%
Sacramento	399	3.5%
Monterey	300	2.6%
Ventura	236	2.1%
Mojave Desert	223	1.9%
Santa Barbara	181	1.6%
Placer	180	1.5%
Yolo-Solano	138	1.2%
Antelope Valley	119	1.0%
Kern	86	0.7%
Butte	85	0.7%
No. Sierra	76	0.7%
Imperial	75	0.7%
El Dorado	65	0.6%
Feather River	64	0.6%
Tehama	37	0.3%
Great Basin	35	0.3%
Tuolumne	29	0.3%
Amador	28	0.2%
No. Sonoma	21	0.2%
Glenn	19	0.2%
Mariposa	15	0.1%
Colusa	14	0.1%
Calaveras	3	0.0%
Lassen	1	0.0%
Modoc	NA	
Shasta	NA	
TOTAL	**11,678**	100%

Note that the three air districts that are compliant with the state ozone standard are exempt from the Phase II and ISD requirements for GDFs installed prior to April 2005. New stations and stations undergoing major modifications must meet EVR requirements. These three air districts are Lake County, Mendocino County and North Coast Unified.

Also, districts that have recently been designated as non-attainment have until November 2010 to meet EVR deadlines. These districts are Siskiyou County, Northern Sonoma and San Luis Obispo.

As can be seen, the majority of the GDFs are located in the South Coast Air Quality Management District (SCAQMD). The SCAQMD staff has provided monthly updates on the number of stations in the EVR Phase II permit process and the number of completed EVR Phase II installations since February 2007. The SCAQMD has 4500 GDFs subject to EVR Phase II requirements. As illustrated in Figure 1 below, as of the end of March 2008, 29% of the total GDFs in the SCAQMD have been issued an authority to construct to install an EVR Phase II system, and 8% are now operating with an EVR Phase II system.

Figure 2



III. POTENTIAL BARRIERS TO MEETING APRIL 2009 DEADLINE AND ACTIONS TO ADDRESS THESE BARRIERS

A. Station Operators Waiting for Additional EVR Options

The first EVR Phase II system was certified in 2005. There are several reasons why many GDF operators have waited to start the process for the EVR Phase II upgrade. These include waiting for additional EVR Phase II systems to be certified, especially a balance system with ISD. In addition, station operators believe there is still plenty of time to get these upgrades started, or if there isn't, then ARB will extend the deadline. More discussion on each of these points is provided below.

1. Waiting for an EVR Phase II balance system with ISD option

As mentioned earlier, equipment changes associated with ORVR compatibility compliance in 2006 resulted in approximately 90 percent balance Phase II systems statewide. Many station operators prefer balance systems as they do not have the dispenser vapor pumps associated with assist systems and thus are viewed as lower maintenance and less costly systems. Although the first EVR Phase II system – the Healy assist system - was certified in 2005, most station owners preferred to do "stepwise" compliance, assuming that a balance EVR Phase II system would be cheaper in the long run.

Although several EVR balance vapor recovery certification applications have been submitted over the last few years, the first EVR Phase II balance system, manufactured by Vapor Systems Technologies (VST), was not certified until November 5, 2007. This first VST certification did not include the ISD option. The VST EVR balance system with ISD was recently certified on April 1, 2008. Thus staff expects that many stations that have been waiting for the balance system with ISD option will now initiate the EVR Phase II upgrade process.

2. Waiting for additional EVR systems to be certified

Equipment manufacturers who are still seeking EVR Phase II system certifications have been touting their proposed systems at trade shows, through product literature, and via their distribution channels. The story told is that the ARB certification for their system is just around the corner, and station owners should wait until their new, better and cheaper system is available.

ARB staff has worked tirelessly with these manufacturers to get their equipment into test stations and begin certification testing. The certification operational test is a minimum of 180 days as provided in ARB's regulations. Unfortunately, many systems have had their certification tests terminated due to failure to meet EVR standards. ARB staff continues to work with these manufacturers, but due to the

time involved in the certification process, there will not be a third EVR Phase II system certified until at least 4th quarter 2008.

3. Thinking there is still plenty of time to complete the upgrade

Station owners who have gone through the two previous vapor recovery equipment upgrades may think they have plenty of time to initiate and complete the EVR Phase II upgrade by April 2009. Experience with installations thus far shows that the EVR Phase II upgrade is more complex and lengthy for several reasons, mostly related to the installation and permitting of the pressure management unit or vapor processor associated with EVR Phase II. These installation and permitting issues are discussed later in this report, but suffice it to say that it may take several months for the EVR Phase II upgrades, while previous upgrades may have been on the order of weeks.

4. Thinking that the April 2009 deadline will be extended

The compliance dates for different phases of the EVR program have been extended several times, either by rulemaking or Executive Officer action. In most cases, these extensions were triggered by unforeseen delays in getting EVR systems certified. Because of these past actions, many GDF operators may assume that the April 2009 deadline will be extended.

The last two ARB EVR advisories have specifically stated that the April 2009 deadline will not be extended. This message has been repeated in various outreach forums, email inquiries and telephone calls. Advisory 373, issued April 4, 2008, outlined possible enforcement actions, such as shutting down the station, and the substantial penalties that may be imposed if operation continues beyond April 2009 without an EVR Phase II system (Appendix 2).

The California Air Pollution Control Officers Association urged adherence to the April 2009 deadline in a November 12, 2007 letter to James Goldstene (Appendix 3). A letter from a major oil company received on November 15, 2007 echoed maintenance of the April 2009 deadline, barring unforeseen delays in permitting and inspection processes (Appendix 4). This oil company stated that "all owners and operators should be held to the same standard. Those that choose to procrastinate, hoping for a compliance extension, should not be rewarded."

B. Vapor Recovery System Equipment Availability

The concern has been raised as to whether the two manufacturers of the currently certified EVR Phase II systems can supply enough vapor recovery equipment to all the GDFs in the state. Both Franklin Fueling (Healy) and Vapor Systems Technologies (VST) have built up inventories of EVR equipment and will increase production as necessary.

ARB staff is monitoring availability of EVR equipment through regular reporting from both Healy and VST. Figure 3 below shows that both the Healy and VST processor units are in stock and ready for shipment.

Figure 3
Inventory of Healy and VST Vapor Processors

The EVR program contains a safety valve which allows the Executive Officer to extend compliance dates if certified equipment is not commercially available. As per regulation, systems are deemed commercially available if the system can be shipped within eight weeks of the receipt of an order by the equipment manufacturer. A form to report unavailability of EVR equipment to ARB is posted on the ARB website (Appendix 6). At this time, both Franklin Fueling and VST are shipping equipment within one week of order receipt.

C. Contractor Availability

Contractors installing EVR equipment must be certified by the EVR system manufacturer. Certification training is offered at locations throughout the state, normally through a 4 hour or 8 hour class. The list of certified manufacturers is provided on the manufacturer's websites and is also linked to the ARB web pages. The total number of certified contractors for each manufacturer in California as of March 2008 is provided in Table 2.

Table 2
Number of EVR Certified Contractors for EVR Phase II and ISD Systems

	Franklin/ Healy	**VST**	**Veeder-Root** (ISD)	**Franklin INCON** (ISD)
Number of Certified Contractors	**1205**	**35**	**512**	**92**

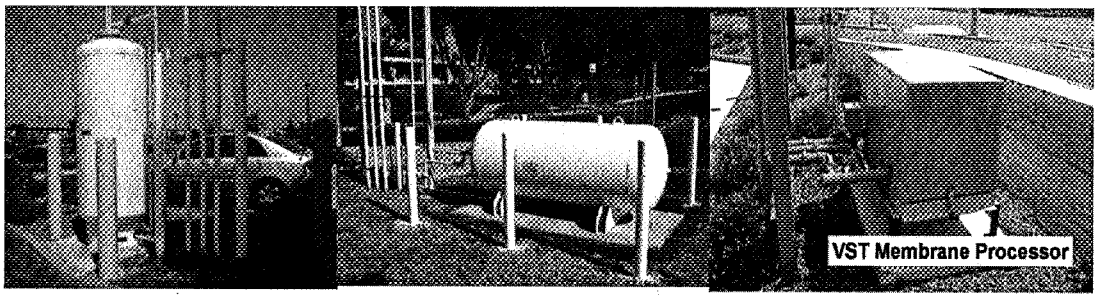
Note that the low number of VST contractors is due to the recent certification of the VST with ISD system on April 1, 2008. The number of VST contractors is expected to grow rapidly over the next few months.

ARB staff has sorted the contractors for Franklin/Healy Phase II and Veeder-Root ISD by district to investigate whether contractors for each system are available throughout the state. The results show that some of the smallest air districts may not have contractors operating in their districts, but there are contractors in neighboring districts available. In general, the contractor distribution mirrors the GDF population.

D. Permitting Delays

The upgrade for EVR Phase II generally requires permits from additional local agencies that were not involved in the previous EVR Phase I and ORVR compatibility upgrades. This is due to the pressure management systems or vapor processors associated with the EVR Phase II systems. Installations of the Franklin/Healy Clean Air Separator, both vertical and horizontal configurations, and the VST membrane processor are shown below.

Healy Clean Air Separators **VST**



The additional local permits that may be required for installation of EVR vapor processors are from county and city planning and building departments. This is in addition to the air district, fire agency and possibly environmental health agency permits. Our experience with initial installations of EVR Phase II systems revealed that many of these permitting agencies are not familiar with vapor recovery requirements, which has led to long application and design reviews, sometimes on the order of months. In addition, some local planning and building agencies have taken opportunity of the EVR review and permit application to include additional requirements, such as landscaping or enclosures to hide equipment, which can increase costs even further.

Education of these local permitting agencies is a high priority of both ARB and local district staff. Special outreach events for these agencies have already been

held in the Bay Area and San Joaquin valley and several more are planned. Staff meets regularly with contractors who pull permits for GDF operators to understand where the delays are occurring and learn which agencies may benefit from EVR education. As a result of ARB and district efforts thus far, several local planning agencies have taken action to clarify their requirements and work cooperatively with their sister agencies to help expedite permitting of EVR upgrades.

Staff recognizes that the potential for delays due to the local permitting process is a real concern and will continue to monitor the situation closely. Staff's progress report in October 2008 will evaluate whether the permitting process will prevent compliance with the April 2009 deadline.

E. Cost of EVR Equipment Upgrades

The estimated equipment and installation cost for the Franklin/Healy Veeder-Root EVR Phase II/ISD system is provided in Table 3. The cost estimates for the Franklin/Healy EVR Phase II system are from a 2007 cost spreadsheet provided by Franklin. If the cost estimates from the February 4, 2000 EVR staff report are adjusted to 2007 dollars by multiplying by the ratio of the 2007/1999 Consumer Price Index (207.342/166.6 or 1.24), then the 2007 estimates are very close to the original staff estimates.

The cost estimates for ISD are taken from the ARB April 2007 staff report, "Cost Analysis for In-Station Diagnostics (ISD) at Gasoline Dispensing Facilities" that was provided to the Board last year.

These estimated costs are in line with actual contractor cost bids provided to staff. These estimates do not include the costs of the various local permits, installation of additional electrical lines (if needed) or start-up tests. Although no data is available yet for VST system installations, staff expects that the costs will be comparable.

Table 3
Estimated Equipment and Installation Costs for EVR Phase II and ISD

	Number of Dispensers			
	2	4	6	12
EVR Phase II	$17,240	$24,925	$32,765	$56,285
ISD	$13,600	$16,500	$19,700	$28,900
TOTAL (rounded to nearest $100)	**$30,800**	**$41,400**	**$52,500**	**$85,200**

GDF operators have complained that these costs are unreasonable, especially given today's financial markets and slim retail margins for gasoline. Many are hoping that a lower cost system may become available before the deadline.

IV. PROCESS TO MONITOR IMPLEMENTATION PROGRESS

A. Updates from Districts on Permits and Installations

ARB and local air district staff are working together to monitor progress towards meeting the April 2009 deadline. Although some districts are already providing regular updates, monthly reports from all districts were requested in a letter to all APCOs dated March 26, 2008 (Appendix 5). The minimum data requested are the total number of GDFs subject to EVR Phase II requirements, the number of facilities who have submitted permit applications for the upgrade, and the number of GDFs who are currently operating with EVR Phase II systems.

B. Monitor Equipment Production and Orders

ARB staff checks in with EVR and ISD manufacturers on a regular basis as to equipment inventory, production forecasts, number of back-orders and time needed to fill equipment orders. Most of this information is business confidential and cannot be listed here, but as already mentioned above, EVR and ISD equipment orders are being filled by the manufacturers within one week. A form posted on the ARB website is available for a GDF operator to notify ARB if a vapor recovery system is not available in time to meet a rule or construction deadline (see Appendix 6).

C. Monitor Number of Certified Contractors

EVR manufacturers provide required training for installation contractors throughout the state. Lists of certified contractors are available on the EVR system manufacturer websites, which are linked to the ARB website for convenience.

D. Critical Path for EVR Phase II

There are an estimated 12,000 GDFs that must install Phase II EVR in the next 11 months. Assuming one week to complete the upgrade, and 1200 certified contractors for the Franklin Healy system, mathematically there is current contractor capability to install around 1000 EVR systems a week. Even if this translates to 1000 EVR systems a month in reality, this is still sufficient time to complete the upgrades.

EVR system manufacturer current production levels, together with contingency plans to increase production as needed are projected to supply sufficient equipment to complete the upgrades.

The critical path limiting factor appears to be the ability to complete the permitting process with all local agencies within a reasonable time period.

V. ACTIONS TAKEN TO EXPEDITE EVR IMPLEMENTATION

A. Outreach and Communication

ARB staff and districts have worked together over the last several years to provide regular communication on EVR activities with EVR stakeholders. These communications include:

1. Public workshops and informational meetings
2. EVR advisories
3. Vapor recovery websites
4. Vapor recovery email listserve
5. EVR color brochure (Appendix 7)
6. Conference and tradeshow Exhibits
7. Meetings with gasoline marketers
8. Meetings with permitting contractors
9. Conversations with GDF operators during annual inspections

Staff has also set up a new website focusing on materials to educate local permitting agencies on EVR requirements and understanding EVR systems. This website, www.evrhome.org, was launched in late 2007 and already has been well-received by local agency staff who have no previous knowledge of the vapor recovery program.

B. Early Permit Application

Several districts have taken steps to encourage or require early submittal of air district permit applications for EVR upgrades. For example, Sacramento Metro AQMD waived the application permit fee if the application was received by April 1, 2008, and construction completed by October 1, 2008. This incentive is believed responsible for SMAQMD having the highest percentage of permits issued thus far. Other districts, such as San Diego APCD and South Coast AQMD, modified their rules to require permit applications or compliance plans for EVR Phase II systems to be submitted by October 1, 2008.

C. Contract with Local Agency Experts

ARB staff contracted with two local agency experts, Norm Covell and Mel Knight, to provide assistance in EVR implementation. The tasks for the short-term contract were as follows:

1. Identify local permit agencies involved in EVR upgrades statewide.
2. Assess and prioritize barriers to meeting EVR deadlines.
3. Recommend strategies for permit streamlining.
4. Develop plan for outreach to local permit agencies.

The contract reports (Appendices 8 and 9) contain several recommendations to address local permitting issues. ARB staff is pursuing several of the recommended actions.

D. Exemption for ORVR Vehicle Fleets

Several districts (i.e., Bay Area, San Diego, San Joaquin and South Coast) have amended or are planning to amend their rules to allow Phase II vapor recovery exemptions for GDFs that dispense only to high percentage ORVR vehicle fleets. This exemption is allowed by USEPA and encouraged by ARB as outlined in ARB's letter of February 20, 2008 (Appendix 8). This exemption will reduce the total number of GDFs subject to the EVR upgrade, though the number of sites qualifying for the exemption is likely small.

VI. ACTIONS PLANNED REGARDING EVR IMPLEMENTATION

A. Expand Outreach to Local Planning and Building Agencies

ARB staff plans to work with the air districts in educating the local city and county planning agencies and develop mechanisms to streamline EVR permitting.

B. Continue Monitoring EVR Implementation Progress

ARB staff will continue to collect data from local districts, EVR manufacturers and GDF operators on progress towards compliance with the April 2009 deadline.

C. Share EVR Implementation Status with Stakeholders

Staff will share information in this report and request feedback in a workshop scheduled for May 14, 2008, in Sacramento.

D. Provide EVR Status Report to Board in October 2008

ARB staff will continue to provide regular updates to the Board chair through normal internal communications. A second status report will be provided in October 2008.

VII. RECOMMENDATION

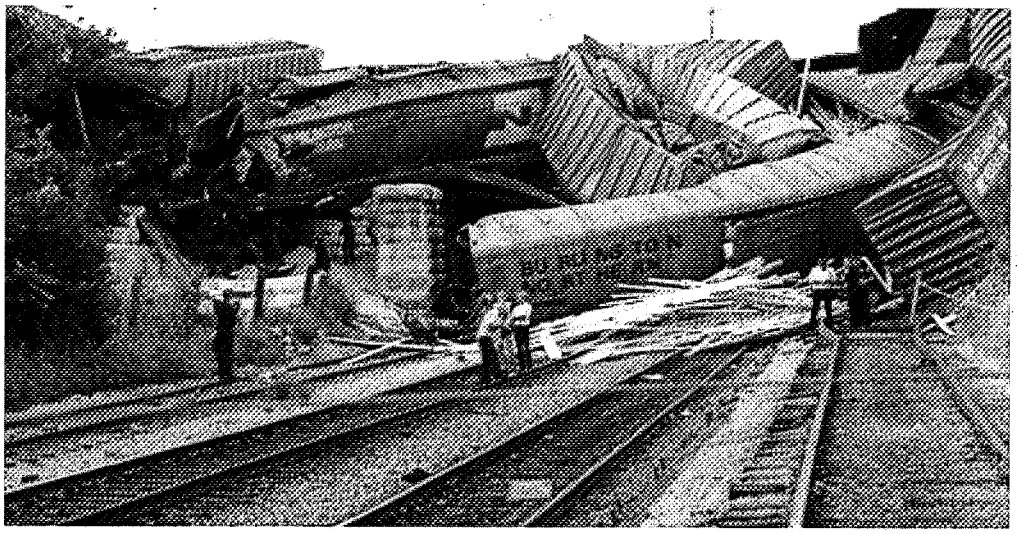
Staff recommends no extension to the EVR Phase II deadline. As discussed in this report, there is still sufficient time and resources available for the remaining 12,000 GDFs to complete the EVR Phase II upgrade by the April 1, 2009 deadline.

APPENDIX 1

AUGUST 30, 2007 AND FEBRUARY 28, 2008 LETTERS FROM JAY MCKEEMAN OF THE CALIFORNIA INDEPENDENT OIL MARKETERS ASSOCIATION (CIOMA) TO MARY NICHOLS, ARB CHAIRMAN

California Independent Oil Marketers Association
3831 N. Freeway Blvd. #130 • Sacramento, CA 95834
(916) 646-5999 • (916) 646-5985-fax
www.cioma.com

August 30, 2007



Enhanced Vapor Recovery Train Wreck Approaching!!

Members of the Air Resources Board:
Ms. Mary D. Nichols, Chair
Ms. Sandra Berg
Ms. Judy Case
Ms. Dede D'Adamo
Dr. Henry Gong, Jr.
Mr. Jerry Hill
Ms. Lydia H. Kennard
Mr. Ron Loveridge
Mrs. Barbara Riordan
Mr. Ron Roberts
Mr. Dan Sperling
California Air Resources Board
P.O. Box 2815
1001 "I" Street
Sacramento, CA 95812

This letter is being written to alert you to a situation that could lead to a very serious and unnecessary disruption of the gasoline marketplace. The problem is that CARB has a regulatory program underway that has the high likelihood of creating a retrofit crisis as a compliance deadline looms in 2009 (i.e. the "train wreck"). All state gasoline dispensers will have to be retrofitted between now and then - and only until recently (May of this year) has CARB staff provided *any* flexibility for the vast majority of state gasoline dispensers in meeting this regulatory burden. More details on the urgency of this situation are explained later in this letter.

There are ***583 days left*** until the EVR installation deadline
Approximately ***11,500 facilities need retrofitting***
20 facilities/day or 600 facilities/month
need to be retrofitted to meet this deadline
(calculated from 8/27/07)

Although 2009 seems like a long time away, there are significant resource shortages likely if this deadline clock keeps ticking without adjustment – meaning that installation deadlines will be missed, penalties are likely, product and installation prices will shoot through the roof, many, many hours will be spent negotiating compliance agreements, tempers will run short and ultimately the California fuel consumer will pay the price. There is also the matter of many independent owners/operators of gasoline dispensing facilities (GDFs) having to procure financing which can only begin when a system that fits their needs is certified and the cost of installing the system becomes available.

We are asking for a short delay in the implementation deadline – *NOT RELIEF FROM CALIFORNIA'S UNIQUE, EXPENSIVE AND TECHNOLOGY-FORCING REQUIREMENTS!!!* We believe this request is reasonable, while providing both small business owners and regulators adequate time to implement new technology on a common-sense basis. And, it will result in the eventual same air quality improvement, merely necessitating an essential and relatively minor adjustment to the compliance time table. Such an adjustment will result in more compliance options, more assured quality installations with reasonable costs and reduction of impact on the gasoline marketing community and the consuming public.

Here are the problems and why they are rapidly approaching "train wreck" status:

Clock is ticking, but certified systems not available – Presently CARB has promulgated a program that requires the enhancement of the current Phase II vapor recovery system in California. While we have reservations with regard to the need for all of these additional enhancements, we are not opposing them. What we are concerned about is an unreasonable deadline based on the certification of a single *vac-assist* vapor recovery system specific to five late model dispensers. *Up until May, 2007 this was the ONLY OPTION available to service stations owners and operators.*

A very large majority (+90%) of the existing GDFs happen to be *balance* type Phase II systems and have dispensers that were not listed in the initial certification. A universal dispenser manual was recently issued by CARB staff to allow the retrofitting of this singular *vac-assist* system on the remainder of existing GDFs. However, recent exploration of the costs for this option is showing that it is equivalent to replacing *balance* system dispensers with *vac-assist* units. The replacement of technology types, such as replacing *balance* systems with *vac-assist* systems, was never envisioned during the initial adoption of the Enhanced Vapor Recovery regulations.

Numerous meetings with CARB staff have been held attempting to obtain a resolution to this problem, but with no willingness to reach a reasonable compromise on their behalf as they feel that a single EVR solution is all that is necessary.

Late options, high cost, uncertain local agency ability to approve – The *vac-assist* universal dispenser manual was offered at the half-way point of the 4-year compliance deadline, and puts unreasonable demands on the entire owner/installer/permitting system, while the clock still ticks. This is in addition to the unreasonable costs of changing *balance* systems to *vac-*

assist technology. Another problem with the current state of the program is that additional options are just now becoming available and they require gearing up the manufacturing processes for new equipment, new certification of installers, education of local agency personnel who oversee the equipment installation and permitting, and education of the regulated community regarding the system costs, operation and effectiveness.

Overall problems with installation of retrofits in a timely manner – Beyond the specific problems associated with the current state of additional options just now becoming available, there remains the unavoidable logistics issues associated with the financing, purchasing, permitting , installation and final inspection of compliant units for 90%+ of California GDFs in *less than 2 years*. The problems are:

- Installation – As noted in the box on the first page of this letter, about 20 facilities/day need to be retrofitted to meet the compliance deadline. Due to permitting and inspection requirements this is an *impossible* task – see the following issues descriptions.

- Permitting/Inspection – Permitting is a major obstacle in achieving timely installation of retrofit technology. It can take months to get permits reviewed and approved and the closer we get to the deadline the more permits stack up on regulatory desks. It is inconceivable to anyone in the regulated community that the substantial number of GDF's that remain to be permitted can be permitted in a timely manner, and inspected before their daily operation is allowed.

  An additional wrinkle in this that installers now need to be certified. Since there has been no certified equipment for *balance* systems (one is pending), there are no certified installers. Trying to certify a large number of installers for new systems will further delay installation and permitting of equipment.

- Financing – For many service station operators, especially those owned and operated by small businesspersons, the high cost of retrofitting service station dispensers must be accomplished by securing loans. Retail margins for petroleum products have plummeted since CARB has adopted unique fuel standards in this state. That creates a significant problem for the small businessperson who has to justify financing to lenders based upon business operations and financial stability. When these costs are added to other high costs of operating in this state (many of those costs created by unique and highly expensive environmental requirements) it becomes difficult to obtain financing.

- Purchasing – The ability to purchase retrofit equipment – again especially for the small businessperson – is compounded by the fact that the equipment cannot be purchased in bulk – as the larger companies can do. So per-unit costs of equipment are increased for the small business operator. In addition, equipment availability can become constrained as deadlines approach, since quantity purchasers get top priority. This also applies to the hiring of contractors.

In any case, as we approach the deadline, the sheer number of dispensers that need retrofitting is likely to overwhelm permitting capability, equipment manufacturers and certified installation contractor capacity. This is the approaching train wreck.

Four years is four years – CARB staff states that, "State law (HSC section 41956.1) provides that vapor recovery systems certified under procedures in effect prior to adoption of revised standards and installed prior to the effective date of the revised standards may continue to be used for a period of four years after the effective date of the revised standards." For practical and reasonable reasons, this premise should only be applied once there are legitimate options available to the regulated community to meet the new standards. This was certainly not the case relative to the April 2005 certification of an EVR II system that was only applicable to about 10% of the GDF population. Although we believe that the 4-year clock should begin with the issuance of an EVR system that meets the majority of the GDFs vapor recovery type (i.e., balance), there is good reason to restart the clock from the date that the universal dispenser manual was issued, or once a balance system is certified.

The Solution – **Our proposal is to provide owners of balance systems four years from the time that CARB approves a retrofit system that can be used with balance systems**, which we are told is likely to be September of this year. In reality that will only be a two-year extension for balance system owners, since it will extend the compliance deadline from April/September, 2009 until September, 2011. This will provide for the timely and orderly change-out of 90% of the state's fuel dispensers with appropriate systems and equipment.

We ask for your immediate consideration of this reasonable, logical and economically prudent request.

Sincerely,

Jay McKeeman,
Vice President of Government Relations and Communications

Dennis DeCota, Executive Director
California Service Station & Automotive Repair Association

cc: Kathleen Quetin, CARB Ombudsperson
Linda Adams, Secretary, Cal/EPA
Bill Loscutoff, Chief, Monitoring & Laboratory Division, CARB

California Independent Oil Marketers Association
3831 N. Freeway Blvd. #130 • Sacramento, CA 95834
(916) 646-5999 • (916) 646-5985-fax
www.cioma.com

February 28, 2008

Ms. Mary Nichols, Chair
California Air Resources Board
P.O. Box 2815/1001 "I" Street
Sacramento, CA 95812

Subject: Consideration of CARB update on the status of the Enhanced Vapor Recovery/In-Station Diagnostics retrofit deadline, April, 2009 by the full Board

Dear Chairperson Nichols:

We understand that the Monitoring & Laboratory Division (MLD) is in the process of preparing an update memorandum to the Board regarding the status of service stations obtaining permits and performing retrofits to meet the April, 2009 CARB regulatory deadline. We also understand that this memo is NOT scheduled for public review by the entire Board.

We are requesting that this update memo be scheduled for public consideration at the May 22-23 Board hearing. The latest statistics show that over 10,000 sites still need to be permitted and retrofitted. This means approximately 950 sites per month, between now and the April, 2009 deadline, will have to be finalized. We frankly see no way that this will be accomplished. In addition, local air districts have not provided sufficient contingency enforcement information if they encounter difficulties in getting stations approved. With the absence of this information we feel quite strongly that fueling stations will be forced to close, creating a serious fuel supply problem in this state. We believe the magnitude of the problem is serious enough to warrant full Board consideration in a public hearing format.

We would appreciate a quick response to this request so that our members can plan accordingly. Fell free to contact me at my office if you have any questions regarding this request.

Sincerely,

Jay McKeeman,
Vice President of Government Relations and Communications

cc: Kathleen Quetin, CARB Ombudsperson
Linda Adams, Secretary, Cal/EPA
Bill Loscutoff, Chief, Monitoring & Laboratory Division, CARB
Jackalyne Pfannenstiel, Chair, California Energy Commission
Gordon Schremp, California Energy Commission
CIOMA Board of Directors

APPENDIX 2

ADVISORY 373: ENHANCED VAPOR RECOVERY (EVR) UPDATE AND PENALTIES FOR APRIL 2009 DEADLINE

California Environmental Protection Agency

Air Resources Board
Vapor Recovery Advisory

Gasoline Dispensing Facility Enhanced Vapor Recovery (EVR) Phase II System Update and Penalties for April 2009 Deadline

Number 373 **April 4, 2008**

Gasoline dispensing facilities (GDFs) with underground storage tanks subject to Phase II vapor recovery requirements must upgrade to Enhanced Vapor Recovery (EVR) Phase II vapor recovery by **April 1, 2009**. **This deadline will not be extended.**

VST BALANCE EVR PHASE II SYSTEM NOW CERTIFIED WITH ISD

The Vapor Systems Technologies EVR Phase II balance system with in-station diagnostics (ISD) was certified on April 1, 2008 (VR-204). Visit http://www.arb.ca.gov/vapor/eos/eo-vr204/eo-vr204a.htm for more information. The VST system joins the Franklin Fueling/Healy system as a certified Phase II vapor recovery system with ISD that complies with the EVR Phase II certification standards and specifications.

NO ADDITIONAL EVR PHASE II SYSTEMS UNTIL 4TH QUARTER 2008 OR LATER

More EVR Phase II systems are in the certification process and could be available by the end of 2008; but there is no guarantee that any system currently in the certification process will successfully complete all performance testing and legal requirements to obtain EVR certification. ARB staff will take appropriate action against those who make false claims about, or distribute false information regarding, the availability of currently uncertified EVR Phase II systems.

PENALTIES IF FAIL TO MEET APRIL 2009 EVR PHASE II DEADLINE

It will be illegal to operate any vehicle fueling system subject to Phase II vapor recovery requirements after March 31, 2009. Failure to comply with the EVR requirements may result in fines and the non-compliant GDFs are subject to being tagged out of service. Substantial penalties for noncompliance are authorized under Health and Safety Code Sections 42400 and 42402 (see http://www.arb.ca.gov/bluebook/bb07/HEAd/HEA_d_26_p_4_ch_4_art_3.htm).

AIR POLLUTION CONTROL DISTRICTS/AIR QUALITY MANAGEMENT DISTRICTS

Air pollution control districts have primary authority for regulating GDFs under vapor recovery laws and rules. **GDF operators should contact the local air district for specific information on local vapor recovery requirements before modifying a facility.** Contact information for local air pollution control districts is available on the air district permit or at http://www.capcoa.org.

FOR MORE INFORMATION...

Visit http://www.arb.ca.gov/vapor/vapor.htm or contact the ARB Engineering and Certification Branch at (916) 327-0900. Information to assist GDF operators and local permitting agencies with applications to install the EVR Phase II vapor recovery systems is available at http://www.evrhome.org/.

APPENDIX 3

NOVEMBER 12, 2007, LETTER FROM DOUG QUETIN, PRESIDENT OF CALIFORNIA AIR POLLUTION CONTROL OFFICERS ASSOCIATION (CAPCOA) TO JAMES GOLDSTENE, ARB EXECUTIVE OFFICER

CAPCOA
CALIFORNIA AIR POLLUTION CONTROL OFFICER'S ASSOCIATION

980 Ninth Street, 16th Floor
Sacramento, CA 95814
(916) 449-9603 (916) 449-9604 FAX
www.capcoa.org

November 12, 2007

PRESIDENT
Douglas Quetin
Monterey Bay Unified APCD

VICE PRESIDENT
Terry Dressler
Santa Barbara County APCD

PAST PRESIDENT
Larry Allen
San Luis Obispo County APCD

SECRETARY/CHIEF FINANCIAL OFFICER
Jim Harris
Amador County APCD

DIRECTORS

Stephen Birdsall
Imperial County APCD

Jack Broadbent
Bay Area AQMD

Thomas Christofk
Placer County APCD

Mat Ehrhardt
Yolo-Solano AQMD

Larry F. Greene
Sacramento Metro AQMD

Barbara Lee
N. Sonoma County APCD

Seyed Sadredin
San Joaquin Valley APCD

Ray Fernandez
San Diego County APCD

W. James Wagoner
Butte County AQMD

Barry Wallerstein
South Coast AQMD

EXEC. DIRECTOR
Melvin D. Zeldin
mel@capcoa.org

Mr. James Goldstene, Executive Officer
California Air Resources Board
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812

Re: Compliance Deadline for Phase II Enhanced Vapor Recovery at Gasoline Dispensing Facilities

Dear Mr. Goldstene:

The California Air Pollution Control Officers Association (CAPCOA) is very concerned with recent requests sent to your office and members of the California Air Resources Board asking for further delay in implementing Phase II Enhanced Vapor Recovery (EVR) at gasoline dispensing facilities (GDF). Given the current and future outlooks for air quality in California, CAPCOA is strongly opposed to any delay in implementing measures that will provide proven and cost effective emission reductions. Therefore, CAPCOA urges your commitment to hold steadfast to the 2009 EVR deadlines that have already been delayed a number of times and have been known to industry since its inception in 2000.

The mandate for enhanced vapor recovery for gasoline dispensing equipment was imposed back in 2000 as a result of a lawsuit regarding the State Implementation Plan. The regulations adopted by your Board already allowed a four-year implementation period, which is ample time, for upgrading existing systems from the time a certified system becomes commercially available. The end result of allowing time for implementation is a nine-year delay from the initial adoption. In addition, with the recent changes in the National Air Quality Standards, many more areas in California are now in non-attainment of the standards. We need to implement all feasible emission reduction measures without delay.

ARB and local air districts staff have conducted joint compliance audits at GDF. These audits revealed dismal compliance rates and many operational and maintenance problems. The use of In-Station Diagnostic (ISD) systems, which is slated for September 2009, will help the operator identify the majority of the problems inspectors now find and minimize avoidable excess emissions resulting from wear-and-tear of the equipment. ARB and local air districts staff have also engaged in considerable outreach effort to notify GDF operators of the impending deadlines and to help them obtain necessary approvals from other regulatory agencies.

ARB's own survey indicates that there are adequate sources for equipment and contractors to meet the demand. New systems are also being proposed and evaluated to further supplement the supply, and to facilitate the availability of such systems, ARB should prioritize system evaluation and certification. ARB's recent certification of the VST system is timely and appropriate. There is no reason to postpone the deadline.

Although there are initial costs to GDF operators, Stage II EVR systems will help recover some of the cost by preventing product losses through vent stacks and better monitoring of the operation, thereby, minimizing equipment down time. Most importantly, gasoline vapor emissions are toxic and pose one of the highest health risks to Californians. Timely implementation of Phase II EVR will minimize these toxic emissions. Therefore, CAPCOA strongly urges you to resist any request for further delay in the implementation of EVR Phase II and ISD requirements.

Sincerely,

Douglas Quetin
President

cc: Tom Cackette, ARB

APPENDIX 4

NOVEMBER 15, 2007, LETTER FROM WILLIAM SPURGEON OF SHELL OIL PRODUCTS US TO MARY NICHOLS, ARB CHAIRMAN

Shell Oil Products US
20945 S Wilmington Ave
Carson, CA 90810

November 15, 2007

Mary D. Nichols, Chairman
California Air Resources Board
1001 I Street
P.O. Box 2815
Sacramento, CA 95812-2815

Subject: April 1, 2009 EVR Phase II Deadline

Dear Ms Nichols:

Shell Oil Products US (Shell) is aware of recent letters and discussions alluding to a possible extension of the April 1, 2009 compliance deadline for EVR Phase II. While we are not pleased with the limited equipment options to meet the requirements, we do believe that the capabilities for all owners and operators to meet the deadline are and have been available. Shell is making a substantial investment in the planning and execution of upgrades to meet the deadline and believe all owners and operators should be held to the same standard. Those that choose to procrastinate, hoping for a compliance extension, should not be rewarded.

As with any significant change, there is the potential that the permitting and inspection processes may extend the installation timeline beyond our original expectations. If this occurs, we will bring the issue to your attention and seek your assistance to remove obstacles that could prevent our timely compliance with the EVR Phase II regulations. While it's important to continue the dialog with all stakeholders as change occurs, we believe it is most productive to discuss the means to achieve regulatory compliance and not extensions of deadlines that should be achievable with the proper diligence.

We appreciate the opportunity to share our views.

Sincerely,

William D Spurgeon
General Manager - West Region

cc: Linda S Adams, Secretary for Environmental Protection, Cal/EPA
Larry Allen, Chair, California Air Pollution Control Officers Association
Honorable Board Members, California Air Resources Board
James Goldstene, Executive Officer, Air Resources Board
Tom Cackette, Chief Deputy Executive Officer, Air Resources Board
William Loscutoff, Division Chief, Air Resources Board
Kathleen Quetin, Ombudsman, Air Resources Board
Barbara A Kornylo, Manager, Government Relations, Shell Oil Company

APPENDIX 5

MARCH 26, 2008, LETTER FROM WILLIAM LOSCUTOFF, CHIEF, ARB MONITORING AND LABORATORY DIVISION TO ALL LOCAL AIR POLLUTION CONTROL OFFICERS

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

March 26, 2008

Addressees: All Local Air District Air Pollution Control Officers (APCO)

Dear APCO:

I am writing to request your help in implementing the Enhanced Vapor Recovery (EVR) program. As you may know, approximately 12,000 gasoline dispensing facilities (GDF) statewide must upgrade their Phase II vapor recovery systems to meet EVR standards by April 1, 2009. We need your help in three primary areas as discussed below.

First, we would like you to identify district staff contacts that can assist GDF operators to obtain EVR information and process air district permits expeditiously. We will then provide a list of vapor recovery contacts on our vapor recovery web pages. Please provide the vapor recovery contact names, telephone numbers and email addresses.

Second, we ask for a district contact to work with to set up a mechanism to track progress towards full EVR implementation through monthly reporting. The minimum data requested each month are the total number of facilities in the district that are subject to Phase II EVR requirements, the number of these facilities who have submitted permit applications for the upgrades, and the number of facilities who are now operating with EVR Phase II systems. Additional desired information would be GDF address, and the Executive Order number for EVR vapor recovery system. This data could be transmitted to Air Resources Board staff via email or telephone call on a monthly basis. We would appreciate the first report by April 11, 2008; in order to include the data in our report to our Board on EVR implementation progress due in mid-April.

Finally, we ask for your help in working with other local agencies involved in permitting GDFs to streamline the permit process for EVR upgrades. Examples of these other local agencies are environmental health, fire, planning and building. I know several of the districts have already taken steps to coordinate with other agencies, but we need to do more. Our plan is to provide GDF operators a guideline to permitting that is specific to each air district. These guidelines would identify the local permitting agency contacts, the order in which these permits are obtained, the permit requirements for each agency, ways to expedite permits, etc. We would appreciate if you could identify staff to work with us in preparing these permit guidelines.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: http://www.arb.ca.gov.

We only have twelve months left for approximately 12,000 GDF operators to obtain permits, purchase equipment, hire qualified contractors, install systems, and conduct start-up testing. This is a tremendous undertaking, but we believe it is possible with your help.

Thank you in advance for your assistance. Please forward the district contact information and GDF implementation progress reports to Sue Wyman at swyman@arb.ca.gov or (916) 327-4731. If you have questions or suggestions, please contact Cindy Castronovo at ccastron@arb.ca.gov or (916) 322-8957. We greatly appreciate your efforts.

Sincerely,

Manjit Ahuja for

William V. Loscutoff, Chief
Monitoring and Laboratory Division

cc: Cindy Castronovo
Monitoring and Laboratory Division

Sue Wyman
Monitoring and Laboratory Division

APPENDIX 6

FORM TO REPORT THAT VAPOR RECOVERY SYSTEM OR INSTALLER IF NOT AVAILABLE TO MEET RULE OR CONSTRUCTION DEADLINE FOR THIS GASOLINE DISPENSING FACILITY

State of California Air Resources Board

REPORT THAT VAPOR RECOVERY SYSTEM OR INSTALLER IS NOT AVAILABLE TO MEET RULE OR CONSTRUCTION DEADLINE FOR THIS GASOLINE DISPENSING FACILITY

Please answer the questions below as fully as possible. For questions on this form, contact Frances Cameron at fcameron@arb.ca.gov or (916) 445-9314.

Company Name					
Gasoline Dispensing Facility Address: (If multiple sites, please include a form for each site.)					
City		**State**		**Zip**	
Contact Name					
Contact Title					
Telephone		**Fax**			
Email:					
Air Pollution Permit No.					
Check what is not available:	□ **Vapor recovery equipment**		□ **Installing contractor**		
Check one:	□ **Retrofit**		□ **New facility**		
What is the vapor recovery system or components that you are seeking to purchase or install? (Give Executive Order number or manufacturer and model number.)					
What is the date by which the installation must be completed?					
Reason for installation target date:					
If vapor recovery equipment was ordered, but is unavailable or is on backorder:					
When was the compliant vapor recovery system or components ordered? (Please attach or fax a copy of the order and the notice showing items on backorder.)					
What is the expected shipping date? (Please attach or fax documentation of the expected ship date.)					
If an installing contractor is unavailable:					
How did you determine that an installing contractor was unavailable?					
Please list up to three contractors you contacted and the date each is first available. Attach or fax copy of contractor response if available.					
Contractor company name:		**Phone No:**		**Date Available:**	
1.					
2.					
3.					
What are the consequences of the delay to your business due to the unavailability of either the vapor recovery equipment or an installing contractor?					
Have you contacted the local air pollution control district regarding this concern?	□ **Yes**		□ **No**		
Thank you for providing the above information. Please keep in mind that submitting this form to the California Air Resources Board does not exempt a GDF operator from complying with all applicable local air pollution control regulations. Contact your local air district for information about these requirements and compliance options, if any.					

Date _____ **Signature** _____

Please add any comments on a separate page. Email to fcameron@arb.ca.gov , mail to Frances Cameron, Air Resources Board, Monitoring and Laboratory Division, P.O. Box 2815, Sacramento, CA 95812, or fax to (916) 322-2444.

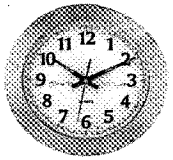
APPENDIX 7

EVR BROCHURE: ENHANCED VAPOR RECOVERY (EVR) AND THE APRIL 2009 DEADLINE

Now is the Time to Plan for EVR Upgrades...

Gasoline Dispensing Facilities (GDFs) with underground storage tanks subject to Phase II vapor recovery requirements will need to upgrade to Enhanced Vapor Recovery (EVR) by ...

APRIL 1, 2009



How do I know if my GDF is subject to EVR?

If your GDF has a Phase II vapor recovery system and an underground storage tank, then it will probably need to be upgraded. GDFs in air districts that are in attainment with the state ozone standard may be exempt from EVR. Check with your local air district to verify if EVR applies to you and to find about other local vapor recovery requirements.

Are new installations subject to EVR now?

Yes. New GDFs, even in ozone attainment air districts, must install EVR systems.

Could my existing GDF be subject to EVR requirements before April 2009?

Yes. Changes to a GDF that qualify as a "major modification" can require immediate upgrades or changes prompted by other agencies, such as the local water quality control agency. Contact your local air district before initiating site changes.

California Air Resources Board
Vapor Recovery Program
Monitoring and Laboratory Division
P.O. Box 2815
Sacramento, CA 95812
(916) 327-0900

For more information go to:
http://www.evrhome.org/ and
http://www.arb.ca.gov/vapor/vapor.htm

For links to local air pollution control districts go to:
http://www.capcoa.org/districts.php

For information in alternative formats:
(916) 323-4916 (voice, ARB ADA Coordinator)
(916) 324-9531 (TDD, Sacramento area only)
(800) 700-8326 (TDD, outside of Sacramento)

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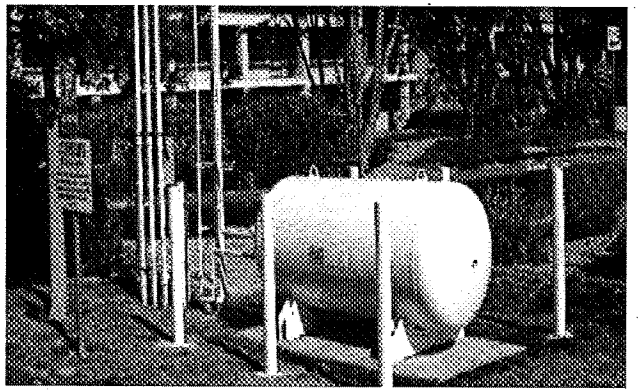
State of California
Air Resources Board

ENHANCED VAPOR RECOVERY PROGRAM

What Gasoline Dispensing Facilities, Local Permitting Agencies and Contractors Need to Know about...

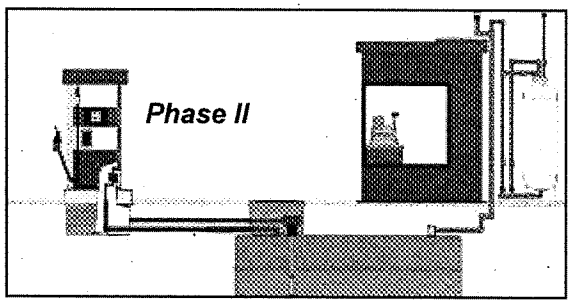
Enhanced Vapor Recovery (EVR) and the APRIL 2009 Phase II DEADLINE



Monitoring and Laboratory Division
www.arb.ca.gov/vapor/vapor.htm
(916) 327-0900
April 2008

What is Enhanced Vapor Recovery (EVR)?

Vapor recovery systems collect gasoline vapors that would otherwise escape into the atmosphere during bulk fuel delivery (Phase I) or vehicle refueling (Phase II). These vapors are a major culprit in the formation of smog.



The EVR program provides more stringent requirements for vapor recovery systems in order to reduce gasoline vapor emissions. Some EVR requirements, such as the installation of EVR Phase I systems and upgrades to make Phase II systems compatible with new vehicles, have already been accomplished. The next deadline requires additional Phase II equipment, including vapor processors, by April 1, 2009.

The final EVR deadlines relate to in-station diagnostics, or ISD. ISD monitors the performance of the vapor recovery systems and triggers alarms when failures occur. If corrective action is not taken, ISD may lead to station shut-down.

Annual Thoughput (gal)	ISD Requirement
More than 1.8 million	*Install ISD by Sept. 2009*
Less than 1.8 million but more than 600,000	*Install ISD by Sept. 2010*
Less than 600,000	*Exempt from ISD*

For Gasoline Dispensing Facilities:

How do I find out what EVR systems are available?

After conducting extensive field testing, ARB certifies vapor recovery systems by issuing an Executive Order. Executive Orders for EVR Phase II systems, both with and without ISD, are available at:
www.arb.ca.gov/vapor/eo-evrphaseII.htm.

Will other EVR Phase II systems be certified before the April 2009 deadline?

ARB staff continues to evaluate applications and conduct certification tests, but it generally takes about one year to complete the certification process. It is recommended that stations plan now for EVR upgrades in order to avoid possible delays and to ensure compliance by April 2009.

Who will be enforcing the EVR deadlines?

Local air districts are responsible for enforcing compliance deadlines for EVR.

Is my service station in compliance?

Check with your local air district to make sure your station meets all federal, state, and local requirements related to vapor recovery.

How can I stay informed on EVR activities?

ARB and local air districts offer public information meetings on EVR and ISD throughout the state. Check ARB's website for more information on upcoming outreach activities.

For Contractors:

What are the requirements for Contractors?

Contractors who install EVR systems must be trained and certified by the manufacturer. Also, some air districts require district training or International Code Council (ICC) certification as an approved vapor recovery installer. Contractors should verify training and certification requirements with air district staff before beginning installation of EVR systems.

In the next year about 12,000 GDFs will need to obtain permits, purchase EVR equipment and arrange for installation by a certified contractor. There is a potential shortage of certified contractors if GDF operators wait too long to install EVR systems.

For Local Permitting Agencies:

California service stations obtain construction and operation permits from the local air district. Installation of vapor recovery equipment may also trigger reviews from other local permitting agencies. This will create excess demand for assistance from:

- ***Local CUPAs***
- ***Local Cities and Counties***
- ***Local Planning Commissions***
- ***Local Fire Districts***
- ***and Certified Contractors***

For help in gathering information for EVR permits, visit www.evrhome.org.

For California Air Districts: http://www.capcoa.org/districts.php
For Vapor Recovery Executive Orders: http://www.arb.ca.gov/vapor/eo.htm
For Permitting Assistance: http://www.evrhome.org
For ARB Vapor Recovery Advisory #373-EVR Phase II System Update: http://www.arb.ca.gov/vapor/advisories/adv373.pdf

APPENDIX 8

CONTRACT NO. 07-528: FINAL REPORT FROM NORM COVELL

REPORT TO THE CALIFORNIA AIR RESOURCES BOARD CONCERNING ISSUES IN THE IMPLEMENTATION OF PHASE II ENHANCED VAPOR RECOVERY

JANUARY, 2008

CONTRACTOR
NORM COVELL
916-337-1624
ncovell@sbcglobal.net

This report is prepared for CARB in fulfillment of the tasks contained within CARB Agreement No. 07-528, dated and effective October 30, 2007

INTRODUCTION

The purpose of this Agreement is to provide assistance to the California Air Resources Board (CARB) staff regarding the matter of the Enhanced Vapor Recovery Program, mandated by requirements of State law and Executive Orders of the CARB.

The process of implementing the Enhanced Vapor Recovery Program is made somewhat problematic due to:

- A variety of local agencies are involved in the inspection and permitting of the installation of equipment, and some have limited, if any, knowledge regarding the EVR Program.
- A lack of sufficient communication between these agencies.
- Hesitancy on the part of many gasoline dispensing facility (GDF) owners to begin the process.
- A limited variety of approved EVR systems were available to GDF owners.

Through contractor assistance to CARB staff, this report will identify the APCD/AQMD's, local fire agencies, and local planning agencies that will be involved in permitting the EVR upgrades (the remaining agencies will be covered under a separate contract report by Mel Knight). Also the report will identify and assess barriers to meeting the EVR deadlines that result from local agency actions. The report will then categorize these barriers and identify critical paths to achieve compliance by GDF by the statutory deadline.

In addition, the report will identify recommended strategies that can be effectively implemented and provide a plan for outreach to the local permit agencies.

INFORMATION GATHERING AND ASSESSMENT

IDENTIFICATION OF LOCAL PERMITTING AGENCIES

Air Quality Management Districts/Air Pollution Control Districts - There are 35 local air districts covering California's 58 counties. Some are single county districts, while others are multi-county regional districts.

Based upon the current ozone attainment status of the local districts, three districts are exempted from the requirements of Enhanced Vapor Recovery. All three districts are relatively small and are located in northwestern California.

This exemption of three air districts will in addition reduce the total number of other permitting agencies that might otherwise be involved in the EVR permitting process. A website link is attached which includes contact information for those local air districts participating in the EVR program.

It is my belief that all of the local air districts required to participate in the EVR program have sufficient knowledge of the requirements and are into the process of permit review and approval. Some, however, may experience manpower problems when the "surge" of last minute applications are submitted.

Roughly 13,000 GDF's are located within the jurisdiction of these 32 air districts. Indications to date show that approximately 12 to 16% of the GDF's have initiated the EVR permit requirements, with a smaller percentage having completed installation.

Fire Departments/Districts - Multiple fire agencies exist in each county throughout the state. The Professional Fire Fighter's Association currently lists 1,006 separate fire-fighting entities. These agencies are involved in the permitting and inspection of facilities and activities that include flammable materials.

Permit requirements in general will be consistent with the California Fire Code and directives of the State Fire Marshall. A primary concern of these agencies seems to be whether processing of fuel occurs vs. mere storage of the fuel and/or associated vapor.

A website link to the Professional Fire Fighter's Association of California is attached.

Land Use Planning Departments – These agencies are involved in the permitting of local land use projects to determine consistency with adopted general plans, CEQA, zoning and aesthetic community standards.

There are 58 county planning agencies and over 480 city agencies throughout California. Most of these will have an interest in the siting of EVR units. The major focus seems to be the size and locality of the EVR project footprint. A second concern is the potential of the project to impair the visibility of drivers, as well as aesthetic concerns.

Many of these agencies have little or no understanding of the purpose of an EVR installation is, or how it works. A significant barrier to a timely permit approval process are manpower limitations in some planning agencies. Some of the cause can be attributed to the recent slowdown in building construction throughout the State of California, which has resulted in staff layoffs.

Website links for each of the city and county planning agencies are attached.

Related Trade Associations and Organizations – While these entities are not a part of the formal permitting process for EVR, they do represent GDF owners/operators and to date, have positioned themselves as very concerned regarding the mandatory compliance timeframe. Some have requested in writing that the CARB address this concern by extending the final compliance date another four years.

The major organizations operating on a statewide level are:

- Western States Petroleum Association (WSPA)
- The California Independent Oil Marketing Association
- The California Grocer's Association

In addition, there are a number of smaller groups that operate at the county or regional level.

It is my belief that some of the hesitancy of GDF owners to move forward in a timely manner with application submittal is due to a belief that the request for a delay of the final compliance date will occur.

Identification of remaining permitting agencies associated with EVR installations are addressed by contractor Mel Knight (CARB Contract #07-529).

BARRIERS TO TIMELY IMPLEMENTATION

Through attendance at EVR workshops, meetings with permitting agencies, discussion with industry representatives and review of correspondence, a number of barriers to obtaining timely EVR compliance by all GDF's have been identified.

Barriers Associated with Permitting Agencies

To date, APCD's/AQMD's are not receiving many applications as the GDF industry is slow to respond to the EVR upgrade requirements for a number of reasons:

- Limited CARB certified equipment choices – This was a more significant issue early on. Now there are currently three certified equipment types available. However, some GDF operators appear to be holding off in anticipation of the promise from manufacturers that more certifications will result in the market being driven down by competition. In some cases, GDF owners are being told by manufacturers of currently uncertified technologies, to hold off as their equipment will be approved in the near future, and will be available at less cost with reduced maintenance requirements. In reality, at this point there are no guarantees that this will be the case.

- Procrastination on the part of GDF owners – The Phase I EVR experience tends to support this. Some of them will hold out until they are forced to become compliant.

- Limited knowledge on the part of some GDF owners concerning the EVR upgrade requirements and the complexity of permitting agencies that must be satisfied during the evaluation and permitting process. Some of the industry are under the mistaken impression that once they secure only the air district permit, they are "good to go" on the project.

- Some of the larger oil companies are divesting their ownership of the GDFs to individual small business owners. In some instances, this is occurring without the new owner having knowledge of the new EVR Phase II requirements. The result of this is new owners who don't know about, let alone understand the EVR requirements, and some of these folks do not have the financing.

- Some GDF owners are hopeful that the industry association's request for delay in the deadline for final compliance will be granted by CARB.

Barriers Associated with Industry

In addition, the following barriers have been identified which exist within the industry. In many cases, this has resulted in confusion, wasted time and additional expense in attempts to secure necessary permits.

- Some agencies, such as planning and fire, are not knowledgeable of what EVR equipment is, or what the installation of the equipment accomplishes. In many cases, agencies do not possess the necessary information required for processing the application.

- Resource limitations of some agencies prohibit a timely processing of the applications.

- Some agencies are not aware of the April 2009 deadline.

- Some agencies interpret the EVR upgrade requirements to trigger other non-related requirements, such as Americans with Disabilities Act (ADA) upgrades, that increase the overall cost to GDF owners.

- Different requirements exist in various jurisdictions. This results in confusion to the industry as to which agencies require review or permit.

- In some jurisdictions, the permit process becomes more complex as different local agencies have established themselves as the "final step" agency, and refuse to issue their permit until all other agencies have granted approval.

- Some agencies stipulate that engineering drawings are required, while others do not. There is a lack of knowledge as to what is required by each agency. Application submittals sometimes result in "surprises" to the applicant.

- Some GDF owners are hesitant to begin the permitting process due to a lack of available financing

- In some cases, there is a significant time delay between permit issuance and final installation. This delay seems to be caused by either problems with the existing installation being different than what was on paper, or parts just don't fit together, or do not operate as planned. Often manufacturing support to the field is lacking or non-existent.

- Some concern is expressed that as we move closer to the final compliance date, the "surge" of business will result in contractors and installers migrating to the urban areas with a higher inventory of GDFs. This results in difficulty in securing a certified contractor to work in the rural areas of the state.

CATEGORIZING THE BARRIERS

In analyzing the nature of identified barriers, it is evident that many of them can be addressed by increased and improved education and communication, focused on a number of various fronts. For purposes of this report, the following areas of concern have been identified.

- ***Getting the GDF industry to act now, rather than later.***
- ***Improving communication between agencies, the industry, GDF owners and contractors/installers.***
- ***Improving communication agency-to-agency.***
- ***Resource problems -- manpower and financial.***
- ***Making allies of the GDF trade associations.***

THE PLAN AND RECOMMENDATIONS

The major emphasis of the plan is a focus upon the delivery of current information on a continuous basis and providing education regarding the need for the EVR program, it's purpose, how it operates, the availability of equipment, the timeframes, and how to be compliant.

Some plan strategies will build upon what CARB has already begun. Other strategies will recommend new or additional effort.

The plan with recommendations follows, and addresses the previously identified groupings.

1. Getting the GDF industry to act now rather than later:

A. It is recommended that CARB and the local air districts take a strong stand with a firm and unified message to the GDF industry, emphasizing that the EVR program is a critical piece of the state's Clean Air Plan. The technology is in place with sufficient supply and installation is available in a timely manner. CARB and the local districts must remain united in notifying all parties that the final compliance date **WILL NOT** be extended.

B. CARB should build this message into their website and encourage all local districts to send a similar message utilizing websites and compliance alerts to GDF permit holders. The message should be repeated on a continual basis throughout the next 15 months. These messages should also include warnings to avoid waiting to ensure compliance ahead of the deadline, thus avoiding costly penalties. GDF owners need to know there is no valid reason for delay of the program.

C. Some local districts have provided incentives such as a waiver or a reduction of fees for permits. These temporary waivers expire prior to the final compliance date and serve as an incentive to act now rather than later. Other districts have established application deadlines which are date specific to encourage early action. CARB should establish a process wherein "best practices" in place at local districts can be shared with others statewide to improve the overall process.

D. Some districts offer a "fast-track" streamlined permit process if specific requirements are met. If this is proving effective, CARB should encourage a similar process be employed by other agencies.

E. CARB and local district messages need to talk about the fact that the process for approving EVR technology is very lengthy and there is no guarantee that any "silver bullet" technology will be approved within the timeframe leading to final compliance.

2. ***Improving communication between GDF agencies, the industry, GDF owners, contractors and installers:***

A. It is recommended that CARB together with the air districts get complete updated information out to the GDF industry, contractors and installers continuously. Such information should address their own permit requirements and enlighten them as to the fact that reviews and/or permits will be required by the defined agencies within their county or region. To the extent possible, the industry needs to know the requirements they will face up front. This can be accomplished by providing an information sheet at the beginning of the process indicating all of the necessary information, thus minimizing any surprises. In addition, this information should remind the contractor/installer to procure a business license for the jurisdiction in which they propose to provide the service.

B. CARB and the air districts need to communicate EVR information to other involved agencies so that they understand what EVR is and they can prepare to deal with the application flow.

C. CARB needs to expand its current EVR website by adding links to fire, planning and building agencies. Remove the word "processor" from all description section language. In addition, CARB needs to provide a web-based blog for contractors and installers to share and discuss issues.

D. CARB should endeavor to build the website as complete as possible and update as necessary. They should also advertise the availability of the website to all interested parties, especially the agency links provided as an attachment to this report. Information regarding best practices in use should be included, as this is beneficial to others.

E. CARB should establish a "hot-line" telephone number to provide rapid response to inquiries by industry and agencies.

F. CARB should consider a mass mailing to all involved agencies which includes a cover letter and a copy of the latest updated version of the EVR brochure.

G. CARB and the local districts need to continue to plan and implement the informational workshops throughout the state and develop outreach information that will serve to increase attendance by more agencies/industry representatives.

H. CARB should continue to pursue involvement as speakers and/or providing information booths at trade shows, seminars, and conferences of related agencies and industry to enhance greater understanding of the EVR program.

3. Improving communication agency to agency:

A. CARB should encourage local districts to develop a good communication link with the other involved local agencies ensuring that they know whom to contact at the local district regarding EVR requirements.

B. CARB should determine which local districts are not promoting the EVR program and offer needed assistance for outreach as necessary.

A feedback loop from the local districts to CARB indicating progress by the district is critical. The districts currently provide permitting information to CARB. However, information specific to progress of the EVR programs must be obtained by CARB to monitor progress statewide. Permit engineers at the local districts should be consulted to establish this necessary process.

4. ***Resource problems – manpower and financial:***

A. Some agencies are experiencing manpower shortages due to reduced land use planning and building activity. In such cases, a good understanding of the EVR program is critical. CARB should suggest the adoption and use of shortcut, fast track information sheets such as that adopted by the City of Riverside Planning Department. Additional best practices should be communicated to these other agencies as CARB learns of them.

B. In the case of air districts experiencing manpower problems, if possible, CARB should consider the feasibility of temporary placement of permitting staff assistance to "fill the gap". A resurgence of the "circuit rider" concept, if you will.

C. CARB should encourage the local air districts as soon as possible to make an extra effort to notify all public agencies including special districts with fleet fueling operations of the pending EVR deadlines. These agencies are currently preparing FY 08-09 budgets and will need to include the costs of EVR system upgrades in their upcoming budgets. Historically, these types of agencies experience difficulty with compliance deadlines due to a lack of funding.

D. CARB should consider conducting a research survey of funding institutions, both public and private, to determine which (if any) will provide funding in the form of grants or loans for this type of pollution control equipment. This information should then be provided to local districts and the industry.

E. CARB must pursue the manufacturers to provide prompt field support to contractors and installers. If possible, to the point of threatening decertification if equipment cannot be properly installed.

F. CARB should utilize information received by the districts to notify contractors and installers when and where potential customers are still in need of EVR installation. This may help ensure contractor assistance in rural and suburban areas of the state.

5. Making allies with the GDF trade associations:

A. CARB, perhaps with the involvement of CAPCOA, should encourage the trade associations such as CIOMA, WSPA, and the California Grocers Association, to promote early action in the EVR program to their respective members. These groups should be providing assistance to their members to aid them in compliance by the deadline. These associations can be very beneficial in getting information to their members and encouraging them to come into compliance in a timely manner. Such an effort would be beneficial to CARB. It would not bode well with the Legislature and/or the CARB Board of Directors if the associations continue to push for further delay when they have refused to participate in an effort to help bring about compliance.

NEXT STEPS - IMPLEMENTATION SUGGESTIONS

It is suggested that CARB enter into short-term contracts to accomplish the following tasks:

- Work with contractors to categorize short-term measures for quick implementation vs. longer-term measures.
- Direct contractors to develop language for the various letters and other mail-outs to agencies and associations.
- Direct contractors to meet with trade association representatives to solicit their support and assistance for the EVR program.
- Direct contractors to assist CARB with "trouble-shooting" issues that arise related to permitting EVR installations.
- Direct contractors to assist CARB in a survey of financial institutions to determine the availability of funding assistance for GDF owners.

ACCESS LISTING OF AGENCY CONTACTS

California Professional Firefighters Association:
http://www.cpf.org/default/fire department directory/index.cfm

Local Air Districts (on the CARB website):
http://www.arb.ca.gov/capcoa/roster.htm

County Planning Directors (Governor's Office of Planning & Research):
http://www/calpin.ca.gov/directory/county.asp

City Planning Directors (Governor's Office of Planning & Research):
http://www.calpin.ca.gov/directory/city.asp

APPENDIX 9

CONTRACT NO. 07-529: FINAL REPORT FROM MEL KNIGHT

Final Report

Outreach Plan for Local Environmental Health and Certified Unified Program Agencies to Ensure Coordinated Permitting and Compliance with Phase 2 of the California State Evaporative Vapor Recovery Requirements

Contractor:
Mel Knight, REHS
109 Gold Rock Court
Folsom, CA 95630-1841
melknight@sbcglobal.net

This report is prepared in fulfillment of CARB contract 07-529.

Background

The Enhanced Vapor Recovery (EVR) program will require significant equipment upgrades to over 13,000 gasoline dispensing facilities (GDFs) in California by April 2009. The relatively few station that have already performed these upgrades have discovered the EVR upgrades may require permits from several local permit agencies, such as city and county planning and building departments, local fire officials and local environmental health agencies. Many of these agencies are not familiar with vapor recovery requirements, which can lead to additional cost and significant delays (over six months) for station owners. Air Resources Board (ARB) staff has initiated contracts with local government experts to work with these permitting agencies in order to ensure that the April 2009 deadline is met.

Identification of Local Permitting Agencies

The primary or lead local agencies for EVR permitting are the local Air Districts. The outreach plan for local Air Districts is being prepared under a separate, coordinated contract (CARB contract 07-528).

Other local agencies with permitting or other regulatory interests that may be associated with EVR projects include Certified Unified Program Agencies (CUPAs), environmental health agencies, planning agencies, building officials, fire marshals, and sealers of weights and measures.

Consistent with contract requirements, this outreach plan focuses on CUPAs and environmental health agencies, with reference to coordinated actions with other interested agencies.

Certified Unified Program Agencies (CUPAs)

California State law requires that local agency responsibility for implementing hazardous materials permitting and regulation must be carried out by a Certified Unified Program Agency. Permitting of hazardous materials storage including above ground and underground storage tanks (USTs) including associated piping and dispensing systems is one of the program responsibilities of CUPAs or their agents. CUPAs have direct concerns as EVR modifications have the potential to impact multiple areas of the UST system, and will potentially trigger additional inspections, testing and coordinated agency activity. EVR upgrades also may to trigger deferred upgrades that are peripherally related to specific EVR requirements.

There are currently approximately 100 CUPAs recognized by CalEPA, and nearly half are located within environmental health agencies. The remaining agencies are typically administered by fire agencies, with a small number residing in other agency configurations. A current listing of CUPAs, including contact information, can be obtained at the following website: www.calcupa.net.

Environmental Health Agencies

California State law requires that local environmental public health responsibilities are performed under the authority of a Local Health Officer and Director of Environmental Health.

Major areas of environmental health (EH) agency interest in gasoline dispensing facilities are related to retail food, potable water, cross-connection and/or on-site sewage disposal. EH agencies have few direct concerns related to the EVR program, unless EVR upgrades have the potential to interfere with other EH permitted activities, or the potential to trigger deferred upgrades unrelated to EVR.
There are currently local health agencies designated for all 58 counties and additional local health agencies in four cities (Berkeley, Long Beach, Pasadena and Vernon). A current roster of local environmental health agencies, including contact information, can be obtained at the following website: www.ccdeh.com.

Building Officials
Counties and incorporated cities in California have a designated Building Official with primary responsibility for the issuance of building permits and compliance with both uniform and local building codes. Local building officials are responsible for permitting of new and renovation construction consistent with locally adopted versions of the California Building Codes (e.g. Uniform Building Code, Uniform Plumbing Code, Uniform Electrical Code and any additional specialty construction requirements.) Building official concerns for EVR upgrades would include compliance with plumbing and electrical construction codes as well as the potential to trigger unrelated deferred building requirements; e.g. ADA accessibility requirements.
Regional or geographic Building Officials Chapter Liaisons can by located on the California Association of Local Building Officials website: www.calbo.org.

Local Fire Officials
City, County and Special District Fire Departments are responsible for fire prevention related to the permitting of structures and activities that contain flammable materials, including fuels. Fire Marshal concerns related to EVR primarily relate to fuel system integrity related to flammable fuels and vapors. Permitting and inspection by Fire Marshals will be consistent with locally adopted Uniform Fire Code and any local variations. Contact information for California Fire agencies can be found at the following link: http://www.cpf.org/default/fire_department_directory/index.cfm

Sealers of Weights and Measures/Agricultural Commissioners
Sealers of Weights and Measures are responsible for the quantitative integrity of dispensing devices, including gasoline dispensers. Local sealers are responsible for accuracy of dispensing systems and would have concern for any potential to interfere with volume measurement systems at gasoline dispensing facilities.
This function is generally carried out in California Counties as a function of the County Agricultural Commissioner. A current roster of County Sealers of Weights and Measures, including contact information, can be obtained at the following website: www.dca.ca.gov/publications/guide/weights

Planning Departments
City and County Planning departments are responsible for approval and permitting of local land use conditions including zoning, CEQA, and aesthetic community standards. Planning Department interests in EVR projects are generally related to visual impact of

EVR system components, including sight barriers. The following is a link to California Planning Departments, including contact information: www.calpin.ca.gov/directory

Prioritizing Barriers

Compliance with EVR upgrade requirements with the myriad of agencies and required permits can pose significant barriers to the gasoline dispensing facilities. These barriers can include:

Required permits directly related to EVR system.
In addition to permits from the local Air Districts, GDFs will typically need to obtain permits from building officials and fire agencies that directly relate to the installation and operation of the EVR system and its components. Examples of these permits would include the building permits associated with the installation of plumbing and electrical systems, Fire Marshal review for compliance with fire codes, as well as land use permits associated with fencing or landscape plans to enhance aesthetics of the project structures or site.

Permits or reviews peripherally related or even unrelated to EVR system.
A number of regulatory agencies may require review, approval and/or permits related to concerns for secondary impacts associated with the EVR upgrade projects. Examples of these reviews or permits include CUPA review for disruption of tank monitoring systems and potentially Weights and Measures review for impact on dispensing volume measurement. At least one local building official has indicated that EVR upgrade projects will trigger a review of the existing facility for all requirements associated with the Americans with Disabilities Act (ADA) and subsequent requirement for the GDF to make necessary renovations.

Concurrent time requirements for each permitted activity.
Many of the local regulatory agencies issue permits that have a limited effective date (e.g. "*This permit is valid for no more than 90 days*") and frequently these date limits or deadlines do not recognize the need for extended timelines that may be associated with the serial nature of obtaining multiple agency reviews and approvals. While governmental agencies have a legitimate concern for issuing 'open ended' permits, uncoordinated and inconsistent deadlines can pose a significant hardship for GDF compliance.

Permit Fees and inspection cost recovery costs associated with each agency.
Following the passage of the tax limitation Proposition 13, local governmental agencies have sought to recover most, if not all regulatory agency costs via permit fees or fees for service. This has resulted in multiple agencies collecting fees that can cumulatively amount to many thousands of dollars in costs to the GDF.

Fines and penalties for non-compliance with requirements and/or deadlines.

Local regulatory agencies can utilize fines or penalties as sanctions for noncompliance or failure to comply by required deadlines. While penalties are intended to be incentives to ensure compliance, GDFs may perceive some non-compliance as unavoidable due to the multiple layers of regulation, and the fines or penalties could be perceived as posing an additional and burdensome cost that may contribute to making the cumulative costs beyond available resources.

Cumulative EVR upgrade costs
Typical EVR upgrade costs for a single GDF are expected to be in the range of $85,000 to $100,000, with additional ongoing operating and maintenance costs. This expenditure may pose a financial hardship for a number of small, independent or marginal operations.

Identification of Critical Paths to Permit Issuance

The following is the typical process and sequence for local agency permit issuance and subsequent confirmation of compliance:

Applicant submittal of completed application(s) with associated fee payment.
GDFs or their authorized agents are required to submit appropriate applications to all local agencies that have pertinent requirements. Applications require project descriptions, site information and technical data that may require sign-off from a professional engineer and/or architect. Applicants will generally be required to make full or partial payment for all anticipated agency costs or fees at the time of application.

Agency review for completeness and adequacy.
Local agencies will perform plan checks to ensure that all applicable information has been provided. If an agency determines that the application is incomplete or does not meet all requirements, applicant will be required to resubmit application with amended information, possibly incurring an additional review fee.

Approval/permit issuance to allow initiation of permitted activity.
Following determination of completeness and adequacy, agencies will issue a permit that relates to the specific agency scope of regulation. In some instances, the permit will be conditioned to also require appropriate sign-off or permit issuance by other interested agencies.

On-site inspection(s) at initiation, during and/or post permitted activity.
Subsequent to permit issuance and agency approval, applicants will be allowed to initiate EVR upgrades, with some agencies requiring an inspector presence on one or more instances that may include the beginning, middle or end of permitted activity. Some agencies may charge a separate inspection fee, and any deficiencies identified during inspection may result in correction, re-inspection and additional fees or penalties.

Subsequent periodic inspections or compliance audits to ensure continued compliance with operational and/or maintenance requirements.
While some local agencies oversight may end with the completion of the permitted and approved upgrade, other agencies will have a continuing program of inspection and

reporting that ensures compliance related to operation and maintenance beyond initial installation. In most instances, building officials, planning agencies and CUPAs will require project permitting and approval for EVR upgrade projects, and they will not typically have an ongoing compliance activity. Air Districts and Fire Marshals will generally have a requirement for ongoing compliance audits or inspections, and these will usually have an annual fee or other cost recovery mechanism.

Recommendations

Recommended Strategies for Streamlined Permit Issuance

The following are recommendations to CARB, local Air Districts and/or other interested agencies or parties have a role in ensuring an enhanced level of timely and effective compliance with pending EVR upgrade requirements:

Document "best practices" in use at successful jurisdictions.
A number of lessons have already been learned by both agencies and GDFs in the EVR upgrades that have been completed to date. Documenting and communicating the experience and procedures that have been associated with successful completed upgrades can be shared and hopefully replicated by other agencies seeking efficient and effective model policies and procedures.

Identify business assistance programs and resources.
In addition to the small business assistance associated with the federal Clean Air Act, many cities and counties have initiated business assistance resources to provide assistance in a wide range of compliance areas. The Sacramento County Business Environmental Resource Center (BERC) is an example of an industry assistance resource that provides multi-agency compliance support at no additional cost to project applicants.

Encourage coordinated permitting and inspections.
A number of cities and counties have established permit application policies and procedures that are intended to ensure that multiple agencies share information and notifications, encouraging coordinated actions that promote timely and efficient review and approval.

Encourage consolidated permitting and inspections.
Several local jurisdictions have initiated 'one stop' permit centers or joint permit counters that have been successful in saving time and costs to both applicants and agencies.

Suggest use of 'lead' agency designation.
In order to ensure timely compliance, a number of local agencies have determined that it is in their interest to assume an active or 'lead' role in the contact and coordination of communication with other agencies. This is frequently utilized where there is multiple agency involvement in toxic site remediation, and a similar model should provide benefit for the multi-agency interests in EVR upgrade projects.

Encourage and promote access to subsidies and alternative funding.
A number of local Air Districts are planning to offer reduced fees for early EVR upgrades. The State Water Resources Control Board may have UST funds available to assist with EVR upgrade costs. CARB and local Air Districts should publicize and assist in publicizing and facilitating access to these monetary assists.

Anticipate need for 'surge' permitting and inspection resources as deadline nears.
Past experience has proven that agency and industry resources can be overwhelmed by a surge of 'last minute' activity as a regulatory deadline nears. This has been the historical case with a number of underground storage tank (UST) and dispensing system upgrades that have exhausted the available engineering, consultant, contractor and regulatory staff resources available to respond to the atypical high volume of upgrade projects that occur as deadlines near. Anticipating this 'surge' of activity may allow planning for temporary help, overtime, redeployment of staff and other actions that will minimize the overwhelming of available resources.

Provision of assistance from CARB and other State and regional entities that may have experience and expertise in subject area.
Cities and counties may be able to receive technical assistance or 'mutual aid' from State agencies or neighboring peer jurisdictions. Local Air Districts, CUPAs, environmental health agencies, fire agencies, and building officials have regional information sharing mechanisms, and these may include agreements to provide mutual aid or assistance. CARB or other CalEPA BDOs may be in a position to provide specific engineering or other technical assistance to local agencies lacking resources or experience with EVR projects.

State or regionally based 'Red Team'(s) might be established to be a 'circuit riding' permit assistance unit.
CARB should encourage or seek to initiate a specialty team or contract resources with the capacity to provide timely regional resource augmentation for local agencies. The State has provided a similar resource in the area of bioterrorism laboratory capacity, and CalEPA and the Attorney General have provided attorney resources to assist with local environmental crimes prosecution.

Recommended Outreach Plan for Permitting Agencies:

Promote early awareness by all involved agencies.
In addition to the existing communication channels with local Air Districts, CARB should initiate continuing and sustained contact with other local agencies to ensure awareness of pending EVR requirements and deadlines.

Develop and distribute written pamphlets and brochures for agencies and applicants.
CARB and local Air Districts should develop and distribute informational materials targeting all GDFs and interested permitting agencies. These materials should be

available in multiple languages in both print and electronic formats, with website links utilized to facilitate multi-agency coordination and collaboration.

Meetings with key leadership of all associations and agencies.
Nearly all industry and governmental agencies have organized networks or associations that have an interest in serving as informational conduits for their membership. Following awareness and 'buy-in' by key association staff and leadership, these existing networks may be utilized in the dissemination and feed back on EVR upgrade information.

Participation in existing agency workshops and conferences.
Regulatory professionals and GDF industry groups sponsor statewide and regional meetings, workshops and conferences that can be utilized as efficient forums to share EVR upgrade information. CARB and local Air Districts can participate in these meetings as a presenter, exhibitor and/or sponsor.

Form private sector alliances with associations, permit assistors and contractors.
There is an existing cadre of private permit assistance contractors and other private sector trade associations with an interest in facilitating efficient and timely EVR upgrade compliance. CARB and local air districts should initiate partnership and collaboration with these private sector resources in the mutual interest of GDF awareness and compliance actions.

Develop and publicize early implementation incentives, as well as disincentives or penalties for late or non-compliance.
Specific local Air Districts have established discounts or subsidies as an incentive for early EVR upgrade compliance, while a number of local regulatory agencies will be assessing fines and penalties for missing compliance deadlines. Increasing the awareness of these enforcement 'carrots and sticks' should assist in encouraging early upgrade implementation.

Develop specific outreach for public agencies that have historically had difficulty in timely upgrades or contracting.
Independently owned as well as government operated GDFs have documented difficulty in timely compliance with previous UST and EVR upgrade requirements. CARB and local Air Districts should anticipate the need for specific targeted outreach directed to these GDFs.

Examples of Specific Recommended Activities:

Participation at CUPA Annual Conference and CUPA Forum regional meetings.
CARB should establish a continuing presence as an exhibitor, presenter, and participant at the CalCUPA Forum Annual Conference. The 2008 Conference will be held in the South San Francisco area in February. CARB should seek participation in the CUPA Forum Board/Executive Committee meeting in order to promote CUPA leadership awareness of the pending EVR upgrade requirements. Participation in the annul

conference should be utilized to establish ground work for future, continuing participation in State and Regional CUPA Forum activities. The CUPA Forum receives staff support from Justin Malan (Justin@ccdeh.com) and Sheryl Baldwin (Sheryl@ccdeh.com) and they can assist in direction to CUPA activities. More information on the CalCUPA Forum organization and activities can be found on the CalCUPA Forum website www.calcupa.net.

Participation in CCDEH Statewide and Regional meetings.
CARB should initiate a continuing presence and availability to local environmental health officers. The California Conference of Directors of Environmental Health (CCDEH) has and annual meeting each Fall, regularly scheduled meetings of their statewide leadership, and there are also periodic meetings of all Directors in four regional zones. Justin Malan is the Executive Director of CCDEH can facilitate participation in CCDEH meetings, and he can be contacted at Justin@ccdeh.com. More information concerning the CCDEH organization and activities can be found on the CCDEH website www.ccdeh.com.

Participation in California Environmental Health Association (CEHA) conference.
CEHA is a professional association that holds an annual symposium each Spring that attracts a large number of environmental health professionals from environmental health jurisdictions throughout the State. This symposium may provide an opportunity to be an exhibitor and possible program presenter promoting EVR awareness. The 2008 CEHA Annual Educational Symposium (AES) will be held in San Diego in March. Communication or participation in CEHA functions can be initiated via the CEHA website at www.CEHA.org.

Establish a basis for similar information sharing with other interested local agency forums including planners, building officials, Sealers of Weights and Measures and local fire officials.
Nearly all regulatory disciplines have an existing association or networking mechanism similar to CAPCOA, CUPA Forum or CCDEH. CARB should establish communication with staff and leadership in these organizations in order to promote awareness and enhanced capacity to participate in EVR upgrade activities.

(Note: Contractor is aware that CARB has planned or accomplished a number of the recommended activities in the course of this project.)

APPENDIX 10

FEBRUARY 20, 2008, LETTER FROM JAMES GOLDSTENE, ARB EXECUTIVE OFFICER TO ALL LOCAL AIR POLLUTION CONTROL OFFICERS

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

February 20, 2008

Addressees: All Local Air District Air Pollution Control Officers (APCO)

Dear APCO:

I am writing to encourage you to revise your district's vapor recovery rules as outlined by the U.S. Environmental Protection Agency (U.S. EPA) in the attached memoranda (Attachment 1). U.S. EPA is encouraging states to eliminate the requirement for Phase II vapor recovery systems on gasoline refueling dispensers for certain motor vehicle fleets in light of the growing use of Onboard Refueling Vapor Recovery (ORVR) systems in those fleets.

The fleets at issue are new vehicles initially fueled at motor vehicle assembly plants, late model rental cars refueled at rental car facilities, corporate fleets refueled at corporate-owned pumps, and flexible fuel vehicles (FFVs) refueled at E85 fuel dispensers.

Section 202(a)(6) of the federal Clean Air Act (Act) allows U.S. EPA to remove the requirement for vehicle refueling gasoline vapor recovery systems in ozone nonattainment areas after determining that ORVR systems for motor vehicles are in widespread use. For new vehicles initially fueled at motor vehicle assembly plants, late model rental cars refueled at rental car facilities, and corporate fleets refueled at corporate-owned pumps, U.S. EPA has defined widespread use as 95 percent of the vehicles equipped with ORVR. By virtue of being made up of new late-model vehicles, these fleets have met this criterion.

For FFVs, U.S. EPA is recommending that states show that any increase in emissions caused by operating E85 refueling dispensers without vapor recovery systems is so small as not to interfere with ozone attainment. ARB staff has estimated the emissions to be less than 0.10 tons per day of reactive organic gases statewide in 2015 (see Attachment 2) and believes that it is reasonable to conclude that there is no impact on ozone attainment.

The process for revising a district's vapor recovery requirements is the same as for any other district rule State Implementation Plan (SIP) submission: adopt the amended rules at a public hearing and transmit the amended rules to ARB for processing as a SIP revision and submittal to U.S. EPA. ARB staff is available to assist you with rule review

or in doing additional analysis before proceeding, including more specific emissions assessment and attainment impacts, impact on progress toward state standards, and any possible toxic air contaminant issues.

If you have any questions or need further information regarding vapor recovery requirements, please contact Cindy Castronovo of the Monitoring and Laboratory Division at (916) 322-8957. For questions regarding the emissions impact analysis, please contact Dean Simeroth, Chief of the Criteria Pollutants Branch, at (916) 322-6020.

Sincerely,

James N. Goldstene
Executive Officer

Attachments

cc: Dean Simeroth, SSD
Kurt Karperos, PTSD
Cindy Castronovo, MLD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

DEC 12 2006

MEMORANDUM

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

SUBJECT: Removal of Stage II Vapor Recovery in Situations Where Widespread Use of Onboard Refueling Vapor Recovery is Demonstrated

FROM: Stephen D. Page, Director
Office of Air Quality Planning and Standards

Margo Tsirigotis Oge, Director
Office of Transportation and Air Quality

TO: Regional Air Division Directors

The purpose of this memorandum is to provide guidance to States concerning the removal of Stage II gasoline vapor recovery systems where States demonstrate to EPA that widespread use of onboard refueling vapor recovery (ORVR) has occurred in specific portions of the motor vehicle fleet. The specific fleets addressed here include:

1. initial fueling of new vehicles at automobile assembly plants
2. refueling of rental cars at rental car facilities
3. refueling of flexible fuel vehicles at E85 dispensing pumps

Background

Stage II vapor recovery systems are required to be used at gasoline dispensing facilities located in serious, severe, and extreme non-attainment areas for ozone under section 182(b)(3) of the Clean Air Act (CAA). States have included these control measures in their federally-approved state implementation plans (SIPs) in the form of generally applicable regulatory requirements governing all gasoline dispensing facilities that exceed the relevant gasoline dispensing throughput criteria. However, section 202(a)(6) of the CAA allows EPA to revise or waive the section 182(b)(3) Stage II requirement for these ozone non-attainment areas after the Agency determines that ORVR is in widespread use throughout the motor vehicle fleet.

CAA section 202(a)(6) does not specify which motor vehicle fleet must be the subject of a widespread use determination before EPA may revise or waive the section 182(b)(3) Stage II requirement. Nor does the CAA identify what level of ORVR use in the motor vehicle fleet must be reached before it is "widespread." EPA expects the possibility of

different rates of the implementation of ORVR across different geographic regions and among different types of motor vehicle fleets within any region. Given this, EPA does not believe that CAA section 202(a)(6) must be read narrowly to allow a widespread use determination and waiver of the Stage II requirement for a given area or area's fleet only if ORVR use has become widespread throughout the entire United States, or only if ORVR use has reached a definite level in each area. Rather, EPA believes that section 202(a)(6) allows the Agency to apply the widespread use criterion to either the entire motor vehicle fleet in a State or non-attainment area, or to special segments of the overall fleet for which ORVR use is shown to be sufficiently high, and to base widespread use determinations on differing levels of ORVR use, as appropriate. Moreover, a single national rulemaking is not needed to grant such a waiver for a specific area. Instead, EPA believes that the Act allows the Agency to use an area-specific rulemaking approving a SIP revision to issue the section 202(a)(6) waiver for a relevant fleet in a non-attainment area, where a State meets the recommended criteria discussed below.

Various metrics have been studied for demonstrating widespread use of ORVR in motor vehicle fleets. One metric focuses on the percentage of vehicles in service that are ORVR-equipped. Based on our preliminary analysis, this metric seems to track fairly closely with the percentage of vehicle miles traveled (VMT) from ORVR-equipped vehicles, and with the percentage of gasoline sold which is dispensed to ORVR-equipped vehicles. In fact, since newer vehicles tend to be driven more miles than older models, VMT traveled by ORVR-equipped vehicles and gasoline dispensed to ORVR-equipped vehicles may exceed 95 percent in a 95 percent ORVR-equipped fleet.

Another metric that EPA considered is when VOC emissions resulting from the application of ORVR controls alone equal the VOC emissions when both Stage II vapor recovery systems and ORVR controls are used, after accounting for incompatibility excess emissions. The incompatibility excess emissions factor relates to losses in control efficiency when certain types of Stage II and ORVR are used together. Studies conducted in three northeastern states indicate that when the percentages of motor vehicles in service with ORVR, vehicle miles traveled by ORVR-equipped vehicles, or gasoline dispensed to ORVR-equipped vehicles are above 95 percent, then the widespread use metric based on comparable VOC emissions will likely have been reached. For this reason, EPA believes that if 95 percent of the vehicles in a fleet have ORVR, then widespread use will likely have been demonstrated.

1. Initial Fueling at Automobile Assembly Plants

Based on our preliminary analysis, EPA expects that if a State's submission of a SIP revision shows that 95 percent of the new vehicles fueled at an automobile assembly plant are equipped with ORVR, and that this level of ORVR use would not decrease, the Agency can determine that widespread use of ORVR has been achieved for the fleet of motor vehicles that are fueled at that facility.

Since model year 2000, all passenger cars have been required to have ORVR. Also since 2006, all light duty trucks, SUVs and medium duty vehicles are required to be equipped

with ORVR. There may be a few situations, such as the chassis for motorized mobile homes, which still do not have ORVR. However, the number of these would be small. It is apparent that at most automobile assembly plants greater than 95 percent of the vehicles manufactured would have ORVR. Many assembly plants manufacture 100 percent ORVR equipped vehicles. Only such new vehicles are expected to be fueled at the automobile assembly plants.

States desiring to remove the Stage II requirement for these facilities would need to submit a SIP revision that EPA would evaluate through notice and comment rulemaking. The SIP would need to demonstrate that the widespread use benchmark has been achieved and provide assurance that any facility wishing to remove Stage II equipment maintains its eligibility for its motor vehicle fleet. Any EPA SIP approval would also be subject to the CAA section 110(l) requirement that the revision not interfere with any applicable requirement concerning attainment and reasonable further progress, or any other requirement of the CAA.

2. Refueling of Rental Cars at Rental Car Facilities

Similarly, EPA expects that if a SIP revision submission demonstrates that 95 percent of the vehicles in an automobile rental fleet refueling at a rental car facility are equipped with ORVR and that this level of ORVR use would not decrease, then widespread use of ORVR could be found for the motor vehicle fleet refueling at that facility. Most large rental car companies rent current model vehicles that would all have ORVR. There may be truck rental companies which have older vehicles which do not have ORVR and that would not be able to demonstrate widespread use of ORVR for their fleets. As discussed above, any SIP revision would be subject to CAA section 110(l) and other applicable requirements, and State and local agencies should consider any potential transportation conformity impacts if Stage II is currently included in a SIP's on-road motor vehicle emissions budget.

3. Refueling Flexible Fuel Vehicles at E85 Dispensing Pumps

E85 is a motor vehicle fuel that is a blend of as little as 15 percent gasoline and up to 85 percent ethanol. (In wintertime applications, the ratio may be 30 percent gasoline and 70 percent ethanol.) Ethanol is ethyl alcohol, a type of alcohol which can be produced from renewable resources such as corn. Based on the agency's survey of existing SIPs, EPA believes that most States have defined "gasoline" (for purposes of controlling emissions of VOC from refueling activities) to include gasoline/alcohol blends that have the same volatility as E85. EPA's guidance for States in developing their Stage II SIPs in the early 1990s suggested that States use the same definition of "gasoline" as the one found in EPA's Standards of Performance for Bulk Gasoline Terminals at 40 C.F.R. 60.501, which includes "any petroleum distillate or petroleum distillate/alcohol blend having a Reid vapor pressure of 27.6 kilopascals (kPa) or greater which is used as a fuel for internal combustion engines." EPA recommended using this definition to most broadly reach situations in which refueling of motor vehicles results in evaporative VOC emissions that contribute to ozone non-attainment concentrations, and to avoid a narrow interpretation of what is "gasoline" that

would allow significant VOC emissions from motor vehicle refueling activities in non-attainment areas to go uncontrolled.

E85 can only be used in specially designed flexible fuel vehicles (FFVs), which have mostly been manufactured since 1998. Since these are newer vehicles, most of them are equipped with ORVR, and every FFV built today has ORVR. Thus, most vehicles refueling at E85 dispensing pumps are already having their evaporative emissions captured, as in the cases of late model rental cars refueling at rental car facilities and newly manufactured cars being fueled for the first time at automobile assembly plants. EPA estimates that 59 percent of FFVs in current use are equipped with ORVR. The percentage of FFVs with ORVR will continue to climb as older vehicles are taken out of service and new models join the fleet. Across different ozone non-attainment areas and between States, these percentages may vary.

EPA believes that encouraging the use of E85 as a motor vehicle fuel reduces emissions of other air pollutants such as CO and benzene, a known human carcinogen, and reduces emissions of greenhouse gases. In addition, based on available information, the Agency is concerned that there is currently a lack of certified Stage II equipment for E85 (which may require different materials of construction than conventional Stage II equipment), and that the timing for when certified E85-compatible equipment will become widely available is uncertain. This may unnecessarily hinder E85 distribution in areas that now require Stage II.

Unlike in the cases of automobile assembly plants and rental car facilities, EPA is not recommending a specific percentage of the FFV fleet that should have ORVR before widespread use could be determined. This is because most E85 compatible vehicles are already equipped with ORVR and this percentage is increasing over time, whereas for automobile assembly plants and car rental facilities very high percentages of ORVR use have in most cases already been reached and are not expected to further increase significantly. The general use of ORVR in FFVs, instead, is expected to significantly increase, as are the miles driven by and amount of fuel dispensed to recent ORVR-equipped FFVs compared to those manufactured before 2000 without ORVR.

Moreover, we believe that in determining whether widespread use of ORVR has been demonstrated, it is reasonable under section 202(a)(6) to consider the VOC emissions impacts of removing Stage II, and that those impacts may inform the percentage of ORVR-equipped vehicles that would need to be achieved for a specific motor vehicle fleet or in a specific non-attainment area. EPA expects that the air quality impact of allowing E85 refueling facilities to operate without Stage II controls would likely be minimal in most non-attainment areas. FFVs currently comprise about 2 percent of the total US fleet. Non-ORVR FFVs are less 1 percent of the total U.S. vehicle fleet. EPA estimates that non-ORVR FFVs participate in only about 0.5 percent of all refueling events. Furthermore, because of the relatively small number of stations that offer E85 (around 1,000 out of 170,000 total refueling stations) EPA believes that very few of these non-ORVR refueling events actually occur at E85 pumps.

Considering the factors discussed above, if an area can demonstrate that any increase in emissions caused by operating E85 fueling facilities without Stage II controls is so small as to clearly not interfere with attainment of the ozone standard or reasonable further progress or any other applicable CAA requirement, then EPA expects it could find that ORVR is in widespread use for FFVs when refueling at E85 facilities in this area. These areas could then allow E85 facilities to operate without Stage II controls, after modifying their SIPs such that E85 is not included within the definition of "gasoline" for purposes of Stage II vapor recovery controls (or after taking other necessary SIP revision action). As discussed above, States would need to submit SIP revisions affecting this change to their current Stage II SIPs, which EPA would evaluate through notice and comment rulemaking, subject to the provisions of CAA section 110(l). In addition, State and local agencies should consider if there are any transportation conformity impacts related to removing Stage II, if emissions reductions from Stage II are included in a SIP's on-road motor vehicle emissions budget. Due to the expected rapid growth of E85 installations, EPA will explore the development of ways to expedite the SIP revision process for States which are dealing with the E85 issue.

General Exclusions from Widespread Use Determinations

States in the ozone transport region (OTR) are still required to apply Stage II, or a comparable measure, in all areas under 184(b)(2) of the CAA. This requirement is not affected by any widespread use determination or waiver of the section 182(b)(3) requirement granted under section 202(a)(6). For the independent section 184(b)(2) "comparable measure" requirement to not prevent an appropriate removal of Stage II controls, OTR States may want to revisit their previously approved comparable measure SIPs to consider substituting available non-Stage II measures for the Stage II controls they currently require.

Also, some States have chosen to add Stage II vapor recovery system requirements in their SIPs for ozone nonattainment areas that are classified in a category lower than "serious." While it is not necessary for States to demonstrate ORVR is in widespread use in moderate or cleaner ozone non-attainment areas, a revision of previously adopted SIP requirements to specifically waive Stage II requirements in such areas would need to comply with the provisions of CAA section 110(l) and, as described above, consider any transportation conformity impacts as applicable.

This guidance for widespread use determinations for special sectors would not necessarily apply to widespread use determinations for the general motor vehicle fleet. Within the overall motor vehicle fleet, the rate of penetration of ORVR-equipped vehicles has not advanced at the same rapid rates as for the fleets discussed in this memorandum. EPA is still considering the possible criteria for determining widespread use for the general fleet.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

NOV 28 2007

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Removal of Stage II Vapor Recovery from Refueling of Corporate Fleets

FROM: Stephen D. Page, Director
Office of Air Quality Planning and Standards

Margo Tsirigotis Oge, Director
Office of Transportation and Air Quality

TO: Regional Air Division Directors

The purpose of this memorandum is to provide guidance to States concerning the removal of Stage II gasoline vapor recovery systems at gasoline refueling facilities exclusively dedicated to refueling "corporate" or "commercial" fleets, where States demonstrate to the Environmental Protection Agency (EPA) that widespread use of onboard refueling vapor recovery (ORVR) has occurred in such fleets. Corporate or commercial fleets include vehicles owned by corporations, governments, universities or other organizations which use the vehicles for business purposes and typically fuel the vehicles at fueling pumps owned and operated by the fleet owner and exclusively dedicated to fueling the fleet.

On December 12, 2006, EPA issued a memorandum, "Removal of Stage II Vapor Recovery in Situations Where Widespread Use of Onboard Refueling Vapor Recovery is Demonstrated," (attached) which discussed how States may explore amendments to their State Implementation Plans (SIPs) to allow Stage II gasoline vapor recovery to be removed from specific fleet situations, namely:

1. initial fueling of new vehicles at automobile assembly plants;
2. refueling of rental cars at rental car facilities; and
3. refueling of flexible fuel vehicles at E85 dispensing pumps.

The December 12, 2006, memo states that widespread use of ORVR will likely have been demonstrated if 95 percent of the vehicles in a fleet have ORVR. In today's memorandum, EPA is indicating that it believes that if a State demonstrates that 95 percent of the vehicles in a corporate or commercial vehicle fleet are equipped with ORVR and that

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this level of ORVR use would not decrease, then widespread use of ORVR could be found for the corporate or commercial motor vehicle fleet, such that Stage II controls could be considered for removal from a refueling facility that is exclusively dedicated to refueling that fleet.

States desiring to remove the Stage II requirement for these facilities would need to submit a SIP revision that EPA would evaluate through notice and comment rulemaking. The SIP would need to demonstrate that the widespread use benchmark has been achieved and provide assurance that any facility wishing to remove Stage II equipment maintains its eligibility for its motor vehicle fleet. Any EPA SIP approval would also be subject to the Clean Air Act (CAA) section 110(l) requirement that the revision not interfere with any applicable requirement concerning attainment and reasonable further progress, or any other requirement of the CAA. In addition, State and local agencies should consider if there are any transportation conformity impacts related to removing Stage II, if emissions reductions from Stage II are included in a SIP's on-road motor vehicle emissions budget(s).

As mentioned in the December 12, 2006 memorandum, this guidance for widespread use determinations for corporate fleets would not necessarily apply to widespread use determinations for the general motor vehicle fleet. Within the overall motor vehicle fleet, the rate of penetration of ORVR-equipped vehicles has not advanced at the same rapid rates as in some corporate and rental fleets. EPA is still considering the possible criteria for determining widespread use for the general fleet.

In addition, the December 12, 2006, memorandum explained that widespread use determinations would not affect separate requirements applicable to States in the ozone transport region. This exclusion would also apply in the case of corporate or commercial fleets with widespread use of ORVR.

If you have questions about this recommendation, you may contact William L. Johnson in EPA's Office of Air Quality Planning and Standards by telephone at (919) 541-5245 or by e-mail at johnson.williamL@epa.gov.

Attachment

Attachment 2

Estimated ROG Emission Increases
From Removal of Stage 2 Vapor Recovery from E85 Fuel Dispensers

Year	Non-ORVR flex fuel vehicle population[1] (1,000's)	Annual VMT per vehicle[2], (1,000's)	% VMT fueled with E85[3]	E85 fuel economy[4] (miles per gallon)	Annual E85 used per vehicle[5], (gallons)	Total E85 used daily[6], 1,000's (gallons)	ROG emissions[7], statewide (tons per day)
2005	110	13.5	0	14.8	0	0	0
2010	95	11.4	5	14.8	38.5	10.0	0.035
2015	67	10.3	15	14.8	104	19.1	0.073
2020	34	9.3	25	14.8	157	14.6	0.055

Notes:

1. Based on data provided to ARB by automobile manufacturers of flex fuel vehicles (FFVs) sold in California 1997 – 2005, for which nearly all FFVs were light-duty trucks. Annual number of FFVs is estimated using survival fraction of vehicles as a function of vehicle age. Assumes all FFV light-duty trucks equipped with onboard refueling vapor recovery (ORVR) starting with MY2003. Average age of vehicles in 2005 non-ORVR FFV fleet is 4 years.

2. Annual vehicle miles traveled (VMT) data for light-duty trucks based on EMFAC2007.

3. Assumes increase in E85 refueling over time as number of E85 pumps increase and motorists become aware that E85 costs less than reformulated gasoline. The assumed percentages in each of the three years are estimates based on these factors.

4. Assumes:

   - Fuel economy of FFVs operating on E85 based on U.S. EPA Fuel Economy Guides;
   - Fuel economy does not decline with vehicle age for newer model year vehicles equipped with advanced on-board diagnostics.

5. Calculated: annual VMT X % fueled with E85 / fuel economy in miles per gallon.

6. Calculated: vehicle population X annual gallons E85 / 365 days per year.

7. Calculated: daily gallons of fuel used X evaporative emissions in pounds TOG per gallon of fuel throughput X 0.92 (ratio of ROG/TOG).