California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

November 18, 2010

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

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
(This facility is accessible to persons with disabilities.)

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

November 18, 2010
9:00 a.m.

CONSENT CALENDAR:

All items on the consent calendar will be voted on by the Board immediately after the start of the public meeting. Any item may be removed from the consent calendar by a Board member or by someone in the audience who would like to speak on that item. The following items are on the consent calendar:

Consent Item #

10-10-1: Public Meeting to Consider Approval of the Sacramento County PM10 Implementation/Maintenance Plan and Redesignation Request

The Board will consider approval of Sacramento's PM10 Maintenance Plan and Redesignation Request. The PM10 Plan demonstrates that the PM10 standard will be maintained in Sacramento County for the next 10 years, and requests that the County be redesignated to attainment.

10-10-2: Public Meeting to Consider Approval of Proposed Imperial County 2009 1997 8-Hour Ozone Modified Air Quality Management Plan and 2009 Reasonably Available Control Technology State Implementation Plan

The Board will consider the approval of these plans, which address the remaining State Implementation Plan requirements for Imperial County as a result of United States Environmental Protection Agency's December 2009 determination that Imperial County attained the 1997 8-hour ozone standard.

10-10-4: Public Meeting to Consider Two Research Proposals

1. "Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles – Augmentation," University of California, Davis, $120,000

2. "Characterization of the Atmospheric Chemistry in the Southern San Joaquin Valley," University of California, Berkley, $45,000

DISCUSSION ITEMS:

Note: The following agenda items may be heard in a different order at the Board meeting.

Agenda Item #

10-10-6: Public Hearing to Consider the Proposed Amendment of the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units and Transport Refrigeration Unit Generator Sets, and Facilities Where Transport Refrigeration Units Operate

Staff is proposing amendments to the Transport Refrigeration Unit (TRU) Control Measure to expand the compliance options. Additionally, the amendments would clarify the operational life of various types of TRUs.

10-10-7: Public Hearing to Consider Adoption of Proposed Amendments to the California Consumer Products Regulation, and to Hear an Informational Update on the Green Chemistry Initiative

Staff is proposing amendments to the Consumer Products Regulation that will set new or lower volatile organic compound (VOC) limits for a number of categories. For several categories, staff will propose prohibitions on the use of certain toxic air contaminants, compounds with higher global warming potentials, and certain surfactants that are toxic to aquatic species. Staff will also propose amendments to Method 310 to specify procedures to determine aromatic compound content in certain products. In addition, staff will present an informational update to the Board on recent activities related to the Green Chemistry initiative.

10-10-8: Public Meeting to Hear an Update on Implementation of the Low Carbon Fuel Standard

Staff will update the Board on the implementation of the Low Carbon Fuel Standard, and the Board may provide additional direction to staff. The update will include a report on the status of key elements of the program including the electronic reporting tool, recommendations of the Expert Workgroup, and progress on the Board's direction when it approved the Low Carbon Fuel Standard regulation.

10-10-9: Public Meeting to Hear a Report on Updates to Emissions Inventories for the Truck and Bus Regulation and the Off-Road Regulation Amendments to be Considered by the Board at the December 2010 Hearing

Staff will report to the Board on updates to the emissions inventories for trucks, buses, and off-road equipment. The updates include methodological improvements; inclusion of new population, emission rate, and activity data; and adjustments to reflect the impact of the economic recession. This is an informational report only; no action will be taken by the Board. The emission inventory updates were made to support the amendments to the Truck and Bus regulation and the Off-road regulation that ARB will consider at the December 2010 Hearing

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 or potential litigation:

Pacific Merchant Shipping Association v. Goldstene, U.S. District Court (E.D. Cal Fresno), Case No. 2:09-CV-01151-MCE-EFB.

American Trucking Associations, et al. v. U.S. Environmental Protection Agency, et al., U.S. Court of Appeals, District of Columbia Circuit, Case No. 09-1090.

POET, LLC, et al. v. Goldstene, et al., Superior Court of California (Fresno County), Case No. 09CECG04850.

Rocky Mountain Farmers Union, et al. v. Goldstene, U.S. District Court (E.D. Cal. Fresno), Case No. 1:09-cv-02234-LJO-DLB.

National Petrochemical & Refiners Association, et al. v. Goldstene, et al., U.S. District Court (E.D. Cal. Fresno) Case No. 1:10-cv-00163-AWI-GSA.

Association of Irritated Residents, et al. v. California Air Resources Board, Superior Court of California (San Francisco County), Case No. CPF-09-509562.

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 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.

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

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:
OFFICE: (916) 322-5594
1001 I Street, Floor 23, Sacramento, California 95814
ARB Homepage: www.arb.ca.gov

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format (i.e., Braille, large print, etc.) or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alterno (por decir, sistema Braille, o en impresión grande) u otro idioma;
- Una acomodación razonable relacionados con una incapacidad.

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

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

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November 18, 2010 at 9:00 a.m.

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CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER THE APPROVAL OF THE SACRAMENTO COUNTY PM10 IMPLEMENTATION/MAINTENANCE PLAN AND REDESIGNATION REQUEST

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider approving the Sacramento County PM10 Implementation/Maintenance Plan and Redesignation Request (PM10 Plan) that was developed and adopted by the Sacramento Metropolitan Air Quality Management District (District). If approved, ARB will submit these elements to the United States Environmental Protection Agency (U.S. EPA) for approval as a revision to the California State Implementation Plan (SIP).

DATE: November 18, 2010

TIME: 9:00 a.m.

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

This item may be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., November 18, 2010, and may continue at 8:30 a.m., on November 19, 2010. This item is scheduled to be heard on the Board's Consent Calendar. All items on the Consent Calendar will be voted on by the Board immediately after the start of the public hearing. Any item may be removed from the Consent Calendar by a Board member or by someone in the audience who would like to speak on that item.

BACKGROUND

The federal Clean Air Act establishes planning requirements for those areas that exceed the health-based National Ambient Air Quality Standards (standards). Areas are designated as nonattainment based on monitored exceedances of air quality standards. These nonattainment areas must develop and implement a plan that demonstrates how they will attain the standards by specified dates.

Sacramento County was designated a moderate non-attainment area by U.S. EPA in January 1994. In March 2002, U.S. EPA officially determined that Sacramento County had attained the 24-hour PM10 standard by the December 31, 2000 deadline. By making a clean data finding, U.S. EPA waived certain planning requirements including those for reasonable further progress, an attainment demonstration, reasonably

available control measures, and contingency measures, since these provisions have the sole purpose of helping achieve attainment of the standard.

On October 28, 2010, the District adopted the PM10 Plan. The PM10 Plan officially requests that Sacramento County be redesignated to attainment for the PM10 standard and charts the course for continued maintenance of the standard. In addition, the PM10 Plan documents a transportation conformity budget through 2022.

PROPOSED ACTION

ARB staff has reviewed the District's PM10 Plan and has concluded that it meets applicable Clean Air Act requirements. ARB staff has also determined that the PM10 Plan would ensure continued maintenance of the standard for the required ten years following redesignation. Staff is recommending that the Board approve the PM10 Plan, as well as the corresponding emissions inventory, maintenance demonstration, and transportation conformity budget as a revision to the California SIP. In addition, ARB staff is recommending that the Board approve the District's request that Sacramento County be redesignated from nonattainment to attainment for the national PM10 standard.

AVAILABILITY OF DOCUMENTS

ARB staff has prepared a written Staff Report. Copies of the Staff Report may be obtained from the ARB Public Information Office, 1001 "I" Street, First Floor, Environmental Services Center, Sacramento, California 95814, (916) 322-2990. This notice, the Staff Report, and the District's PM10 Plan will be available from ARB's website at: http://www.arb.ca.gov/planning/sip/sip.htm

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, or may be submitted by postal mail or by electronic submittal 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, Wednesday November 17, 2010,** 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

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 20 copies of any written submission. Also, 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 Ms. Sylvia Zulawnick, Manager of the Particulate Matter Analysis Section, Planning and Technical Support Division at (916) 324-7163, or Ms. Tina Suarez-Murias, Air Pollution Specialist, Planning and Technical Support Division at (916) 322-6161.

SPECIAL ACCOMMODATION REQUEST

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CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: October 20, 2010

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.

State of California

California Environmental Protection Agency

AIR RESOURCES BOARD

Staff Report

Analysis of the Sacramento Metropolitan Air Quality Management District PM10 Implementation/Maintenance Plan and Redesignation Request for Sacramento County

Release Date: October 29, 2010
Scheduled for Consideration: November 18-19, 2010

This document has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

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EXECUTIVE SUMMARY

The Sacramento Metropolitan Air Quality Management District (District) shares the same jurisdictional boundary as Sacramento County (County) and has prepared documentation to demonstrate that the County now meets the remaining federal health standard for particulate matter of 10 microns in diameter or smaller (PM10) and should be redesignated to attainment. On July 1, 1987, the United States Environmental Protection Agency (U.S. EPA) adopted the PM10 national ambient air quality standard (NAAQS or standard) consisting of an annual average standard of 50 $\mu g/m^3$, and a 24-hour standard of 150 $\mu g/m^3$. Subsequently, on December 18, 2006, U.S. EPA revoked the national annual average PM10 standard.

In 1994, U.S. EPA designated the County a moderate nonattainment area, with an attainment deadline of December 31, 2000. Effective March 18, 2002, U.S. EPA officially determined that monitors in the County measured air quality attaining the 24-hour PM10 standard by the moderate area deadline. The District must provide documentation specified in the federal Clean Air Act (the Act) demonstrating the 24-hour PM10 standard can be maintained in order to request that U.S. EPA redesignate the County to attainment.

The District prepared the PM10 Implementation/Maintenance Plan and Redesignation Request for Sacramento County (Sacramento PM10 Plan or Plan) as required. The Plan affirms the County has attained the standard and demonstrates that existing federal, State, and local control measures will maintain the 24-hour PM10 standard in the District. On October 28, 2010, the District Board adopted the Plan at a public hearing.

The Plan contains all elements needed for redesignation to attainment:

- Demonstration that PM10 attainment concentrations measured between 2007 and 2009 will be maintained for ten years after redesignation;
- Commitment that the monitoring network will be maintained to track attainment for at least ten years after redesignation;
- Contingency provisions for correcting any future violations of the PM10 NAAQS;
- Emission inventories for PM10 and nitrogen oxides (NOx);
- Transportation conformity budgets which sets limits for mobile source emissions of PM10 and NOx through 2022.

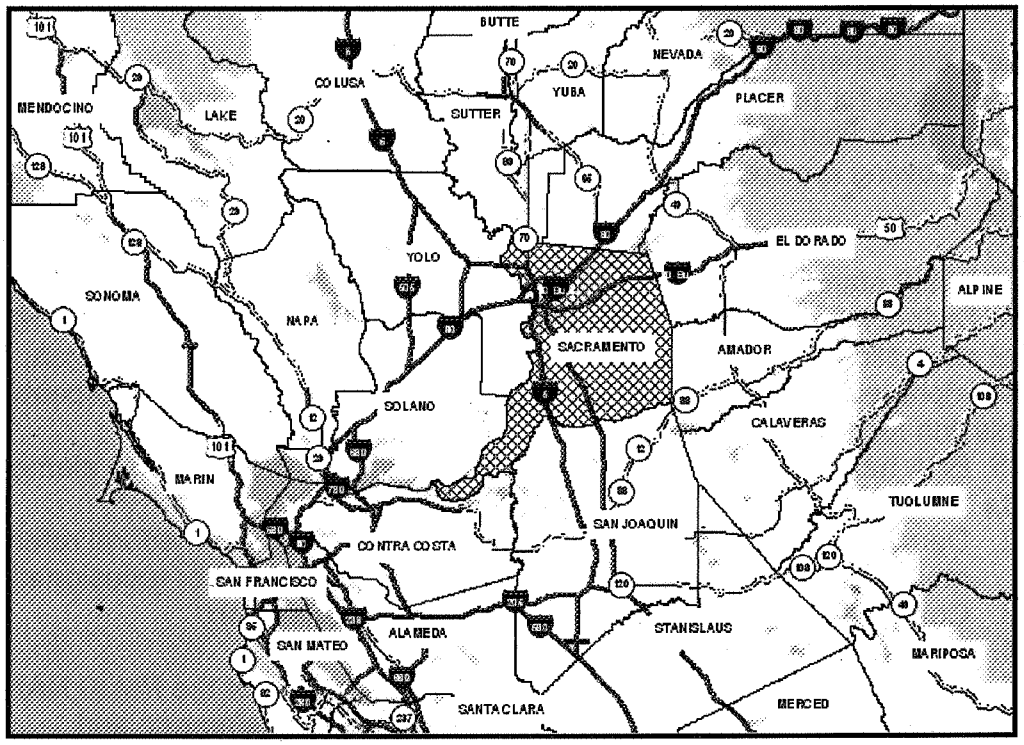
In addition, eight years after the U.S. EPA redesignates the area as attainment, the District will submit a revised maintenance plan providing for continued attainment for an additional ten years.

ARB staff concurs with the District's Sacramento PM10 Plan and recommends the Board approve the Plan, as a revision to the California State Implementation Plan (SIP), for submittal to U.S. EPA.

I. BACKGROUND

Sacramento County, as shown in Figure 1, was initially designated as a moderate PM10 nonattainment area in 1994 with an attainment date of December 31. 2000. The County is approximately 994 square miles in size. The population of about 1,443,000 residents has grown rapidly, increasing almost 40 percent in the past twenty years. The urbanized areas are surrounded by agricultural croplands and ranchlands. Four major interstate highways cross the county and the major economic activities are related to government services, retail trade, agriculture, construction materials, and other industrial uses. Despite the changes in land use over time, there have been no violations of the 24-hour average PM10 NAAQS since the mid-1990s.

Figure 1
Location of Sacramento County



On March 18, 2002, U.S. EPA determined that Sacramento County had attained the PM10 standard by the 2000 deadline. Based on this clean data finding, certain nonattainment area requirements do not apply, including those for reasonable further progress, an attainment demonstration, reasonably available control measures, and contingency measures, because these provision's sole purpose is to achieve attainment of the standard. On October 28, 2010, the District adopted the Sacramento County PM10 Plan. The Plan officially requests that this area be redesignated to attainment for the PM10 standard and charts the course for continued maintenance of the standard. The State mobile source control strategy and local District rules have resulted in Sacramento County attaining the 24-hour PM10 standard based on both past and current data.

II. REDESIGNATION REQUIREMENTS

The Act sets the general framework for redesignation requests. In 1992, U.S. EPA provided guidance for processing redesignation requests[1]. ARB staff reviewed the Sacramento PM10 Plan within the context of the Act and the U.S. EPA guidance, which identify the following requirements an area must meet for formal redesignation to attainment:

A. The PM10 standard has been attained;
B. The District has an approved State Implementation Plan (SIP) and the State has met all applicable Act requirements for PM10 in the nonattainment area;
C. The improvement in PM10 air quality is due to permanent and enforceable emission reductions; and
D. U.S. EPA has approved a Maintenance Plan which includes these elements:
    1. Attainment emission inventory;
    2. Demonstration that PM10 attainment concentrations at federal reference monitoring stations will be maintained for ten years after redesignation;
    3. Commitment to ongoing monitoring network operation;
    4. Continued verification of attainment;
    5. Contingency plan to promptly correct any violation of the PM10 NAAQS that occurs after the area has been redesignated to attainment; and
    6. Transportation conformity budgets for the ten years following the anticipated year of U.S. EPA approval of the submittal.

[1] A principal source of EPA guidance with respect to redesignations to attainment can be found in a Memorandum from U.S. EPA Office of Air Quality Planning and Standards entitled *"Procedures for Processing Requests to Redesignate Areas to Attainment,"* John Calcagni, Director, Air Quality Management Division, U.S. EPA, Research Triangle Park, North Carolina September 4, 1992.

III. EVALUATION OF THE SACRAMENTO PM10 PLAN

Based on review of the Sacramento PM10 Plan and the District's supporting technical analysis, ARB staff concur that the Plan meets the Act's requirements. The following sections indicate how the Plan meets the redesignation and maintenance plan requirements.

A. Sacramento County Attains the 24-Hour PM10 Standard

Currently, PM10 concentrations are measured at six monitoring sites using federal reference method monitors (FRMs). These filter-based, high-volume, size-selective inlet samplers collect PM10 samples on an hourly basis, for a 24-hour period, every six days. Figure 2 shows the location of all the ambient air monitors in Sacramento County with the FRMs for PM10 outlined in the key.

Table 1 lists the highest 24-hour average PM10 concentration during each year for the three-year period of 2007-2009. The 24-hour PM10 standard is met when the estimated number of exceedances measured over a three-year period averages one or less per year. The FRMs' data demonstrate that the County attains the 24-hour PM10 standard.

Figure 2
PM10 Monitoring Stations in Sacramento County

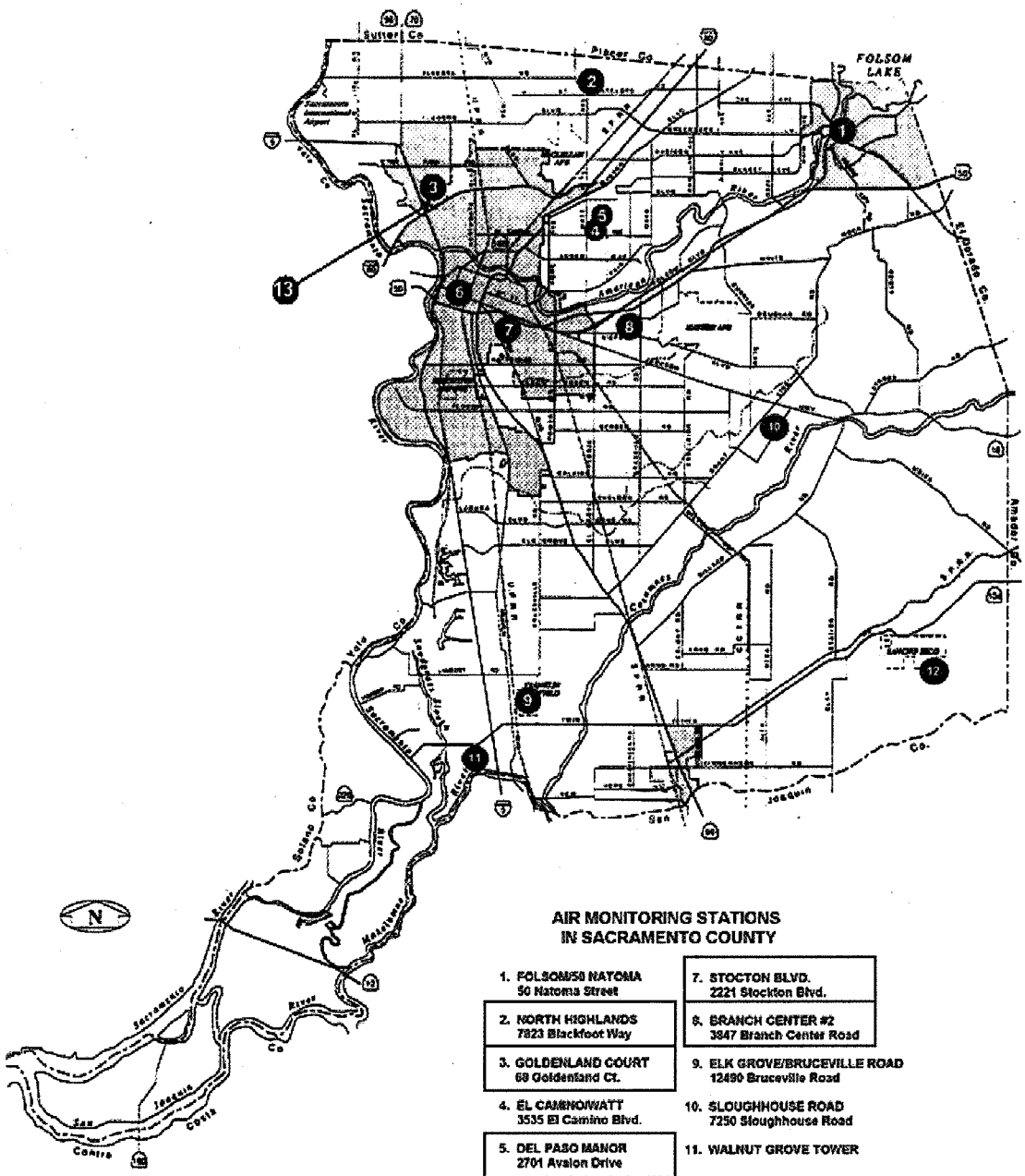


Table 1
FRM PM10 Data from 2007 to 2009

Monitoring Station Name	Maximum 24-hour Average Concentration ($\mu g/m^3$)			Three-year Total Number of Days Exceeding the Standard
	2007	2008	2009	
Branch Center Road	56	89	76	0
Del Paso Manor	70	71	45	0
Goldenland Court*	--	56	48	0
North Highlands	56	97	33	0
Stockton Blvd	56	88	45	0
T Street	53	73	47	0

** The Goldenland Court monitor replaced the Airport Road monitor starting in October 2008.*

B. The State Has Met Applicable Act Requirements

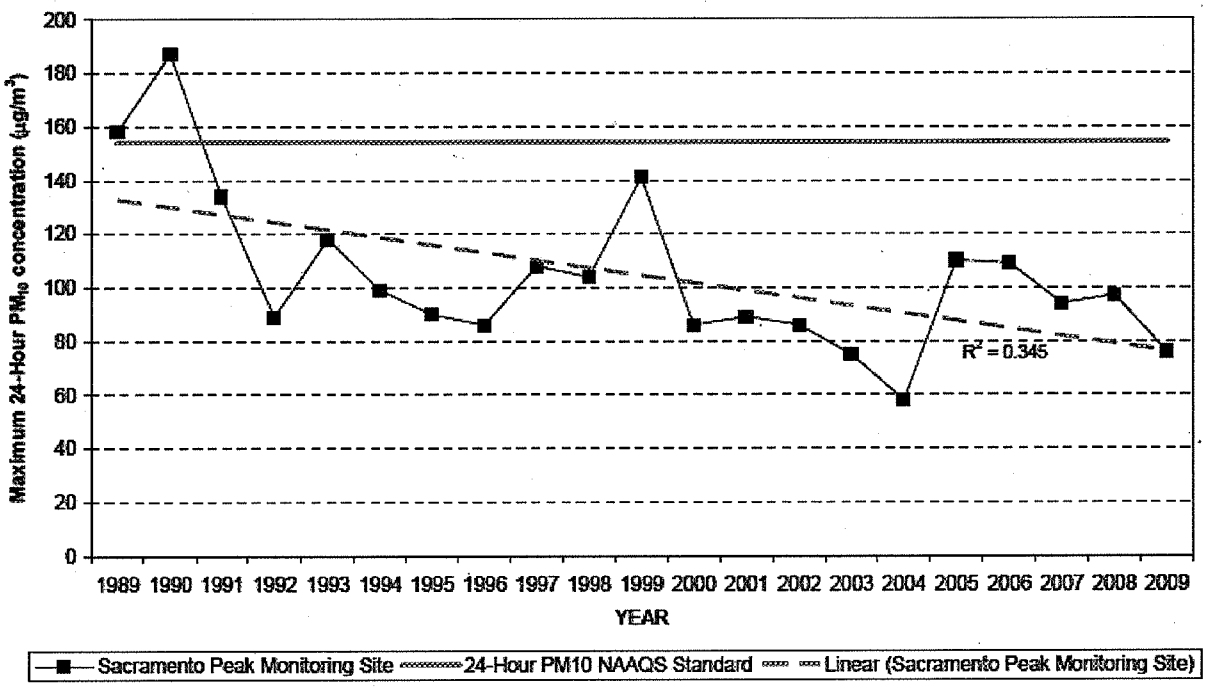
The Sacramento PM10 Plan serves both the implementation and maintenance plan functions prescribed by the Act, since U.S. EPA determined that the PM10 standard was met by the 2000 deadline. ARB and the District have also met all of the Act requirements applicable for a moderate PM10 nonattainment area to be considered for redesignation to attainment.

C. Improvement in Sacramento PM10 Air Quality is Due to Permanent and Enforceable Reductions in Emissions

Current District rules controlling emissions of particulate matter and precursor gases (NOx, sulfur oxides (SOx), and reactive organic gases (ROG)) from stationary sources, and ARB-adopted measures governing mobile sources, have all resulted in emission reductions. In addition, the District adopted a residential wood-burning measure that curtails wood smoke during winter months, when residential wood smoke contributes to PM10 levels. The adopted measures are fully enforceable and are explained in detail in the Plan.

The benefit of these emissions reductions are indicated by the downward trend of the highest average 24-hour concentration each year at the peak Sacramento monitoring site as shown in Figure 3. These measures have provided for continuous attainment of the 24-hour PM10 standard in the region since the early 1990s. Based on analyses of long-term meteorological variables, including precipitation, wind speed and direction, temperature, and stagnation, the District found that meteorological conditions during the 2007-2009 period were not unusually favorable to lower PM10 levels. Therefore, air quality improvements leading to PM10 attainment in the District are due to emission reductions from adopted, fully enforceable control measures.

Figure 3
Peak 24-Hour Average PM10 Concentrations
Sacramento County 1989-2009



Note: The peak 1999 concentration of 141 µg/m³ occurred on July 5th at the Del Paso Manor monitoring site, and was likely impacted by emissions from the Fourth of July fireworks.

D. Maintenance Plan

The Sacramento PM10 Plan includes the following components: attainment emission inventory; maintenance demonstration; commitment to continue monitoring network operation; commitment for verification of continued attainment; a contingency plan; and transportation conformity budgets.

1. Attainment Emission Inventory

The Plan must demonstrate that the PM10 standard is attained and maintained, despite future growth in the emissions inventory. The emissions inventory is a systematic listing of the sources of air pollutants along with the amount of pollutants emitted from each source or category over a given period of time. The inventory is a critical tool used to indicate trends, measure control efficacy, and evaluate air pollution mitigation. To determine the expected emissions in future years, projected emission inventories incorporate the effects of growth and existing regulations on a baseline inventory. Emission inventories are estimates of the air pollutant emissions released into the environment – they are not direct ambient concentration measurements. However, if the inventory is reviewed in conjunction with the actual pollutant concentrations measured by the monitoring network, proportional relationships can be developed to

predict future concentrations of pollutants. This exercise, detailed in the Plan, demonstrates continued attainment of the standard into the future.

In Sacramento County, the emissions inventory was analyzed for directly-emitted PM10 and NOx (as a precursor to ammonium nitrate). The District prepared seasonal emission inventory projections for a winter day since 24-hour PM10 average concentrations have historically been the highest during this time. The main emissions source types contributing to winter PM10 air quality in the County are secondary ammonium nitrate particles and directly emitted particles from motor vehicle exhaust and wood smoke. Typical wintertime weather conditions in Sacramento County include high atmospheric stability, low wind dispersion, and colder temperatures which are conducive to PM10 pollutant build-up, especially for ammonium nitrate particles.

The Plan used 2008 as the base year from which emission inventories were projected into the future for 2012 and 2022. The 2008 emissions inventory is the most recent available. The future years of 2012 and 2022 bracket the ten-year maintenance period which would start in 2012, the first year after U.S. EPA's anticipated approval of redesignation to attainment. The District inventory updates include the latest point and area source emissions information; ARB's EMFAC mobile source emission outputs; and planning assumptions in the Sacramento Area Council of Governments' (SACOG) most recent Regional Transportation Plan. Emissions reduction credits established prior to 2008 through the regulatory control measures to offset future growth were included in the emissions inventory forecasts, so as not to underestimate future emissions for the maintenance demonstration for the years 2012 and 2022.

2. Maintenance Demonstration

The Act requires the District to show that the PM10 24-hour standard can be maintained for at least 10 years after the redesignation request is approved by U.S. EPA. The District analyzed the future mix of sources and emission rates and used proportional rollback modeling to show that the emissions would not result in a violation of the standard during the maintenance planning period years, 2012-2022. The premise of proportional rollback is that changes in emissions from individual pollution sources over time are directly proportional to the change in associated ambient concentrations due to that individual source.

The source categories were determined by receptor modeling using the Chemical Mass Balance (CMB) model and the apportionment determined for the winter season in Sacramento.[2] The PM10 component species were matched to the appropriate emission inventory categories in the rollback analysis. The PM10 and precursor emissions source categories were assumed to vary directly with the matching CMB ambient PM10 speciation categories, thereby determining the proportional contributions to overall mass measured at a typical monitor. The emissions inventory projections for these source categories include the effects of adopted and enforceable controls of ARB,

[2] Motallebi, Nehzat. *"Wintertime $PM_{2.5}$ and PM_{10} Source Apportionment at Sacramento California"*. Air and Waste Management Association 1999: 25-34.

the District, and other local measures already in place. They also take into account an additional 1.5 tons of PM10 in 2022 which can be added to the inventory projections for transportation conformity purposes when the planning horizon for regional transportation plans exceed the maintenance plan period.

Table 2 shows the 2012 and 2022 projected maximum 24-hour average PM10 concentration compared with the base year 2008. The projected changes in peak concentration reflect the projected changes in the emissions inventory. The predicted peak PM10 average daily concentrations do not exceed 150 $\mu g/m^3$. This demonstrates continued attainment of the 24-hour PM10 NAAQS in Sacramento County.

Table 2
Projected Maintenance of 24-hour PM10 NAAQS in Sacramento County

PM10 CMB Analysis	Percent of PM10 Mass	Peak Monitored Value Concentration	2012 Projected Peak Concentration	2022 Projected Peak Concentration
Source Category	**(% total)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**	**($\mu g/m^3$)**
Ammonium Nitrate	24.4%	26.6	23.7	18.1
Motor Vehicles	24.5%	26.7	24.9	20.7
Wood Smoke	17.8%	19.4	18.1	20.0
Fugitive Dust	15.1%	16.5	16.7	18.6
Ammonium Sulfate	1.3%	1.4	2.2	2.4
Unidentified Other	16.9%	18.4	18.2	18.9
TOTAL PM10	**100.0%**	**109***	**104**	**99**

* *109 $\mu g/m^3$ was the peak monitored value in Sacramento County from the three-year period ending in the 2008 base year, using ambient air monitoring data from the T Street monitor in 2006.*

3. PM10 Monitoring Network

The District commits to continue PM10 monitoring to verify sustained attainment of the PM10 standard in the County. The existing PM10 monitoring network in Sacramento includes six FRM monitors (Figure 2). The minimum number of monitors required is two to four monitors based on the population of the Metropolitan Statistical Area containing Sacramento County[3]. Therefore, the current number of monitors within the County is greater than the PM10 monitoring network requirement for the area. The District commits to continue to maintain and operate a PM10 ambient monitoring network in Sacramento County that meets or exceeds the minimum monitoring requirements.

[3] *"Network Design Criteria for Ambient Air Quality Monitoring"*, 40 CFR Part 58, Appendix D.

4. Verification of Continued Attainment

To verify continued attainment of the PM10 standards, the District commits to reevaluate the Plan in accordance with requirements for maintenance plans found in the Act. The District will review the assumptions and data for the PM10 maintenance demonstration in 2015 and 2018 to fulfill the verification and tracking requirements. Eight years after the County has been redesignated to attainment, the District will submit to U.S. EPA the required revision to the Plan demonstrating maintenance of the standard for the following ten-year period. On a regular basis, the District will continue to analyze PM10 data from FRMs and compare daily PM10 values to the level of the 24-hour standard. This includes tracking the indicator for triggering the maintenance contingency plan. In addition, the District may also evaluate data from continuous monitors to aid in the analysis of air quality trends.

5. Contingency Plan

The Act requires a maintenance plan to include contingency provisions for prompt correction of any PM10 standard violation that might occur after the area has been redesignated to attainment. The maintenance plan is not required to contain fully adopted contingency control measures that will go into effect without further state action as is required in attainment SIPs. Instead, for maintenance plans, the area must have a plan to ensure that contingency actions occur once they are triggered. The Plan identifies the specific indicator or trigger which will be used to determine when contingency provisions should be implemented.

The trigger will be any violation of the 24-hour PM10 standard at a PM10 monitor, verified through filter sampling, weighing and processing. If the data point cannot be flagged and approved as an exceptional event, then the District will analyze the event to determine the possible causes and whether applicable emissions reductions from existing measures due to be implemented would be sufficient to prevent future PM10 violations. If not, the District would proceed with selecting specific measures for adoption and implementation to address the PM10 problem. The Plan contains a timeline for this process along with a suggested list of reasonably available control measures that may provide cost-effective, particulate matter emissions reductions benefits, according to the circumstances associated with the violation.

6. Transportation Conformity Budgets

The Act requires that transportation plans, programs, and projects receiving federal funding or requiring federal approval must be found to be fully consistent with the SIP. The federal Transportation Conformity Rule[4] requires SIPs to specify on-road motor vehicle emission budgets (transportation conformity budgets) that are consistent with the attainment and maintenance demonstrations in the SIP. The conformity regulation requires metropolitan planning organizations (MPO) to demonstrate that emissions from regional transportation plans and programs do not exceed these emissions budgets.

[4] The Transportation Conformity Regulation is found at 40 CFR Parts 51 and 93.

The MPO for Sacramento County is SACOG, whose forecasts of vehicle miles travelled (VMT) were developed from the MPO's projections of future population, dwelling units, and employment. These VMT forecasts were used to develop the transportation conformity budgets for future years for PM10 and NOx using ARB's latest on-road mobile source emission factor model EMFAC2007 and transportation activity data from the August 2009 Metropolitan Transportation Improvement Program analysis. SACOG's travel demand model predicts that growth in vehicle trips and vehicle miles traveled will be slightly lower than the population growth rate for the Sacramento region through 2035.

The transportation conformity budgets reflect emission reductions from control measures already adopted through federal, State and District regulations applied to projected growth in emissions from re-entrained dust from travel on paved and unpaved roads, vehicular exhaust, and road construction. The Transportation Conformity Rule requires that PM10 from construction-related fugitive dust be included in the budget because it was identified as a contributor to the non-attainment problem. NOx is the only precursor included in the budgets, because ammonium nitrate was shown to contribute significantly to peak PM10 concentrations.

Table 3 shows the proposed transportation conformity budgets for NOx and PM10 average winter day emissions for Sacramento County. If U.S. EPA determines these budgets to be adequate, future transportation plan amendments and updates in Sacramento County will need to conform to these budgets. SACOG must ensure that the aggregate transportation wintertime emissions in the County do not exceed these levels when approving new metropolitan transportation plans and transportation programs, even if the mix of projects changes or growth increases. These budgets will remain in effect until other budgets are found adequate through approval by U.S. EPA.

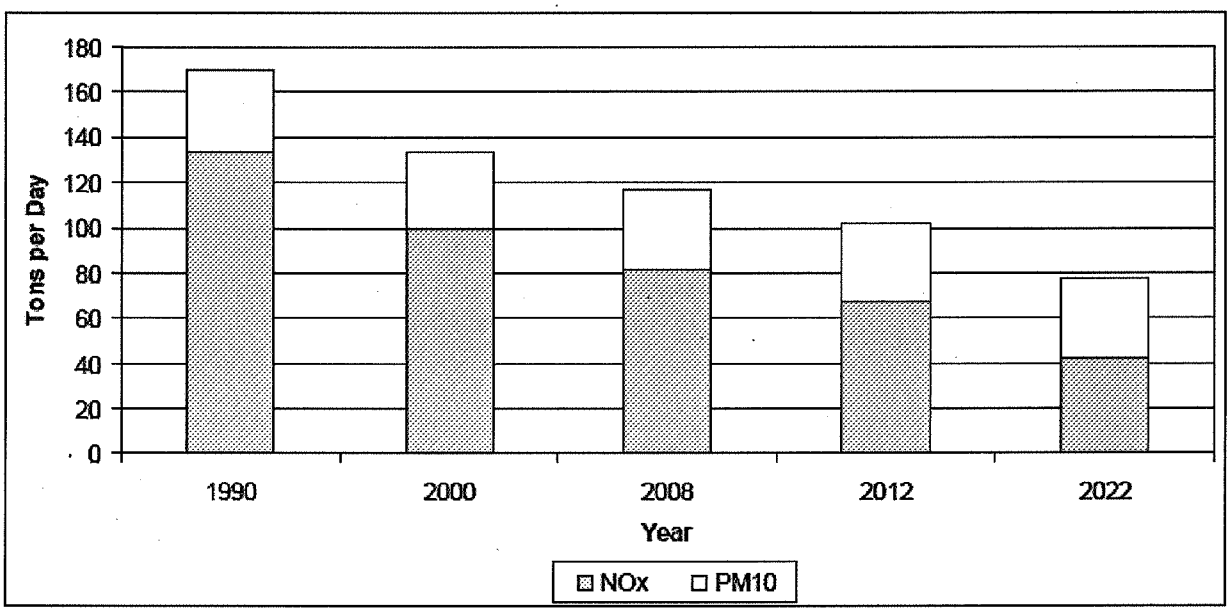
Table 3
Motor Vehicle Emission Budgets for Maintenance of the 24-hour PM10 NAAQS

Sacramento County	2008		2012		2022	
	NOx	PM10	NOx	PM10	NOx	PM10
Average Emissions in Tons per Winter Day	50	15	38	15	19	17

For transportation conformity purposes, an additional 1.5 tons per day of PM10 were added to the 2022 budget to account for potential emissions increases in dust from paved roads and construction. This accommodation is only allowed for transportation conformity purposes when the emissions forecasts and budgets will be lower than the emissions level needed to provide continued maintenance of the standard. These emissions are also accounted for in the maintenance emissions inventory forecasts. Figure 4 illustrates that the future NOx emissions inventory is projected to decrease at a considerably faster rate than projected growth in the PM10 inventory, thereby

maintaining emissions at a level that will not result in a violation of the 24-hour PM10 NAAQS.

Figure 4
PM10 and NOx Precursor Emissions for Sacramento County 1990-2022*



* *Data for 1990, 2000, and 2008 are historical, while data for 2012 and 2022 are projections*

IV. STAFF RECOMMENDATION

ARB staff has reviewed the Plan prepared by the District and consulted with the District staff during this review. ARB staff concurs with the District's Plan and finds that the Plan meets all applicable Act requirements. ARB staff believes that implementation of this Plan will continue to maintain PM10 levels below the national air quality standard in Sacramento County. Therefore, ARB staff recommend that the Board approve the Sacramento PM10 Plan, including the transportation conformity budgets for the County, as a revision to the California SIP for submittal to U.S. EPA. In addition, ARB staff recommends that the Board approve the District's request to U.S. EPA that Sacramento County be redesignated from nonattainment to attainment for the national PM10 standard.

PROPOSED

State of California
AIR RESOURCES BOARD

Resolution 10-37

Adoption and Submittal of the PM10 Implementation/Maintenance Plan and Redesignation Request for Sacramento County

November 18, 2010

Agenda Item No.: 10-10-1

WHEREAS, the Legislature in Health and Safety Code section 39602 has designated the State Air Resources Board (ARB or Board) as the air pollution control agency for all purposes set forth in federal law;

WHEREAS, ARB is responsible for the preparation of the State Implementation Plan (SIP) for attaining and maintaining the national ambient air quality standards (NAAQS) as required by the federal Clean Air Act (the Act; 42 U.S.C. section 7401 et seq.), and to this end is directed by Health and Safety Code section 39602 to coordinate the activities of all local and regional air pollution control and air quality management districts (districts) necessary to comply with the Act;

WHEREAS, section 39602 of the Health and Safety Code also provides that the SIP shall include only those provisions necessary to meet the requirements of the Act;

WHEREAS, ARB has responsibility for ensuring that the districts meet their responsibilities under the Act pursuant to sections 39002, 39500, 39602, and 41650 of the Health and Safety Code;

WHEREAS, ARB is authorized by section 39600 of the Health and Safety Code to do such acts as may be necessary for the proper execution of its powers and duties;

WHEREAS, sections 39515 and 39516 of the Health and Safety Code provide that any power, duty, purpose, function, or jurisdiction of the Board may be delegated to ARB Executive Officer as the Board deems appropriate;

WHEREAS, the local air districts have primary responsibility for controlling air pollution from non-vehicular sources and for adopting control measures, rules, and regulations to attain the NAAQS within their boundaries pursuant to sections 39002, 40000, 40001, 40701, 40702, and 41650 of the Health and Safety Code;

WHEREAS, the Sacramento Metropolitan Air Quality Management District (District) was established pursuant to sections 40950, 40960, and 40961 of the Health and Safety Code as the air pollution control district responsible for carrying out these responsibilities in Sacramento County;

WHEREAS, the Sacramento Council of Governments (SACOG) is an association of Sacramento region governments with responsibility for providing regional forecasting for transportation needs in Sacramento County, preparing metropolitan transportation plans and improvement programs, and approving federal expenditures on transportation projects in the region surrounding and including Sacramento County, pursuant to title 23, U.S.C., section 134, and sections 174, 175A, and 176 of the Act;

WHEREAS, in January 1994, the United States Environmental Protection Agency (U.S. EPA) designated Sacramento County as a "moderate" nonattainment area for the 24-hour PM10 NAAQS with an attainment date of December 31, 2000;

WHEREAS, Sacramento County showed no measured exceedances of the 24-hour PM10 NAAQS for the three-year period (1998-2000) prior to the attainment date deadline;

WHEREAS, on February 15, 2002, U.S. EPA issued a final clean data finding that determined Sacramento County attained the PM10 NAAQS by the attainment deadline;

WHEREAS, section 107(d)(3)(D) of the Act provides that a state may request U.S. EPA to redesignate an area from nonattainment to attainment of the NAAQS;

WHEREAS, section 107(d)(3)(E) of the Act sets forth the requirements which must be met for the U.S. EPA to redesignate an area from nonattainment to attainment of the NAAQS;

WHEREAS, the clean data finding relieves the District from developing an attainment demonstration, a reasonable further progress demonstration, reasonable available control measures, and contingency measures for Sacramento County;

WHEREAS, the District developed the PM10 Implementation/Maintenance Plan and Redesignation Request for Sacramento County (Sacramento PM10 Plan) to address the requirements of the Act;

WHEREAS, the Sacramento PM10 Plan contains:

1. An Attainment Emissions Inventory;
2. Maintenance Demonstrations;
3. Monitoring Network Maintenance Commitments;
4. Contingency Provisions; and
5. Transportation Conformity Budgets.

WHEREAS, consistent with section 107(d)(3)(E)(i) of the Act, the District demonstrated continued attainment with no violations of the PM10 NAAQS since the 1998-2000 period, based on quality-assured federal reference monitoring method data from the State and local monitoring network;

WHEREAS, consistent with section 107(d)(3)(E)(ii) of the Act, the District prepared the Sacramento PM10 Plan in part to meet the requirement for an approvable PM10 SIP under section 110(k) of the Act;

WHEREAS, consistent with section 107(d)(3)(E)(iii) of the Act, the District demonstrated in the Sacramento PM10 Plan that improvement in air quality is due to permanent and enforceable emission control measures;

WHEREAS, consistent with section 107(d)(3)(E)(iv) of the Act, the Sacramento PM10 Plan meets the maintenance plan requirement of section 175A of the Act;

WHEREAS, consistent with section 107(d)(3)(E)(v) of the Act, the Sacramento PM10 Plan meets the requirements of section 110 and part D of the Act;

WHEREAS, consistent with section 176 of the Act, the District developed transportation conformity budgets for PM10 and NOx using the most recent estimates of emissions for 2008 and projections to 2022;

WHEREAS, federal law set forth in section 110(l) of the Act and Title 40, Code of Federal Regulations (CFR), section 51.102 requires that one or more public hearings, preceded by at least 30 days notice and opportunity for public review, must be conducted prior to the adoption and submittal to the U.S. EPA of any SIP revision;

WHEREAS, the District conducted a public hearing on October 28, 2010, after giving 30 days public notice of the Sacramento PM10 Plan availability for public review and comment prior to the hearing date;

WHEREAS, at the public hearing the District Board voted to:

1. Adopt the Sacramento PM10 Plan to fulfill the applicable requirements of the Act for maintenance of an attainment area for the PM10 NAAQS; and
2. Request a redesignation for Sacramento County to attainment of the PM10 NAAQS;

WHEREAS, the District submitted the Sacramento PM10 Plan to ARB as a SIP revision on November 2, 2010, in accordance with State and federal law;

WHEREAS, the California Environmental Quality Act (CEQA) requires that no project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, the Sacramento PM10 Plan contains already adopted regulations and rules that have undergone environmental review at the time of their adoption, and any measure that may be developed or amended as a contingency provision will undergo environmental review at the time of adoption;

WHEREAS, the Board finds that:

1. California's air pollution control programs have successfully reduced PM10 ambient concentrations leading to PM10 NAAQS attainment in Sacramento County;

2. The Sacramento PM10 Plan complies with the requirements of section 107(d)(3)(E) of the Act;

3. The Sacramento PM10 Plan is necessary for U.S. EPA to redesignate Sacramento County to attainment for the PM10 NAAQS;

4. The Sacramento PM10 Plan addresses current attainment and continued maintenance of the 24-hour PM10 NAAQS through 2022;

5. Consistent with U.S. EPA guidance, the Sacramento PM10 Plan includes an attainment emission inventory; commitments by the District to continue operating the PM10 monitoring network; and a process to verify continued PM10 attainment;

6. The Sacramento PM10 Plan includes contingency provisions to assure prompt correction of any post-redesignation violation of the PM10 NAAQS;

7. The Sacramento PM10 Plan has identified county-level PM10 and NOx emission budgets for transportation conformity for 2008, 2012, and 2022 based on current emissions and activity data, and the budgets are adequate to ensure continued maintenance of the PM10 NAAQS; and

8. The Sacramento PM10 Plan relies entirely on adopted regulations to demonstrate continued maintenance. These adopted District and ARB regulations are reflected in the baseline emission projections in the Sacramento PM10 Plan and were subject to environmental review such that no further analysis is required at this time.

WHEREAS, the Board further finds that ARB has reviewed and considered the Sacramento PM10 Plan along with the comments presented by interested parties, and finds that the Sacramento PM10 Plan meets the requirements of the Act and CEQA.

NOW, THEREFORE BE IT RESOLVED that the Board hereby adopts the Sacramento PM10 Plan, including the redesignation request and transportation conformity budgets, as a revision to the California SIP.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to submit the Sacramento PM10 Plan, together with the appropriate supporting documentation, to U.S. EPA for approval as revision to the California SIP to be effective, for purposes of federal law, upon approval by U.S. EPA.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to work with the District and U.S. EPA and take appropriate action to resolve any completeness or approvability issues that may arise regarding the SIP submission.

BE IT FURTHER RESOLVED that the Board authorizes the Executive Officer to include in the SIP submittal any technical corrections, clarifications, or additions that may be necessary to secure U.S. EPA approval.

BE IT FURTHER RESOLVED that the Board hereby certifies pursuant to 40 CFR section 51.102 that the Sacramento PM10 Plan was adopted after notice and public hearing as required by 40 CFR section 51.102.

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER APPROVAL OF THE IMPERIAL COUNTY 2009 1997 8-HOUR OZONE MODIFIED AIR QUALITY MANAGEMENT PLAN AND 2009 REASONABLY AVAILABLE CONTROL TECHNONOLGY STATE IMPLEMENTATION PLAN

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider the approval of the proposed Imperial County 2009 1997 8-Hour Ozone Modified Air Quality Management Plan (2009 Ozone Plan) and 2009 Reasonably Available Control Technology State Implementation Plan (2009 RACT SIP) for the Imperial County Nonattainment Area. If approved by the Board, ARB will submit the 2009 Ozone Plan and 2009 RACT SIP to the United States Environmental Protection Agency (U.S. EPA) for approval as a revision to the California State Implementation Plan (SIP).

DATE: November 18, 2010

TIME: 9:00 a.m.

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

This item may be considered at a two-day Board meeting, which will commence at 9:00 a.m., November 18, 2010, and may continue at 8:30 a.m., on November 19, 2010. This item may not be considered until November 19, 2010. Please consult the agenda for the meeting, which will be available at least ten days before November 18, 2010, to determine the day on which this item will be considered.

Background

The federal Clean Air Act (CAA) establishes planning requirements for areas that exceed the health-based National Ambient Air Quality Standards (NAAQS) and have been designated as nonattainment based on monitored exceedances of the NAAQS. Nonattainment areas must develop and implement SIPs that demonstrate how they will attain the NAAQS by specified dates.

In 2004 U.S. EPA identified Imperial County as a "marginal" nonattainment area for the 8-hour ozone NAAQS promulgated in 1997. On February 13, 2008, U.S. EPA found that Imperial County had not attained the 1997 8-hour ozone NAAQS by the marginal area attainment deadline of June 15, 2007, and reclassified it as a "moderate" nonattainment area. Under the CAA, this action requires California to submit as a SIP

revision a moderate area ozone plan for Imperial County, demonstrating attainment of the 8-hour ozone NAAQS by June 15, 2010.

On February 19, 2009, ARB submitted a clean data finding request for Imperial County to U.S. EPA. The request was based on certified air monitoring data recorded from 2006 through 2008 that indicated attainment of the 1997 8-hour ozone NAAQS. In response to ARB's request, on December 3, 2009, U.S. EPA published in the Federal Register its determination that Imperial County attained the 1997 8-hour ozone standard. This action suspended some CAA nonattainment area plan requirements. However, California is still required to submit revisions to the SIP to address remaining elements required for moderate ozone nonattainment areas, including rule review and adoption relative to the reasonably available control technology (RACT) requirements, emission inventories, and new source review requirements.

On July 30, 2010, the Imperial County Air Pollution Control District adopted the 2009 Ozone Plan and 2009 RACT SIP to address the CAA moderate area plan requirements.

Proposed Action

ARB staff has reviewed the Imperial County 2009 Ozone Plan and 2009 RACT SIP, and consulted with District staff during its review. ARB staff finds that the Imperial County 2009 Ozone Plan and 2009 RACT SIP meet all applicable CAA requirements for a moderate nonattainment area. Staff recommends that the Board approve the Imperial County 2009 Ozone Plan and 2009 RACT SIP and direct the Executive Officer to submit them to U.S. EPA as revisions to the California SIP.

Availability of Documents

Copies of staff's written report may be obtained from ARB's Public Information Office, 1001 I street, First Floor, Environmental Services Center, Sacramento, California, 95814, (916) 322-2990, beginning October 19, 2010. The report may also be obtained from ARB's website at http://www.arb.ca.gov/planning/sip/sip.htm.

Submittal of Comments

Interested members of the public may present comments orally or in writing at the meeting and may be submitted by postal mail or by electronic submittal 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, November 17, 2010**, 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

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 20 copies of any written submission. Also, ARB requests that written and email statements be filed at least ten 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 Mr. Dmitri Smith, Air Pollution Specialist, at (916) 323-1537.

Special Accommodation Request

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format (i.e., Braille, large print, etc.) or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at 916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia
- Documentos disponibles en un formato alterno (por decir, sistema Braille, o en impresión grande) u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: 10/13/2010

State of California
AIR RESOURCES BOARD

STAFF REPORT

Analysis of the Imperial County 2009 1997 8-Hour Ozone Modified Air Quality Management Plan and Reasonably Available Control Technology Plan

Date of Release:
Scheduled for Consideration: November 18, 2010

California Environmental Protection Agency
Air Resources Board

This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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I. Introduction

This staff report reviews plans adopted by the Imperial County Air Pollution Control District to address federal Clean Air Act (CAA) nonattainment area plan requirements applicable to moderate ozone nonattainment areas.

With the promulgation of the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS) in April 2004, the United States Environmental Protection Agency (U.S. EPA) classified Imperial County as a marginal nonattainment area. On February 13, 2008, U.S. EPA found that Imperial County had not attained the 1997 8-hour ozone NAAQS by the marginal area deadline of June 2007, and reclassified the County as a moderate nonattainment area. U.S. EPA's action also required the State to submit a moderate area SIP for the Imperial County nonattainment area, by December 31, 2008, that demonstrates attainment of the 8-hour ozone standard by June 15, 2010.

On February 19, 2009, ARB requested that U.S. EPA make a "clean data" finding for Imperial County. The request demonstrated that the area's 2008 design value for the 8-hour ozone NAAQS, which was based on monitoring data collected from 2006 through 2008, showed attainment of the standard. U.S. EPA issued its clean data finding on December 3, 2009.

A clean data finding does not constitute a redesignation to attainment under the national CAA, so Imperial County remains a moderate nonattainment area. The clean data finding suspended some CAA nonattainment area plan requirements. However, the State is still required to submit revisions to the SIP to address remaining elements required for moderate ozone nonattainment areas, including rule review and adoption relative to the reasonably available control technology (RACT) requirements, emission inventories, and new source review requirements.

On July 30, 2010, the Imperial County Air Pollution Control District adopted the 2009 1997 8-Hour Ozone Modified Air Quality Management Plan (2009 Ozone Plan) and 2009 Reasonably Available Control Technology State Implementation Plan (2009 RACT SIP) to address the CAA moderate area plan requirements.

ARB staff reviewed the Imperial County 2009 Ozone Plan and RACT SIP and find that both plans meet all applicable CAA requirements for a moderate nonattainment area. Staff recommends that the Air Resources Board adopt the Imperial County 2009 Ozone Plan and the 2009 RACT SIP and direct the Executive Officer to submit the plans to U.S. EPA as proposed revisions to the California SIP.

II. Background

Profile of Imperial County

Imperial County is part of the Salton Sea Air Basin. The Imperial County Ozone Nonattainment Area consists of the entire county, and is under the jurisdiction of the Imperial County Air Pollution Control District (District).

Imperial County covers 4,482 square miles of mostly arid lands in the southeastern corner of California. It is bordered by Mexico to the south, Arizona on the east, San Diego County on the west, and Riverside County on the north. Imperial County's elevation ranges from more than 2,800 feet on the mountain summits to the east to 230 feet below sea level in the Salton Sea. Winters are mild and dry with daily average temperature ranges between 65 and 75°F, although daily high temperatures of up to 80°F are not uncommon. Summers are extremely hot with daily average temperature ranges between 104 and 115°F and daily high temperatures of up to 120°F. The County has an annual rainfall of approximately 3 inches, occurring mostly from late summer to midwinter.

Imperial County has a population of approximately 180,000 people. The County's major population centers include the cities of El Centro (25 percent of the county population), Calexico (22 percent), and Brawley (15 percent). Approximately 22 percent of the population resides in unincorporated areas.

Mexicali, Mexico – a city of approximately 900,000 people – spreads southward from the California/Mexico border at Imperial County. Mexicali's residential and industrial centers begin less than 5 miles from Calexico and 15 and 25 miles, respectively, from El Centro and Brawley. Because the New River is the only geographical feature separating Imperial County from Mexicali, air pollution transport between the two areas is possible. ARB's June, 1993 transport assessment report identified Mexico as the source of emissions that caused or contributed to some of the exceedances of the state ozone standard recorded in Imperial County from 1989 to 1991[1].

Air Quality History

Ozone air quality has improved significantly in Imperial County in recent years as shown by both the number of days in which ozone values exceed the 8-hour ozone NAAQS (exceedance days) and the recorded daily high ozone concentrations. In 1997, Imperial County exceeded the 1997 8-hour ozone NAAQS of 0.085 parts per million (0.085 ppm), also expressed as 85 parts per billion (85 ppb), on 50 days. In 2009, the number of exceedance days declined to 2. Table 1 shows the progressive decrease in exceedance days at each routine monitoring site in Imperial County.

[1] Air Resources Board, Assessment and Mitigation of the Impacts of Transported Pollutants on Ozone Concentrations in California, June 1993

Table 1
Imperial County Exceedance Days, 8-Hour Ozone NAAQS
2001 - 2009

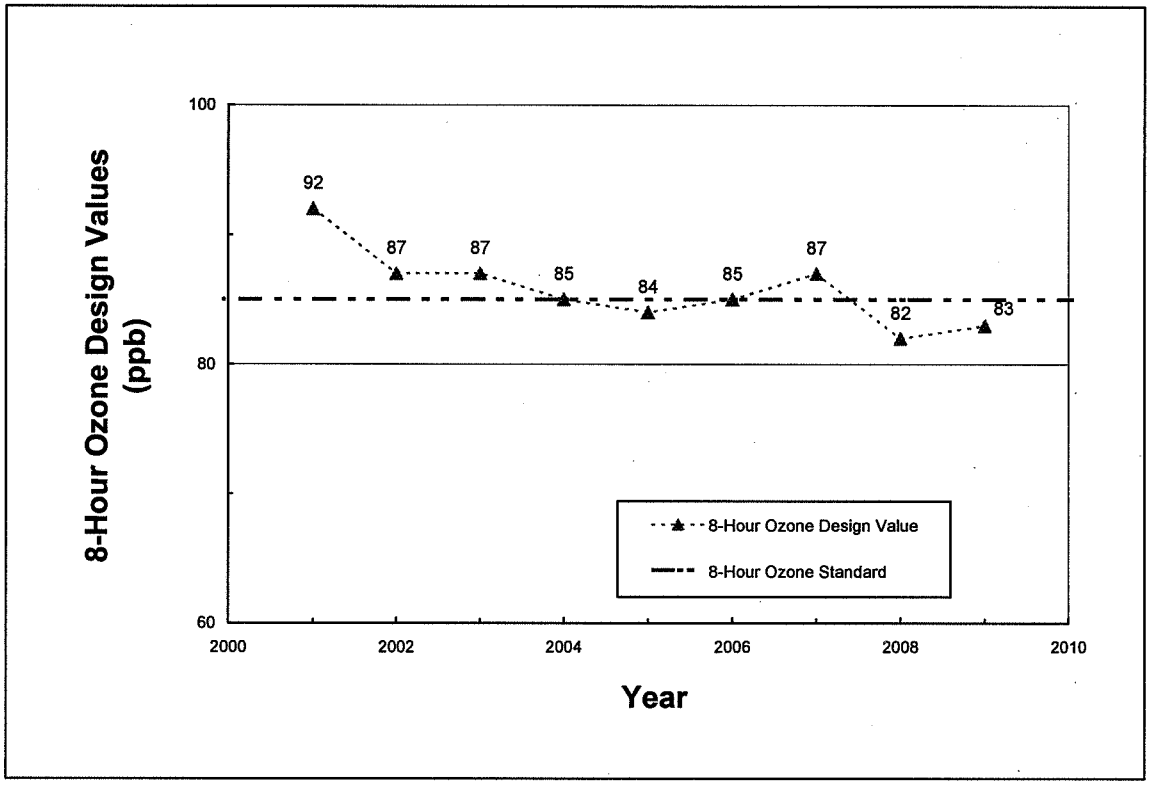
Monitoring Site	2001	2002	2003	2004	2005	2006	2007	2008	2009
Calexico East	7	4	0	1	0	0	2	1	0
Calexico Ethel	11	1	0	0	1	1	4	4	0
El Centro	2	9	8	0	5	9	3	0	1
Niland	1	5	0	0	0	0	0	1	0
Westmorland	1	0	0	0	10	5	5	2	1

Figure 1 shows the federal design value trend in Imperial County from 2001 to 2009 and the respective 1997 8-hour ozone standard. The SIP design value is based on the fourth highest value recorded each year, averaged over three consecutive years. Imperial County's 8-hour ozone design value has decreased by ten percent since 2001, and now meets the 1997 federal NAAQS.

When compared to other indicators such as peak concentrations, the design value is a more stable indicator for evaluating year to year changes resulting from emission control programs, and is the only indicator that can be used to determine compliance with the NAAQS. Peak concentrations measure the severity of ozone exposure but not the frequency, and can be influenced by year to year weather variations.

The U.S. EPA is in the process of revising the 8-hour ozone NAAQS, and is expected to promulgate its revised standard in late 2010. The range of values the agency is considering for the new NAAQS – from 0.070 ppm to 0.060 ppm (70 ppb to 60 ppb) – is from 29 percent to 17 percent more stringent than the current 8-hour ozone NAAQS of 0.085 ppm. Recent monitoring data suggests that Imperial County will be designated as nonattainment for the new standard.

Figure 1
Imperial County Design Value



III. Moderate Area Requirements

On December 3, 2009, U.S. EPA published its finding that Imperial County attained the 1997 8-hour ozone standard. U.S. EPA's "clean data finding" suspends certain SIP elements including the attainment demonstration, reasonable further progress demonstration, and contingency measures requirements. However, some SIP requirements remain, and some were added when U.S. EPA reclassified Imperial County from marginal to moderate. Table 2 shows SIP elements required for marginal and moderate area plans, and identify the SIP elements suspended by the clean data finding.

Table 2
Marginal and Moderate Ozone Nonattainment Area SIP Requirements and Clean Data Finding Elements

Ozone Part D SIP Requirement	marginal area	moderate area	requirement suspended with clean data finding
Attainment demonstration (182(b)(1))		x	x
Subpart 1 Reasonably Available Control Measures (172(c)(1))	x	x	x
Reasonable Further Progress (172(c)(2), 182(b)(1))		x	x
Contingency measures (172(c)(9))		x	x
Vehicle Inspection/Maintenance (182(a)(2)(B), (b)(4))	x	x	Note: N/A in Imperial County because of population (<200,000)
Stage 2 Gasoline Vapor Recovery (182(b)(3))		Note: Stage 2 GVR no longer required in moderate ozone areas per Onboard Refueling Vapor Recovery rule. CAA 202(a)(6); 59 FR16262 (April 6, 1994).	
Emissions Inventory (172(c)(3), 182(a)(1)	x	x	
New Source Review (172(c)(4) and (5); 182(a)(2)(C))	x	x	
Infrastructure SIP (172(c)(7))	x	x	
Subpart 2 Reasonably Available Control Technology for VOCs and NOx (182(b)(2), 182(f))		x	
Periodic Inventory (182(a)(3)(A))	x	x	
Emissions Statement Rule (182(a)(3)(B))	x	x	
Offset Ratio (182(a)(4); 182(b)(5))	1.1 to 1	1.15 to 1	

IV. Evaluation of the Imperial County Modified Plan

ARB staff has reviewed the Imperial County 2009 Ozone Plan and the District's supporting technical analysis, and determined that the plan meets CAA SIP requirements for moderate ozone nonattainment areas. The following sections describe the major elements of the plan.

A. Attainment of the 1997 8-Hour Ozone Standard

On February 19, 2009, ARB requested that U.S. EPA make a "clean data" finding for Imperial County. The request demonstrated that the area's 2008 design value for the 8-hour ozone NAAQS, which was based on monitoring data collected from 2006 through 2008, show attainment of the 1997 8-hour ozone NAAQS. On December 3, 2009, U.S. EPA published a clean data finding for Imperial County. Subsequent monitoring data show that the County continues to meet the 1997 8-hour ozone standard. Figure 2 illustrates the Imperial County ozone nonattainment area and monitoring locations.

Figure 2 shows the location of routine ozone monitoring stations in Imperial County. The number of routine ozone monitoring sites in Imperial County exceeds the monitoring density required in federal regulations for a county of approximately 180,000 residents (40 CFR Part 58, Appendix D).

Figure 2
Map of Imperial County and Monitoring Stations

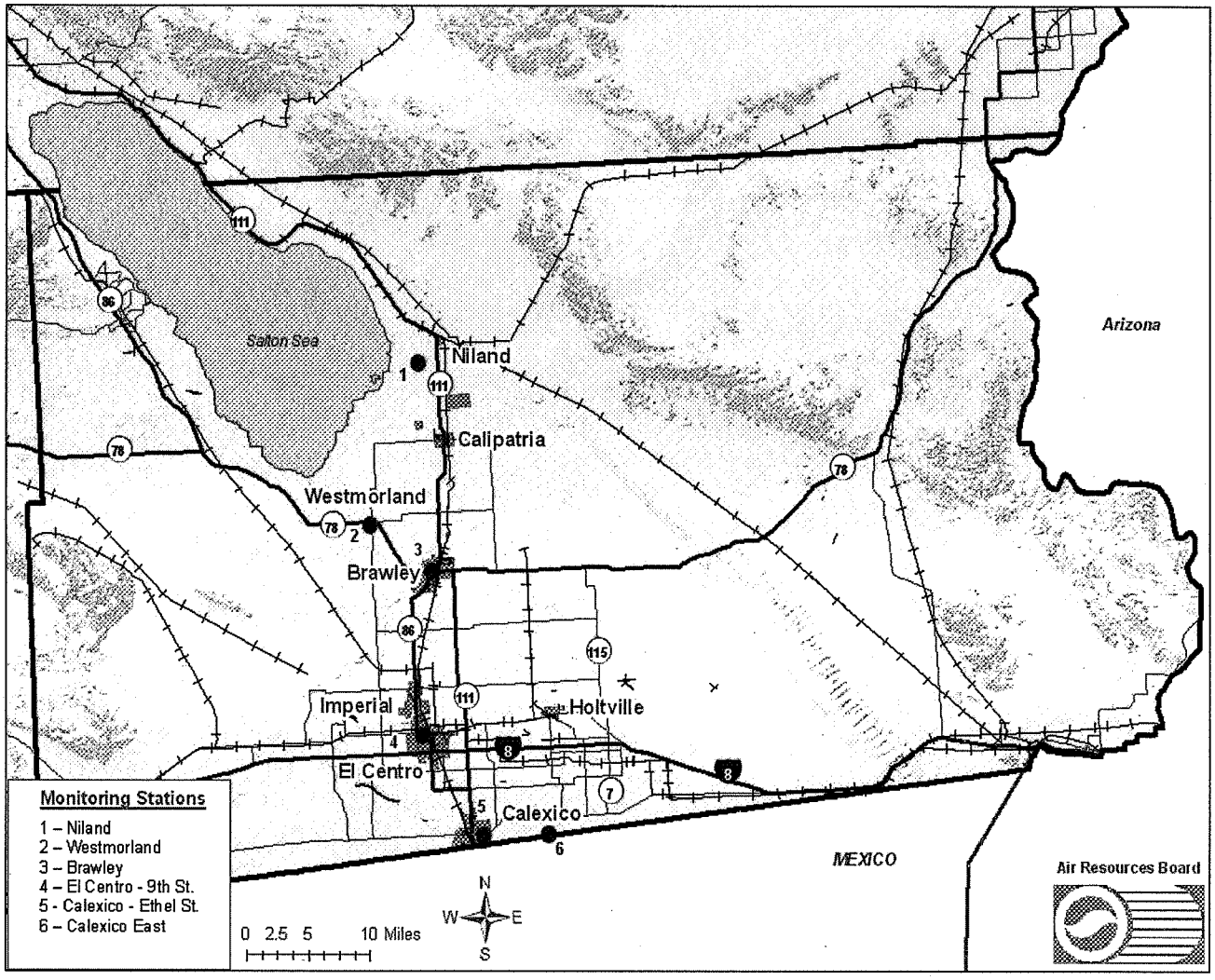


Table 3 shows the Imperial County air monitoring stations design values for 2006 through 2009, representing 2004 through 2009 monitoring data. The design values for all of the monitoring sites are at or below the mandated 0.085 ppm threshold. The El Centro 9th Street and Westmorland started with the highest design values; both show a trend of improving air quality. The design values for the Niland and Calexico-East sites show slight upward trends, but in both cases are still well below the 1997 8-hour ozone standard. On the map above, a dot represents an air monitoring station.

Table 3
Imperial Monitoring Station County Design Values
(ppm)

Monitoring Sites	2006	2007	2008	2009
El Centro-9th Street	0.085	0.086	0.082	0.079
Westmorland-W 1st Street	0.085	0.087	0.082	0.079
Niland	0.073	0.074	0.075	0.076
Calexico-Ethel	0.074	0.079	0.080	0.083
Calexico East	0.076	0.079*	0.079*	0.075*
Calexico Grant	0.069	0.072	Closed	Closed

* Design values impacted by the deletion of June 2007 through October 2007 data due to monitoring irregularities.

Pollution transport from Mexico contributed to high readings in some ozone exceedance days in Calexico, and possibly in some other Imperial County sites. The CAA allows the exclusion of concentrations caused by transport from another country in the development of attainment demonstration plans. This plan does not utilize international transport exclusion since the clean data finding does not rely on the transport argument.

B. Moderate Nonattainment Area Requirements

As discussed earlier, U.S. EPA's clean data finding suspends certain SIP requirements. This section reviews the elements that the District submitted to fulfill the remaining moderate area nonattainment requirements.

New Source Review and Offset Ratio

Federal New Source Review (NSR) regulations are applied to the siting and modification of sources that are located in areas designated as federal nonattainment for NAAQS. The purpose of federal NSR is to ensure that ambient air quality does not deteriorate any further in nonattainment areas. Imperial's SIP-approved NSR rule, Rule 207, was adopted by the Imperial County Air Pollution Control Board on November 10, 1980. The CAA requires moderate nonattainment areas to have offsets ratios of 1.15 to 1. Rule 207 has a 1.15 to 1 offset ratio for ozone precursors. This rule and the offset ratio fulfill the requirements of the CAA.

RACT Analysis

The District completed its RACT analysis in a separate document (please refer to Section V). The Imperial County Air Pollution Control Board adopted the 2009 RACT SIP at the July 13, 2010, Board meeting.

Emissions Inventory

The precursors of ozone are oxides of nitrogen (NOx) and reactive organic gases (ROG). Mobile sources contribute the bulk of Imperial County's NOx emissions with heavy duty trucks clearly leading locomotives, and passenger vehicles as the top source (Table 4). Livestock waste, passenger vehicles, and pesticides constitute the top sources for ROG emissions (Table 5). ROG and NOx emissions decreased significantly in these categories between 2002 and 2009, as did total emissions, as shown in Tables 4 and 5.

The Emission Statement Rule requires the owner or operator of each stationary source that emits NOx or ROG to provide a statement for classes or categories of sources showing the actual emissions. The Imperial County Air Pollution Control Board adopted an Emissions Statement and Certification Rule on February 23, 2010.

Air Quality Planning

In developing this plan, the District held regularly scheduled SIP working group meetings that included various community representatives, health, environmental, and industry and military representatives, local and county governments, and state and federal agencies. The meetings were initiated in March 2008 and ended in June 2009. The District also posted drafts of the 2009 Ozone Plan on their website throughout the process.

Table 4
Imperial County NOx Sources

Imperial County - Top Sources of NOx (tons per day)			
Rank (2002)	**Source Category**	**2002**	**2009**
1	HEAVY DUTY DIESEL TRUCKS	13	11
2	LOCOMOTIVES	7	5
3	PASSENGER VEHICLES	6	5
4	FARM EQUIPMENT (COMBINES AND TRACTORS)	3	2
5	OFF-ROAD EQUIPMENT	2	1
6	ELECTRIC UTILITIES	1	1
7	MANUFACTURING AND INDUSTRIAL (BOILERS, IC ENGINES)	1	1
8	MANAGED BURNING AND DISPOSAL	1	1
9	AIRCRAFT	1	2
10	AGRICULTURAL IRRIGATION PUMPS	1	1
TOP 10 CATEGORIES TOTAL		36	31
TOTAL EMISSIONS		37	32
TOP 10 CATEGORIES PERCENT OF TOTAL		96%	95%

Numbers may not add due to rounding
"Top 10" categories are prioritized by 2002 emissions

Table 5
Imperial County ROG Sources

Imperial County - Top Sources of ROG (tons per day)			
Rank (2002)	**Source Category**	**2002**	**2009**
1	LIVESTOCK WASTE	9	6
2	PASSENGER VEHICLES	7	5
3	PESTICIDES	5	3
4	OFF-ROAD RECREATIONAL VEHICLES	3	4
5	MANAGED BURNING AND DISPOSAL	2	2
6	ASPHALT PAVING / ROOFING	2	2
7	CONSUMER PRODUCTS	1	1
8	AIRCRAFT	1	2
9	HEAVY DUTY DIESEL TRUCKS	1	1
10	RECREATIONAL BOATS	1	1
TOP 10 CATEGORIES TOTAL		33	27
TOTAL EMISSIONS		37	32
TOP 10 CATEGORIES PERCENT OF TOTAL		87%	86%

Numbers may not add due to rounding
"Top 10" categories are prioritized by 2002 emissions

The District released the draft 2009 Ozone Plan and the 2009 RACT SIP on June 13, 2010 following several months of coordinated efforts between District staff and the SIP working group. The District released a notice of public hearing for the adoption of the 2009 Ozone Plan and associated negative declaration 30 days prior to its Board meeting, and held two public workshops to discuss both the 2009 Ozone Plan and 2009 RACT SIP.

Air Pollution Transport

Since Imperial County in effect shares an air basin with the Baja California city of Mexicali, ozone levels in southern part of the county are likely impacted by emissions from Mexico. The CAA allows states to demonstrate that an area would have attained the NAAQS by the applicable attainment date but for emissions emanating from outside of the United States (CAA section 179B(b)). Imperial County's 2009 Ozone Plan does not utilize the international transport provision since it was not needed to demonstrate attainment of the 1997 8-hour ozone NAAQS. However, ARB has previously assessed the impacts of transported pollutants on violations of the State Ambient Air Quality Standard (SAAQS) for ozone, and determined that transport from Mexico can cause or contribute to high ozone levels in Imperial County. ARB, the local District, and U.S. EPA continue to coordinate on efforts to improve air quality and reduce transported pollutants throughout the border region.

V. 2009 RACT SIP

Ozone non-attainment areas classified as moderate or above are required by CAA sections 182(b)(2) and 182(f) to implement RACT for sources subject to Control Techniques Guideline (CTG) documents and for all major sources of VOC and NOx that are not subject to a CTG. The 2009 RACT SIP fulfills CAA requirements for a moderate area, and ARB staff recommends that it be submitted as a SIP revision simultaneously with the 2009 Ozone Plan. The District worked closely with U.S. EPA and stakeholders as it prepared its RACT SIP. The District also released a public notice 30 days prior to its Board hearing, and held two workshops to discuss the draft 2009 RACT SIP. On July 13, 2010, the Imperial County Air Pollution Control Board adopted the 2009 RACT SIP.

VI. Staff Recommendations

ARB staff has reviewed the Imperial County 2009 Ozone Plan for the Imperial County ozone nonattainment area, including the 2009 RACT SIP, and consulted with District staff during its review. ARB staff finds that the Imperial County 2009 Ozone Plan and 2009 RACT SIP meet all applicable CAA requirements for a moderate nonattainment area. Staff recommends that the Board adopt the Imperial County 2009 1997 8-Hour Ozone Modified Air Quality Management Plan and 2009 Reasonably Available Control Technology State Implementation Plan, and direct the Executive Officer to submit them to U.S. EPA as proposed revisions to California's SIP.

S:\Imperial County\2009 Ozone Plan\Board Item\Div Final Draft Staff Report2.doc

Assignment # 7897

PROPOSED

State of California
AIR RESOURCES BOARD

Resolution 10-35

November 18, 2010

Agenda Item No: 10-10-2

WHEREAS, the Legislature in Health and Safety Code section 39602 has designated the State Air Resources Board (ARB or Board) as the air pollution control agency for all purposes set forth in federal law;

WHEREAS, ARB is responsible for the preparation of the State Implementation Plan (SIP) for attaining and maintaining the national ambient air quality standards (NAAQS) as required by the federal Clean Air Act (the Act; 42 U.S.C. section 7401 et seq.), and to this end is directed by Health and Safety Code section 39602 to coordinate the activities of all local and regional air pollution control and air quality management districts (districts) necessary to comply with the Act;

WHEREAS, section 39602 of the Health and Safety Code also provides that the SIP shall include only those provisions necessary to meet the requirements of the Act;

WHEREAS, ARB is authorized by section 39600 of the Health and Safety Code to do such acts as may be necessary for the proper execution of its powers and duties;

WHEREAS, section 41650 of the Health and Safety Code requires ARB to approve the nonattainment area plan approved and adopted by a district as part of the SIP, unless the Board finds, after a public hearing, that the plan does not meet the requirements of the Act;

WHEREAS, sections 39515 and 39516 of the Health and Safety Code provide that any power, duty, purpose, function or jurisdiction of the Board may be delegated to the Board's Executive Officer as the Board deems appropriate;

WHEREAS, the local air districts have primary responsibility for the control of air pollution from non-vehicular sources and for adopting control measures, rules, and regulations to attain the NAAQS within their boundaries pursuant to sections 39002, 40000, 40001, 40701, 40702, and 41650 of the Health and Safety Code;

WHEREAS, the United States Environmental Protection Agency (U.S. EPA) has published Control Technique Guidelines (CTG) that establish Reasonably Available Control Technology (RACT) limits for volatile organic compounds emissions from

specific stationary source categories and establish various major source threshold limits for areas classified as nonattainment for the 1997 8-Hour Ozone NAAQS;

WHEREAS, U.S. EPA requires districts to review their rules for CTG and major non-CTG sources located in the district to determine if those rules meet RACT requirements and to update or adopt new rules if necessary;

WHEREAS, U.S. EPA requires districts not having a listed CTG or major non-CTG source, and consequently lacking a RACT rule for that CTG category, to make a negative declaration stating this;

WHEREAS, U.S. EPA requires nonattainment districts to submit new or amended rules, when applicable for a given district, for U.S. EPA approval by the due date for the attainment SIPs;

WHEREAS, the Imperial County Air Pollution Control District (District) is the air pollution control district responsible for carrying out these responsibilities in the Imperial County nonattainment area, which consists of all of Imperial County;

WHEREAS, On April 30, 2004, U.S. EPA designated Imperial County as nonattainment for the 1997 8-Hour Ozone NAAQS, and classified the county as "marginal" based on 2001 through 2003 air monitoring data with an attainment date of June 15, 2007;

WHEREAS, On February 13, 2008, U.S. EPA found that Imperial County failed to attain the 1997 8-Hour Ozone NAAQS by the June 15, 2007 deadline for marginal nonattainment areas; Imperial County was therefore reclassified as a moderate nonattainment for that standard;

WHEREAS, on December 3, 2009, U.S. EPA determined that the Imperial County nonattainment area attained the 1997 8-Hour Ozone NAAQS based upon certified ambient air monitoring data for the 2006–2008 monitoring period;

WHEREAS, due to U.S. EPA's finding of attainment, the 8-hour ozone SIP for the Imperial County nonattainment area is not required to include an attainment demonstration, demonstration of reasonable further progress, or contingency measures;

WHEREAS, federal law set forth in section 110(l) of the Act and Title 40, Code of Federal Regulations, section 51.102, requires that one or more public hearings, preceded by at least 30 days notice and opportunity for public review, must be conducted prior to the adoption and submittal to U.S. EPA of any SIP revision;

WHEREAS, following a duly noticed public hearing on July 13, 2010, the Imperial County Air Pollution Control Board adopted the 2009 Ozone Plan to fulfill the applicable requirements of the Act for a moderate 8-hour ozone nonattainment area;

WHEREAS, following a duly noticed public hearing on July 13, 2010, the Imperial County Air Pollution Control Board adopted the 2009 RACT SIP to fulfill the applicable requirements of the Act for a moderate 8-hour ozone nonattainment area;

WHEREAS, on July 28, 2010 the District submitted the 2009 Ozone Plan and 2009 RACT SIP to ARB as proposed revisions to the California SIP;

WHEREAS, the California Environmental Quality Act (CEQA) requires that no project which may have significant adverse environmental impacts may be adopted as originally proposed if feasible alternative or mitigation measures are available to reduce or eliminate such impacts, unless specific overriding considerations are identified that outweigh the potential adverse consequences of any unmitigated impacts;

WHEREAS, to comply with CEQA, the District prepared and adopted Negative Declarations for the 2009 Ozone Plan and the RACT SIP, finding that these projects will not will lead to or result in significant adverse impacts;

WHEREAS, the Board finds that; (1) California's State and local air pollution control programs have together successfully reduced ozone concentrations leading to attainment of the 1997 8-Hour Ozone NAAQS in the Imperial County nonattainment area; (2) The District's 2009 Ozone Plan and 2009 RACT meet the requirements of the Clear Air Act; (3) The District's 2009 Ozone Plan and 2009 RACT SIP were adopted in compliance with CEQA requirements.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby adopts the Imperial County 2009 Ozone Plan and 2009 RACT SIP as revisions to the California SIP.

BE IT FURTHER RESOLVED that the Board hereby directs the Executive Officer to submit the Imperial County 2009 Ozone Plan and 2009 RACT SIP with the appropriate supporting documentation to the U.S. EPA for approval as revisions to the California SIP, to be effective, for purposes of federal law, upon approval by U.S. EPA.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to work with the District and U.S. EPA and take appropriate action to resolve any completeness or approvability issues that may arise regarding this SIP submission.

BE IT FURTHER RESOLVED that the Board authorizes the Executive Officer to include in the SIP submittal any technical corrections, clarifications, or additions that may be necessary to secure U.S. EPA approval.

BE IT FURTHER RESOLVED that the Board certifies pursuant to 40 CFR Section 51.102 that the Imperial County 2009 Ozone Plan and 2009 RACT SIP were adopted after notice and public hearing as required by 40 CFR Section 51.102.

PROPOSED

State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 10-38

November 18, 2010

Agenda Item No.: 10-10-4

WHEREAS, the Air Resources Board (ARB or Board) has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2703-268, entitled "Characterization of the Atmospheric Chemistry in the Southern San Joaquin Valley," has been submitted by the University of California, Berkeley to augment contract number 08-316;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 2703-268 entitled "Characterization of the Atmospheric Chemistry in the Southern San Joaquin," submitted by the University of California, Berkeley, for a total amount not to exceed $45,000.

NOW, THEREFORE BE IT RESOLVED that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 2703-268 entitled "Characterization of the Atmospheric Chemistry in the Southern San Joaquin Valley," submitted by the University of California, Berkeley, for a total amount not to exceed $45,000.

BE IT FURTHER RESOLVED that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed $45,000.

ATTACHMENT A

Characterization of the Atmospheric Chemistry in the Southern San Joaquin Valley (Augmentation to ARB Contract No. 08-316)

Background

A budget augmentation is requested to cover unanticipated expenses associated with changing the monitoring location of this project, which served as the super monitoring site in the southern San Joaquin Valley for the CalNex 2010 field study. The original budget assumed that this "supersite" would be at the long-term ARB monitoring site in Arvin. However, shortly before the contract was executed, staff of the Monitoring & Laboratory Division informed the project planners that ARB had lost the lease to the Arvin site when the property owner would not renew the agreement. Consequently, the contractor (UC Berkeley) needed to investigate potential alternate sites and to establish a new monitoring site suitable for serving as the Bakersfield supersite for the CalNex field study, which was set to begin the field measurements phase a few months later in May of 2010. Because it was necessary to find and set-up a totally new monitoring site, this contract incurred significant (~10% of the budget) additional costs associated with ground preparation, installation and distribution of electrical power, etc. To cover these unanticipated logistical expenses, an augmentation of the budget for Contract No. 08-316 is needed.

Objective

This requested augmentation of the budget for Contract No. 08-316 will defray the costs that UC Berkeley unexpectedly incurred in establishing a new monitoring site. The requested augmentation will ensure that the objectives and deliverables of the project are fully met. The technical objective of the project remains to collect and analyze the CalNex gas and aerosol measurements and to improve the current understanding of atmospheric chemistry and the performance of models simulating O_3 and PM2.5 production in the southern San Joaquin Valley.

Methods

The principal investigators, their sub-contractors, and other CalNex 2010 participants collected specialized air quality measurements in the San Joaquin Valley to address air quality and climate change issues. The investigators will share results and analyze the data to better characterize the atmospheric chemistry at work in determining ambient air quality in the San Joaquin Valley.

Expected Results

This project will improve our understanding of the atmospheric chemistry in the southern San Joaquin Valley and how it controls the formation of secondarily formed pollutants (e.g., O_3 and PM2.5).

Significance to the Board
The measurements and data analyses from this project and the larger parent CalNex 2010 study will support the development of appropriate and cost-effective control strategies for reducing secondarily formed pollutants like O_3 and PM2.5 in the San Joaquin Valley and the South Coast Air Basin. The CalNex 2010 study will provide critical data for characterizing the potential impacts of climate change on ambient air quality in California.

Contractor:
University of California, Berkeley

Contract Period:
36 months

Principal Investigators (PIs):
Professors Ronald Cohen and Allen Goldstein

Original Contract Amount:
$1,050,000

Contract Augmentation:
$45,000

Basis for Indirect Cost Rate:
The State and the University of California system have agreed to a ten percent indirect cost rate.

Past Experience with these Principal Investigators:
Professors Cohen and Goldstein are well-respected researchers in the atmospheric measurements and chemistry community. They have worked with other high-level, national research groups (e.g., the National Aeronautics and Space Administration) in the past. At least four staff members of ARB Research Division have worked with these PIs on at least seven projects (e.g., biogenics, organic aerosols, Lake Tahoe Atmospheric Deposition Study, night-time chemistry, satellite measurements) in the past. Staff has been very satisfied with their research.

Prior Research Division Funding to (UCB):

Year	2009	2008	2007
Funding	$1,509,539	$1,157,110	$1,420,484

AUGMENTATION BUDGET SUMMARY

Contractor: University of California, Berkeley

Characterization of Atmospheric Chemistry in the Southern San Joaquin Valley

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	0	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	0	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	0	
8.	Supplies	$	40,909	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$40,909
INDIRECT COSTS				
1.	Overhead	$	4,091	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$4,091
TOTAL PROJECT COSTS		**$**	**45,000**	

PROPOSED

State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 10-41

November 18, 2010

Agenda Item No.: 10-10-4

WHEREAS, the Air Resources Board (ARB or Board) has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705;

WHEREAS, a research proposal, number 2702-268, entitled "Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles," has been submitted by the University of California, Los Angeles to augment contract number 08-318;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 2702-268 entitled "Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles," submitted by the University of California, Los Angeles for a total amount not to exceed $120,000.

NOW, THEREFORE BE IT RESOLVED that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 2702-268 entitled "Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles," submitted by the University of California, Los Angeles, for a total amount not to exceed $120,000.

BE IT FURTHER RESOLVED that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed $120,000.

ATTACHMENT A

"Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles" (Augmentation to ARB Contract No. 08-318)

Background

A contract augmentation is requested to cover unanticipated expenses associated with changing the field site of the project, which also served as a supersite for the CalNex 2010 field study, from the originally intended Los Angeles Department of Water and Power (LADWP) building at North Main Street to a site on the campus of the California Institute of Technology.

The original contract was awarded in January 2009 and work commenced immediately on planning and organizing other groups as part of CalNex 2010. In January of 2010, however, the LADWP decided to install solar panels at the North Main street building during the time planned for field work in CalNex 2010. Caltech offered assistance with a site large enough for the entire field experiment, which involved over 30 research groups with 30 gas-phase and 30 aerosol instruments. Because of this change in location, however, the project incurred additional costs associated with installation of power and rental of trailers and towers, and with the need for a more sensitive detector component for the increased light path of the Principal Investigators Differential Optical Absorption Spectroscopy (DOAS) instrument. To cover these logistical expenses, the original contract was amended to shift funds out of salary to appropriate categories. The final deliverables were correspondingly affected: the planned analysis of data can not be carried out with current funding (the PI and graduate student researcher provided in-kind labor to run the instruments and collect data during the field campaign). The requested augmentation would restore the original funding for salary.

Objectives

The augmentation will allow the PI to carry out the originally planned analyses of the nocturnal chemistry in the South Coast Air Basin based on observations made during the CalNex field experiment. These studies along with the vertical concentration profiles provided by this project will help ARB both validate and improve the chemistry in urban airshed models.

Methods

This and another project (Contract No. 08-318 - Nocturnal Chemistry in an Urban Area; Contract No. 08-319 - Characterization of Aerosols and SOA Formation, respectively) were confirmed early in 2009 by the Research Screening Committee with the intent to act as the nucleus of a supersite in the South Coast Air Basin for the CalNex 2010 field study – a joint collaboration between the National Oceanic and Atmospheric Administration and ARB to address inter-related issues at the nexus between climate change and air quality in California. The primary tasks for this project, being conducted by UCLA's Professor Jochen Stutz, are to organize and help set up the field site, conduct DOAS measurements of important nocturnal trace gases (vertical profiles of O_3,

NO_2, NO_3, HONO, HCHO, glyoxal, and SO_2), and interpret the comprehensive data set using UCLA's one-dimensional chemical transport model.

Expected Results
The expected results from this work are a greatly improved understanding of nocturnal chemistry and meteorology and of its impact on daytime ozone and particle formation in urban atmospheres.

Significance to the Board
With vertical species profiles and calculations from UCLA's one-dimensional-chemistry and transport model, the PI will assess the impact of nocturnal processes on daytime air quality in Los Angeles. As a follow-on, both the measurements and analyses/interpretations will allow the ARB to validate urban airshed models of the South Coast Air Basin with a focus on the, thus far poorly studied, nocturnal behavior of these models. This information will ultimately lead to more accurate air quality models for polluted urban areas, which are needed in the development of future mitigation strategies to meet air quality standards.

Contractor:
University of California, Los Angeles

Contract Period:
12 months

Principal Investigator (PI):
Jochen Stutz

Original Contract Amount:
$289,090

Contract Augmentation:
$120,000

Basis for Indirect Cost Rate:
The State and the University of California system have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator:
Professor Jochen Stutz has recently completed outstanding work for ARB project, Contract# 05-307, "Impact of Reactive Halogens on the Air Quality in California Coastal Areas." For this project, Professor Stutz carried out field site setup, ambient measurements, data analysis and final report writing on budget and within the originally planned time frame. Staff has great confidence that Professor Stutz's proposed study will be successful and yield new and important information about nocturnal chemistry in urban areas.

Prior Research Division Funding to (UCLA):

Year	2009	2008	2007
Funding	$506,565	$386,076	$616,171

AUGMENTED BUDGET SUMMARY

Contractor: University of California, Los Angeles

Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles

DIRECT COSTS AND BENEFITS		
1.	Labor and Employee Fringe Benefits	$ 108,507
2.	Subcontractors	$ 0
3.	Equipment	$ 0
4.	Travel and Subsistence	$ 0
5.	Electronic Data Processing	$ 0
6.	Reproduction/Publication	$ 584
7.	Mail and Phone	$ 0
8.	Supplies	$ 0
9.	Analyses	$ 0
10.	Miscellaneous	$ 0
	Total Direct Costs	$ 109,091
INDIRECT COSTS		
1.	Overhead	$ 10,909
2.	General and Administrative Expenses	$ 0
3.	Other Indirect Costs	$ 0
4.	Fee or Profit	$ 0
	Total Indirect Costs	$ 10,909
TOTAL PROJECT COSTS		**$ 120,000**

TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER THE PROPOSED AMENDMENT OF THE AIRBORNE TOXIC CONTROL MEASURE FOR IN-USE DIESEL-FUELED TRANSPORT REFRIGERATION UNITS (TRU) AND TRU GENERATOR SETS, AND FACILITIES WHERE TRUs OPERATE

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider the adoption of amendments to the regulation affecting transport refrigeration units (TRU) and TRU generator sets (TRU gen set) (collectively, TRUs and TRU gen sets shall be referred to as TRUs).[1] As explained in greater detail below, the proposed amendments would change the in-use performance standards for model year (MY) 2003 and certain 2004 TRU engines. The Board will also be considering amendments that would clarify the requirements for "flexibility" engines used in TRUs by original equipment manufacturers under the Transitional Program for Equipment Manufacturers and would require TRU original equipment manufacturers to report certain TRU production data.

DATE: November 18, 2010

TIME: 9:00 a.m.

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

This item may be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., on Thursday, November 18, 2010, and may continue at 8:30 a.m., Friday, November 19, 2010. This item may not be considered until Friday, November 19, 2010. Please consult the agenda for the meeting, which will be available at least ten days before November 18, 2010, to determine the day on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to California Code of Regulations (CCR), title 13, Division 3, Chapter 9, Article 8, section 2477.

Background: Over 90 percent of Californians breathe unhealthful air at times. To improve air quality and human health, ARB establishes requirements to reduce

[1] Title 13, CCR section 2477 is known as the Transport Refrigeration Unit Airborne Toxic Control Measure and establishes in-use performance standards, recordkeeping, and facility reporting requirements for TRUs and TRU generator sets.

emissions from new and in-use on-road and off-road vehicles, engines, and other sources.

In 1998, the Board identified particulate matter emissions from diesel-fueled engines as a toxic air contaminant. Two years later, in September 2000, the Board adopted the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Plan). The Plan established a goal of reducing emissions and the resultant health risk from virtually all diesel-fueled engines and vehicles within the State of California by the year 2020. The Plan included a goal of reducing diesel PM by 85 percent in 2020 from the baseline emissions in 2000. The Plan also identified various control measures for achieving the goals. These measures included new, more stringent standards for all new diesel-fueled engines and vehicles, the replacement of older in-use engines with new, cleaner engines, the use of diesel emission control strategies on in-use engines, and the use of low-sulfur and alternative diesel fuels.

TRU diesel engines currently emit approximately 1.6 tons per day of diesel PM. Staff believes that there are situations where the estimated 70-year potential cancer risk resulting from exposure to diesel PM emissions from TRUs is in excess of a 100 in a million. This is because of the high cancer-causing potential of diesel PM and the potential for large numbers of TRUs to operate at one location, such as distribution centers located near residential areas.

On May 16, 2002, the Board approved the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines* (title 13 CCR, sections 2700-2710). This rule establishes procedures for the verification of diesel emission control strategies by ARB that can be applied on various diesel-fueled engines and vehicles to significantly reduce diesel PM emissions. It is important to reduce diesel PM emissions from TRUs. Health and Safety Code sections 39666 and 39667 requires the ARB to adopt regulations to achieve the maximum possible reduction in public exposure to TACs through the application of best available control technology (BACT), or a more effective control method, in consideration of cost, risk, environmental impacts, and other specified factors.

ARB adopted the TRU Airborne Toxic Control Measure (ATCM) in 2004. The TRU ATCM is part of ARB's ongoing effort to reduce PM emissions from diesel-fueled engines and vehicles and improve air quality. The TRU ATCM established in-use performance standards for TRUs and TRU gen sets that were to be phased in commencing on December 31, 2008. In March 2005, staff requested the U.S. Environmental Protection Agency (U.S. EPA) to grant authorization to ARB to adopt and enforce the TRU ATCM pursuant to Clean Air Act (CAA) section 209(e)(2). U.S. EPA granted California authorization on January 16, 2009. Because U.S. EPA's authorization was granted after the first compliance date, ARB delayed the enforcement of the TRU ATCM's in-use performance standards until January 2010.

ARB staff has prepared an Initial Statement of Reasons (ISOR) for the proposed amendments to the *Airborne Toxic Control Measure for In-Use Diesel-Fueled TRUs and TRU Gen Sets, and Facilities where TRUs Operate*.

Description of the Proposed Regulatory Action:

ARB staff is proposing to amend the TRU ATCM that the Board approved for adoption on February 26, 2004, and became effective December 10, 2004. The primary purpose of the proposed amendments is to change the in-use performance standard for MY 2003 TRU engines in the 25 hp and greater category and MY 2003 and MY 2004 engines in the less than 25 hp category from the ultra-low-emission TRU (ULETRU) in-use performance standard to allow TRU owners to comply by either meeting the ULETRU standard or, as an option, the less stringent low-emission TRU (LETRU) in-use standard. The initial compliance deadlines for MYs 2003 and 2004 TRU engines are December 31, 2010 and December 31, 2011, respectively. The proposed amendments would also require that all MY 2003 and MY 2004 engines meet the ULETRU standard seven years after the initial compliance date (in 2017 or 2018).

Requirements for "flexibility" engines used in TRUs by original equipment manufacturers under the federal Transitional Program for Equipment Manufacturers and California's equipment manufacturer flexibility program (title 13 CCR, section 2423(d)) would also be clarified to provide seven years of operational life to flexibility engines installed before the effective date of these amendments. Flexibility engines installed after that would have a shorter operational life under the amendments. In addition, the amendments would impose new reporting requirements on TRU original equipment manufacturers. A more detailed description of the proposed amendments is presented below.

Applicability

The proposed amendments would affect owners of TRUs and TRU gen sets that operate in California that are equipped with MY 2003 engines, regardless of horsepower category, and MY 2004 engines in the less than 25 hp category. This would include all TRU and TRU gen set owners, whether based in California or out-of-state, that transport perishable goods using refrigerated trucks, trailers, shipping containers, and railcars within the State. Most TRUs are owned or operated by corporations, businesses, and individuals. There are a few local municipalities, school districts, and correctional institutions that operate TRUs that may be affected. These amendments would affect the owners of TRUs and TRU gen sets equipped with "flexibility engines" and would also extend the applicability for new reporting requirements to TRU and TRU gen set original equipment manufacturers that directly or indirectly sell or offer for sale TRUs and TRU gen sets to the California market. There are currently only three affected TRU and TRU gen set manufacturers.

In-Use Emission Standard Amendment

The amendments would change the in-use standards for MY 2003 TRU and TRU gen set engines in the 25 hp and greater power category from the ULETRU in-use standard to allow either the ULETRU standard or, as an option, the less stringent LETRU in-use

standard. This change would provide owners with more compliance flexibility and is needed because ULETRU compliance options presently are limited and relatively costly compared to LETRU compliance costs. The compliance date for meeting one of these standards would remain December 31, 2010. Seven years later, by the end of 2017, the MY 2003 engines that are still remaining in service would be required to meet ULETRU if the owner chose to meet the LETRU standard in 2010.

The amendments would also change the in-use standard for MY 2003 and MY 2004 engines in the less than 25 hp category from the ULETRU in-use standard to allow either the ULETRU standard or, as an option, the LETRU in-use standard. The compliance dates would remain December 31, 2010, for MY 2003 engines and December 31, 2011, for MY 2004 engines, when the owner must choose to meet one of these standards. Seven years later, by the end of 2017, the MY 2003 engines that still remain in service would be required to meet the ULETRU standard if the owner chose to meet the LETRU standard in 2010. By the end of 2018, the MY 2004 engines that still remain in service would also be required to meet the ULETRU standard if the owner chose to meet the LETRU standard in 2011.

Flexibility Engines – "Effective Model Year"

The staff is also proposing to amend the requirements for "flexibility" engines that are used in TRUs by original equipment manufacturers under the federal Transitional Program for Equipment Manufacturers and California's equipment manufacturer flexibility program[2]. The amendments would clarify that flexibility engines installed before the effective date of the amendments would be provided a full seven years of operational life from the year of the engine's manufacture before having to meet the more stringent ULETRU in-use performance standard. Flexibility engines installed after that date would have a reduced operational life given that compliance would be based on the last year that the flexibility engine's tier standard was in effect.
As permitted under federal and State regulations, TRU and TRU gen set original equipment manufacturers (TRU OEMs) have installed "flexibility engines" that meet an emissions standard tier that is no longer in effect for new engines at the time that the equipment is manufactured.[3]

To date, TRU OEMs and engine manufacturers have not followed a consistent practice in identifying the model year of flexibility engines. While some manufacturers have identified the model year of these engines to be the year of manufacturer of the engine, others have identified the model year as being the last year that the emission standard tier of the flexibility engine was in effect for new engine certification (under the proposed amendments, this second designation is referred to as "effective model year"). The use

[2] Flexibility engines are new engines that are allowed under these programs to be certified to a lower emission standard than is otherwise in effect for new engines at the time of manufacture.

[3] This is allowed for a limited number of engines under the federal Transitional Program for Equipment Manufacturers and California's equipment manufacturer flexibility program (13 CCR, section 2423(d)) for several years after an emissions standard changes to a more stringent tier.

of the effective model-year designation has adversely impacted the operational life of TRUs under the TRU ATCM in that TRU owners must meet in-use performance standards seven years after the engine model year. The last year that a prior tier was in effect for new engine certification is typically one to two years before the manufacture date of the flexibility engine, resulting in the loss of up to several years of operational life. In most cases, owners have not been aware of this loss of operational life of the TRU engines that they have purchased.

To address this issue, staff is proposing that flexibility engines meeting a prior tier new engine standard would be allowed to use the actual engine manufacture year to determine in-use compliance requirements. For example, a Tier 1 engine installed in a TRU after the Tier 2 new engine emission standards became effective for new engines would be allowed to use the engine manufacture year to determine in-use compliance requirements. This would ensure that all TRUs with flexibility engines that are purchased before the effective date of these amendments receive a full seven years of operational life.

The amendments would further provide that flexibility engines installed in TRUs after the effective date of the amendments would be required to use the "effective model year" of the flexibility engine to determine future ULETRU compliance dates. As stated, the effective model year of the flexibility engine would be the last year that the flexibility engine's tier standard was in effect for new engine compliance. Compliance with the in-use standards would then be required by the end of the seventh year after the effective model year of the flexibility engine. Using the effective model year for future flexibility engine use would discourage their use since operational life is affected. It would also result in dirtier, earlier tier flexibility engines being phased out sooner thereby ensuring that the emission reductions intended under the original TRU ATCM will be achieved as intended.

TRU OEMs would also be required to disclose to the end user at point of sale that the unit has a flexibility engine and that there is a loss of operational life associated with the use of flexibility engines. They must also provide the end user with the date that the engine must meet the ULETRU in-use standard.

TRU Manufacturer Reporting

Staff is proposing to amend the TRU ATCM to require that TRU OEMS report production information, including information on flexibility engines installed in TRUs. This reporting will ensure that manufacturers provide the data necessary for the proposed flexibility engine amendments, allow ARB to consider improvements to the TRU registration process, and more accurately estimate emissions inventories. TRU OEMs would be required to periodically report data on each TRU and installed engine produced in future model years. TRU OEMs would also be required to submit reports on TRU sales from previous years.

COMPARABLE FEDERAL REGULATIONS

There are no federal regulations comparable to the TRU ATCM for in-use TRUs. Under federal Clean Air Act (CAA) section 213, U.S. EPA is without authority to adopt in-use standards for off-road (non-road) engines.[4]

Section 209(e)(1) of the CAA conclusively preempts states, including California, from adopting requirements for new off-road engines less than 175 hp that are used in farm or construction equipment. Under section 209(e)(2), California may adopt and enforce emission standards and other requirements for off-road engines and equipment not conclusively preempted by section 209(e)(1), so long as California applies for and receives authorization from the Administrator of U.S. EPA. TRU engines are not used in farm and construction equipment and are thus not preempted. California requested and received authorization from U.S. EPA for the initially adopted TRU ATCM in January 2009.[5]

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the potential environmental and economic impacts of the proposal. The report is entitled, *Proposed Amendment of the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units and TRU Generator Sets, and Facilities Where TRUs Operate.*

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strike-out format to allow comparison with the existing TRU ATCM, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, on September 29, 2010.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on ARB's website for this rulemaking at: http://www.arb.ca.gov/regact/2010/tru2010/tru2010.htm.

Inquiries concerning the substance of the proposed regulations may be directed to the designated agency contact persons, Richard Boyd, Manager of the Process Evaluation Section, Emission Assessment Branch, Stationary Source Division, at (916) 322-8285, or Rod Hill, Staff Air Pollution Specialist, Stationary Source Division, at (916) 327-5636.

Further, the agency representative and designated back-up contact persons to whom nonsubstantive inquiries concerning the proposed administrative action may be directed, are Ms. Lori Andreoni, Manager, Board Administration & Regulatory

[4] The California term "off-road" and the federal term "nonroad" refer to the same sources and are used interchangeably.
[5] 74 Fed Reg 3030 (January 16, 2009).

Coordination Unit, (916) 322-4011, or Ms. Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the 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 ARB's website for this rulemaking at www.arb.ca.gov/regact/2010/tru2010/tru2010.htm.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the Staff Report.

Costs or Savings to Businesses and Private Individuals

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The amendments would result in compliance cost savings due to changing the in-use standard from ULETRU to either ULETRU or LETRU because the Level 2 Verified Diesel Emissions Control Strategies (VDECS) required to meet LETRU costs about $2,000 less than the Level 3 VDECS required to meet ULETRU. The total compliance cost savings related to the in-use standard option would be about $2.1 million in 2010 and 2011, assuming about 30 percent of the affected units will comply by retrofitting (30 percent of the MY 2002 engines complied by retrofitting, so staff assumed this trend would continue for MY 2003 and 2004 engines). However, to the extent that MY 2003 and MY 2004 engines comply by meeting the LETRU standard in 2010 and are still operating in 2017 and 2018, respectively, they would need to meet ULETRU standard in that year. This would potentially reduce compliance cost savings to a net savings of about $300,000 in 2010 dollars. The proposed amendments do not affect the cost of repowering a unit with a cleaner engine to maintain compliance, which was the compliance option chosen for 65 percent of the 2002 units, nor the cost of using Alternative Technologies (such as hybrid electric), which was chosen as the compliance option by five percent of the TRU owners.

There are no end-user compliance costs related to the amendment addressing the past use of flexibility engines. The TRU OEMs, however, would incur costs related to flexibility engine reporting in 2010. Staff estimates these one-time costs would be about $19,000, total in 2010 dollars.

The cost of compliance with the TRU OEM reporting amendment for current year and prior year production would be about $25,000 for the initial one-time reports due soon after the amendments take effect and about $8,000 per year for periodic update reports. Staff anticipates that the cost of preparing and submitting these will be reduced significantly as opportunities to automate this work are phased in.

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 determined that the proposed regulatory action would not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR.

The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action would affect small businesses because staff anticipates there will be cost savings if TRU and TRU gen set owners choose the retrofit compliance option. Compliance cost would not be affected if owners choose the repower option.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the regulation which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Before taking final action on the proposed regulatory amendments, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, 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 than the proposed action.

Costs or Savings to Local and State Government Agencies

Pursuant to Government Code sections 11346.5(a)(5), the Executive Officer has determined that the proposed regulatory action would not create any costs to or mandates on any local agency or school district that is reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500).

Pursuant to Government Code sections 11346.5(a)(6), the Executive Officer has further determined, based on estimates prepared in accordance with instruction adopted by the Department of Finance, that the proposed regulatory action would not create additional costs to any State agency or to any local agency or school district, whether or not reimbursable by the State pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500), create other nondiscretionary costs on local agencies, and affect costs or savings in federal funding to the State.

Several local agencies, school districts, and State agencies own TRUs, so the compliance cost savings discussed above may apply to these agencies if they own MY 2003 TRU engines in the 25 hp and greater power category or MY 2004 TRU engines in the less then 25 hp category.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and comments may be submitted by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on October 4, 2010. To be considered by the Board, written comments, not physically submitted at the meeting, must be submitted on or after October 4, 2010, and received no later than 12:00 noon on November 17, 2010, and must be 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

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), written and oral comments, attachments, and associated contact information (e.g., your mailing address, phone number, email address, 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, that 20 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 in Health and Safety Code, sections 39600, 39601, 39618, 39658, 39659, 39666, 39667, 39674, 39675, 42400, 42400.14, 42400.2, 42400.3.5, 42402. 42402.2, 42410, 43013, 43018. This action is proposed to implement, interpret, and make specific sections 39618, 39650, 39658, 39659, 39666, 39667, 39674, 39675, 42400, 42400.1, 42400.2, 42400.3.5, 42402, 42402.2, 42410, 40717.9, 43013, and 43018.

HEARING PROCEDURES

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

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 and 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 ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format (i.e., Braille, large print, etc.) or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at 916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno (por decir, sistema Braille, o en impresión grande) u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

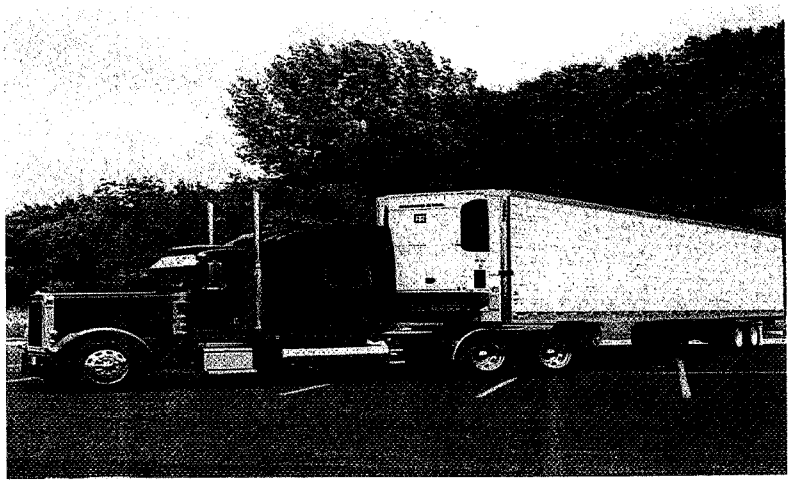
James N. Goldstene
Executive Officer

Date: September 21, 2010

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 Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING



AMENDMENTS FOR THE AIRBORNE TOXIC CONTROL MEASURE FOR IN-USE DIESEL-FUELED TRANSPORT REFRIGERATION UNITS (TRU) AND TRU GENERATOR SETS, AND FACILITIES WHERE TRUs OPERATE

Stationary Source Division
Emissions Assessment Branch

September 2010

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

PROPOSED AMENDMENT OF THE AIRBORNE TOXIC CONTROL MEASURE FOR IN-USE DIESEL-FUELED TRANSPORT REFRIGERATION UNITS (TRU) AND TRU GENERATOR SETS, AND FACILITIES WHERE TRUs OPERATE

To be considered by the Air Resources Board on November 18, 2010, at:

California Environmental Protection Agency
Headquarters Building
1001 "I" Street
Byron Sher Auditorium
Sacramento, California

Stationary Source Division:
Richard W. Corey, Chief
Cynthia Marvin, Assistant Chief
Emission Assessment Branch:
Dan Donohoue, Chief
Process Evaluation Section:
Richard Boyd, Manager

This report has been prepared by the staff of the Air Resources Board. Publication does not signify that the contents reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENT OF THE AIRBORNE TOXIC CONTROL MEASURE FOR IN-USE DIESEL-FUELED TRANSPORT REFRIGERATION UNITS (TRU) AND TRU GENERATOR SETS, AND FACILITIES WHERE TRUs OPERATE

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**Staff Report: Initial Statement of Reasons
for the Proposed Amendment of the Airborne Toxic Control Measure
for In-Use Diesel-Fueled Transport Refrigeration Units (TRU)
and TRU Generator Sets, and Facilities where TRUs Operate**

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EXECUTIVE SUMMARY

The California Air Resources Board (ARB or Board) staff is proposing amendments to the existing regulations affecting transport refrigeration units (TRU) and TRU generator sets (gen set). When we refer to TRUs in this report, we also include TRU gen sets unless otherwise specified. These proposed amendments affect the TRU Airborne Toxic Control Measure[1] that the Board approved for adoption on February 26, 2004. All characterizations of benefits and impacts are relative to the estimates in the 2003 ARB Staff Report for the 2004 TRU regulation (ARB, 2003). The proposed 2010 amendments to the TRU regulation are included here as Appendix A.

Implementation of the TRU regulation is reducing diesel particulate matter (PM) emissions and the associated health risk in communities near distribution centers, railyards, and ports. The end goal of the existing regulation is to upgrade the in-use TRUs to 85 percent PM control or better, with the compliance schedule based on a seven-year operational life for the equipment. Staff believes that three changes are needed now to respond to new information that affects upcoming compliance deadlines. The proposed amendments would:

1. Add an interim, lower cost retrofit option for a subset of TRU engines due to very limited availability of the most effective retrofit devices. To expand the range of options, owners could retrofit model year 2003 and some 2004 TRUs with Level 2 (50 percent PM control) filters now for compliance with the December 2010 requirements (December 2011 for some 2004 TRUs). TRUs that comply by using Level 2 retrofits would need to be upgraded to meet 85 percent emission controls via retrofit or replacement in seven years.

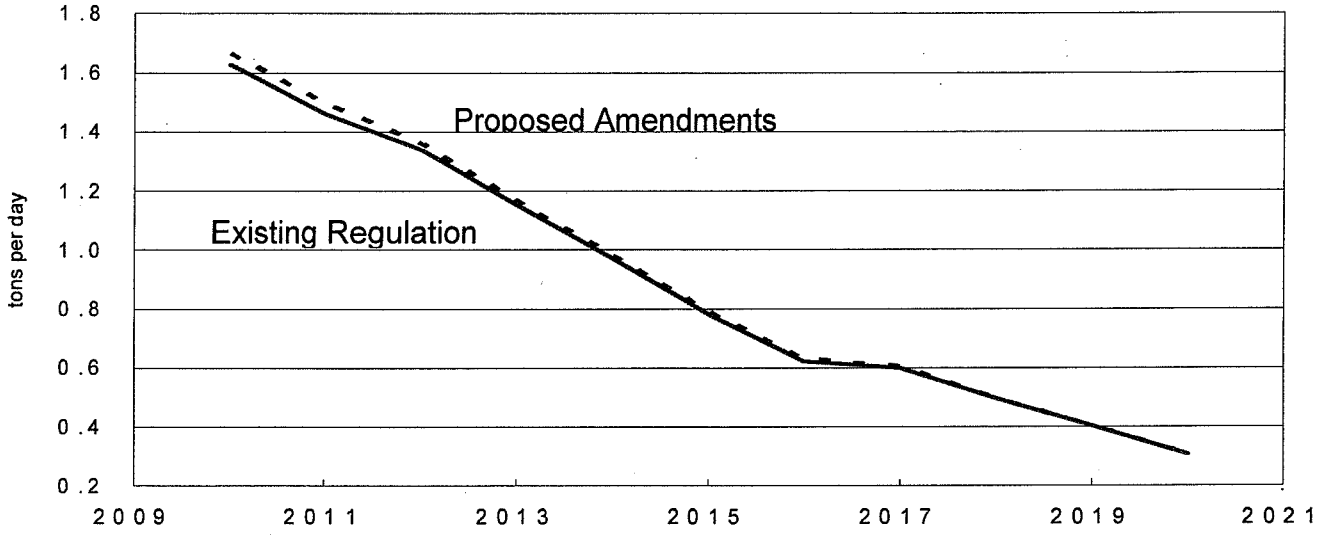
2. Phase in provisions that link the schedule to upgrade TRU "flexibility engines" to the actual emissions profile of the engines, rather than the labeled engine model year. The existing TRU regulation establishes an upgrade schedule based on the engine model year. TRU manufacturers are selling significant quantities of new TRUs with flexibility engines that rely on older, less effective control technology instead of the latest technology. While this is permitted under the federal and State regulations for new engines, it delays turnover to cleaner engines. The amendments would use the emissions profile (characterized as the "effective model year") to define when the flexibility engines need to be upgraded. Future purchases of flexibility engines would be regulated based on the effective model year of the engine. However, to preserve prior-year investments that TRU owners have already made in purchasing new TRUs that are equipped with a higher-emitting flexibility engine, the manufacture year of the engine (typically a later date than the effective model year) would be used.

[1]Title 13, CCR section 2477 is known as the Transport Refrigeration Unit Airborne Toxic Control Measure and establishes in-use performance standards, recordkeeping, and facility reporting requirements for TRUs.

3. Increase reporting by TRU manufacturers to assist TRU owners with compliance.

With the proposed amendments, the TRU regulation would continue to substantially decrease diesel PM and NOx emissions, but defer a small portion of the expected emission reductions from now until the 2017-2018 period. Figure ES-1 shows the decline in diesel PM emissions expected under the TRU regulation, and the change with the proposed 2010 amendments. The overall deferred reductions from the proposed amendments amount to 0.04 tons PM per day statewide in 2010, steadily decreasing to 0.001 tons PM per day statewide by 2018. The amendments would also allow TRU owners selecting a two-step retrofit path to realize near-term cost savings while still reducing diesel PM now.

Figure ES-1: Statewide Diesel PM Emissions from TRUs With Existing Regulation and Proposed 2010 Amendments



To evaluate the health impact of deferring these emission reductions for the seven-year period, we conservatively assumed that an individual living near a large distribution center was exposed to the maximum increment of higher emissions for a full 70 years. This would increase the maximum potential cancer risk by less than one in a million.

A. Background

TRUs are refrigeration systems (powered by an integral diesel engine) to protect perishable goods transported in insulated truck and trailer vans, rail cars, and domestic shipping containers. TRU gen sets provide onboard electric power to electrically driven refrigeration systems that are used in shipping containers and trailers.

Federal and State regulations establish progressively more stringent emission standards that TRU engine manufacturers must meet over time. These standards are

characterized by emission "tier" levels that apply to a range of manufacturing model years.

To reduce PM emissions from in-use engines, ARB verifies diesel PM retrofit devices based on levels of PM control. Table ES-1 shows the PM control associated with the emissions tiers for new engines and the emissions levels for retrofit devices.

Table ES-1: Effectiveness of PM Emission Standards for New TRU Engines vs PM Control Levels for Verified Retrofit Devices

New TRU Engines: Emissions Tiers	% PM Control	Retrofit Devices: Emissions Levels
Tier 0 Engine	None	-
Tier 1 Engine	20%	-
Tier 2 Engine	40%	-
-	50%	Level 2 Retrofit
Tier 4i Engine	70%	-
-	85%	Level 3 Retrofit
Tier 4f Engine	97%	-

ARB adopted the existing TRU regulation in 2004 to accelerate the cleanup of existing TRUs through retrofit, engine repower, or unit replacement. The compliance schedule is based on the model year of the existing engine – the oldest model year TRU engines had to be upgraded first. The schedule provides a seven-year operational life for the equipment. Ultimately, all TRUs must have 85 percent PM control to fully comply with the regulation. Currently, only the Level 3 retrofit can provide the 85 percent control. New model year 2010 TRU engines are Tier 4i with 70 percent PM control. Tier 4f engines with 97 percent PM control will be produced beginning in 2013.

Under the existing regulation, the owners of model year 2003 and 2004 TRUs can currently choose from the following compliance paths:

1. Retrofit the existing TRU with a Level 3 (85 percent PM control) filter system at a cost of about $6,000.

2. Replace the existing unit with a new TRU (equipped with 70 percent PM control) at a cost of $20,000-$25,000 now, then upgrade that TRU with a Level 3 retrofit or another new TRU (equipped with at least 85 percent PM control) in seven years. Owners selecting this path typically have higher use existing TRUs that are at or beyond their useful life and need to be replaced anyway for operational and reliability reasons.

3. Repower the TRU engine with a new engine (equipped with 70 percent PM control) at a cost of $5,500-$9,750 now, then upgrade that engine or TRU with a

Level 3 retrofit or another new TRU (equipped with at least 85 percent PM control) in seven years.

4. Use an alternative technology, like an electric standby-equipped TRU or cryogenic temperature control system.

B. Add an Interim, Lower Cost Retrofit Option for a Subset of TRUs

Issue: Over the next year, more than 4,000 existing engines need to be upgraded to comply with the TRU regulation. The model year 2003 engines must upgrade by the end of 2010 and the 2004 engines must do so by the end of 2011. As of this report, there is a single ARB-verified Level 3 filter system available for these TRUs. After some setbacks in the field testing that required redesign, this unit received its ARB verification in June 2010. Since June, the sole manufacturer has produced about 50 units for sale, far short of the more than 1,200 units that need to be purchased and installed by December 31, 2010, under the existing regulation.

However, two manufacturers are producing several models of Level 2 filters, which have been successfully installed on thousands of model year 2002 and older TRUs at a cost of $3,650 to $4,750 for each filter. These filters for model year 2002 TRUs are compatible with the model year 2003 engine technology as well. The Level 2 filters have an established network of dealers and installers; the filters have also have been thoroughly demonstrated.

Proposal: Amend the TRU regulation to allow Level 2 filters to be used for interim compliance on this subset of model year 2003 and some 2004 (less than 25 horsepower) engines. There is a sufficient supply of the Level 2 filters, plus capacity at dealers and installers, to meet the demand over the next few months. Model year 2003 and 2004 (<25 hp) engines are also compatible with Level 2 filters. This proposed amendment would give TRU owners an additional, cheaper option now (retrofit a Level 2 filter on an existing TRU) and allow them to defer for seven years the need to retrofit to a Level 3 filter or purchase a new TRU with an engine that meets the most stringent PM in-use standard.

Controlling diesel PM from a portion of the affected TRUs by 50 percent, rather than the current 85 percent, means that fewer of the expected emission reductions will be realized between 2010 and 2017, as compared to the original TRU regulation. There would also be a net savings for the TRU owner on the compliance costs due to the regulation, based on the lower cost to purchase Level 2 rather than Level 3 retrofit technology now, and deferral of the upgrade to Level 3 control to the 2017 timeframe.

The impact from this provision would be to temporarily defer a very small quantity of the anticipated emission reductions from the TRU regulation – 0.012 tons PM per day statewide in 2010 – steadily decreasing to less than 0.004 tons PM per day by 2017 and to zero from 2018 on. This assumes that all owners using the retrofit option would

comply using a Level 2 filter. The near-term emissions impact would be less if owners are able to obtain and install the limited number of available Level 3 filters.

C. Link Compliance Schedule for Flexibility Engines to Their Emissions Tier

Issue: When staff evaluated the reductions in emissions and heath risk associated with the original TRU regulation, we assumed that TRU engines manufactured in a specific year would meet the emission standards applicable for that year. However, federal and State regulations for new TRU engines allow manufacturers to certify a portion of new TRU engines to a less effective emission standard. This provision for "flexibility engines" is intended to provide equipment manufacturers with more time to design, engineer, and produce equipment for each successive phase of cleaner engines. As a result, a new TRU for sale could contain a new engine with older, less effective control technology based on emission standards for prior model years. Based on data provided by TRU original equipment manufacturers, there are significantly more flexibility engines being used in California than originally anticipated. This diminishes the emission reductions being achieved with the regulation.

Proposal: The proposed TRU amendments would specify that for future purchases of TRUs with flexibility engines, the emissions tier or effective model year would be used to determine the compliance schedule to upgrade that engine. However, many TRU owners were unaware that purchasing a TRU equipped with a flexibility engine would trigger an earlier requirement to upgrade compared to a TRU engine with the latest emission controls. For TRUs with flexibility engines that were purchased prior to the effective date of the TRU amendments, the compliance schedule would be based on the year the engine was manufactured. While this temporarily defers a very small quantity of the anticipated emission reductions expected in 2010 – 0.025 tons PM per day – it provides the full seven-year operational life to these TRUs before upgrades would be required.

D. Expand Reporting by TRU Manufacturers

Issue: To implement the proposed amendment to address flexibility engines, staff will need additional data from the TRU manufacturers. In addition, staff is working on enhancements to the TRU on-line registration system – ARBER - to make data entry by TRU owners easier and to reduce data entry errors. Staff is also working to improve estimates of TRU populations and statewide emissions.

Proposal: To help accomplish these goals, ARB staff is proposing to require the TRU manufacturers to periodically report data on each TRU and TRU engine for the coming production year as well as production information for previous years.

E. Impacts of Proposed 2010 Amendments to TRU Regulation

Emission Impacts. Even with no changes to the existing TRU regulation, expanded use of higher emitting flexibility engines will slightly increase PM and NOx emissions

compared to the regulatory estimates in the 2003 Staff Report. While this does not mean a net increase in emissions; it does mean that all of the expected emission reductions will not be realized. With the proposed change for flexibility engines, this loss of emission reductions will end by 2018. The proposal to allow owners of model year 2003 and 2004 (<25 hp) TRUs to use a Level 2 filter as an interim compliance strategy would mean 50 percent PM control instead of 85 percent control on a subset of engines until 2017 or 2018. The combined, maximum impact of the proposed amendments would be approximately 0.04 tons per day of diesel PM reductions not realized statewide in 2010, decreasing to zero in 2018. The impact on NOx emissions is expected to range from a high of 0.10 tons per day of unrealized reductions in 2010, decreasing to nearly zero by 2020.

Compliance Cost Impacts. There will be cost savings due to allowing use of lower cost Level 2 filters for model year 2003 and 2004 (<25 hp) TRUs in the near-term. The total savings would be about $2.1 million (annualized over the seven-year operational life and presented in 2010 dollars). However, since the engines with Level 2 retrofits still operating in 2017 and 2018 would need to upgrade again to Level 3 PM control, the deferred compliance costs would be about $1.79 million in 2010 dollars. The net savings for TRU owners would be about $310,000 in 2010 dollars. The proposed amendments do not affect the cost of repowering a unit with a cleaner engine to maintain compliance.

There are no end-user compliance costs related to the amendment addressing the past use of flexibility engines. Together, the TRU manufacturers would incur total one-time costs of about $19,000 for flexibility engine reporting, total one-time costs of $25,000 for the initial prior production reports, and total annual costs of $8,000 for 18 years of periodic update reports. The total cost to all of the TRU manufacturers combined adds to nearly $150,000 over the 18 years of implementation. Staff anticipates that the manufacturers can significantly reduce the cost of preparing and submitting these reports through automation and electronic reporting.

With a net savings for TRU owners of $310,000 and a net cost to TRU manufacturers of $150,000, the overall cost impact of the proposed amendments is a savings of $160,000 in 2010 dollars.

Public Health Impacts. Staff applied the estimated emissions impacts to dispersion models to estimate the change in public exposure to PM. Staff then applied that exposure to risk models and found that the change in the public health risk to be negligible. Under the proposed amendments, a small increment of diesel PM emission reductions would not be realized for seven years, ranging from 0.001 to 0.04 tons per day statewide, compared to the original TRU regulation.

Using the State's cancer risk modeling protocols and assuming constant exposure to the maximum emissions for a 70-year life, the increase in the maximum individual cancer risk near a large distribution center would be less one in a million.

Environmental Justice. The proposed 2010 amendments to the TRU regulation are consistent with ARB environmental justice policies. They restore the emission reduction benefits that would otherwise be lost to the future use of flexibility engines, while deferring a small portion of the expected reductions to accommodate technology availability. The proposed amendments have a negligible net effect on emissions and public health risks in communities near distribution centers, rail yards, intermodal facilities or ports.

F. Public Outreach and Comments

In developing the proposed 2010 amendments to the TRU regulation, ARB staff conducted three public workshops and worked closely with stakeholders, including TRU owners and fleet operators, trade associations, trade journal reporters, TRU original equipment manufacturers, TRU dealers and service centers, truck and trailer dealers, brokers and leasing companies, diesel particulate matter emissions control system manufacturers, environmental groups, engine rebuilders, and other interested parties.

Stakeholders provided informal comments during the workshops and prior to release of the 45-day public notice. TRU owners and trade associations have expressed support for the amendments related to changing the requirements for model year 2003 and 2004 (<25 hp) engines to Level 2 PM control. Similarly, the TRU manufacturers, dealers, and owners are supportive of the amendment that allows existing flexibility engines to use the manufacture date as the model year of the engine. The TRU manufacturers are generally willing to cooperate with the periodic recordkeeping requirements; however, they are concerned about the security of confidential production information. Current California law provides the necessary protection for TRU manufacturers' data by allowing them to declare the data as confidential or trade secret. ARB staff has worked through this concern with manufacturers in other competitive industries and developed effective procedures to protect such data.

G. Staff Recommendation for Board Action

ARB staff recommends the Board approve the proposed 2010 amendments to the TRU regulation as presented in Appendix A of this Staff Report.

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I. Introduction

A. Overview

This Staff Report: Initial Statement of Reasons for Proposed Rulemaking (Staff Report) provides the basis for the California Air Resources Board (ARB or Board) staff's proposal to amend the regulations affecting transport refrigeration units (TRU)[2]. The primary purpose of the proposed TRU ATCM 2010 amendments is to change the in-use performance standard for model year (MY) 2003 TRU engines from the Ultra-Low-Emission TRU (ULETRU) in-use standard to either ULETRU or the less stringent Low-Emission TRU (LETRU) in-use standard. This change is needed because the control technology that is needed for the retrofit compliance option to meet ULETRU has limited availability while the technology for meeting LETRU is readily available.

Requirements for "flexibility" engines used in TRUs by original equipment manufacturers under the Transitional Program for Equipment Manufacturers are also clarified. In addition, new reporting requirements for TRU original equipment manufacturers are proposed. The proposed TRU ATCM 2010 amendments are provided in Appendix A of this Staff Report.

This Staff Report discusses California's estimated population of affected TRU engines, the emissions impacts, and the health risk impacts associated with the proposed TRU ATCM 2010 amendments. Potential environmental, health, and economic impacts of the proposed TRU ATCM 2010 amendments are discussed, as well as the alternatives that were considered.

The basis of the original TRU ATCM and background information can be found in the *Staff Report: Initial Statement of Reasons for Proposed Rulemaking – Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate*, October 2003 (ARB,2003). For the remainder of this report, the original 2003 staff report will be referred to as the 2003 Staff Report.

B. Need for Regulation

ARB's mission is to protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants, while recognizing and considering the effects on the economy of the State. ARB's vision is that all individuals in California, especially children and the elderly, can live, work, and play in a healthful environment – free from potential harmful exposure to air pollution. To help achieve this, ARB has adopted regulations to control emissions from many different sources, including diesel-fueled engines. Diesel-fueled engine exhaust is a significant health concern

[2]Title 13, California Code of Regulations (CCR) section 2477 is known as the Transport Refrigeration Unit Airborne Toxic Control Measure (TRU ATCM) and establishes in-use performance standards, recordkeeping, and facility reporting requirements for TRUs.

because it is a source of unhealthful air pollutants including particulate matter, gaseous and particulate-phase toxic air contaminants (TAC), nitrogen oxides (NO_x), carbon monoxide, and hydrocarbons.

In 1998, the Board identified diesel PM as a TAC with no specified threshold exposure level below which adverse health impacts would be expected, pursuant to Health and Safety Code (HSC) sections 39650 through 39675. A needs assessment for diesel PM was conducted between 1998 and 2000 pursuant to HSC sections 39658, 39665, and 39666. This resulted in ARB staff developing, and the Board approving, the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (Diesel RRP) in 2000 (ARB, 2000). The Diesel RRP presented information on the available options for reducing diesel PM and recommended regulations to achieve these reductions. The Diesel RRP's scope addressed all categories of mobile and stationary diesel engines and included control measures for off-road diesel PM sources, such as those covered by the TRU ATCM. The ultimate goal of the Diesel RRP is to reduce, by 2020, California's diesel PM emissions and associated potential cancer risks by 85 percent from the 2000 levels.

The federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (U.S. EPA) to establish National Ambient Air Quality Standards (standards) for pollutants considered harmful to public health, including fine particulate matter (PM2.5) and ozone. The South Coast and San Joaquin Valley Air Basins are the two areas in the State that exceed the annual PM2.5 standards. These air basins are required by federal law to develop State Implementation Plans (SIP) describing how they will attain the standards by 2015. U.S. EPA further requires that all necessary emission reductions be achieved one calendar year sooner – by 2014 – in recognition of the annual average form of the standard. Diesel PM emission reductions are needed because diesel PM contributes to ambient concentrations of PM2.5.

C. Regulatory Authority

Several sections of the California Health and Safety Code (HSC) provide ARB with authority to adopt the TRU ATCM and these TRU ATCM 2010 amendments. HSC sections 39600 (General Powers) and 39601 (Standards, Definitions, Rules, and Measures) confer to ARB, the general authority and obligation to adopt rules and measures necessary to execute the Board's powers and duties imposed by State law. HSC sections 43013(b) and 43018 provide broad authority for adopting measures to reduce TACs and other air pollutant emissions from vehicular and other mobile sources. HSC section 39618 classifies refrigerated trailers as off-road mobile sources under ARB jurisdiction.

More specifically, California's Air Toxics Program, established under California law by AB 1807 (Stats. 1983, Ch. 1047) and set forth in Health and Safety Code sections 39650 through 39675, mandates the identification and control of air toxics in California. The identification phase of the Air Toxics Program requires ARB, with participation of other state agencies, such as the Office of Environmental Health Hazard

Assessment (OEHHA), to evaluate the health impacts of, and exposure to, substances and to identify those substances that pose the greatest health threat as TACs. ARB's evaluation is made available to the public and is formally reviewed by the Scientific Review Panel (SRP) established under Health and Safety Code section 39670. Following ARB's evaluation and SRP's review, the Board may formally identify a TAC at a public hearing. Following the identification of a substance as a TAC, Health and Safety Code sections 39658, 39665, 39666, and 39667 requires ARB, with the participation of the air pollution control and air quality management districts, and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance.

As discussed above, the Board identified diesel PM as a TAC and in October 2000, ARB published a "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles." In the Diesel Risk Reduction Plan, ARB identified TRU emissions associated with refrigerated warehouse distribution centers as creating potential cancer risks and included off-road engines in the plan to reduce diesel PM emissions.

On February 26, 2004, the Board approved for adoption the TRU ATCM, establishing in-use performance standards for TRUs and TRU gen sets that would be phased in commencing on December 31, 2008. The Office of Administrative Law (OAL) approved the TRU ATCM, which was codified at title 13, CCR, section 2477 on November 10, 2004, and the regulation became effective 30 days later upon being certified by the California Secretary of State.

Staff requested U.S. EPA grant authorization to adopt and enforce the TRU ATCM pursuant to Clean Air Act (CAA) section 209(e)(2). U.S. EPA granted California authorization to enforce the TRU ATCM on January 16, 2009[3] (U.S. EPA, 2009).

ARB delayed the enforcement of the TRU ATCM's in-use performance standards until January 2010, because U.S. EPA's authorization was granted after the first compliance date, creating uncertainty for the regulated community.

[3] 74 Fed. Reg, 3030 (January 16, 2009)

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II. Summary of Proposed TRU ATCM 2010 Amendments

Staff is proposing to amend the TRU ATCM to change the in-use performance standards for two model years and two horsepower categories. In addition, the in-use requirements for "flexibility" engines will be clarified. Also, new reporting requirements for TRU and TRU gen set original equipment manufacturers (TRU OEM) are being proposed.

A. Background Information on Emissions Standards for New Off-Road Engines

TRU and TRU gen set engines utilize off-road engines.[4] Off-road engine standards adopted by U.S. EPA [5] and ARB (CCR, 2010) require new off-road engines to become progressively cleaner. In developing the new engine standards, ARB staff worked closely with U.S. EPA to develop a harmonized federal and State program to more effectively control emissions from off-road equipment.

The new engine emission standards are divided into four increasingly stringent levels (tiers); the allowed emission level (standard) and effective dates vary with horsepower category. Until the mid-1990's, off-road diesel engines were not subject to any emission standards (commonly referred to as "Tier 0" or "uncontrolled engines"). Engines that are used in TRUs and nearly all of the TRU gen sets are less than 50 horsepower (hp). TableII-1 illustrates how these standards change over time for the horsepower categories for engines used in TRUs. The numerical standards vary by category, but the downward trend in emissions is the same for all horsepower categories.

Table II-1: ARB and U.S. EPA PM Emission Standards for New Non-Road/Off-Road Diesel Engines Used in TRUs

Off-road Standard Tier	Less than 11 hp		11 hp to less than 25 hp		25 hp to less than 50 hp	
	PM Standard[1]	Tier Effective Date[2]	PM Standard[1]	Tier Effective Date[2]	PM Standard[1]	Tier Effective Date[2]
Tier 0	N/A[3]		N/A		N/A	
Tier 1	0.75	2000-2004	0.60	2000-2004	0.60	1999-2003
Tier 2	0.60	2005-2007	0.60	2005-2007	0.45	2004-2007
Tier 4 interim	N/A[3]	N/A	N/A	N/A	0.22	2008-2012
Tier 4 final	0.30	2008+	0.30	2008+	0.02	2013+

1. Emission rates expressed in grams per brake horsepower-hour (g/bhp-hr)
2. Effective dates indicate when the tier standards are in effect and start on January 1 of the first year shown and extend to December 31 of the second year shown, except that "+" means "and subsequent years".
3. N/A means "Not Applicable"

[4] Off-road is the term used in California to identify an internal combustion engine that is neither used to propel a vehicle designed and intended for highway use or an engine used to power a stationary source. Off-road is used interchangeably with the term "nonroad," which is used in the federal Clean Air Act and regulations adopted by the U.S. Environmental Protection Agency (U.S. EPA)

[5] Title 40 Code of Federal Regulations, Parts 89 and 1039

The two lowest horsepower categories shown in Table II-1 were combined for the TRU ATCM's in-use standards because less than 25 hp engines are generally used in straight truck (bobtail) TRUs. Engines used in trailer TRUs and TRU gen sets are generally from the 25 hp to less than 50 horsepower category. Further discussion is provided below for these two horsepower categories on the history of the tiers.

Less than 25 hp category: As Table II-1 shows, Tier 1 standards became effective for less than 25 hp engines on January 1, 2000, continuing through December 31, 2004. Between January 1, 2005 and the end of 2007, Tier 2 was in effect for this horsepower category. There was no Tier 3 standard for this category. Tier 4 final (Tier 4f) became effective January 1, 2008 and subsequent years. There was no Interim Tier 4 (Tier 4i) standard for this category, like there is for the 25 hp to less than 50 hp category.

25 hp to less than 50 hp category: Table II-1 also shows that on January 1,1999, the Tier 1 standards became effective for 25 to less than 50 hp engines and continued through the end of 2003. Between January 1, 2004 and the end of 2007, Tier 2 standards were in effect. Again, there was no Tier 3 standard for this horsepower category. Tier 4 standards are divided into two stages: Tier 4i, which began the beginning of 2008 and is in effect through the end of 2012; and Tier 4f, which will become effective January 1, 2013, and will be effective in subsequent years. The Tier 4f standards will likely necessitate the use of advanced exhaust after-treatment technologies, and will result in diesel engines that will be over 94 percent cleaner (PM) than Tier 0 engines.

B. Background Information on Existing In-Use Requirements

As adopted in 2004, the TRU ATCM's in-use performance standards require that in-use TRU and TRU gen set engine PM emissions be reduced by the end of the seventh year after the engine model year (MY). There are two levels of in-use standard stringency: the Low-Emission TRU (LETRU) in-use standard, which reduces diesel PM by at least 50 percent, and the more stringent Ultra-Low-Emission TRU (ULETRU) in-use standard, which reduces diesel PM by at least 85 percent.

As originally adopted, LETRU applies to MY 2002 and older TRU and TRU gen set engines. Seven years after complying with LETRU, these MY 2002 and older engines are required to meet the ULETRU in-use standard. For example, a model year 2002 engine is required to meet the LETRU in-use standard by December 31, 2009, and then meet the ULETRU in-use standard by December 31, 2016. As originally adopted, MY 2003 and subsequent model year engines are required to skip LETRU and meet ULETRU by the end of the seventh year after the engine model year; for example MY 2003 engines must meet ULETRU by December 31, 2010. The TRU ATCM requires that all TRU and TRU gen set engines must eventually meet the ULETRU in-se standard.

As shown in Table II-2 below, compliance with the existing in-use standards can be achieved several ways. For less than 25 hp engines, LETRU can be achieved by using

an engine certified to meet 0.30 grams per brake horsepower-hour (g/bhp-hr) PM, or by retrofitting the engine with a Level 2 Verified Diesel Emissions Control Strategy (VDECS). VDECS that are typically used on TRUs are diesel particulate filters (DPF) that control particulate matter engine exhaust emissions. These DPFs must be verified by ARB to control the PM emissions to the level claimed by the manufacturer and must be shown to meet durability requirements.[6] For 25 hp or greater engines, LETRU can be achieved by using an engine certified to meet 0.22 g/bhp-hr PM, or by retrofitting the engine with a Level 2 VDECS, which reduces diesel PM by at least 50 percent.

ULETRU can be achieved by using an engine certified to meet 0.02 g/hp-hr PM, or by retrofitting the engine with a Level 3 VDECS, which reduces diesel PM by at least 85 percent. All TRU and TRU gen set engines must eventually meet ULETRU. As currently adopted, MY 2003 and subsequent model year TRU and TRU gen set engines skip LETRU and must meet ULETRU by the end of the seventh year after the engine model year.

Table II-2: Existing TRU and TRU Gen Set In-Use Performance Standards

Horsepower Category	Engine Emissions Certification for PM	Retrofit Level of VDECS
Low-Emission TRU In-Use Standard		
<25	0.30 g/hp-hr	Level 2 or better (>50 percent PM reduction)
>25	0.22 g/hp-hr	Level 2 or better(>50 percent PM reduction)
Ultra-Low-Emission TRU In-Use Standard		
<25	N/A[1]	Level 3 (>85 percent PM reduction)
>25	0.02 g/hp-hr	Level 3 (>85 percent PM reduction)

1. N/A means "Not Applicable", another compliance option must be chosen.

Another compliance option is to use an Alternative Technology, such as electric standby or hybrid electric TRUs, or hybrid cryogenic temperature control systems. To qualify as an Alternative Technology, these technologies must be used in a way that eliminates the diesel engine operations at facilities where TRUs operate. For example, the TRU engines can run on the road, but not at distribution centers, where they must run on electricity or use cryogenic cooling. Under the TRU ATCM, if diesel PM emissions are eliminated to qualify as an Alternative Technology, the technology meets the ULETRU standard and would also be a compliance option to meet the LETRU standard, since ULETRU is more stringent than LETRU.

Many owners have elected to maintain their TRUs and TRU gen sets in compliance by repowering these units with new replacement engines or rebuilt replacement engines that meet a more stringent emissions standard than the engines being replaced. At this time, although an owner choosing to repower a TRU with a new Tier 4i engine would meet the LETRU standard, it could not be used to comply with the ULETRU standard.

[6] Title 13. California Code of Regulations (CCR), section 2700 through 2710.

However, repowering with a newer model year Tier 4i or Tier 2 engine would have the effect of keeping a unit in compliance by resetting the in-use compliance requirements and dates, which are based on the engine model-year designation. For example, if a MY 2002 35 hp engine is repowered with a new MY 2009 Tier 4i replacement engine, it would be in compliance until the end of 2016, when it must meet ULETRU.

New replacement engines may be manufactured to meet current or prior-tier new engine emissions standards. A new replacement engine that meets the tier of the emissions standard that is in effect when it was manufactured would use the engine model year to determine compliance requirements and dates. The engine model year is indicated on the engine's emissions label when it is manufactured to meet the emissions standards that are currently in effect at the time of manufacture.

A new replacement engine that is manufactured to meet a prior-tier standard that is no longer in effect at the time of manufacture would use the effective model year for determining compliance requirements. The effective model year is the last year that the prior-tier standard was in effect. For example, a 35 hp new replacement engine that meets Tier 2, but was installed in 2009, when Tier 4i was in effect, would have an effective model year of 2007 (the last year that Tier 2 was in effect), and would be required to meet ULETRU by December 31, 2014, seven years after the effective model year. More discussion and details related to effective model year will be presented later in this staff report.

A rebuilt replacement engine that meets a prior tier new engine emissions standard also resets the in-use compliance requirements and compliance dates, which would be based on the rebuilt engine's effective model year. Similar to the case of the new replacement engine, a rebuilt replacement engine that meets a current new engine standard would use an effective model year, which would be the same as the rebuild year; and if it meets a prior-tier standard, the effective model year would be the last year that the prior-tier standard was in effect.

C. Proposed Amendment for MY 2003 (25 hp and greater) - Change In-Use Standard from ULETRU to LETRU

Staff is proposing that the in-use standards for MY 2003 TRU engines in the 25 hp and greater horsepower category be changed to allow owners to comply with the in-use standards by meeting either the ULETRU or LETRU standards. Under the current regulation, the compliance options for MY 2003 TRU engines are currently limited. New engines that meet ULETRU are currently not in production and Level 3 VDECS (85 percent PM control) are not readily available in the marketplace in sufficient numbers to retrofit the MY 2003 engines that need to comply by the end of 2010. The amendments would allow owners to comply in the near-term by installing either a Level 2 (50 percent diesel PM control) VDECS or a Level 3 VDECS (85 percent diesel PM control). The compliance date for meeting either the ULETRU or LETRU standard would still be December 31, 2010.

Level 2 VDECS, for meeting the LETRU standards, are readily available on the market and have been installed in thousands of MY 2002 and older TRUs. The existing dealer and installation network is well established and will be able to meet product demand. An additional advantage is that Level 2 VDECS cost about $1,300 to $2,000 less than a Level 3 VDECS, so near-term compliance costs would be reduced during the current down-economy. Further, extending existing verifications to MY 2003 engines is straightforward since the MY 2003 engines in the 25 to <50 hp category also meet Tier 1, like the MY 1999 to MY 2002 engines for which Level 2 verifications have been approved. As Table II-1 shows, 2003 was the last year that Tier 1 was in effect for 25 hp to less than 50 hp engines. Also, model year 2004 engines were the first year that new engines were required to meet the cleaner Tier 2 standards, which makes these engines a better match for Level 3 VDECS that must achieve 85 percent PM reductions.

The proposed amendments would also require that all MY 2003 engines remaining in service meet the ULETRU standard by December 31, 2017, seven years after the initial compliance date for those owners who chose to comply by meeting the LETRU standard in 2010. As stated above, all TRU and TRU gen set engines must eventually meet the ULETRU in-use standard. So, if the owner chose to comply with ULETRU in 2010, there would be no subsequent compliance date for meeting a more stringent in-use standard.

Staff published TRU Advisory 10-19 in July 2010 to inform MY 2003 TRU and TRU gen set owners of its intent to propose this amendment to the Board. Advisory 10-19 also informed affected owners that the compliance date would continue to be December 31, 2010.

Table II-3 shows this proposed amendment using the underline convention to show added requirements. In the row for MY 2003, the letter "U" stands for ULETRU. The letter "L" stands for LETRU, and is shown underlined, indicating this in-use standard would be an option under the amendments. Again, if "L" is chosen in 2010, "U" is still required in 2017.

Table II-3: ≥25 HP TRU and TRU Gen Set Engines
Proposed In-Use Compliance Dates for In-Use Standards

Engine MY	In-Use Compliance Year[7]													
	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older		L	L	L	L	L	L	L	U	U	U	U	U	U
'02			L	L	L	L	L	L	L	U	U	U	U	U
'03				U or L	U or L	U or L	U or L	U or L	U or L	U or L	U	U	U	U
'04					U	U	U	U	U	U	U	U	U	U
'05						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10'											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

D. Proposed Amendment for MY 2003 and 2004 (less than 25 hp) - Change In-Use Standard from ULETRU to LETRU

Staff is proposing similar amendments to those proposed above for both MY 2003 and 2004 engines in the less than 25 hp category. The amendments would allow owners to comply by either meeting the ULETRU or LETRU in-use standards. The compliance dates for meeting one of the standards would remain December 31, 2010, for MY 2003 engines, and December 31, 2011, for MY 2004 engines. MY 2004 engines in the less than 25 hp category are included in the proposed amendment because Tier 1 was effective through 2004, so Level 2 VDECS would be a good match with these engines (explained further below). This is in contrast with the 25 hp and greater category because Tier 1 ended in 2003 for the 25 to 50 hp new engine standard.

The amendments are necessary because for MYs 2003 and 2004, compliance options are relatively limited. Repowering with an engine that meets an in-use emissions standard is not an option for meeting the ULETRU standard. This is because the new off-road engine standards do not require these engines to have PM exhaust after-treatment emissions controls that would reduce emissions at least 85 percent from 2000 levels, which is what is needed to meet the ULETRU in-use standard (note Table II-2 indicates "N/A", or not applicable for this horsepower category which means that another compliance option must be chosen).

[7] Compliance date is December 31st of the compliance year shown. "MY" means model year. Black shaded areas are years with no requirements since in-use compliance year precedes model year . Dark shaded areas without letter codes have no in-use standard requirements, pending in-use compliance date. "L" means must meet LETRU in-use performance standards. "U" means must meet ULETRU in-use performance standards.

Furthermore, while a Level 3 VDECS has been verified for the < 25 hp category, it cannot be used with TRUs because it cannot fit inside the TRU housing. Also, unless the TRU was equipped with electric standby when new, electric standby would not be a viable Alternative Technology option because retrofitting is very expensive.

In contrast, Level 2 VDECS meeting LETRU standards are readily available on the market for most truck TRUs and have been installed in hundreds of MY 2002 and older TRUs. Dealer and installation networks are established and these products have been demonstrated. In addition, since MY 2003 and 2004 engines are the last two years of Tier 1 in this hp category, they are the same engines as the MY 2000 through 2002 engines (all meet Tier 1), so Level 2 VDECS verifications are straightforward. As noted above, Table II-1 shows that 2004 was the last year that Tier 1 was in effect for less than 25 hp engines and model year 2005 engines were the first year that new engines were required to meet the cleaner Tier 2 standards, making these engines a better match for Level 3 VDECS that must achieve 85 percent PM reductions.

This proposed amendment would still require the ULETRU standard to be met by December 31, 2017, for MY 2003 and by December 31, 2018, for MY 2004 engines, seven years after the initial compliance date for the owners who chose to comply with LETRU in 2010 and 2011. If the owner chose to comply with ULETRU in 2010, there would be no subsequent compliance date for meeting a more stringent in-use standard.

As discussed above, staff published TRU Advisory 10-19 in July 2010, to inform MY 2003 and 2004 TRU and TRU gen set owners of this proposed amendment and informed affected owners that they should make plans to choose a compliance option and place orders in time to comply by December 31, 2010.

Table II-4 shows this proposed amendment in the rows for MY 2003 and 2004, using the same lettering conventions as in Table II-2, above. As an example, the row for MY 2004 engines shows that compliance with either ULETRU of LETRU is required by December 31, 2011, and if LETRU is chosen in 2011, then ULETRU would still be required by December 31, 2018.

Table II-4: <25 HP TRU and TRU Gen Set Engines
Proposed In-Use Compliance Dates and In-Use Standards

Engine MY	In-Use Compliance Year[8]													
	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older		L	L	L	L	L	L	L	U	U	U	U	U	U
'02			L	L	L	L	L	L	L	U	U	U	U	U
'03				U or L	U or L	U or L	U or L	U or L	U or L	U or L	U	U	U	U
'04					U or L	U or L	U or L	U or L	U or L	U or L	U or L	U	U	U
'05						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

E. Other Proposed TRU ATCM 2010 Amendments

Several other amendments that are considered to be essential in the short term are also being proposed for the TRU ATCM 2010 amendments.

1. Requirements for "Flexibility" Engines

Background on Flexibility Engines

When U.S. EPA and ARB adopted new engine emission standards for off-road diesel engines, they included "flexibility" provisions.[9] The flexibility provisions are also called the Transitional Program for Equipment Manufacturers (TPEM or flexibility engine) and allow equipment manufacturers to produce limited numbers of equipment with engines that meet less stringent emission standards for up to seven years after a new tier of emissions standards has gone into effect. In doing so, the number of engines used cannot exceed 80 percent of the total engines produced in a production year, expressed as cumulative yearly percentage increments for each production year that flexibility engines are produced. The intent of TPEM is to give more time for equipment manufacturers to change equipment designs to be compatible with new engines

[8] Compliance date is December 31st of the compliance year shown. "MY" means model year. Black shaded areas are years with no requirements since in-use compliance year precedes model year . Dark shaded areas without letter codes have no requirements, pending in-use compliance date. "L" means must meet LETRU in-use performance standards. "U" means must meet ULETRU in-use performance standards.

[9] Title 40 Code of Federal Regulations, section 89.102 (40 CFR 89.102), 40 CFR 1039.625, 40 CFR 1068.265, and title 13, CCR section 2423(d))(CFR, 2010a; CFR, 2010b; CFR, 2010c; CCR, 2010)

meeting the new standards, since dimensions, engine mounts, and controls may be affected.

For example, under the federal and state flexibility provisions, when Tier 1 off-road new engine standards went into effect in 2000, TRU OEMs were allowed to install pre-Tier 1 "flexibility" engines (i.e. non-certified engines) for up to seven years. Later, when new engines were required to meet the Tier 2 standards, TRU OEMs were allowed to install a limited number of flexibility engines meeting pre-Tier 1 or Tier 1 emission standards. Similar allowances are made each time the tier standard changes.

Table II-5 displays the tier standards that apply to TRU engines, the PM emissions limits and years that each tier standard was in effect, along with the last year that flexibility engines were allowed to be used.

Table II-5: Flexibility Engine Allowances

Emissions Standard in Effect	PM Emissions Limit (g/hp-hr)	Tier Standard Effective Years	Last Year of Seven-Year Flexibility Engine Usage Period
Tier 1 (<11 hp)	0.75	2000-2004	2012
Tier 1 (11-<25 hp)	0.60	2000-2004	2012
Tier 2 (<25 hp)	0.60	2005-2007	2015
Tier 4f (<25 hp)	0.30	2008 and Subsequent	2016
Tier 1 (25 to ≤50 hp)	0.60	1999-2003	2011
Tier 2 (25 to <50 hp)	0.45	2004-2007	2015
Tier 4i (25 to <50 hp)	0.22	2008-2012	2020
Tier 4f (25 to <50 hp)	0.02	2013 and Subsequent	2021

As described above, flexibility engines are manufactured to meet a less stringent, prior-tier standard than the standard currently in effect for new engine certification. An example of what actually happened follows: looking at the 25 to less than 50 hp category in row 6, after Tier 2 went into effect in 2004, TRU manufacturers installed Tier 1 engines in TRUs during 2004 and 2005.

Until now, the practice of manufacturers in identifying the model year of flexibility engines has varied. Many engine emissions labels have identified the model year as the last year that the flexibility engine's tier was in effect even though the engine may have been manufactured several years after the next tier was in effect. ARB's term for this model-year designation is the "effective model year" of the flexibility engine. Other engines have emission labels identifying the model year of the flexibility engine as the engine's manufacture date. This variance of identification has resulted in confusion for ARB and stakeholders.

Table II-6 lists the new engine tier standards that apply to TRU and TRU gen set engines, the years that each tier is effective, and the corresponding effective model years that result for these tiers when ARB's term is applied to flexibility engines.

Table II-6: Effective Model Year

Prior-Tier Engine Emissions Standard	Tier Standard Effective Years	Effective Model Year[1]
Tier 1, under 25 hp (truck)	2000-2004	2004
Tier 2, under 25 hp (truck)	2005-2007	2007
Tier 1, 25-50 hp (trailer)	1999-2003	2003
Tier 2, 25-50 hp (trailer)	2004-2007	2007
Tier 4i, 25-50 hp (trailer)	2008-2012	2012[2]

1. Engines that meet a prior tier (less stringent than currently in effect) have an effective model year that is the last year that the prior tier was in effect.
2. Effective model year applies for this tier only after Tier 4f becomes effective in 2013 for 25 to less than 50 hp engines.

Use of the effective model year of the flexibility engine effectively shortens the operational life[10] of the TRU engine. Under the TRU ATCM, the operational life of an engine is typically seven years – that is, an engine is not required to meet a more stringent in-use performance standard until seven years after the denoted model year of the engine. By using the effective model year (which may be one to two years before the engine's manufacture date) the operational life of the engine may be shortened several years.

To address this shortened operational life, a TRU manufacturer and many TRU fleets have requested that Tier 1 flexibility engines that were manufactured and installed in trailer TRUs during Tier 2 (e.g. during 2004, 2005, or 2006) be allowed to use the actual engine manufacture year as the model year, even though many engine labels on these engines show the effective model year as the last year of the prior tier (MY 2003 for Tier 1). Two TRU manufacturers have provided information on their use of flexibility engines. Over 10,000 flexibility engines have been directed to the California market and over 37,000 have been directed to the U.S. market.

Staff has evaluated the flexibility engine data provided by TRU manufacturers and found that these flexibility engines' actual certification values for PM are below the Tier 2 standard. However, in the case of oxides of nitrogen plus non-methane hydrocarbon (NO_X+NMHC) emissions, the certification values were somewhat above the Tier 2 standard.

Staff has further found that many TRU owners unknowingly purchased TRUs with flexibility engines in the past and were unaware that flexibility engines may have a shortened operational life under the TRU ATCM in comparison to engines that denoted a model year based upon year of manufacture.

Proposed Amendment

Staff has determined that it would be appropriate to amend the regulation to allow owners of flexibility engines purchased prior to the effective date of the amendments to

[10] Operational life is the life of the engine or unit as allowed under the regulation. Operational life should be distinguished from useful life, as defined under new engine standards and used for survivability (engine mortality over time) in engine population inventory reports.

use the engine manufacture year to determine compliance requirements and deadlines under the TRU ATCM. This would ensure that TRU owners obtain the benefits of a full seven-year operational life. Staff is also proposing that flexibility engines installed in TRUs after the effective date of the amendments would be required to use the "effective model year" of the flexibility engine to determine future ULETRU compliance dates. As stated, the effective model year of the flexibility engine would be the last year that the flexibility engine's tier standard was in effect for new engine compliance. Compliance with the in-use standards would then be required by the end of the seventh year after the effective model year of the flexibility engine.

Staff is further proposing that TRU OEMs be required to report to ARB information on the use of flexibility engines, including the serial numbers of the TRU units with flexibility engines. ARB would then use the unit serial number to identify the information in the ARB Equipment Registration (ARBER) system and would change the model year of the affected engines to be the manufacture year. The upcoming ULETRU compliance date would also be changed in ARBER, based on the engine manufacture year instead of the effective model year. Since flexibility engine labels often show the effective model year, a notation would also be added to each affected ARBER record to explain the reason for the discrepancy to enforcement staff that may observe this discrepancy in the field.

In order to retain the emission reduction benefits of the regulation in future years, limiting the operational life of flexibility engines in 2011 and beyond is critical. Beginning in 2013 the new off-road engine standards in the 25 to <50 hp category will transition from Tier 4i to Tier 4f. This action will result in PM reductions of about 90 percent (0.22 g/hp-hr goes to 0.02 g/hp-hr) and NOx reductions of almost 40 percent (5.6 g/hp-hr goes to 3.5 g/hp-hr). Limiting the operational life of flexibility engines in the future will ensure that these PM and NOx reductions will be achieved as expeditiously as intended. Staff believes that using the effective model year for future flexibility engine use would discourage their use since operational life is affected and would result in dirtier earlier tier flexibility engines being phased out sooner.

By way of example, if a flexibility engine meeting Tier 4i is installed in a TRU manufactured in 2013, when Tier 4f is in effect, the flexibility engine's effective model year would be 2012, so the flexibility engine would be required to meet the ULETRU in-use standard seven years later, by the end of 2019. Had a MY 2013 engine meeting Tier 4f been installed, compliance would be required by the end of 2020. So, the use of a flexibility engine in 2013 would result in the loss of a year of operational life under the proposed amendments. Continued use of flexibility engines meeting Tier 4i (effective MY 2012) in 2014 would result in the loss of an additional year of operational life because the ULETRU compliance date would still be 2019.

Staff is further proposing that if a TRU OEM installs flexibility engines after January 1, 2011, they would be required to disclose the following information to the end user before sale is completed: a) that a flexibility engine is installed; b) the effective model year of the engine; and c) the resulting in-use compliance date, seven years after the effective model year.

2. Reporting Requirements for TRU and TRU Gen Set OEMs

The TRU ATCM includes requirements for California-based TRUs and TRU gen sets to be registered with ARB. Registration is voluntary for units that are based outside of California. Complying units are issued an ARB Identification Number (IDN) that is affixed to the unit housing. The purpose of registration is to provide a way to track compliance and make enforcement inspections a more efficient, less time-consuming process for owner/operators through the use of prescreened registration information. Owners may register online, using ARB's Equipment Registration (ARBER) system, or manually using paper forms. Online application is encouraged to reduce errors and allow ARBER to instantly issue IDNs.

Staff is working on enhancements to the ARBER system to make data entry by TRU owners easier and to further reduce data entry errors. Staff is also working to improve estimates of TRU populations and statewide emissions. To accomplish these goals, ARB staff is proposing to require the TRU and TRU gen set OEMs to periodically report unit and engine data for the coming production year as well as production information for previous years. Information that is needed includes the TRU models that will be in production, along with the engine information for each model. Specifically, OEMs would be required to report the manufacturer of the engine installed in the TRU; the engine model and family; the rated horsepower and speed, displacement, exhaust emissions control system, and tier standard of the engine; and ARB's Executive Order certifying the engine for use in off-road equipment.

In addition, staff has been working to improve the quality of the data in ARBER and simplify the registration process. Also, improvements in estimates of TRU populations and statewide emissions is needed. Currently, there is no existing, comprehensive, reliable database that provides TRU and TRU gen set production numbers that can be used for this purpose. To facilitate this work, the TRU ATCM 2010 amendments would require the TRU and TRU gen set OEMs to report to ARB on production information for five previous calendar years, or alternatively, unit and engine information for specific unit and engine serial numbers. Periodic reporting would also be required going forward, unit and engine information needed to improve emissions estimates.

F. Alternatives Considered

Staff considered alternatives to each of the proposed TRU ATCM amendments.

Retain Existing Provisions

This alternative would retain both the ULETRU standard and the December 31, 2010, compliance date. This would effectively eliminate retrofit as a compliance option since the Level 3 VDECS retrofit has limited availability. Compliance options would effectively be limited to the more available choices: unit replacements, new and rebuilt engine repowers, and Alternative Technologies. Compliance costs would be greater than the Level 2 retrofit to meet LETRU, as demonstrated by the comparisons in Table II-7 (ARB, 2010).

Table II-7: Compliance Cost Comparisons for Trailer TRUs

Compliance Option	Compliance Cost per Unit
Retrofit with Level 2 VDECS to meet LETRU	$3,650 to $4,750
Retrofit with Level 3 VDECS to meet ULETRU	$5,000 to $6,000
New Engine Repower	$5,500 to $9,750
Rebuilt Engine Repower	$6,250
Unit Replacement	$19,000 to $25,000

Retrofitting trailer TRUs with electric standby (an Alternative Technology) is not economically attractive because it would cost more than replacing the engine and has never been attempted, to staff's knowledge.

Retaining the existing provisions would also negatively impact TRU owners that purchased units with flexibility engines. By not adjusting the regulation requirements to allow the use of the manufacture year for flexibility engines installed prior to 2011, TRU owners would loose one to two years of operational life. This would create hardship for TRU owners that were unaware that flexibility engines were used in the TRU units that they purchased. Finally, retaining the existing provisions would prevent staff from making improvements to ARBER and the TRU emissions inventory.

Delay In-Use Compliance Date for MY 2003 Engines by One Year

In lieu of changing of the in-use standard going from ULETRU to LETRU for MY 2003 engines in the 25 hp and greater power category, and for MY 2003 and 2004 engine in the less than 25 hp category, staff considered and rejected retaining the ULETRU in-use standard and delaying the in-use compliance date by one year. Staff's evaluation found that the short-term compliance costs for this alternative would be greater because a Level 3 VDECS (meeting ULETRU) costs $1,300 to $2,000 more than a Level 2 VDECS (meeting LETRU) for trailer TRUs. However, the overall statewide compliance cost for this alternative would be about $500,000 less (in 2010 dollars) than the proposed amendment after annualizing the costs and discounting to 2010 dollars. This is because the proposed amendment includes both the 2010 LETRU compliance costs and the 2017 ULETRU compliance costs while the alternative has only ULETRU compliance costs in 2011.

However, this alternative has a number of drawbacks. First, no diesel PM reductions would be realized for a year, which would negatively impact residents living near distribution centers due to exposure to elevated diesel PM emissions. Second, since 65 percent of compliance has been through engine repower with a cleaner engine, the NOx+NMHC reductions would also be delayed for one year. Third, the near-term economic relief for the down economy, a benefit of the proposed amendment, would be lost - specifically, the near-term savings realized by the Level 2 VDECS retrofit compliance ($1,300 to $2,000 per unit savings). Additionally, if a fleet owned MY 2003 and 2004 engines, the economic impact would be more severe in 2011, when both compliance dates came due.

An additional consideration is the impact that suspending the standard for a year would have on VDECS manufacturers, new replacement engine manufacturers, and rebuilt replacement engine manufacturers. Delaying the standard for a year would mean that manufacturing and installation operations would be suspended for a year. Then production, distribution, and installation would need to ramp up again in 2011 to twice the levels of a normal phase compliance year to meet the needs of MY 2003 and 2004 engine compliance.

Past delays in the compliance schedule have shown staff that they cause a significant level of uncertainty that is detrimental to timely compliance. Most owners stop evaluating compliance options, put off field testing of compliance technology, and postpone purchase decisions until the new compliance deadline approaches. The uncertainty also affects compliance technology manufacturers, who delay their product development, testing, and verification work. Staff believes that delays cause lower rates of compliance.

On the other hand, staff is concerned that since TRU Advisory 10-19 was issued, instructing owners of MY 2003 engines to comply by December 31, 2010, there would be negative consequences if this alternative is not rejected. First, staff knows that some owners have in good-faith, already invested in LETRU compliance technologies so they will be at a competitive disadvantage with those owners that may delay, if the alternative was accepted. Second, compliance technology manufacturers and dealers have already gone to considerable expense, having launched marketing promotions for the LETRU compliance options.

Given these potential adverse impacts, staff rejected this alternative.

Only Allow a One-Year Adjustment for "Flexibility" Engines

Staff also considered and rejected providing a maximum of one additional year of useful life for flexibility engines. Although this would have restored a measure of fairness to the owner who purchased a TRU with a flexibility engine, it would still leave an inequity for the end user who has an engine manufacture year of more than one year. Given the small impact on emissions for flexibility engines installed prior to 2011, providing TRU owners the full operational life is appropriate.

III. EMISSIONS INVENTORY AND HEALTH RISK

In this chapter, staff provides estimates of the impact of the proposed amendments on the TRU emissions inventory. The emissions inventory estimates for the proposed amendments utilize the same assumptions and data sources as the methodology used in the 2003 Staff Report (see Appendix D of the 2003 Staff Report). The specific emissions impacts for each of the proposed amendment are listed below and combined in Section E of this chapter. The emissions impacts represent emission reductions that were anticipated but will not be realized due to needed adjustment to the existing TRU ATCM.

A. MY 2003 and MY 2004 Engine Populations

As discussed in Chapter II, staff is proposing to amend the in-use standards from ULETRU or Level 3 VDECS to allow LETRU or Level 2 VDECS as well as ULETRU for MY 2003 engines in both the <25 hp and the 25 to <50 hp categories and for MY 2004 engines in the <25 hp category. Staff estimated the population of affected engines using the assumptions for sales of MY 2003 and MY 2004 TRUs and the survival rates from Appendix D of the 2003 Staff Report. A summary of the population of affected engines in calendar year (CY) 2010 by equipment type and hp category is provided in Table III-1 below.

Table III-1: Summary of Population of Affected MY 2003 and MY 2004 Engines (2010)

Equipment Type	Horsepower Category (hp)	Approximate Number of TRUs	Number of TRU Generator Sets
California-based truck van	Less than 15	840	N/A
California-based truck van	15- <25	300	N/A
California-based semi-trailer	25- <50	2,040	N/A
Out-of state semi-trailer	25- <50	670	N/A
Railcar	25- <50	150	N/A
California-based TRU gen set (shipping container)	25- <50	N/A	300
Total		4,000	300

N/A – Not Applicable
All values rounded.

B. Emissions from MY 2003 and MY 2004 Engines

The change in emissions from the affected MY 2003 and MY 2004 engines due to the proposed amendments is estimated by multiplying the TRU population, the annual

hours of engine operation, engine hp, load factor, and the change in emission factors between ULETRU and LETRU. PM emission factors were reduced 25 percent from those in the OFFROAD model to incorporate data that was provided by the engine manufacturers at the time of the earlier analysis. This factor was also used in the Addendum to Appendix D of the 2003 Staff Report. The average annual hours of engine operation, average engine power ratings, and load factors as listed in Appendix D of the 2003 Staff Report are shown in Table III-2.

Table III-2: Annual Hours of Operation, Average Engine Power, and Load Factors for TRUs by Equipment Type

Equipment Type	Horsepower Category (hp)	Annual Engine Operation (hours)	Average Engine Power (hp)	Load Factor
California-based truck van	Less than 15	1,038	10	0.64
California-based truck van	15-25	1,038	17	0.64
California-based semi-trailer	25-50	1,465	34	0.53
Out-of state semi-trailer	25-50	1,465	34	0.53
Railcar	25-50	1,465	34	0.53
California-based TRU gen set (shipping container)	25-50	1,100	31	0.45

Emission factors for Particulate Matter (PM) and Oxides of Nitrogen (NO_x), as estimated for ARB's OFFROAD model and listed in Appendix D of the 2003 Staff Report, are shown in Table III-3.

Table III-3: Off-road Emission Factors for TRUs by Equipment Type

Equipment Category	Horsepower Category (hp)	PM Emission Factors (g/hp-hr)	NOx Emission Factors (g/hp-hr)
California-based truck van	Less than 15	0.47	6.08
California-based truck van	15-25	0.38	5.79
California-based semi-trailer	25-50	0.60	5.55
Out-of state semi-trailer	25-50	0.60	5.55
Railcar	25-50	0.60	5.55
California-based TRU gen set (shipping container)	25-50	0.60	5.55

The current in-use standard of ULETRU requires a PM reduction of 85 percent. The proposed in-use standard of LETRU requires a PM reduction of 50 percent. Therefore,

a change from ULETRU to LETRU would result in 35 percent less PM control (41 percent less PM reduction) for the affected engine population than originally estimated.

The emission reductions that would be lost from the proposed amendment is estimated to be 0.041 tons/day (tpd) of diesel PM in 2010 and 0.013 tpd in 2017 if the entire affected population retrofitted with Level 2 VDECS. However, based on the Level 2 VDECS retrofits on 2002 engines, staff has estimated that approximately 30 percent of the population will retrofit (with approximately 65 percent repowering and 5 percent using alternative technology), decreasing the emission reductions lost to approximately 0.012 tpd in 2010. The change in PM emissions ends after 2018 as all the surviving affected MY 2003 and MY 2004 engines will be subject to ULETRU then. As NO_x emissions are not affected by the change to allow LETRU, there would be no change to the NO_x emissions impact projected in the 2003 Staff Report.

C. Population of Flexibility Engines

Staff has estimated the population of TRU flexibility engines from information provided by the TRU Original Equipment Manufacturers (OEM) in 2010. The population of TRU flexibility engines was not estimated in 2003. Appendix D of the 2003 Staff Report estimated populations using sales data of TRUs and therefore assumed that the sales year would also be the model year of the engine. To estimate the emissions from flexibility engines that were not accounted for in 2003, staff estimated the percentage of the overall population represented by flexibility engines. A summary of these populations is shown in Table III-4. As shown in the table, a large percentage of the flexibility engines were installed in the first year after a change in engine tier standards.

Table III-4: Flexibility Engine Population Share by MY and Horsepower Category[1]

Horsepower Category (hp)	Model Year	Percent of Nationwide Share
25- <50[2]	2004	56
	2005	18
	2006	0
Less than 25[3]	2004	0
	2005	50
	2006	5

1. Flexibility engine population in emissions estimate are all Tier 1 engines.
2. Tier 2 engine standard effective starting in 2004 for 25-< 50 hp.
3. Tier 2 engine standard effective starting in 2005 for < 25 hp.

D. Emissions from Flexibility Engines

The change in emissions due to the use of flexibility engines associated with the proposed amendments is due to the unknown prior use of flexibility engines instead of the more stringent, current tier engines. While the amendment offers an adjustment in compliance dates for prior flexibility engines, it also clarifies compliance dates for future flexibility engines which preserve the intended emissions reductions when more stringent tiers come into effect. This change is estimated by multiplying the TRU population using flexibility engines, the annual hours of operation, engine hp, load factor, and the change in emission factors between the year of manufacture as a flexibility engine and the effective MY (the last year that the prior tier met by flexibility engine was in effect). The annual hours of engine operation, average engine power, and average load factors using the methodology in Appendix D of the 2003 Staff Report are shown in Table III-5.

Table III-5: Annual Hours of Operation, Average Engine Power, and Average Load Factors for Flexibility Engines by Horsepower Category

Horsepower Category (hp)	Annual Hours of Operation (hours)	Average Engine Size (hp)	Average Load Factor
Less than 15	1,038	10	0.64
15- <25	1,038	17	0.64
25-< 50	1,465	34	0.53

Emission factors for diesel PM and NO_x, for flexibility engines are shown in Table II-6.

Table III-6: Off-road Emission Factors for Flexibility Engines by Horsepower Category

Horsepower Category (hp)	PM Emission Factors (g/hp-hr)				NOx Emission Factors (g/hp-hr)			
Year	2003	2004	2005	2006	2003	2004	2005	2006
Less than 15	0.47	-	0.38	0.38	6.08	-	4.37	4.37
15- <25	0.38	-	0.38	0.38	5.79	-	4.57	4.57
25- <50	0.60	0.43	0.38	-	5.55	5.10	4.95	-

The incremental change in diesel PM emissions due to the proposed amendment for flexibility engines is 0.025 tpd in 2010 and 0.010 tpd in 2012. After 2012, the incremental change becomes negligible as the surviving flexibility engines are required to meet ULETRU. The incremental change in NO_x emissions from the proposed

amendment for flexibility engines is 0.10 tpd in 2010 and is due to the higher emissions from the previous tier engines.

E. Total Combined Emissions Impacts from Proposed Amendment

Table III-7 presents staff's estimate of anticipated emission reduction that will not be achieved due to the proposed amendments. Overall emissions impact from both proposed amendment categories is estimated to be 0.04 tpd of diesel PM and 0.10 tpd of NO_x in 2010. For additional information, see Appendix D of the 2003 Staff Report.

Table III-7: Overall Emissions Impacts from Proposed TRU ATCM 2010 Amendments (2010)

	Affected MY 2003 and MY 2004 Engines	Flexibility Engines Adjustment	Total Overall Emissions
PM Emissions (tpd)	0.012	0.025	0.04
NOx Emissions (tpd)	0.0	0.10	0.10

All values rounded.

Table III-8 provides a summary of the overall incremental annual statewide diesel PM changes that will result from the TRU ATCM 2010 amendments in tons/year in 2010 through 2020. The summary is based on a 30 percent usage of Level 2 VDECS for compliance by the affected MY 2003 and MY 2004 engines. Emission reductions that were anticipated but will not be realized are highest in 2010 and are approximately 0.012 tpd of diesel PM for affected MY 2003 and MY 2004 engines dependent on compliance method and approximately 0.025 tpd of diesel PM for flexibility engine adjustments, for a total of 0.04 tpd. This emissions increase will primarily occur in years 2010 through 2012 with negligible increase after 2017 for affected MY 2003 and MY 2004 and after 2012 for the flexibility engine adjustments. Emission reductions that will not be realized for NO_x result only from the flexibility engine adjustments and are approximately 0.10 tpd in 2010.

Table III-8: Statewide Diesel PM Emission Reductions Attributable to the Existing TRU Regulation and Subset of Reductions to be Deferred Under the Proposed 2010 TRU Amendments

Year	Emission Reductions to be Achieved by Existing TRU Regulation (2003 Staff Report)		Emission Reductions to be Deferred Under the Proposed 2010 TRU Amendments					
			Affected MY 2003 and MY 2004 Engines		Flexibility Engine Adjustment		Total	
	PM (tpd)	NO_x (tpd)	PM (tpd)	NO_x (tpd)	PM (tpd)	NO_x (tpd)	PM (tpd)	NO_x (tpd)
2010	0.600	0.922	0.012	0	0.025	0.10	0.037	0.10
2011	0.695	0.935	0.012	0	0.024	0.10	0.036	0.10
2012	0.739	0.937	0.011	0	0.010	0.09	0.021	0.09
2013	0.765	0.941	0.010	0	0.003	0.09	0.013	0.09
2014	0.786	0.958	0.009	0	0.003	0.08	0.012	0.08
2015	0.811	0.990	0.007	0	0.003	0.07	0.010	0.07
2016	0.805	0.926	0.006	0	0.002	0.06	0.008	0.06
2017	0.664	0.862	0.004	0	0.002	0.05	0.006	0.05
2018	0.610	0.903	0.000	0	0.001	0.04	0.001	0.04
2019	0.559	0.950	0.000	0	0.001	0.02	0.001	0.02
2020	0.525	1.002	0.000	0	0.000	0.01	0.000	0.01

All values rounded.

F. Health Risk

The Board listed diesel PM as a toxic air contaminant in 1998 based on its potential to cause cancer, premature death, and other health effects. NO_x is a precursor to the formation of ozone and contributes to secondarily formed PM in the lower atmosphere. The Office of Environmental Health Hazard Assessment (OEHHA) has shown both chronic cancer and non-cancer health impacts due to exposure to diesel PM, but the cancer health risk impacts are generally higher than the non-cancer health impacts. For this analysis, only cancer risks were addressed for diesel TRUs. A summary of the risks reported in the 2003 Staff Report and impacts estimated as a result of the proposed amendments are provided below.

In the 2003 Staff Report, ARB staff estimated potential cancer risks from diesel TRU using activities at a distribution center where 35 horsepower diesel TRU engines operate. The potential excess cancer risk from diesel PM was estimated to be approximately 130 chances in a million up to one-half mile from a large facility operating 2,000 hours per week. These estimates were based on the year 2000 fleet average emission rate (0.7 grams PM per brake horsepower-hr (g/bhp-hr)). The 2010 estimated fleet average emission rate is 0.24 g PM/bhp-hr or about a factor of 3 lower. As a result of the significant change in the average emission rate of TRUs over the past 10 years, this same facility in 2010 (without the existing TRU regulation) would have an updated excess cancer risk of about 45 chances per million. The existing TRU regulation reduces excess cancer risks near distribution centers to approximately 33 chances per million. With the deferred emission reductions from the proposed 2010 amendments,

the excess cancer risk would increase by less than one chance per million in each of seven years. All parameters and assumptions, along with the methodology for estimating these cancer risks, are found in Appendix E of the 2003 Staff Report (ARB, 2003).

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IV. ENVIRONMENTAL AND HEALTH IMPACTS OF PROPOSED AMENDMENTS

The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential environmental impacts of proposed regulations. Because ARB's program involving the adoption of regulations has been certified by the Secretary of Resources pursuant to Public Resources Code section 21080.5, the CEQA environmental analysis requirements may be included in the Initial Statement of Reasons (ISOR) for this rulemaking. In the ISOR, ARB must include a "functionally equivalent" document, rather than adhering to the format described in CEQA of an Initial Study, a Negative Declaration, and an Environmental Impact Report. In addition, staff will respond, in the Final Statement of Reasons for the proposed regulation, to all significant environmental issues raised by the public during the public review period or at the Board public hearing. Public Resources Code section 21159 requires that the environmental impact analysis conducted by ARB include the following:

- An analysis of reasonably foreseeable environmental impacts of the methods of compliance;
- An analysis of reasonably foreseeable feasible mitigation measures (CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts); and
- An analysis of reasonably foreseeable alternative means of compliance with the proposed regulation.

ARB staff's analysis of these requirements is presented below. The proposed TRU ATCM 2010 amendments reduce the cost of complying with the ATCM while still ensuring the emissions and risks from TRU diesel engines are mitigated.

A. Statewide Emissions Impacts

ARB staff has estimated the incremental emissions which were anticipated but may not be realized with the proposed TRU ATCM 2010 amendments for 2010 through 2020 as shown in Table IV-1. As stated earlier, statewide emissions from these specific engine model year categories are a small portion of the total TRU emissions. However, these emission reductions are important in achieving the Board's goals in the Diesel Risk Reduction Plan (ARB, 2000) and Goods Movement Action Plan (CalEPA, 2007), as well as attaining and maintaining ambient air quality standards.

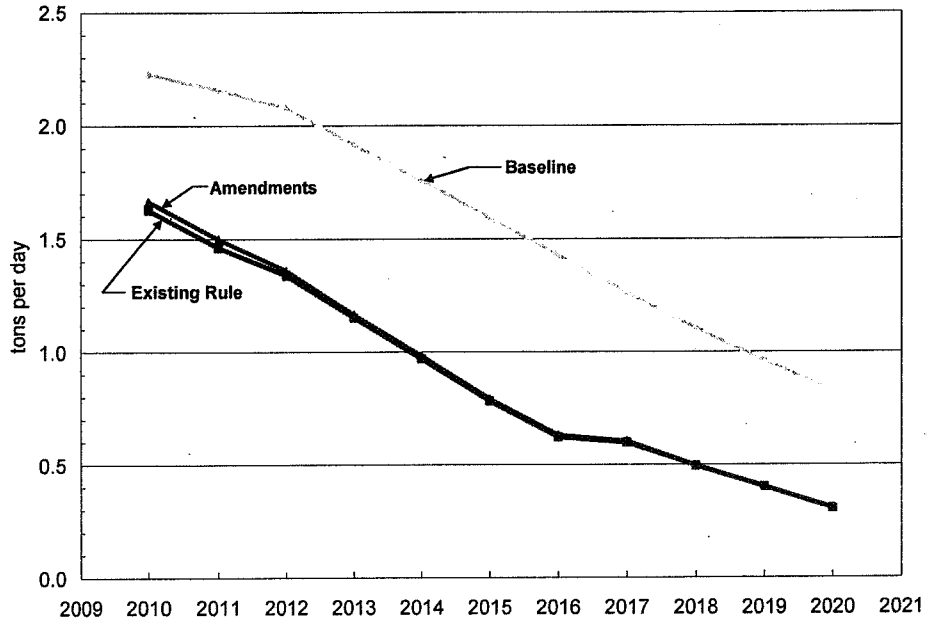
Table IV-1: Statewide Diesel PM Annual Unrealized Emission Reductions for 2010 to 2020 Attributable to Proposed TRU ATCM 2010 Amendments

Year	Affected MY 2003 and MY 2004 Engines		Flexibility Engine Adjustment		Total	
	PM (tpd)	NO_x (tpd)	PM (tpd)	NO_x (tpd)	PM (tpd)	NO_x (tpd)
2010	0.012	0	0.025	0.10	0.037	0.10
2011	0.012	0	0.024	0.10	0.036	0.10
2012	0.011	0	0.010	0.09	0.021	0.09
2013	0.010	0	0.003	0.09	0.013	0.09
2014	0.009	0	0.003	0.08	0.012	0.08
2015	0.007	0	0.003	0.07	0.010	0.07
2016	0.006	0	0.002	0.06	0.008	0.06
2017	0.004	0	0.002	0.05	0.006	0.05
2018	0.000	0	0.001	0.04	0.001	0.04
2019	0.000	0	0.001	0.02	0.001	0.02
2020	0.000	0	0.000	0.01	0.000	0.01

Values are rounded.

The projected total statewide diesel PM emission incremental changes from the proposed TRU ATCM 2010 amendments are presented in Figure IV-1 as a comparison to the TRU ATCM and the TRU baseline as estimated in the 2003 Staff Report. The diesel PM emissions from TRUs in 2010 were estimated to be about 1.6 tpd in the 2003 Staff Report, dropping to about 0.31 tpd in 2020. The incremental change in PM emissions that would occur as a result of the proposed TRU ATCM 2010 amendments drops from 2010 through 2020, with the impacts becoming negligible after 2018. As discussed in Chapter III, the only incremental NO_x emission impacts are due to the use of flexibility engines which have higher emissions. This amendment allows the adjustment of compliance dates for prior flexibility engines, but limits the life of future flexibility engines to preserve emission reductions.

Figure IV-1: Projected Statewide Diesel PM Emissions for Baseline, TRU ATCM and with Proposed TRU ATCM 2010 Amendments



As Figure IV-1 shows, the emissions impact from the proposed TRU ATCM 2010 amendments is negligible, but nonetheless represents an adverse, although not substantial, emissions impact. The highest concentrations of diesel PM from TRUs are expected to occur at locations where numerous TRUs operate such as distribution facilities, ports and intermodal facilities. These locations could see slightly increased concentrations of approximately 0.04 tpd of diesel PM.

B. Health Impacts

The impacts associated with the proposed TRU ATCM 2010 amendments would result in slight increases of ambient particulate matter (PM) emissions and exposure to diesel PM and NO_x. Estimating the impact of the diesel PM emission due to the proposed TRU ATCM 2010 amendments on potential cancer risk depends on location of the emission impacts. The diesel PM emission impacts between the end of 2010 and the end of 2017 due to the proposed TRU ATCM 2010 amendments may result in a small increase in potential health risks of less than one per million (see Chapter III for additional details).

Staff believes that the majority of TRU owners will continue to comply with the in-use emissions standards by repowering with new replacement engines and TRU gen set owners will continue to replace the entire unit. If there is a change in this trend, so that more owners elect to retrofit with exhaust aftertreatment systems, a 2 to 5 percent fuel

penalty is typically associated with diesel particulate filters; and the increased fuel use would translate into increased carbon dioxide (CO_2) emissions. While this potentially could occur, staff does not believe the TRU ATCM 2010 amendments, by themselves, would cause a significant change in the use of the retrofit option over the repower option. In general newer engines are expected to be more fuel efficient than the older engines being replaced, but there is some uncertainty whether this will be the case when engine manufacturers may need to utilize exhaust aftertreatment technologies to meet Tier 4 final new engine emissions standards in the 25 horsepower (hp) to less than 50 hp category.

C. Environmental Impacts

ARB staff anticipates that the proposed TRU ATCM 2010 amendments to allow owner's to comply by meeting either the LETRU or ULETRU requirements and adjust the compliance deadline for prior flexibility engines, but limit use of future flexibility engines, will not significantly increase criteria, toxic, and greenhouse gas (GHG) emissions. As shown in Table VI-1, emissions reductions not realized consist of 0.037 tpd of PM and 0.10 tpd of NO_x in 2010. There would not be any change to the impacts discussed in the 2003 Staff Report for potential compliance methods including diesel particulate filters (DPF).

D. Global Warming Impacts

The following sections provide an overview of the current understanding of the potential climate impacts of the pollutants emitted by diesel engines, which are used to power all but a few TRUs and TRU gen sets.

Particulate Matter (PM): PM from diesel engine exhaust is composed of combustion particles consisting of elemental and organic carbon and sulfate, all of which can form aerosols. Atmospheric aerosols play an important role in the climate system through modifications of the global energy budget: directly, by the scattering and absorption of radiation; indirectly, by the modification of cloud properties. Black carbon typically emitted as a fraction of PM from combustion processes, is the main light-absorbing component of aerosols and thereby causes global warming. In recent years, there has been increased attention to black carbon for its global warming potential through direct and semi-direct effects.

Overall, the climate impact assessment of PM emitted by diesel engines is rather complex: radiative forcing of black carbon is positive (climate warming impact), while radiative forcing of sulfate particles is negative (cooling impact). The particles emitted from diesel engines represent a variety of compositions and sizes. The magnitude of the overall direct climate impact of black carbon emitted from diesel engines and information on emissions of diesel-exhaust particles, such as detailed characterization of chemical composition, microphysical characteristics and the fate of the particles in the environment are not well known. (ARB, 2008) A better characterization of diesel

engine emissions is needed to improve the understanding of the climate change impacts from control strategies.

Nitrogen oxides (NO_x): Through the production of tropospheric ozone, emissions of NO_x have a climate warming impact. However, by affecting the concentration of hydroxyl radical (OH), they reduce the levels of methane, providing a cooling effect. The net climate impact of changes in NO_x emissions will depend on whether ozone or methane production dominates. At this time, there is no consensus on which action is likely to dominate or on the overall magnitude of the impact due to changes in NO_x emissions resulting from the regulation. (ARB, 2008)

Conclusion: With the proposed TRU ATCM 2010 amendments, the TRU ATCM would continue to substantially decrease diesel PM and NO_x emissions, but defer a very small portion of the expected emission reductions until the 2017-2018 period. Additionally, staff expects the proposed TRU ATCM 2010 amendments to have a negligible effect on global warming.

E. Reasonably Foreseeable Mitigation Measures

ARB staff has concluded that the emissions impact from the proposed TRU ATCM 2010 amendments will be negligible and will not have a significant adverse impact on the environment. The proposed TRU ATCM 2010 amendments are necessary in that they will add a compliance option for affected MY 2003 and MY 2004 engines and clarify the standards with regard to flexibility engines while ensuring that the goals of the ATCM to reduce emissions and risks from TRU diesel engines continue to be met.

F. Reasonably Foreseeable Alternative Means of Compliance with the Proposed ATCM

Having found that the amendments will not result in any significant environmental effects, it is not necessary to address alternatives to the proposed amendments under CEQA. However, staff has considered alternatives to the regulation as discussed in Chapter II of this report.

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V. ECONOMIC IMPACTS

This chapter discusses the estimated incremental costs and incremental economic impacts associated with implementation of the proposed TRU ATCM 2010 Amendments. The expected equipment incremental costs for potential compliance options, the cost and associated economic impacts on businesses, as well as an analysis of the cost-effectiveness of proposed TRU ATCM 2010 amendments to the regulation are presented. Estimates in this section are based on the costs incurred and incremental emissions during the years of 2010 to 2027. The costs, presented as net present value (NPV) in 2010 dollars, are included with an explanation of the methodology used in Section C.

A. Summary of the Economic Impacts

In assessing the costs and savings associated with the proposed TRU ATCM 2010 amendments, ARB staff developed estimates for regulatory costs and savings associated with the proposed amendments to the in-use standards for MY 2003 and MY 2004 engines for TRU operators, as well as the regulatory costs of additional recordkeeping and reporting for the OEMs. The estimated regulatory costs for TRU operators include the incremental capital cost differential between installing a Level 2 VDECS to meet LETRU rather than installing a Level 3 VDECS for ULETRU adjusted for the estimated percentage of use of VDECS for compliance, the cost of a Level 3 VDECS on the surviving TRUs in 2017, and the time value of money associated with the additional ULETRU step. If a business chooses to replace the TRU engine rather than retrofit with a VDECS, there is no incremental cost from the proposed TRU ATCM 2010 amendments as engine replacement is a compliance option in both regulatory scenarios. The proposed amendment to provide additional compliance time for flexibility engines has no change in economic impacts from the original TRU ATCM as the original economic impacts were based on year of sale, not the model year of the engine. However, it does provide some relief to businesses that were anticipating expenditures based on the model year of the TRU purchased, but are currently faced with unexpected early expenditures based on the model year of the engine.

There will be compliance cost savings due to changing the in-use standard to allow compliance to be achieved with the optional LETRU standard because the Level 2 VDECS required to meet the LETRU standard costs about $2,000 less than the Level 3 VDECS required to meet ULETRU. The total savings would be about $2.1 million (annualized over the seven year operational life and presented in 2010 dollars). However, since the affected engines still operating in 2017 and 2018 would still need to meet ULETRU, these compliance costs would reduce the savings by about $1.79 million in 2010 dollars. After considering the additional cost to OEMs for recordkeeping and reporting, staff estimates that the net cost savings for compliance with the proposed TRU ATCM 2010 amendments to the regulation to be approximately $160,000 (2010 dollars) from 2010 through 2027.

Staff evaluated the economic impacts the proposed TRU ATCM 2010 amendments had on businesses by estimating the effect of the regulatory costs on small businesses and typical businesses. The impact produces a significant cost savings in early years for all business, but has a cost impact in later years if the TRU owner decides to comply with ULETRU when the engine is 14-years old. The OEMs incur annual reporting costs that are not significant; however they have an initial report that includes the previous five years of data.

One state agency would be impacted by the proposed TRU ATCM 2010 amendments to the regulation. The California Department of Corrections operates refrigerated trucks and trailers used to service correctional facilities, three TRUs of which are impacted by this amendment to the in-use engine standards. The capital cost savings to this state agency is estimated to be a maximum of $6,000. Refrigerated trucks and trailers are owned and operated by at least 25 local school districts and county agencies, which may have maximum cost savings of $10,000, and by the Federal Bureau of Prisons, which may have maximum cost savings of $4,000.

Cost-effectiveness is expressed in terms of costs in dollars per unit of emissions reduced (pounds or tons). As the proposed TRU ATCM 2010 amendments will generate cost savings and emissions reductions that were anticipated but will not be realized, we will not describe the impacts in terms of cost-effectiveness.

B. Legal Requirements

In this section we explain the legal requirements that must be satisfied in analyzing the economic impacts of the proposed TRU ATCM 2010 amendments to the TRU ATCM.

Section 11346.3 of the Government Code requires State agencies assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed amended regulation on California jobs, business expansion, elimination or creation, and the ability of California business to compete with businesses in other states. Also, California state agencies are required to estimate the cost or savings to any State or local agency in accordance with instructions adopted by the Department of Finance (DOF). The estimate shall include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

In addition, Health and Safety Code section 57005 requires the ARB to perform an economic impact analysis of submitted alternatives to a proposed regulation before adopting any major regulation. A major regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding 10 million dollars in any single year. Because the estimated cost of the TRU ATCM 2010 amendments to the TRU ATCM does not exceed 10 million dollars in any single year, the proposed TRU ATCM 2010 amendments to the TRU ATCM do not constitute a major regulation.

The following is a description of the methodology used to estimate costs as well as ARB staff's analysis of the economic impacts on California businesses, as well as, federal, State, and local agencies.

C. Methodology for Estimating Costs Associated with Proposed Amendments

In this section, the estimated costs associated with the proposed TRU ATCM 2010 amendments are discussed. Briefly, the methodology entailed:

- Estimating the regulatory costs associated with the proposed amendments to the in-use performance standards for MY 2003 and MY 2004 engines.
- Estimating the regulatory costs of additional recordkeeping and reporting for the OEMs. The only costs associated with the flexibility engine adjustment are OEM reporting to identify TRUs with flexibility engines. No additional reporting costs are anticipated for TRU owners since the required information will be provided by the OEM and the registration updates will be done by ARB staff.
- Costs were estimated in 2010 dollars and also adjusted to NPV using a five percent discount rate.

1. Differential in VDECS Retrofit Costs for Level 2 and Level 3:

The estimated costs for purchasing and installing VDECS in an in-use TRU were determined using manufacturers suggested cost data from the Level 2 VDECS manufacturers and the Level 3 VDECS manufacturers. There are currently two Level 2 VDECS manufacturers with two sizes of VDECS and one Level 3 VDECS manufacturer marketing VDECS for TRUs. The estimated costs included the cost of the filter, new injectors as required by the VDECS verifications, and the labor for installation. Staff's estimate of the average costs for purchase and installation of a VDECS retrofit, as well as the cost differential are shown in Table V-1.

Table V-1: Estimated Average VDECS Retrofit Costs by Equipment Type (2010 Dollars)

Equipment Type	Horsepower Category (hp)	Cost of Level 2 VDECS[1]	Cost of Level 3 VDECS[1]	Incremental Cost Decrease between Level 3 and Level 2
California-based truck van	Less than 15	$3,650	$6,000	$2,350
California-based truck van	Less than 25	$3,650	$6,000	$2,350
California-based semi-trailer	25- <50	$4,705	$6,000	$1,295
Out-of-state semi-trailer	25- <50	$4,705	$6,000	$1,295
Railcar	25- <50	$4,705	$6,000	$1,295
California-based container on semi-trailer/railcar	25- <50	$4,705	$6,000	$1,295

1. Includes VDECS, labor, and ancillary equipment costs.

Table V-2 presents estimates of the number of affected engines in 2010 and 2011 and cost of installing Level 2 VDECS on these engines. Staff has adjusted the incremental cost assuming that about 30 percent of TRU operators are expected to comply with the TRU ATCM by retrofitting with a VDECS. This percentage adjustment is based on the compliance percentage for 2002 engines. The detailed calculations associated with this cost savings estimate are located in Matrix 1 of Appendix B: Proposed TRU ATCM 2010 Amendments In-Use Compliance Cost Estimates.

Table V-2: Incremental Cost Savings from Proposed Amendment Extending the Level 2 VDECS Requirement to MY 2003 and MY 2004 Engines (2010 Dollars)

Equipment Type	Horsepower Category (hp)	Number of TRUs Affected		Number of TRUs Expected to Use Level 2		Incremental Level 2 VDECS Cost Savings (2010 Dollars)	
		2010	2011	2010	2011	2010	2011
California-based truck van	Less than 15	403	442	121	133	$2,350	$2,253
California-based truck van	15-<25	149	161	45	40	$2,350	$2,233
California-based semi-trailer	25-<50	2,038	0	611	0	$1,295	N/A
Out-of-state semi-trailer	25-<50	672	0	202	0	$1,295	N/A
Railcar	25-<50	150	0	45	0	$1,295	N/A
California-based container on semi-trailer/railcar	25-<50	292	0	45	0	$1,295	N/A

2. Future Level 3 VDECS Costs

If Level 2 VDECS are installed on MY 2003 and MY 2004 engines, an additional ULETRU compliance step must be performed on surviving engines by December 31 of the 14th year after the model year of the engine (2017 for MY 2003 engines and 2018 for MY 2004 engines less than 25 hp). Again, staff has adjusted the incremental cost assuming that about 30 percent of TRU operators are expected to comply with the TRU ATCM by retrofitting with a VDECS. This is a conservative assumption as staff anticipates that most TRU operators with Level 2 VDECS will comply with the regulation in 2017 and 2018 by replacing their existing TRUs rather than retrofitting with a Level 3 VDECS because these TRUs will be at the end of their useful service life. Table V-3 presents estimates of the number of surviving engines in 2017 and the cost of installing Level 3 VDECS on the surviving engines. These costs were derived by applying a five percent discount rate to the 2010 costs listed in Table V-1. The detailed calculations associated with this cost estimate are located in Matrix 1 of Appendix B: Proposed TRU ATCM 2010 Amendments In-Use Compliance Cost Estimates.

Table V-3: Costs from Proposed Amendment Extending the Level 3 VDECS Compliance Deadline for MY 2003 and MY 2004 Engines to 2017 and 2018 (2010 Dollars)

Equipment Type	Horsepower Category (hp)	Number of TRUs Affected		Number of TRUs Expected to Use Level 3 VDECS		Level 3 VDECS Cost (2010 Dollars)	
		2017	2018	2017	2018	2017	2018
California-based truck van	Less than 15	126	132	38	40	$4,190	$3,981
California-based truck van	15-25	47	48	14	14	$4,190	$3,981
California-based semi-trailer	25-50	638	0	191	0	$4,190	$3,981
Out-of state semi-trailer	25-50	211	0	63	0	$4,190	$3,981
Railcar	25-50	47	0	14	0	$4,190	$3,981
California-based container on semi-trailer/railcar	25-50	92	0	28	0	$4,190	$3,981

3. Flexibility Engine Adjustments

Staff anticipates that the only change in costs from flexibility engines from the economic analysis in the 2003 Staff Report is attributed to the one-time reporting cost for TRU manufacturers. In the 2003 Staff Report, capital costs were expected in the year of sale, not the effective engine model year, therefore there is no incremental change in capital cost as this amendment proposes to return the costs to year of sale rather than the 7th year after the effective engine model year. There are increased emissions impacts associated with this adjustment as the emissions for the year of sale (Tier 2 in effect) were estimated from the current tier engines (Tier 2) for the year of sale, which is lower than the emissions than the emissions from the flexibility engines (Tier 1).

4. Operation and Maintenance Costs

Staff does not anticipate that there will be a significant change in the operating and maintenance costs for the proposed Level 2 VDECS in-use standard compared to the current Level 3 VDECS standard as noted in the 2003 Staff Report.

5. Recordkeeping and Reporting Costs

Under staff's proposal, OEMs are required to report flexibility engine data to ARB, as well as unit and engine data for both prior and current production years. The cost for collecting and reporting this data to ARB was estimated by contacting the OEMs for estimates of the time to prepare these reports. The flexibility engine reporting and the initial prior production reporting will occur in 2010 and is based on estimates provided

by the OEMs for reporting of flexibility engines. ARB staff estimates a cost of about $19,000 for initial reporting of flexibility engines and $25,000 for initial reporting of five years of data for prior production years. Based on ARBER registrations, ARB estimates that approximately 10,000 TRUs per year will require prior year production reporting for an estimated cost of $5,000. Current production year reporting is estimated to be approximately $3,400 per year based on an estimate of the number of models per production year.

D. Total Regulatory Costs

Table V-4 provides the regulatory costs attributed to the proposed TRU ATCM 2010 amendments from the calculations located in Matrix 1 and Matrix 2 of Appendix B. The in-use engine regulatory costs are derived from the cost differential between Level 2 and Level 3 VDECS, the future cost of Level 3 VDECS in 2017, and the reporting cost. The net total regulatory cost savings for the TRU ATCM 2010 amendments over the years 2010 to 2027 are estimated to be about $160,000 (2010 dollars).

Table V-4: Total Estimated Regulatory Costs for Proposed TRU ATCM 2010 Amendments (2010 Dollars)

Proposed TRU ATCM 2010 Amendments	Regulatory Cost or (Savings)
NPV Incremental Cost Savings for MY 2003 and MY 2004 < 25 hp Savings (2010 $)	($810,000)
NPV Incremental Cost Savings for MY 2003 > 25 hp Savings (2010 $)	($1,290,000)
NPV ULETRU Cost for MY 2003 and MY 2004 < 25 hp (2010 $)	$460,000
NPV ULETRU Cost for MY 2003 > 25 hp (2010 $)	$1,330,000
NPV OEM Reporting Cost (2010 $)	$150,000
Operating and Maintenance Cost (2010 $)	$0
NPV Net Total Cost or (Savings) (2010 $)	**($160,000)**

All values rounded.

E. Estimated Costs to Businesses

The costs and economic impacts on businesses are presented in this section. The overall impact on business competitiveness, employment, and other impacts on business are also presented.

1. Potential Impact on Employment, Business Creation, Elimination or Expansion

a. Potential Impact on Employment

The proposed TRU ATCM 2010 amendments are not expected to cause a measurable change in California employment and payroll. The proposed TRU ATCM 2010 amendments are likely to result in no change in employment in businesses as compared to the 2003 Staff Report.

b. Potential Impact on Business Creation, Elimination, or Expansion

The proposed TRU ATCM 2010 amendments would have a positive impact on the status of California businesses. The proposed TRU ATCM 2010 amendments reduce the economic burden on businesses which have affected MY 2003 and MY 2004 engines, and extend the current compliance dates for flexibility engines. These businesses may benefit from the proposed addition of a less expensive compliance alternative for MY 2003 and MY 2004 engines, and the proposed relief from the unexpected compliance costs associated with flexibility engines.

c. Potential Impact on Business Competitiveness

The proposed TRU ATCM 2010 amendments would have no significant impact on the ability of California businesses to compete with businesses in other states. The proposed TRU ATCM 2010 amendments are likely to result in no change in business competitiveness as compared to the 2003 Staff Report, as Non-California-based TRUs operating in California will be required to meet the same regulatory requirements as California-based TRUs.

2. Estimated Regulatory Cost for Small and Typical Business

About 80 percent of the companies that own TRUs are considered small businesses, having less than 20 TRUs. The estimated regulatory cost for small and typical business is presented in Table V-5. The estimated regulatory cost savings from these TRU ATCM 2010 amendments for a small business ranges from $2,000 for one unit to $40,000 for 20 units, with an average of $21,000. The estimated regulatory cost savings for a typical business ranges from $42,000 for 21 units to $100,000 for 50 units with an average of $71,000. The estimated regulatory costs for OEMs are estimated at about $44,000 initially and about $8,000 per year thereafter.

Table V-5: Estimated Incremental Regulatory Cost Savings for Small and Typical Business (2010 Dollars)

Year	Incremental Cost Savings to Small Business		Incremental Cost Savings to Typical Business		Cost to OEMs
	1 Unit	20 units	21 Units	50 Units	
Capital Cost Savings (2010 $)	$2,000	$40,000	$42,000	$100,000	N/A
Annualized Capital Cost Savings (2010 $)	$400	$8,000	$8,000	$40,000	N/A
OEM Initial Reporting Costs (2010 $)	N/A	N/A	N/A	N/A	$44,000
OEM Annual Reporting Costs (2010 $)	N/A	N/A	N/A	N/A	$8,000

All values rounded.

F. Cost to Local, State, and Federal Agencies

One state agency would be impacted by the proposed TRU ATCM 2010 amendments to the regulation. The California Department of Corrections operates refrigerated trucks and trailers used to service correctional facilities, three of which are impacted by this amendment to the in-use engine requirements. The capital cost savings to this state agency is estimated to be a maximum of $6,000. Refrigerated trucks and trailers are owned and operated by at least 25 local school districts and local agencies, which may have a maximum cost savings of $10,000, and by the Federal Bureau of Prisons, which may have a maximum cost savings of $4,000.

The proposed TRU ATCM 2010 amendments are not expected to add significant costs above those already required to implement and enforce the proposed amended regulation. ARB's administrative costs for outreach, educational efforts, and technical assistance would be absorbed within existing budgets and resources.

G. Cost-Effectiveness

Cost-effectiveness is expressed in terms of costs in dollars per unit of emissions reduced (pounds or tons). As the proposed TRU ATCM 2010 amendments to the TRU ATCM will generate cost savings and emissions reductions not realized, it is not practical to describe the impacts in terms of cost-effectiveness.

Table V-6 shows the range of cost effectiveness for ARB regulations. The cost savings and emission reductions lost from the proposed TRU ATCM 2010 amendments are negligible and do not affect the original cost-effectiveness range of the TRU ATCM as presented in the 2003 Staff Report.

Table V-6: Comparison of Diesel PM Cost Effectiveness of the Proposed TRU ATCM 2010 Amendments to Other ARB Regulations

Regulation or Airborne Toxic Control Measure	Diesel PM Cost- Effectiveness Dollars/ Pound PM
Commercial Harbor Craft (2007)	$29
Commercial Harbor Craft (2010 Amendments)	$35
In-Use Off-Road Diesel Vehicles	$40
Cargo Handling Equipment Proposal	$41
Solid Waste Collection Vehicle Rule	$28
Stationary Diesel Engine ATCM	$4 - $26
Transport Refrigeration Unit ATCM (2004)	$10 - $20
Transport Refrigeration Unit ATCM (2010 Amendments)	$10 - $20

VI. Public Outreach and Future Activities

A. Public Outreach

Staff has provided opportunities for participation in the rulemaking process. Staff's public outreach efforts included three public workshops at which draft regulatory concepts, language, emissions impacts, health risk impacts, and economic impacts were provided. Staff's public outreach efforts included meetings, webcasts, teleconferences, telephone contacts, and emails with TRU owners and fleet operators, trade associations, trade journal reporters, TRU original equipment manufacturers, TRU dealers and service centers, truck and trailer dealers, brokers, leasing companies, diesel particulate matter emissions control system manufacturers, environmental groups, engine rebuilders, and other interested parties. Staff also created a website and maintained an email address list that includes over 5,100 addresses to automatically update interested parties about rulemaking developments. The TRU website can be accessed at: http://www.arb.ca.gov/diesel/tru.htm

B. Environmental Justice

The proposed amendments result in a short-term negligible increase diesel PM emissions and will impact diesel PM emissions at distribution centers, grocery stores, and other facilities where TRUs operate. Communities near distribution centers are often more heavily impacted by TRUs operating at these locations. On December 13, 2001, the Board approved "Policies and Actions for Environmental Justice," which formally established a framework for integration of environmental justice into ARB's programs, consistent with the directive of California state law. These policies apply to all communities in California; however, environmental justice issues have been raised specifically in the context of low-income areas and ethnically diverse communities. The proposed amendments are consistent with our environmental justice policy to reduce health risk in all communities, including those with low-income and ethnically diverse populations.

C. Future Activities

When staff began this rule amendment process our goal was to bring to the Board a series of amendments addressing implementation, enforcement, and economic issues. As we progressed through the first two workshops, the number of potential amendments grew as did the number of possible approaches to address issues and concerns. It became clear to staff that additional data collection and analysis would be needed before we would be in a position to recommend specific rule changes to the Board. However, there were several amendments that required Board action in 2010 because of compliance dates that become effective at the end of the year. As a result, staff decided to bring the rulemaking forward in two phases. Phase 1, which is the subject of this Staff Report, would address time-critical amendments that urgently need Board approval before the end of the year.

Phase 2, which we tentatively plan to bring to the Board in July 2011, would address the remaining issues and concerns that are not as time-critical. This will provide staff additional time to adequately develop the remaining proposed amendments, address stakeholder concerns, and complete the necessary update to the emissions inventory. Below is a list of the issues we will be working on:

Changes to Emission Standards

- Clarify ULETRU standard for less than 25 hp engines meeting Tier 4f – require highest level VDECS retrofit available or alternative technology when 7 years old

Changes to the Compliance Schedule

- Extend LETRU compliance period by one year for complying by original December 31, 2008, compliance date (engine model years 2001 and older)
- Extend LETRU compliance period by one year for complying by December 31, 2009, compliance date (engine model year 2002)
- Provide an alternative compliance schedule for low-use TRUs using automated GPS/wireless recordkeeping

Sell Thru Provisions

- Establish the "effective model year" for TRUs where the difference between the model year of the engine and model year of the TRU is no more than 1 year to be the more recent model year

Monitoring, Reporting, Recordkeeping, and Labeling Provisions

- Require OEMs to provide unit labels identifying the effective model year
- Require engine rebuilders to provide labels identifying the effective model year
- Require engine rebuilders, sellers, and installers to provide unit and engine data to ARB and purchaser
- Add monitoring, recordkeeping, and reporting requirements for Alternative Technologies, such as hybrid-electric TRUs and hybrid cryogenic temperature control systems
- Clarify dealer registration requirements and handling of noncompliant units

Other Proposed Changes

- Clarify purchase, transport, and storage requirements for noncompliant units
- Exempt TRUs used during State or federal declared emergencies
- Provide Executive Officer authority to grant limited exemptions where complying technology has not been delivered on time or is not available
- Extend compliance co-responsibility to the entity that arranges transport (e.g. brokers, shippers, or receivers)
- Clarify the existing prohibition on the sale of noncompliant units

VII. RECOMMENDATION

ARB staff recommends the Board approve the proposed TRU ATCM 2010 amendments to the regulations, as presented in Appendix A, for the following reasons:

Proposed Amendment to the In-Use Emissions Standards for MY 2003 and MY 2004 Engines

- Level 3 VDECS were anticipated being available as a compliance option for TRUs early in 2010. This has not occurred. Amending the ULETRU requirements is necessary given that there is only one Level 3 VDECS currently available, that verification of this VDECS did not occur until July 2010, that the availability of this VDECS is limited, that the supporting dealer network is in the initial stages of development, and that there are no Level 3 VDECS that fit in the TRU housing for <25 hp units.
- Level 2 VDECS are readily available on the market, and have been installed in thousands of model year (MY) 2002 and older TRUs, so the dealer and installation network is established and these products have been thoroughly demonstrated.
- Level 2 VDECS are compatible with MY 2003 engines in the 25 hp to less than 50 hp category and the VDECS verifications have been extended to include this model year.
- Level 2 VDECS are compatible with MY 2003 and 2004 engines in the less than 25 hp category and the VDECS verifications have been extended to include this model year.

Flex Engine Provisions

- Staff finds that because TRU owners were unaware that purchasing a TRU equipped with a flexibility engines would not have the same operating life as an engine meeting the tier standards in effect at the time of manufacture, using the manufacturer year for flexibility engines installed in the past is appropriate. However, going forward, the effective model year for flexibility engines needs to be used to provide an incentive to original equipment manufacturers to install the cleanest engines that are available in new equipment as soon as possible and to ensure that if flexibility engines that meet dirtier prior-tier standards are installed in new equipment, they are cleaned up as soon as possible. The effective model year of an engine that was manufactured to a prior tier standard that was not the standard currently in effect at the time of manufacture would be the last year that the prior tier standard was in effect.

Reporting Provisions

- To facilitate staff efforts to provide enhancements to the ARBER registration system, making it easier for owners to register, and to improve the emissions inventory, TRU and TRU gen set OEMs need to periodically report unit and engine data for the coming production year and prior production years.

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REFERENCES

(ARB, 2000) California Air Resources Board. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* Sacramento, California. October 2000.

(ARB, 2003) Air Resources Board, *Staff Report: Initial Statement of Reasons for proposed Rulemaking of the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities where TRUs Operate*, October 2003.

(ARB, 2008) Air Resources Board, *Initial Statement of Reasons for Proposed Rulemaking: Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels Within California Waters and 24 Nautical Miles of the California Baseline.* June 2008.

(ARB, 2010) Air Resources Board, *Diesel PM Control Technology Options for complying with TRU ATCM,* August 2010

(CalEPA, 2007) Business, Housing, and Transportation Agency, and California Environmental Protection Agency, *Goods Movement Action Plan.* January 2007.

(CFR, 2010a) Title 40, Code of Federal Regulations, Part 89, section 89.102. *Effective dates, optional inclusion, flexibility for equipment manufacturers.* Current as of September 1, 2010.

(CFR, 2010b) Title 40, Code of Federal Regulations, Part 1039, section 1039.625. *What requirements apply under the program for equipment manufacturer flexibility?* Current as of September 1, 2010.

(CFR, 2010c) Title 40, Code of Federal Regulations, Part 1068, section 1068.265. *What provisions apply to engines that are conditionally exempted from certification?* Current as of September 1, 2010.

(CCR, 2010) Title 13, California Code of Regulations, section 2423. *Exhaust Emission Standards and Test Procedures – Off-Road Compression Ignition Engines.* Operative 1-6-2006 (Register 2005, No. 49).

(U.S. EPA, 2009) *California State Nonroad Engine and Vehicle Pollution Control Standards; Authorization of Transport Refrigeration Unit Engine Standards, Notice of Decision.* Federal Register, Vol. 74, No. 11, page 3030, Friday, January 16, 2009, Notices.

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APPENDIX A

PROPOSED AMENDMENT OF AIRBORNE TOXIC CONTROL MEASURE FOR IN-USE DIESEL-FUELED TRANSPORT REFRIGERATION UNITS (TRU) AND TRU GENERATOR SETS, AND FACILITIES WHERE TRUs OPERATE

TITLE 13, CALIFORNIA CODE OF REGULATIONS SECTION 2477

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Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate

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Amend article 8, Off-Road Airborne Toxic Control Measures, and section 2477, within division 3, chapter 9, title 13, California Code of Regulations, to read as follows: (Note: Proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions.)

Article 8. Off-Road Airborne Toxic Control Measures

Section 2477. Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate.

(a) **Purpose**. Diesel particulate matter (PM) was identified in 1998 as a toxic air contaminant. This regulation implements provisions of the Diesel Risk Reduction Plan, adopted by the Air Resources Board in October, 2000, as mandated by the Health and Safety Code Sections 39650-39675, to reduce emissions of substances that have been determined to be toxic air contaminants. Specifically, this regulation will use a phased approach to reduce the diesel PM emissions from in-use transport refrigeration units (TRUs) and TRU generator (gen) set equipment used to power electrically driven refrigerated shipping containers and trailers that are operated in California.

(b) **Applicability**.

(1) Except as provided in subsection (c), this regulation applies to owners and operators of diesel-fueled TRUs and TRU gen sets (see definition of operator and owner in subsection (d) that operate in the state of California. This specifically includes:

(A) Operators and owners of California-based TRUs and TRU gen sets that are installed on trucks, or trailers, shipping containers, or railcars; and

(B) Operators and owners of non-California-based TRUs and TRU gen sets that are installed on trucks, trailers, shipping containers, or trailers.

(2) This regulation applies to facilities located in California with 20 or more loading dock doors serving refrigerated areas where perishable goods are loaded or unloaded for distribution on trucks, trailers, shipping containers, or rail cars that are equipped with TRUs and TRU gen sets and that are owned, leased, or contracted for by the facility, its parent company, affiliate, or subsidiary that are under facility control (see definition).

(3) To the extent not already covered under subsections (b)(1) and (b)(2), above, subsection (g) of this regulation shall apply to any person engaged in this State in the business of selling to an ultimate purchaser, or renting or leasing new or used TRUs or TRU gen sets, including, but not limited to, manufacturers, distributors, and dealers.

(4) TRU and TRU gen set original equipment manufacturers that directly or indirectly sell or offer for sale TRUs and TRU gen sets to the California market.

~~(4)~~(5) Severability. If any subsection, paragraph, subparagraph, sentence; clause, phrase, or portion of this regulations is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of the regulation.

(c) **Exemptions**. This regulation does not apply to military tactical support equipment.

(d) **Definitions**. For purposes of this regulation, the following definitions apply:

(1) "Affiliate or Affiliation" refers to a relationship of direct or indirect control or shared interests between the subject business and another business.

(2) "Alternative Fuel" means natural gas, propane, ethanol, methanol, or advanced technologies that do not rely on diesel fuel, except as a pilot ignition source at an average ratio of less than 1 part diesel fuel to 10 parts total fuel on an energy equivalent basis. Alternative fuels also means any of these fuels used in combination with each other or in combination with other non-diesel fuels. Alternative-fueled engines shall not have the capability of idling or operating solely on diesel fuel at any time.

(3) "Alternative-Fueled Engine" means an engine that is fueled with a fuel meeting the definition of alternative fuel.

(4) "Alternative Diesel Fuel" means any fuel used in diesel engines that is not commonly or commercially known, sold or represented as diesel fuel No. 1-D or No. 2-D, pursuant to the specification for Diesel Fuel Oils D975-81, and does not require engine or fuel system modifications for the engine to operate, although minor modifications (e.g. recalibration of the engine fuel control) may enhance performance. Examples of alternative diesel fuels include, but are not limited to, biodiesel, Fischer Tropsch fuels, and emulsions of water in diesel fuel. Natural gas is not an alternative diesel fuel. An emission control strategy using a fuel additive will be treated as an alternative diesel fuel based strategy unless:

(A) The additive is supplied to the vehicle or engine fuel by an on-board dosing mechanism, or

(B) The additive is directly mixed into the base fuel inside the fuel tank of the vehicle or engine, or

(C) The additive and base fuel are not mixed until vehicle or engine fueling commences, and no more additive plus base fuel combination is mixed than required for a single fueling of a single engine or vehicle.

(5) "ARB" means the California Air Resources Board.

(6) "B100 Biodiesel Fuel" means 100% biodiesel fuel derived from vegetable oil or animal fat and complying with ASTM D 6751-02 and commonly or commercially known, sold, or represented as "neat" biodiesel or B100. B100 biodiesel fuel is an alternative diesel fuel.

(7) "B100 Biodiesel-Fueled" (compression-ignition engine) means a compression-ignition engine that is fueled by B100 biodiesel fuel.

(8) "Business" means an entity organized for profit including, but not limited to, an individual, sole proprietorship, partnership, limited liability partnership, corporation, limited liability company, joint venture, association or cooperative; or solely for purposes of the Prompt Payment Act (Government Code 927 et seq.), a duly authorized nonprofit corporation.

(9) "California-Based TRUs and TRU Gen Sets" means TRUs and TRU gen sets equipped on trucks, trailers, shipping containers, or railcars that a reasonable person would find to be regularly assigned to terminals within California.

(10)"CARB Diesel Fuel" means any diesel fuel that is commonly or commercially known, sold or represented as diesel fuel No. 1-D or No. 2-D, pursuant to the specification for Diesel Fuel Oils D975-81 and meets the specifications defined in *13 CCR 2281, 13 CCR 2282, and 13 CCR 2284.*

(11)"Carbon Monoxide (CO)" means a colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels.

(12)"Carrier" means any person, party, or entity who undertakes the transport of goods from one point to another.

(13)"Certification" means the obtaining of an Executive Order for a new offroad compression-ignition engine family that complies with the off-road compression-ignition emission standards and requirements specified in the California Code of Regulations, Title 13, Section 2423. A "certified engine" is an engine that belongs to an engine family that has received a certification Executive Order.

(14)"Certification Data" means the ARB Executive Order number and related exhaust emission data for each test cycle mode used to certify the engine family and obtain the certification level shown in the certification Executive Order. Such data includes modal exhaust emissions data for nitrogen oxides, nonmethane hydrocarbons, carbon monoxide, and particulate matter includes, as a minimum, torque, engine speed, weighting factor, power, mass emission rate (grams per hour), and certification test fuel.

(15)"Compression Ignition (CI) Engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The regulation of power by controlling fuel supply in lieu of a throttle is indicative of a compression ignition engine.

(16)"Consignee" (see receiver).

(17)"Consignor" (see shipper).

(18)"Cryogenic Temperature Control System" means a heating and cooling system that uses a cryogen, such as liquid carbon dioxide or liquid nitrogen that is routed through an evaporator coil that cools air blown over the coil. The cryogenic system uses a vapor motor to drive a fan and alternator, and a propane-fired heater superheats the carbon dioxide for heating and defrosting. Electrically driven fans may be used instead of a vapor motor and heating and defrost needs may be met by using electric heaters and/or vehicle engine coolant.

(19)"Deterioration Factor (DF)" means a factor that is applied to the certification emission test data to represent emissions at the end of the useful life of the engine. Separate DFs apply to each measured pollutant, except that a combined NMHC+NOx DF applies to engines that do not use aftertreatment devices. Decreasing emissions over time would not be allowed to offset increasing emissions of the other pollutant in this combined DF.

(20)"Diesel Fuel" means any fuel that is commonly or commercially known, sold, or represented as diesel fuel, including any mixture of primarily liquid hydrocarbons – organic compounds consisting exclusively of the elements carbon and hydrogen – that is sold or represented as suitable for use in an internal combustion, compression-ignition engine.

(21)"Diesel-Fueled" means fueled by diesel fuel or CARB diesel fuel in whole or in part, except as allowed for a pilot ignition source under the definition for "alternative fuel".

(22)"Diesel Oxidation Catalyst (DOC)" means the use of a catalyst to promote the oxidation processes in diesel exhaust. Usually refers to an emission control device that includes a flow-through substrate where the surfaces that contact the exhaust flow have been catalyzed to reduce emissions of the organic fraction of diesel particulates, gas-phase hydrocarbons, and carbon monoxide.

(23)"Diesel Particulate Filter (DPF)" means an emission control technology that reduces PM emissions by trapping the particles in a flow filter substrate. Periodically the collected particles are either physically removed or oxidized (burned off) in a process called regeneration.

(24)"Diesel Particulate Matter" means the particles found in the exhaust of diesel-fueled CI engines. Diesel PM may agglomerate and adsorb other species to form structures of complex physical and chemical properties.

(25)"Dual-Fuel Engine" means an engine designed to operate on a combination of alternative fuel, such as compressed natural gas (CNG) or liquefied petroleum gas (LPG), and conventional fuel, such as diesel or gasoline. These engines have two separate fuel systems, which either inject both fuels simultaneously into the engine combustion chamber or fumigate the gaseous fuel with the intake air and inject the liquid fuel into the combustion chamber.

(26) "Effective model year" or "effective engine model year" is an alternative model-year designation (see definition of "model year") for a new replacement engine, rebuilt replacement engine, or flexibility engine when the engine does not meet, at the time of manufacture, the most stringent emission tier standard for a new engine in effect for the horsepower rating of the engine. When an engine is manufactured to meet a less stringent prior-tier emissions standard than is currently in effect, the effective model year is the last year that the prior-tier emission standard was in effect. Table 1 lists the tier standards that apply to TRUs and TRU gen sets and the corresponding effective model years.

Table 1
Effective Model Year

Prior-Tier Engine Emissions Standard	Tier Standard Effective Years	Effective Model Year
Tier 1, 25-50 Hp (trailer)	1999-2003	2003
Tier 1, under 25 Hp (truck)	2000-2004	2004
Tier 2, 25-50 Hp (trailer)	2004-2007	2007
Tier 2, under 25 Hp (truck)	2005-2007	2007
Tier 4i, 25-50 hp (trailer)	2008-2012	2012[11]

[11] Effective model year applies for this tier only after Tier 4f becomes effective in 2013 for 25 to less than 50 hp engines.

~~(26)~~(27) "Emergency" means any of the following times:

(A) A failure or loss of normal power service that is not part of an "interruptible service contract" (see definition in subsection (d));

(B) A failure of a facility's internal power distribution system, provided the failure is beyond the reasonable control of the operator;

(C) When an affected facility is placed under an involuntary "rotating outage" (see definition in subsection (d)).

~~(27)~~(28) "Emission Control Strategy" means any device, system, or strategy employed with a diesel-fueled CI engine that is intended to reduce emissions. Examples of emission control strategies include, but are not limited to, particulate filters, diesel oxidation catalysts, selective catalytic reduction systems, alternative fuels, fuel additives used in combination with particulate filters, alternative diesel fuels, and combinations of the above.

~~(28)~~(29) "Emissions Rate" means the weight of a pollutant emitted per unit of time (e.g., grams per second).

~~(29)~~(30) "Executive Officer" means the Executive Officer of the California Air Resources Board or his or her delegate.

~~(30)~~(31) "Facility" means any facility where TRU-equipped trucks, trailers, shipping containers or railcars are loaded or unloaded with perishable goods. This includes, but is not limited to, grocery distribution centers, food service distribution centers, cold storage warehouses, and intermodal facilities. Each business entity at a commercial development is a separate facility for the purposes of this regulation, provided the businesses are "independently owned and operated" (see definition in subsection (d)).

~~(31)~~(32) "Facility Control (of TRUs or TRU Gen Sets)" means the TRUs or TRU gen sets located at the facility are owned or leased by the facility, its parent company, affiliate, or a subsidiary, or under contract for the purpose of providing carrier service to the facility, and the TRUs' or TRU gen sets' arrival, departure, loading, unloading, shipping and/or receiving of cargo is determined by the facility, parent company, affiliate, or subsidiary (e.g scheduled receiving, dispatched shipments).

~~(32)~~(33) "Fischer-Tropsch Diesel Fuel" See "ultra-low-aromatic synthetic diesel fuel".

(34) "Flexibility engine" means an engine installed in new equipment by an original equipment manufacturer under the Transitional Program for Equipment Manufacturers in accordance with title 40 Code of Federal Regulations (40 CFR)

sections 89.102 and 1039.625, and title 13 CCR section 2423(d). Such engines shall use the "effective model year" designation for purposes of compliance with this subarticle, except as allowed under subsection (e)(1)(B)5.a.

~~(33)~~(35)"Fuel Additive" means any substance designed to be added to fuel or fuel systems or other engine-related engine systems such that it is present in-cylinder during combustion and has any of the following effects: decreased emissions, improved fuel economy, increased performance of the engine; or assists diesel emission control strategies in decreasing emissions, or improving fuel economy or increasing performance of the engine.

~~(34)~~(36)"Generator Set (gen set)" means a CI engine coupled to a generator used as a source of electricity.

~~(35)~~(37)"Hybrid Cryogenic Temperature Control System" means a temperature control system that uses a cryogenic temperature control system in conjunction with a conventional TRU.

~~(36)~~(38) "Independently Owned and Operated" means a business concern that independently manages and controls the day-to-day operations of its own business through its ownership and management, without undue influence by an outside entity or person that may have an ownership and/or financial interest in the management responsibilities of the applicant business or small business.

~~(37)~~(39)"Intermodal Facility" means a facility involved in the movement of goods in one and the same loading unit or vehicle which uses successively several modes of transport without handling of the goods themselves in changing modes. Such a facility is typically involved in loading and unloading refrigerated shipping containers and trailers to and from railcars, trucks, and ocean-going ships.

~~(38)~~(40)"Interruptible Service Contract" means any arrangement in which a nonresidential electrical customer agrees to reduce or consider reducing its electrical consumption during periods of peak demand or at the request of the System Operator in exchange for compensation, or assurances not to be blacked out or other similar non-monetary assurances.

~~(39)~~(41)"In Use TRU, TRU gen set, or engine" means a TRU, TRU gen set, or engine that is not a "new" TRU, TRU gen set, or engine.

~~(40)~~(42) "Low Emission TRU (LETRU or L)" means a TRU or TRU gen set that meets the performance standards described under paragraph (e)(1)(A)1. or (e)(1)(A)2.

~~(41)~~(43) "Manufacturer" means a business as defined in Government Code § 14837(c).

~~(42)~~(44) "Military tactical support equipment (TSE)" means equipment that meets military specifications, owned by the U.S. Department of Defense and/or the U.S. military services, and used in combat, combat support, combat service support, tactical or relief operations, or training for such operations.

~~(43)~~(45) "Model Year (MY)" means the following:

(A) The designation used for engines manufactured to meet the emissions tier standard in effect for new engines at time of manufacture (see alternative designation, "effective model year, defined above); and

(B) The diesel-fueled engine manufacturer's annual production period, which includes January 1st of a calendar year, or if the manufacturer has no annual production period, the calendar year.

~~(44)~~(46) "New TRU, TRU Gen Set, or Engine" means any TRU, TRU gen set, or engine that has never been subject to a retail sale or lease to an "ultimate purchaser" (see definition in subsection (d)).

~~(45)~~(47) "Nitrogen Oxide (NOx)" means compounds of nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition.

~~(46)~~(48)"Non-California-Based TRUs and TRU Gen Sets" means TRUs and TRU gen sets that are equipped on or used in trucks, trailers, shipping containers, or railcars that a reasonable person would find to be regularly assigned to terminals outside of California and operate in California from time to time for the purpose of transporting perishable goods into or out of the state.

~~(47)~~(49) "Non-methane Hydrocarbons (NMHC)" means the sum of all hydrocarbon air pollutants except methane. NMHCs are precursors to ozone formation.

~~(48)~~(50) "Operate" means to start, cause to function, program the temperature controller, select an operating program or otherwise control, fuel, monitor to assure proper operation, or keep in operation.

~~(49)~~(51) "Operator" means any person, party or entity that operates a TRU or TRU gen set for the purposes of transporting perishable goods, excluding an employee driver and third party maintenance and repair service, and including but not limited to:

(D) Manufacturer, producer, supplier, carrier, shipper, consignor, consignee, receiver, distribution center, or warehouse of perishable goods;

(E) An individual, trust, firm, joint stock company, business concern, partnership, limited liability company, association, or corporation including but not limited to, a government corporation;

(F) Any city, county, district, commission, the state or any department, agency, or political subdivision thereof, any interstate body, and the federal government or any department or agency thereof to the extent permitted by law.

~~(50)~~(52) "Owner" means any person that legally holds the title (or its equivalent) showing ownership of a TRU or TRU gen set, excluding a bank or other financial lending institution, and including but not limited to:

(A) Manufacturer, producer, supplier, carrier, shipper, consignor, consignee, receiver, distribution center, warehouse;

(B) An individual, trust, firm, joint stock company, business concern, partnership, limited liability company, association, or corporation including but not limited to, a government corporation;

(C) Any city, county, district, commission, the state or any department, agency, or political subdivision thereof, any interstate body, and the federal government or any department or agency thereof to the extent permitted by law.

~~(51)~~(53) "Owner/Operator" means a requirement applies to the owner and/or operator of a TRU or TRU gen set, as determined by agreement or contract between the parties if the two are separate business entities.

~~(52)~~(54) "Parent Company" means a company that has a controlling interest in another company, usually through ownership of more than one-half the voting stock.

~~(53)~~(55) "Particulate Matter (PM)" means the particles found in the exhaust of CI engines, which may agglomerate and adsorb other species to form structures of complex physical and chemical properties.

~~(54)~~(56) "Rated Brake Horsepower" means the power delivered, according to the statement of the engine manufacturer, at the rated speed.

~~(55)~~(57) "Real Emission Reductions" means that an action is taken that results in reductions in the PM emission rate of an in-use engine (e.g. a VDECS is installed that reduced the PM emissions rate by more than 50%).

~~(56)~~(58) "Receiver" means the person, party, or entity that receives shipped goods, cargo, or commodities.

~~(57)~~(59) "Refrigerated Trailer" means a trailer van, railcar, or shipping container equipped with a TRU or TRU gen set. Pursuant to Health and Safety Code section 39618, refrigerated trailers are mobile sources and shall be regulated by the ARB on a statewide basis.

~~(58)~~(60) "Rotating Outage" means a controlled involuntary curtailment of electrical power service to consumers as ordered by the system operator - see definition in subsection (d).

~~(59)~~(61) "Shipper" means the person, party, or entity who usually owns or supplies the commodities shipped by a carrier.

~~(60)~~(62) "System Operator" means one of the several organizations that control energy in California. System operators include, but are not limited to, the California Independent System Operator, the Los Angeles Department of Water and Power, the Imperial Irrigation District, the Sacramento Municipal Utility District.

~~(61)~~(63) "Terminal" means any place where a TRU or TRU gen set equipped truck, trailer, shipping container, railcar or TRU gen set is regularly garaged, maintained, operated, or dispatched from, including a dispatch office, cross-dock facility, maintenance shop, business, or private residence.

~~(62)~~(64)"Tier 4 Nonroad/Offroad Emission Standards" means the emission standards and associated procedures promulgated by U.S. Environmental Protection Agency in "Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule" (Vol. 69, No. 124 Fed.Reg. pp. 38957-39273 (June 29, 2004).

~~(63)~~(65) "Transport Refrigeration Unit (TRU)" means refrigeration systems powered by integral internal combustion engines designed to control the environment of temperature sensitive products that are transported in trucks and refrigerated trailers. TRUs may be capable of both cooling and heating.

~~(64)~~(66) "TRU Generator Set (TRU gen set)" means a generator set that is designed and used to provide electric power to electrically driven refrigeration units of any kind. This includes, but is not limited to gen sets that provide electricity to electrically powered refrigeration systems for semi-trailer vans and shipping containers.

~~(65)~~(67) "Ultimate Purchaser" means with respect to a new TRU, TRU gen set, or engine, the first person who in good faith purchases a new TRU, TRU gen set, or engine for purposes other than resale.

~~(66)~~(68) "Ultra-Low-Aromatic Synthetic Diesel Fuel" means fuel produced from natural gas, coal, or biomass by the Fischer-Tropsch gas-to-liquid chemical conversion process, or similar process that meets the following properties:

Table ~~12~~

Property	ASTM	Value
Sulfur Content (ppmw)	D5453-93	<1
Total Aromatic Content (wt %)	D5186-96	<1.5%
Polynuclear Aromatic Content (wt %)	D5186-96	<0.5%
Natural Cetane Number	D613-84	>74

~~(67)~~(69) "Ultra-Low Emission TRU (ULETRU or U)" means a TRU or TRU gen set that meets the performance standards described under subparagraph (e)(1)(A)1. and (e)(1)(A)2. or that uses an "alternative technology" in accordance with subparagraph (e)(1)(A)3.

~~(68)~~(70) "Verification Classification Level" means the classification assigned to a Diesel Emission Control Strategy by the Executive Officer as defined in the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emission from Diesel Engines (13 CCR Sections 2700 – 2710)*. PM reductions correspond as follows: Level 1: ≥ 25%; Level 2: ≥50%; Level 3: ≥85% or 0.01 g/hp-hr.

~~(69)~~(71) "Verified Diesel Emission Control Strategy" (VDECS) means an emission control strategy designed primarily for the reduction of diesel particulate matter emissions that has been verified per the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines (13 CCR Sections 2700 – 2710)*. Examples of diesel retrofit systems that may be verified include, but are not limited to, diesel particulate filters, diesel oxidation catalysts, fuel additives (e.g. fuel-borne catalysts), alternative fuels (e.g. dual fuel), alternative diesel fuels, and combinations of the above.

(e) **Requirements**.

(1) **In-Use Operation**:

(A) **In-Use Performance Standards:** In accordance with the schedule set forth below in paragraph (e)(1)(B), no owner/operator shall operate a TRU or TRU gen set in California unless it meets the in-use emission category performance standards set forth below.

1. In-Use performance standard categories for TRU and TRU gen set engines with rated brake horsepower less than 25 horsepower (<25 hp) are shown in Table ~~2~~3, along with the engine certification standards or

the level of Verified Diesel Emission Control Strategy (VDECS) (see definition) that is necessary to qualify for each category.

Table ~~23~~
<25 HP TRU and TRU Gen Set In-Use PM Performance Standards

In-Use Emission Category	Engine Certification (g/hp-hr)	Level of VDECS Equipped with
Low Emission TRU (LETRU or L)	0.30[12]	Level 2
Ultra-Low Emission TRU (ULETRU or U)	NA[13]	Level 3

a. Compliance can be achieved by:

I. Using a certified engine meeting the applicable nonroad/offroad emissions standards for all regulated pollutants and the in-use PM performance standard. Only engines for which certification data and deterioration factors have been provided to ARB shall be considered when determining compliance. The Executive Officer will consider such submittals, publish, and make available a list of qualifying engines.

II. Equipping the engine with the required Level of VDECS.

2. In-Use performance standard categories for TRU and TRU gen set engines with rated brake horsepower greater than or equal to 25 horsepower (≥25 hp) are shown in Table ~~34~~, along with the engine certification standards or the level of VDECS that is necessary to qualify for each category.

Table ~~34~~
≥25 HP TRU and TRU Gen Set In-Use PM Performance Standards

In-Use Emission Category	Engine Certification (g/hp-hr)	Level of VDECS Equipped with
Low Emission TRU (LETRU or L)	0.22[14]	Level 2
Ultra-Low Emission TRU (ULETRU or U)	0.02[15]	Level 3

[12] The Engine Certification value for the Low Emission TRU category corresponds to the "Interim" Tier 4 Nonroad/Offroad Emission Standards that are to go into effect in 2008.

[13] Not Applicable – must choose another compliance option ~~ARB and U.S. EPA will perform a technical review in 2007 to evaluate DOC or filter-based standard for <25 hp category new engines in 2013. If a more stringent "long term" level for new tier 4 (as identified in the Tier 4 Nonroad/Offroad Emission Standards) engines is adopted by U.S. EPA for this horsepower category, the Board will consider adopting an engine certification in-use performance standard for ULETRU for <25 hp TRUs and TRU gen sets.~~

[14] The Engine Certification value for Low Emission TRU category corresponds to the "Interim" Tier 4 Nonroad/Offroad Emission Standards that are to go into effect in 2008.

a. Compliance can be achieved by:

I. Using a certified engine meeting the applicable nonroad/offroad emissions standards for all regulated pollutants and the in-use PM performance standard. Only engines for which certification data and deterioration factors have been provided to ARB shall be considered when determining compliance. The Executive Officer will consider such submittals, publish, and make available a list of qualifying engines.

II. Equipping the engine with the required Level of VDECS.

3. As an alternative to meeting the ULETRU in-use performance standards in subsections (e)(1)(A)1. and 2., an owner/operator may operate a TRU or TRU gen set in California meeting one of the *Alternative Technology* options listed below. Alternative Technologies qualify to meet the ULETRU in-use performance standard only if the TRU or TRU gen set is operated under the conditions included in the description listed below.

a. Electric standby, provided that the TRU is not operated under diesel engine power while at a facility, except during an emergency.

b. Cryogenic temperature control systems or hybrid cryogenic temperature control systems, provided that the TRU does not operate under diesel engine power while at a facility, except during an emergency.

c. Alternative-fueled engines (see definition in subsection (d)). If the engine is a CI engine, a VDECS is required.

Note: If the engine is not a compression ignition diesel fueled engine, this regulation would not apply, but the engine may have to meet other emission standards (e.g. large spark-ignited engine standards if >25 hp).

d. Fuel exclusively with an alternative diesel fuel (see definition in subsection (d)) that has been verified as a VDECS, provided it is used in accordance with the requirements of subsection (e)(2)(A) and the alternative diesel fuel contains no conventional diesel or CARB diesel fuel.

e. Power by fuel cells. If a reformer is used with diesel fuel as the source of hydrocarbons, then emissions must be evaluated and verified through the *Verification Procedure Warranty and In-Use*

[15] The Engine Certification value for the Ultra-Low Emission TRU category corresponds to the ~~"Long Term"~~ Tier 4 "final" Nonroad/Offroad Emission Standards that will go into effect in 2012 or 2013.

Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines (13CCR section 2700 – 2710).

f. Equip with any other system approved by the Executive Officer to not emit diesel PM or increase public health risk while at a facility.

(B) **In-Use Compliance Dates**~~.~~: In-use compliance dates are based upon the engine MY or effective MY, except as allowed under subparagraph (e)(1)(B)5.a.

1. No owner/operator shall operate a 2001 and older model year (MY) TRU or TRU gen set engine in California unless it meets the in-use performance criteria set forth in paragraph (e)(1)(A) for

   a. LETRU on or before December 31, 2008, and

   b. ULETRU on or before December 31, 2015, as shown in Tables ~~4~~5 and ~~5~~6.

2. No owner/operator shall operate a 2002 MY TRU or TRU gen set engine in California unless it meets the in-use performance criteria set forth in paragraph (e)(1)(A) for

   a. LETRU on or before December 31, 2009, and

   b. ULETRU on or before December 31, 2016, as shown in Tables ~~4~~5 and ~~5~~6.

3. No owner/operator shall operate a 2003 MY TRU or TRU gen set engine in California unless it meets the in-use performance criteria set forth in subsection (e)(1)(A) for

   a. LETRU on or before December 31, 2010, and

   b. ULETRU on or before December 31, 2017, as shown in Tables 5 and 6.

4. No owner/operator shall operate a ~~2003~~2004 MY and subsequent MY TRU or TRU gen set engine in California unless it meets the in-use performance criteria set forth in paragraph (e)(1)(A) for ULETRU on or before December 31st of the seventh year past the ~~unit~~engine's model year, as shown in Tables ~~4~~5[16] and ~~5~~6[6], with the following exception:~~.~~

[16] Model years 2013 and subsequent (not shown in Table 5 and 6), shall meet ULETRU by December 31st of the seventh year after the engine model year or effective model year, except as allowed under subparagraph (e)(1)(B)5.

a. Less than 25 hp model year 2004 engines shall meet the in-use performance criteria set forth in paragraph (e)(1)(A), shown in Table 5, for:

I. LETRU on or before December 31, 2011, and

II. ULETRU by December 31, 2018.

Table 45: <25 HP TRU and TRU Gen Set Engines In-Use Compliance Dates

MY	In-Use Compliance Year[17]													
	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older		L	L	L	L	L	L	L	U	U	U	U	U	U
'02			L	L	L	L	L	L	L	U	U	U	U	U
'03				UL	UL	UL	UL	UL	UL	UL	U	U	U	U
'04					UL	UL	UL	UL	UL	UL	UL	U	U	U
'05[18]						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

[17] Compliance date is December 31st of the compliance year shown. "MY" means model year. Black shaded areas are years with no requirements since in-use compliance year precedes model year . Dark shaded areas without letter codes have no requirements, pending in-use compliance date. "L" means must meet LETRU in-use performance standards. "U" means must meet ULETRU in-use performance standards.

[18] TRUs and TRU gen sets with MY 2003~~5~~ engines and subsequent MY engines shall be required to comply with ULETRU requirements by the end of the seventh year after the model year or effective model year, except as allowed under subparagraph (e)(1)(B)5. ~~The exception to this is ≥25 hp 2013 and subsequent model years, since these model years would meet ULETRU in-use performance standards as new engines.~~

Table ~~5~~6: ≥25 HP TRU and TRU Gen Set Engines
In-Use Compliance Dates

MY	In-Use Compliance Year[19]													
	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
'01 & Older		L	L	L	L	L	L	L	U	U	U	U	U	U
'02			L	L	L	L	L	L	L	U	U	U	U	U
'03				~~U~~L	~~U~~L	~~U~~L	~~U~~L	~~U~~L	~~U~~L	~~U~~L	U	U	U	U
'04[20]					U	U	U	U	U	U	U	U	U	U
'05						U	U	U	U	U	U	U	U	U
'06							U	U	U	U	U	U	U	U
'07								U	U	U	U	U	U	U
'08									U	U	U	U	U	U
'09										U	U	U	U	U
'10'											U	U	U	U
'11												U	U	U
'12													U	U
'13														U

5. Requirements for TRUs or TRU gen sets that are equipped with flexibility engines and operated in California.

   a. Flexibility engines installed in TRUs and TRU gen sets manufactured prior to [effective date of amendments], and operated in California shall meet the in-use performance standards of subsection (e)(1)(A) by December 31st of the seventh year after the TRU or TRU gen set engine's manufacture year instead of the effective model year provided the TRU or TRU gen set owner registers the flexibility engine equipped TRU or TRU gen set in ARBER in accordance with subsection (e)(1)(E) by [60 days after the effective date of these amendments].

   b. To allow TRU and TRU gen set owners to meet the registration requirements of subparagraph (a) above, the original equipment manufacturer shall by [30 days after the effective date of these amendments]:
      I. Provide the following unit and flexibility engine information to ARB in electronic format:

[19] Compliance date is December 31st of the compliance year shown. "MY" means model year. Black shaded areas are years with no requirements since in-use compliance year precedes model year . Dark shaded areas without letter codes have no requirements, pending in-use compliance date. "L" means must meet LETRU in-use performance standards. "U" means must meet ULETRU in-use performance standards.

[20] TRUs and TRU gen sets with MY 200~~3~~4 engines and subsequent MY engines shall be required to comply with ULETRU requirements by the end of the seventh year after the model year or effective model year, except as allowed under subparagraph (e)(1)(B)5.. ~~The exception to this is ≥25 hp~~Tier 4 final standards go into effect in 2013 ~~and subsequent model years, since these model years~~which would meet ULETRU in-use performance standards ~~as new engines~~ in the 25 hp to less than 50 hp category. If engines installed by original equipment manufacturers do not meet ULETRU in 2013, then subparagraph (e)(1)((A)5. applies.

i. TRU or TRU gen set manufacturer;
ii. TRU or TRU model name;
iii. TRU or TRU gen set serial number;
iv. TRU manufacture date;
v. Engine manufacturer
vi. Engine Family;
vii. Engine manufacture year; and
viii. Engine serial number;

II. Notify the TRU or TRU gen set owners in writing that:
i. The unit they own is equipped with a flexibility or TPEM engine; and
ii. The owner must register the TRU or TRU gen set that is equipped with a flexibility engine in ARBER by [60 days after the effective date of amendments];

III. Provide directly or through its dealers instructions and assistance on registration in ARBER to all owners of TRUs and TRU gen sets equipped with flexibility engines that request such help, which shall include specific instructions and assistance that ensures that information entered in ARBER is consistent with what appears on the unit label and engine emissions label, including the model year.

c. The following requirements shall apply to flexibility engines installed in TRUs and TRU gen sets manufactured after [the effective date of the amendments], and operated in California:

I. The owner of a TRU or TRU gen set that is operated in California shall comply with the in-use performance standards set forth in subsection (e)(1)(A) by December 31st of the seventh year after the engine's effective model year.

II. The original equipment manufacturer shall provide the following, written disclosures to the interested ultimate purchaser of a TRU or TRU gen set that is equipped with a flexibility engine prior to its sale:
i. The TRU or TRU gen set has a flexibility engine that meets a less stringent emissions standard than was in effect at the time the flexibility engine was manufactured;
ii. The effective model year of the flexibility engine;
iii. If the owner registers the unit in ARBER, the owner must report the effective model year of the engine, not the model year of engine manufacture, and failure to do so may result in the owner being cited;

iv. If the TRU or TRU gen set is operated in California, the owner will be responsible at a future date for the engine meeting the ULETRU in-use standard based on the effective model year of the engine, in accordance with subsection (e)(1)(B) .

(C) **Replacements Due to Failures.**

1. If a VDECS fails within its warranty period, the owner/operator of the TRU or TRU gen set must replace it with the same VDECS or a higher verification classification level, if available.

2. If a VDECS fails outside its warranty period and a higher verification classification level VDECS is available, then the owner/operator of the TRU or TRU gen set shall upgrade to the highest level VDECS required under paragraphs (e)(1)(A)1. and (e)(1)(A)2. that is determined to be cost-effective by the Executive Officer.

(D) **In-Use Recordkeeping and Reporting.** In-use recordkeeping and reporting shall be completed by the operator in accordance with the requirements of subsection (f)(1).

(E) **ARB Identification Numbering Requirements**. Identification numbers will be issued to help expedite the inspection procedure and prevent shipping delays.

1. California-based TRUs and TRU gen sets:

a. On or before January 31, 2009, owner/operators of all California-based TRUs and TRU gen sets subject to this regulation shall apply for an ARB identification number for all California-based TRUs or TRU gen sets operated by the operator by submitting an application that includes the information listed below.

I. Operator name, address, and contact information for the responsible official (e.g. phone number, email address, fax number).

II. Owner name, address, and contact information (if other than operator).

III. TRU or TRU gen set make, model, model year, and serial number.

IV. TRU engine make, model, model year, and serial number.

V. Terminal or terminals that the TRU-equipped truck or trailer is assigned to, with address and contact information.

VI. Other associated identification numbers, which may include (as applicable):

i. Vehicle Identification Number (VIN) of the TRU-equipped truck or trailer.

ii. Vehicle license number of the TRU-equipped truck or trailer.

iii. Railcar recording mark and car number.

iv. Shipping container number (for TRU-equipped shipping containers only).

v. Company equipment number (if any).

VII. Compliance status with paragraph (e)(1)(A) requirements. If compliance not as-yet required, mark N/A.

i. Date when compliance was achieved.

ii. What performance standard was met (e.g. LETRU or ULETRU).

iii. How compliance was achieved (e.g. new compliant TRU, TRU engine replacement, or description of VDECS that was used).

iv. Identify who did the installation work (if applicable).

b. Applications shall be submitted by one of the following methods:

I. Mail or deliver a physical report to ARB at the address listed immediately below:

California Air Resources Board
Stationary Source Division (TRU)
P.O. Box 2815
Sacramento, CA 95812

II. Electronically submit through ARB's web site. The web address will be identified in an advisory.

c. TRUs and TRU gen sets added to an operator's TRU operations after January 31, 2009 shall be brought into compliance with subsection

(e)(1)(E). An application shall be submitted to ARB within 30 days of the unit entering the operator's control:

I. Requesting an ARB I.D. number for a new TRU or TRU gen set that was not previously numbered, or

II. Requesting a change in owner or operator (or other pertinent application information) for used equipment that already has an ARB I.D. number.

d. Failure to apply or submittal of false information is a violation of state law subject to civil penalty.

e. On or before February 1, 2009, the Executive Officer shall begin issuing identification numbers to TRU and TRU gen set operators for each unit based in California for which a complete application has been filed. The number will include a 2-digit prefix for model year (e.g. 2001 model year would have a prefix 01); a 6-digit serial number; a check-digit, and a letter indicating compliance status with in-use performance standards (either "L" or "U"). In the event that an operator applies for an early compliance certificate in accordance with subsection (e)(1)(F), ARB will also issue a certificate which acknowledges early compliance per (e)(1)(F)3.

f. Within 30 days of receipt of the ARB-issued identification number, owner/operators shall permanently affix or paint the identification number on the TRU or TRU gen set chassis housing in clear view according to the following specification:

I. The ARB identification number shall be preceded by the letters "**ARB**".

II. Letters and numbers shall contrast sharply in color with the color of the background surface on which the letters are placed.

III. The location of the I.D. number shall be as follows:

i. Truck and trailer TRUs - both sides of TRU chassis housing.

ii. Rail car and shipping container TRUs– both sides of the TRU.

iii. TRU gen sets – both sides of gen set housing.

IV. Letters and numbers shall be readily legible during daylight hours, from a distance of 50 feet (15.24 meters) while unit is stationary.

V. Marking shall be kept maintained in a manner that retains the legibility required by the subparagraph immediately above.

2. Non-California-based TRUs and TRU Gen Sets:

a. Operators of non-California-based TRUs and TRU gen sets may voluntarily apply for ARB identification numbers for TRUs that are based outside of California but operate within California during the normal course of business. Non-California-based operators may voluntarily submit the same application information listed above in subparagraph (e)(1)(E)1.a., above, using the same methods of submittal listed in subparagraph (e)(1)(e)1.b., above. Upon application approval, ARB would issue identification numbers to the operator in accordance with subparagraph (e)(1)(E)1.e., above. The non-California-based operator would then permanently affix or paint the identification number on the TRU or TRU gen set chassis in clear view, in accordance with (e)(1)(E)1.f., above.

(F) **Early Compliance with LETRU In-Use Performance Standards**.

1. For 2002 and older MY TRU and TRU gen set engines, operators or owners that meet the LETRU in-use performance standard earlier than required in paragraph (e)(1)(B) may apply to the Executive Officer for a delay in the ULETRU in-use performance standard. Except as provided below, early compliance would be achieved through any of the options available in paragraph (e)(1)(A).
   a. This delay would not be available to the operator or owner if the engine manufacturer of the replacement engine is using the early compliance with engine emissions standards in U.S. EPA's Averaging, Banking, and Trading Program (or California's equivalent program).

   b. Early compliance is conditioned upon real emission reductions (refer to definition in sub section (d)) occurring earlier than the applicable compliance deadline.

   c. This delay may not be available to the operator or owner if public funds were used for early compliance. The applicant shall disclose whether public funds were used for any portion of early compliance and what program the funding came from.

2. Early LETRU compliance with real emission reductions would allow specific units to delay compliance with ULETRU in-use performance standards by up to three years, according to the rounding conventions and examples listed below.

a. Each year of early compliance with the LETRU in-use performance standards would be rewarded with 1 year delay in the ULETRU in-use performance standard.

I. One full year early compliance qualifies for one full year delay in meeting ULETRU compliance.

II. Two full years early compliance qualifies for two full years delay in meeting ULETRU compliance.

III. Three full years early compliance qualifies for three full years delay in meeting ULETRU compliance.

b. A partial year of early LETRU compliance would be rounded to the nearest full year for the delayed ULETRU requirements.

I. Early LETRU compliance of 183 days or more in a calendar year would count toward a one year ULETRU delay.

II. Early LETRU compliance of 182 days or less in a calendar year would not count toward a ULETRU delay.

3. Upon receipt of an application to delay ULETRU compliance, the Executive Officer shall determine if the application demonstrates early compliance with LETRU in-use performance standards in accordance with subsection (e)(1)(F)1., and if the application is approved, shall delay the in-use ULETRU compliance date for specific TRUs and TRU gen sets operating in California in accordance with subparagraph (e)(1)(F)2.

4. Upon approval of the application, ARB shall issue a certificate and ARB identification number in accordance with subsection (e)(1)(E)1.e. which acknowledges early compliance with LETRU requirements and discloses the number of years delay granted, and resulting ULETRU compliance date.

5. The operator shall maintain a legible copy of the certificate in a water-tight sleeve mounted inside the TRU or TRU gen set chassis housing. The operator shall paint the identification number in clear view in accordance with subsection (e)(1)(E)1.f. on the specific TRU or TRU gen set that was granted the compliance extension.

(2) **Fuel Requirements.**

(A) **Operators Choosing to Use Alternative Diesel Fuels.** Operators choosing to use alternative diesel fuels in compression ignition TRU and TRU gen set engines to meet the requirements of subsection (e)(1) shall:

1. Maintain records in accordance with subsection (f)(1)(B) of this regulation.

2. Use only fuel that is a VDECS alternative diesel fuel that contains no conventional diesel or CARB diesel fuel in TRUs or TRU gen sets operated in California.

3. Permanently affix a label in clear view near the fill spout that identifies the proper fuel that is required to be in compliance.

4. In the event that the operator decides to revert to using conventional diesel or CARB diesel fuel, the operator shall comply with the requirements of subsection (e)(1) within 10 days of discontinuation of alternative diesel fuel use. Within 10 days of discontinuation, the operator shall notify the Executive Officer in writing of this change in fuel use and shall include an update to any ARB I.D. number application or annual report submitted to comply with subsections (e)(1)(E), (e)(1)(F), or (f)(1).

(B) **Operators that Retrofit TRUs or TRU Gen Sets with a VDECS**. Operators that retrofit TRUs or TRU gen sets with a VDECS that requires certain fuel properties to be met in order to achieve the required PM reduction or PM emissions shall only fuel the subject TRU or TRU gen set with fuel that meets these specifications when operating in the state of California. In addition, operators that choose a VDECS that requires certain fuel properties to be met in order to prevent damage to the VDECS or an increase in toxic air contaminants, other harmful compounds, or in the nature of the emitted PM shall only fuel the subject TRU or TRU gen set with fuel that meets these specifications.

(f) **Monitoring, Recordkeeping, and Reporting Requirements.**

(1) **TRU and TRU Gen Set Operator Recordkeeping and Reporting**.

(A) **Operator Reporting**.

1. All operators subject to this regulation shall submit an Operator Report to ARB by January 31, 2009 that shall include the following information:

   a. Operator name, address, and contact information for the responsible official (phone number, email address, fax number).

   b. List of all terminals owned or leased by the operator located within California, with address, phone number, and terminal contact name.

c. TRU and TRU gen set inventory information for each TRU and TRU gen set based in California that is owned or leased by the operator:

I. TRU or gen set make, model, model year, and serial number.

II. TRU owner, and if other than operator, owner name, address, and contact.

III. Engine make, model, model year, and serial number.

IV. Terminal(s) that the TRU is assigned to.

V. ARB TRU or TRU gen set identification number, if already issued. If the ARB identification number has not been issued or there has been a change in the other identification numbers listed below since the prior annual report, then provide the following identification numbers (as applicable):

i. Vehicle Identification Number.

ii. Vehicle license number.

iii. Railcar recording mark and car number.

iv. Shipping container number (for TRU-equipped shipping containers only):

v. Company equipment number.

VI. Compliance status with paragraph (e)(1)(A) requirements.

2. The Operator Report shall be updated within 30 days when changes to any of the above operator information occur.

a. Operator Reports shall be submitted by one of the following methods:

I. Mail or deliver a physical report to ARB at the address listed immediately below:

California Air Resources Board
Stationary Source Division (TRU)
P.O. Box 2815
Sacramento, CA 95812

II. Electronically submit through ARB's web site. The web address will be identified in an advisory.

3. Failure to report or submittal of false information is a violation of state law subject to civil penalty.

(B) **Alternative Diesel Fuel Use and Fuel Additive Recordkeeping and Reporting**.

1. Operators that choose a compliance pathway that involves the use of alternative diesel fuel in accordance with subparagraph (e)(1)(A)3.d. (e.g. B100 biodiesel fuel or ultra-low-aromatic synthetic diesel fuel) and/or a VDECS that includes the use of a fuel additive (e.g. fuel-borne catalyst) shall maintain records that document exclusive use of the chosen fuel or additive for each affected CI engine and hours of operation. Appropriate records would be copies of receipts or invoices of appropriate fuel and/or fuel additive and daily operating hour logs.

2. Records shall be kept available for a minimum of three (3) years and shall be compiled and made available to the ARB upon request.

3. Failure to keep records or submittal of false information is a violation of state law subject to civil penalty.

(2) **Facility Monitoring, Recordkeeping, and Reporting**.

(A) **Facility Reporting**. All facilities subject to this subsection shall submit a Facility Report to ARB by January 31, 2006, containing the following information, as of December 31, 2005:

1. Contact information for the facility's responsible official.

2. Provide all North American Industrial Classification System codes (NAICS) applicable to the facility.

3. The number of loading dock doors serving refrigerated storage space.

4. The number of square feet of refrigerated storage space.

5. The number of TRUs or TRU gen sets under facility control by model year and horsepower category.

6. The number of refrigerated trucks, trailers, shipping containers, or railcars leased or rented.

7. The total annual TRU engine operating hours for all TRUs or TRU gen sets under facility control during 2005 (e.g. total TRU engine operating time for both on-road and off-road operations).

8. The average weekly number of inbound refrigerated trucks, trailers, shipping containers, and railcars delivering goods to the facility during 2005, calculated by dividing the annual total inbound refrigerated loads by 52.

9. The average weekly number of outbound refrigerated trucks, trailers, shipping containers and railcars delivering goods from the facility during 2005, calculated by dividing the annual total outbound refrigerated loads by 52.

10. The average total number of hours per week that outbound TRU or TRU gen set engines operate while at the facility during 2005. Average TRU or TRU gen set engine operating time at facility for outbound refrigerated loads may be used if the result is representative of the outbound TRU or TRU gen set operations at facilities, as determined by the Executive Officer. Average values would be determined for outbound loads based on recordkeeping, conducted in accordance with subparagraph (f)(2)(B)2., and applied to the total annual number of refrigerated outbound loads, and then weekly averages calculated as follows: Average TRU or TRU gen set engine operating time per outbound refrigerated load multiplied by the total annual number of outbound loads, divided by 52 weeks equals the average total number of hours per week that outbound TRU or TRU gen set engines operate while at the facility.

11. The average total number of hours per week that inbound TRU or TRU gen set engines operate while at the facility during 2005. Average TRU or TRU gen set engine operating time at facility for inbound refrigerated loads may be used if the result is representative of the inbound TRU or TRU gen set operations at facilities, as determined by the Executive Officer. Average values would be determined for inbound loads based on recordkeeping, conducted in accordance with subparagraph (f)(2)(B)2., and applied to the total annual number of refrigerated inbound loads, and then weekly averages calculated as follows: Average TRU or TRU gen set engine operating time per inbound refrigerated load multiplied by the total annual number of inbound loads, divided by 52 weeks equals the average total number of hours per week that inbound TRU or TRU gen set engines operate while at the facility.

12. The number of refrigerated trailers (as defined) that are used at the facility for cold storage, the total annual number of hours of TRU engine operation associated with these refrigerated trailers, and the total annual number of hours of operation using electric standby associated with these refrigerated trailers.

(B) **Recordkeeping.**

1. Recordkeeping that substantiates the information reported in the Facility Report shall be maintained and shall be compiled and made available to State inspectors upon request for a minimum of three (3) years.

2. The Executive Officer may approve alternative recordkeeping and calculation procedures for determining the average weekly hours of TRU engine operation at a facility for inbound and outbound refrigerated loads, provided the Executive Officer finds that the alternative procedures meet the intent of subparagraph (f)(2).

(C) **Facility Report Submittals**. Facility Reports shall be submitted by one of the following methods:

1. Mail or deliver a physical report to ARB at the address listed immediately below:

   California Air Resources Board
   Stationary Source Division (TRU)
   P.O. Box 2815
   Sacramento, CA 95812

2. Electronically submit through ARB's web site. The web address will be identified in an advisory.

(D) **Failure to report or submittal of false information**. Failure to report or submittal of false information is a violation of state law subject to civil penalty.

(3) Original Equipment Manufacturer Reporting

(A) Current Production Reports: Beginning [30 days after the effective date of the amendment], and by January 1st and June 30th of each calendar year thereafter, TRU and TRU gen set original equipment manufacturers shall provide to ARB the information listed below for all TRUs and TRU gen sets that will be manufactured and marketed for sale in the following markets: California, United States, Canada, and Mexico. The following data shall be provided for TRUs and TRU gen sets that will be produced during the six-month period following the report due date for each market area:

1. TRU or TRU genset manufacturer and model name, as it appears on the unit label; and

2. The following engine information for each TRU or TRU gen set model:

a. Engine manufacturer;
b. Engine model, as it appears on the engine emissions label;
c. Engine model, as it appears on the serial number label, if different;
d. Engine Family;
e. Rated horsepower and rated speed;
f. Displacement (liters);
g. Exhaust Emissions Control System
h. Tier standard met
i. ARB's Executive Order that the engines are manufactured under

3. Current Production Reports shall be submitted by one of the following methods:

a. Mail or deliver a physical report in electronic format to ARB at the address listed immediately below:

California Air Resources Board
Stationary Source Division (TRU)
1001 I Street
Sacramento, CA 95814

b. Electronically submit to ARB's TRU Program via email at: tru@arb.ca.gov

4. Original equipment manufacturers that produce less than 100 TRUs or TRU gen sets per calendar year may submit Current Production Year Reports within ten days of installing the first engine in a production run of a new model.

(B) Prior Production Reports:

1. Prior unit and engine data. TRU and TRU gen set original equipment manufacturers shall:

a. By [30 days after the effective date of this amendment], provide a production report to ARB with the information listed below in subparagraph 3 for the previous five calendar years for each TRU or TRU gen set produced for sale in California, North America, Canada, and Mexico; or

b. If the TRU or TRU gen set original equipment manufacturer elects not to provide the information in subparagraph (f)(3)(B)1.a., then within 30 days of any request from ARB, the TRU or TRU gen set original equipment manufacturer shall provide a production report to ARB with the information listed below in subparagraph 3 for the unit and engine serial numbers provided in ARB's request.

2. Monthly production reports. TRU and TRU gen set original equipment manufacturers shall either:

   a. Beginning [30 days after the effective date of this amendment], provide by the 15th of each calendar month, a monthly production report to ARB with the information listed below in subparagraph 3 for the previous calendar month for each TRU or TRU gen set produced for sale in California, North America, Canada, and Mexico; or

   b. As an alternative, the TRU or TRU gen set original equipment manufacturer may request reporting that is equivalent to and at least as effective as subparagraph (f)(3)(B)2.a., immediately above, subject to Executive Officer approval.

3. Original equipment manufacturers shall provide the following information for each TRU and TRU gen set:
   a. TRU or TRU gen set model name, as it appears on the unit label
   b. TRU or TRU gen set serial number
   c. Engine manufacturer
   d. Engine model, as it appears on the engine emissions label
   e. Engine model, as it appears on the serial number label, if different;
   f. Engine Family
   g. Engine serial number
   h. Rated horsepower and rated speed
   i. Tier standard met

4. Prior Production Reports and Flexibility Engine Reports shall be submitted on CD or DVD to:

   California Air Resources Board
   Stationary Source Division (TRU)
   1001 I Street
   Sacramento, CA 95814

(C) Confidentiality of current and prior production reports. TRU and TRU gen set original equipment manufacturers may designate current and prior production report information as confidential or trade secret, and such information will be handled in accordance with title 17, CCR, section 91000.

(g) **Prohibitions.**

(1) No person who is engaged in this State in the business of selling to an ultimate purchaser, or renting or leasing new or used TRUs or TRU gen sets, including, but not limited to, manufacturers, distributors, and dealers, shall intentionally or negligently import, deliver, purchase, receive, or otherwise acquire a new or

used TRU or TRU gen set engine that does not meet the performance requirements or alternatives set forth in section (e)(1) above.

(2) No person who is engaged in this State in the business of selling to an ultimate purchaser new or used TRU or TRU gen set engines, including, but not limited to, manufacturers, distributors, and dealers, shall sell, or offer to sell, to an ultimate purchaser who is a resident of this State or a person that could reasonably be expected to do business in this State a new or used TRU or TRU gen set engine that does not meet the performance requirements or alternatives set forth in section (e)(1) above.

(3) No person who is engaged in this State in the business of renting or leasing new or used TRU or TRU gen set engines, including, but not limited to, manufacturers, distributors, and dealers, shall lease, offer to lease, rent, or offer to rent, in this state any new or used TRU or TRU gen set engine that does not meet the performance requirements or alternatives set forth in section (e)(1) above.

(4) Operators of affected facilities and operators of affected TRUs and TRU gen sets are prohibited from taking action to divert affected TRUs to alternative staging areas in order to circumvent the requirements of this section.

(h) **Penalties.**

(1) All persons, as defined in section 19 of the Health and Safety Code, found to be in violation of title 13, CCR, section 2477 may be cited and subject to the penalty provisions set forth in Health and Safety Code sections 39674, 39675, 42400 et seq., 42402 et seq., and 42410.

NOTE: Authority cited: sections 39600, 39601, 39618, 39658, 39659, 39666, 39667, 39674, 39675, 42400 ~~et seq.~~, 42400.1, 42400.2, 42400.3.5, 42402 ~~et seq.~~, 42402.2, 42410, 43013, 43018, California Health and Safety Code. Reference: sections 39618, 39650, 39658, 39659, 39666, 39667, 39674, 39675, 42400, ~~et seq.~~ 42400.1, 42400.2, 42400.3.5, 42402 ~~et seq.~~, 42402.2, 42410, 40717.9, 43013, and 43018.

APPENDIX B

PROPOSED TRU ATCM 2010 AMENDMENTS IN-USE COMPLIANCE COST ESTIMATES

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Proposed TRU ATCM 2010 Amendments In-Use Compliance Cost Estimates — Matrix #1

8/25/2010

This Matrix calculates the incremental in-use cost of compliance for TRUs and TRU gen sets ("TRUs") for the proposed change from ULETRU to LETRU for 2003 MY and Affected 2004 MY engines
It assumes 30% of the annual TRU population will retrofit and multiplies them by the capital and annual costs for the compliance technology shown.
The capital costs of retrofit with Level 2 VDECS are amortized over an assumed seven-year useful life, the capital costs of retrofit with Level 3 VDECS are amortized over an assumed ten-year life and all annual costs are converted to constant year (2010) dollars using standard present worth analysis techniques.
The proposed amendment for change from ULETRU to LETRU is shown below in two steps, the first which describes the incremental cost savings for LETRU expected in-use compliance costs for the surviving TRUs in 2010 and 2011, and the second which describes the capital cost for ULETRU application for the surviving TRUs in 2017 and 2018.
In each scenario, on a year-by-year basis, population figures for each engine category are multiplied by a compliance cost component (annualized capital or annual maintenance), these products are then summed to determine the compliance cost for a given year.
Maintenance costs are assumed to be unchanged from original economic analysis, therefore incremental costs are $0

Interest Rates Used for Present Worth Analysis

Capital Costs	0.05	Real interest rate, which is a 7% nominal rate minus an assumed 2% inflation rate
Annual Costs	0.05	Real interest rate, which is a 7% nominal rate minus an assumed 2% inflation rate

Assumptions:	7-year useful life for compliance technology; capital cost is amortized over a 7-year period	0.1728
	30% of surviving TRU population uses VDECS as a compliance scenario	0.3

Incremental-Cost Savings: Assume ULETRU Requirement is changed to LETRU for 2003 MY and Affected 2004 MY

In-Use Compliance Technology Used

	Inc. Cap. Cost Inc Ann. Cost - TRUs		Inc. Ann. Cost - Gen Sets
Inc. LETRU vs ULETRU Engine <25 Hp	$2,350	$0	$0
Inc. LETRU vs ULETRU Engine > 25 Hp	$1,296	$0	$0

Engine Population Category <25 Hp

Engine Model Year	Calendar Year	< 15hp	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	25-50 hp Gen Sets CA-based	25-50 hp Gen Sets Out-of-State	25-50 hp Reefer Railcar	Total 25-50 hp (Info Only)	Total (this year)	Annualized Incremental Capital Cost Savings[1]
2003	2010	121	45	0	0	0	0	0	0	166	$406
2004	2011	133	40	0	0	0	0	0	0	172	$406
								Total		338	

	Capital Cost Subtotal		Capital Cost Subtotal	Capital Cost Subt
	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	
2010	$49,095			
2011	$49,095	$53,846		
2012	$49,095	$53,846		
2013	$49,095	$53,846		
2014	$49,095	$53,846		
2015	$49,095	$53,846		
2016	$49,095	$53,846		
2017		$53,846		

	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	
2010	$18,152		$0	$0
2011	$18,152	$16,081	$0	$0
2012	$18,152	$16,081	$0	$0
2013	$18,152	$16,081	$0	$0
2014	$18,152	$16,081	$0	$0
2015	$18,152	$16,081	$0	$0
2016	$18,152	$16,081	$0	$0
2017		$16,081		

[1] This is the annualized capital cost savings of retrofitting with Level 2 instead of Level 3. The interest rate used is given at the top of this matrix
[2] This is the annual cost of maintaining the Level 2 VDECS over and above that for Level 3 VDECS

Engine Population Category >25 Hp

Engine Model Year	Calendar Year	< 15hp	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	25-50 hp Gen Sets CA-based	25-50 hp Gen Sets Out-of-State	25-50 hp Reefer Railcar	Total 25-50 hp (Info Only)	Total (this year)	Annualized Incremental Capital Cost Savings[1]
2003	2010	0	0	611	202	88	0	45	946	946	$224

	Capital Cost Subtotal		Capital Cost Subtotal	Capital Cost Subt
	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	
2010	$0			
2011	$0			
2012	$0			
2013	$0			
2014	$0			
2015	$0			
2016	$0			

	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	
2010	$0		$136,817	$45,113
2011	$0		$136,817	$45,113
2012	$0		$136,817	$45,113
2013	$0		$136,817	$45,113
2014	$0		$136,817	$45,113
2015	$0		$136,817	$45,113
2016	$0		$136,817	$45,113

[1] This is the annualized capital cost savings of retrofitting with Level 2 instead of Level 3. The interest rate used is given at the top of this matrix
[2] This is the annual cost of maintaining the Level 2 VDECS over and above that for Level 3 VDECS.

Matrix #1

otal	Capital Cost Subtotal		Capital Cost Subtotal		Capital Cost Subtotal			Capital Cost Subtotal			Maintenance Cost Subtotal			Maintenance Cost Subtotal			Total
	25-50 hp Gen Sets CA-based		25-50 hp Gen Sets Out-of-State		25-50 hp Reefer Railcars			Incremental Capital Cost Savings Sub-Total	NPV Incremental Capital Cost Savings Sub-Total (2010 $)	Annual Mtce Cost[2] <25hp				Maint Cost Sub-Total	NPV Maintenance Cost Sub-Total (2010 $)	Total Incremental Annual In-Use Cost Savings	NPV Total Incremental Annual In-Use Cost Savings (2010 $)	
2010	$0	2010	$0	2010	$0	2010		$67,247	$67,247	$0	2010	$0	2010	$0	$0	$67,247	$67,247	
2011	$0	2011	$0	2011	$0	2011		$137,174	$130,642	$0	2011	$0	2011	$0	$0	$137,174	$130,642	
2012	$0	2012	$0	2012	$0	2012		$137,174	$124,421	$0	2012	$0	2012	$0	$0	$137,174	$124,421	
2013	$0	2013	$0	2013	$0	2013		$137,174	$118,496	$0	2013	$0	2013	$0	$0	$137,174	$118,496	
2014	$0	2014	$0	2014	$0	2014		$137,174	$112,853	$0	2014	$0	2014	$0	$0	$137,174	$112,853	
2015	$0	2015	$0	2015	$0	2015		$137,174	$107,479	$0	2015	$0	2015	$0	$0	$137,174	$107,479	
2016	$0	2016	$0	2016	$0	2016		$137,174	$102,361	$0	2016	$0	2016	$0	$0	$137,174	$102,361	
						2017		$69,927	$49,696	$0	2017	$0	2017	$0	$0	$69,927	$49,696	
									$813,195				Total Incremental Cost Savings for <25 Hp Engine				$813,195	

otal	Capital Cost Subtotal		Capital Cost Subtotal		Capital Cost Subtotal			Capital Cost Subtotal			Maintenance Cost Subtotal			Maintenance Cost Subtotal			Total
	25-50 hp Gen Sets CA-based		25-50 hp Gen Sets Out-of-State		25-50 hp Reefer Railcars			Incremental Capital Cost Savings Sub-Total	NPV Incremental Capital Cost Savings Sub-Total (2010 $)	Annual Mtce Cost[2] <25hp				Maint Cost Sub-Total	NPV Maintenance Cost Sub-Total (2010 $)	Total Incremental Annual In-Use Cost Savings	NPV Total Incremental Annual In-Use Cost Savings (2010 $)	
2010	$19,603	2010	$0	2010	$10,070	2010		$211,603	$211,603	$0	2010	$0	2010	$0	$0	$211,603	$211,603	
2011	$19,603	2011	$0	2011	$10,070	2011		$211,603	$201,526	$0	2011	$0	2011	$0	$0	$211,603	$201,526	
2012	$19,603	2012	$0	2012	$10,070	2012		$211,603	$191,930	$0	2012	$0	2012	$0	$0	$211,603	$191,930	
2013	$19,603	2013	$0	2013	$10,070	2013		$211,603	$182,790	$0	2013	$0	2013	$0	$0	$211,603	$182,790	
2014	$19,603	2014	$0	2014	$10,070	2014		$211,603	$174,086	$0	2014	$0	2014	$0	$0	$211,603	$174,086	
2015	$19,603	2015	$0	2015	$10,070	2015		$211,603	$165,796	$0	2015	$0	2015	$0	$0	$211,603	$165,796	
2016	$19,603	2016	$0	2016	$10,070	2016		$211,603	$157,901	$0	2016	$0	2016	$0	$0	$211,603	$157,901	
									$1,285,632				Total NPV Incremental Cost Savings for <25 Hp Engine				$1,285,632	
													Total NPV Incremental Cost Savings for LETRU vs ULETRU				$2,098,827	

Matrix #1

Cost: Apply ULETRU to Residual TRU population of 2003 MY and Affected 2004 MY in 2017 and 2018

Assumptions		
	10-year useful life for compliance technology; capital cost is amortized over a 10-year per	0.1295
	30% of surviving TRU population uses VDECS as a compliance scenario	0.3

In-Use Compliance Technology Used

	Inc. Cap. Cost Inc Ann. Cost - TRUs	Inc. Ann. Cost - Gen Sets
ULETRU Engine <25 Hp	$6,000 $0	$0
ULETRU Engine >25 Hp	$6,000 $0	$0

Engine Population Category <25 Hp

Engine Model Year	Calendar Year	< 15hp	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	25-50 hp Gen Sets CA-based	25-50 hp Gen Sets Out-of-State	25-50 hp Reefer Railcar	Total 25-50 hp (Info Only)	Total (this year)	Annualized Capital Cost[1]
2003	2017	38	14	0	0	0	0	0	0	52	$777
2004	2018	40	14	0	0	0	0	0	0	54	$777
									Total	106	

Capital Cost Subtotal

	< 15hp	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State
2017	$29,371	2017 $10,956	2017 $0	2017 $0
2018	$29,371 $30,769	2018 $10,956 $11,189	2018 $0	2018 $0
2019	$29,371 $30,769	2019 $10,956 $11,189	2019 $0	2019 $0
2020	$29,371 $30,769	2020 $10,956 $11,189	2020 $0	2020 $0
2021	$29,371 $30,769	2021 $10,956 $11,189	2021 $0	2021 $0
2022	$29,371 $30,769	2022 $10,956 $11,189	2022 $0	2022 $0
2023	$29,371 $30,769	2023 $10,956 $11,189	2023 $0	2023 $0
2024	$29,371 $30,769	2024 $10,956 $11,189	2024 $0	2024 $0
2025	$29,371 $30,769	2025 $10,956 $11,189	2025 $0	2025 $0
2026	$29,371 $30,769	2026 $10,956 $11,189	2026 $0	2026 $0
2027	$30,769	2027 $11,189	2027 $0	2027 $0

Engine Population Category >25 Hp

Engine Model Year	Calendar Year	< 15hp	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State	25-50 hp Gen Sets CA-based	25-50 hp Gen Sets Out-of-State	25-50 hp Reefer Railcar	Total 25-50 hp (Info Only)	Total (this year)	Annualized Capital Cost[1]
2003	2017	0	0	191	63	28	0	14	296	296	$777

Capital Cost Subtotal

	< 15hp	15-25 hp	25-50 hp CA-based	25-50 hp Out-of-State
2017	$0	2017 $0	2017 $148,718	2017 $49,184
2018	$0	2018 $0	2018 $148,718	2018 $49,184
2019	$0	2019 $0	2019 $148,718	2019 $49,184
2020	$0	2020 $0	2020 $148,718	2020 $49,184
2021	$0	2021 $0	2021 $148,718	2021 $49,184
2022	$0	2022 $0	2022 $148,718	2022 $49,184
2023	$0	2023 $0	2023 $148,718	2023 $49,184
2024	$0	2024 $0	2024 $148,718	2024 $49,184
2025	$0	2025 $0	2025 $148,718	2025 $49,184
2026	$0	2026 $0	2026 $148,718	2026 $49,184

[1] This is the annualized capital costs of retrofitting with Level 3 VDECS. The interest rate used is given at the top of this matrix.
[2] This is the annual cost of maintaining the Level 3 VDECS.

Matrix #1

otal	Capital Cost Subtotal		Capital Cost Subtotal		Capital Cost Subtotal		Capital Cost Subtotal			Maintenance Cost Subtotal			Maintenance Cost Subtotal			
	25-50 hp Gen Sets CA-based		25-50 hp Gen Sets Out-of-State		25-50 hp Reefer Railcars		Capital Cost Sub-Total	NPV Capital Cost Sub-Total (2010 $)	Annual Mtce Cost				Maint Cost Sub-Total	NPV Maintenance Cost Sub-Total (2010 $)	Total Annual In-Use Cost	NPV Total Annual In-Use Cost (2010 $)
	2017	$0	2017	$0	2017	$0	2017	$40,328	$28,659	$0	2017	$0	2017	$0	$0	$40,328	$28,659
	2018	$0	2018	$0	2018	$0	2018	$82,284	$55,693	$0	2018	$0	2018	$0	$0	$82,284	$55,693
	2019	$0	2019	$0	2019	$0	2019	$82,284	$53,041	$0	2019	$0	2019	$0	$0	$82,284	$53,041
	2020	$0	2020	$0	2020	$0	2020	$82,284	$50,515	$0	2020	$0	2020	$0	$0	$82,284	$50,515
	2021	$0	2021	$0	2021	$0	2021	$82,284	$48,110	$0	2021	$0	2021	$0	$0	$82,284	$48,110
	2022	$0	2022	$0	2022	$0	2022	$82,284	$45,819	$0	2022	$0	2022	$0	$0	$82,284	$45,819
	2023	$0	2023	$0	2023	$0	2023	$82,284	$43,637	$0	2023	$0	2023	$0	$0	$82,284	$43,637
	2024	$0	2024	$0	2024	$0	2024	$82,284	$41,559	$0	2024	$0	2024	$0	$0	$82,284	$41,559
	2025	$0	2025	$0	2025	$0	2025	$82,284	$39,580	$0	2025	$0	2025	$0	$0	$82,284	$39,580
	2026	$0	2026	$0	2026	$0	2026	$82,284	$37,695	$0	2026	$0	2026	$0	$0	$82,284	$37,695
	2027	$0	2027	$0	2027	$0	2027	$41,958	$19,306	$0	2027	$0	2027	$0	$0	$41,958	$19,306
									$462,616						Total NPV Capital Costs for <25 Hp Engine ($2010)	$462,616

	25-50 hp Gen Sets CA-based		25-50 hp Gen Sets Out-of-State		25-50 hp Reefer Railcars		Capital Cost Sub-Total	NPV Capital Cost Sub-Total (2010 $)	Annual Mtce Cost				Maint Cost Sub-Total	NPV Maintenance Cost Sub-Total (2010 $)	Total Annual In-Use Cost	NPV Total Annual In-Use Cost (2010 $)
	2017	$21,445	2017	$0	2017	$10,956	$230,303	$163,672	$0	2017	$0	2017	$0	$0	$230,303	$163,672
	2018	$21,445	2018	$0	2018	$10,956	$230,303	$155,878	$0	2018	$0	2018	$0	$0	$230,303	$155,878
	2019	$21,445	2019	$0	2019	$10,956	$230,303	$148,455	$0	2019	$0	2019	$0	$0	$230,303	$148,455
	2020	$21,445	2020	$0	2020	$10,956	$230,303	$141,386	$0	2020	$0	2020	$0	$0	$230,303	$141,386
	2021	$21,445	2021	$0	2021	$10,956	$230,303	$134,653	$0	2021	$0	2021	$0	$0	$230,303	$134,653
	2022	$21,445	2022	$0	2022	$10,956	$230,303	$128,241	$0	2022	$0	2022	$0	$0	$230,303	$128,241
	2023	$21,445	2023	$0	2023	$10,956	$230,303	$122,134	$0	2023	$0	2023	$0	$0	$230,303	$122,134
	2024	$21,445	2024	$0	2024	$10,956	$230,303	$116,319	$0	2024	$0	2024	$0	$0	$230,303	$116,319
	2025	$21,445	2025	$0	2025	$10,956	$230,303	$110,780	$0	2025	$0	2025	$0	$0	$230,303	$110,780
	2026	$21,445	2026	$0	2026	$10,956	$230,303	$105,504	$0	2026	$0	2026	$0	$0	$230,303	$105,504
								$1,327,023							Total NPV Capital Costs for >25 Hp Engine ($2010)	$1,327,023
															Total NPV Capital Costs for ULETRU Compliance ($201	$1,789,638
															Total NPV Incremental Cost Savings less Capital Costs for ULETRU Compliance ($2010)	$309,188

Matrix #1

Cost: OEM Reporting Costs

8/31/2010

Cost of OEM reporting for flexibility engines

Assumptions:

1. One-time report
2. Tasks include pulling data out of existing databases, compiling, conducting QA/QC checks, management review, and submittal on CD or by email
3. Cost based on Thermo King's (TK) Paul Barbaro's statement that they had 3 people working for a week and a half to put the records together and QA/QC them
4. Carrier Transicold (CT) would have a similar cost per unit, applied to their flexibility engine use
5. Fully burdened labor rate of $100 per hour includes wages, benefits, IT support, and management review and approval

	3	people
	1.5	weeks
	40	hour/week
$	100	per hour labor rate
$	18,000	TK Cost
	36000	Number of TK flex engines
$	0.50	cost per unit
	1000	Number of CT flex engines
$	500	CT cost
$	18,500	Total cost for TK and CT flex engine reporting

Cost of OEM Reporting: Current Production Report

Assumptions:

1. On-going semi-annual report
2. Work tasks include pulling up unit and engine information, entering data it into a spreadsheet, management check/review, electronic submittal on CD or by email
3. TK has about 5 models to compile data on.
4. CT has about 10 models to compile data on.
5. Zanotti Transblock (ZT) has about 2 models to compile data on
6. No other companies will report
7. It takes about one hour per model to complete all tasks.
8. Fully burdened labor rate of $100 per hour includes wages, benefits, IT support, and management review and approval

	2	Number of reports per year
	17	total number of TRU & TRU genset models
	1	hour per model
$	100	per hour labor rate
$	3,400	Annual cost for TK, CT, & ZT

Cost of reporting: Prior Production Report

Assumptions:

1. Initial report for prior years is a one-time report that covers the prior 5 years
2. Ongoing monthly Prior Production Reports cover only the past production period since prior report, but costs for all reports during a year are lumped together for cost estimate
3. Cost per unit is initially similar to that for flexibility engine reporting (similar tasks).
4. Annual TRU and TRU gen set production averages about 10,000 units
5. Reporting will become more automated over time, so cost per unit will decline significantly, offsetting growth in the number of units and the requirement to submit multiple reports per year.

Initial Prior Production Report

	5	years of prior production
	10,000	units per year average for all TRU and TRU generator set manufacturers
$	0.50	Cost per unit
$	25,000	Total cost for Initial Prior Production Years Report

Ongoing monthly Prior Production Reports

	10,000	units per year average for all TRU and TRU generator set manufacturers
$	0.50	Cost per unit
$	5,000	Annual total cost for periodic Prior Production Reports

Incremental Annual Cost Savings (regulation, PM only) 8/25/2010

Proposed Amendments:

Assume ULETRU Requirement is changed to LETRU for 2003 MY and Affected 2004 MY

Apply ULETRU to Residual TRU population of 2003 MY and Affected 2004 MY in 2017 and 2018

Adjustment to Compliance Year for Flexibility Engines

OEM Reporting

Interest rate for 2010 Cost Pmt. Adj. 0.05

Year	ULETRU to LETRU Incremental Emission Increases (tpy)	Flex Engine Adj Incremental Emission Increases (tpy)	Total Incremental Emission Increases (tpy)	<25 Hp Engine Incremental Annual In-Use Equipment Cost Savings (2010 $)	>25 Hp Engine Incremental Annual In-Use Equipment Cost Savings (2010 $)	<25 Hp Engine ULETRU Equipment Cost (2010 $)	>25 Hp Engine Incremental Equipment Cost (2010 $)	Incremental Annual Operating Cost (2010 $)	Net NPV In-Use & Operating Costs = Total Ann. Operating Cost Reduction (2010 $)	Flexibility Adjustment In-Use Cost (2010 $)	Annual OEM Reporting Cost ($)	NPV Annual OEM Reporting Cost (2010 $)	2010 TRU ATCM Amendments Cost Reductions (2010 $)
2010	4.513	9.127	13.640	$67,247	$211,603	$0	$0	$0	$278,849	$18,500	$33,400	$33,400	$226,949
2011	4.348	8.745	13.093	$130,642	$201,526	$0	$0	$0	$332,168	$0	$8,400	$8,000	$324,168
2012	4.081	3.550	7.631	$124,421	$191,930	$0	$0	$0	$316,350	$0	$8,400	$7,619	$308,731
2013	3.654	1.202	4.856	$118,496	$182,790	$0	$0	$0	$301,286	$0	$8,400	$7,256	$294,030
2014	3.220	1.082	4.302	$112,853	$174,086	$0	$0	$0	$286,939	$0	$8,400	$6,911	$280,029
2015	2.681	0.958	3.639	$107,479	$165,796	$0	$0	$0	$273,275	$0	$8,400	$6,582	$266,694
2016	2.086	0.812	2.898	$102,361	$157,901	$0	$0	$0	$260,262	$0	$8,400	$6,268	$253,994
2017	1.437	0.646	2.082	$49,696	$0	$28,659	$163,672	$0	-$142,635	$0	$8,400	$5,970	-$148,605
2018	0.054	0.464	0.517	$0	$0	$55,693	$155,878	$0	-$211,571	$0	$8,400	$5,685	-$217,257
2019	0.000	0.255	0.255	$0	$0	$53,041	$148,455	$0	-$201,496	$0	$8,400	$5,415	-$206,911
2020	0.000	0.144	0.144	$0	$0	$50,515	$141,386	$0	-$191,901	$0	$8,400	$5,157	-$197,058
2021	0.000	0.093	0.093	$0	$0	$48,110	$134,653	$0	-$182,763	$0	$8,400	$4,911	-$187,675
2022	0.000	0.057	0.057	$0	$0	$45,819	$128,241	$0	-$174,060	$0	$8,400	$4,677	-$178,738
2023	0.000	0.036	0.036	$0	$0	$43,637	$122,134	$0	-$165,772	$0	$8,400	$4,455	-$170,226
2024	0.000	0.010	0.010	$0	$0	$41,559	$116,319	$0	-$157,878	$0	$8,400	$4,243	-$162,120
2025	0.000	0.000	0.000	$0	$0	$39,580	$110,780	$0	-$150,360	$0	$8,400	$4,041	-$154,400
2026	0.000	0.000	0.000	$0	$0	$37,695	$105,504	$0	-$143,200	$0	$8,400	$3,848	-$147,048
2027	0.000	0.000	0.000	$0	$0	$18,306	$0	$0	-$18,306	$0	$8,400	$3,665	-$21,971
	26.073	**27.181**	**53.254**	$813,195	$1,285,632	$462,616	$1,327,023	$0	$309,188	$18,500		$128,102	$162,586

APPENDIX C

ACRONYMS

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Appendix C

LIST OF ACRONYMS AND ABBREVIATIONS

$/lb	Dollars per pound
AB	Assembly bill
ARB, or the Board	Air Resources Board
ATCM	Airborne Toxic Control Measure
CCR	California Code of Regulations
DECS	Diesel Emission Control System or Strategy
DPF	Diesel particulate filter
DRRP, or Plan	Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles Risk Reduction Plan
ED	Enforcement Division of ARB
EO	Executive Officer of the Air Resource Board
E/S	Electric standby
g/hp-hr	Grams per horsepower-hour
>	Greater than
≥	Greater than or equal to
H&SC	Health and Safety Code
<	Less than
≤	Less than or equal to
LETRU	Low Emissions Transport Refrigeration Unit
MY	Model year
NMHC	Non-methane hydrocarbons
NO_x	Oxides of nitrogen
O & M	Operation and maintenance
PM	Particulate matter
PTSD	Planning and Technical Support Division of ARB
SSD	Stationary Source Division of ARB
TAC	Toxic air contaminant
tpd	Tons per day
TRU	Transport Refrigeration Unit
TRU OEM	Transport Refrigeration Unit Original Equipment Manufacturer
ULETRU	Ultra-Low Emission Transport Refrigeration Unit
U. S. EPA	United States Environmental Protection Agency
VDECS	Verified Diesel Emission Control Strategy

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 Emissions from Consumer Products, and Method 310, "Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products."

DATE: November 18, 2010

TIME: 9:00 a.m.

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

This item may be considered at a two day meeting of the Board, which will commence at 9:00 a.m., November 18, 2010, and may continue at 8:30 a.m., November 19, 2010. This item may not be considered until November 19, 2010. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2010, to determine the day on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to sections 94508, 94509, 94510, 94512, and 94515, title 17, California Code of Regulations and proposed amendments to Method 310, which is incorporated by reference in section 94515, title 17, CCR, to amend section 2.0 and add new subsections 3.3.8 and 4.2.3.

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. The Health and Safety Code further stipulates in section 41712(e) that public health agencies be consulted, and their

recommendations be considered, prior to adopting regulations for health benefit products. 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 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 achieve an additional 30 to 40 tons per day of VOC emission reductions statewide from consumer products by January 1, 2014. In 2008 and 2009, the Board approved amendments to the Consumer Products Regulation to set new or lower VOC limits. These limits will result in 19.2 tons per day of VOC emission reductions once fully effective. Achieving additional VOC emission reductions from consumer products is an important element of the 2007 SIP and is necessary to attain State and federal air quality standards. This proposed rulemaking is the third increment toward meeting the 2007 SIP commitment. If the Board approves the amendments proposed in this rulemaking, total reductions toward the commitment would be about 26 tons per day.

Method 310 was adopted on September 25, 1997, and has been subsequently amended. Method 310 is used for compliance purposes to determine the VOC content of a consumer product and the presence of any compounds prohibited by ARB regulations.

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 a number of consumer product categories. The proposed VOC limits would result in VOC emission reductions of about 6.9 tons per day once fully effective.

Staff is proposing minor modifications to a number of existing definitions to clarify the types of products included or excluded in specific categories. Several new definitions are also proposed to describe additional product categories. A description of other proposals follows.

Staff is proposing to modify the definition of Artist's Solvent/Thinner to specify that an Artist's Solvent/Thinner is a product packaged in a container of 34 ounces or less. At present, Artist's Solvents/Thinners are defined as products packaged in containers equal to or less than 32 ounces. This change is being proposed because staff has determined that some Artist's Solvents/Thinners are commonly packaged in metric

units, (*i.e.* a liter, which is 33.8 ounces), rather than English units (*i.e.* a quart, which is 32 ounces).

Staff is proposing to modify the definition of Oven Cleaner to include grill cleaning products. As proposed, the newly added Oven or Grill Cleaner products would be given until December 31, 2012, to comply to allow the necessary time to reformulate. Staff is also proposing to increase the limit for nonaerosol Oven or Grill Cleaner products from 1 percent to 4 percent VOC by weight to accommodate use of noncaustic technologies. To expedite providing this alternative, the proposed limit revision would become effective on the date the amendments become legally effective. This change will result in a small emission increase of about 0.1 tons per day. However, emission reductions from the other categories included in this proposal will offset this small shortfall.

Staff is proposing to include spot remover products used on dry clean only fabrics into the currently regulated "Spot Remover" category. These are primarily products used at dry cleaning operations. To accommodate the necessary time for these products to reformulate, staff is also proposing to delay the effective date of the VOC limit for "Spot Remover" products from December 31, 2010, to December 31, 2012. The proposed change would result in delaying about a 0.25 ton per day VOC emission reduction for two years. The existing prohibition on use of methylene chloride, perchloroethylene, and trichloroethylene for "Spot Remover" products would also apply to the newly added products effective December 31, 2012.

Mitigation measures under the California Environmental Quality Act (CEQA) are also proposed for some categories. For the categories "Metal Polish or Cleanser," "Silicone-based Multi-purpose Lubricant," and "Special Purpose Lubricant" staff is proposing to prohibit the use of the toxic air contaminants methylene chloride, perchloroethylene, and trichloroethylene. These prohibitions are proposed to ensure that use of these toxic air contaminants does not occur as products are reformulated to meet the proposed VOC limits. The proposed prohibitions are contained in section 94509(m).

A second CEQA mitigation measure would prohibit the use of alkylphenol ethoxylate surfactants in "General Purpose Cleaner" (nonaerosol), "General Purpose Degreaser" (nonaerosol), "Glass Cleaner" (nonaerosol), "Heavy-duty Hand Cleaner or Soap" (nonaerosol) products, and "Oven or Grill Cleaner" products. These prohibitions are proposed to ensure that use of these compounds, which are known to be toxic to aquatic species, does not occur as products are reformulated to meet the proposed VOC limits. The proposed prohibitions are contained in section 94509(m).

A third proposed CEQA mitigation measure would prohibit use of compounds with global warming potential values of 150 or greater in "Flying Bug Insecticide," "Furniture Maintenance Product," "Metal Polish or Cleanser," "Special-purpose Lubricant," "Spot Remover," and "Wasp or Hornet Insecticide" products. These prohibitions are proposed to ensure that use of compounds with global warming potential (GWP) values greater than or equal to 150 does not occur as products are reformulated to the meet proposed VOC limits. The proposed prohibitions are contained in section 94509(n).

Currently, several subsections within section 94509 contain provisions prohibiting the use of several chlorinated toxic air contaminants. Staff is proposing to consolidate all of these requirements into two tables that would be contained in a single subsection. One table would include all of the categories where use of methylene chloride, perchloroethylene, and trichloroethylene is prohibited. A second table would include the categories where use of para-dichlorobenzene is prohibited. The modified subsection would also consolidate the provisions that specify sell-through dates and exemptions for impurities (except no exemption for impurities is provided for para-dichlorobenzene). The modifications are proposed to simplify the regulation and make it easier to find the requirements for all categories where these compounds are prohibited. The proposed consolidation of toxic air contaminant prohibitions would be contained in section 94509(m).

At present, several subsections in section 94509 contain prohibitions on the use of compounds that have GWP values of 150 or greater. Staff is proposing to consolidate these provisions into a single subsection. The modified subsection would also consolidate the provisions that specify sell-through dates and exemptions for impurities. The modifications are proposed to simplify the regulation and make it easier to find the limitations on use of compounds with higher GWP values. The proposed consolidation of GWP limits would be contained in section 94509(n).

Staff is proposing to amend the Most Restrictive Limit provision contained in section 94512(a) to clarify the regulation's applicability when two defined categories exclude each other within their definitions. As proposed, when a definition for a specific category excludes another specific category and *vice versa*, the product is subject to the VOC limit for whichever category is lower.

Along with the proposals to consolidate toxics prohibitions and GWP limits, other proposed modifications include deleting several subsections and renumbering remaining subsections.

We are also proposing to amend Test Method 310 to incorporate additional testing procedures and standard test methods to analyze consumer products for compliance. These modifications are proposed to specify the procedures to be used to analyze for the aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products and the VOC content of "Fabric Softener-Single Use Dryer Product."

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 (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.

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 include 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. Because California has unique air quality problems, we work to 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 noncomplying 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 does not prohibit the use of certain toxic air contaminants and there is no comparable federal regulation related to reducing greenhouse gas 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 regulatory action, which includes the rationale for the proposed amendments and a summary of the potential environmental and economic impacts of the proposal. The report is entitled: "Proposed Amendments to the California Regulation for Reducing Emissions from Consumer Products and Test Method 310: Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strike-out format to allow for comparison with the existing regulations, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitor and Environmental Services Center, First Floor, Sacramento, California 95814, (916) 322-2990, on September 29, 2010.

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 ARB's website 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; or Mr. Nicholas Berger, Air Pollution Specialist, at (916) 327-1516.

Further, the agency representative and designated back-up contact persons to whom non-substantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011 or Ms. Amy Whiting, Regulations Coordinator, (916) 322-6533. 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 website for this rulemaking at http://www.arb.ca.gov/regact/2010/cp2010/cp2010.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 Executive Officer has determined that the proposed regulatory action will 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 cost 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 economic 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 will 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 should 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 will affect small businesses.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board or that has otherwise been identified and brought to the attention of the Board 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 than the proposed action.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and comments may be submitted by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on **October 4, 2010**. To be considered by the Board, written submissions not physically submitted at the meeting must be submitted on or after **October 4, 2010**, and received no later than **12:00 noon, November 17, 2010**, 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

Please note that under the California Public Records Act (Gov. Code, § 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 available via Google, Yahoo, and other search engines.

The Board requests but does not require that 20 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, 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, 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, First Floor, Sacramento, California 95814, (916) 322-2990.

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- Documentos disponibles en un formato alterno (por decir, sistema Braille, o en impresión grande) u otro idioma.
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audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: September 21, 2010

California Environmental Protection Agency

Air Resources Board

Initial Statement of Reasons

Proposed Amendments to the California Regulation for Reducing Emissions from Consumer Products and Test Method 310: Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products



Release Date: September 29, 2010

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 Emissions from Consumer Products, and Method 310, "Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products."

DATE: November 18, 2010

TIME: 9:00 a.m.

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

This item may be considered at a two day meeting of the Board, which will commence at 9:00 a.m., November 18, 2010, and may continue at 8:30 a.m., November 19, 2010. This item may not be considered until November 19, 2010. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2010, to determine the day on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to sections 94508, 94509, 94510, 94512, and 94515, title 17, California Code of Regulations and proposed amendments to Method 310, which is incorporated by reference in section 94515, title 17, CCR, to amend section 2.0 and add new subsections 3.3.8 and 4.2.3.

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. The Health and Safety Code further stipulates in section 41712(e) that public health agencies be consulted, and their

recommendations be considered, prior to adopting regulations for health benefit products. 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 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 achieve an additional 30 to 40 tons per day of VOC emission reductions statewide from consumer products by January 1, 2014. In 2008 and 2009, the Board approved amendments to the Consumer Products Regulation to set new or lower VOC limits. These limits will result in 19.2 tons per day of VOC emission reductions once fully effective. Achieving additional VOC emission reductions from consumer products is an important element of the 2007 SIP and is necessary to attain State and federal air quality standards. This proposed rulemaking is the third increment toward meeting the 2007 SIP commitment. If the Board approves the amendments proposed in this rulemaking, total reductions toward the commitment would be about 26 tons per day.

Method 310 was adopted on September 25, 1997, and has been subsequently amended. Method 310 is used for compliance purposes to determine the VOC content of a consumer product and the presence of any compounds prohibited by ARB regulations.

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 a number of consumer product categories. The proposed VOC limits would result in VOC emission reductions of about 6.9 tons per day once fully effective.

Staff is proposing minor modifications to a number of existing definitions to clarify the types of products included or excluded in specific categories. Several new definitions are also proposed to describe additional product categories. A description of other proposals follows.

Staff is proposing to modify the definition of Artist's Solvent/Thinner to specify that an Artist's Solvent/Thinner is a product packaged in a container of 34 ounces or less. At present, Artist's Solvents/Thinners are defined as products packaged in containers equal to or less than 32 ounces. This change is being proposed because staff has determined that some Artist's Solvents/Thinners are commonly packaged in metric

units, (*i.e.* a liter, which is 33.8 ounces), rather than English units (*i.e.* a quart, which is 32 ounces).

Staff is proposing to modify the definition of Oven Cleaner to include grill cleaning products. As proposed, the newly added Oven or Grill Cleaner products would be given until December 31, 2012, to comply to allow the necessary time to reformulate. Staff is also proposing to increase the limit for nonaerosol Oven or Grill Cleaner products from 1 percent to 4 percent VOC by weight to accommodate use of noncaustic technologies. To expedite providing this alternative, the proposed limit revision would become effective on the date the amendments become legally effective. This change will result in a small emission increase of about 0.1 tons per day. However, emission reductions from the other categories included in this proposal will offset this small shortfall.

Staff is proposing to include spot remover products used on dry clean only fabrics into the currently regulated "Spot Remover" category. These are primarily products used at dry cleaning operations. To accommodate the necessary time for these products to reformulate, staff is also proposing to delay the effective date of the VOC limit for "Spot Remover" products from December 31, 2010, to December 31, 2012. The proposed change would result in delaying about a 0.25 ton per day VOC emission reduction for two years. The existing prohibition on use of methylene chloride, perchloroethylene, and trichloroethylene for "Spot Remover" products would also apply to the newly added products effective December 31, 2012.

Mitigation measures under the California Environmental Quality Act (CEQA) are also proposed for some categories. For the categories "Metal Polish or Cleanser," "Silicone-based Multi-purpose Lubricant," and "Special Purpose Lubricant" staff is proposing to prohibit the use of the toxic air contaminants methylene chloride, perchloroethylene, and trichloroethylene. These prohibitions are proposed to ensure that use of these toxic air contaminants does not occur as products are reformulated to meet the proposed VOC limits. The proposed prohibitions are contained in section 94509(m).

A second CEQA mitigation measure would prohibit the use of alkylphenol ethoxylate surfactants in "General Purpose Cleaner" (nonaerosol), "General Purpose Degreaser" (nonaerosol), "Glass Cleaner" (nonaerosol), "Heavy-duty Hand Cleaner or Soap" (nonaerosol) products, and "Oven or Grill Cleaner" products. These prohibitions are proposed to ensure that use of these compounds, which are known to be toxic to aquatic species, does not occur as products are reformulated to meet the proposed VOC limits. The proposed prohibitions are contained in section 94509(m).

A third proposed CEQA mitigation measure would prohibit use of compounds with global warming potential values of 150 or greater in "Flying Bug Insecticide," "Furniture Maintenance Product," "Metal Polish or Cleanser," "Special-purpose Lubricant," "Spot Remover," and "Wasp or Hornet Insecticide" products. These prohibitions are proposed to ensure that use of compounds with global warming potential (GWP) values greater than or equal to 150 does not occur as products are reformulated to the meet proposed VOC limits. The proposed prohibitions are contained in section 94509(n).

Currently, several subsections within section 94509 contain provisions prohibiting the use of several chlorinated toxic air contaminants. Staff is proposing to consolidate all of these requirements into two tables that would be contained in a single subsection. One table would include all of the categories where use of methylene chloride, perchloroethylene, and trichloroethylene is prohibited. A second table would include the categories where use of para-dichlorobenzene is prohibited. The modified subsection would also consolidate the provisions that specify sell-through dates and exemptions for impurities (except no exemption for impurities is provided for para-dichlorobenzene). The modifications are proposed to simplify the regulation and make it easier to find the requirements for all categories where these compounds are prohibited. The proposed consolidation of toxic air contaminant prohibitions would be contained in section 94509(m).

At present, several subsections in section 94509 contain prohibitions on the use of compounds that have GWP values of 150 or greater. Staff is proposing to consolidate these provisions into a single subsection. The modified subsection would also consolidate the provisions that specify sell-through dates and exemptions for impurities. The modifications are proposed to simplify the regulation and make it easier to find the limitations on use of compounds with higher GWP values. The proposed consolidation of GWP limits would be contained in section 94509(n).

Staff is proposing to amend the Most Restrictive Limit provision contained in section 94512(a) to clarify the regulation's applicability when two defined categories exclude each other within their definitions. As proposed, when a definition for a specific category excludes another specific category and *vice versa*, the product is subject to the VOC limit for whichever category is lower.

Along with the proposals to consolidate toxics prohibitions and GWP limits, other proposed modifications include deleting several subsections and renumbering remaining subsections.

We are also proposing to amend Test Method 310 to incorporate additional testing procedures and standard test methods to analyze consumer products for compliance. These modifications are proposed to specify the procedures to be used to analyze for the aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products and the VOC content of "Fabric Softener-Single Use Dryer Product."

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 (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.

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 include 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. Because California has unique air quality problems, we work to 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 noncomplying 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 does not prohibit the use of certain toxic air contaminants and there is no comparable federal regulation related to reducing greenhouse gas 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 regulatory action, which includes the rationale for the proposed amendments and a summary of the potential environmental and economic impacts of the proposal. The report is entitled: "Proposed Amendments to the California Regulation for Reducing Emissions from Consumer Products and Test Method 310: Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strike-out format to allow for comparison with the existing regulations, may be accessed on ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitor and Environmental Services Center, First Floor, Sacramento, California 95814, (916) 322-2990, on September 29, 2010.

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 ARB's website 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; or Mr. Nicholas Berger, Air Pollution Specialist, at (916) 327-1516.

Further, the agency representative and designated back-up contact persons to whom non-substantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011 or Ms. Amy Whiting, Regulations Coordinator, (916) 322-6533. 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 website for this rulemaking at http://www.arb.ca.gov/regact/2010/cp2010/cp2010.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 Executive Officer has determined that the proposed regulatory action will 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 cost 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 economic 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 will 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 should 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 will affect small businesses.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board or that has otherwise been identified and brought to the attention of the Board 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 than the proposed action.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and comments may be submitted by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on **October 4, 2010**. To be considered by the Board, written submissions not physically submitted at the meeting must be submitted on or after **October 4, 2010**, and received no later than **12:00 noon, November 17, 2010**, 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

Please note that under the California Public Records Act (Gov. Code, § 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 available via Google, Yahoo, and other search engines.

The Board requests but does not require that 20 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, 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, 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.

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CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: September 21, 2010

State of California
AIR RESOURCES BOARD

Initial Statement of Reasons

Proposed Amendments to the California Regulation for Reducing Emissions from Consumer Products

and

Test Method 310: "Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products"

To be considered by the Air Resources Board at a Public Hearing on November 18, 2010, at:

Byron Sher Auditorium
Air Resources Board, Cal/EPA Headquarters
1001 I Street
Sacramento, CA 95814

P.O. Box 2815
Sacramento, CA 95812

September 29, 2010

This report has been prepared by staff of the California Air Resources Board. Publication does not signify that the contents reflect the views and policies of the Air Resources Board. The mention or representation of trade names or commercial products does not constitute an endorsement or recommendation for use.

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State of California
AIR RESOURCES BOARD

Initial Statement of Reasons for Proposed Amendments to the California Regulation for Reducing Emissions from Consumer Products
and
Test Method 310: "Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products"

Executive Summary

Executive Summary

In this rulemaking, California Air Resources Board (ARB or Board) staff is proposing amendments to the Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation). The amendments are primarily designed to reduce volatile organic compound (VOC) emissions. The proposed amendments would set new or lower VOC limits for 11 categories of consumer products. When fully implemented, about 6.7 tons per day of VOC emission reductions would be achieved and be creditable to the current State Implementation Plan (SIP) commitment. These reductions are an incremental step toward attaining the national ambient air quality standard for ozone. Additional reductions would be achieved and creditable toward future SIP commitments.

We are also proposing to prohibit the use of several chlorinated Toxic Air Contaminants (TAC) in three categories, preclude use of compounds with higher global warming potential (GWP) values in six categories, and prohibit use of alkylphenol ethoxylate surfactants in five categories. These proposals are mitigation measures developed in accordance with the California Environmental Quality Act (CEQA). They are designed to ensure that TAC chlorinated solvents, compounds with higher GWP values, and certain surfactants are not used to meet new and lower VOC limits. Other amendments would clarify and improve existing regulatory provisions. The regulation is codified in title 17, California Code of Regulations, sections 94507-94517.

Amendments to the analytical method "Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products" (Test Method 310) are also proposed. The amendments would set forth analytical methods and procedures to be followed to determine the VOC content of "Fabric Softener-Single Use Dryer Product" and the aromatic compound content of "Paint Thinner" and "Multi-purpose Solvent" products.

This Executive Summary, together with the Technical Support Document, is the Initial Statement of Reasons for Proposed Rulemaking required by the California Administrative Procedure Act. Appendices A and B contain the amendments to the Consumer Products Regulation, and Test Method 310, respectively. The proposed changes are shown in underline and ~~strikeout~~ format.

Among other things, this Executive Summary provides a description of the proposed amendments to the Consumer Products Regulation and to Test Method 310, and explains the rationale for the proposed changes. In accordance with Government Code

section 11346.2(a)(1), a "plain English" summary of the proposal is provided in Chapter VI of the Technical Support Document.

A. Authority to Regulate Consumer Products

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

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

B. Existing Regulations

Over the last twenty years, the Board has taken numerous actions to fulfill the legislative mandates pertaining to the regulation of consumer products. Five regulations have been adopted. Three regulations have set VOC limits for 127 consumer product categories. The adopted limits, when fully effective, will have resulted in reducing emissions by about 225 tons per day, an overall 50 percent reduction in VOC emissions compared to 1990 levels. By 2020, limits on the use of ingredients with higher GWP values will be equivalent to reducing about 0.23 million metric tons of carbon dioxide equivalents per year.

We have also reduced exposure to TACs. Emissions of TACs have been reduced by over 13 tons per day by prohibiting use of chlorinated compounds in 72 categories.

Two 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 formed. Participation in the CPRWG is open to any member of the public. The CPRWG participated in the development of the 2006 Consumer and Commercial Products Survey (2006 Survey) and the 2008 Survey for Dry Clean Only Spot Remover products (2008 Survey Update). The CPRWG was instrumental in the development of these proposed amendments. Consumer product manufacturers; chemical producers;

marketers; trade associations; environmental groups; air districts; and various other stakeholders are all active participants.

In addition to the CPRWG meetings, an initial public workshop was held in August of 2008, to begin the public process of developing this proposal. Two more public workshops to discuss proposals were held on April 13, 2010, and July 29, 2010. Prior to the public workshops we posted materials to the consumer products program website for review and comment. Stakeholders could participate in person or *via* teleconference at each workshop. In addition to these public meetings, numerous meetings with individual stakeholders and associations were held.

D. Basis for the Proposal and VOC Emissions

Emissions of VOCs from consumer products contribute to the formation of both ground-level ozone and particulate matter pollution. This section focuses on reducing VOCs as a ground-level ozone control strategy. Despite reducing emissions by 225 tons per day, it is estimated that the 2010 consumer products emissions are approximately 245 tons per day, or about 12 percent of the overall statewide VOC inventory. We also estimate that the 2010 consumer product emissions comprise about 18 and 7 percent of VOC emissions in the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD), respectively. Without further actions, consumer product emissions are expected to grow to approximately 270 tons per day statewide in 2020, representing almost 14 percent of statewide VOC emissions (ARB, 2009a).

The categories for which VOC limits are proposed in this rulemaking emit about 22 tons per day of VOCs. The basis for this estimate is the 2006 Survey and the 2008 Survey Update. The 2006 Survey was mailed to over 5,000 companies in July 2007. Over 570 companies responded to the 2006 Survey with information on over 12,000 products (ARB, 2007e). The 2008 Survey Update was sent to manufacturers of spot removers primarily used at dry cleaning operations in January 2009. Eight companies responded with information on about 50 products (ARB, 2009e).

The 2006 Survey and 2008 Survey Update provided staff with detailed information on the formulations of consumer products proposed for regulation. Data summaries from the 2006 Survey and the 2008 Survey Update were posted to the website and input from industry was used to correct inaccuracies in the data. For this rulemaking, the emissions data from the 2006 Survey and the 2008 Survey Update were grown by population to predicted 2010 emissions. Staff is confident that the 2006 Survey and 2008 Survey Update had adequate representation of the available technologies in the market place for the categories proposed for regulation and finds that the data are adequate to support the proposal.

E. Consumer Product VOC Emission Reduction Commitments in the State Implementation Plan (SIP)

Reduction of VOC emissions is necessary to attain the ambient air quality standards for ozone. In 1988, with the passing of the California Clean Air Act, the importance of controlling emissions from consumer products was set forth. To meet the federal ozone standard, in 1994 emission reductions from consumer products became part of the SIP to meet the federal standard for ozone.

The 2007 SIP, the State Strategy for California's 2007 State Implementation Plan, is California's plan to attain the national ozone standard of 0.08 parts per million (ppm) averaged over eight hours. In this SIP ARB committed to an additional 30 to 40 ton per day VOC reduction statewide from consumer products by January 1, 2014.

Table ES-1 shows our progress and remaining reductions needed to meet the consumer products commitment in the SIP. As shown in the table, the adopted rulemakings from 2008 and 2009 will result in over 19 tons per day of reductions once fully effective.

Table ES-1
Consumer Product SIP Commitment and Progress to Date

Consumer Products Rulemaking	Statewide VOC Reductions (tons per day)
June 2008 Amendments	4.5 (adopted)
September 2009 Amendments	14.7* (adopted)
2010 Amendments (this proposal)	6.7 (proposed)
Additional Reductions from Consumer Product Categories	~ 4.0 – 14.0 (needed)
Totals Reductions Needed by January 1, 2014	**30 – 40**

* Emission reductions of about 12.7 tons per day of this reduction occur in all areas of the State except the South Coast Air Quality Management District (district has their own rule, Rule 1143, for Paint Thinners and Multi-purpose Solvents) (ARB, 2009c).

The amendments proposed in this rulemaking are the third increment of emission reductions toward fulfilling the SIP commitment for VOC reductions from consumer products. As shown, if adopted this proposal would contribute an additional 6.7 tons per day statewide toward the commitment. Additional rulemakings will be necessary to complete the commitment.

F. Summary of Proposed Amendments to the Consumer Products Regulation

Amendments are proposed to the following sections of the regulation: section 94508 "Definitions;" section 94509 "Standards for Consumer Products;" section 94510 "Exemptions;" section 94512 "Administrative Requirements;" and section 94515 "Test Methods." The proposed modifications to sections 94510 and 94515 are minor

clarifications to reference new sections or delete redundant language. The proposed amendments to the other sections are summarized below. A summary of proposed amendments to Test Method 310 is also provided. Chapter VI of the Technical Support Document contains more detailed information on each proposed requirement.

1. Definitions (section 94508)

Section 94508 "Definitions," provides all of the terms used in the Consumer Products Regulation which are not self-explanatory. The proposed amendments to the Regulation include the modification of 16 definitions, and the addition of 3 new definitions. These definitions are necessary to define categories proposed for VOC limits, clarify products that are not subject to the VOC limits, or to improve the enforceability of the Consumer Products Regulation. We are also proposing a minor change to the definition for Artist's Solvent/Thinner products to change the size criterion from 32 to 34 fluid ounces. This definitional change, as well as a several other definition proposals, are further explained in Chapter VI.

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

Amendments are being proposed to the Table of Standards. Several modifications are proposed to consolidate various prohibitions on use of TAC compounds and limits on use of compounds with higher GWPs. Also proposed are prohibitions on use of certain TACs, compounds with higher GWPs, and specific surfactants in several categories.

Table of Standards: section 94509(a)

The proposed amendments would specify new or lower VOC limits for the product categories shown in Table ES-2. Together, VOC limits are proposed for 11 categories with 15 VOC limits. "Special-purpose Lubricant" products are not currently regulated, while the other categories are currently subject to VOC limits. However, in the case of "Spot Remover" and "Oven or Grill Cleaner," additional products are proposed for inclusion. For all but one of the currently regulated categories we are proposing lower VOC limits. We are proposing to increase the current limit for nonaerosol "Oven or Grill Cleaner." This proposal is explained below. The limits would become effective on December 31, 2012, or December 31, 2013. Where appropriate we are proposing separate limits for aerosol product forms to ensure feasibility. Other minor clarifications to the Table of Standards are also proposed.

The categories with limits becoming effective by January 1, 2014, would be creditable toward the 2007 SIP commitment, and would result in VOC emission reductions of about 6.7 tons per day. As specified in the regulation, the effective date of the limits for products requiring Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as well as Department of Pesticide Regulation (DPR) registration, would be one year after the effective date listed to allow adequate time for the State and federal registration process. Because of this, the reductions from Flying Bug Insecticide and Wasp or

Hornet Insecticide products would be credited toward a future SIP commitment. Reductions from these two categories total about 0.2 tons per day.

Several of the proposed VOC limits for the categories listed in Table ES-2 warrant additional explanation.

Proposal for "Oven or Grill Cleaner": We are proposing to incorporate grill cleaning products into the existing Oven Cleaner category. To allow the previously unregulated grill cleaner products the necessary time to reformulate, proposed subsection 94509(q) would specify that the VOC limits do not apply to these products until December 31, 2012.

Nonaerosol Oven Cleaner products are currently subject to a limit of 1 percent by weight. When this limit was adopted reported products relied on low or non-VOC caustic technologies. We have since learned of other technologies introduced to provide alternatives to caustic products. To accommodate the use of these technologies we are proposing to increase the current VOC limit to 4 percent by weight for nonaerosol Oven or Grill Cleaner products. To expedite providing this alternative, as proposed, the limit revision would become effective when the amendments become legally effective. This proposal results in a small shortfall of about 0.1 tons per day. However, other reductions from this proposal would offset this change.

Proposal for "Spot Remover": We are proposing to incorporate spot removers used for dry clean-only fabrics into the currently regulated "Spot Remover" category. These are primarily products used at dry cleaning operations. To accommodate the necessary time for these products to reformulate, we are also proposing to delay the effective date of the VOC limit for "Spot Remover" products from December 31, 2010, to December 31, 2012. This modification is proposed to allow adequate time for reformulation of the new products being included in the category. The proposal to extend the effective date is intended to simplify enforcement activities for this category; it would be difficult to discern the difference between the newly added products and those currently regulated. The proposal for the "Spot Remover" category would result in delaying about a 0.25 tons per day VOC reduction for 2 years. The newly added products would also be subject to the existing prohibition on use of methylene chloride, perchloroethylene, and trichloroethylene beginning December 31, 2012.

Other Amendments to section 94509

Proposed Consolidation of Prohibitions on Use of Toxic Compounds: Currently, several subsections within section 94509 specify provisions prohibiting use of several chlorinated TACs. We are proposing to consolidate all of these requirements into two tables that would be contained in proposed modified subsection (m). One table would include all of the categories where use of methylene chloride, perchloroethylene, and trichloroethylene is prohibited. A second table would include the categories where use of para-dichlorobenzene is prohibited. The modified subsection (m) would also consolidate the provisions that specify sell-through dates and exemptions for impurities

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

Product Category	Product Form	2010 VOC Emissions* (tons per day)	Proposed VOC Limit (weight percent)	VOC Reduction** (tons per day)
Flying Bug Insecticide	Aerosol	0.65	20	0.06+
Furniture Maintenance Product	Aerosol	1.32	12	0.36
General Purpose Cleaner	Nonaerosol	12.04	0.5	3.73+
General Purpose Degreaser	Nonaerosol	1.91	0.5	1.17
Glass Cleaner	Nonaerosol	3.34	3	0.41
Heavy-duty Hand Cleaner or Soap	Nonaerosol	0.79	1	0.53
Metal Polish or Cleanser	Aerosol	0.22	15	0.07
Metal Polish or Cleanser	Nonaerosol	0.20	3	0.15
Oven or Grill Cleaner	Aerosol	0.08	8	>0.0
Oven or Grill Cleaner	Nonaerosol	0.24	4	-0.12
Special-purpose Lubricant	Aerosol	0.26	25	0.10
Special-purpose Lubricant	Nonaerosol	0.18	3	0.13
Spot Remover (Dry Clean Only)	Aerosol	>0.0	15	>0.0
Spot Remover (Dry Clean Only)	Nonaerosol	0.17	3	0.17
Wasp or Hornet Insecticide	Aerosol	0.31	10	0.14+
Total Emissions 2010	**21.7 tons per day**			
Total VOC Reductions Creditable Toward 2007 SIP				**6.7 tons per day**
Total VOC Reductions Creditable Toward Future Commitment				**0.2 tons per day**

* Survey emissions adjusted for market coverage and grown to 2010 based on population
** Emission reductions grown to effective date based on population
\+ Products subject to FIFRA and DPR registration requirement given an extra year to complete the registration process

(except no exemption for impurities is provided for para-dichlorobenzene). The modifications are proposed to simplify the regulation by making it easier to find the prohibitions on toxic compounds.

Proposed Additional Prohibitions on Use of Methylene Chloride, Perchloroethylene, and Trichloroethylene: New Table 94509(m)(1) also contains proposed prohibitions on use of methylene chloride, perchloroethylene, and trichloroethylene in "Metal Polish or Cleanser," "Silicone-based Multi-purpose Lubricant," and "Special-purpose Lubricant." These prohibitions are proposed to ensure that use of these TACs does not occur as products are reformulated to meet the proposed VOC limits. The newly added "Spot Remover" products would be subject to the existing prohibition on use of these solvents. These prohibitions are proposed as a mitigation measure under the CEQA.

Proposed Consolidation of Prohibitions on the Use of Any Chemical Compound that has a GWP Value of 150 or Greater: At present, several subsections contain prohibitions on the use of compounds that have GWP values of 150 or greater. We are proposing to consolidate these provisions into modified subsection 94509(n). Subsection (n) would also consolidate the provisions that specify sell-through dates and exemptions for impurities. The modifications are proposed to simplify the regulation by making it easier to find the prohibitions on use of compounds with GWP values of 150 or greater.

Proposed Additional Prohibitions on the Use of Any Chemical Compound that has a GWP Value of 150 or Greater: In this rulemaking we are also proposing to limit the use of global warming compounds with higher GWP values in "Flying Bug Insecticide," "Furniture Maintenance Product," "Metal Polish or Cleanser," "Special-purpose Lubricant," "Spot Remover," and "Wasp or Hornet Insecticide" products. These prohibitions are proposed to ensure that use of compounds with GWP values greater than or equal to 150 does not begin as products are reformulated to meet proposed VOC limits. The measure is proposed as a CEQA mitigation measure.

Proposed Prohibition on Use of Alkylphenol Ethoxylate Surfactants: Alkylphenol ethoxylates are nonionic surface active agents (surfactants) used as wetting agents, emulsifiers, and dispersants in cleaning and degreasing products. Once into wastewater, alkylphenol ethoxylates do not readily degrade and they and/or their degradation products enter aquatic environments through wastewater treatment facilities and storm water.

Alkylphenol ethoxylates, in particular octylphenol and nonylphenol ethoxylates, have been found to be toxic to aquatic species; they are hormone disruptors, with the primary concern focused on the estrogenic effects (David *et al.*, 2009). Because of this, ARB staff consulted with staff of the State Water Resources Control Board (SWRCB). Information provided to SWRCB staff indicates that alkylphenol ethoxylates are found in measurable concentrations in California's receiving waters. Moreover, SWRCB staff is concerned that any potential additional use could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). Therefore, ARB staff is proposing a mitigation measure in accordance with CEQA. As proposed, after December 31, 2012, use of alkylphenol ethoxylate surfactants would be prohibited from use in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, and Glass Cleaner. A prohibition on use in nonaerosol Heavy-duty Hand Cleaner or Soap products would become effective

December 31, 2013. These prohibitions are proposed to ensure that use of these compounds does not occur as products are reformulated to meet the proposed VOC limits. This proposal would be contained in modified subsection 94509(m)(3).

Staff also finds that replacements for alkylphenol ethoxylates are readily available. Alcohol ethoxylates, linear alkylbenzene sulphonates, and alkyl polyglucosides surfactants are considered to be effective and environmentally safer. Additional information on this proposal is contained in Chapter IX, Environmental Impacts, section E.

Additional Modifications to Section 94509 to Accommodate New Subsections (m) and (n): Because of the proposals to consolidate various provisions into new subsections 94509(m) and (n), additional "clean up" modifications to various subsections are proposed. These modifications include deleting several subsections and re-lettering and reorganizing remaining subsections. The references to the various toxic compound prohibitions and the GWP limits within the Table of Standards would also be modified to reference new subsections or re-lettered subsections.

3. Proposed Amendments to Administrative Requirements (section 94512)

We are proposing to amend the Most Restrictive Limit provision contained in subsection 94512(a). Specifically, subpart (3) would be modified to clarify the regulation's applicability when two defined categories exclude each other within their respective definitions. As proposed, when a definition for a specific category excludes another specific category, and *vice versa*, the product is subject to the VOC limit for whichever category is lower.

G. Proposed Amendments to Test Method 310

ARB Test Method 310 sets forth the analytical procedures and processes to determine the VOC content of consumer products. We are proposing to amend this method to incorporate additional testing procedures and standard test methods to analyze consumer products for compliance. These modifications are proposed to specify the procedures to be used to analyze for the aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products, and the VOC content of "Fabric Softener-Single Use Dryer Product."

Proposed amendments to section 2 of Method 310 would include additional applicable test methods to analyze consumer products for compliance.

New subsections are also being proposed. Proposed new subsection 3.3.8 would specify the procedures for analyzing for aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products. New section 4.2.3 would specify the procedures for analyzing for the VOC content of "Fabric Softener-Single Use Dryer Product."

H. Compliance with the Proposed Amendments

Manufacturers have the flexibility to choose from a variety of formulation options to meet the applicable limits (see Chapter VII, Description of Product Categories). To comply with VOC limits, VOC solvents or propellants may need to be replaced, or partially replaced, with VOC exempt ingredients. This may require using VOC exempt compounds, or formulating with an exempt VOC propellant. Use of water or low vapor pressure (LVP) VOC compounds is also feasible. Manufacturers may also need to change the valve, container, delivery system, or the other components of the consumer product depending on the individual formulation. For each category and proposed VOC limit staff has determined feasible pathways toward reformulation. We also note that the survey data show that, in each category, products are already being sold that comply with the proposed VOC limits. Table ES-3 shows the number of products and percent of the market that would currently comply with staff's proposed VOC limits.

Table ES-3
Summary of Complying Products and Complying Market Shares

Product Category	Product Form	Proposed VOC Limit (weight percent)	Number of Complying Products/Total Products	Percent Complying Market Share
Flying Bug Insecticide	Aerosol	20	18 / 51	55
Furniture Maintenance Product	Aerosol	12	37 / 87	10
General Purpose Cleaner	Nonaerosol	0.5	980 / 1518	69
General Purpose Degreaser	Nonaerosol	0.5	232 / 462	73
Glass Cleaner	Nonaerosol	3	165 / 298	10
Heavy-duty Hand Cleaner or Soap	Nonaerosol	1	113 / 255	30
Metal Polish or Cleanser	Aerosol	15	20 / 73	35
Metal Polish or Cleanser	Nonaerosol	3	96 / 154	78
Oven or Grill Cleaner	Aerosol	8	18 / 21	87
Oven or Grill Cleaner	Nonaerosol	4	81 / 90	> 95
Special-purpose Lubricant	Aerosol	25	64 / 168	47
Special-purpose Lubricant	Nonaerosol	3	166 / 224	97
Spot Remover (Dry Clean Only)	Aerosol	15	<5 / <5	<5
Spot Remover (Dry Clean Only)	Nonaerosol	3	16 / 49	46
Wasp or Hornet Insecticide	Aerosol	10	38 / 56	60

Source: 2006 Consumer & Commercial Products Survey and 2008 Spot Remover Survey Update.

Staff concludes that technology exists, and is readily available to comply with the proposed limits in the timeframes provided. Staff has also proposed limits that are feasible without the use of compounds with GWPs of 150 or greater, alkylphenol ethoxylates, and the TACs methylene chloride, perchloroethylene, and trichloroethylene.

Several reformulation options warrant further discussion.

LVP-VOC Glycol Ethers

Stakeholders, as well as ARB staff, had concerns that reformulations to comply with the VOC limits for various cleaning products could result in use of certain compounds that may pose adverse health impacts. Staff evaluated various reformulation options and identified use of LVP-VOC glycol ethers as one of several reformulation options. To fully evaluate whether use of LVP-VOC glycol ethers would pose potential health hazards, ARB staff consulted with the Office of Environmental Health Hazard Assessment (OEHHA).

Based on available health effects data OEHHA developed draft provisional Reference Exposure Levels (REL) for a number of LVP-VOC glycol ethers. A REL is a concentration in air that is considered safe. However, due to lack of publicly available health effects data, large uncertainty factors were applied to the RELs. Further analysis by OEHHA determined that the RELs should not be used as a basis for regulatory action due to an overall lack of information on the toxicity of these compounds. OEHHA will continue to monitor developments in the toxicological literature and will re-evaluate the provisional RELS in the future, if needed (OEHHA, 2010).

In addition, based on staff's ongoing analysis of reformulation approaches we have concluded that use of these compounds is neither necessary, nor the preferred reformulation approach. This is because a large share of products that already comply with the proposed VOC limits for "General Purpose Cleaner" and "General Purpose Degreaser" do not rely on use of LVP-VOC glycol ethers. We also believe the proposed VOC limit for "Glass Cleaner" products is set at a level such that use of LVP-VOC glycol ethers is not needed. Nevertheless, we will monitor use of the LVP-VOC glycol ethers through regular surveys of the industry.

Acetone

Staff has identified use of acetone as a potential reformulation option in specific categories. Acetone is a low photochemically reactive compound that has been excluded from the definition of VOC. However, concerns with its use have been raised because it is an extremely flammable solvent. Although acetone may have limited use in some categories, as shown in Appendix D, 'typical' complying and noncomplying formulas used as a basis for our economic analysis did not include acetone. This indicates that other reformulations to comply are more likely. In other cases where it could be used it would be in small amounts or in products already labeled to warn

consumers of flammability concerns. Therefore, we do not believe any additional use of acetone would pose safety concerns.

Other Compliance Options

Manufacturers can also comply with the proposed amendments through the use of the Innovative Products Provision (IPP) which allows a product to exceed the VOC limit if it is clearly demonstrated that the "innovative" product will result in less VOC emissions than a complying product that meets the applicable VOC limit.

Manufacturers can also comply with the proposed amendments through the use of the Alternative Control Plan (ACP) that allows emissions averaging of various regulated products throughout their product lines.

I. Economic Impacts

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

1. Overall Cost

We estimate that the overall cost to comply with the proposed amendments is about $5 million per year for ten years, for a total of almost $50 million. This amount includes both recurring (e.g., raw materials) and nonrecurring (e.g., research and development) costs and is estimated based on assumptions specific to each category. The cost represents the average of low and high cost estimates and represents our prediction of the costs most likely to be incurred.

2. Cost-effectiveness

Another measure of the economic impacts of the proposal is to determine the "dollars to be spent per pound of VOC reduced," or cost-effectiveness (CE). The CE of the proposed amendments has been calculated to be about $0.98 per pound of VOC reduced. This is based on total expected emission reductions of about 6.9 tons per day (includes reductions occurring in 2014). The CE of Consumer Product Regulation amendments proposed in 2006, 2008, and 2009 was about $2.35, $6.23, and $0.29 per pound of VOC reduced, respectively. Thus, the CE of this proposal is within the range of previously adopted consumer products amendments.

3. Return on Owner's Equity (ROE)

Another measure of the impacts of the proposed amendments on manufacturers is to determine the ROE. ROE is a calculation which compares a company's percentage reduction in profitability after incurring the costs associated with the proposed amendments. In calculating ROE, we make the conservative assumption that

manufacturers will absorb all compliance costs without passing any of these costs on to the consumer. Our analysis found that the overall reduction in profitability ranges from about 1 percent to about 3 percent, with an average reduction in profitability of about 1.6 percent.

Based on the small reduction in profitability, we believe that overall, most affected businesses' profitability will not be adversely affected. If they are unable to absorb all or a portion of the compliance costs, these costs will be passed through to the consumer.

4. Impacts on California Businesses

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

5. Increased Cost to Consumers

As a result of this proposal, consumers may have to pay more for some products, depending on the extent to which manufacturers pass along their compliance costs. If all assumed compliance costs are passed on to the consumer, we estimate the cost per unit increase would range from negligible or no cost for a nonaerosol Glass Cleaner product to about $0.44 for a Heavy Duty Hand Cleaner or Soap product. The aforementioned costs do not include typical retail mark-up.

6. Fiscal Impacts

No significant adverse economic impacts to any local or State agency were identified. We are aware that the California Prison Industry Authority (PIA) manufactures some products for which VOC limits are proposed. Based on the 2006 Survey, the PIA manufactures nonaerosol "General Purpose Cleaner," "General Purpose Degreaser," and "Glass Cleaner" products. All of these reported products already comply with the proposed VOC limits for these categories. Therefore, we expect no impacts on the PIA.

ARB will have costs for enforcing the proposed amendments. It is estimated that beginning in fiscal year 2012-13 the Enforcement Division will require an additional 1.5 staff. The costs for these additional resources will need to be addressed in the future.

J. Environmental Impacts

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

would have beneficial impacts on the environment. No significant adverse impacts were identified, however several mitigation measures are proposed to ensure no adverse impacts would result.

Once fully effective, VOC emissions would be reduced statewide by about 6.9 tons per day. Our qualitative health risk assessment concludes that because VOCs are ozone precursors, public health is further protected by reducing these emissions. The actual lowering of health risks has not been quantified. The reductions resulting from this proposal would be an incremental step toward achieving the State and federal ozone standards.

In addition to ground level ozone impacts, we evaluated how implementing the proposed amendments would impact particulate matter (particularly secondary organic aerosols); climate change, stratospheric ozone depletion; solid waste disposal; water quality; and energy use. No potential adverse impacts were identified. However, our evaluation of potential use of several TACs, compounds with higher GWP values, and certain surfactants indicated that there was a potential for adverse impacts resulting from compliance with the proposed VOC limits. Therefore, to address these impacts staff is proposing mitigation measures in accordance with CEQA. A complete analysis of the potential environmental impacts of the proposal is contained in Chapter IX of the Technical Support Document. A summary of proposed mitigation measures follows.

1. Prohibition on Use of Certain Toxic Air Contaminants

A mitigation measure, in accordance with CEQA, is proposed to prohibit the use of the TACs methylene chloride, perchloroethylene, and trichloroethylene in "Metal Polish or Cleanser," "Silicone-based Multi-purpose Lubricant," and "Special Purpose Lubricant" products. These provisions are proposed in subsection 94509(m) and are designed to ensure that use of these solvents does not occur as products reformulate to meet VOC limits. This proposal would reduce toxic emissions by about 0.1 ton per day.

2. Limit on Use of Global Warming Compounds

Several compounds with higher GWPs could be used in reformulated products. To minimize climate change impacts from implementing the proposed VOC limits, we are proposing to prohibit use of compounds with GWP values of 150 or greater in "Flying Bug Insecticide," "Furniture Maintenance Product," "Metal Polish or Cleanser," "Special-purpose Lubricant," "Spot Remover," and "Wasp or Hornet Insecticide" products. These prohibitions are proposed to ensure that use of compounds with GWP values greater than or equal to 150 does not begin as products are reformulated to meet proposed VOC limits. These provisions are proposed in subsections 94509(n). This proposal would allow use of the propellant hydrofluorocarbon (HFC) 152a, but preclude the use of HFC-134a. This limit is also proposed as a mitigation measure under CEQA.

3. Prohibition on Use of Alkylphenol Ethoxylate Surfactants

Alkylphenol ethoxylates are nonionic surface active agents (surfactants) used as wetting agents, emulsifiers, and dispersants in cleaning and degreasing products. For some categories one reformulation pathway to the meet proposed VOC limits would be to replace VOC solvents with surfactants. Alkylphenol ethoxylates meet the definition of LVP-VOC so their use is not currently restricted by the VOC limits in the Consumer Products Regulation. In the cleaning/degreasing categories, because of how the products are used, some product is washed 'down the drain.' Once into wastewater, alkylphenol ethoxylates do not readily degrade and they and/or their degradation products enter aquatic environments through wastewater treatment facilities and storm water.

Ample scientific evidence implicates the alkylphenol ethoxylates, particularly the octylphenol and nonylphenol ethoxylates, as toxic to aquatic species. Therefore, as a mitigation measure under CEQA, we are proposing that use of alkylphenol ethoxylate surfactants would be prohibited from use in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, and Glass Cleaner products effective on December 31, 2012. We are also proposing that the alkylphenol ethoxylate surfactants be prohibited from use in Heavy-duty Hand Cleaner or Soap products effective December 31, 2013. These prohibitions are proposed to ensure that use of these compounds does not occur as products are reformulated to meet the proposed VOC limits. This proposal would be contained in modified subsection 94509(m)(3).

K. Environmental Justice

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

L. Future Plans

Future activities include continued review of the 2006 Consumer and Commercial Products Survey to determine if more VOC reductions are feasible. We also plan to conduct an additional survey to update emissions of aerosol coating products and various other consumer products. This survey will serve as the basis for completing the SIP commitment for consumer products.

We also will explore options for identifying complying products destined for sale in California and develop advisories to clarify what constitutes "incidental use" and to clarify how limits for "general" purpose products are enforced.

M. Recommendation

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

REFERENCES

1. Air Resources Board. The California Almanac of Emissions and Air Quality – 2009 Edition. 2009. (ARB, 2009a)

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7. San Francisco Estuary Institute. Occurrence of Alkylphenol Ethoxylate Surfactants in San Francisco Bay and Potential Impacts on Water Quality. Memorandum dated July 13, 2010, from Rainer Hoenicke, Ph.D., Executive Director, San Francisco Estuary Institute, to Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Resources Control Board. (SFEI, 2010)

8. Southern California Coastal Water Research Project. Effects on Water Quality of Alkylphenol Ethoxylate Surfactants (APEOs). Memorandum dated July 15, 2010, from Keith Maruya, Principle Scientist, Southern California Coastal Water Research Project, to Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Resources Control Board. (SCCWRP, 2010)

9. State Water Resources Control Board. Water Quality Effects of Alkylphenol Ethoxylate Surfactants. Memorandum dated September 20, 2010, from Darrin, Deputy Director, Division of Water Quality, State Water Resources Control Board, to Richard Corey, Chief, Stationary Source Division, Air Resources Board. (SWRCB, 2010a)

10. State Water Resources Control Board. Effects on Water Quality of Alkylphenol Ethoxylate Surfactants. Memorandum dated July 19, 2010, from Valerie Connor, Ph.D., Deputy Director, Office of Information Management and Analysis, State Water Resources Control Board, to Darrin, Deputy Director, Division of Water Quality, State Water Resources Control Board. (SWRCB, 2010b)

State of California
AIR RESOURCES BOARD

Initial Statement of Reasons for Proposed Amendments to the California Regulation for Reducing Emissions from Consumer Products
and
Test Method 310: "Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products"

Technical Support Document

Chapter I. Introduction

In this rulemaking Air Resources Board (ARB) staff is proposing amendments to the Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation) that are designed to reduce the volatile organic compound (VOC) content of various consumer products. Mitigation measures are also proposed to ensure that use of several toxic air contaminants, compounds with higher global warming potential (GWP) values, and certain surfactants are not used as replacements to meet the proposed VOC limits. Other proposals would clarify and improve existing regulatory provisions and definitions. The regulation is codified in title 17, California Code of Regulations, sections 94507-94517. The proposed amendments are necessary as an incremental step towards fulfilling the consumer products element of the 2007 State Implementation Plan for Ozone.

Amendments to the test method used to verify consumer products' compliance with VOC limits are also proposed. These amendments to Test Method 310: "Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products" (Test Method 310) are necessary to enforce newly adopted provisions in the Consumer Products Regulation.

This Technical Support Document is ARB staff's technical justification and analysis of the proposed amendments. It is part of the Initial Statement of Reasons (ISOR) for Proposed Amendments to the California Consumer Products Regulation and Test Method 310. The proposed amendments to the Consumer Products Regulation and Test Method 310 can be found in Appendices A and B, respectively, of this document.

Included in this Technical Support Document is the following information:

- background information on the consumer products program related to the control of VOC and greenhouse gas (GHG) emissions;
- information on the public process used to develop the proposed amendments;
- an overview of the requirements of State law and the State Implementation Plan commitment for consumer products;
- an overview of air quality focusing on criteria pollutants and climate change which are germane to the regulation of consumer products;
- a review of the emissions from the categories proposed for regulation and development of the VOC limits;
- a description, in plain language, of the proposed amendments to the Consumer Products Regulation and Test Method 310;

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

A. Enabling Legislation

The Health and Safety Code sets forth ARB's authority to regulate consumer products. Section 41712 sets forth the authority to control VOC emissions to reduce ground-level ozone concentrations. Section 38500 *et seq.* provides the authority to reduce emissions of GHGs. Authority to mitigate potential adverse impacts of proposed regulations is set forth in Public Resources Code section 21000 *et seq.* A summary of each of these requirements in State law follows.

1. Health and Safety Code section 41712

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

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

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

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

AB 32 required ARB to identify a list of "discrete early action greenhouse gas reduction measures" by June 30, 2007. Once on the list, these measures are to be developed into regulatory proposals, adopted by the Board, and made legally enforceable

(approved by Office of Administrative Law) by January 1, 2010. Reduction of compounds with higher GWP values that are used in consumer products was designated as one of these measures, and became part of the State's comprehensive strategy when the Board approved the Scoping Plan on December 12, 2008.

3. Public Resources Code section 21000 *et seq.*

In addition to requirements set forth in California's Health and Safety Code, the California Environmental Quality Act (CEQA) requires that environmental impacts of proposed regulations be evaluated. If significant adverse environmental impacts are identified, mitigation measures must be put in place, if available, to reduce or eliminate such impacts. California's Public Resources Code, commencing with section 21000 *et seq.*, specifies these provisions.

B. Background

To date, the Board has taken numerous actions to fulfill the legislative mandate pertaining to the regulation of VOCs in consumer products. A synopsis of the regulations adopted to date follows.

1. Existing Consumer Product Regulations

Three regulations have been adopted that affect 127 consumer product categories. These limits, once fully effective will result in reducing VOC emissions by about 225 tons per day by the end of 2013, an overall 50 percent reduction.

Exposure to toxic air contaminants (TAC) has also been reduced by prohibiting use of certain chlorinated compounds in 72 categories. Total emissions of TACs have been reduced by over 13 tons per day.

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

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

Regulation of consumer products began in 1989 with adoption of the Antiperspirants and Deodorants Regulation. The "general" Consumer Products Regulation was approved in 1990 and has been amended numerous times. The most recent amendments to the Consumer Products Regulation were adopted on August 6, 2010. These amendments set new or lower VOC limits for three categories of consumer products. When fully effective VOC emissions from the 2009 amendments will be

reduced by an additional 14.7 tons per day. 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.

Greenhouse gas emission reductions of about 0.2 million metric tons of carbon dioxide equivalents (MMT CO_2e) per year have also been achieved.

2. Consumer Products and the State Strategy for California's 2007 State Implementation Plan (SIP)

Federal clean air laws require areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide and inhalable particulate matter to develop 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. The Code of Federal Regulations (CFR) Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items which are included in the California SIP.

The SIP showing how California's nonattainment areas will meet the eight-hour standard of 0.08 parts per million (ppm) was adopted at the September 25, 2007, Board hearing (ARB, 2007d). California's SIP was submitted to U.S. EPA in late 2007. As of this writing the U.S. EPA has not acted to approve this SIP.

Specific to consumer products, in the SIP, ARB committed to reducing consumer product VOC emissions statewide by 30 to 40 tons per day by January 1, 2014. This means that all limits designed to meet this commitment must be effective before January 1, 2014. Rulemakings from 2008 and 2009 will result in over 19 tons per day of reductions once fully effective. The amendments proposed in this rulemaking are the third increment toward fulfilling the commitment for VOC reductions from consumer products. Additional information on the consumer products element of the SIP, including progress toward meeting the goal, is included in Chapter III.

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 in this chapter greenhouse gas reductions from consumer products was designated a Discrete Early Action Measure.

The Discrete Early Action Measure is a GHG emission reduction from consumer products estimated to be 0.25 MMT CO_2e, if feasible. As mentioned previously, in 2020 the reduction achieved will be 0.23 MMT CO_2e. We continue to evaluate whether GHG

emission reductions from other consumer product categories are feasible, however, any additional measures would not be creditable to the Discrete Early Action Measure.

4. National Consumer Products Regulations

On September 11, 1998, U.S. EPA promulgated a national consumer products regulation, the "National Volatile Organic Compound Emission Standards for Consumer Products" (40 CFR Part 59, Subpart C, Sections 59.201 et seq.). This action set national VOC emission standards for various categories of consumer products. The regulation became effective on September 11, 1998, and the VOC limits became effective on December 10, 1998, (U.S. EPA, 1998a). There are similarities and differences between the California and national consumer products regulations; however, the national regulation does not preclude states from adopting more stringent regulations.

In 2011, U.S. EPA will begin working on amendments to their existing national consumer products regulation. Their amendments are based on California's CONS-1 (2004 Consumer Products Regulation Amendments) categories and limits. The amendments are expected to become effective in 2012, with a compliance date of January 2013.

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

The national consumer products regulation is less effective in reducing VOC emissions from consumer products. The national regulation does not regulate a number of product categories that are currently regulated under the ARB regulation. For the categories that are regulated under both regulations, many of ARB's limits are more stringent than the national limits. Therefore, ARB's consumer products regulations have achieved significant additional reductions over those that would be achieved by the national regulation alone.

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.

The national regulations for consumer products and aerosol coatings do not prohibit the use of certain TACs. To date, the California Consumer Products Regulation includes prohibitions on the use of certain TACs in 72 categories, resulting in a reduction of toxic compound emissions of over 13 tons per day.

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

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1. Air Resources Board. State Strategy for California's 2007 Implementation Plan. Released April 26, 2007. Adopted by the Air Resources Board on September 27, 2007. (ARB, 2007d)

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

3. United States Environmental Protection Agency. National Volatile Organic Compound Emission Standards for Consumer Products. (40 CFR Part 59). Federal Register: September 11, 1998. Volume 63, Number 176: 48819-48847. (U.S. EPA, 1998a)

Chapter II. Public Process

This chapter contains a description of the public process used to develop the proposed amendments. The Administrative Procedure Act (APA) (Government Code section 11340 *et seq.*) requires that development of regulations must allow for public input.

Our process for development of these proposed limits included a number of formal and informal opportunities for public participation. In order to involve the public, the Consumer Products Regulation Workgroup (CPRWG) was formed. Participation is open to any member of the public. The CPRWG participated in the development of the 2006 Consumer and Commercial Products Survey (2006 Survey). The CPRWG actively participated in the development of the 2004, 2006, 2008, and 2009 amendments, as well as, these proposed amendments.

Further, the CPRWG also participated in the development of the 2008 Survey Update for Dry Clean Only Spot Remover Products (ARB, 2009e). The intent of this survey was to evaluate emissions from spot remover products used at dry cleaning facilities. The survey was conducted in response to comments from stakeholders that indicated the market was not sufficiently covered by the 2006 Survey (ARB, 2007e). Combined, these surveys serve as the basis for this proposal.

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

- American Chemistry Council (ACC)
- American Cleaning Institute (ACI)
- American Coatings Association (ACA)
- Automotive Specialty Products Association (ASPA)
- Coalition for Clean Air
- Consumer Specialty Products Association (CSPA)
- Institute for Research and Technical Assistance (IRTA)
- International Sanitary Supply Association (ISSA)
- National Aerosol Association (NAA)
- Personal Care Products Council (PCPC)

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

ARB staff maintains a mailing list of over 5,000 companies and interested parties, including environmental organizations. We have established an electronic list serve, which has over 2,800 subscribers, to allow subscribers to receive pertinent information. We also have a public website for the 2010 Consumer Products Regulatory Work Group Activity.

The public process to evaluate the categories included in these proposed amendments began in July of 2007 with release of the 2006 Survey. The Survey (along with the 2008 Survey Update) provided detailed information on sales and product volatile organic compound (VOC) content which allowed for calculation of emissions and identified possible reformulation strategies to reduce VOC content.

To begin this rulemaking process, on August 15, 2008, staff posted data summaries for several cleaning product categories to the CPRWG activity website. Draft VOC limits for these categories were posted on August 22, 2008. The data and proposals were discussed at a public workshop on August 27, 2008. 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. Based on comments received, staff postponed consideration of the proposals to assess health impacts associated with potential reformulation strategies.

Staff continued review of the 2006 Survey and on October 19, 2009, data summaries were posted for the remaining 2006 Survey categories. Corrections to the data were made, as appropriate, based on stakeholder comments.

The data summaries were evaluated for potential VOC reduction opportunities. Based on this review, draft categories and VOC limits for various categories were posted to the CPRWG activity website on April 8, 2010. The data and proposals were discussed at a second public workshop on April 13, 2010. At the meeting, staff discussed the draft regulatory categories, proposed limits, and the rulemaking timeline. Stakeholders participated in person and *via* teleconference. Useful comments on the proposals were received. These comments led to additional evaluation of the survey data, and in some instances resulted in modifications to the proposal to ensure commercial and technological feasibility of each proposed limit.

To solicit additional information and comments, staff held individual meetings and teleconferences with stakeholders. At several of these meetings, industry representatives presented technical information related to reformulation of products.

A third public workshop to discuss the proposal was held on July 29, 2010. As with each of the previous public workshops, stakeholders participated in person and *via* teleconference. Prior to the public workshop materials to be discussed were posted to the 2010 CPRWG activity website. The proposal reflected some modifications based on comments received at earlier workshops.

REFERENCES

1. Air Resources Board. 2008 Consumer & Commercial Products Survey Update for Dry Clean Only Spot Removers. January 14, 2009. (ARB, 2009e)

2. Air Resources Board. 2006 Consumer & Commercial Products Survey (Including Aerosol Coating Products). July 24, 2007. (ARB, 2007e)

Chapter III. Statutory Requirements and the State Implementation Plan Commitment for Emission Reductions

In this chapter, we describe State law requirements related to setting volatile organic compound (VOC) and greenhouse gas (GHG) limits, and how our proposals meet these criteria. Interpretation of the terms commercially feasible and technologically feasible is provided. The commitment for consumer products in the 2007 State Implementation Plan (SIP), and progress to date, are also described.

A. VOC Reductions

Health and Safety Code section 41712 gives the Air Resources Board (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 national ambient air quality standards and the regulations are commercially and technologically feasible. Section 41712 also specifies that regulations cannot result in the elimination of a product form. Product form refers to the shape and/or structure of the product such as liquid; solid; powder; gel; crystal; aerosol; or pump spray.

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

Section C provides the interpretation of the terms commercially and technologically feasible as they relate to setting VOC limits. During the early development of consumer product regulations, guidelines were established to ensure that these statutory criteria were met when setting limits. These guidelines and statutory criteria were followed in

developing the proposed amendments. Chapter V includes our rationale for why staff finds that the VOC limits meet these criteria.

B. Greenhouse Gas Reductions

Health and Safety Code section 38500 *et. seq.* (Assembly Bill 32) requires ARB to develop regulations and consider market mechanisms that will ultimately reduce California's greenhouse gas emissions equivalent to the 1990 levels by 2020. It required ARB to identify a list of "discrete early action greenhouse gas reduction measures" by June 30, 2007. Reduction of compounds with higher global warming potential (GWP) values that are used in consumer products was designated as one of these measures, and is part of the State's Scoping Plan.

In accordance with section 38562, certain criteria are to be met in developing regulations to meet GHG reduction goals. Among other things, the regulations must be equitable, minimize costs, and maximize the benefits to California. The GHG regulations are also required to be technologically feasible and cost-effective.

In this rulemaking, we are not proposing limits under the authority granted under Assembly Bill 32. We are, however, proposing a mitigation measure under authority granted by the California Environmental Quality Act to ensure that use of compounds with higher GWP values are not used to reformulate products to meet VOC limits.

C. Interpretation of the Terms Technological and Commercial Feasibility in Relation to Proposing VOC Limits

Staff bases proposals for VOC limits on the lower VOC content technologies reported within a product category, on technology transfer from other product categories, or on research into emerging technologies, that with lead time, will likely be feasible. In doing this, staff must ensure that the various product forms within each category will be preserved and that efficacy of health benefit products will not be affected. Our interpretation of the terms "technologically feasible" and "commercially feasible" follows.

1. Technologically Feasible

Health and Safety Code section 41712(b) requires that the Board adopt consumer product regulations that are "technologically feasible." Technological feasibility is a different concept than "commercial feasibility," and does not take into account the cost of reformulating a product. We believe that a proposed limit is technologically feasible if it meets at least one of the following criteria: (1) the limit is already being met by at least one product within the same category, or (2) the limit can reasonably be expected to be met in the time frame provided through additional development efforts.

In setting the proposed VOC limits, an effort was made, wherever possible, to ensure that multiple reformulation technologies exist which would allow products to comply. Proposed limits were set at VOC levels that staff determined could be met without

increased use of toxic air contaminants, greenhouse gases, or ozone-depleting compounds. General reformulation options include addition of exempt VOC solvents such as acetone, use of low vapor pressure (LVP)-VOC solvents, use of water-based technologies, use of VOC exempt propellants, increased use of surfactants, and use of inorganic compounds.

2. Commercially Feasible

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

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

By way of example, a consumer has a basic market demand for a glass cleaner to remove soils, grease, dirt or grime from their windows. Glass cleaners may be formulated with glycol ether solvents or with ammonia. Consumers may choose an ammoniated glass cleaner because they prefer the performance characteristics, or they may choose a nonammoniated 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 noncomplying products which perform the same basic function as complying product counterparts must reduce the amount of VOCs in their products. It is expected that when a product's formulation changes, some attributes of the product will also change.

If ARB were to establish limits which accounted for every distinct feature of every product, then each product would require a limit unto itself. Using this approach, it would be impossible to achieve the maximum feasible reduction in VOC emissions.

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

Chapter V of this report provides the rationale of why we believe the amendments proposed in this rulemaking meet these criteria.

D. State Implementation Plans

The Board must also meet its obligations under the SIP. Because VOCs are ozone precursors, specific consumer product control measures have been developed and included in SIPs to meet the previous one-hour peak ozone standard, as well as the eight-hour ozone standard. To meet the national standards, emission reductions from consumer products became part of the SIP for ozone in 1994. In this SIP, consumer products measures were put in place to work towards attaining the federal one-hour ambient air quality standard for ozone. In the 2003 SIP, ARB reiterated the commitment to reduce consumer products' VOC emissions to meet the one-hour federal ozone standard. Our summary here focuses on the current consumer product element designed to meet the 0.08 parts per million (ppm) eight-hour ambient air quality standard for ozone (ARB, 2008b).

1. The 2007 SIP Commitment for Consumer Products

In 2007, a new SIP was adopted. This State Strategy for California's 2007 State Implementation Plan continues California's approach to attaining the federal ozone standard of 0.08 ppm averaged over eight hours (ARB, 2007d). The consumer products commitment in this SIP, to reduce VOC emissions by 30-40 tons per day statewide, supplements the 1994 and 2003 commitments. Table III-1 displays the progress toward meeting the January 1, 2014, deadline. Once fully effective the adopted limits from the 2008 and 2009 rulemakings will reduce VOC emissions by 19.2 tons per day.

Table III-1
Consumer Product SIP Commitment and Progress to Date

Consumer Products Rulemaking	Statewide VOC Reductions (tons per day)
June 2008 Amendments	4.5 (adopted)
September 2009 Amendments	14.7* (adopted)
2010 Amendments (this proposal)	6.7 (proposed)
Additional Reductions from Consumer Product Categories	~ 4.0 – 14.0 (needed)
Total Reductions by January 1, 2014	**30 – 40**

* Emission reductions of about 12.7 tons per day of this reduction occur in all areas of the State except the South Coast Air Quality Management District (district has their own rule, Rule 1143, for Paint Thinners and Multi-purpose Solvents) (ARB, 2009c).

The amendments proposed in this rulemaking are the third increment toward fulfilling the 2007 SIP commitment for VOC reductions from consumer products. As shown in Table III-1, the proposal described in this report is designed to achieve a VOC reduction of about 6.7 tons per day statewide. Table III-1 also shows that additional rulemakings to complete the commitment are necessary.

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 SIP, 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 SIP includes a commitment to explore innovative reduction approaches in the longer term. One such measure would include investigating emission reduction opportunities through reactivity-based standards.

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

2. Future SIPs

Up-to-date information on SIP activities can be found on ARB's website at: http://www.arb.ca.gov/planning/sip/sip.htm. Effective May 27, 2008, U.S. EPA reduced the eight-hour "primary" ozone standard to a level of 0.075 ppm. U.S. EPA also set a secondary eight-hour ozone standard to the level of 0.075 ppm, making it identical to the revised primary standard. As of this writing these standards have been withdrawn and are being reconsidered. U.S. EPA proposed that the new primary standard be in the range of 0.060-0.070 ppm. The final rule is expected by late October of this year (2010). Revisions to the current eight-hour standard will require that new SIPs be drafted. A complete new State strategy will be developed for 2013 (U.S. EPA, 2010c). The 2013 SIP will likely require more VOC reductions from consumer products.

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Chapter IV. Air Pollutants, Area Designations, and Consumer Products' Emissions

California's extreme air quality problems require unique strategies for improving air quality and slowing climate change. For example, nearly all Californians, or about 99 percent, live in areas designated as nonattainment for the State's ozone and/or particulate matter (PM) standards (ARB, 2009a). In this chapter, we provide an overview of air quality focusing on criteria pollutants and climate change problems which are germane to the regulation of consumer products. This chapter also includes a summary of national and State ambient air quality standards and displays areas of the State that are not in attainment with these standards. Information on consumer products emissions and emission trends is also provided.

A. Criteria Pollutants

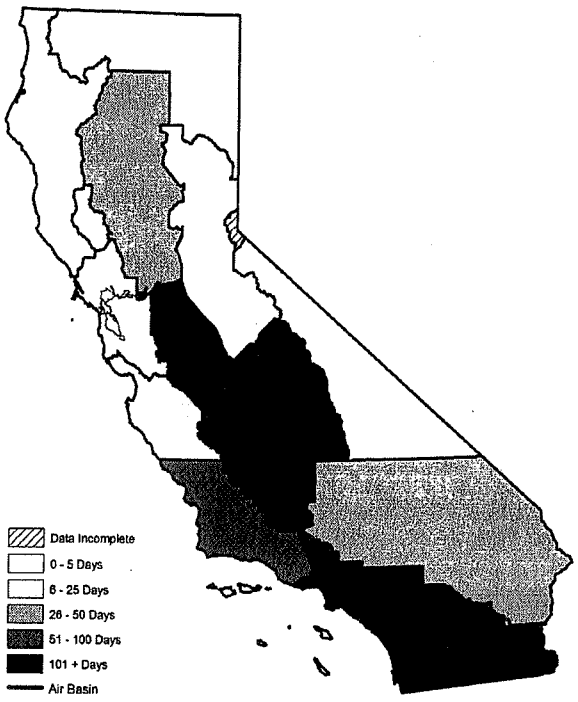
National and State ambient air quality standards have been established to protect California's population from the harmful effects of ozone and PM. An ambient air quality standard sets legal limits on the level of an air pollutant in the outdoor (ambient) air that has been deemed necessary to protect 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 and various paint products. 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. Emissions from consumer products are indirect sources of PM.

1. Ozone

Ozone formation in the lower atmosphere results from a series of chemical reactions between VOCs and NO_x 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 most persistent air quality problems. Over 90 percent of the State's population lives in areas where the State's eight-hour ozone standard is exceeded (ARB, 2006b). Figure IV-1 below displays, by air basin, the number of days in 2007 that the State's eight-hour ozone standard was exceeded.

Figure IV-1
Number of Days the State Eight-Hour Ozone Standard was Exceeded in Each Air Basin During 2007



As shown in Figure IV-1, large areas of the State experience over 50 days per year of unhealthful air due to ground-level ozone concentrations that exceed the State standard.

It has been well documented that ozone adversely affects the respiratory function of humans and animals. Research has shown that, when inhaled, ozone can cause respiratory problems, aggravate asthma, impair the immune system, and cause increased risk of premature death. Human health studies show that short-term exposure to ozone injures the lung (ARB, 2008b). 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, 2008b). 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. 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. The greatest risk from ozone exposure is to those who are active outdoors during smoggy periods, such as children, athletes, and outdoor workers.

Not only does ozone adversely affect human and animal health, but it also affects vegetation, resulting in reduced yield and quality in agricultural crops, disfiguration or unsatisfactory growth in ornamental vegetation, and damage to native plants. During the summer, ozone levels are often highest in the urban centers in Southern California, the San Joaquin Valley, and Sacramento Valley, which are adjacent to the principal production areas in the State's multibillion-dollar agricultural industry (USDA, 2010). ARB studies indicate that ozone pollution damage to crops is estimated to cost agriculture over $500 million dollars annually (ARB, 1987; ARB, 2006b).

2. Fine Particulate Matter

Particulate matter 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; Laden *et al.*, 2000). The association with premature mortality is considerably stronger for annual average $PM_{2.5}$ exposure than for daily average $PM_{2.5}$. That is, long-term exposure appears to pose a greater risk of death than short-term exposure.

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

- Daily exposure to $PM_{2.5}$ has been associated with hospitalization for heart and lung related causes (Moolgavkar, 2003; Zanobetti and Schwartz, 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, 2003). Other research indicates that exposure to $PM_{2.5}$ leads to increased asthma medication usage (Gent *et al.*, 2003), and increased asthma symptoms (e.g., Delfino *et al.*, 2002; Whittemore and Korn, 1980). Exposure to $PM_{2.5}$ has also been associated with an increase in the loss of work days (Ostro *et al.*, 1993; Ostro and Rothschild, 1989).

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

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

B. Ambient Air Quality Standards

To protect public health California has set two standards for ozone. The one-hour peak standard for ozone is 0.09 parts per million (ppm). The eight-hour standard for ozone is 0.070 ppm averaged over eight hours. The PM_{10} annual average standard is 20 micrograms per cubic meter ($\mu g/m^3$) and the annual average $PM_{2.5}$ standard is 12 $\mu g/m^3$. The State PM_{10} standard for a 24-hour period is 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 reflects the previous national eight-hour standard for ozone of 0.08 ppm. This is because the 0.075 ppm standard, promulgated on March 27, 2008, is being reconsidered. It is expected that the revised primary standard will be set within the range of 0.060 to 0.070 ppm to provide increased protection for children and other 'at risk' populations (U.S. EPA, 2010c). The final rule on the national standard is expected in October of this year. Table IV-1 shows that California's standards for PM and ozone continue to be more heath protective than those at the federal level.

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 $\mu g/m^3$)	0.08 ppm** (157 $\mu g/m^3$)
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 $\mu g/m^3$	15.0 $\mu g/m^3$

Source: Air Resources Board, Ambient Air Quality Standards April 1, 2008 (ARB, 2008b).
* The federal one-hour standard was revoked on June 15, 2005.
** The previously promulgated standard of 0.075 ppm is being reconsidered. The 2007 SIP is designed to reach attainment with the standard of 0.08 ppm (U.S. EPA, 2010c).

1. 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 "nonattainment" for the State ozone standards.

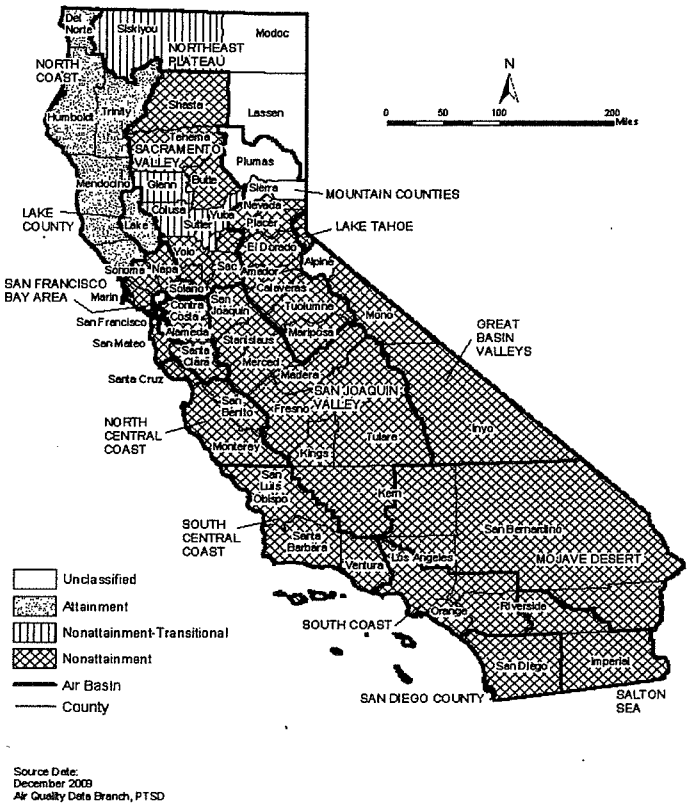
For the year 2010, Figure IV-2 shows the counties designated as nonattainment (or nonattainment transitional, which is a subcategory of nonattainment) for the State ozone standard. As shown, unhealthy levels of ozone are not limited to urban areas, but can be found in nearly every county in California. This map clearly indicates the extent and magnitude of the ozone problem in California.

Some of the areas that are nonattainment for the State ozone standards are also nonattainment for the 0.08 ppm federal eight-hour ozone standard. SIPs showing how each nonattainment area would meet the 0.08 ppm eight-hour ozone standard were submitted to U.S EPA in 2007. In order to maintain progress towards clean air, the federal Clean Air Act prohibits backsliding on the control program.

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

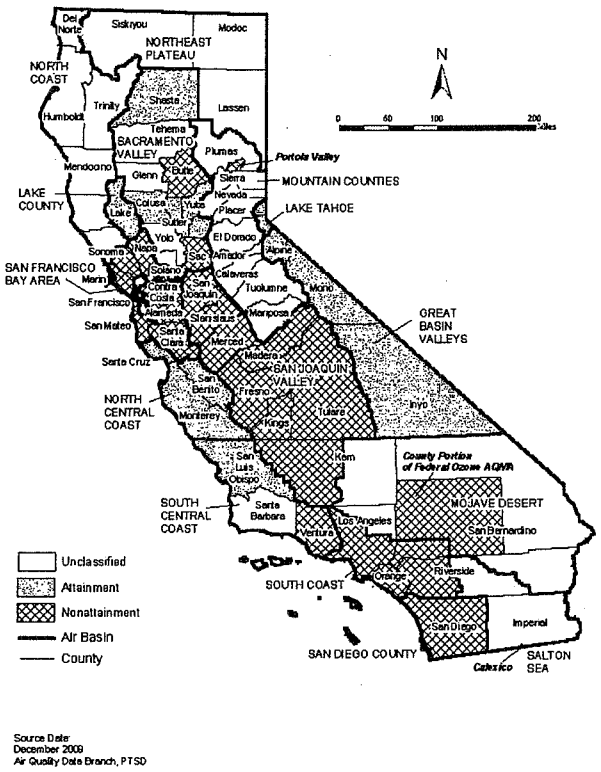
Figure IV-3 shows the counties designated as nonattainment for the State $PM_{2.5}$ standard. As with ozone, unhealthy levels of $PM_{2.5}$ are not limited to urban areas, but can be found in many counties throughout California.

Figure IV-2
Area Designations for State Ambient Air Quality Standard for Ozone



Nonattainment areas for the federal 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ include the South Coast Air Quality Management District (SCAQMD); San Joaquin Valley Air Pollution Control District (SJVAPCD); Bay Area Air Quality Management District; Sacramento Metropolitan Air Quality Management District; and portions of the El Dorado County Air Quality Management District, Placer County Air Pollution Control District, Yolo/Solano Air Quality Management District, Feather River Air Quality Management District, Butte County Air Quality Management District, and Imperial County Air Pollution Control District. Thus, most of the areas shown in Figure IV-3 are also nonattainment for the federal 24-hour $PM_{2.5}$ standard. SIPs are due to U.S. EPA for the federal 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ in 2012.

Figure IV-3
Area Designations for State Ambient Air Quality Standard for $PM_{2.5}$



SIPs for the federal $PM_{2.5}$ annual standard of 15.0 $\mu g/m^3$ were due to U.S. EPA in 2008. The $PM_{2.5}$ SIP for SCAQMD was approved by the Board in September 2007 and was submitted to U.S. EPA in November 2007. The $PM_{2.5}$ SIP for SJVAPCD was approved by the Board in May 2008 and was submitted to U.S. EPA in June 2008.

C. 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. Changes in the atmospheric abundance of greenhouse gases (GHG) alter the energy balance of the climate system. These changes are expressed in terms of radiative forcing. The standard definition of "greenhouse gas" includes, but is not limited to, six substances as

identified in the Kyoto Protocol; carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

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

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

The GWP values used by ARB are generally the 1996 SAR GWP values (ARB, 2007c). These values are used when converting emissions of GHGs to CO_2 equivalent values (CO_2e). The SAR GWP values are used to be consistent with the Board's Discrete Early Action Report, other statewide and national GHG inventories, and ARB's Scoping Plan. When no SAR GWP value is listed, ARB uses the 2007 Fourth Assessment Report (FAR) GWP value (IPCC, 2007).

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

D. Consumer Product Emissions

Consumer products are a significant source of VOC emissions in California. These VOC emissions also contribute to secondary organic aerosol formation. The contribution of consumer products to overall GHG emissions is modest relative to other sources, such as vehicle exhaust. This section focuses on emissions of VOCs and GHGs.

1. VOC Emissions

Although each consumer product may seem to be a small source of emissions, the cumulative use of these products by over 39 million Californians results in significant

emissions (ARB, 2009a). 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 current (2010) consumer products emissions are approximately 245 tons per day, or about 12 percent of the overall statewide VOC inventory. Consumer product emissions comprise about 18 percent and 7 percent of VOC emissions in SCAQMD and SJVAPCD, respectively. Without further actions, consumer product emissions are expected to grow to approximately 270 tons per day in 2020, representing about 14 percent of statewide VOC emissions (ARB, 2009a).

As control measures for other VOC sources (i.e. mobile sources) become effective, consumer product emissions become more important. For example, it is estimated that emissions from consumer products will be the largest source of VOC emissions in the SCAQMD in 2020. Given this, further reductions in VOC emissions from consumer products are needed, if ozone attainment is to be achieved and maintained.

Despite these projections, ARB's consumer products program has made significant progress. Since 1989, regulations adopted by the ARB, along with numerous amendments to the regulations, have substantially reduced VOC emissions from consumer products. Absent these regulations today, consumer product emissions would likely be about 450 tons per day. Figure IV-4 shows that statewide consumer product VOC emissions will have been reduced by over 225 tons per day by 2013. However, Figure IV-4 also shows that without further actions population growth would likely reverse the trend.

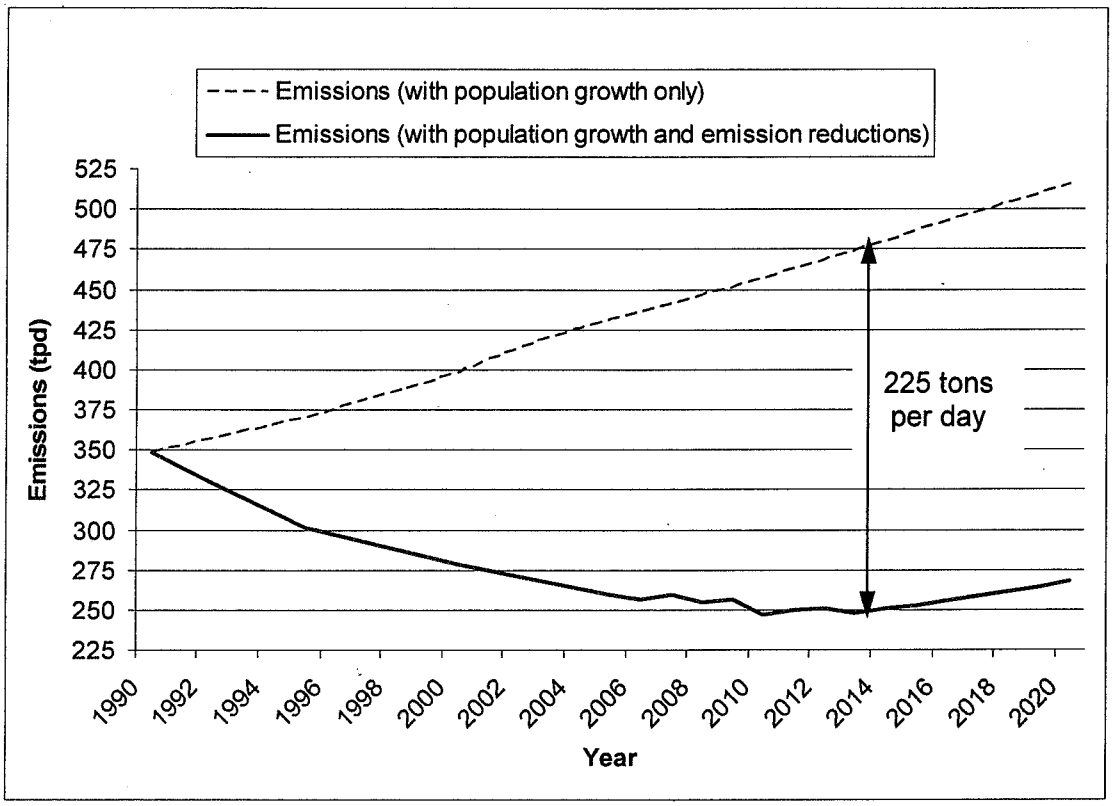
The emission values in Figure IV-4 are derived from several data sources. The 1990 to 2007 emissions are taken from the ARB Forecasted Emissions by Summary Category, 2009 Almanac (ARB, 2007a; ARB, 2009b). Emissions are then grown in proportion to expected population increase. Population growth is in accordance with estimates in the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008c). For categories regulated by the 2009 Consumer Products Regulation Amendments, emission values from the 2006 Survey and estimated emission reductions resulting from the VOC limits approved by the Board at its September 2009, hearing, are reflected in the figure (ARB, 2009c). As shown in Figure IV-4, the important emission reductions that have been realized from the ARB's Consumer Products Program will, in 2014, begin to be offset by population growth. California's population is expected to grow to 40 million by 2012 (CA DOF, 2007). Therefore, ARB must continue its commitment to pursue additional technologically and commercially feasible consumer products emission reductions.

2. Greenhouse Gas Emissions

Several GHGs are used in consumer products. Compounds of interest include CO_2, N_2O, HFCs, hydrochlorofluorocarbons, and hydrofluoroethers. However, the

propellants CO_2, HFC-134a, and HFC-152a are the predominate GHGs used in consumer products today. The propellants HFC-134a and HFC-152a are low

Figure IV-4
Consumer Products VOC Emission Trends



photochemically reactive compounds that are VOC exempt; they have been used as a reformulation strategy to reduce VOC content in other categories. CO_2 is not a VOC.

Using the second assessment report for GWP values, HFC-152a has a GWP of 140, while HFC-134a has a GWP of 1,300. The value for HFC-134a is approximately ten times greater than the GWP of HFC-152a and 1,300 times greater than CO_2. Thus, consumer product emission reduction strategies have primarily focused on restricting the use of HFC-134a.

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Chapter V. Development of the Proposed VOC Limits

In Chapter III information on statutory requirements and the State Implementation Plan (SIP) commitment was provided. Chapter IV focused on California's air quality problems to demonstrate why there is a need to control emissions from consumer products. This chapter describes the development of the proposed limits and why we believe the limits are commercially and technologically feasible, and necessary. The following information is included:

- surveys conducted to estimate emissions in categories proposed for regulation;
- emissions from categories proposed for regulation;
- proposed volatile organic compound (VOC) limits and reductions resulting if the limits are adopted;
- commercial and technological feasibility of the proposed VOC limits;
- general reformulation strategies for noncomplying products;
- necessity of achieving the reductions; and
- alternative regulatory proposals considered.

A. Surveys, Estimated Emissions, and Reductions from Categories Proposed to be Regulated

In this section, we provide an overview of the surveys used to develop these proposed amendments. The survey data are used to estimate VOC and greenhouse gas (GHG) emissions from consumer products and evaluate opportunities for reductions. The categories, emissions, and proposed limits are also provided.

1. Consumer and Commercial Products Surveys

The 2006 Consumer and Commercial Products Survey was mailed to over 5,000 companies in July 2007. The 2008 Dry Clean Only Spot Remover Survey Update (2008 Survey Update) was sent to companies in January 2009. Over 570 companies responded to the 2006 Survey with information on over 12,000 products (ARB, 2007e). Eight companies responded to the 2008 Survey Update with information on about 50 products (ARB, 2009e). The surveys were designed to obtain the comprehensive information necessary to develop new consumer product emission standards. Data received from these surveys formed the basis for the emissions used in this rulemaking.

The 2006 Survey and 2008 Survey Update provided staff with detailed information on the formulations of consumer products proposed for regulation, including complete

speciation of VOCs, low vapor pressure VOC (LVP-VOC) solvents, GHGs, and key exempt ingredients (ARB, 2007e; ARB, 2009e). Total volumes of inorganic and other compounds were also provided. Information on sales, product form, customer types, and company size and economics was also obtained.

Data summaries from the 2006 Survey and 2008 Survey Update were posted to the website and input from industry was used to correct inaccuracies in the data. For this rulemaking, the emissions data from the 2006 Survey and the 2008 Survey Update were grown by population to predict current year emissions (2010). Reported emissions were assumed to account for 90 percent of overall emissions. Data were also grown to ensure complete market coverage. Emission reduction estimates were grown to the date the limits become effective. The basis for these adjustments is the estimates in the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008c).

Staff is confident that the 2006 Survey and 2008 Survey Update had adequate representation of the available technologies in the market place for the categories proposed for regulation 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 through data review by manufacturers, category research, shelf surveys, and the wide range of VOC content reported for products in the categories proposed for regulation.

2. Staff Evaluation of Emission Reduction Opportunities

Development of the proposed amendments began with review of the survey data. In developing these proposals, staff worked with stakeholders on each category proposed for regulation. Numerous product labels and associated literature for each category were analyzed. Category information was also obtained from shelf surveys, trade journals, Internet sites, textbooks, patents, and directly from manufacturers.

In developing the proposed amendments, staff reorganized survey categories based on similarities or other criteria. Staff further developed the proposed VOC limits for product categories based on technical information provided by stakeholders and staff's research efforts.

As part of the public process, we presented specific proposals and alternatives to the public for consideration. Modifications were made to the original proposal after consideration and evaluation of comments.

3. VOC Emissions, Proposed Categories, and Limits

Based on the process described above, staff is proposing VOC limits for 11 categories. Table V-1 displays the statewide VOC emissions from the categories proposed for regulation. As shown in Table V-1, 2010 emissions are estimated to be about 21.7 tons per day. The table also includes the proposed VOC limit and emission reduction

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

Product Category	Product Form	2010 VOC Emissions* (tons per day)	Proposed VOC Limit (weight %)	VOC Reduction** (tons per day)
Flying Bug Insecticide	Aerosol	0.65	20	0.06+
Furniture Maintenance Product	Aerosol	1.32	12	0.36
General Purpose Cleaner	Nonaerosol	12.04	0.5	3.73+
General Purpose Degreaser	Nonaerosol	1.91	0.5	1.17
Glass Cleaner	Nonaerosol	3.34	3	0.41
Heavy-duty Hand Cleaner or Soap	Nonaerosol	0.79	1	0.53
Metal Polish or Cleanser	Aerosol	0.22	15	0.07
Metal Polish or Cleanser	Nonaerosol	0.20	3	0.15
Oven or Grill Cleaner	Aerosol	0.08	8	>0.0
Oven or Grill Cleaner	Nonaerosol	0.24	4	-0.12
Special-purpose Lubricant	Aerosol	0.26	25	0.10
Special-purpose Lubricant	Nonaerosol	0.18	3	0.13
Spot Remover (Dry Clean Only)	Aerosol	>0.0	15	>0.0
Spot Remover (Dry Clean Only)	Nonaerosol	0.17	3	0.17
Wasp or Hornet Insecticide	Aerosol	0.31	10	0.14+
Total Emissions 2010		**21.7 tons per day**		
Total VOC Reductions Creditable Toward 2007 SIP				**6.7 tons per day**
Total VOC Reductions Creditable Toward Future Commitment				**0.2 tons per day**

* Survey emissions adjusted for market coverage and grown to 2010 based on population
** Emission reductions grown to effective date based on population
+ Products subject to FIFRA registration requirement given an extra year to complete the registration process

at the date the proposed limits become effective. If adopted, VOC emission reductions from the limits that become effective prior to January 1, 2014, will be approximately 6.7 tons per day. An additional reduction of about 0.2 tons per day would be realized by the end of 2014. Although important to overall air quality, these reductions from Flying

Bug and Wasp or Hornet Insecticide products will not occur within the timeframe to be credited toward the current SIP commitment.

4. Greenhouse Gas Emissions

The GHGs reported in the categories proposed for regulation include CO_2, hydrofluorocarbon-152a (HFC-152a), and hydrochlorfluorcarbon-141b (HCFC-141b). Reported emissions, in pounds per year, for CO_2 are 41,145; for HFC-152a are 34,646; and for HCFC-141b are less than one pound per day. In combination, this is less than 0.01 million metric tons per year of CO_2 equivalents (MMT CO_2e).

B. Commercial and Technological Feasibility of the Proposed VOC Limits

In accordance with State law staff must demonstrate that the limits are commercially and technologically feasible. Useful measures for evaluating feasibility are the number of products that currently comply with the proposed limits and/or the market share, based on sales, of those products. As shown in Table V-2, the complying market shares (except where confidential) range from about 5 percent to over 95 percent. For each category 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. Based on the complying market share and/or the number of complying products in each category, staff believes the proposed VOC limits are commercially and technologically feasible.

In categories where the complying market share is low, staff has determined that the proposed effective dates will allow adequate time to successfully reformulate and bring products to market. Table V-2 also shows that for many categories separate limits have been proposed based on product form. This approach ensures that the proposed limits do not eliminate a product form, but also maximizes the reductions that are commercially and technologically feasible.

C. Options for Complying with the Proposed VOC Limits

Manufacturers of noncomplying products have the flexibility to choose from a variety of formulation options to meet the applicable limits. The reformulation options vary with each product category and are discussed in greater detail for each category in Chapter VII. To comply with VOC limits, VOC solvents or propellants will need to be replaced, or partially replaced, with non-VOC ingredients. This may require using water, exempt VOC compounds, substituting LVP-VOCs, increasing use of surfactants, increasing product solids, or formulating with a non-VOC propellant. Manufacturers may also need to change the valve, container, delivery system, or other components of the consumer product depending on the individual formulation. ARB staff has proposed

Table V-2
Summary of Complying Products and Complying Market Shares

Product Category	Product Form	Proposed VOC Limit (weight %)	Number of Complying Products/Total Products	Complying Market Share (%)
Flying Bug Insecticide	Aerosol	20	18 / 51	55
Furniture Maintenance Product	Aerosol	12	37 / 87	10
General Purpose Cleaner	Nonaerosol	0.5	980 / 1518	69
General Purpose Degreaser	Nonaerosol	0.5	232 / 462	73
Glass Cleaner	Nonaerosol	3	165 / 298	10
Heavy-duty Hand Cleaner or Soap	Nonaerosol	1	113 / 255	30
Metal Polish or Cleanser	Aerosol	15	20 / 73	35
Metal Polish or Cleanser	Nonaerosol	3	96 / 154	78
Oven or Grill Cleaner	Aerosol	8	18 / 21	87
Oven or Grill Cleaner	Nonaerosol	4	81 / 90	> 95
Special-purpose Lubricant	Aerosol	25	64 / 168	47
Special-purpose Lubricant	Nonaerosol	3	166 / 224	97
Spot Remover (Dry Clean Only)	Aerosol	15	<5 / <5	<5
Spot Remover (Dry Clean Only)	Nonaerosol	3	16 / 49	46
Wasp or Hornet Insecticide	Aerosol	10	38 / 56	60

Source: 2006 Consumer and Commercial Products Survey (2006 Survey) and 2008 Survey Update for Dry Clean Only Spot Removers (Survey Update) grown to 2010 based on population

VOC limits that can be met without the increased use of toxic air contaminants, GHGs with higher GWP values, and certain surfactants.

In general, we believe that aerosol products can and will be reformulated by reducing the amount of hydrocarbon propellant or using non-VOC propellants such as HFC-152a or CO_2. Some modification to the valve/spray nozzle may also be needed. The VOC solvents will likely be replaced with LVP-VOC, or VOC exempt solvents.

For nonaerosol products, developing water-based formulations is the most likely reformulation option for manufacturers of noncomplying products. We believe that VOC

solvents will be replaced with VOC exempt compounds; LVP-VOCs, such as methyl esters, glycol ethers, and hydrocarbons; surfactants; and/or inorganic compounds.

Several reformulation options warrant further discussion.

LVP-VOC Glycol Ethers

Stakeholders, as well as ARB staff, had concerns that reformulations to comply with the VOC limits for various cleaning products could result in use of certain compounds that may pose adverse health impacts. Staff evaluated various reformulation options and identified use of LVP-VOC glycol ethers as one of several reformulation options. To fully evaluate whether use of LVP-VOC glycol ethers would pose potential health hazards, ARB staff consulted with the Office of Environmental Health Hazard Assessment (OEHHA).

Based on available health effects data OEHHA developed draft provisional Reference Exposure Levels (REL) for a number of LVP-VOC glycol ethers. A REL is a concentration in air that is considered safe. However, due to lack of publicly available health effects data, large uncertainty factors were applied to the RELs. Further analysis by OEHHA determined that the RELs should not be used as a basis for regulatory action due to an overall lack of information on the toxicity of these compounds. OEHHA will continue to monitor developments in the toxicological literature and will re-evaluate the provisional RELs in the future, if needed (OEHHA, 2010).

In addition, based on staff's ongoing analysis of reformulation approaches we have concluded that use of these compounds is neither necessary, nor the preferred reformulation approach. This is because a large share of products that already comply with the proposed VOC limits for "General Purpose Cleaner" and "General Purpose Degreaser" do not rely on use of LVP-VOC glycol ethers. We also believe the proposed VOC limit for "Glass Cleaner" products is set at a level such that use of LVP-VOC glycol ethers is not needed. Nevertheless, we will monitor use of the LVP-VOC glycol ethers through regular surveys of the industry.

Acetone

Staff has identified use of acetone as a potential reformulation option in specific categories. Acetone is a low photochemically reactive compound that has been excluded from the definition of VOC. However, concerns with its use have been raised because it is an extremely flammable solvent. Although acetone may have limited use in some categories, as shown in Appendix D, 'typical' complying and noncomplying formulas developed for our economic impacts analysis did not include acetone. This indicates that reformulations not containing acetone are more likely. In categories where acetone could be used, the aerosol product form is already considered flammable due to the hydrocarbon propellant. Use of acetone in these products would not appreciably change how a consumer would use the product; consumers are already aware of the flammability hazard inherent in the use of aerosol products. In nonaerosol

products, we expect the reformulated products to contain water as the primary ingredient with small amounts of VOC solvents. If acetone were to be used in either nonaerosol or aerosol products, because only a relatively small amount of product is required to perform a specific task, the fire hazard is low.

Other Reformulation Options

Staff has identified that certain toxic compounds, GHGs, or surfactants could be used in reformulated products. Where necessary, staff is proposing mitigation measures to ensure that use of the toxic air contaminants methylene chloride, perchloroethylene, and trichloroethylene does not increase as products are reformulated. A specific mitigation measure is also proposed to ensure that use of GHG with GWP values at or above 150 does not begin. Another proposed mitigation measure would preclude use of the alkylphenol ethoxylate surfactants due to aquatic toxicity impacts. More information on each of these proposals is contained in Chapters VI, VII, and IX.

Options Other than Direct Compliance with the Proposed VOC Limits

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 a manufacturer 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. The manufacturer 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.

D. Necessity of Proposed Amendments

Because significant further VOC emissions reductions are necessary to attain the national and State ozone standards, 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 the "necessity" of a regulation is to be evaluated in terms of both the State and federal standards.

The applicable State and federal laws show that both the U.S. Congress and the California Legislature intended progress toward clean air be made as quickly as possible. The CCAA specifically declares that it is the intent of the Legislature that the State air quality standards be achieved "...by the earliest practicable date..." (See Health

and Safety Code, sections 40910 and 40913(a); see also the uncodified section 1(b)(2) of the Act (Stats. 1988, Chapter 1568)). A similar intent is expressed in the federal Clean Air Act, which declares that the federal air quality standards are to be achieved "...as expeditiously as practicable..." (See sections 172(a)(2), 181(a), and 188(c) of the federal Clean Air Act). For all of the reasons described above, the proposed amendments are "necessary" within the meaning of section 41712 of the Health and Safety Code.

The amendments proposed in this rulemaking are the third increment toward fulfilling the 2007 SIP element for VOC reductions from consumer products.

E. Alternatives Considered

Government Code section 11346.2 requires ARB to consider and evaluate reasonable alternatives to the proposed regulation and provide reasons for rejecting those alternatives. We identified three alternative approaches to the current proposal: "No action," "set different limits," and "set reactivity-based VOC limits." Our rationale for rejecting these alternatives, in favor of the proposal chosen, follows.

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 (see Chapter III). If the SIP commitments are not met, there is a potential that the State could lose federal funds. In addition, the citizens of California would not benefit from the improved air quality that would result from the reduction of emissions being proposed. This alternative would have no cost to business.

Alternative Two – Set Different Limits

Staff thoroughly evaluated each category for which a limit is proposed. Limits were proposed based on low emitting technologies reported in the 2006 Survey and 2008 Survey Update. Stakeholders provided additional information pertinent to the categories and, in some cases, proposed alternative limits. We evaluated all comments and determined the most feasible limit and effective dates from all of the alternatives proposed or considered. The final proposal contains limits that were determined to obtain the maximum feasible reduction, were commercially and technologically feasible, preserved product forms, maintained efficacy of health benefit products, and together achieved the necessary emission reductions to partially fulfill ARB's SIP commitments.

Alternative Three – Set Reactivity-based Limits

For each category staff determined the maximum feasible VOC reduction that could be achieved through proposing mass-based VOC limits. Staff then compared this

reduction to the reduction that could be achieved by proposing reactivity-based VOC limits. Staff found that mass-based limits provided the better air quality benefit. In some categories a small number of VOC ingredients are used making VOC substitution unfeasible. VOC substitution is the premise for reactivity-based VOC limits. In other categories, use of water and surfactant technology appears to be the most viable reformulation option. Use of this technology is negligibly reactive so again, there is little opportunity for substitution. Finally, in other categories the mass-based limits proposed resulted in greater air quality benefits. For all of these reasons we rejected the alternative to set reactivity-based limits.

REFERENCES

1. Air Resources Board. 2008 Consumer & Commercial Products Survey Update for Dry Clean Only Spot Removers. January 14, 2009. (ARB, 2009e)

2. Air Resources Board. Statewide Human Population Chart: Population and Vehicle Trends Report. April 2008. (ARB, 2008c)

3. Air Resources Board. 2006 Consumer & Commercial Products Survey (Including Aerosol Coating Products). July 24, 2007. (ARB, 2007e)

4. Office of Environmental Health Hazard Assessment. Provisional Reference Exposure Levels (RELS) Compounds of Interest As Possible LVP-VOCS. Memorandum dated September 16, 2010, from Melanie Marty, Ph.D., Chief, Air Toxicology and Epidemiology Branch, Office of Environmental Health Hazard Assessment, to Janette Brooks, Chief, Air Quality Measures Branch, Air Resources Board. (OEHHA, 2010)

Chapter VI. Plain Language Description of the Proposed Amendments to the Consumer Products Regulation

In this chapter, we provide a plain language description of the proposed amendments to the California Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation) and explain the rationale and necessity for the proposals. The regulation is codified in title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 8.5, Article 2, Consumer Products, sections 94507-94515. A description of the proposed changes to test method "Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products" (Method 310) is also included.

The information in this chapter satisfies 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. Where applicable, key terms or concepts involved in each proposed amendment are described. The proposed amendments to the Consumer Products Regulation and Method 310 can be found in Appendices A and B, respectively.

Amendments are being proposed to the following sections in the Consumer Products Regulation: section 94508 "Definitions;" section 94509 "Standards for Consumer Products;" section 94510 "Exemptions," section 94512 "Administrative Requirements," and section 94515 "Test Methods."

A more detailed discussion of the existing regulatory requirements can be found in additional ARB publications which are referenced at the end of this chapter (ARB, 2009c; ARB, 2008a; ARB, 2006a; ARB, 2004b; ARB, 1999; ARB, 1997b; ARB, 1991; ARB, 1990).

Changes to Method 310 would modify section 2 to include additional applicable test methods to analyze consumer products for compliance. Proposed new subsection 3.3.8 would specify the procedures for analyzing for aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products. New subsection 4.2.3 is proposed to specify the procedures for analyzing for the VOC content of "Fabric Softener-Single Use Dryer Product."

In Chapter III we summarized the legal requirements that must be adhered to in the regulation of consumer products. In the sections below, we describe the proposed amendments and the rationale for them.

A. Proposed Amendments to Section 94508(a): Definitions

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 3 new and 16 revised definitions. Table VI-1 lists the proposed new or modified definitions. These changes are necessary to improve clarity, improve enforceability, or to describe the types of products that are included or excluded from the product categories. Because of the proposed definitional changes, section 94508(a) would also be reorganized to reflect proper alphabetical order. Chapter VII, contains a detailed description of the products in each category for which a VOC limit is proposed, along with the proposed limits.

Table VI-1
Proposed New and Modified Definitions

Alkylphenol Ethoxylate *
Artist's Thinner/Solvent
Automotive Wax/Polish/Sealant/Glaze
Dry Cleaning Fluid
Existing Product
General Purpose Cleaner
General Purpose Degreaser
Gum or Candle Wax Remover *
Lawn and Garden Insecticide
Laundry Prewash
Lubricant
Metal Polish/Cleanser
Multi-purpose Solvent
Oven or Grill Cleaner
Sealant or Caulking Compound
Silicone-based Multi-purpose Lubricant
Special-purpose Lubricant *
Spot Remover
Wasp and Hornet Insecticide

* New Definition

Many of the proposed changes to definitions are minor clarifications. However, several of these proposed definitions warrant further discussion.

Alkylphenol Ethoxylate

We are proposing to add a definition for Alkylphenol Ethoxylate. An alkylphenol ethoxylate would be defined as a nonionic surface active agent (surfactant) composed of an alkyl chain of at least eight carbon atoms and a polyethoxylate chain attached to a benzene ring. Alkylphenol ethoxylate would include, but not be limited to, octylphenol ethoxylate (an alkyl chain consisting of eight carbon atoms), and nonylphenol ethoxylate (an alkyl chain consisting of nine carbon atoms). The definition is needed to implement our proposal to preclude use of these compounds in several categories. This is explained further in section B of this chapter.

Artist's Solvent/Thinner

At present, products meeting the definition of Artist's Solvent/Thinner are limited to specific products sold in packages of 32 fluid ounces. We are proposing to modify the definition of Artist's Solvent/Thinner to specify that an Artist's Solvent/Thinner is a product packaged in a container of 34 ounces or less. This change is being proposed because staff has determined that Artist's Solvents/Thinners are commonly packaged in metric units (*i.e.* a liter which is 33.8 ounces), rather than English units (*i.e.* a quart which is 32 ounces). Products sold in containers of this size (and meeting other criteria) are not subject to the VOC limits for Paint Thinner products. The proposed change would have negligible impacts on emissions because over the course of time, the same amount of thinner would be used.

Automotive Wax, Polish, Sealant or Glaze

The Automotive Wax, Polish, Sealant or Glaze definition has been reorganized to clarify the various subcategories that meet the definition.

General Purpose Degreaser and Lubricant

We are proposing to clarify the exemption for General Purpose Degreaser and Lubricant products used at manufacturing facilities. At present these definitions exclude products that are sold exclusively to facilities that manufacture or construct goods or commodities, and that are labeled "not for retail sale." We have determined that the phrase "not for retail sale" is inadequate to describe products used in the manufacturing process and that use of this term could allow for unintended products to meet this exemption criterion. We have also determined that in the normal chain of commerce, responsible parties for General Purpose Degreaser and Lubricant products sell products to distributors, who in turn, sell to manufacturing facilities. With this understanding, we are proposing to amend the exclusion to include distributors that sell directly to manufacturing facilities. To ensure that only products used in the manufacturing process itself meet the exclusion, we are proposing that these products be labeled "For Manufacturing Use Only." The phrase "not for retail sale," for the purposes of this regulation, would be deleted. As proposed, these provisions would become effective at the end of 2012.

Multi-purpose Solvent

Modification to the Multi-purpose Solvent definition is proposed to clarify that products that are labeled exclusively to clean a specific contaminant on a single substrate are not included in the Multi-purpose Solvent category.

Oven or Grill Cleaner

The Oven Cleaner definition is proposed for modification to include grill cleaning products. We are also proposing to clarify that to be considered an Oven or Grill

Cleaner, products must be labeled only for removing baked on cooking greases from food preparation and/or food cooking surfaces. The proposed modifications would also clarify the differences among "Oven or Grill Cleaner," "General Purpose Cleaner" and "General Purpose Degreaser" products.

Special-purpose Lubricant

Based on staff's evaluation and results of the survey data we are also proposing to combine several special or single purpose lubricant products (nonsilicone-based) into a single category of Special-purpose Lubricant. The proposed new category would include cutting oils; tapping oils; anti-seize products; gear, chain, and wire lubricants; and rust preventative or rust control products that make lubricating claims. Food grade lubricants with these end functions would also be considered Special-purpose Lubricants. "Special-purpose Lubricant" would not include the other regulated categories "Multi-purpose Lubricant," "Silicone-based Multi-purpose Lubricant," "Penetrant," products designed and labeled exclusively to release manufactured products from molds, and products designed or labeled to provide lubricity solely by depositing a thin film of graphite, molybdenum disulfide ("moly") or polytetrafluoroethylene or closely related fluoropolymer ("teflon") on surfaces.

Spot Remover

At present, spotting agents used at commercial laundry and dry cleaning operations are excluded from the definition of Spot Remover. Comments were received that these products were formulated with toxic compounds and that the need for continuing to exclude these products should be evaluated. In response, staff surveyed these products and determined that these spotting agents should be regulated along with the currently regulated Spot Remover products. Therefore, we are proposing to modify the definition of "Spot Remover" to include Spot Removers used at commercial dry cleaning and laundry operations.

To implement this proposal minor clarifications to the definitions for "Laundry Prewash" and "Dry Cleaning Fluid" are also proposed. As proposed, the definition of "Laundry Prewash" would be clarified to mean the product is used in a wet cleaning process. The modification to the "Dry Cleaning Fluid" definition would clarify that a dry cleaning fluid is a product used in only dry cleaning machines or by businesses that clean fabrics such as draperies at the customer's residence.

B. Proposed Amendments to Section 94509: Standards for Consumer Products

We are proposing to amend the Table of Standards contained in section 94509(a) as well as several other requirements in section 94509. These proposals are described below.

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

The proposed regulatory action would amend the existing Consumer Products Regulation by specifying new or lower VOC limits for the product categories shown in Table VI-2. Together, VOC limits are proposed for 11 categories with 15 VOC limits. Special Purpose Lubricants are not currently regulated, while all of the other categories are currently subject to VOC limits. However, in the case of "Spot Remover" and "Oven or Grill Cleaner," additional products are proposed for inclusion. For all but one of the currently regulated categories we are proposing lower VOC limits. We are proposing to slightly increase the current limit for nonaerosol "Oven or Grill Cleaner." This proposal is explained further below.

Table VI-2 also displays the proposed effective date for each proposed limit. As specified by the regulation, the effective date for products requiring Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) registration would be one year after the effective date shown here to allow for the registration process. Where appropriate, we are proposing separate limits for aerosol products to ensure feasibility. All of these proposed limits would be reflected in the Table of Standards in section 94509(a).

Although not shown in Table VI-2, we are also proposing to delete the phrase "Non-FDA regulated" from the category "Astringent/Toner." This phrase is not necessary because the category definition clearly specifies the types of products that are regulated as "Astringent/Toner" products. Other minor amendments to the Table of Standards are proposed to provide consistency or delete redundant language.

The emission reductions from categories with limits becoming effective by January 1, 2014, would be creditable toward the current State Implementation Plan (SIP) commitment, and would result in VOC emission reductions of about 6.7 tons per day. Products in the categories that require FIFRA registration are provided an additional year beyond the effective date shown in Table VI-2. Because of this, the reductions from Flying Bug Insecticide and Wasp or Hornet Insecticide would be credited toward a future SIP commitment. Reductions from these two categories total about 0.2 tons per day.

Several of the proposed VOC limits for the categories listed in Table VI-2 warrant additional explanation.

Proposal for "Oven or Grill Cleaner"

We are proposing to incorporate grill cleaning products into the Oven Cleaner Category. To allow the previously unregulated grill cleaner products the necessary time to reformulate, proposed subsection 94509(q) would specify that the VOC limits do not apply to these products until December 31, 2012.

Table VI-2
Proposed VOC Limits by Product Form and Effective Dates

Product Category	Product Form	Proposed VOC Limit (weight percent)	Effective Date
Flying Bug Insecticide	Aerosol	20	12/31/2013*
Furniture Maintenance Product	Aerosol	12	12/31/2013
General Purpose Cleaner	Nonaerosol	0.5	12/31/2012*
General Purpose Degreaser	Nonaerosol	0.5	12/31/2012
Glass Cleaner	Nonaerosol	3	12/31/2012
Heavy-duty Hand Cleaner or Soap	Nonaerosol	1	12/31/2013
Metal Polish or Cleanser	Aerosol	15	12/31/2012
Metal Polish or Cleanser	Nonaerosol	3	12/31/2012
Oven or Grill Cleaner	Aerosol	8	12/31/2012**
Oven or Grill Cleaner	Nonaerosol	4	[Effective Date]**
Special-purpose Lubricant	Aerosol	25	12/31/2012
Special-purpose Lubricant	Nonaerosol	3	12/31/2012
Spot Remover (Dry Clean Only)	Aerosol	15	12/31/2012
Spot Remover (Dry Clean Only)	Nonaerosol	3	12/31/2012
Wasp or Hornet Insecticide	Aerosol	10	12/31/2013*

* Products subject to FIFRA registration given an extra year to complete the registration process.
** Only products being proposed for addition to the category have until 12/31/2012 to comply (see new proposed subsection 94509(q)).

Nonaerosol Oven Cleaner products are currently subject to a VOC limit of 1 percent by weight. When this limit was adopted reported products relied on low or non-VOC caustic technologies. We have since learned of technologies that provide alternatives to caustic products. To accommodate the use of these technologies we are proposing to increase the current VOC limit to 4 percent by weight for nonaerosol Oven or Grill Cleaner products. To expedite allowing use of alternatives, as proposed, the limit revision would become effective when the amendments become legally effective. This proposal results in a small shortfall of about 0.1 tons per day. However, other reductions from this proposal would offset this change. We believe allowing for these less harsh alternatives outweighs the small VOC increase that would result.

Proposal for "Spot Remover"

We are proposing to incorporate spotters used for dry clean only fabrics into the currently regulated "Spot Remover" category. These are primarily those products used at dry cleaning operations. To accommodate the necessary time for these products to reformulate, we are also proposing to delay the effective date of the VOC limit for "Spot

Remover" products from December 31, 2010, to December 31, 2012. This modification is proposed to allow adequate time for reformulation of the new products being included in the category. The proposal to extend the effective date is intended to simplify enforcement activities related to this category; it would be difficult to discern the difference between the newly added products and those currently regulated. The proposal would result in delaying about a 0.25 tons per day VOC reduction for two years. Even with this proposed delay, the reductions would occur within the timeframe necessary to be creditable to the 2007 SIP. The newly added products would also be subject to the existing prohibition on the use of methylene chloride, perchloroethylene, and trichloroethylene for Spot Remover products effective December 31, 2012.

2. Proposed Modifications to Subsections 94509 (i)(3), (m), (n), (o), (p), (q), (r), (t), and (u)

Requirements Limiting the Use of Specific Toxic Compounds in Specific Consumer Products Categories

Currently, subsections 94509 (i)(3), (m), (n), (p), (q), and (u) specify provisions prohibiting use of the chlorinated toxic air contaminants methylene chloride, perchloroethylene, and trichloroethylene in specified categories. Subsection 94509(r) specifies prohibitions on the use of methylene chloride and perchloroethylene in Pressurized Gas Duster products. A prohibition on the use of para-dichlorobenzene in Solid Air Fresheners and Toilet/Urinal Care products is specified in subsection 94509(o). Each of these subsections also has provisions that specify sell-through dates and exemptions for impurities (except no exemption for impurities is provided for para-dichlorobenzene). The provisions are all similar except for effective and sell-through dates. We are proposing to consolidate these provisions into tables in proposed modified subsection 94509(m). The modifications are proposed to simplify the regulation by making it easier to find the prohibitions on toxic compounds.

As proposed, subsection 94509(m)(1) would contain a new table, Table 94509(m)(1), that would list categories, effective dates, and sell-through dates for all categories where use of methylene chloride, perchloroethylene, and trichloroethylene is prohibited. A reference within the table is proposed to clarify that there are additional requirements for products defined as Brake Cleaner, Carburetor or Fuel Injection Air Intake Cleaner, Engine Degreaser, and General Purpose Degreaser - intended for use in automotive products. These products are also subject to the Airborne Toxic Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities, section 93111, title 17, California Code of Regulations.

New Table 94509(m)(1) also contains proposed prohibitions on use of methylene chloride, perchloroethylene, and trichloroethylene in "Metal Polish or Cleanser," "Silicone-based Multi-purpose Lubricant," and "Special-purpose Lubricant." These prohibitions are proposed to ensure that use of these toxic air contaminants does not occur as products are reformulated to meet the proposed VOC limits. These prohibitions are proposed as a mitigation measure under the California Environmental

Quality Act (CEQA). The rationale for the prohibition is further explained in Chapter IX, Environmental Impacts, section E. The new table would also reflect that the effective date for "Spot Remover" products would be extended to December 31, 2012, to harmonize with the proposed modification of the effective date of the VOC limit. Although additional products are being added into the "Oven or Grill Cleaner" category, we are not proposing to extend the date the prohibition on use of methylene chloride, perchloroethylene, and trichloroethylene becomes effective. This is feasible because the products being added into the category do not currently use these compounds.

Proposed subsection 94509(m)(2) would contain a new table, Table 94509(m)(2), that would list the categories effective dates, and sell-through dates for all categories where use of para-dichlorobenzene is prohibited.

Requirements Limiting the Use of Alkylphenol Ethoxylate Surfactants in Specific Consumer Product Categories

Staff is also proposing to prohibit the use of alkylphenol ethoxylate surfactants in several categories as a CEQA mitigation measure. Alkylphenol ethoxylates are nonionic surface active agents (surfactants) used as wetting agents, emulsifiers, and dispersants in cleaning and degreasing products. One reformulation pathway to meet proposed VOC limits would be to replace VOC solvents with surfactants. Alkylphenol ethoxylates meet the definition of LVP-VOC so their use is not currently restricted by the VOC limits in the Consumer Products Regulation. In the cleaning/degreasing categories, because of how the products are used, some product is washed 'down the drain.' Once into wastewater, alkylphenol ethoxylates do not readily degrade and they and/or their degradation products enter aquatic environments through wastewater treatment facilities or storm water.

Ample scientific evidence implicates the alkylphenol ethoxylates as toxic to aquatic species. Among other things, they are suspected hormone disruptors, with the primary concern focused on the estrogenic effects of their degradation products (David *et. al*, 2009). Nonylphenol and octylphenol ethoxylates have been shown to mimic the hormone estrogen. In light of this, ARB staff consulted with staff of the State Water Resources Control Board (SWRCB) to determine if use or increased use of alkylphenol ethoxylates would pose an adverse impact on California's receiving waters.

Information provided to the SWRCB staff indicates that alkylphenol ethoxylates are found in measurable concentrations in the State's receiving waters. Moreover, SWRCB staff is concerned that any potential increased use of alkylphenol ethoxylates could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). As proposed, after December 31, 2012, use of alkylphenol ethoxylate surfactants would be prohibited from use in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, and Glass Cleaner. A proposed prohibition on use in nonaerosol Heavy-duty Hand Cleaner or Soap products would become effective December 31, 2013. These prohibitions are proposed to ensure that use of these compounds does not occur as products are

reformulated to meet the proposed VOC limits. This proposal would be contained in modified subsection 94509(m)(3).

Staff also finds that replacements for alkylphenol ethoxylates are readily available. Alcohol ethoxylate, linear alkylbenzene sulphonate, and alkyl polyglucoside surfactants are considered to be effective and environmentally safer. Additional information on this proposal is contained in Chapter IX, Environmental Impacts, section E.

Additional Modifications to subsection 94509(m)

Proposed new subparts 94509(m)(4) and (m)(5) would specify the provisions related to sell-through of products manufactured before the effective dates of the prohibitions. Proposed new subpart 94509(m)(6) would specify the exemption for impurities for the categories listed in Table (m)(1).

Requirements for Specific Consumer Products Limiting the Use of Any Chemical Compound that has a Global Warming Potential (GWP) Value of 150 or Greater

At present, subsections 94509(r), (t), and (q), among other things, contain prohibitions on the use of compounds that have GWP values of 150 or greater. We are proposing to consolidate these provisions into modified subsection 94509(n). New Table 94509(n)(1) would list the categories, effective date, and sell-through date for each category where GWP limits have been adopted. Newly proposed Table 94509(n)(1) would also include additional categories for which we are proposing GWP limits in this rulemaking. We are proposing to prohibit the use of global warming compounds that have GWP values of 150 or greater in "Flying Bug Insecticide," "Furniture Maintenance Product," "Metal Polish or Cleanser," "Special-purpose Lubricant," "Spot Remover," and "Wasp or Hornet Insecticide" products. These prohibitions are proposed to ensure that use of compounds with higher GWP values does not begin as products are reformulated to meet proposed VOC limits. The measure is proposed as a CEQA mitigation measure and the rationale for the prohibition is further explained in Chapter IX, Environmental Impacts, section E.

New subparts (n)(2) and (3) would specify the provision related to sell-through. New subpart (n)(4) would specify the exemption for impurities. The modifications are proposed to simplify the regulation by making it easier to find the prohibitions on use of compounds with GWP values of 150 or greater.

Additional Modifications to Section 94509

Because of the consolidation of various provisions into new subsections 94509(m) and (n), as described above, we are proposing to delete existing subparts (i)(3), (m), (n), (o), (p), (q), (r), and (t). Subsection (s) would be re-lettered to subsection (o). Subsection (u) would be re-lettered to subsection (p) and be modified to pertain only to provisions related to limiting the aromatic compound content of Paint Thinner and Multi-purpose

Solvent products. The references within the Table of Standards in section 94509(a) to the various toxic compound prohibitions and the GWP limits would also be modified to reference new subsections (m) and (n), as well as the re-lettered subsections (o) and (p).

Proposed new subsection 94509(q) would specify the compliance date for new products added to the "Oven or Grill Cleaner" category. As proposed, the effective date for the newly added products would be December 31, 2012. This should allow adequate time for the noncomplying products to reformulate.

C. Proposed Amendments to Sections 94510: Exemptions and Section 94515: Test Methods

Minor amendments are proposed to sections 94510 and 94515. The amendments to subsection (c) would delete unnecessary language. Amendment to subsection (g) is proposed to reference new subsection (m)(2) relating to prohibitions on use of para-dichlorobenzene.

Minor modifications are proposed to subsections 94515 (c) and (d) to reflect the reorganization of subsection 94509 (m) and (n). Sections (c) and (d) specify procedures related to determining the aromatic compound content of Paint Thinner and Multi-purpose Solvent products.

D. Proposed Amendments to Section 94512: Administrative Requirements

We are proposing to amend the Most Restrictive Limit provision contained in subsection 94512(a). Subpart (3) would be modified to clarify the regulation's applicability when two defined categories exclude each other within their respective definitions. As proposed, when a definition for a specific category excludes another specific category and *vice versa*, the product is subject to the VOC limit for whichever category is lower.

E. Proposed Amendments to Method 310

ARB Test Method 310 sets forth the analytical procedures and processes to determine the VOC content of consumer products. We are proposing to amend this method to incorporate additional testing procedures and standard test methods to analyze consumer products for compliance. These modifications are proposed to specify the procedures to be used to analyze for the aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products and the VOC content of "Fabric Softener-Single Use Dryer Product."

Proposed amendments to section 2 of Method 310 would include additional applicable test methods to analyze consumer products for compliance. The added methods would

pertain to analysis of aromatic compound content. The following methods are proposed for addition:

- ASTM D 3257-06: Standard Test Methods for Aromatics in Mineral Spirits by Gas Chromatography (April 1, 2006)
- ASTM D 3606-07: Standard Test Method for Determination of Benzene and Toluene in Finished Motor and Aviation Gasoline by Gas Chromatography (Nov. 1, 2007)
- ASTM D 3710-95 (Reapproved 2004): Standard Test Method for Boiling Range Distribution of Gasoline and Gasoline Fractions by Gas Chromatography (Nov. 1, 2004)
- ASTM D 5443-04: Standard Test Method for Paraffin, Naphthene, and Aromatic Hydrocarbon Type Analysis in Petroleum Distillates Through 200° C by Multi-Dimensional Gas Chromatography (Nov. 1, 2004)
- ASTM D 5580-02 (Reapproved in 2007): Standard Test Method for Determination of Benzene, Toluene, Ethylbenzene, p/m-Xylene, o-Xylene, C_9 and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography (Nov. 1, 2007)
- ASTM E 1782-08: Standard Test Method for Determining Vapor Pressure by Thermal Analysis (March 1, 2008)
- U.S. EPA Method 602: Purgable Aromatics, 40CFR Part 136 Appendix A, Method for Organic Chemical Analysis of Municipal and Industrial Wastewater (January 2008)
- U.S. EPA Method 625: Base/Neutrals and Acids, 40CFR Part 136 Appendix A, Method for Organic Chemical Analysis of Municipal and Industrial Wastewater (January 2008)
- U.S. EPA SW-846 Method 8015B: Nonhalogenated Organics Using GC/FID (Rev 2, December 1996)
- U.S. EPA SW-846 Method 8020A: Aromatic Volatile Organics by Gas Chromatography (Rev 1, September 1994)
- U.S. EPA SW-846 Method 8270D: Semivolatile Organic Compounds by Gas Chromatography / Mass Spectroscopy (GC/MS) (Rev. 4, January 1998)

New subsections are also being proposed. Proposed new subsection 3.3.8 would specify the procedures for analyzing for aromatic compound content in "Paint Thinner" and "Multi-purpose Solvent" products. New subsection 4.2.3 would specify the

procedures for analyzing for the VOC content of "Fabric Softener-Single Use Dryer Product."

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

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

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

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

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

7. Air Resources Board. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Phase II – Staff Report. October, 1991. (ARB, 1991)

8. Air Resources Board. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products – Staff Report. August, 1990. (ARB, 1990)

9. David, A., Fenet, H., Gomez, E. Alkylphenols in Marine Environments: Distribution Monitoring Strategies and Detection Considerations. 2009. Marine Pollution Bulletin. Volume 58: 953-960. (David *et al.*, 2009)

10. San Francisco Estuary Institute. Occurrence of Alkylphenol Ethoxylate Surfactants in San Francisco Bay and Potential Impacts on Water Quality. Memorandum dated July 13, 2010, from Rainer Hoenicke, Ph.D., Executive

Director, San Francisco Estuary Institute, to Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Resources Control Board. (SFEI, 2010)

11. Southern California Coastal Water Research Project. Effects on Water Quality of Alkylphenol Ethoxylate Surfactants (APEOs). Memorandum dated July 15, 2010, from Keith Maruya, Principle Scientist, Southern California Coastal Water Research Project, to Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Resources Control Board. (SCCWRP, 2010)

12. State Water Resources Control Board. Water Quality Effects of Alkylphenol Ethoxylate Surfactants. Memorandum dated September 20, 2010, from Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Resources Control Board, to Richard Corey, Chief, Stationary Source Division, Air Resources Board. (SWRCB, 2010a)

13. State Water Resources Control Board. Effects on Water Quality of Alkylphenol Ethoxylate Surfactants. Memorandum dated July 19, 2010, from Valerie Connor, Ph.D., Deputy Director, Office of Information Management and Analysis, State Water Resources Control Board, to Darrin Polhemus, Deputy Director, Division of Water Quality, State Water Resources Control Board. (SWRCB, 2010b)

Chapter VII. Description of Product Categories

In this chapter, we describe each product category and provide the technical basis for the proposed requirements. We are proposing volatile organic compound (VOC) limits for 11 categories. In several categories, prohibitions on use of specific toxic air contaminants (TAC), green house gas (GHG) compounds with higher global warming potential (GWP) values, and alkylphenol ethoxylate surfactants are proposed. These three prohibitions are proposed in accordance with the California Environmental Quality Act (CEQA). If applicable, proposed modifications to definitions are provided along with the rationale for the changes.

In each section below, two tables of data are provided. Unless otherwise indicated, the data in the tables are based on the 2006 Consumer and Commercial Products Survey (2006 Survey). The data have been grown to the current calendar year, 2010, based on population increases. In addition, in each category it is assumed that the 2006 Survey contains information for about 90 percent of the products sold into California. Therefore, the data in the tables are adjusted for market coverage. The VOC emission reductions predicted are also grown to the calendar year the proposed limits would become effective, based on projected population increases. In one category, "Spot Remover" (Dry Clean Only), the data are based on the 2008 Survey Update for Dry Clean Only Spot Removers (2008 Survey Update). The surveys are described in greater detail in Chapter V.

A. Flying Bug Insecticide (aerosol)

Flying Bug Insecticide products are designed to be used primarily by consumers in the control of flying household insects or pests such as flies, mosquitoes, gnats, and moths. Flying Bug Insecticide products do not include "Wasp or Hornet Insecticide," products designed to be used on humans or animals, or any moth-proofing product.

All insecticides sold within California must be registered with the California Department of Pesticide Regulation (DPR) and with the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). These registrations are designed to thoroughly evaluate the insecticide product to ensure it meets both federal and State requirements to protect public health and the environment. As part of the registration process, the efficacy data are reviewed to validate the spectrum of activity. For products registered under FIFRA, as specified in section 94509(d), the Consumer Products Regulation allows an additional year for compliance with the VOC limit to allow the necessary time to complete the registrations.

Flying Bug Insecticide products were first regulated as part of the Phase-II amendments approved by the Board in January 1992. At that time, the Board approved a 35 percent by weight VOC limit for all forms, effective January 1, 1995. In 1999, the VOC limit for aerosol Flying Bug Insecticide products was lowered to 25 percent by weight, effective December 31, 2003. Additional information on product use and marketing can be found in the 1991 Phase-II and the 1999 Midterm Measures II "staff reports" (ARB, 1991; ARB 1999).

The 2006 Survey data provide the basis for our determination that it is both technologically and commercially feasible to further reduce the VOC content of Flying Bug Insecticide products. Based on these data, staff is proposing to lower the VOC limit for aerosol products to 20 percent by weight.

Table VII-1 below summarizes the sales and emissions from aerosol Flying Bug Insecticide products based on the results of the 2006 Survey (ARB, 2007e). The data for the 51 reported products have been grown, by population, to 2010. Total category sales from these products are about 5,858 pounds per day.

Table VII-1
Flying Bug Insecticide

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol	51	5,858	1,306

Also shown in Table VII-1, estimated 2010 market-adjusted VOC emissions for aerosol Flying Bug Insecticide products are 1,306 pounds per day, or about 0.7 tons per day in California. Although not shown, the sales-weighted average VOC content is about 22 percent by weight.

Product Use and Marketing:

Flying Bug Insecticide products are used primarily by household consumers and janitors. These products may be used either indoors or outdoors and in multiple settings including households, businesses, and institutions. Flying Bug Insecticide products also include some foggers designed to release contents, as a fog or mist, in outdoor areas to control flying insects.

Flying Bug Insecticide products are typically sold in supermarkets; general mass market stores; discount stores; home improvement stores; and nurseries.

Product Formulation:

Flying Bug Insecticide products contain both "active" and "inert" ingredients. The terms "active ingredient" and "inert ingredient" have been defined by the U.S. EPA. An active

ingredient prevents, destroys, repels or mitigates a pest, or is a plant regulator, defoliant, desiccant or nitrogen stabilizer. By law, the name and percent by weight of the active ingredient must be identified and displayed on the product label.

An inert ingredient is defined by U.S. EPA as any substance (or group of structurally similar substances if designated by U.S. EPA), other than an active ingredient, which is intentionally included in a pesticide product. Inert ingredients may play a key role in the effectiveness of a pesticide product. For example, inert ingredients may serve as a solvent, or may extend the pesticide product's shelf-life. Pesticide products can contain many inert ingredients, but federal law does not require that these ingredients be identified by name or percentage on the label. Only the total percentage of inert ingredients is required to be on the pesticide product label (U.S. EPA, 2003b; U.S. EPA, 2010a).

In this rulemaking, our proposal does not directly affect the active ingredients to be used. The proposal affects the inert ingredients that are VOCs and compounds with higher GWP values.

The VOC content of aerosol Flying Bug Insecticide products ranges from 0 to 25 percent by weight. Flying Bug Insecticide products typically contain about 1 percent pyrethrins and/or pyrethroids as the active ingredient (ARB, 2007e). Pyrethrins are derived from Chrysanthemum flowers and pyrethroids are synthetic derivatives of pyrethrins. Some commonly used pyrethroids in Flying Bug Insecticide products include permethrin, tetramethrin, allethrin, and resmethrin. These active ingredients perform the key function of the insecticide which is to either kill or inhibit the targeted pest. Most active ingredients qualify as low vapor pressure (LVP) VOCs, therefore the proposed VOC limit would not apply to these compounds.

Based on data received from the 2006 Survey, most products in this category are water-based and use a hydrocarbon propellant to evacuate the contents. Hydrocarbon propellants are the primary source of VOCs in these products and the propellants comprise up to about 25 percent by weight of the product. A small amount of LVP-VOC surfactant is often added to emulsify the active ingredients with water. Together, these are the inert ingredients.

Proposed VOC Limit and Compliance:

The proposed VOC limit for aerosol Flying Bug Insecticide products is 20 percent by weight, effective December 31, 2013. As shown in Table VII-2, using adjusted emissions, the proposed 20 percent limit will result in an estimated VOC emission reduction of 115 pounds per day, or about 0.06 tons per day, in 2014. The emission reduction is estimated for 2014 because to complete the registration process required by FIFRA and the DPR the Consumer Products Regulation allows an extra year to complete this process. This reduction, although important to overall air quality, will not occur within the timeframe to be credited toward the current SIP commitment.

Table VII-2
Flying Bug Insecticide Proposal

Product Form	Proposed VOC Limit (weight percent)	Number of Complying Products	Complying Market Share (percent)	2014 Emissions Reductions (pounds per day)
Aerosol	20	18	55	115

As shown in Table VII-2, 18 products, representing approximately 55 percent of the market, currently comply with the proposed VOC limit of 20 percent by weight. Thus, staff has determined that reformulation to the proposed limit is both technologically and commercially feasible.

In determining the most feasible limit staff reviewed data indicating that aerosol Flying Bug Insecticides require about 20 percent VOC propellant. This amount is necessary to achieve the appropriate particle size to remain suspended in the air for an adequate amount of time to directly contact the flying insect. Effective particle size is approximately 30-50 micrometers in diameter (AgrEvo, 2010). The data also indicated that as the level of propellant decreases, particle size increases (MGK, 2010). When the amount of propellant was reduced to less than 20 percent particles greater than 60 micrometers in diameter were dispersed. These are too large to maintain product efficacy. Further, these data demonstrate the continued validity of a statement staff made in the "Midterm Measures II" staff report: "Particle size is a key difference between crawling and flying bug killers, and is generally related to the amount of propellant in the formulation" (ARB, 1999). Flying Bug Insecticide product manufacturers also identified 20 percent VOC as the lowest possible limit that would maintain product efficacy (CSPA, 2010a).

Reformulation options that can be used by manufacturers to meet the proposed limit include reducing the level of hydrocarbon propellant and increasing the amount of water, and/or LVP-VOC distillate. We expect that manufacturers will meet the proposed limit by using formulation technologies similar to those already used in complying products.

Proposed Global Warming Potential (GWP) Limit:

No compounds with GWP values at or above 150 were reported in the 2006 Survey for this category. However, to ensure that use of compounds with higher GWP values does not begin as products reformulate to comply with the proposed 20 percent by weight VOC limit, we are proposing a GWP limit of 150 for any chemical compound used in Flying Bug Insecticide products, effective December 31, 2013. While this proposal would allow use of the non-VOC propellant, HFC-152a, we believe other reformulation options are more likely. The proposed limit would not apply to any chemicals present as contaminants, which in aggregate are 0.1 percent by weight or less. This limit is proposed as a mitigation measure under CEQA (see Chapter IX, Environmental Impacts, section E). The proposed GWP limit is contained in section 94509(n).

B. Furniture Maintenance Product (aerosol)

"Furniture Maintenance Product" is defined as a product designed or labeled to wax, polish, protect, or enhance a previously finished wood surface by leaving a protective finish that is designed to be periodically replenished. Products designed for use on wood floors are not included. These products may also be used on other furniture surfaces, such as acrylics, ceramic, plastics, stone, metal, and fiberglass. This category does not include "Dusting Aid," "Wood Cleaner," and products designed solely for the purpose of cleaning. Products designed to leave a permanent finish such as stains, sanding sealers, and lacquers are also excluded. Products that are designed with the sole purpose of removing dust without leaving a protective finish are regulated as "Dusting Aid." While the "Furniture Maintenance Product" category includes products that claim to clean and polish wood surfaces, products that are designed solely to clean a wood surface are regulated as "Wood Cleaners."

Aerosol Furniture Maintenance Products are currently subject to a 17 percent by weight VOC limit, which has been in effect since December 31, 2004.

The 2006 Survey data provides the basis for our determination that it is both technologically and commercially feasible to further reduce the VOC content of these products. Based on these data, staff is proposing to lower the VOC limit for aerosol Furniture Maintenance Products to 12 percent by weight.

Table VII-3 below summarizes the sales and emissions from aerosol Furniture Maintenance Products based on the results of the 2006 Survey (ARB, 2007e). The data for the 87 reported products have been grown, by population, to 2010. Total category sales from these products are about 16,792 pounds per day.

Table VII-3
Furniture Maintenance Product

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol	87	16,792	2,640

Also shown in Table VII-3, estimated 2010 market-adjusted VOC emissions for aerosol Furniture Maintenance Products are 2,640 pounds per day, or about 1.3 tons per day in California. Although not shown, the sales-weighted average VOC content is about 15.7 percent by weight.

Product Use and Marketing:

Aerosol Furniture Maintenance Products are used by household, institutional, and industrial users. Many of these products are designed for use on a variety of wood surfaces. In addition, there are a number of aerosol Furniture Maintenance Products

that are designed for use on other furniture surfaces such as ceramic, plastic, stone, metal, and fiberglass. Aerosol Furniture Maintenance Products are designed to be sprayed either directly on a furniture surface and wiped with a clean cloth, or sprayed directly onto a clean cloth which is then used to wipe a surface. Aerosol Furniture Maintenance Products that contain silicone oils are often labeled with the claim "increases shine without leaving a waxy residue."

Aerosol Furniture Maintenance Products are primarily sold to the household consumer through retail outlets such as supermarkets, grocery stores, and warehouse stores. Products sold to institutional and industrial users are supplied though a variety of locations, including direct sales, catalog sales, janitorial stores, and the Internet.

Product Formulation:

Aerosol Furniture Maintenance Products are emulsions that typically contain water; a VOC hydrocarbon solvent; a VOC hydrocarbon propellant; and a polishing component such as silicone oil, mineral oil, or wax. The VOC hydrocarbon solvent constitutes up to about 7 percent of the product. The solvent functions to suspend the wax or oil and assists to remove smudges and fingerprint oils. The main polishing compounds reported are the exempt VOC volatile methylated siloxanes (VMS). VMS content of aerosol Furniture Maintenance Products ranges from 2 to 8 percent by weight. Another common polishing component found in these products is an LVP-VOC mineral oil. The hydrocarbon propellant which serves to expel the product ranges from about 4 to12 percent by weight. These products may also contain a small amount of fragrance, such as citrus oils (ARB, 2007e).

Proposed VOC limit and Compliance:

The proposed VOC limit for aerosol Furniture Maintenance Products is 12 percent by weight, effective December 31, 2013. As shown in Table VII-4, using adjusted 2006 emissions, the proposed VOC limit will result in an estimated emission reduction of 724 pounds per day, or about 0.36 tons per day by 2013.

Table VII-4
Furniture Maintenance Product Proposal

Product Form	**Proposed VOC Limit** (weight percent)	**Number of Complying Products**	**Complying Market Share** (percent)	**2013 Emissions Reductions** (pounds per day)
Aerosol	12	37	9.8	724

As shown in Table VII-4, 37 of 87 reported products representing about 10 percent of product sales currently comply with the proposed 12 percent VOC limit. Therefore, staff has determined that the proposed VOC limit is technologically and commercially feasible.

Complying products reported in the 2006 Survey contain an LVP-VOC solvent, a smaller percentage of hydrocarbon propellant, and mineral oil or VMS as the polishing agents. Reformulation options that can be used to meet the proposed limit include replacing all or part of the VOC hydrocarbon solvent by increasing use of LVP-VOC hydrocarbon solvent. Reducing the amount of hydrocarbon propellant also appears to be feasible, based on the 2006 Survey (ARB, 2007e).

GWP Limit:

No compounds with GWP values at or above 150 were reported in the 2006 Survey for this category. However, to ensure that use of compounds with higher GWP values does not begin as products reformulate to comply with the proposed 12 percent by weight VOC limit, we are proposing a GWP limit of 150 for any chemical compound used in Furniture Maintenance Products, effective December 31, 2013. While this proposal would allow use of the non-VOC propellant, HFC-152a, we believe other reformulation options are more likely. The proposed limit would not apply to any chemicals present as contaminants, which in aggregate are 0.1 percent by weight or less. This limit is proposed as a mitigation measure under CEQA (see Chapter IX, Environmental Impacts, section E). The proposed limit is contained in section 94509(n).

Issues:

1 **Issue:** Lowering the VOC limit in this category would open up the possibility of Wood Cleaner products being subject to the most restrictive limit (*i.e.* a product that is primarily a Wood Cleaner but whose label claims could be construed to also belong to the Furniture Maintenance Product). Such a product would have to meet the proposed 12 percent by weight VOC limit instead of the current 17 percent by weight Wood Cleaner VOC limit.

Response: Staff agrees that if a Wood Cleaner product makes claims that it is suitable for use as a Furniture Maintenance Product, the most restrictive limit provision applies and the product would need to contain no more than 12 percent VOC by weight. Therefore, it is incumbent on the responsible party to ensure that labeling claims are consistent only with the Wood Cleaner category.

C. General Purpose Cleaner (nonaerosol)

"General Purpose Cleaner" products are currently defined as a general purpose cleaning product labeled for use on a variety of hard surfaces, including small appliances. The General Purpose Cleaner category 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. Because of its many uses, General Purpose Cleaner products are not subject to the Most Restrictive Limit provision in section 94512(a). Staff is proposing minor changes to the definition of "General Purpose Cleaner" to improve clarity. The proposed modified definition reads as follows:

"General Purpose Cleaner" means a ~~general purpose cleaning~~ product labeled ~~for use on~~ to clean 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.

Nonaerosol General Purpose Cleaner products are currently subject to a 4 percent by weight VOC limit, which has been in effect since December 31, 2004. In addition, use of the TACs methylene chloride, perchloroethylene, and trichloroethylene is prohibited. This prohibition became effective December 31, 2008.

The 2006 Survey data provides the basis for our determination that it is both technologically and commercially feasible to further reduce the VOC content of these products. Based on these data, in this rulemaking we are proposing to lower the VOC limit for nonaerosol General Purpose Cleaner products to 0.5 percent by weight.

Table VII-5 below summarizes the sales and emissions from nonaerosol General Purpose Cleaner products based on the results of the 2006 Survey (ARB, 2007e). The data for the 1,518 reported products have been grown, by population, to 2010. Total category sales from these products are about 870,854 pounds per day.

Also shown in Table VII-5, estimated 2010 market-adjusted VOC emissions for nonaerosol General Purpose Cleaner products are 24,078 pounds per day, or

Table VII-5
General Purpose Cleaner

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Nonaerosol	1,518	870,854	24,078

about 12 tons per day in California. Although not shown in the table, the sales-weighted average VOC content is 0.8 percent by weight.

Based on data from the 2003 Survey (ARB, 2004a), aerosol General Purpose Cleaner products were found to have sales of about 6,800 pounds per day, or about 3.4 tons per day. This suggests that nonaerosol products dominate the market in this category.

Product Use and Marketing:

General Purpose Cleaner products are used by household and institutional consumers for general cleaning and removal of soils, stains, or spots from different hard surfaces such as floors, counters, and sinks. For cleaning, products are applied either directly to

the surface or indirectly with a mop or sponge to cover large areas. Rinsing may or may not be necessary after the product is used.

Nonaerosol General Purpose Cleaner products are sold either as concentrates or ready-to-use (RTU) products and are available with many different delivery systems, including liquids, solids, pump sprays, and wipes. Industrial and Institutional consumers might also use products in automated dispensing machines. Some products are marketed under the name of a specific active ingredient in their formulations such as citrus cleaner, pine cleaner, bleach cleaner, or ammoniated cleaner. Because of their degreasing and glass cleaning abilities, some of the products are also marketed as "cleaner-degreaser," "all-purpose cleaner," "glass and surface cleaner," or "multi-surface cleaner." There are also General Purpose Cleaner products that make anti-microbial claims.

General Purpose Cleaner products are available in a variety of stores, including grocery stores, janitorial supply stores, discount stores, *etc.* They are sold to household consumers, janitors, restaurants, and other commercial or institutional establishments for general cleaning and, to a certain extent as an anti-microbial agent. For the purpose of this regulation, products primarily labeled as "General Purpose Cleaner" that make anti-microbial or disinfecting claims are considered "General Purpose Cleaner" products.

Additional information on product use and marketing can be found in the "1999 Mid-term Measures II" and "2006 CONS-2" "Initial Statement of Reasons for the Proposed Amendments to the Consumer Products Regulation" (ARB, 1999; ARB, 2006a).

Product Formulation:

Nonaerosol General Purpose Cleaner products are primarily water-based products. In liquid products VOC ingredients are isopropyl and ethyl alcohols, ethylene glycol monobutyl ether, pinene, and d-limonene. The VOC content ranges from 0 to 4 percent by weight. LVP-VOCs reported include several glycol ethers and triethanolamine. Other ingredients reported include, surfactants, and inorganic compounds. The VOC and LVP-VOC glycol ethers, terpenes, and alcohols provide solvency to remove most soils. Inorganic compounds aid in maintaining pH and solvency. Ethanolamines are weak bases that can provide stability and texture to a product. Products generally contain a small amount of fragrance. Surfactants play a key role in the cleaning process. Their role is discussed below.

Nonaerosol General Purpose Cleaner product formulations use a variety of wetting agents or surfactants. They reduce surface tension of liquids and assist in the cleaning of soils from multiple surfaces. Ionic surfactants are either anionic or cationic. Anionic surfactants are water soluble and have a negative charge in solution. They typically are 'foaming' or 'sudsy' and are good cleaners. Examples include linear alkyl benzene sulfonate, soaps or fatty acid salts, and sodium dodecyl sulfate (CQ, 2008). Cationic surfactants are positively charged in aqueous solution. They are less effective cleaners.

The primary cationic surfactants, are the quaternary ammonium compounds. These are the typical active ingredients in products making anti-microbial claims (PG, 2010).

Nonionic surfactants are low sudsing and do not have a charge. Because they do not ionize in solution they are not affected by water hardness. They are good cleaning agents. Common nonionic surfactants include alcohol ethoxylates, alkyl polysaccharides, and alkylphenol ethoxylates.

Nonaerosol General Purpose Cleaner products that make anti-microbial claims must be FIFRA and DPR registered. About 80 of the reported products are FIFRA registered products. Many anti-microbial General Purpose Cleaner products contain LVP-VOC quaternary ammonium compounds as the active ingredient. Other reported active anti-microbial ingredients include sodium hypochlorite (bleach) and l-lactic acid. These compounds did not have to be speciated in the survey, but we are aware that these are the active anti-microbial agents because of FIFRA labeling requirements.

Health and Safety Code Section 41712(e)(1) directs the ARB to consider recommendations from a health agency (local, state, or federal) regarding regulation of health benefit products. This process was put in place to ensure that public health would not be compromised by regulating the VOC content of such products. Because anti-microbial nonaerosol General Purpose Cleaner products may be considered health benefit products, in accordance with the statute, staff consulted with the California Department of Public Health (DPH). DPH staff indicated that reducing the VOC content of General Purpose Cleaner products should not affect the ability of manufacturers to sell efficacious anti-microbial general purpose cleaning products (CA DPH, 2010).

Proposed VOC Limit and Compliance:

The proposed VOC limit for nonaerosol General Purpose Cleaner products is 0.5 percent by weight, effective December 31, 2012. As shown in Table VII-6, using adjusted 2006 emissions, the proposed VOC limit will result in an estimated emission reduction of 7,460 pounds per day, or about 3.73 tons per day effective December 31, 2012.

Table VII-6
General Purpose Cleaner Proposal

Product Form	Proposed VOC Limit (percent)	Number of Complying Products	Complying Market Share (percent)	2012 Emissions Reductions (pounds per day)
Nonaerosol	0.5	980	69	7,460

Table VII-6 also shows that 980 products representing 69 percent of the market currently comply with the proposed limit. Data from the 2006 Survey also show complying products in each reported method of delivery. Although not shown, for FIFRA registered products, the complying market share is 73 percent.

The 0.5 percent by weight VOC limit is proposed based on staff's review of the data collected from the 2006 Survey as well as the review of existing technologies for use in cleaning applications. Reformulation options include the continued use of water along with various cleaning ingredients such as inorganic compounds (sulfates), LVP-VOC glycol ethers, triethanolamine, bleach, carbonates, ammonia, and surfactants. Because there are many viable low, and non-VOC alternatives available, as well as a high complying market share, we believe the proposed limit is commercially and technologically feasible.

Proposal to Prohibit Use of Alkylphenol Ethoxylate Surfactants:

Alkylphenol ethoxylate surfactants, in particular the octylphenol and nonylphenol ethoxylates, are known to be toxic to aquatic species. We are aware that some nonaerosol General Purpose Cleaner products contain these compounds. Because of this, ARB staff consulted with State Water Resources Control Board (SWRCB) staff to determine if continued use of these compounds could adversely affect water quality. Information provided to SWRCB staff indicates that alkylphenol ethoxylates were found in measurable concentrations in the State's receiving waters. Therefore, SWRCB staff expressed concern that any potential increased use of alkylphenol ethoxylate surfactants could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). In light of this finding, we are proposing a CEQA mitigation measure to ensure that use of alkylphenol ethoxylate surfactants does not occur as products reformulate. As proposed, section 94509(m)(3) would preclude use of alkylphenol ethoxylate surfactants in General Purpose Cleaner (nonaerosol) products effective December 31, 2012. Further information on this proposal, as well as the need, is contained in Chapters VI and IX.

Issues:

1. **Issue:** The proposed VOC limit is not commercially and/or technologically feasible.

   Response: While working with stakeholders on this issue, staff thoroughly investigated the claim. At the request of stakeholders data were subdivided into all delivery mechanisms. Anti-microbial products were also evaluated. Complying products are available in every type of delivery system. Therefore, staff believes that the proposed VOC limit is technologically and commercially feasible.

2. **Issue:** The proposed limit will negatively impact anti-microbial products.

   Response: Survey data have shown that anti-microbial products are available at or below the proposed limit. The complying market share for anti-microbial products is 73 percent. It should also be noted that the most commonly used active ingredients for these products are quaternary ammonium compounds,

which are LVP-VOCs. DPH staff indicated that reducing the VOC content of General Purpose Cleaner products should not affect the ability of manufacturers to sell efficacious anti-microbial general purpose cleaning products (CA DPH, 2010).

3. **Issue:** An exemption should be provided for products that use an integrated cleaning system.

   Response: The data show a high complying market share for General Purpose Cleaner products that perform similar tasks, *i.e.*, floor cleaning. Therefore, staff concludes that an exemption for products that employ an integrated system is not warranted. The data clearly show that the basic market demand can be met. Providing an exemption for specific delivery mechanisms would unnecessarily diminish emission reductions.

4. **Issue:** The proposed VOC limit is not feasible for 'wipe' products.

   Response: It is important to note that a 'wipe' product is a method to deliver a liquid product. The VOC limit is feasible for liquid products.

D. General Purpose Degreaser (nonaerosol)

General Purpose Degreaser products are products labeled to remove or dissolve grease, grime, oil and other oil-based contaminants from a variety of substrates, including automotive or miscellaneous metallic parts. The General Purpose Degreaser category currently does not include the other regulated categories "Engine Degreaser," "General Purpose Cleaner," "Adhesive Remover," "Electronic Cleaner," "Electrical Cleaner," "Energized Electrical Cleaner," or "Metal Polish or Cleanser." Products used exclusively in solvent cleaning tanks or related equipment, such as cold cleaners, vapor degreasers, conveyorized degreasers, or film cleaning machines are not General Purpose Degreaser products. An additional exclusion is provided for industrial products that are (A) sold exclusively to establishments which manufacture or construct goods or commodities; and (B) are labeled "not for retail sale." Products designed to clean miscellaneous metallic parts by immersion in a container are also excluded.

Nonaerosol General Purpose Degreaser products are currently subject to a 4 percent by weight VOC limit, which has been in effect since December 31, 2004. In addition, use of the TACs methylene chloride, perchloroethylene, and trichloroethylene is prohibited. This prohibition became effective December 31, 2005.

The 2006 Survey provides the basis for our determination that it is commercially and technologically feasible to further reduce the VOC content of these products. Based on these data, staff is proposing to lower the VOC limit for nonaerosol products to 0.5 percent by weight. Modifications to the definition are also proposed.

We are proposing to amend the General Purpose Degreaser definition to clarify the exemption for products used at manufacturing facilities. At present the definition excludes products that are sold exclusively to facilities that manufacture or construct goods or commodities, and that are labeled "not for retail sale." We have determined that the phrase "not for retail sale" is inadequate to describe these products used in the manufacturing process and that use of this term could allow for unintended products to meet this exemption criterion. We have also determined that in the normal chain of commerce, responsible parties for General Purpose Degreaser products sell products to distributors, who in turn, sell to manufacturing facilities. With this understanding, we are proposing to amend the exclusion to also allow distributors to sell directly to manufacturing facilities. To ensure that only products used in the manufacturing process itself meet the exclusion, we are proposing that these products must be labeled "For Manufacturing Use Only." The phrase "not for retail sale," for the purpose of this regulation, would be deleted. As proposed, this provision would become effective at the end of 2012. Until that time the current definition would remain in effect.

On or after December 31, 2012, a "General Purpose Degreaser" would be defined as: 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 "Adhesive Remover," "Electrical Cleaner," "Electronic Cleaner," "Energized Electrical Cleaner," "Engine Degreaser," "General Purpose Cleaner," "Metal Polish or Cleanser," or "Oven or Grill Cleaner." "General Purpose Degreaser" also does not include products used exclusively in "solvent cleaning tanks or related equipment," or products that are (A) exclusively sold directly or through distributors to establishments which manufacture or construct goods or commodities; and (B) labeled exclusively for "use in the manufacturing process only." "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.

Note that in the proposed definition we are proposing a reorganization. Only the new provisions are shown in underline format. The exclusion for "Oven or Grill Cleaner" products is being proposed because of modifications proposed to the definition for the "Oven or Grill Cleaner" category definition. This is further described in part H of this chapter. In general, the Oven or Grill Cleaner category would be limited to products that are labeled exclusively to remove baked-on food soils. The definition would further clarify that if an Oven or Grill Cleaner product also makes claims that it is suitable for general degreasing, that product would be considered a "General Purpose Degreaser."

Table VII-7 below summarizes the sales and emissions from nonaerosol General Purpose Degreaser products based on the results of the 2006 Survey (ARB, 2007e). The data for the 462 reported products have been grown, by population, to 2010. Total category sales from these products are about 87,931 pounds per day.

Table VII-7
General Purpose Degreaser

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Nonaerosol	462	87,931	3,816

Also shown in Table VII-7, estimated 2010 market-adjusted VOC emissions for nonaerosol General Purpose Degreaser products are 3,816 pounds per day, or about 1.9 tons per day in California. Although not shown in Table VII-7, the VOC content of nonaerosol General Purpose Degreaser products ranges from 0 to 100 percent by weight, with a sales-weighted average VOC content of about 3 percent by weight. A further explanation of the existence of products above the VOC limit is necessary.

Review of the 2006 Survey data show that many of the higher VOC content products reported are solvent degreasers which, for example, are used for automotive surface preparation prior to painting automotive surfaces. Such products correctly reported in the 2003 Survey in the unregulated category of "Multi-purpose Solvent." At the time of the 2006 Survey, Multi-purpose Solvent products were not subject to VOC restrictions. However, changes to the definition for Multi-purpose Solvent products that were approved in 2006 clarified that Multi-purpose Solvent products that make claims that they are suitable for use as a consumer product which meets another definition in section 94508(a) are not Multi-purpose Solvents and are subject to the Most Restrictive Limit provision in section 94512(a). Therefore, because automotive surface preparation products make degreasing claims, they were correctly reported in the 2006 Survey as General Purpose Degreaser products (ARB, 2004a; ARB, 2007e).

Product Use and Marketing:

General Purpose Degreaser products are used for a wide range of degreasing duties and many are marketed for use in industrial or manufacturing applications, automotive maintenance and repair, residential garage or machine shop areas, and similar settings. Products marketed for such applications typically remove petroleum-based greases, oils, hydrocarbon residues, greasy soils, motor oil, axle grease, hydraulic fluid, lithium grease, lubricant oils, silicones, or similar industrial or manufacturing fluids from hard surfaces. For example, products are used on machinery, concrete, equipment, plumbing or pipe-fittings, tools, floors, walls, miscellaneous metallic or nonmetallic parts, and automotive parts. Products are also used to degrease surfaces prior to applying paint.

In addition, General Purpose Degreaser products are marketed for use in food service areas including: supermarkets, restaurants, butcher shops or meat-cutting facilities, janitorial services, residential and institutional kitchen areas, and similar settings. Products marketed for such applications are formulated similarly to Oven or Grill Cleaner products and are generally labeled to remove food-related greases or soils.

These degreaser products can be used on floors, walls, countertops, stoves, ovens, grills, appliances or similar surfaces associated with food preparation. Proposed changes to the Oven or Grill Cleaner category definition would clarify that a product that is labeled as an oven or grill cleaner that makes claims that it is suitable for degreasing other hard surfaces is a General Purpose Degreaser.

The General Purpose Degreaser category includes products that are sold as ready-to-use (RTU) products or concentrates. Delivery mechanisms for RTU products are typically pump sprays or wipes. Products are sprayed, mopped, sponged, wiped, brushed, or poured directly onto surfaces. In addition, products can be used in automatic dispensing machines or pressure washer systems. It is common for concentrated products to display dilution/mixing recommendations and use instructions for: "pump spray," "mop and bucket," "automatic dispensing systems," "foaming," "sponge," "pressure washer," or combinations based on the surface or substrate, soil build-up, or method of application.

Products can be purchased through many sales outlets including grocery and drug stores, discount stores, wholesalers, mass merchandisers, hardware stores, warehouse stores, and home centers. Products are also sold to industrial or institutional users through distributors or through direct sales by the manufacturer.

Additional information on product use and marketing can be found in the "1997 Midterm Measures I," "1999 Midterm Measures II," and the "2006 CONS-2" "Initial Statement of Reasons for the Proposed Amendments to the Consumer Products Regulation" (ARB, 1997b; ARB 1999; ARB, 2006a).

Product Formulation:

There are many kinds of degreasing products, but most can be categorized as: alkaline water-based, solvent-based, or water-soluble. Product formulations also vary depending upon the target market. Factors affecting the strength of the degreaser include the product concentration, the solvent or solvents used, the pH of the product, and the type of surfactant used.

Nonaerosol General Purpose Degreaser product formulations often contain water and water-soluble solvents such as glycols, glycol ethers, d-limonene, and alcohols (ARB, 2007e). Nonionic surfactants, such as alcohol ethoxylates or alkylphenol ethoxylates, are also used. Many nonaerosol General Purpose Degreaser products are formulated to be moderately alkaline, with ingredients such as sodium and potassium silicates, alkali metal hydroxides, metasilicates, and ethanolamines. Buffering ingredients such as tetra-potassium pyrophosphate or ethylene diamine tetra-acetic acid (EDTA) are often found in relatively low concentrations and are used as pH adjusters. Further discussion of surfactant technologies is discussed in part C of this chapter.

Water-based degreasers for heavy degreasing applications often contain higher levels of sodium metasilicate, or other metallic carbonates, are of higher pH and generally

contain more glycol ethers such as 2-butoxyethanol, alcohols such as isopropyl alcohol, or d-limonene. Removal of biological oils and greases normally found in the home or restaurants, which are primarily triglycerides, can be done effectively by water-based, alkaline products with surfactants and little or no organic solvent (ARB, 2007e). Heavy-duty alkaline degreasers are often used in commercial or institutional applications such as food service facilities or for use in restaurants.

Many water-based or water containing nonaerosol General Purpose Degreaser products are also used to remove motor oils and heavy greases in machine and repair shop environments. Some products are formulated with enzymes or live bacteria cultures that can digest greases and oils.

Solvent-based products previously categorized as "Multi-purpose Solvent" can be up to 100 percent VOC solvent, and typically contain mineral spirits, VM&P Naphtha, toluene, xylenes, or other organic solvents. These products are used in surface preparation to dissolve grease, wax, or oil on automotive surfaces prior to painting. However, the 2006 Survey data also show that a number of very low VOC surface preparation degreaser products are sold.

Solvent-based products can also be formulated as an emulsion with solvents such as glycol ethers, alcohols, or d-limonene to loosen and solubilize soils such as oily/greasy grime, asphalt, creosote, resins, and wax from surfaces. These lipophilic soils are solubilized by water-in-oil emulsions. The water in the emulsion acts as a "carrier" for the solvent "continuous phase." Because the solvent is on the outside, the emulsion does not have to break for the solvent to be directly exposed to the greasy/oily surface. Water-in-oil emulsions are an effective way to use lower amounts of VOC solvent in a General Purpose Degreaser product.

Water-rinsable degreasers are designed to degrease equipment or areas where high levels of oils are present, such as plant warehouse concrete floors. The degreaser can be pressure sprayed on the surface and wiped or rinsed off with water, at which time an emulsion forms, carrying away the product and oils with it. Water-soluble solvent degreasers range from those used for degreasing concrete driveways, around loading platforms, kitchens, or machine shop areas to specialized foam degreasers or clinging foam degreasers used to degrease meat-processing equipment. These products can contain hydrocarbon solvents, glycol ethers, and emulsifiers.

Proposed VOC Limit and Compliance:

The proposed VOC limit for nonaerosol General Purpose Degreaser products is 0.5 percent by weight, effective December 31, 2012. As shown in Table VII-8, using adjusted 2006 emissions, the proposed limit will result in an estimated emission reduction of 2,340 pounds per day, or about 1.17 tons per day in 2012.

Table VII-8
General Purpose Degreaser Proposal

Product Form	Proposed VOC Limit (percent)	Number of Complying Products	Complying Market Share (percent)	2012 Emissions Reductions (pounds per day)
Nonaerosol	0.5	232	73	2,340

Table VII-8 also shows that 232 products, representing over 70 percent of the market currently comply with the proposed VOC limit of 0.5 percent by weight for nonaerosol General Purpose Degreaser products. Complying products are formulated with surfactants such as alkyl benzene sulfonate, and alcohol ethoxylates; water conditioning agents such as polyacrylates, carbonates, phosphonates, gluconates, tetra-potassium pyrophosphate or ethylene diamine tetra-acetic acid (EDTA); alkaline or acid builders; and water. Complying products are also formulated with the following LVP-VOC ingredients: glycol ethers, methyl esters, triethanolamine, and hydrocarbon solvents.

To comply with the proposed VOC limit of 0.5 percent by weight, we predict manufacturers will reformulate products with based on use of: surfactant technologies; non-VOC alkaline ingredients; LVP-VOC solvent substitutions; or water-solvent emulsions using LVP-VOC glycol ethers or LVP-VOC hydrocarbon solvents.

Proposal to Prohibit Use of Alkylphenol Ethoxylate Surfactants:

Alkylphenol ethoxylate surfactants, in particular the octylphenol and nonylphenol ethoxylates, are known to be toxic to aquatic species. We are aware that some General Purpose Degreaser (nonaerosol) products contain these compounds. Because of this, ARB staff consulted with State Water Resources Control Board (SWRCB) staff to determine if continued use of these compounds could adversely affect water quality. Information provided to SWRCB staff indicates that alkylphenol ethoxylates were found in measurable concentrations in the State's receiving waters. Therefore, SWRCB staff expressed concern that any potential increased use of alkylphenol ethoxylate surfactants could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). In light of this finding, we are proposing a CEQA mitigation measure to ensure that use of alkylphenol ethoxylate surfactants does not occur as products reformulate. As proposed, section 94509(m)(3) would preclude use of alkylphenol ethoxylate surfactants in General Purpose Degreaser (nonaerosol) products effective December 31, 2012. Further information on this proposal, as well as the need, is contained in Chapters VI and IX.

E. Glass Cleaner (nonaerosol)

"Glass Cleaner" products are designed primarily for cleaning surfaces made of glass such as windows, mirrors, glass tabletops, and computer screens. Products designed solely for the purpose of cleaning optical materials used in eyeglasses, photographic

equipment, scientific equipment, or photocopying machines are excluded from the Glass Cleaner category. Products marketed as "Glass and Surface Cleaner" are also not included in this category; they are "General Purpose Cleaner" products.

Glass Cleaner products were first regulated under the Phase-I amendments approved by the Board approved in October of 1990 (ARB, 1990). At that time, the Board approved a VOC limit of 8 percent by weight for nonaerosol Glass Cleaner products, effective January 1, 1993. The current VOC limit for nonaerosol Glass Cleaner products is 4 percent by weight, which has been in effect since December 31, 2004.

The 2006 Survey provides the basis for our determination that it is commercially and technologically feasible to further reduce the VOC content of these products. Based on these data, staff is proposing to lower the VOC limit for nonaerosol Glass Cleaner products to 3 percent by weight.

Table VII-9 below summarizes the sales and emissions from nonaerosol Glass Cleaner products based on the results of the 2006 Survey (ARB, 2007e). The data for the 298 reported products have been grown, by population, to 2010. Total category sales from these products are about 149,812 pounds per day.

Table VII-9
Glass Cleaner

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Nonaerosol	298	149,812	6,685

As shown in Table VII-9, nonaerosol Glass Cleaner products have estimated VOC emissions of 6,685 pounds per day, or about 3.3 tons per day in California. Nonaerosol products represent 96 percent of Glass Cleaner products sold in California. Although not shown, the sales-weighted average VOC content is about 3.4 percent by weight.

Product Use and Marketing:

The Glass Cleaner (nonaerosol) category consists of cleaning products that are labeled for use on glass surfaces. In addition to window cleaning, these cleaners are used to remove soils from glass furniture, fixtures, mirrors, or special surfaces such as stained glass. Nonaerosol Glass Cleaner products are formulated as ready-to-use (RTU) pump spray or wipes, or as concentrates which require dilution by the consumer before use. Nonaerosol Glass Cleaner products are applied and wiped off with a cloth or paper towel. A very small number of products are diluted during use. These "hose-connect" products are designed for the cleaning of exterior glass surfaces and windows. Certain Glass Cleaner products also claim to provide special properties to the cleaned surface. For example, some products claim to provide anti-fogging properties.

Glass Cleaner products are sold to household consumers, janitors, hospitality industries and other commercial or institutional establishments for glass cleaning. They are available at grocery stores, discount stores, janitorial supply stores, and warehouse stores. They may also be sold directly to institutional and commercial facilities.

Glass Cleaner products are used by household, commercial, and industrial establishments. Depending on the cleaning application, both the delivery method and product form varies. RTU pump spray products appear to be preferred by the household consumer. In a household setting Glass Cleaner products are used to clean a variety of soils on glass surfaces such as food, grease, and oils (including sebum, such as fingerprints) in addition to dust and other particulate. Oily soils and particulate also need to be removed from inside vehicles windows. In addition, consumers use Glass Cleaner products to remove outdoor soils including mineral deposits, hard water stains, dirt, and heavier soils including animal deposits. To clean these household soils, desirable performance characteristics include ease of use, quick drying, and effectiveness in soil removal, such that the product does not produce or leave streaks and/or solids on the glass surface.

Most Glass Cleaner products sold to commercial and industrial establishments are concentrated products. Following dilution these products are applied to mirrors, high-rise exterior and interior windows, "clear-guards" at food establishments, along manufacturing lines, or other glass surfaces. End users can mix the appropriate parts of water and cleaner manually with measuring devices, but some vendors also supply closed-loop dispensing and proportioning systems for automated dilution. Dispensers and proportioners work by using a metering tip to mix the product with the recommended amount of water to proper concentration (Schafer, 2008).

Product Formulation:

Nonaerosol Glass Cleaner products are commonly formulated with a high water content. Short carbon chains alcohols such as isopropyl or ethyl and/or glycol ethers are used to dissolve oily soils. Some products are also formulated with vinegar (dilute acetic acid), exempt VOCs, and ammonia. Small amounts of surfactants are included to emulsify oily soils. The surfactant also creates a layer of foam which allows the product to cling to the surface. Fragrance is also routinely added in small amounts.

Proposed VOC Limit and Compliance:

The proposed VOC limit for nonaerosol Glass Cleaner products is 3 percent by weight, effective December 31, 2012. As shown in Table VII-10, the proposed VOC limit would result in an estimated emission reduction of 827 pounds per day, or 0.41 tons per day statewide in 2012.

Table VII-10
Glass Cleaner Proposal

Product Form	Proposed VOC Limit (percent)	Number of Complying Products	Complying Market Share (percent)	2012 Emissions Reductions (pounds per day)
Nonaerosol	3	165	10	827

As shown in Table VII-10, a large number of products already comply with the proposed 3 percent by weight VOC limit, however, the overall complying market share is relatively low. For most nonaerosol Glass Cleaner products, reformulation to meet the proposed VOC limit will involve adjusting the water content, reducing the amount of VOC solvents, or replacing VOC solvents with LVP-VOC solvents, exempt VOCs, or surfactants. We expect most noncomplying products will reformulate with a smaller amount of VOC glycol ether or alcohol, with the balance being water and surfactants.

Proposal to Prohibit Use of Alkylphenol Ethoxylate Surfactants:

Alkylphenol ethoxylate surfactants, in particular the octylphenol and nonylphenol ethoxylates, are known to be toxic to aquatic species. We are aware that some Glass Cleaner (nonaerosol) products contain these compounds. Because of this, ARB staff consulted with State Water Resources Control Board (SWRCB) staff to determine if continued use of these compounds could adversely affect water quality. Information provided to SWRCB staff indicates that alkylphenol ethoxylates were found in measurable concentrations in the State's receiving waters. Therefore, SWRCB staff expressed concern that any potential increased use of alkylphenol ethoxylate surfactants could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). In light of this finding, we are proposing a CEQA mitigation measure to ensure that use of alkylphenol ethoxylate surfactants does not occur as products reformulate. As proposed, section 94509(m)(3) would preclude use of alkylphenol ethoxylate surfactants in Glass Cleaner (nonaerosol) products effective December 31, 2012. Further information on this proposal, as well as the need, is contained in Chapters VI and IX.

Issues:

1. **Issue:** The proposed 3 percent VOC limit should be lower.

   Response: Staff's evaluation of the 2006 Survey indicate that the complying market share at the proposed 3 percent limit is low (about 10 percent). Although there are a number of products that comply, their overall sales are low. Some of the complying products are designed solely to be diluted in a bucket for outdoor window cleaning. This type of product is not suitable for indoor use. Staff also reviewed data that show that when the amount of VOC cleaning solvent is reduced there are potential safety hazards. For example, in automotive glass,

streaks or haze left behind from inadequate cleaning, or excess residuals can lead to haze and unsafe driving conditions. Therefore, staff believes the 3 percent VOC limit is appropriate.

F. Heavy-duty Hand Cleaner or Soap (nonaerosol)

Heavy-duty Hand Cleaner or Soap products are designed to clean or remove difficult dirt and soils from the hand with or without the use of water. Products remove a variety of tough soils including oil, grease, grime, tar, shellac, putty, printer's ink, paint, graphite, cement, carbon, asphalt, or adhesives. The Heavy-duty Hand Cleaner or Soap category 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, or Rubbing Alcohol.

Heavy-duty Hand Cleaner or Soap products are currently subject to a VOC limit of 8 percent by weight for all product forms, which has been in effect since January 1, 2005 (ARB, 1997a). A description of these products is also included in the staff report for that rulemaking, the Midterm Measures I (ARB, 1997b).

In this rulemaking, we are proposing to reduce the VOC limit to 1 percent by weight for nonaerosol Heavy-duty Hand Cleaner or Soap products. These products are sold as liquids (which include wipes and pump spray), semisolids, and solids. The current VOC limit of 8 percent by weight for aerosol Heavy-duty Hand Cleaner or Soap products will be retained.

Table VII-11 below summarizes the sales and emissions from nonaerosol Heavy-duty Hand Cleaner or Soap products based on the results of the 2006 Survey (ARB, 2007e). The data have been grown, by population, to 2010. Total category sales for the 255 reported products are about 26,093 pounds per day.

Table VII-11
Heavy-duty Hand Cleaner or Soap

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Nonaerosol	255	26,093	1,585

Table VII-11 also shows the 2010 market-adjusted VOC emissions are 1,585 pounds per day, or about 0.79 tons per day, statewide. Although not shown, the sales-weighted average VOC content is about 4.6 percent.

Product Use and Marketing:

Nonaerosol Heavy-duty Hand Cleaner or Soap products are found and used in the home, garage, business, manufacturing, construction and mobile business settings

(CSPA, 2010b). These products are commonly used to remove the toughest dirt and soils that cannot be easily washed off with general-use soaps. Typically, the hand cleaner is rubbed into dry or wet hands until the dirt and soils are dissolved or suspended in the product. In the 2006 Survey, about 10 percent of the liquid products reported were towelette (wipe) products. Except for towelette products, virtually all the products instruct the user to wipe the hands with a towel or cloth to remove the dirt or soil suspended in the product, or first rinse with water and then follow with hand wiping. After rinsing with water, hands are often dried with a towel or cloth to aid in mechanically removing product or any stubborn soils that remain on the skin (Willard *et. al,* 2005).

Nonaerosol Heavy-duty Hand Cleaner or Soap products are typically sold in automotive supply stores, discount stores, hardware stores, home supply stores, paint stores, hobby and craft stores, and through Internet sales and catalog sales. These products are also sold to industrial or institutional users through distributors or through direct sales by the manufacturers.

Product Formulation:

Nonaerosol Heavy-duty Hand Cleaner or Soap products typically contain water, surfactants (anionic and nonionic), VOC and/or LVP-VOC solvents, and abrasives. These ingredients assist in removing tough dirt and soils from the hands. In addition, nonaerosol Heavy-duty Hand Cleaner or Soap products may contain fragrance and moisturizing agents. The VOC content of the reported nonaerosol Heavy-duty Hand Cleaner or Soap products ranges from 0 to 8 percent by weight.

Nonaerosol Heavy-duty Hand Cleaner or Soap products are commonly formulated with water in combination with surfactants to suspend dirt and grease. Approximately 95 percent of the products reported in the 2006 Survey reported having water in the product formulation. In products containing water, the water content ranged from near 0 to 95 percent by weight, with a sales-weighted average of approximately 60 percent (ARB, 2007e).

Use of both anionic and nonionic surfactants is common. Among the surfactants used are diethanolamine, sodium lauryl sulfate, alkylphenol ethoxylates, ethoxylated alcohols, and PEG-6 tridecyl ether (ARB, 2007e).

Typical VOC solvents used in nonaerosol Heavy-duty Hand Cleaner or Soap products include hydrocarbon solvents, such as mineral spirits, and terpenes, such as d-limonene. These hand cleaners have a VOC content ranging from 1 to 8 percent by weight. The VOC solvents may act as both an active ingredient by dissolving dirt and soils, or as a carrier for other ingredients. Use of LVP-VOC hydrocarbon and methyl ester solvents was also reported.

Abrasives are active ingredients which remove dirt through physical action. Examples of abrasives are pumice, silica, diatomaceous earth, and polybeads. Bio-based

abrasives include ground nut shells or seeds and corn cob grit. Products with abrasives typically come with use instructions to towel off or rinse off the product with water after the cleansing process to achieve residue-free hands (ARB, 2007e). As reported in the 2006 Survey, the amount of abrasives used in nonaerosol Heavy-duty Hand Cleaner or Soap products ranges from 0 to 53 percent of the product weight, with a sales-weighted average of about 8 percent by weight.

Moisturizers and fragrances may be included in the formulation of nonaerosol Heavy-duty Hand Cleaner or Soap products. Common moisturizers include aloe vera, jojoba oil, lanolin, and mineral oil to help condition the skin and prevent drying.

A number of nonaerosol Heavy-duty Hand Cleaner or Soap products are labeled to remove paint and adhesives from the hands. Most, if not all of these hand cleaners, contain the dibasic esters dimethyl adipate or dimethyl succinate. Dimethyl succinate is a VOC while dimethyl adipate is a LVP-VOC. Both are used in the formulation because of their ability to dissolve the paint resins (ARB, 2007e).

Proposed VOC Limit and Compliance:

The proposed VOC limit for nonaerosol Heavy-duty Hand Cleaner or Soap products is 1 percent by weight with an effective date of December 31, 2013. As shown in Table VII-12, the proposed VOC limit would result in emission reductions of 1,051 pounds per day, or about 0.53 tons per day, statewide in 2013.

Also shown in Table VII-12, 113 products, representing 30 percent of the market already comply with the proposed VOC limit of 1 percent by weight, demonstrating that the proposed VOC limit is technologically and commercially feasible.

Table VII-12
Heavy-duty Hand Cleaner or Soap Proposal

Product Form	Proposed VOC Limit (weight percent)	Number of Complying Products	Complying Market Share (percent)	2013 Emissions Reductions (pounds per day)
Nonaerosol	1	113	30	1,051

For most nonaerosol Heavy-duty Hand Cleaner or Soap products, reformulation to meet the proposed VOC limit of 1 percent by weight will involve adjusting the water content, reducing the amount of VOC solvents or replacing VOC solvents with LVP-VOC solvents, increasing the amount of surfactants or abrasives, or a combination of the above. The proposed limit will not require a change in the amount of moisturizing agents (aloe vera, jojoba oil, lanolin, mineral oil) used in the formulation of the product. These moisturizing agents are LVP-VOCs which are not counted toward a product's VOC content.

Approximately 60 percent of the 113 products that comply with the proposed VOC limit of 1 percent by weight contain abrasives. Thus, use of these materials appears to be a viable reformulation strategy.

To allow manufacturers the needed time to reformulate all noncomplying products, staff is proposing December 31, 2013, as the effective date of the proposed VOC limit.

Proposal to Prohibit Use of Alkylphenol Ethoxylate Surfactants:

Alkylphenol ethoxylate surfactants, in particular the octylphenol and nonylphenol ethoxylates, are known to be toxic to aquatic species. We are aware that some Heavy-duty Hand Cleaner or Soap (nonaerosol) products contain these compounds. Because of this, ARB staff consulted with State Water Resources Control Board (SWRCB) staff to determine if continued use of these compounds could adversely affect water quality. Information provided to SWRCB staff indicates that alkylphenol ethoxylates were found in measurable concentrations in the State's receiving waters. Therefore, SWRCB staff expressed concern that any potential increased use of alkylphenol ethoxylate surfactants could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). In light of this finding, we are proposing a CEQA mitigation measure to ensure that use of alkylphenol ethoxylate surfactants does not occur as products reformulate. As proposed, section 94509(m)(3) would preclude use of alkylphenol ethoxylate surfactants in Heavy-duty Hand Cleaner or Soap (nonaerosol) products effective December 31, 2013. Further information on this proposal, as well as the need, is contained in Chapters VI and IX.

Issues:

1. **Issue:** A proposed 1 percent by weight VOC limit for nonaerosol Heavy-duty Hand Cleaner or Soap products could result in an increase in the use of LVP-VOC ingredients. Substituting VOC ingredients with LVP-VOC ingredients would contribute to increased product residue left on hands, making hands sticky or slippery. This potentially causes unsafe situations for emergency response and utility workers out in the field without a source of running water.

   Response: Staff identified that one reformulation option is to use more LVP-VOC ingredients. However, the commenter did not provide sufficient information to staff to support their claims that such reformulated products would result in more residue left on hands and lead to unsafe situations. Use instructions on the labels indicate that products intended to be used without water are to be wiped off with paper towels or cloths; this action should remove much of the residue from the hands. Complying towelette products were also reported in the 2006 Survey. In addition, staff contacted representatives of potential users, including fire fighters, emergency medical technicians (EMT), and utility workers. Staff was told that these workers typically wear gloves when out on calls. According to the organizations contacted by staff, firefighters do not take nonaerosol Heavy-duty Hand Cleaner or Soap products out on calls but

would use such products to clean their hands upon their return to the station. EMTs do not take nonaerosol Heavy-duty Hand Cleaner or Soap out on calls. A utility representative indicated that the field workers do take nonaerosol Heavy-duty Hand Cleaner or Soap products with them but use of such products is limited because the workers would be wearing gloves.

2. **Issue:** Products with 1 percent by weight VOC content would not meet the rigorous performance requirements of heavy-duty hand cleaners.

   Response: Heavy-duty Hand Cleaner or Soap product is currently defined as 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. According to label claims, many of the 113 complying products reported in the 2006 Survey are designed to clean or remove a variety of such soils.

3. **Issue:** A proposed 1 percent by weight VOC limit for nonaerosol Heavy-duty Hand Cleaner or Soap products could result in an increase in the use of abrasive ingredients. Increased amounts of abrasive ingredients will potentially be washed "down the drain," impacting water treatment and increasing solid waste.

   Response: Staff identified that a reformulation option is to use more abrasive ingredients. However, staff has no reason to believe that the reformulation of nonaerosol Heavy-duty Hand Cleaner or Soap products would have significant adverse impacts on water treatment or solid waste disposal systems. Approximately 60 percent of the 113 products that comply with the proposed VOC limit of 1 percent by weight contain abrasives with 12 products containing less than 1 percent by weight. About half of the complying products contain very little or no abrasive ingredients, indicating that product reformulations that do not rely on increase use of abrasives are just as likely.

4. **Issue:** CSPA and its members have provided ARB staff with a counterproposal for a VOC limit of 5 percent by weight.

   Response: As shown by the 2006 Survey, numerous products currently comply with staff's proposed 1 percent by weight VOC limit and are available, and based on the sales data, are well accepted by consumers. In addition, the 30 percent complying market share, with 113 complying products out of 255 products, indicates that the proposed limit is both technologically and commercially feasible.

5. **Issue:** An exemption of 5 percent by weight should be provided for 'bio-based' VOC solvents. These solvents are better for the environment than are petroleum-based solvents.

Response: Use of petroleum-based solvents is not the only reformulation option. The data show that the proposed 1 percent limit is feasible using a variety of reformulation options. While some products are currently formulated with bio-based solvents such as d-limonene, many other products do not contain this VOC. Products can also be reformulated to meet the 1 percent VOC limit without petroleum-based solvents. For example use of the LVP-VOC bio-based soy methyl ester solvents is a feasible reformulation option. Products can also be formulated without VOC or LVP-VOC solvents. Use of surfactants with water, and use of bio-based abrasives are also feasible options.

G. Metal Polish or Cleanser

Metal Polish or Cleanser is defined as "any product designed or labeled to improve the appearance and/or protect finished metal, metallic, or metallized surfaces by physical or chemical action. To "improve the appearance" means to clean, remove, or reduce stains, impurities, or oxidation from surfaces or to make surfaces smooth and shiny. "Metal Polish/Cleanser" includes, but is not limited to metal polishes used on brass, silver, chrome, copper, stainless steel and other ornamental metals. "Metal Polish/Cleanser" does not include "Automotive Wax, Polish, Sealant or Glaze," "Tire or Wheel Cleaner," "Paint Remover or Stripper," products designed and labeled exclusively for automotive and marine detailing, or products designed for use in degreasing tanks."

A number of Metal Polish/Cleansers were reported for use on a single metallic surface. However, some Metal Polish/Cleansers are designed for use on a variety of substrates and are labeled as multi-surface Metal Polish/Cleansers.

Metal Polish/Cleansers were first regulated in 1997 (ARB, 1997b). Products were required to meet a VOC limit of 30 percent by weight, effective January 1, 2005. In the current rulemaking, we are proposing a further VOC reduction for Metal Polish/Cleansers. To maximize reductions, we are also proposing to divide the category into aerosol and nonaerosol product forms. We are also proposing to change the category name from Metal Polish/Cleanser to "Metal Polish or Cleanser" to clarify that products making either claim are subject to the VOC limits.

Table VII-13 below summarizes the sales and emissions of aerosol and nonaerosol Metal Polish or Cleanser products based on the results of the 2006 Survey (ARB, 2007e). The data for the 227 reported products have been grown, by population, to 2010. As shown in Table VII-13, category sales for the 73 reported aerosol products are about 2,097 pounds per day. The 154 reported nonaerosol products have sales of about 10,522 pounds per day.

Table VII-13
Metal Polish or Cleanser

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol	73	2,097	437
Nonaerosol	154	10,522	409

Table VII-13 also shows the 2010 market-adjusted VOC emissions for aerosol products are 437 pounds per day, or about 0.22 tons per day. Table VII-13 also shows that the 2010 market-adjusted VOC emissions for nonaerosol products are 409 pounds per day, or about 0.20 tons per day. Although not shown, the sales-weighted average VOC content is about 21 percent by weight for aerosol products and 4 percent by weight for nonaerosol products.

Product Use and Marketing:

As mentioned earlier, Metal Polish or Cleanser products are used to improve the appearance of finished metal, metallic or metalized surfaces by physical or chemical action. Metal Polish or Cleanser products remove dust, fingerprints, tarnish, and many products claim to provide protection from future tarnishing (CSPA, 2010a). Tarnish is the result of the reaction of metal surfaces with pollutants in the air. Pollutants, such as nitrogen oxides, sulfur oxides and carbon monoxide, dissolve in the moisture in the air to form acidic solutions. These acidic solutions further react with the metal surfaces to produce tarnish (CSPA, 2010a).

Because of the differences in metal hardness and uses, polishes are designed to work without scratching the metal (CSPA, 2010a). Silver and aluminum have a fairly soft surface. Brass, copper, bronze and pewter surfaces are considered to have intermediate hardness. Soft and intermediate surface cleaners remove soil build up and tarnish, and claim to leave a smooth polished surface, and prevent further oxidation and corrosion. Stainless steel and chrome surfaces are considered hard and more durable. Cleaners for these metals are designed to leave a streak free appearance, remove soils, and leave a protective coating.

Metal Polish or Cleanser products are used in both household and institutional settings. These products are available in aerosols; liquids; semisolids, such as pastes or creams; and solids (ARB, 2007e).

A household consumer will use these products for a variety of cleaning and polishing needs around the home. Examples include, cleaning and polishing appliances, jewelry, flatware, fireplace accessories, home furnaces, metal surfaced or coated items, decorative trim, appliances, kitchen or bathroom fixtures, brass doors, end plates, wall coverings and railings.

In institutional settings such as restaurants, hotels, office buildings and hospitals, Metal Polish or Cleanser products are used to clean metal objects such as stainless steel surfaces, brass railings, brass fixtures, stovetops and decorative objects.

Metal Polish or Cleaner products that clean by physical action include liquids, semisolids and solids. These products require some physical scrubbing action to clean and shine the metallic substrate. Liquid products are usually applied using a moist cloth. After a short period of time the product is rinsed off with water and wiped or buffed off with a clean sponge or cloth. Semisolids typically clean through abrasion. They are applied with a damp cloth, rubbed onto the substrate and then wiped or rinsed off with soap and water.

Metal Polish or Cleanser products that clean by chemical action are typically liquids and aerosols that have a higher VOC content. Generally, these products are applied using a clean soft cloth, allowed to dry after slight rubbing to loosen badly discolored areas, and polished with a soft, dry cloth. Some liquids are available as dips in which objects are placed into the container of liquid product, pulled out and wiped or rinsed off to get a clean shiny appearance. Aerosol products, based on product labels, appear to be used for quick spot cleaning to get into hard to clean crevices. According to the 2006 Survey, aerosol products are more widely used in the institutional market than the household market (ARB, 2007e).

Metal Polish or Cleanser products are sold at numerous locations such as department stores, grocery stores, hardware stores, hobby shops, warehouse stores, paint stores, and janitorial supply stores.

Product Formulation:

Metal Polish or Cleanser products are formulated with water and a variety of VOC ingredients. VOC ingredients reported include various hydrocarbon solvents, alcohols, terpenes, and/or glycol ethers. Limited use of xylenes and perchloroethylene was reported. A number of products also contain an LVP-VOC mineral oil which provides a protective coating on the surface. Some products also contain a small amount of fragrance. Depending on the function of the Metal Polish or Cleanser product, formulations may also include weak acids or ammonia. Ingredients, such as abrasive polishing agents, did not have to be speciated in the 2006 Survey. However, review of product labels lists ingredients such as silica, diatomaceous earth, talc, chalk, pumice, or clay as the abrasive polishing agents. The type of abrasive polish agent used in products depends on the hardness of the metal to be polished.

The propellants reported for aerosol products are hydrocarbon blends of propane, butane, and iso-butane. The range of propellant reported is about 5 to 30 percent by weight.

A typical stainless steel cleaner product contains water, VOC hydrocarbon solvent, alcohol, d-limonene, fragrance, and an LVP-VOC mineral oil. Use of acetone was also

reported. The mineral oil deposits a protective coating on the surface. A hydrocarbon propellant is typically used in the aerosol product form, however, a few products reported use of carbon dioxide.

A typical tarnish remover contains water, VOC hydrocarbon solvent, alcohol, ammonia, LVP-VOC solvent, exempt compounds, clay or silica, acid, and/or fragrance. Hydrocarbon propellants are used in the aerosol product form.

A typical polish contains water, VOC hydrocarbon solvent, alcohol, glycol ether, LVP-VOC mineral oil, abrasives such as pumice, clay, or silica, inorganic compounds, ammonia, acid, and/or fragrance. Hydrocarbon propellants are typically used in the aerosol product form.

Proposed VOC Limit and Compliance:

The proposed VOC limit for aerosol Metal Polish or Cleanser products is 15 percent by weight. The proposed VOC limit for nonaerosol Metal Polish or Cleanser products is 3 percent by weight. These VOC limits would become effective December 31, 2012. As shown in Table VII-14, using adjusted emissions, the proposed VOC limits would result in VOC emission reductions of approximately 440 pounds per day, or about 0.22 tons per day in 2012.

Table VII-14
Metal Polish or Cleanser Proposal

Product Form	**Proposed VOC Limit** (weight percent)	**Number of Complying Products**	**Complying Market Share** (percent)	**2012 Emissions Reductions** (pounds per day)
Aerosol	15	20	35	140
Nonaerosol	3	96	78	300

Table VII-14 also shows 35 percent of the market already complies with the proposed aerosol VOC limit of 15 percent by weight. For nonaerosol products, 78 percent of the market complies with the proposed VOC limit of 3 percent by weight.

A typical complying nonaerosol stainless steel cleaner contains up to 80 percent water, with the balance being a combination of grouped LVP-VOC and alcohol. A typical complying aerosol stainless steel cleaner contains similar ingredients with about 10 percent hydrocarbon propellant.

A typical complying tarnish remover contains up to 64 percent water. Other reported ingredients include inorganic compounds, clay, small amounts of ammonia, VOC hydrocarbon solvent, and fragrance. A typical complying aerosol tarnish remover contains similar ingredients with about 10 percent hydrocarbon propellant.

A typical complying polish contains about 50 percent water. Other reported ingredients include inorganic compounds, silica, a small amount of mineral oil, a small amount of alcohol, and a weak acid. A typical complying aerosol polish contains similar ingredients with about 10 percent hydrocarbon propellant.

We expect noncomplying products to reformulate using similar ingredients and technologies as the current complying products. Reformulation options include use of water, LVP-VOC hydrocarbon solvents, abrasives, VOC exempt compounds, or any combination.

Proposal to Prohibit Use of Certain TAC Solvents:

We are proposing a CEQA mitigation measure to prohibit the use of the chlorinated TAC solvents methylene chloride, perchloroethylene, and trichloroethylene in Metal Polish or Cleanser products. The prohibition of these three solvents is necessary, particularly for methylene chloride and perchloroethylene, because they are exempt VOCs and could be used in reformulated products without 'counting' toward VOC content. For this rulemaking, staff's evaluation of the 2006 Survey data show formulation technologies that do not contain methylene chloride, perchloroethylene, or trichloroethylene are readily available, and are not needed to comply with the proposed limits. This provision would become effective on December 31, 2012. More information on this proposal is contained in Chapter IX, Environmental Impacts, Section E.

Proposed GWP Limit:

No compounds with GWP values at or above 150 were reported in the 2006 Survey for this category. However, to ensure that use of compounds with higher GWP values does not begin as products reformulate to comply with the proposed VOC limits, we are proposing a GWP limit of 150 for any chemical compound used in Metal Polish or Cleanser products, effective December 31, 2012. While this proposal would allow use of the non-VOC propellant, HFC-152a, we believe other reformulation options are more likely. The proposed limit would not apply to any chemicals present as contaminants, which in aggregate are 0.1 percent by weight or less. This limit is proposed as a mitigation measure under CEQA (see Chapter IX, Environmental Impacts. Section E). The proposed limit is contained in section 94509(n).

H. Oven or Grill Cleaner

"Oven Cleaner" products are designed to remove cooked or baked-on food soils from the inside of oven surfaces or similar cooking surfaces. Nonaerosol Oven or Grill Cleaner products are currently subject to a 1 percent by weight VOC limit, which has been in effect since December 31, 2008. At that time Oven Cleaner products were primarily caustic products.

As part of the 2006 Survey, data for grill cleaning products was obtained. Our evaluation of the grill cleaner products indicates that these products are similarly

formulated and have similar functions to Oven Cleaner products. Because they have similar functions we are proposing to add grill cleaning products into the existing Oven Cleaner category and rename the category to "Oven or Grill Cleaner." Products in this combined category are often labeled as: "Oven Cleaner," "Oven or Grill Cleaner," "Oven Cleaner and Heavy Duty Degreaser," "Grill and Fryer Cleaner," or "Grill Cleaner."

During our evaluation we also learned that less harsh VOC technologies are available as alternatives to caustic products. These products require a higher VOC content than would be allowed by the 1 percent VOC limit. Therefore, we are proposing to increase the VOC limit for Oven or Grill Cleaner products slightly to allow for use of these alternatives.

We are also proposing to clarify that an Oven or Grill Cleaner product making other general degreasing claims is a "General Purpose Degreaser" product. Likewise, we are proposing to clarify that a Oven or Grill Cleaner product making general cleaning claims is a "General Purpose Cleaner" product. The proposed changes to the definition are shown below in strikethrough/underline format.

"Oven or Grill Cleaner" means ~~any cleaning~~ a product ~~designed or~~ labeled exclusively ~~to clean and~~ to remove ~~dried or~~ baked on greases and/or ~~food~~ deposits from ~~oven walls~~ food preparation and/or food cooking surfaces. A product that is labeled as an "Oven or Grill Cleaner" that makes claims that it is suitable for degreasing other hard surfaces is a "General Purpose Degreaser." A product that is labeled as an "Oven or Grill Cleaner" that makes claims that it is suitable for cleaning other hard surfaces is a "General Purpose Cleaner."

Surfaces likely to be soiled with baked-on greases and/or deposits that would require use of an Oven or Grill Cleaner product include: ovens, grills, broilers, deep fat fryers, rotisseries, stove hoods, exhaust vents, oven racks, bakery carts, or drip pans.

Oven Cleaner products were defined and regulated under the Phase-I amendments approved by the Board in October 1990 (ARB, 1990). At that time, the Board approved an 8 percent by weight VOC limit for aerosol and pump spray product forms, and a 5 percent by weight VOC limit for liquid product forms. The VOC limits became effective on January 1, 1993.

At the November 16, 2006, hearing, the Board approved amendments to lower the VOC limit for nonaerosol Oven Cleaner products (thereby incorporating pump spray and liquid products into a single subcategory) to 1 percent by weight, effective December 31, 2008. The 1 percent by weight VOC limit for nonaerosol products was determined to be technologically and commercially feasible based on the data reported (ARB, 2004a). In addition, a prohibition on the use of the TACs methylene chloride, perchloroethylene, and trichloroethylene was put in place.

Table VII-15 below, summarizes the sales and emissions from the Grill Cleaner products that we are incorporating into the Oven or Grill Cleaner category

(ARB, 2007e). Data for the 111 reported products have been grown to 2010. As shown in Table VII-15, total Grill Cleaner product sales are about 32,898 pounds per day in California.

Table VII-15
Oven or Grill Cleaner *

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol	21	1,868	162
Nonaerosol	90	31,030	479

*Data are for Grill Cleaner products only. Oven Cleaner products were surveyed in 2003.

Table VII-15 also shows aerosol Grill Cleaner products have estimated VOC emissions of 162 pounds per day, or about 0.08 tons per day in California. Nonaerosol Grill Cleaner products have estimated VOC emissions of 479 pounds per day, or about 0.24 tons per day in California. Although not shown, the sales-weighted average VOC content is 8.7 percent by weight for aerosol products and 1.4 percent by weight for nonaerosol products.

Product Use and Marketing:

Oven or Grill Cleaner products are sold through a variety of sales outlets including supermarkets, home centers, grocery stores, drug stores, and by mass merchandisers. Oven or Grill Cleaner products are also sold to commercial or institutional users through distributors or through direct sales by the manufacturer.

Products are used to remove food soils from household, commercial, and industrial ovens and grills, as well as, other surfaces where polymerized food soils have accumulated. At normal cooking temperatures organic deposits of fats, greases, oils, proteins, and carbohydrates are converted into a polymerized film or mass of charred material. For removal, such polymerized or baked-on deposits require use of Oven or Grill Cleaner products. Collectively, as used here, we are employing the term "polymerized food soils" to describe the types of soils an Oven or Grill Cleaner product would be used to remove. Inorganic deposits of water, including insoluble salts of calcium, magnesium, iron, and manganese also require use of an Oven or Grill Cleaner to remove them. These deposits reduce heating efficiency, increase fire hazards and cause unpleasant odors. Dirty ovens or grills also distort the food's flavor and aroma and can promote or support the growth of microorganisms that can contaminate food or other materials or surfaces.

Product labels, especially those for caustic products, include precautionary recommendations to use protective eye goggles, and to wear long sleeves and rubber gloves when using the product. Directions for using products recommend protecting surfaces from overspray and to apply product to the bottom of the oven, then sides and

top evenly. Labels also indicate Oven or Grill Cleaner products can be used in warm or cold ovens. Following application the product should dwell for a period of time prior to wiping surface to remove materials.

Nonaerosol products are sold as ready-to-use (RTU) pump sprays or as liquid concentrates. Products can be applied using a brush, sponge, grill pad, or pump spray. Applying the product using a pump spray allows the product to be applied to vertical, overhead or inclined surfaces. For this reason, many liquid concentrate products include dilution instructions for use in re-usable pump spray bottles.

Product Formulation:

Oven or Grill Cleaner products use compounds that provide alkalinity for saponification (alkali reacts with fats to form soluble soap) along with solvents and surfactants to remove polymerized food soils. Solvents penetrate greases and assist in depolymerizing reacted food soils. When surfactants are present above the critical micelle concentration, they can act as emulsifiers that will allow a compound that is normally insoluble in water to dissolve.

The primary alkaline ingredients in Oven or Grill Cleaner products continue to be the caustic alkalis, sodium and potassium hydroxide. These compounds react with fats, partially converting them into their sodium or potassium salts which are water-soluble and easily removable. Products often contain 30 percent or more of sodium or potassium hydroxide.

Typical reported VOC solvents include 2-butoxyethanol, monoethanolamine, isopropyl alcohol, ethyl alcohol, amino methyl propanol, and d-limonene. Typical reported LVP-VOC solvents include diethylene glycol monobutyl ether, tripropylene glycol methyl ether, diethanolamine, and triethanolamine. Additional reported ingredients include sodium xylene sulfonate, alkylphenol ethoxylates, ethoxylated alcohols, tetrapotassium pyrophosphate, metallic carbonates, and metasilicates.

Proposed VOC Limit and Compliance:

We are proposing to incorporate grill cleaning products into the Oven or Grill Cleaner category. To allow the previously unregulated grill cleaner products the necessary time to reformulate, proposed subsection 94509(r) would specify that the VOC limits do not apply to these products until December 31, 2012.

Nonaerosol Oven Cleaner products are currently subject to a VOC limit of 1 percent by weight. When this limit was approved reported products relied on low or non-VOC caustic technologies. We have since learned of less harsh technologies introduced to provide alternatives to caustic products. To accommodate the use of these technologies we are proposing to increase the current VOC limit to 4 percent by weight for nonaerosol Oven or Grill Cleaner products. To expedite providing this alternative, as proposed, the limit revision would become effective when the amendments become

legally effective. As shown in Table VII-16, this proposal results in a small emission reduction shortfall of 240 pounds per day, or about 0.1 tons per day. However, other reductions from this proposal would offset this change. To arrive at the amount of VOC increase resulting from the proposal, data from the Oven Cleaner products surveyed in 2003 were considered.

Table VII-16
Oven or Grill Cleaner Proposal

Product Form	Proposed VOC Limit (weight percent)	Number of Complying Products	Complying Market Share (percent)	2012 Emissions Reductions (pounds per day)
Aerosol	8	18	87	> 0
Nonaerosol	4	81	99	- 240*

* Previously regulated oven cleaning products incorporated to arrive at the emissions increase. Some of these oven cleaning products will reformulate from 1 percent VOC by weight to 4 percent VOC by weight.

Table VII-16, also show 87 percent of the market already complies with the aerosol VOC limit of 8 percent. For nonaerosol products, 99 percent of the market complies with the proposed 4 percent VOC limit. We expect the few noncomplying products to reformulate using ingredients less harsh than the caustic alkalis sodium or potassium hydroxide. Reformulated products would likely reformulate using LVP-VOC glycol ethers, ethanolamines, ethoxylated alcohols, metallic carbonates, and meta-silicates.

Proposal to Prohibit Use of Alkylphenol Ethoxylate Surfactants:

Alkylphenol ethoxylate surfactants, in particular the octylphenol and nonylphenol ethoxylates, are known to be toxic to aquatic species. We are aware that some Oven or Grill Cleaner products contain these compounds. Because of this, ARB staff consulted with State Water Resources Control Board (SWRCB) staff to determine if continued use of these compounds could adversely affect water quality. Information provided to SWRCB staff indicates that alkylphenol ethoxylates were found in measurable concentrations in the State's receiving waters. Therefore, SWRCB staff expressed concern that any potential increased use of alkylphenol ethoxylate surfactants could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). In light of this finding, we are proposing a CEQA mitigation measure to ensure that use of alkylphenol ethoxylate surfactants does not occur as products reformulate. As proposed, section 94509(m)(3) would preclude use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products effective December 31, 2012. Further information on this proposal, as well as the need, is contained in Chapters VI and IX.

I. Special-purpose Lubricant

The Special-purpose Lubricant category is not currently regulated. We are proposing to define "Special-purpose Lubricant" as a lubricant designed or labeled as: a cutting or tapping oil; an anti-seize product; an open gear, chain or wire lubricant; and products which claim to prevent and/or inhibit corrosion that makes a lubricating claim. The "Special-purpose Lubricant" category would not include the other regulated categories "Multi-purpose Lubricant," "Silicone-based Multi-purpose Lubricant," "Penetrant," products designed and labeled exclusively to release manufactured products from molds, and products designed or labeled to provide lubricity solely by depositing a thin film of graphite, molybdenum disulfide ("moly"), or polytetrafluoroethylene or closely related fluoropolymer ("teflon") on surfaces.

Special-purpose Lubricants are used in household, automotive, institutional, and industrial settings on metal parts to reduce friction, heat and wear between moving parts. Products that lubricate may also secondarily function to inhibit rust.

Table VII-17 below summarizes the sales and emissions from Special-purpose Lubricant based on the results of the 2006 Survey (ARB, 2007e). Data have been grown, by population, to 2010. As shown, Special-purpose Lubricant products have category sales of 29,600 pounds per day in California.

Table VII-17
Special-purpose Lubricant

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol	168	1,413	512
Nonaerosol	224	28,187	365

As shown in Table VII-17, Special-purpose Lubricant products are sold in both the aerosol and nonaerosol forms, with estimated VOC emissions of 877 pounds per day, or about 0.44 tons per day in California. Although not shown, the sales-weighted average VOC content of the aerosol and nonaerosol products are 36 and 1 percent by weight, respectively.

Product Use and Marketing:

Special-purpose Lubricant products are used by professionals and do-it-yourselfers in specific applications. These products are used on tools, all kinds of machinery, construction equipment, automotive and marine engines, and parts which need lubrication in order to function properly. They are also used for maintenance to reduce wear and extend the usable life of the substrate being lubricated.

Special-purpose Lubricant products have specific purposes, for example, cutting and tapping oils. These oils are used on drills, saws, and taps to extend tool life. Machining operations (e.g., sawing, milling, tapping, drilling, shaping, etc.) use various cutting oils depending on material. Besides lubricating, cutting and tapping oils also aid the cutting process by cooling or removing the heat generated due to friction between the tool and the surfaces. It can be a product which leaves a film after application for lubrication, or it may also be a fluid which continuously flows onto the moving parts to reduce heat and friction and improve tool efficiency.

Anti-seize lubricant products are typically used on machinery where seizing, fretting or galling of parts can be a problem due to extreme temperature and/or pressure conditions. Application of these products is especially important in environmentally adverse conditions such as high humidity and salinity, and acidic atmospheres. Anti-seize lubricant products contain powdered metallic additives such as zinc, copper, aluminum, and nickel or nonmetallic materials such as molybdenum disulfide, graphite, zinc oxide or calcium oxide. These additives enable the product to prevent the metal parts from seizing. A combination of these solid lubricating agents results in different high temperature limits and lubricities to suit specific needs.

In some applications rust preventative lubricant products are used to improve corrosion resistance to allow parts to be subsequently disassembled in a variety of settings. These formulas are also used to break down rust and corrosion, to free plumbing, rusted bolts and other fittings, release jammed or locked mechanisms, and corroded parts. Typically, these lubricants form a thin, anti-rust, nondrying film by displacing moisture which protects various metal surfaces.

Open gear, chain or wire lubricants penetrate, protect and preserve open gears, chains, bars, wire ropes, cables, hoists, pulleys, conveyors, forklifts, elevators, overhead door drives with minimum "throw-off" from centrifugal force.

Some products proposed for inclusion in the Special-purpose Lubricant category also makes claims that they are suitable in situations where there may be direct or indirect contact with food. These 'food grade' lubricants would be included in the category.

Special-purpose Lubricant products are sold primarily in hardware stores, automotive parts stores, and industrial supply houses. These products are also sold through distributors or through direct sales by the manufacturer to industrial or institutional users.

Product Formulation:

As reported in the 2006 Survey, Special-purpose Lubricant product formulations are typically composed of petroleum base oils. Petroleum distillates such as naphthenic and aliphatic hydrocarbons serve as the carrier fluid. Limited use of trichloroethylene, methylene chloride, or perchloroethylene was reported.

The VOC content of products in this category ranges from 0 to 100 percent by weight for both aerosol and nonaerosol products, with a sales-weighted average VOC content of 36 and 1 percent by weight for aerosol and nonaerosol products, respectively.

Special additives such as PTFE, greases, and powdered metals are sometimes used to accomplish the lubrication, depending on the application.

For aerosol products, hydrocarbon propellant (such as propane, butane, iso-butane) is most often used. In some cases carbon dioxide (CO_2) is used.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Special-purpose Lubricant products is 25 percent by weight for aerosols and 3 percent by weight for nonaerosols, effective December 31, 2012. As shown in Table VII-18, using emissions adjusted to 2012, the proposed limits for the category will result in an estimated emission reduction of 461 pounds per day, or about 0.23 tons per day statewide.

Table VII-18
Special-purpose Lubricant Proposal

Product Form	Proposed VOC Limit (weight percent)	Number of Complying Products	Complying Market Share (percent)	2012 Emissions Reductions (pounds per day)**
Aerosol	25	64	47	207
Nonaerosol	3	166	97	254

Table VII-18 also shows that 47 percent of the aerosol market currently complies with the proposed 25 percent VOC limit, and 97 percent of the nonaerosol market complies with 3 percent VOC limit. Complying aerosol and nonaerosol products are already sold in each type of lubricant proposed for consolidation into the Special-purpose Lubricant category.

Staff has determined that reformulation to the proposed limits is technologically and commercially feasible. As shown in Table VII-18, the majority of nonaerosol products in this category already meet the proposed 3 percent limit. Additionally, the 47 percent complying market share demonstrates that aerosol products with VOC content at or below 25 percent are already available and well-accepted by consumers.

Reformulation options that can be used by manufacturers to meet the proposed limit include using LVP-VOC hydrocarbon solvents and acetone. Acetone is currently used in several Special-purpose Lubricant product formulations at a level of 10 to 50 percent. Another reformulation option is to use a non-VOC propellant such as CO_2 as a replacement for hydrocarbon propellants. CO_2 may also be used in combination with hydrocarbon propellants along with LVP-VOC or non-VOC solvents. However, because

CO_2 typically only constitutes about 2 to 5 percent of the overall formulation, additional reformulation techniques must be used in order to achieve compliance. We expect that manufacturers will meet the proposed limit by using formulation technologies similar to complying products.

Proposal to Prohibit Use of Certain TAC Solvents:

We are proposing a CEQA mitigation measure to prohibit the use of the chlorinated TAC solvents methylene chloride, perchloroethylene, and trichloroethylene. The prohibition of these three solvents is necessary, particularly for methylene chloride and perchloroethylene, because they are exempt VOCs and could be used in reformulated products without 'counting' toward VOC content. The prohibition would become effective on December 31, 2012. Survey data show that the proposed limits can be met without the use of these compounds. More information on this proposal is contained in Chapter IX, Environmental Impacts, section E.

Proposed GWP Limit:

No compounds with GWP values above 150 were reported in the 2006 Survey for this category. However, to ensure that use of compounds with higher GWP values does not begin as products reformulate to comply with the proposed VOC limits, we are proposing a GWP limit of 150 for any chemical compound used in Special-purpose Lubricant products, effective December 31, 2012. While this proposal would allow use of the non-VOC propellant, HFC-152a, we believe other reformulation options are more likely. The proposed limit would not apply to any chemicals present as contaminants, which in aggregate are 0.1 percent by weight or less. This limit is proposed as a mitigation measure under CEQA (see Chapter IX, Environmental Impacts, section E). The proposed limit is contained in section 94509(n).

Issues:

1. **Issue:** Every kind of Special-purpose Lubricant cannot be accommodated by one VOC limit.

   Response: All subcategories of Special-purpose Lubricant have been thoroughly evaluated and the proposed VOC limits have been found to be technologically and commercially feasible. Complying products were available in every surveyed subcategory in aerosol and nonaerosol forms.

J. Spot Remover (Dry Clean Only)

In the Consumer Products Regulation, "Spot Remover" means any product labeled to clean localized areas, or remove localized spots or stains on cloth or fabric such as drapes, carpets, upholstery, or clothing, that does not require subsequent laundering to achieve stain removal. "Dry Cleaning Fluid," "Laundry Prewash," and "aerosol products labeled solely for gum removal" are excluded from the definition of "Spot Remover."

Spot Remover products that are used at dry cleaners and other commercial launderers for spot-cleaning and stain removal have been considered "Dry Cleaning Fluid" products. Therefore, these products have not been regulated under the category of "Spot Remover."

Spot Remover products were first regulated in 2001, when VOC limits of 25 percent by weight for the aerosol form and 8 percent by weight for the nonaerosol forms were adopted. In 2008, the Board approved amendments to lower the VOC limit for the aerosol form of Spot Remover products to 15 percent by weight, and the nonaerosol form to 3 percent VOC by weight. A prohibition on use of the TACs methylene chloride, perchloroethylene, and trichloroethylene, was also approved. These requirements are to become effective December 31, 2010 (ARB, 2009d).

To evaluate whether the exemption for Spot Remover (Dry Clean Only) products was still necessary, companies that sold spotting chemicals to dry cleaning establishments, or that sold household "dry cleaning" products, were surveyed for their 2008 California sales. The survey was titled, "2008 Survey Update for Dry Clean Only Spot Removers" (2008 Survey Update). The survey data review indicates that the exemption is no longer necessary. Therefore, ARB staff is proposing to remove the exclusion. This would mean that Spot Remover (Dry Clean Only) products would be subject to the VOC limits already in place.

Spot Remover (Dry Clean Only) products are also referred to in this section as "spotting agents," "spotters," or "spotting chemicals." These products are formulated to remove localized spots or stains on fabrics labeled for "dry clean only," or on "S-coded fabrics," such as clothing, rugs, curtains, or other similar items that can be cleaned by a commercial dry cleaning establishment or professional laundry facility. A few 'home use' products are available to the general public. "S-coded fabrics" refer to fabrics specified by the Joint Industry Fabric Standards Committee to be cleaned only with water-free spot cleaning products. Spotting chemicals may be intended for one type of stain, or for several (ARB, 2008a; and SCRDC, 2010). Industry separates spotting agents into two main categories: "dry-side" and "wet-side" (U.S. EPA, 1998b).

As their names imply, dry-side spotting agents are for garments and items that would be washed with nonaqueous solvents, *i.e.,* intended for a typical nonaqueous, solvent-based dry cleaning machine such as a perchloroethylene or hydrocarbon system. Dry-side spotters are for removing oil-based stains and spots, including but not limited to paint, grease, tar, and nail polish.

Wet-side spotting agents are for stains that are water-based, including but not limited to perspiration, grass stains, blood, certain foods or beverages, mustard and other plant-based stains. Some spotters are for both wet and dry-side stains.

To clarify the products that would be included or excluded from the definition of Spot Remover, staff is proposing modifications to three definitions. The proposed changes are presented in strikeout/underline format for ease of reviewing the edits.

1. Proposed modification to the definition of Spot Remover:

"Spot Remover" means any product labeled to clean localized areas, or remove localized spots or stains on cloth or fabric such as drapes, carpets, upholstery, or clothing, that ~~does~~ may or may not require subsequent laundering to achieve stain removal. "Spot Remover" includes spotting agents used by commercial launderers and dry cleaners. "Spot Remover" does not include ~~"Dry Cleaning Fluid,"~~ "Laundry Prewash~~,~~" or aerosol products labeled solely for gum removal.

This modification is necessary to clarify that spotters used at commercial launderers and dry cleaners are considered "Spot Remover" products.

2. Proposed modification to the definition of Dry Cleaning Fluid:

"Dry Cleaning Fluid" means any ~~non-aqueous liquid product~~ nonaqueous solvent that is (A) used in dry-cleaning machines at commercial dry cleaners or used by commercial businesses that clean fabrics such as draperies at the customer's residence or work place; and (B) is designed and labeled exclusively to clean ~~for use on~~: (1) fabrics which are labeled "for dry clean only," such as clothing or drapery; or (2) "S-coded" fabrics. ~~"Dry Cleaning Fluid" includes, but is not limited to, those products used by commercial dry cleaners and commercial businesses that clean fabrics such as draperies at the customer's residence or work place.~~ "Dry Cleaning Fluid" does not include "Spot Remover" or "Carpet/Upholstery Cleaner." For the purposes of this definition, S-coded fabric means an upholstery fabric designed to be cleaned only with water-free spot cleaning products as specified by the Joint Industry Fabric Standards Committee."

This modification is intended to clarify that "Dry Cleaning Fluid" means only the solvent used in dry cleaning machines. Spotting chemicals would no longer be considered "Dry Cleaning Fluid" products.

3. Proposed modification to the definition of Laundry Prewash:

"Laundry Prewash" means a product that is designed for application to a fabric prior to laundering in a wet-cleaning process, and that supplements and contributes to the effectiveness of laundry detergents and/or provides specialized performance.

This modification is intended to clarify that a "Laundry Prewash" is a product used in a cleaning process that uses water as the solvent.

Table VII-19 below summarizes the sales and emissions, grown to 2010, for Spot Remover (Dry Clean Only) products (ARB, 2009e). Total category sales are about 860 pounds per day, or 0.43 tons per day in California.

Table VII-19
Spot Remover (Dry Clean Only) *

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol **	< 5	< 10	< 10
Nonaerosol	49	860	350

* Based on 2008 Dry Clean Only Spot Remover Survey (ARB, 2009e).
** Data estimated to preserve confidentiality.

As shown in Table VII-19, Spot Remover (Dry Clean Only) products are sold in both the aerosol and nonaerosol forms, with total estimated VOC emissions of 350 pounds per day, or about 0.17 tons per day in California. Although not shown, the sales-weighted average VOC content for the aerosol and nonaerosol Spot Remover (Dry Clean Only) product forms is about 25 and 40 percent by weight, respectively.

Product Use and Marketing:

Spot Remover (Dry Clean Only) products are used by commercial laundering or dry cleaning establishments, for cleaning localized spots, stains, and soiled areas on items which include, but are not limited to, articles of clothing labeled "dry clean only;" delicate fabrics, leather items such as jackets, belts, and purses; window coverings, and rugs.

Articles that can be laundered are cleaned in a dry cleaning or wet-cleaning machine after "pre-spotting" with the spot remover product. Pre-spotting involves the article being placed on the establishment's "spotting board," where the spotting chemical is applied to the stain or spot, the area may be agitated with a brush or spatula, then the article may be left to sit a few minutes before laundering in the dry cleaning machine or washing machine. The spotting chemical is not allowed to dry before the article goes into the machine for laundering.

If an article is unsuitable for laundering, such as a purse or belt, it would undergo the same procedure as an article that still has a spot or stain after the machine cleaning, called "post-spotting." Post-spotting is a procedure where the spotting chemical is applied to a spot or stain, agitated with a brush or spatula, then may be blotted dry, or rinsed with a solvent, water, or steam, if appropriate. The article is then air-dried. The spotting chemical or rinse is intended to evaporate after use without leaving a residue. The article does not then need to be re-cleaned after the post-spotting application (ARB, 2009e).

Spot Remover (Dry Clean Only) products are typically sold to dry cleaning establishments and professional laundering facilities through the products' manufacturers and their distributors. Marketing is done through catalogs, trade magazines, and on the Internet. Only a few products are intended for the household market.

Product Formulation:

Dry-side spotting agents are mainly formulated with nonaqueous solvents, meaning they have little or no water content. In the 2008 Survey Update, the most common reported ingredients include trichloroethylene, glycol ethers, amyl and butyl acetate, methyl isobutyl ketone, and VOC hydrocarbon solvents. A small amount of methylene chloride was reported. Some complying dry-side spotting agents contain LVP-VOC hydrocarbon solvents and LVP-VOC glycol ethers.

Wet-side spotting agents are generally water-based products containing ingredients such as glycol ethers, surfactants, enzymes, and various inorganic cleaning compounds. Ingredients vary depending on the types of spots and stains to be removed, although many products are formulated for general use to address several types of stains. A common VOC ingredient is ethylene glycol monobutyl ether which is used to treat many oil-based and water-based stains. LVP-VOC glycol ethers are also used (ARB 2009e).

Many complying products reported in this category were wet-side spotting agents. Technically these water-based products do not meet the definition of "Dry Cleaning Fluid." From this observation, we infer there has already been a shift in the market due to phase-out of perchloroethylene from dry cleaning operations, as required by the Airborne Toxic Control Measure for Emissions of Perchloroethylene from Dry Cleaning and Water-Repelling Operations (ARB, 2007b).

The aerosol products were consistent in formulation with the Spot Remover products that are currently regulated. The reported emissions from the aerosol products were negligible compared to the nonaerosol products (ARB, 2009e).

The reported nonaerosol products were generally liquids dispensed from a jar, can, tube, or squeeze-tube. Most low-VOC products were water-based, and formulations included LVP-VOC ingredients, such as surfactants and LVP-VOC glycol ethers, and inorganic ingredients. Some products were sold in concentrated liquid form. Specialized products also exist in this category. For example, products containing non-VOC inorganic acids or bases are used to remove rust and certain water-based stains (ARB, 2009e).

Proposed Limits and Compliance:

ARB staff is proposing to incorporate Spot Remover (Dry Clean Only) products into the currently regulated Spot Remover category. As such, aerosol and nonaerosol spotting products would need to comply with the 15 percent by weight and 3 percent by weight VOC limits, respectively. These VOC limits for Spot Remover products are to become effective December 31, 2010. To provide industry with the necessary time to reformulate the newly added products to meet the limits, we believe extending the effective date is appropriate; it would be difficult, from an enforcement perspective, to discern currently regulated products from those being newly added. Therefore, we are

proposing to extend the effective date for two years, until December 31, 2012. This proposal would result in delaying 573 pounds per day, or about 0.29 tons per day of VOC emission reductions until the end of 2012.

As shown in Table VII-20, using emissions adjusted to 2012, the proposed limits for the category will result in an estimated emission reduction of 340 pounds per day, or about 0.17 tons per day statewide.

Table VII-20
Spot Remover (Dry Clean Only) Proposal *

Product Form	Proposed VOC Limit (weight percent)	Number of Complying Products	Complying Market Share (percent)	2012 Emissions Reductions (pounds per day)
Aerosol **	15	< 5	< 5	< 3
Nonaerosol	3	16	46	340

* Based on 2008 Dry Clean Only Spot Remover Survey Update (ARB, 2009e).
** Data estimated to preserve confidentiality.

The staff report for the 2008 CONS-II amendments provides information on commercially and technologically feasible reformulation options for aerosol Spot Remover (Dry Clean Only) products to meet the 15 percent by weight VOC limit (ARB, 2008a). Non-VOC propellant options are available, which would allow reformulated products to contain up to 15 percent by weight VOC solvent such as ethylene glycol monobutyl ether. A combination of VOC hydrocarbon propellant with LVP-VOC solvents, inorganic ingredients, or exempt compounds is another viable alternative to reformulate dry-side spotting agents.

The proposed VOC limit for nonaerosol Spot Remover (Dry Clean Only) products would allow up to 3 percent by weight VOC ingredients such as ethylene glycol monobutyl ether. The balance would be primarily water along with LVP-VOC solvents, surfactants, enzymes, inorganic compounds, or other exempt compounds (ARB, 2009e). In its report on alternative spotting chemicals tested in dry cleaning establishments, the Institute for Research and Technical Assistance found several nonaerosol formulations that were effective and met the proposed 3 percent by weight VOC limit (IRTA, 2009).

Additionally, at the end of 2010, prohibitions on the use of the TACs methylene chloride, perchloroethylene, trichloroethylene were to become effective. The newly added spotting products would also be subject to these prohibitions. The proposal to extend the effective date to December 31, 2012, would apply to these provisions as well.

Proposal to Prohibit Use of Certain TAC Solvents:

"Spot Remover" products that are currently regulated are subject to a prohibition on use of methylene chloride, perchloroethylene, and trichloroethylene. We are proposing to prohibit the use of the chlorinated TAC solvents methylene chloride, perchloroethylene, and trichloroethylene in these newly added products. The prohibition of these three solvents is necessary, particularly for methylene chloride and perchloroethylene, because they are exempt VOCs and could be used in reformulated products without 'counting' toward VOC content. The provision would become effective on December 31, 2012. Staff's evaluation of the 2008 Survey Update data show formulation technologies that do not contain methylene chloride, perchloroethylene, or trichloroethylene are readily available, and are not needed to comply with the proposed standard. More information on this proposal is contained in Chapter IX, Environmental Impacts, section E.

Proposed GWP Limit:

A small amount of hydrochlorofluorocarbon-141b (HCFC-141b) was reported. However, we have since learned that products containing this compound are no longer sold in California. Other than HCFC-141b, no compounds with GWP values at or above 150 were reported in the 2008 Survey Update for this category. However, to ensure that use of compounds with higher GWP values does not begin as products reformulate to comply with the proposed VOC limits, we are proposing a GWP limit of 150 for any chemical compound used in Spot Remover (Dry Clean Only) products, effective December 31, 2012. While this proposal would allow use of the non-VOC propellant, HFC-152a, we believe other reformulation options are more likely. The proposed limit would not apply to any chemicals present as contaminants, which in aggregate are 0.1 percent by weight or less. This limit is proposed as a mitigation measure under CEQA (see Chapter IX, Environmental Impacts, section E). The proposed limit is contained in section 94509(n).

Issues:

1. **Issue:** Some dry cleaning establishments are using spotting chemicals that contain the solvent normal-propyl bromide (n-PB). The Bay Area Air Quality Management District banned this chemical from dry cleaning spotters in its jurisdiction, and ARB should do the same because of n-PB's potential reproductive and neurotoxic effects.

   Response: The chemical n-PB is a VOC. As such, ARB staff has determined that the VOC limits are sufficiently low such that use of n-PB, if any, will be negligible. Therefore, a prohibition is not needed.

K. Wasp or Hornet Insecticide (aerosol)

"Wasp or 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. The Wasp or Hornet Insecticide category does not include products that are used to repel these insects.

Aerosol Wasp or Hornet Insecticide products are currently subject to a 40 percent by weight VOC limit, which has been in effect since January 1, 2005. Wasp or Hornet Insecticide products were first regulated under the "Midterm-measures II" amendments approved in October 1999. A description of these products is included in the staff report for that rulemaking (ARB, 1999).

The 2006 Survey provides the basis for our determination that it is technologically and commercially feasible to further reduce VOCs from these products. Based on these data, staff is proposing to lower the VOC limit for aerosol Wasp or Hornet Insecticide products to 10 percent by weight. We are also proposing to change the category name from "Wasp and Hornet Insecticide" to "Wasp or Hornet Insecticide" and limit the use of compounds with higher GWP values.

Product Use and Marketing:

Table VII-21 summarizes the sales and emissions from aerosol Wasp or Hornet Insecticide products (ARB, 2007e). The data have been grown, by population, to 2010. As shown in Table VII-21, the 56 aerosol Wasp or Hornet Insecticide products reported have estimated category sales of 6,112 pounds per day in California.

Table VII-21 also shows the 2010 market-adjusted VOC emissions are 618 pounds per day, or about 0.31 tons per day in California. Although not shown, the sales-weighted average VOC content for this category is 10.1 percent by weight, excluding fragrance.

Table VII-21
Wasp or Hornet Insecticide

Product Form	Number of Products	2010 Category Sales (pounds per day)	2010 Market-Adjusted VOC Emissions (pounds per day)
Aerosol	56	6,112	618

Product Use and Marketing:

Aerosol Wasp or Hornet Insecticide products are used by household consumers and institutional consumers, such as utility or telecommunication company's workers. These products must enable the user to knockdown and kill the insects rapidly to avoid attack.

Most products dispense the insecticide in a liquid jet stream while a few produce a foam which blankets the insect or nest.

Wasp or Hornet Insecticide products can be purchased through supermarkets, drug stores, discount stores, mass merchandisers, hardware stores, garden and landscape supply stores, warehouse stores, and home centers. Consumers may also purchase products through catalog sales and the Internet.

Wasp or Hornet Insecticide products sold within California must be registered with California's DPR in addition to being FIFRA registered. These registrations are designed to thoroughly evaluate the insecticide product to ensure it meets both federal and State requirements to protect public health and the environment. As part of the registration process, the efficacy data are reviewed to validate the spectrum of activity. The Consumer Products Regulation allows FIFRA registered products an additional year for compliance to allow the necessary time to complete the registration.

Control of wasps or hornets is sometimes difficult because if they are not killed quickly they may become agitated and attack the user. The object is to kill all of the wasps or hornets in the nest quickly and completely. The ingredients in aerosol Wasp or Hornet Insecticide products are similar to crawling bug insecticides. However, aerosol Wasp or Hornet Insecticide products have unique propellant and aerosol hardware systems to produce a jet-type spray that reaches from ten to over twenty feet. This allows the user to spray the insecticide into inaccessible nests located in areas such as rooftops or trees. Products available can deliver the insecticides with a 22 foot foam blast. This allows users to stand back and "lock" the wasps or hornets inside their nest with a blanket of foam. It is recommended that users wear protective clothing and attempt to eradicate wasps or hornets in early morning or late afternoon/evening when the insects are at rest (ARB, 1997b; CSPA, 2010a; Claire, 2010).

Product Formulation:

Pesticide products contain both "active" and "inert" ingredients. The terms "active ingredient" and "inert ingredient" have been defined by FIFRA since 1947. The U.S. EPA defines an active ingredient as one that prevents, destroys, repels or mitigates a pest, or is a plant regulator, defoliant, desiccant or nitrogen stabilizer. By law, the name and percentage of the active ingredient must be identified and displayed on the product label.

An inert ingredient is defined by U.S. EPA as any substance (or group of structurally similar substances if designated by U.S. EPA), other than an active ingredient, which is intentionally included in a pesticide product. Inert ingredients play a key role in the effectiveness of a pesticide product. For example, inert ingredients may serve as a solvent, allowing the pesticide's active ingredient to be delivered to the target pest. In some instances, inert ingredients are added to extend the pesticide product's shelf-life or to protect the pesticide from degradation due to exposure to sunlight. Pesticide products can contain more than one inert ingredient, but federal law does not require

that these ingredients be identified by name or percentage on the label. Only the total percentage of inert ingredients is required to be on the pesticide product label (U.S. EPA, 2003b; U.S. EPA, 2010a).

In this rulemaking, our proposal does not directly affect the active ingredients to be used. The proposal is intended to only affect the use of inert ingredients that are VOCs and compounds with higher GWP values in Wasp or Hornet Insecticide products.

Active Ingredients:

As shown on product labels, the active ingredients make up only a small portion of Wasp or Hornet Insecticide product formulations. Typically about 1 percent by weight of active ingredients is used. Based on data from the 2006 Survey, the active ingredients found in Wasp or Hornet Insecticide products are pyrethroids and the synergists piperonyl butoxide, and N-octyl bicycloheptene dicarboxmide (MGK-264). According to U.S. EPA, the synergists have no pesticidal effects of their own but enhance the effectiveness of pyrethrins and pyrethroids (U.S. EPA, 2010b).

Inert Ingredients:

The bulk of the Wasp or Hornet Insecticide product formulation consists of the inert ingredients, such as propellants, solvents, and co-solvents. The propellants are typically hydrocarbon blends or compressed gases such as carbon dioxide (CO_2). Solvents and co-solvents include VOC and LVP-VOC petroleum distillates, water, emulsifiers, surfactants, or corrosion inhibitors (ARB, 2007e; ARB, 1997b; AgrEvo, 2010).

Emulsifiers, surfactants, and corrosion inhibitors are typically present in small amounts in the product formulation. Some inert ingredients are used to solubilize the actives, and aid the mixing of actives to create a homogeneous liquid that can be sprayed. Solvents and co-solvents may be used to increase the vapor pressure in a product, and, along with the aerosol container, valve, and nozzle, to control spray pattern.

The most frequently used inert ingredients reported in the 2006 Survey include water, mineral spirits, propane, propylene glycol n-butyl ether, n-butane, petroleum distillates and synthetic paraffinic hydrocarbons. LVP-VOC glycols, such as dipropylene glycol and propylene glycol, were also reported in the 2006 Survey for some of the Wasp or Hornet Insecticides products. The majority of the products did not report the use of fragrance mixtures.

Propellants:

Propellant blends used vary depending on the formulation. According to the 2006 Survey, propellant content in Wasp or Hornet Insecticide products ranged from 1 percent to about 10 percent of product weight. The propellants used include hydrocarbon blends of n-butane, iso-butane, and propane. Over 70 percent of the

product formulations reported the use of CO_2. No VOC exempt propellants were reported.

Proposed VOC Limit and Compliance:

The proposed VOC limit for aerosol Wasp or Hornet Insecticide products is 10 percent by weight, effective December 31, 2013. As shown in Table VII-22, the proposed 10 percent by weight VOC would result in emission reductions of 286 pounds per day, or about 0.14 tons per day, statewide in 2014. The emission reduction is estimated for 2014 because products requiring FIFRA registration are given an extra year, as specified in section 94509(d), from the proposed effective date to comply. This reduction, although important to overall air quality, will not occur within the timeframe to be credited toward the current SIP commitment.

Table VII-22
Wasp or Hornet Insecticide Proposal

Product Form	**Proposed VOC Limit** (weight percent)	**Number of Complying Products**	**Complying Market Share** (percent)	**2014 Emissions Reductions** (pounds per day)
Aerosol	10	38	60	286

As shown in Table VII-22, 38 products reflecting 60 percent of the market for aerosol Wasp or Hornet Insecticide products already comply with the proposed 10 percent by weight VOC limit. This indicates that further reductions can be achieved from this category and that the proposed VOC limit is both technologically and commercially feasible.

Compliance with the proposed 10 percent by weight VOC limit is expected to be accomplished by reformulating products with up to 10 percent VOC solvent or VOC propellant along with VOC and LVP-VOC solvent mixtures, water, or non-VOC propellant. These technologies are currently available and widely accepted in both the household and institutional markets as shown by the 2006 Survey. In addition, the 2006 Survey indicates that companies will be able to maintain their dielectric strength and knockdown capabilities using an LVP-VOC only solvent system.

Proposed GWP Limit:

No solvents or propellants with high GWP values were reported in the Wasp or Hornet Insecticide category surveyed in 2006. However, to ensure that use of compounds with higher GWP values does not begin as products reformulate to comply with the proposed 10 percent by weight VOC limit, we are proposing a GWP limit of 150 for any chemical compound used in aerosol Wasp or Hornet Insecticide products, effective December 31, 2013. While this proposal would allow use of the non-VOC propellant, HFC-152a, we believe other reformulation options are more likely. The proposed limit would not apply to any chemicals present as contaminants, which in aggregate are

0.1 percent by weight or less. This limit is proposed as a mitigation measure under CEQA (see Chapter IX, Environmental Impacts, section E). The proposed limit is contained in section 94509(n).

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Chapter VIII. Economic Impacts

This chapter provides our analysis of the estimated economic and fiscal impacts of the proposed amendments. The analysis focuses on costs to comply with the proposed volatile organic compound (VOC) limits. We expect the other proposals such as mitigation measures to prohibit use of certain toxic air contaminants, limit the use of greenhouse gases with high global warming potential values, and preclude use of alkylphenol surfactants to result in negligible or no costs. Proposed amendments to Test Method 310 will have no economic or fiscal impact. Businesses that manufacture products with VOC contents above the proposed VOC limits would incur costs to reformulate their products. Potential fiscal impacts would be costs incurred by State agencies to administer, enforce, or comply with the proposal.

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

The summary of economic and fiscal impacts of the proposed VOC limits is presented in section A. The other sections provide the step-by-step details of how we determined the compliance costs and potential impacts. Section F contains information on alternative means of compliance.

This economic impacts analysis was conducted in accordance with the current legal requirements under the Administrative Procedure Act (APA). This analysis uses similar methodologies and assumptions as were used in the 2009 consumer products rulemaking (ARB, 2009c).

A. Summary of Economic Impacts

Staff has estimated that the overall cost to comply with the proposed VOC limits is about $5 million per year for ten years (just under $50 million in total). This amount includes both recurring (*e.g.*, raw materials) and nonrecurring (*e.g.*, research and development) costs and is estimated based on assumptions specific to each category.

The cost represents the average of low and high cost estimates and is staff's prediction of the costs businesses would most likely incur.

Another measure of the economic impacts of the proposal is to determine the "dollars to be spent per pound of VOC reduced," or cost-effectiveness (CE). The CE of the proposed amendments has been calculated to be about $0.98 per pound of VOC reduced. This is based on expected emission reductions of about 6.9 tons per day. The CE of other recent consumer products rulemakings has ranged from about $0.30 to about $6.25. Based on this range, staff believes the proposed amendments are cost effective.

The impacts of the proposed amendments on manufacturers are estimated by determining the "return on owner's equity" (ROE). In the ROE analysis we compare a company's percentage reduction in profitability before and after incurring the costs associated with the proposed amendments. The analysis found that the overall reduction in profitability ranges from about 1 percent to about 3 percent. The overall average decline in ROE is about 1.6 percent. To the extent that the projected costs are passed on to consumers, the impact on business profitability is likely to be much less than estimated in our projection.

Because we expect some businesses will pass on at least a portion of their compliance costs to the consumer, we estimated the increased cost the consumer may experience. If all assumed compliance costs are passed on to the consumer, without consideration of typical retail mark-up, we estimate the cost per unit increase would range from negligible cost (net savings or no cost) for a nonaerosol General Purpose Cleaner product to about $0.44 for a Heavy-duty Hand Cleaner or Soap product. When considering normal retail mark-up of 100 percent, increased cost to the consumer to purchase a Heavy-duty Hand Cleaner or Soap product would increase by about $0.90 per gallon.

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

We determined that there would be no significant adverse fiscal impacts to any local or State agencies. While not significant, ARB will have costs in the future to enforce the new limits proposed here.

Staff believes that the regulation cost and CE determination methodologies are conservative. For example, the average cost scenario of low and high determines the overall cost and CE of the regulation. The low cost scenario assumes that companies would choose the lowest cost reformulation pathway, making minor adjustments to a

product's formulation, or simply ceasing sale of some noncomplying products. We believe that most manufacturers would choose the lowest cost reformulation option. For the high cost scenario, it is assumed that there is significant research and development, and new equipment is needed to reformulate the product. We believe that few manufacturers would need to take the high cost reformulation approach.

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

B. Costs of Compliance

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

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

1. Recurring Costs

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

a. Methodology

Using the data from the 2006 Survey and the 2008 Survey Update staff determined the formulations which most closely reflect the "typical" formulations for compliant and noncompliant products in each category. For each category staff estimated a "low cost" and "high cost" by varying costs for ingredients. Information on how raw material costs were estimated, as well as formulations evaluated (with individual weight fractions and unit prices per pound), are shown in Appendix D. While these formulations may not reflect the exact composition of existing noncompliant products and compliant products

that will be marketed, we believe they are reasonably representative for the purposes of this analysis.

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

b. Results

The estimated cost of typical noncompliant and compliant formulations for each category is displayed in Table VIII-1a. The values in columns A and B are taken from Appendix D. The difference between high and low cost of noncompliant and compliant formulations yields the change in ingredient costs. As shown in Table VIII-1a, Columns C_1 and C_2, the anticipated raw materials cost change ranges from no cost (net savings or no cost) for a 23 ounce General Purpose Degreaser (nonaerosol) product to about $0.64 increase per unit for a 133 ounce Heavy-duty Hand Cleaner or Soap. In instances when the cost for raw materials in the predicted reformulated product are comparable or slightly cheaper to those currently used, rather than assigning a negative cost, we assume there will be no change in the cost of raw materials.

Using the change in the cost per unit from Table VIII-1a, the total recurring costs per category are calculated as shown in Table VIII-1b. To arrive at the total cost per category, estimated noncompliant unit sales (Column D) are multiplied by the recurring costs per unit taken from Table VIII-1a, Columns C_1 and C_2. As shown in Table VIII-1b, Column E_3 the average total recurring cost per category ranges from no cost for several categories to about $346,900 for the Heavy-duty Hand Cleaner or Soap products reformulated to comply with the 1 percent VOC limit.

2. Nonrecurring Costs

In this portion of the analysis, we evaluated the impacts of nonrecurring costs likely to be expended to comply with the proposed limits. These are assumed to be costs incurred once to conduct the necessary research and development to produce a complying product. Technical literature and industry trade journals provide little information to estimate nonrecurring costs directly. This is not surprising because the

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

Category	Formula Cost per Unit				Cost Increase to Comply per Unit	
	Noncomplying		Complying			
	Low	High	Low	High	Low	High
	A_1	A_2	B_1	B_2	$C_1 = B_1 - A_1$	$C_2 = B_2 - A_2$
Furniture Maintenance Product (aerosol)	$0.31	$0.57	$0.35	$0.60	$0.04+	$0.04+
General Purpose Cleaner (nonaerosol)	$0.19	$0.25	$0.13	$0.17	$0.00	$0.00
General Purpose Degreaser (nonaerosol)	$0.34	$0.50	$0.22	$0.39	$0.00	$0.00
Glass Cleaner (nonaerosol)	$0.07	$0.10	$0.06	$0.08	$0.00	$0.00
Heavy-duty Hand Cleaner or Soap	$4.76	$8.30	$4.99	$8.93	$0.23	$0.64
Insecticide – Flying Bug (aerosol)	$0.44	$0.71	$0.36	$0.57	$0.00	$0.00
Insecticide – Wasp or Hornet (aerosol)	$0.69	$0.86	$0.80	$0.93	$0.11	$0.07
Lubricant – Special Purpose (aerosol)	$0.52	$0.72	$0.51	$0.71	$0.00	$0.00
Lubricant – Special Purpose (nonaerosol)	$0.63	$0.82	$0.65	$0.85	$0.02	$0.03
Oven or Grill Cleaner (aerosol)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Oven or Grill Cleaner (nonaerosol)	$3.65	$4.26	$2.07	$3.67	$0.00	$0.00
Spot Remover – Dry Clean Only (aerosol)	$0.93	$1.36	$0.79	$1.14	$0.00	$0.00
Spot Remover – Dry Clean Only (nonaerosol)	$1.44	$1.81	$1.35	$1.78	$0.00	$0.00
Metal Polish or Cleanser (aerosol)	$0.96	$1.14	$0.32	$0.40	$0.00	$0.00
Metal Polish or Cleanser (nonaerosol)	$1.07	$1.25	$0.41	$0.46	$0.00	$0.00

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

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

consumer products industry is competitive, and production cost data specific to a company are closely guarded trade secrets. Stakeholders have generally concurred that our assumptions for nonrecurring costs are reasonable. Appendix E displays the various phases of product development and the costs that are assigned to each phase.

Table VIII-1b
Total Estimated Recurring Cost

Category	Annual California Noncomplying Unit Sales*	Total Annual Recurring Cost per Category+		
		LOW	HIGH	AVERAGE
	D	E_1 = D X C_1**	E_2 = D X C_2**	E_3 = (E_1+E_2)/2
Furniture Maintenance Product (aerosol)	5,205,245	$218,236	$185,053	$201,645
General Purpose Cleaner (nonaerosol)	47,023,377	$0.00	$0.00	$0.00
General Purpose Degreaser (nonaerosol)	2,114,007	$0.00	$0.00	$0.00
Glass Cleaner (nonaerosol)	23,775,680	$0.00	$0.00	$0.00
Heavy-duty Hand Cleaner or Soap (nonaerosol)	802,431	$181,710	$512,122	$346,916
Insecticide – Flying Bug (aerosol)	1,022,141	$0.00	$0.00	$0.00
Insecticide – Wasp or Hornet (aerosol)	1,024,272	$110,237	$67,218	$88,728
Lubricant – Special Purpose (aerosol)	314,820	$0.00	$0.00	$0.00
Lubricant – Special Purpose (nonaerosol)	310,193	$4,715	$10,258	$7,487
Oven or Grill Cleaner (aerosol)	68,952	$0.00	$0.00	$0.00
Oven or Grill Cleaner (nonaerosol)	12,406	$0.00	$0.00	$0.00
Spot Remover – Dry Clean Only (aerosol)	***	$0.00	$0.00	$0.00
Spot Remover – Dry Clean Only (nonaerosol)	159,754	$0.00	$0.00	$0.00
Metal Polish or Cleanser (aerosol)	443,930	$0.00	$0.00	$0.00
Metal Polish or Cleanser (nonaerosol)	422,410	$0.00	$0.00	$0.00

* Assumes "typical" unit size as shown in Appendix D.
** C_1 and C_2 are from Table VIII-1a
+ Numbers have been rounded in tables, however unrounded numbers are used for calculations.
*** Data are confidential.

a. Methodology

To estimate nonrecurring costs, we used two approaches for each product category, one for low cost, and one for high cost, with a different set of assumptions for each approach. The categories proposed for regulation are considered "household care" or "pesticide and disinfectant" products.

Appendix E displays the various high and low nonrecurring costs for each of these sectors. For each category only new or additional costs were considered. Costs were not considered that would have been expected in the normal course of business if the regulation had not been in effect.

b. Results

Table VIII-2, Columns A_1 and A_2, display the results of our assessment of the nonrecurring costs to be incurred for each category. These costs are taken from Appendix E. Estimated nonrecurring costs for the low cost scenario range from about $300 to $11,600 per category. Note also that nonrecurring costs for the high cost scenario range from about $4,900 to $160,250 per category.

c. Amortizing Nonrecurring Costs

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

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

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

Where:

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

We assumed a project horizon of ten years, a commonly cited period for an investment's useful lifetime in the chemical processing industry. We also assumed a

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

Category	Cost Per Product Low	Cost Per Product High	Amortized Cost Per Product Low	Amortized Cost Per Product High
	A_1	A_2	$B_1 = A_1$ X CRF*	$B_2 = A_2$ X CRF*
Furniture Maintenance Product (aerosol)	$11,638	$43,570	$1,894	$7,091
General Purpose Cleaner (nonaerosol)	$7,311	$38,795	$1,190	$6,314
General Purpose Degreaser (nonaerosol)	$7,311	$28,350	$1,190	$4,614
Glass Cleaner (nonaerosol)	$1,641	$9,400	$267	$1,530
Heavy-duty Hand Cleaner or Soap (nonaerosol)	$448	$5,968	$73	$971
Insecticide – Flying Bug (aerosol)	$1,641	$56,402	$267	$9,179
Insecticide – Wasp or Hornet (aerosol)	$298	$140,855	$48	$22,924
Lubricant – Special Purpose (aerosol)	$597	$26,858	$97	$4,371
Lubricant – Special Purpose (nonaerosol)	$6,118	$27,902	$996	$4,541
Oven or Grill Cleaner (aerosol)	$5,670	$19,696	$923	$3,205
Oven or Grill Cleaner (nonaerosol)	$5,670	$19,696	$923	$3,205
Spot Remover – Dry Clean Only (aerosol)	$3,432	$160,253	$559	$26,080
Spot Remover – Dry Clean Only (nonaerosol)	$1,940	$119,369	$316	$19,427
Metal Polish or Cleanser (aerosol)	$746	$4,924	$121	$801
Metal Polish or Cleanser (nonaerosol)	$746	$4,924	$121	$801

*CRF = Capital Recovery Factor of 0.16275

fixed interest rate of 10 percent throughout the project horizon. These assumptions are conservative and constitute standard practice in analyses of consumer products regulations, including previous consumer product rulemakings. Based on these assumptions, the Capital Recovery Factor (CRF), as shown below, is 0.16275.

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

Using the low cost estimate for Furniture Maintenance Product (aerosol) from Table VIII-2, Column A_1, then the amortized cost is:

Amortized Cost: $11,638 X 0.16275 = $1,894

For the low cost scenario, as shown in Column B_1, of Table VIII-2, we project per-product annualized nonrecurring costs to be about $50 to $1,900 for each of ten years. For the high cost scenario (Column B_2), we project per-product annualized nonrecurring costs to range from about $800 to $26,000 for each of ten years.

Next, nonrecurring costs for all noncomplying products per category are calculated by using the low and high amortized costs from Table VIII-2, Columns B_1 and B_2. To arrive at the range of total nonrecurring cost per category, two different scenarios are calculated. In the low cost scenario, we assume that manufacturers will conduct research and other product development once for a given product category, and use these efforts as a basis to reformulate all their other noncomplying products in the same category. As shown in Table VIII-3, the low cost incurred by all businesses is the product of the low product cost (Column C) and number of companies (Column B) that have noncomplying products within the given category.

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

As shown in Table VIII-3, total category annualized nonrecurring costs for the low cost scenario range from about $560 for a Spot Remover (Dry Clean Only) (aerosol) product to $161,800 for a General Purpose Cleaner (nonaerosol) product. For the high cost scenario, costs range from $9,600 for an Oven or Grill Cleaner (aerosol) product to $3,775,600 for a General Purpose Cleaner (nonaerosol) product. The high cost scenario for a General Purpose Cleaner (nonaerosol) product is overestimated. This is because to calculate this cost we assumed that all General Purpose Cleaner (nonaerosol) products would incur the costs for the registration required by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In reality only about 5 percent of products are currently registered as FIFRA products. Therefore, this cost estimate is conservative. Also as shown in Table VIII-3, the total nonrecurring cost to industry is projected to range from about $389,200 to just over $8,217,300 dollars per year for ten years.

3. Total Costs

For each category, the total cost of reformulation is estimated by summing recurring costs (see Table VIII-1b, Columns E_1 and E_2) with nonrecurring amortized costs (see Table VIII-3, Columns E_1 and E_2). Table VIII-4 displays the total low and high cost to

Table VIII-3
Estimated Total Nonrecurring Cost per Category

Category	# Non-complying Products*	# Companies	Low Cost/ Product	High Cost/ Product	Total Nonrecurring Cost per Category Low	High
	A	B	C	D	E_1 = B X C	E_2 = D X A
Furniture Maintenance Product (aerosol)	56	30	$1,894	$7,091	$56,821	$397,086
General Purpose Cleaner (nonaerosol)	598	136	$1,190	$6,314	$161,817	$3,775,597
General Purpose Degreaser (nonaerosol)	257	82	$1,190	$4,614	$97,566	$1,185,755
Glass Cleaner (nonaerosol)	148	80	$267	$1,530	$21,365	$226,411
Heavy-duty Hand Cleaner or Soap (nonaerosol)	161	51	$73	$971	$3,718	$156,374
Insecticide – Flying Bug (aerosol)	37	23	$267	$9,179	$6,142	$339,629
Insecticide – Wasp or Hornet (aerosol)	20	14	$48	$22,924	$679	$458,470
Lubricant – Special Purpose (aerosol)	118	43	$97	$4,371	$4,178	$515,780
Lubricant – Special Purpose (nonaerosol)	66	18	$996	$4,541	$17,922	$299,701
Oven or Grill Cleaner (aerosol)	3	3	$923	$3,205	$2,768	$9,616
Oven or Grill Cleaner (nonaerosol)	9	5	$923	$3,205	$4,614	$28,849
Spot Remover – Dry Clean Only (aerosol)	1	1	$559	$26,080	$559	$26,080
Spot Remover – Dry Clean Only (nonaerosol)	36	5	$316	$19,427	$1,579	$699,363
Metal Polish or Cleanser (aerosol)	59	37	$121	$801	$4,492	$47,280
Metal Polish or Cleanser (nonaerosol)	64	41	$121	$801	$4,978	$51,287
Total:	1,633				$389,198	$8,217,278

* Adjusted for market covered in survey. Assume 90% market coverage for all categories.

reformulate all noncomplying products for each category. As shown in Table VIII-4, Column C_1, we estimate the low per year industry compliance costs to range from a low of about $560 for Spot Remover (Dry Clean Only) (aerosol) products, to a high of about $275,000 for a Furniture Maintenance Product (aerosol) product. We estimate the high per year industry compliance costs to range from a low of about $9,600 for Oven or Grill Cleaner (aerosol) products, to a high of about $3,775,600 for General Purpose Cleaner (nonaerosol) products. Again, this cost for General Purpose Cleaner (nonaerosol) products is conservative based on the assumption that all products would incur the costs of FIFRA registration. Table VIII-4 (Column C_3) also shows the average cost estimates to range from about $6,200 for Oven or Grill Cleaner (aerosol) products to $1,968,700 for General Purpose Cleaner (nonaerosol) products (Column C_2). As shown in Column C_3, the overall average cost to reformulate all noncomplying products for all categories is just under $5 million.

4. Cost per Unit

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

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

Therefore, we assume that the costs of compliance will not be assessed only to products sold in California, but will be spread over products sold across the country. To do this, our analysis used the California-apportioned (by population) high and low nonrecurring costs (Table VIII-3). Using this alternative approach, we discounted the nonrecurring cost per unit by the California-apportionment factor (*i.e.*, the current ratio of California to U.S. population, or 12.0 percent (U.S. Census, 2010)). To illustrate, using the total nonrecurring high cost for Special Purpose Lubricant (nonaerosol) products of $299,701 the nonrecurring portion of cost that would be passed onto California consumers is 12 percent of this amount, or about $36,000. The California portion of low and high nonrecurring costs (Table VIII-3, Columns E_1 and E_2) are each divided by the number of noncomplying units sold in California per year (see column A of Table VIII-5b). The resulting nonrecurring high and low cost per unit is then added to the recurring high and low cost per unit (taken from Table VIII-1a, Columns C_1 and C_2) to arrive at the total increase in cost per unit to the consumer.

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

	Nonrecurring Costs		Recurring Costs*	
	Low	High	Low	High
	A_1	A_2	B_1	B_2
Furniture Maintenance Product (aerosol)	$56,821	$397,086	$218,236	$185,053
General Purpose Cleaner (nonaerosol)	$161,817	$3,775,597	$0.00	$0.00
General Purpose Degreaser (nonaerosol)	$97,566	$1,185,755	$0.00	$0.00
Glass Cleaner (nonaerosol)	$21,365	$226,411	$0.00	$0.00
Heavy-duty Hand Cleaner or Soap	$3,718	$156,374	$181,710	$512,122
Insecticide – Flying Bug (aerosol)	$6,142	$339,629	$0.00	$0.00
Insecticide – Wasp or Hornet (aerosol)	$679	$458,470	$110,237	$67,218
Lubricant – Special Purpose (aerosol)	$4,178	$515,780	$0.00	$0.00
Lubricant – Special Purpose (nonaerosol)	$17,922	$299,701	$4,715	$10,258
Oven or Grill Cleaner (aerosol)	$2,768	$9,616	$0.00	$0.00
Oven or Grill Cleaner (nonaerosol)	$4,614	$28,849	$0.00	$0.00
Spot Remover – Dry Clean Only (aerosol)	$559	$26,080	$0.00	$0.00
Spot Remover – Dry Clean Only (nonaerosol)	$1,579	$699,363	$0.00	$0.00
Metal Polish or Cleanser (aerosol)	$4,492	$47,280	$0.00	$0.00
Metal Polish or Cleanser (nonaerosol)	$4,978	$51,287	$0.00	$0.00

	Nonrecurring and Recurring Costs+		
	Low	High	Average
	$C_1 = A_1 + B_1$	$C_2 = A_2 + B_2$	$C_3 = (C_1 + C_2)/2$
Furniture Maintenance Product (aerosol)	$275,057	$582,139	$428,598
General Purpose Cleaner (nonaerosol)	$161,817	$3,775,597	$1,968,707
General Purpose Degreaser (nonaerosol)	$97,566	$1,185,755	$641,660
Glass Cleaner (nonaerosol)	$21,365	$226,411	$123,888
Heavy-duty Hand Cleaner or Soap (nonaerosol)	$185,428	$668,496	$426,962
Insecticide – Flying Bug (aerosol)	$6,142	$339,629	$172,886
Insecticide – Wasp or Hornet (aerosol)	$110,916	$525,688	$318,302
Lubricant – Special Purpose (aerosol)	$4,178	$515,780	$259,979
Lubricant – Special Purpose (nonaerosol)	$22,637	$309,959	$166,298
Oven or Grill Cleaner (aerosol)	$2,768	$9,616	$6,192
Oven or Grill Cleaner (nonaerosol)	$4,614	$28,849	$16,731
Spot Remover – Dry Clean Only (aerosol)	$559	$26,080	$13,319
Spot Remover – Dry Clean Only (nonaerosol)	$1,579	$699,363	$350,471
Metal Polish or Cleanser (aerosol)	$4,492	$47,280	$25,886
Metal Polish or Cleanser (nonaerosol)	$4,978	$51,287	$28,132
TOTAL:	$904,097	$8,991,929	$4,948,013

* A cost of $0 may indicate a per unit cost of less than one-half of one cent.
+ Numbers have been rounded in tables, however unrounded numbers are used for calculations.

Table VIII-5a
Estimated Per-Unit Cost Increases from Annualized Nonrecurring and Annual Recurring Costs*

Category	Annual California Noncomplying Unit Sales	Annualized Nonrecurring Low Cost/Unit**+	Annualized Nonrecurring High Cost/Unit	Annual Recurring Low Cost/Unit[z]	Annual Recurring High Cost/Unit[z]
	A	B_1	B_2	C_1	C_2
Furniture Maintenance Product (aerosol)	5,205,245	$0.00	$0.01	$0.04	$0.04
General Purpose Cleaner (nonaerosol)	47,023,377	$0.00	$0.01	$0.00	$0.00
General Purpose Degreaser (nonaerosol)	2,114,007	$0.01	$0.07	$0.00	$0.00
Glass Cleaner (nonaerosol)	23,775,680	$0.00	$0.00	$0.00	$0.00
Heavy-duty Hand Cleaner or Soap (nonaerosol)	802,431	$0.00	$0.02	$0.23	$0.64
Insecticide – Flying Bug (aerosol)	1,022,141	$0.00	$0.04	$0.00	$0.00
Insecticide – Wasp or Hornet (aerosol)	1,024,272	$0.00	$0.05	$0.11	$0.07
Lubricant – Special Purpose (aerosol)	314,820	$0.00	$0.20	$0.00	$0.00
Lubricant – Special Purpose (nonaerosol)	310,193	$0.01	$0.12	$0.02	$0.03
Oven or Grill Cleaner (aerosol)	68,952	$0.00	$0.02	$0.00	$0.00
Oven or Grill Cleaner (nonaerosol)	12,406	$0.04	$0.28	$0.00	$0.00
Spot Remover – Dry Clean Only (aerosol)	175,200	$0.00	$0.02	$0.00	$0.00
Spot Remover – Dry Clean Only (nonaerosol)	159,754	$0.00	$0.53	$0.00	$0.00
Metal Polish or Cleanser (aerosol)	443,930	$0.00	$0.01	$0.00	$0.00
Metal Polish or Cleanser (nonaerosol)	422,410	$0.00	$0.01	$0.00	$0.00

* Numbers have been rounded in tables, however unrounded numbers are used for calculations.
\+ A cost of $0 may indicate a per unit cost of less than one-half of one cent.
** Costs in Columns B_1 and B_2 arrived at by apportioning nonrecurring total costs from Table VIII-3, Columns E_1 and E_2, by the percentage of California population (12%).
z Costs are from Table VIII-1a, Columns C_1 and C_2.

Table VIII-5b
Sum of Estimated Per-Unit Cost Increases from Both Annualized Nonrecurring and Annual Recurring Costs

Category	Total Increase Low/Unit*+	Total Increase High/Unit	Total Increase Mid/Unit
	D_1	D_2	D_3
Furniture Maintenance Product (aerosol)	$0.04	$0.04	$0.04
General Purpose Cleaner (nonaerosol)	$0.00	$0.01	$0.01
General Purpose Degreaser (nonaerosol)	$0.01	$0.07	$0.04
Glass Cleaner (nonaerosol)	$0.00	$0.00	$0.00
Heavy-duty Hand Cleaner or Soap (nonaerosol)	$0.23	$0.66	$0.44
Insecticide – Flying Bug (aerosol)	$0.00	$0.04	$0.02
Insecticide – Wasp or Hornet (aerosol)	$0.11	$0.12	$0.11
Lubricant – Special Purpose (aerosol)	$0.00	$0.20	$0.10
Lubricant – Special Purpose (nonaerosol)	$0.02	$0.15	$0.09
Oven or Grill Cleaner (aerosol)	$0.00	$0.02	$0.01
Oven or Grill Cleaner (nonaerosol)	$0.04	$0.28	$0.16
Spot Remover – Dry Clean Only (aerosol)	$0.00	$0.02	$0.01
Spot Remover – Dry Clean Only (nonaerosol)	$0.00	$0.53	$0.26
Metal Polish or Cleanser (aerosol)	$0.00	$0.01	$0.01
Metal Polish or Cleanser (nonaerosol)	$0.00	$0.01	$0.01

* A cost of $0 may indicate a per unit cost of less than one-half of one cent.
\+ Numbers have been rounded in tables, however unrounded numbers are used for calculations.

For most products the total cost of reformulating products is estimated to be quite minimal. The recurring raw materials costs to reformulate a number of products to meet the proposed VOC limits are projected to be zero. This is because the costs of ingredients of a complying product are actually less than the cost of ingredients of a noncomplying product. For the purposes of our cost calculations, in this case, as was done in economic analyses for previous rulemakings, we assume that the ingredient costs are zero. As for the nonrecurring costs (research and development), while these costs are significant, once the costs are spread over the number of units sold, the resulting overall cost per unit is negligible.

As shown in Table VIII-5b, we estimate the average cost per unit increase to the California consumer to range from no cost increase to about $0.44. The worst case scenario cost increase would be about $0.66 for Heavy-duty Hand Cleaner or Soap products. This cost does not reflect typical retail mark-up. 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.

5. Cost-effectiveness (CE)

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

The CE of a reduction strategy is generally defined as the ratio of total dollars to be spent to comply with the strategy (as an annual cost) to the mass reduction of the pollutant(s) to be achieved by complying with that strategy (in annual pounds). The CE is calculated as shown by the following general equation:

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

We estimate that, when fully effective, the proposed VOC limits will result in an emission reduction of about 6.9 tons per day, or 5,037,000 pounds per year. In this chapter, we have calculated that the average total annual cost to comply with the proposed VOC limits is $4,948,013.

The CE of the proposed amendments related to complying with the VOC limits is about $0.98 per pound of VOC reduced, as shown by the following equation:

$$\frac{\$4,948,013}{5,037,000} = \$0.98 \text{ per pound}$$

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

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

Regulation/Control Measure	Cost-Effectiveness (Dollars per Pound VOC Reduced)
2010 Amendments	$0.98
2009 Amendments (ARB, 2009c)	$0.29
2008 Amendments (ARB, 2008a)	$6.23
2006 Amendments (ARB, 2006a)	$2.35

As shown in Table VIII-6, the CE compares favorably with other recent rulemakings.

C. Return on Owners' Equity

Typical California businesses are affected by the proposed new limits to the extent that the implementation of these requirements would change their profitability. To estimate reduction in profitability, this portion of the economic impacts analysis compares the Return on Owners' Equity (ROE) for affected businesses before and after inclusion of the cost to comply with the proposed requirements. The data used in this analysis are obtained from Dun and Bradstreet Industry Norms and Key Business Ratio (D&B, 2008; D&B, 2009), the ARB's 2006 Consumer and Commercial Products Survey (ARB, 2007e), the Survey Update for Dry Clean Only Spot Remover products (ARB, 2009e), and the CE analysis described previously in section B.

1. Affected Businesses

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

The consumer products subject to the proposed measures are manufactured, marketed, or distributed by a large number of companies worldwide. According to our Surveys, there are about 244 companies that market the affected products in California. Many of these companies manufacture, market, and distribute a broad range of solvent, adhesive, household, and personal care products. All together, there are about 1,633 noncomplying products (based on reported figures). Of the companies manufacturing these products, 29 small-sized firms are located in California.

These 244 companies can be described by the North American Industry Classification System codes (NAICS): 325611, Soap and Other Detergent Manufacturing; 325612, Polish and Other Sanitation Goods manufacturing; 325320, Pesticides and Agricultural Chemicals; and 324191, Lubricant manufacturing.

2. Analysis Approach

This analysis covers 4 industries with at least 244 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 respondents to the surveys.
(2) A range of compliance costs were estimated for each affected product category. The average cost (see Table VIII-4) for each category was used in this analysis.

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

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

3. Assumptions

This analysis uses 2006-2008 Dun and Bradstreet financial data (D&B, 2009) for a nationwide typical businesses in the Polish and Other Sanitation Good Manufacturing industry (325612 NAICS code); Pesticides and Agricultural Chemicals (325320 NAICS code); and Lubricant manufacturing (324191 NAICS code). For Soap and Other Detergent Manufacturing (NAICS code 325611) 2005-2007 Dun and Bradstreet financial data (D&B, 2008) were used due to lack of 2008 data. These data were used to calculate the ROEs before and after the subtraction of the compliance costs for a typical business. The calculations were based on the following assumptions:

(1) A typical business on a nationwide basis in each industry is representative of a typical California business in that industry;
(2) All affected businesses were subject to federal and State tax rates of 35 percent and 9.3 percent respectively; and
(3) Affected businesses are neither able to increase the prices of their products, nor can they lower their costs of doing business through short-term cost-cutting measures.

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

4. Results

Table VIII-7 shows the results of our analysis of ROE. The percentage reduction in profitability ranges from less than 1 percent for Polish and Other Sanitation Good Manufacturing to less than 3 percent for Soap and Other Detergent Manufacturing. The mean percentage reduction in profitability is 1.6 percent.

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

NAICS	Industry	Percent Reduction in ROE
325611	Soap and Other Detergent Manufacturing	2.9
325612	Polish & Other Sanitation Good Manufacturing	0.8
325320	Pesticides and Agricultural Chemicals	1.6
324191	Lubricant Manufacturing	1.1
Average		**1.6**

Based on the estimated ROEs, we believe that overall, most affected businesses will be able to absorb the costs with no significant adverse impacts on their profitability. To the extent that at least some of the estimated costs are passed on to consumers, the impact on businesses' profitability will be less than estimated here. However, the proposed amendments may impose economic hardship on some businesses with very little or no margin of profitability.

D. Impacts on California Businesses, Consumers, and State and Local Agencies

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

1. Potential Impact on California Businesses

Our profitability analysis shows no significant change in the average profitability of affected businesses that manufacture the products subject to these proposed amendments. Our analysis assumes that the companies absorbed the entire costs of compliance. However, some individual companies may experience declines in profitability that are different than what we predict. In these instances we believe that these manufacturers will pass through at least a portion of their compliance costs to maintain profitability. To the extent that businesses are able to pass on the increased costs to consumers, the adverse impact of the proposed measures would be less than projected in this analysis. Furthermore, the projected impact will be less if businesses are able to improve their operational efficiency, thus reducing their costs.

Nevertheless, the proposed measures may impose economic hardship on some businesses with very little or no margin of profitability. These businesses, if hard pressed, can seek relief under the variance provision of the consumer products regulation for extensions to their compliance dates. Such extensions may provide

sufficient time to minimize the cost impacts to these businesses. Additional mitigation may be achieved by taking advantage of the compliance flexibility offered by the existing Innovative Product Provision (IPP) and the Alternative Control Plan (ACP) Regulation (see Section F of this chapter and section G of Chapter IX).

2. Potential Impact on Business Creation, Elimination or Expansion

The proposed amendments would have no noticeable impact on the status of California businesses. This is because most affected businesses are expected to be able to pass on the bulk of the reformulation cost to consumers in terms of higher prices for their products. Should the proposed measures impose significant hardship on California businesses, temporary relief in the form of a compliance date extension under the variance provision may be warranted.

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

3. Potential Impact on Business Competitiveness

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

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

4. Potential Impact on California Employment

The proposed amendments are not expected to cause a noticeable change in California employment and payroll. As shown in Table VIII-8, according to the U.S. Department of Commerce, California employment in the industries affected by the proposed amendments was about 3,574 in 2008, or about 6.0 percent of national employment in the affected industries. This represents less than 1 percent of manufacturing employment in California. Also, as shown in Table VIII-8, these employees generated about $188,488 million in payroll, or about 5.5 percent of national payroll in the affected industries. This also accounts for less than 1 percent of the total California manufacturing payroll in 2008.

Table VIII-8
California Employment and Payroll in Affected Industries

NAICS	Number of Employees		Payroll	
	California	California Share as Percent of U.S.	California (thousand dollars in 2008)	California Share as Percent of U.S.
325611	952	4.4	46,606	4.1
325612	1400	8.1	70,360	7.4
325320	647	5.7	35,741	5.0
324191	575	5.6	35,781	5.8
Total	3,574	5.9	188,488	5.5

Source: (County Business Patterns, 2008)

5. Impacts on California Consumers

The potential impact of the proposed amendments on consumers depends upon the ability of affected businesses to pass on the cost increases to consumers. However, 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.

Assuming the affected industry will pass on the entire compliance costs to consumers in terms of higher prices, we estimate the average price of a product (including typical retail mark-up) would be about $0.06. This value is different than reported earlier in the chapter. In the analysis here, we assume that a manufacturer will choose to spread the cost of compliance among all products they manufacture (not just those affected by this proposal).

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

6. Potential Impacts to California State or Local Agencies

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

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

We are aware that the California Prison Industry Authority (PIA) manufactures some products for which VOC limits are proposed. Based on their response to the 2006 Survey, the PIA manufactures nonaerosol "General Purpose Cleaner," "General Purpose Degreaser," and "Glass Cleaner" products. All of these reported products already comply with the proposed VOC limits for these categories. Therefore, we expect no impacts on the PIA.

ARB will have costs for enforcing the proposed amendments. It is estimated that beginning in fiscal year 2012-13 the Enforcement Division will require an additional 1.5 staff. The costs for these additional resources will need to be addressed in the future.

E. Other Possible Economic Impacts of Regulatory Changes

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

F. Mitigation of Potential Impacts Through Additional Regulatory Flexibility

If adopted by the Board, the proposed VOC limits will be incorporated in section 94509 of the Consumer Products Regulation (title 17, California Code of Regulations, sections 94507-94517). To complement the mandatory VOC limits, the existing consumer products program provides 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 manufacturers to sell products that have VOC contents greater than the applicable VOC limit, provided they demonstrate that such products actually emit less VOCs, on a per use basis, 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. Additional information on these provisions is contained in Chapter IX, section G.

Based on participation, it is reasonable to conclude that manufacturers are using these programs to provide consumers with products that meet their needs, while lowering costs, improving the "market value" of their products, or otherwise maintaining profit margins.

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

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

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

4. Air Resources Board. 2006 Consumer & Commercial Products Survey (Including Aerosol Coatings Products). July 24, 2007. (ARB, 2007e)

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Chapter IX. Environmental Impacts

In this rulemaking, ARB staff is proposing amendments to the Consumer Products Regulation that are designed to reduce volatile organic compound (VOC) emissions. Mitigation measures are also proposed to ensure that use of certain toxic air contaminants (TAC), greenhouse gas (GHG) compounds with higher global warming potential (GWP) values, and certain surfactants known to be toxic to aquatic species, are not used as products reformulate to meet the proposed VOC limits.

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. In making this determination, we evaluated how the proposed amendments would impact ground-level ozone concentrations, particulate matter (secondary organic aerosols), climate change, stratospheric ozone depletion, air toxic emissions, water quality, solid waste, and energy use.

Staff has conducted a qualitative health risk assessment that concludes that public health would be further protected by adoption of the proposed amendments. This finding is primarily related to the decrease in ground-level ozone concentrations that would result if the proposal were adopted. Staff has also determined that the public's exposure to TACs will be reduced by the proposed mitigation measure to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in several product categories.

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 these proposed amendments.

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 of the proposal, for ease of the reader the proposed amendments are summarized in Part B.

B. Summary of Proposed Amendments

Staff is proposing to establish lower VOC limits for 11 consumer product categories. These limits would reduce VOC emissions by about 6.9 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 State Implementation Plan (SIP) to meet the national ozone standard.

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

- Modifying several definitions and proposing two new definitions;
- Prohibiting use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics (other Spot Remover products are subject to an existing prohibition on use of these TACs).
- Prohibiting use of compounds with GWP values at or above 150 in Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Special-purpose Lubricant, Spot Remover, and Wasp or Hornet Insecticide products;
- Prohibiting use of alkylphenol ethoxylate surfactants in General Purpose Cleaner (nonaerosol), General Purpose Degreaser (nonaerosol), Glass Cleaner (nonaerosol), Heavy-duty Hand Cleaner or Soap (nonaerosol), and Oven or Grill Cleaner products.
- Consolidating and clarifying some existing regulatory provisions; and
- Modifying Test Method 310 by adding the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinners and Multi-purpose Solvent products.

C. Summary of Impacts on Atmospheric Processes

In this section, we evaluate the impacts on atmospheric processes. The evaluation includes our assessment of 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 (NO_x) in the presence of sunlight. The rate of ozone generation is related closely to the amount and reactivity of VOC emissions as well as the amount of NO_x emissions available in the atmosphere (Seinfeld and Pandis, 1998). It is one of the State's most persistent air quality problems. Research has shown that, when inhaled, ozone can cause respiratory problems, aggravate asthma, impair the immune system, and cause increased risk of premature death. Ozone also adversely affects vegetation throughout most of California. 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 6.9 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. The categories proposed for regulation and the corresponding VOC emission reductions are shown in Table IX-1.

b. Proposed Toxics Prohibition: In accordance with CEQA, we are proposing a mitigation measure to ensure that emissions of methylene chloride, perchloroethylene, and trichloroethylene are not used as products are reformulated. We are proposing to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics. The prohibition of these three solvents is necessary, particularly for methylene chloride and perchloroethylene, because they are exempt VOCs and could be used in reformulated products without 'counting' toward VOC content. However, the proposal to prohibit their use in these products could result in a slight increase in VOC emissions. This is because products containing these TACs may have to be reformulated using VOC solvents. Staff, therefore, evaluated the potential for VOC emission increases resulting from this proposal.

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

Product Category	Product Form	Proposed VOC Limit (weight percent)	2010 VOC Emissions* (tons per day)	Effective Date	VOC Reductions at Effective Date (tons per day)
Flying Bug Insecticide	Aerosol	20	0.65	12/31/2013	0.06
Furniture Maintenance Product	Aerosol	12	1.32	12/31/2013	0.36
General Purpose Cleaner	Nonaerosol	0.5	12.04	12/31/2012	3.73
General Purpose Degreaser	Nonaerosol	0.5	1.91	12/31/2012	1.17
Glass Cleaner	Nonaerosol	3	3.34	12/31/2012	0.41
Heavy-duty Hand Cleaner or Soap	Nonaerosol	1	0.79	12/31/2013	0.53
Metal Polish or Cleanser	Aerosol	15	0.22	12/31/2012	0.07
Metal Polish or Cleanser	Nonaerosol	3	0.20	12/31/2012	0.15
Oven or Grill Cleaner	Aerosol	8	0.08	12/31/2012	>0.0
Oven or Grill Cleaner	Nonaerosol	4	0.24	12/31/2012	-0.12
Special-purpose Lubricant	Aerosol	25	0.26	12/31/2012	0.10
Special-purpose Lubricant	Nonaerosol	3	0.18	12/31/2012	0.13
Spot Remover (Dry Clean Only)	Aerosol	15	>0.0	12/31/2012	>0.0
Spot Remover (Dry Clean Only)	Nonaerosol	3	0.17	12/31/2012	0.17
Wasp or Hornet Insecticide	Aerosol	10	0.31	12/31/2013	0.14
Total Emissions 2010	**21.7 tons per day**				
Total VOC Reductions Creditable Toward 2007 SIP	**6.7 tons per day**				
Total VOC Reductions Creditable Toward Future Commitment	**0.2 tons per day**				

* Survey emissions adjusted for market coverage and grown to the 2010 calendar year

The emissions of chlorinated solvents in these products totals about 0.1 tons per day. All but a small fraction of this total (< 1 percent) is emissions of trichloroethylene. Because this solvent is a VOC, as a matter of course, its use would essentially be

precluded by imposition of the VOC limits. Therefore, we have concluded that VOC emissions would not increase as a result of the proposed prohibitions. The proposed prohibition, then, would have no adverse impact on ground-level ozone concentrations. If there were to be a very small increase in VOC emissions we believe that preventing exposure to these TAC solvents outweighs the very small VOC emission increase that may occur.

c. Proposed Global Warming Potential Limits: In accordance with CEQA, we are proposing a global warming potential (GWP) limit of 150 for compounds used in Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Special-purpose Lubricant, Spot Remover, and Wasp or Hornet Insecticide products. Absent this provision, use of several compounds with GWP values at or above 150 could result in some small additional ozone reduction benefit if they were to be used in reformulations.

d. Proposed Prohibition on Use of Alkylphenol Ethoxylate Surfactants: We are proposing to prohibit the use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We do not expect this proposal to have an impact on ground level ozone concentrations. While this prohibition would eliminate one potential reformulation option, many other surfactants are suitable, and readily available, for use in these categories, making the use of alkylphenol ethoxylate surfactants unnecessary. These surfactants are considered low vapor pressure (LVP) VOC compounds and do not count toward a product's VOC content. Because of the many alternatives available, precluding the use of alkylphenol ethoxylate surfactants does not necessitate raising the proposed VOC limit.

e. Proposed New and Modified Definitions: We expect no impact on ground-level ozone concentrations resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits, but do not themselves impose any requirements that would impact ground level ozone concentrations.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These clarifications may result in an incremental improvement in compliance and therefore, could result in an additional ozone reduction benefit.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves are expected to have no impact on ground level ozone concentrations. However, the proposals would allow enforcement of requirements designed to reduce ozone concentrations.

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

Fine particulate matter (PM) is prevalent in the urban atmosphere (see, for example, Pandis *et al.,* 1992). 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). Similarly to ozone, PM can be formed via atmospheric oxidation of organic compounds (Finlayson-Pitts and Pitts, 2000). 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 a 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). More information on the health impacts of PM is found in Chapter IV of the report.

Although most organic compounds contribute to ozone formation, SOA is usually formed from photooxidation of VOCs 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. The analysis of the impact on SOA formation resulting from implementing the proposed VOC limits is detailed below.

In general terms, the potential to form SOA among common 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 about 6.9 tons per day of VOC ingredients with 6.9 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 surfactants; 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 that could 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.

If manufacturers were to reduce overall VOC content to comply with the proposed limits by reformulating with smaller amounts of stronger VOC 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. In the categories proposed for regulation we do not believe that aromatic compounds are a likely reformulation pathway. Therefore, we expect no increase in SOA due to use of aromatic compounds. However, substitution of LVP-VOC solvents for VOCs could result in a slight SOA increase (Chan *et al.*, 2009).

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. For example, one potential reformulation option for Heavy Duty Hand Cleaner or Soap products would be to substitute an LVP-VOC hydrocarbon solvent for terpenes such as d-limonene, a VOC. D-limonene can react with ozone to form a variety of secondary products including formaldehyde and SOA (Singer *et al.*, 2006). Potential use of this proposed reformulation option could result in lower SOA formation. We will continue to monitor implementation of the regulation and reassess the impacts as more data quantitative data on SOA formation potentials become available.

b. Proposed Toxics Prohibition: The proposal to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics should have no or negligible impacts on SOA formation. These compounds are not expected to be potent participants in SOA formation because they are small molecules and have only one or two carbon atoms. By precluding use of these solvents in current formulations and as a reformulation option, we would potentially relinquish some additional small reduction in the production of SOA. For example, if these TAC solvents, rather than LVP-VOC solvents were to be used, the SOA formation potential of reformulated products could be slightly lower. However, we believe that preventing the public's exposure to these TAC solvents, which are potential human carcinogens, outweighs the uncertain small potential for a reduction in SOA.

c. Proposed Global Warming Potential Limits: The proposed GWP limit of 150 for compounds used in the reformulation of Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Special-purpose Lubricant, Spot Remover, and Wasp or Hornet Insecticide products is expected to have negligible or no impact on PM or SOA formation. We do not believe that compounds with GWP values at or above

150 could be substituted in such a way to significantly change the amount of SOA formed from these categories.

d. Proposed Prohibition on Use of Alkylphenol Ethoxylate Surfactants: We are proposing to prohibit the use of octylphenol and nonylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We expect this proposal to have a neutral impact on SOA formation. Alkylphenol ethoxylate surfactants, as well as other surfactants that would be used in these categories, are considered LVP-VOC compounds and do not count toward a product's VOC content. It is also unlikely that these large molecules have an air fate. Therefore, regardless of which surfactant is selected, the impacts on SOA, if any, are likely similar.

e. Proposed New and Modified Definitions: We expect no impact on SOA formation resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits but do not themselves impose any requirements that would affect SOA formation.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These consolidations of existing requirements, and language clarifications do not result in any change to the environment. Therefore, we expect these amendments to have no impact on SOA formation.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves impose no requirements and should have no impact on SOA formation.

3. Impacts of Proposed Amendments on Climate Change

Climate change or global warming is the process whereby emissions of anthropogenic pollutants, together with other naturally-occurring gases, absorb infrared radiation in the atmosphere, leading to increases in the overall average global temperature.

Gases in the atmosphere can contribute to the greenhouse effect both directly and indirectly. Direct effects occur when the gas itself is a GHG. Indirect radiative forcing occurs when chemical transformations of the original gas produce other GHGs, when a gas influences the atmospheric lifetimes of methane, and/or when a gas affects atmospheric processes that alter the radiative balance of the earth (*e.g.*, affect cloud formation).

Compounds with direct effects include VOCs, carbon dioxide (CO_2), hydrofluorocarbons (HFCs), hydrofluoroethers (HFEs), and hydrochlorofluorocarbons (HCFCs). Even though VOCs have direct effects, they are considered GHGs primarily because of their role in creating ozone and in prolonging the life of methane in the atmosphere, although the effect varies depending on local air quality. More information on climate change can be found in Chapter IV of this report.

a. Proposed VOC Standards: As described above, VOCs are considered GHGs because of their role in ground-level ozone formation. However, because these amendments would reduce the total amount of VOCs, and thereby ground-level ozone concentrations, the proposed VOC limits should have an overall positive impact on climate change. However, two reformulation options may lead to very slight increases in GHG emissions. These are discussed below.

To meet the proposed VOC limits, CO_2, to a limited extent, could be used to replace hydrocarbon propellants in some consumer product categories. The survey data indicate that CO_2 is already used in certain consumer products proposed for regulation, including Special-purpose Lubricant and Wasp or Hornet Insecticide products. 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 impact 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. 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 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 the aerosol products may be to replace some or all the typical hydrocarbon propellants with HFC-152a or HFC-134a. These compounds are exempt VOCs, but are global warming compounds. HFC-152a and HFC-134a have global warming potentials of 140 and 1,300, respectively. Limited use of the moderately warming compound HFC-152a was reported in several categories proposed for regulation. No use of the higher warming HFC-134a was reported. Staff has proposed limits that are achievable without the use of either of these exempt propellants. Because of this, along with the substantially higher cost of these propellants, we do not expect emissions of HFC-152a to increase. As described later in section E of this chapter, to ensure that reformulating to meet the VOC limits does not result in an adverse impact on climate change we are proposing to preclude use of compounds with GWP values at or above 150. This proposed mitigation measure will ensure that there would be no additional impact on climate change from use of these global warming compounds.

b. Proposed Toxics Prohibition: The proposal to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics will likely have no or negligible

impacts on climate change. Even if VOCs or compounds with GWP values less than 150 were used to replace TACs in these products there would be a negligible increase in global warming compound emissions because the total amount of these TACs is less than 0.1 tons per day.

c. Proposed Global Warming Potential Limits: The proposed GWP limit of 150 for compounds used in Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Spot Remover, Special-purpose Lubricant, and Wasp or Hornet Insecticide products is designed to minimize the climate change impacts of the emissions from products in these categories. Therefore, we expect the proposal to have overall beneficial impacts on climate change by preventing use of compounds with higher GWP values.

d. Proposed Prohibition on Use of Ethoxylate Surfactants: We are proposing to prohibit the use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We do not expect this proposal to have an impact on climate change because the compounds that would be used in place of the alkylphenol ethoxylate surfactants are not global warming compounds.

e. Proposed New and Modified Definitions: We expect no impact on climate change resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits but do not themselves impose any requirements that would affect climate change.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These consolidations of existing requirements, and language clarifications do not result in any change to the environment. Therefore we expect these amendments to have no impact on climate change.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves impose no requirements and should have no impact on climate change.

4. Impacts of Proposed Amendments on Stratospheric Ozone Depletion

The stratospheric ozone layer shields the earth from harmful ultraviolet (UV) radiation. Depletion of the earth's ozone layer allows a higher penetration of UV radiation to the earth's surface. This increase in UV radiation penetration leads to a greater incidence of skin cancer, cataracts, and impaired immune systems. Reduced crop yields and diminished ocean productivity are also expected. Because the chemical reactions,

which form ground-level ozone are driven by UV radiation, it is conceivable that a reduction in stratospheric ozone concentrations 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, 2000). The chemicals most implicated as causing stratospheric ozone depletion are chlorofluorocarbons (CFCs), HCFCs, and halons (U.S. EPA, 2003a). 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, 2008d).

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 Toxics Prohibition: The proposal to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics should have no impact on stratospheric ozone depletion. In order to comply with this prohibition, VOCs may replace these TACs in reformulated products. VOCs are not stratospheric ozone depleting compounds. It should also be noted that manufacturers are precluded from reformulating with stratospheric ozone depleting compounds because use of these compounds is already restricted by the Consumer Products Regulation (see section 94509(e)).

c. Proposed Global Warming Potential Limits: The proposed GWP limit of 150 for compounds used in Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Spot Remover, Special-purpose Lubricant, and Wasp or Hornet Insecticide products will ensure that these products' emissions do not contribute to further depletion

of the stratospheric ozone layer. This is because some compounds with higher GWPs are also stratospheric ozone depleting compounds.

d. Proposed Prohibition on Use of Alkylphenol Ethoxylate Surfactants: We are proposing to prohibit the use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We do not expect this proposal to have an impact on stratospheric ozone depletion because the compounds that would be used in place of the alkylphenol ethoxylate surfactants are not stratospheric ozone depleting compounds.

e. Proposed New and Modified Definitions: We expect no impact on stratospheric ozone depletion resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits but do not themselves impose any requirements that would have an impact on stratospheric ozone depletion.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These consolidations of existing requirements, and language clarifications do not result in any change to the environment. Therefore, we expect these amendments to have no impact on stratospheric ozone depletion.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves impose no requirements and should have no impact on stratospheric ozone depletion.

D. Other Potential Environmental Impacts

In section C we evaluated the proposed amendments' impacts on air quality. In this section we provide an analysis as to whether the proposed amendments would impact other media.

1. Impacts of Proposed Amendments on Solid Waste Disposal

Consumer products contribute to the solid waste stream by virtue of the packaging, container, or mechanism such as 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. Most of the reformulation options include increasing production of existing complying products,

using water-based formulations, or replacing VOC solvents with exempt compounds or LVP-VOC solvents. These reformulation options are not expected to alter the current methods of packaging, container, delivery mechanism.

b. Proposed Toxics Prohibition: The proposal to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics should have no impact on solid waste disposal because the compounds used to replace them require no different packaging, or additional packaging. In addition, this proposed prohibition on use of chlorinated TAC solvents should ensure that there is no increased hazardous waste disposal.

c. Proposed Global Warming Potential Limits: The proposed GWP limit of 150 for compounds used in Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Spot Remover, Special-purpose Lubricant, Wasp or Hornet Insecticide products is expected to have no impact on waste disposal. Implementing this proposal does not cause a change in the manner in which products are to be disposed.

d. Proposed Prohibition on Use of Ethoxylate Surfactants: We are proposing to prohibit the use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We do not expect this proposal to have an impact on solid waste disposal because the compounds that would be used in place of the alkylphenol ethoxylate surfactants are not disposed of in a manner that would be different.

e. Proposed New and Modified Definitions: We expect no impact on solid waste disposal resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits but do not themselves impose any requirements that would affect solid waste disposal.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These consolidations of existing requirements, and language clarifications do not result in any change to the environment. Therefore, we expect these amendments to have no impact on solid waste disposal.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves impose no requirements and should have no impact on solid waste disposal.

2. Impacts of Proposed Amendments on Water Quality

Because of how consumer products are used there are potential water quality impacts. For example many products are diluted with water and used with a mop and bucket. This generally results in excess product that is disposed of "down the drain." Therefore, we evaluated the impacts of the proposed amendments on water quality.

a. Proposed VOC Standards

Overall, 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 solvent compounds replace VOCs in reformulated products, there should be no increased impact. This is because as far as water chemistry is concerned, VOCs and VOC exempt solvents are similar. It is also true that many VOCs are biodegraded as they pass through the waste water stream.

Staff has determined that use of surfactants is a viable reformulation pathway for several cleaning products. Generally, surfactants are LVP-VOC ingredients. Depending on the type of surfactant chosen there could be water quality impacts if these surfactants are washed "down the drain." In particular, the alkylphenol ethoxylate surfactants are known to have toxic impacts on aquatic species. They are estrogenic. In light of this, staff is proposing a specific mitigation measure as described in subpart 'd' of this section and in section E.

One reformulation option for nonaerosol Heavy-duty Hand Cleaner or Soap products could result in an increase in the use of abrasive ingredients. Increased amounts of abrasive ingredients will potentially be washed "down the drain," impacting water treatment and increasing solid waste. Therefore, staff evaluated the potential that increased use of abrasives could impact water quality. We determined that there is no reason to believe that the reformulation of nonaerosol Heavy-duty Hand Cleaner or Soap products would have significant adverse impacts on water treatment systems. Approximately 60 percent of the 113 products that comply with the proposed VOC limit of 1 percent by weight contain abrasives with 12 products containing less than 1 percent by weight. About half of the complying products contain very little or no abrasive ingredients, indicating that product reformulations that do not rely on increase use of abrasives are just as likely. Moreover, should manufacturers choose to use abrasive ingredients, biodegradable materials such as crushed nut shells, seeds or corn cobs are options.

b. Proposed Toxics Prohibition: The proposal to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products for use on dry clean only fabrics should have a positive impact on water quality by ensuring that these TACs will not enter the water system and

subsequently effect influent and effluent concentrations at publicly owned treatment works (POTW).

c. Proposed Global Warming Potential Limits: The proposed GWP limit of 150 for compounds used in Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Spot Remover, Special-purpose Lubricant, Wasp or Hornet Insecticide products is expected to have no impact on water quality. We are not aware of compounds with GWP values at or greater than 150 that could lead to improving water quality if they were to be used in formulations. Therefore, we expect no adverse impacts from this proposed limit.

d. Proposed Prohibition on Use of Alkylphenol Ethoxylate Surfactants: We are proposing to prohibit the use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We expect this proposal to have a beneficial impact on water quality because amounts of these aquatic toxicants would be reduced. The need for this prohibition is set forth in section E of this chapter.

e. Proposed New and Modified Definitions: We expect no impact on water quality resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits but do not themselves impose any requirements that would affect water quality.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These consolidations of existing requirements, and language clarifications do not result in any change to the environment. Therefore, we expect these amendments to have no impact on water quality.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves impose no requirements and should have no impact on water quality.

3. Impacts of Proposed Amendments on Energy

As products are reformulated to comply with the proposed amendments staff evaluated, to the extent feasible, whether the reformulation process or finished products would impact energy consumption. Among the processes to consider would be transportation related or raw ingredient manufacturing costs.

a. Proposed VOC Standards: Reformulation of products to meet the proposed VOC limits should have no impact on energy use because we do not expect the

manufacturing processes or shipping practices to be changed. We also do not expect the manufacture of compounds used in reformulations to result in energy use above the current situation because the types of chemicals predicted to be used are similar to those being replaced.

b. Proposed Toxics Prohibition: The proposal to prohibit use of methylene chloride, perchloroethylene, and trichloroethylene in products described as Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products used on dry clean only fabrics is expected to have negligible, or no impact on energy use. Absent the proposed prohibition, we are not aware of how these compounds could be used in a manner that would cause an appreciable change in energy use or savings.

c. Proposed Global Warming Potential Limits: The proposed GWP limit of 150 for compounds used in aerosol Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Spot Remover, Special-purpose Lubricant, Wasp or Hornet Insecticide products is expected to have no impact on energy use. In the absence of this provision we are not aware of how these compounds could be used in reformulations that would cause an appreciable change in energy use or savings.

d. Proposed Prohibition on Use of Ethoxylate Surfactants: We are proposing to prohibit the use of alkylphenol ethoxylate surfactants in Oven or Grill Cleaner products and in the nonaerosol forms of General Purpose Cleaner, General Purpose Degreaser, Glass Cleaner, and Heavy-duty Hand Cleaner or Soap products. We do not expect this proposal to have an impact on energy use because the compounds that would be used in place of the alkylphenol ethoxylate surfactants are similar.

e. Proposed New and Modified Definitions: 'We expect no impact on energy use resulting from the proposed new and modified definitions. These definitions are necessary to describe or clarify the types of products that are subject to the VOC limits but do not themselves impose any requirements that would affect energy use.

f. Other Proposed Amendments: A number of modifications to the regulatory language are proposed to consolidate various toxic prohibitions, consolidate GWP limits, and to clarify other provisions of the regulation. These consolidations of existing requirements, and language clarifications do not impose requirements that would result in energy use that is different from energy use that would occur absent these provisions. Therefore, we expect these amendments to cause no appreciable change in energy use or savings.

g. Proposed Changes to Method 310: The proposed changes to Method 310 would add the procedures for determining the VOC content of Fabric Softener-Single Use Dryer Products and determining aromatic compound content of Paint Thinner and Multi-purpose Solvent products. These procedures themselves impose no requirements and should have no impact on energy use.

E. Analysis of Need for Reasonably Foreseeable Mitigation Measures

As part of our obligations under CEQA, 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 products for which VOC limits are proposed, or that are potential reformulation options, are known to have health impacts, or otherwise adversely impact the environment. An increased or continued use of these compounds in the categories proposed for regulation could lead to potential adverse environmental impacts. Because of this, ARB staff evaluated this potential to determine if use of these compounds, at the concentrations predicted, could result in adverse public or personal exposures or result in any other potential adverse environmental impact. Staff's analyses follow.

1. Proposed Mitigation Measure to Prohibit Use of Certain Chlorinated TACs

Use of three chlorinated solvents, methylene chloride, perchloroethylene, and trichloroethylene, was reported as currently used in several categories proposed for regulation. In review of reformulation approaches for several other categories staff determined that these compounds, although not currently used, could be used as products reformulate to meet the proposed VOC limits. These chlorinated solvents have been identified as TACs because they are possible or probable human carcinogens.

Two of these TACs, methylene chloride and perchloroethylene, are specifically exempted from the VOC definition (see section 94508a) 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. Because these two compounds are TACs we are proposing a specific mitigation measure to address their use. While trichloroethylene is regulated as a VOC, such that its use should not increase as products reformulate to meet VOC limits, because it is a TAC we believe a mitigation measure is necessary to ensure that it is not used.

For specific information related to the toxicity of these compounds the reader is referred to the following documents:

a. 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, 2000).

b. 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).

c. Initial Statement of Reasons for the Proposed Amendments to the California Consumer Products Regulations. May 9, 2008. (ARB, 2008a)

In this rulemaking staff is proposing to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene in Silicone-based Multi-purpose Lubricant, Special-purpose Lubricant, Metal Polish or Cleanser, and Spot Remover products for use on dry clean only fabrics. The proposed prohibitions would be contained in section 94509(m) of the regulation. Implementing this provision would reduce emissions of methylene chloride, perchloroethylene, and trichloroethylene by about 0.1 tons per day and prevent their use in reformulated products.

In each category where we are proposing this prohibition, staff has determined that use of these TAC compounds poses an unnecessary health hazard. Therefore, 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.

Staff also determined that a variety of reformulation technologies exist such that use of these TACs is not necessary in these categories. More detailed information on alternative products and chemicals that can be used to reformulate products such that use of methylene chloride, perchloroethylene, and trichloroethylene is unnecessary is contained in Chapter VII.

The proposed prohibition is 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.*

2. Proposed Mitigation Measure Related to Greenhouse Gas Emissions

Staff evaluated data for categories for which VOC limits are proposed to determine whether compounds with higher GWP values could be used to reformulate products.

Limited use of the propellant HFC-152a was reported in several categories. Although not reported, staff determined that use of the exempt VOC propellant HFC-134a could occur. A very small amount (less than 1 pound per day) of the exempt VOC HCFC-141b was reported in one category. We have since learned that products containing this compound are no longer sold in California.

Even though it does not appear that use of compounds with high GWPs is necessary or desirable, staff is proposing a mitigation measure in accordance with CEQA to ensure that use of compounds with higher GWP values does not begin as products are reformulated to meet the proposed VOC limits. Specifically a GWP limit of 150 is proposed for Flying Bug Insecticide, Furniture Maintenance Product, Metal Polish or Cleanser, Spot Remover, Special-purpose Lubricant, and Wasp or Hornet Insecticide products. These provisions are proposed in subsection 94509(n).

This limit would not preclude use of HFC-152a, an exempt VOC with a moderate GWP of 140. The proposed limit would prohibit use of HFC-134a which has a GWP value of 1,300.

Staff believes that the VOC limits for these categories are set at a level that does not mandate the use of compounds with GWP values of 150 or greater. Staff also determined that a variety of reformulation technologies exist such that use of compounds with higher GWPs is not necessary in these categories. More detailed information on alternative products and chemicals that can be used as products reformulate is contained in Chapter VII.

3. Proposed Mitigation Measure Related to Use of Alkylphenol Ethoxylates

Staff is also proposing to prohibit the use of certain alkylphenol ethoxylate surfactants in several categories as a CEQA mitigation measure. Alkylphenol ethoxylates are nonionic surface active agents (surfactants) used as wetting agents, emulsifiers, and dispersants in cleaning and degreasing products. One reformulation pathway to meet proposed VOC limits would be to replace VOC solvents with surfactants, such as alkylphenol ethoxylates. Alkylphenol ethoxylates meet the definition of LVP-VOC so their use is not currently restricted by the VOC limits in the Consumer Products Regulation. In the cleaning/degreasing categories, because of how the products are used, some product is washed 'down the drain.' Once into wastewaters, alkylphenol ethoxylates do not readily degrade and they and/or their degradation products enter aquatic environments through wastewater treatment facilities and storm water.

Ample scientific evidence implicates the alkylphenol ethoxylates as toxic to aquatic species. Among other things, they are suspected hormone disruptors, with the primary concern focused on the estrogenic effects of their degradation products (David *et al.*, 2009). In particular, two alkylphenols, octylphenol and nonylphenol, have been shown to mimic the hormone estrogen. In light of this, staff consulted with staff of the State

Water Resources Control Board (SWRCB) to determine if use or increased use of alkylphenol ethoxylates would pose an adverse impact on California's receiving waters.

Information provided to the SWRCB staff indicates that alkylphenol ethoxylates are found in measurable concentrations in the State's receiving waters. Moreover, SWRCB staff is concerned that any potential increased use of alkylphenol ethoxylates could adversely impact aquatic species (SWRCB, 2010a; SWRCB, 2010b; SCCWRP, 2010; and SFEI, 2010). As proposed, after December 31, 2012, use of alkylphenol ethoxylate surfactants would be prohibited from use in General Purpose Cleaner (nonaerosol), General Purpose Degreaser (nonaerosol), Glass Cleaner (nonaerosol), and Oven or Grill Cleaner products. For Heavy-duty Hand Cleaner or Soap (nonaerosol) products the prohibition would become effective December 31, 2013. These prohibitions are proposed to ensure that use of these compounds does not occur as products are reformulated to meet the proposed VOC limits. This proposal would be contained in modified subsection 94509(m)(3).

Staff also finds that replacements for alkylphenol ethoxylates are readily available. Alcohol ethoxylate, linear alkylbenzene sulphonates, and alkyl polyglucosides surfactants are considered to be effective and environmentally safer.

F. Risk Assessment for Implementing the Proposed Amendments

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 linked the onset of asthma to exposure to elevated ozone levels in exercising children (McConnell *et al.*, 2002). It has also been shown that ozone exposure is associated with premature death. 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. Qualitatively, however, 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 because the reductions represent progress toward attaining both the national and State ozone standards.

As shown in Table IX-1, the proposed amendments 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 6.9 tons per day. Of this amount, 6.7 tons per day would be creditable toward the 2007 SIP while an additional 0.2 tons per day reduction would be credited toward a future SIP commitment. The impacts of our proposal on SOA formation are not clear, although we do not expect a disbenefit.

Prohibition of the use of the chlorinated TAC solvents methylene chloride, perchloroethylene, and trichloroethylene in certain categories would reduce exposure to these potential human carcinogens and further protect public health. The proposed GWP limits are designed to ensure that the emissions of reformulated products do not pose a climate change impact.

The prohibition on use of alkylphenol ethoxylate surfactants should reduce aquatic species' exposure to these known hormone disruptors.

G. Alternative Means of Compliance

Two alternative means of compliance with the Consumer Products Regulation have been adopted. 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. This means that a manufacturer may sell some products that exceed the VOC limits in the Regulation as long as those increased emissions were offset by additional products that overcomply with the 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 a mass-based limit 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. More information is available in Chapter V of this report.

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.

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Chapter X. Future and Ongoing Activities

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

A. Consumer Product Emissions Reduction Commitments in the State Implementation Plan (SIP)

As described in Chapter III, in the 2007 SIP, the State Strategy for California's 2007 State Implementation Plan, ARB committed to achieving a further 30 to 40 tons per day statewide VOC emission reduction from consumer products by 2014. The amendments proposed in this rulemaking represent the third increment toward achieving the commitment. Table X-1 shows our progress toward meeting the consumer products commitment in the SIP.

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

Consumer Products Rulemaking	Statewide VOC Reductions (tons per day)
June 2008 Amendments	4.5 (adopted)
September 2009 Amendments	14.7* (adopted)
2010 Amendments (this proposal)	6.7 (proposed)
Additional Reductions from Consumer Product Categories	~ 4.0 – 14.0
Totals Reductions by January 1, 2014	**30 – 40**

* Emission reductions of about 12.7 tons per day of this reduction occur in all areas of the State except the South Coast Air Quality Management District (district has their own rule, Rule 1143, for Paint Thinners and Multi-purpose Solvents) (ARB, 2009c).

As shown in Table X-1, adopted amendments will result in 19.2 tons per day toward the commitment. If adopted the amendments proposed here would provide an additional 6.7 tons per day statewide toward the commitment. The remaining commitment would be to achieve at a minimum about 4.0 tons per day by the end of 2013. Proposed amendments to complete the emission reduction commitment will occur in 2011.

Earlier this year U.S. EPA began reconsidering the "primary" ozone standard of 0.075 ppm. To be more health protective U.S. EPA proposed a revised standard in the range of 0.060 to 0.070 ppm (U.S. EPA, 2010c). The final rule is expected in October of this year (2010). The revision will require that a new SIP be drafted in the 2013 timeframe. This SIP will likely require more VOC reductions from consumer products.

B. Consumer and Commercial Products Survey

A survey of various categories of consumer products will be conducted to obtain the necessary data to propose limits to meet the final increment of emission reductions in the 2007 SIP. Among the categories to be included are aerosol coatings, aerosol adhesives, Deodorant Body Sprays, Antiperspirants, Deodorants, Undercoatings (aerosol), hair care products, and sun tanning/block products.

C. Compliance Assistance

Compliance assistance activities in 2011 will include exploring options for identifying complying products destined for sale in California and developing advisories. Advisories will be developed to address questions that have been raised related to provisions in section 94509(b). This subsection specifies how VOC content is determined for concentrated products, but provides an exclusion for "incidental use" of a more concentrated product. The goal of the advisory would be to clarify what constitutes "incidental use." Additional advisories will be explored to clarify how VOC limits for "general" or "multi-purpose" products are enforced.

REFERENCES

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2. United States Environmental Protection Agency. National Ambient Air Quality Standards for Ozone (40CFR Parts 50 and 58). Federal Register: January 19, 2010. Volume 75, Number 11. (U.S. EPA, 2010c)

Appendix A

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 EMISSIONS
FROM CONSUMER PRODUCTS

SUBCHAPTER 8.5 CONSUMER PRODUCTS

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

Article 2. Consumer Products

No amendments are proposed to §94507, Applicability.

Amend sections §94508, §94509, and §94510 to read as follows:

§ 94508. Definitions.

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

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

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

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

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

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

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

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

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

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

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

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

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

"Home use" means use in a household or its immediate environment.

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

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

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

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

(8) "Alkylphenol Ethoxylate" means, for the purpose of this regulation only, a nonionic surface active agent (surfactant) compound composed of an alkyl chain that contains at least eight carbon atoms and a polyethoxylate chain attached to a benzene ring. "Alkylphenol Ethoxylate" includes, but is not limited to, octylphenol ethoxylate with an alkyl chain consisting of eight carbon atoms and nonylphenol ethoxylate with an alkyl chain consisting of nine carbon atoms.

(~~8~~ 9) "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~~ 10) "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~~ 11) "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~~ 12) "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~~ 13) "Architectural Coating" means a coating applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.

(~~13~~ 14) "Aromatic Compound" means a carbon containing compound that contains one or more benzene or equivalent heterocyclic rings and has an initial boiling point less than or equal to 280°C. "Aromatic Compound" does not include compounds excluded from the definition of Volatile Organic Compound (VOC) in this Section 94508(a).

(~~14~~ 15) "Artist's Solvent/Thinner" means any liquid product, labeled to meet ASTM D4236 – ~~95~~ 94 (March 1, 2005) Standard Practice for Labeling Art Materials for Chronic Health Hazards, which is incorporated by reference herein, and packaged in a container equal to or less than ~~32~~ 34 fluid ounces, labeled to reduce the viscosity of, and or remove, art coating compositions or components.

(~~15~~ 16) "ASTM" means ASTM International.

(~~16~~ 17) "Astringent/Toner" means any product designed or labeled to be applied to the skin for the purpose of cleaning or tightening pores. This category also includes clarifiers and substrate-impregnated products. This category does not include any hand, face, or body cleaner or soap product, "Medicated Astringent/Medicated Toner," cold cream, lotion, antiperspirant, or any Astringent/Toner product regulated as a drug by the United States Food and Drug Administration (FDA).

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

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

(~~19~~ 18) "Automotive Rubbing or Polishing Compound" means a product designed primarily to remove oxidation, old paint, scratches or "swirl marks," and other defects from the painted surfaces of motor vehicles without leaving a protective barrier.

(~~20~~ 19) "Automotive Wax, Polish, Sealant or Glaze" means a product designed to seal out moisture, increase gloss, or otherwise enhance a motor vehicle's painted surfaces. "Automotive Wax, Polish, Sealant or Glaze" includes, but is not limited to, products designed for use in autobody repair shops and "drive-through" car washes, as well as products designed for the general public. "Automotive Wax, Polish, Sealant or Glaze" does not include "Automotive Rubbing or Polishing Compound," automotive wash and wax products, surfactant-containing car wash products, and products designed for use on unpainted surfaces such as bare metal, chrome, glass, or plastic. "Automotive Wax, Polish, Sealant or Glaze" products are subcategorized into "All Other Forms," "Hard Paste Wax," and "Instant Detailer:"

(1) "All Other Forms" subcategory consists of all automotive wax, polish, sealant or glaze products that are not either a "Hard Paste Wax" or "Instant Detailer."

(2) "Hard Paste Wax" means a product which (A) is designed to protect and improve the appearance of automotive painted surfaces; (B) is a solid at room temperature; and (C) contains zero percent water by formulation.

(3) "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.

(~~21~~ 20) "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 10 gallons or more, or a container with a capacity of one quart or less; and

(B) the product is designed or labeled for use in a motor vehicle windshield washer fluid system either as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Dilutable)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

(~~22~~ 21) "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 10 gallons; and

(B) the product is designed or labeled for use in a motor vehicle windshield washer fluid system as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Pre-Mixed)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

(~~23~~ 22) "Bathroom and Tile Cleaner" means a product designed or labeled to clean tile or surfaces in bathrooms. "Bathroom and Tile Cleaner" does not include "Toilet/Urinal Care Product."

(~~24~~ 23) "Brake Cleaner" means a cleaning product designed or labeled to remove oil, grease, brake fluid, brake pad material or dirt from motor vehicle brake mechanisms.

(~~25~~ 24) "Bug and Tar Remover" means a product labeled to remove either or both of the following from painted motor vehicle surfaces without causing damage to the finish: (A) biological-type residues such as insect carcasses and tree sap and, (B) road grime, such as road tar, roadway paint markings, and asphalt.

(~~26~~ 25) "California Sales" means the sales (net pounds of product, less packaging and container, per year) in California for either the calendar year immediately prior to the year that the information required by the Executive Officer pursuant to section 94513 (required information) is due or, if that data is not available, any consecutive 12 month period commencing no earlier than 2 years prior to the due date of the required information. If direct sales data for California is not available, sales may be estimated by prorating national or regional sales data by population.

(~~27~~ 26) "Carburetor or Fuel-Injection Air Intake Cleaner" means a product designed or labeled to remove fuel deposits, dirt, or other contaminants from a carburetor, choke, throttle body of a fuel-injection system, or associated linkages. "Carburetor or Fuel-injection Air Intake Cleaner" does not include products designed or labeled exclusively to be introduced directly into the fuel lines or fuel storage tank prior to introduction into the carburetor or fuel injectors, or products designed or labeled exclusively to be introduced during engine operation directly into air intake vacuum lines by using a pressurized sprayer wand.

(~~28~~ 27) "Carpet/Upholstery Cleaner" means a cleaning product designed or labeled for the purpose of eliminating dirt or stains on rugs, carpeting, or objects upholstered or covered with fabrics such as wool, cotton, nylon or other synthetic fabrics. "Carpet/Upholstery Cleaner" includes, but is not limited to, products used on household furniture, the interior of motor vehicles, and products that make "Fabric Protectant" claims. "Carpet/Upholstery Cleaner" does not include

"Spot Remover," vinyl or leather cleaners, "Dry Cleaning Fluid," or products designed exclusively for use at industrial facilities engaged in furniture or carpet manufacturing.

(~~29~~ 28) "Charcoal Lighter Material" means any combustible material designed to be applied on, incorporated in, added to, or used with charcoal to enhance ignition. "Charcoal Lighter Material" does not include any of the following: (A) electrical starters and probes, (B) metallic cylinders using paper tinder, (C) natural gas, (D) propane, and (E) fat wood.

(~~30~~ 29) "Colorant" means any pigment or coloring material used in a consumer product for an aesthetic effect, or to dramatize an ingredient.

(~~31~~ 30) "Construction, Panel, and Floor Covering Adhesive" means any non-aerosol, one-component adhesive that is designed or labeled for the installation, remodeling, maintenance, or repair of: (A) structural and building components that include, but are not limited to, beams, trusses, studs, paneling (drywall or drywall laminates, fiberglass reinforced plastic (FRP), plywood, particle board, insulation board, pre-decorated hardboard or tileboard, etc.), ceiling and acoustical tile, molding, fixtures, countertops or countertop laminates, cove or wall bases, and flooring or subflooring; or (B) floor or wall coverings that include, but are not limited to, wood or simulated wood covering, carpet, carpet pad or cushion, vinyl-backed carpet, flexible flooring material, nonresilient flooring material, mirror tiles and other types of tiles, and artificial grass. "Construction, Panel, and Floor Covering Adhesive" does not include "Floor Seam Sealer."

(~~32~~ 31) "Consumer" means any person who seeks, purchases, or acquires any consumer product for personal, family, household, or institutional use. Persons acquiring a consumer product for resale are not "consumers" for that product.

(~~33~~ 32) "Consumer Product" means a chemically formulated product used by household and institutional consumers including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings. As used in this article, the term "consumer product" shall also refer to aerosol adhesives, including aerosol adhesives used for consumer, industrial, and commercial uses.

(~~34~~ 33) "Contact Adhesive" means a non-aerosol adhesive that: (A) is designed for application to both surfaces to be bonded together, and (B) is allowed to dry before the two surfaces are placed in contact with each other, and (C) forms an immediate bond that is impossible, or difficult, to reposition after both adhesive-coated surfaces are placed in contact with each other, and (D) does not need sustained pressure or clamping of surfaces after the adhesive-coated surfaces have been brought together using sufficient momentary pressure to establish full

contact between both surfaces. "Contact Adhesive" does not include rubber cements that are primarily intended for use on paper substrates. "Contact Adhesive" also does not include vulcanizing fluids that are designed and labeled for tire repair only.

(~~35~~ 34) "Contact Adhesive - General Purpose" means any contact adhesive that is not a "Contact Adhesive - Special Purpose."

(~~36~~ 35) "Contact Adhesive - Special Purpose" means a contact adhesive that: (A) is used to bond melamine-covered board, unprimed metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber, high pressure laminate or wood veneer 1/16 inch or less in thickness to any porous or nonporous surface, and is sold in units of product, less packaging, that contain more than eight fluid ounces, or (B) is used in automotive applications that are (1.) automotive under-the-hood applications requiring heat, oil or gasoline resistance, or (2.) body-side molding, automotive weatherstrip or decorative trim.

(~~37~~ 36) "Container/Packaging" means the part or parts of the consumer or institutional product which serve only to contain, enclose, incorporate, deliver, dispense, wrap or store the chemically formulated substance or mixture of substances which is solely responsible for accomplishing the purposes for which the product was designed or intended. "Container/Packaging" includes any article onto or into which the principal display panel and other accompanying literature or graphics are incorporated, etched, printed or attached.

(~~38~~ 37) "Crawling Bug Insecticide" means any insecticide product that is designed for use against ants, cockroaches, or other household crawling arthropods, including, but not limited to, mites, silverfish or spiders. "Crawling Bug Insecticide" does not include products designed to be used exclusively on humans or animals, or any house dust mite product. For the purposes of this definition only:

"House dust mite product" means a product whose label, packaging, or accompanying literature states that the product is suitable for use against house dust mites, but does not indicate that the product is suitable for use against ants, cockroaches, or other household crawling arthropods.

"House dust mite" means mites which feed primarily on skin cells shed in the home by humans and pets and which belong to the phylum Arthropoda, the subphylum Chelicerata, the class Arachnida, the subclass Acari, the order Astigmata, and the family Pyroglyphidae.

(~~39~~ 38) "Deodorant Body Spray" means:

(A) for products manufactured before January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance.

(B) for products manufactured on or after January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance, that is designed for application all over the human body to provide a scent. A "Deodorant Body Spray" product that indicates or depicts on the container or packaging, or on any sticker or label affixed thereto, that it can be used on or applied to the human axilla, is a "Deodorant" as defined in section 94501(d).

(~~40~~ 39) "Device" means any instrument or contrivance (other than a firearm) which is designed for trapping, destroying, repelling, or mitigating any pest or any other form of plant or animal life (other than man and other than bacteria, virus, or other microorganism on or in living man or other living animals); but not including equipment used for the application of pesticides when sold separately therefrom.

(~~41~~ 40) "Disinfectant" means a product that is labeled as a "disinfectant", or is labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered as a "disinfectant" under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). Products that are labeled as both a "sanitizer" and a "disinfectant" are considered disinfectants. "Disinfectant" does not include any of the following: (A) products labeled solely for use on humans or animals, (B) products labeled solely for agricultural use, (C) products labeled solely for use in swimming pools, therapeutic tubs, or hot tubs, (D) products which are labeled to be used on heat sensitive critical or semi-critical medical devices or medical equipment surfaces, (E) products which are pre-moistened wipes or towelettes sold exclusively to medical, convalescent, or veterinary establishments, (F) products which are labeled to be applied to food-contact surfaces and are not required to be rinsed prior to contact with food, or (G) products which are labeled as "Bathroom and Tile Cleaner," "Glass Cleaner," "General Purpose Cleaner," "Toilet/Urinal Care Product," "Metal Polish," "Carpet Cleaner," or "Fabric Refresher" that may also make disinfecting or anti-microbial claims on the label.

(~~42~~ 41) "Distributor" means any person to whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce, except that manufacturers, retailers, and consumers are not distributors.

(~~43~~ 42) "Double Phase Aerosol Air Freshener" means an aerosol air freshener with the liquid contents in two or more distinct phases that requires the product container be shaken before use to mix the phases, producing an emulsion.

(44 43) "Dry Cleaning Fluid" means any ~~non-aqueous liquid product~~ nonaqueous solvent that is (A) used in dry-cleaning machines at commercial dry cleaners or used by commercial businesses that clean fabrics such as draperies at the customer's residence or work place; and (B) is designed and labeled exclusively to clean ~~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" does not

include "Spot Remover" or "Carpet/Upholstery Cleaner." For the purposes of this definition, S-coded fabric means an upholstery fabric designed to be cleaned only with water-free spot cleaning products as specified by the Joint Industry Fabric Standards Committee." ~~"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.~~

(~~45~~ 44) "Dual Purpose Air Freshener/Disinfectant" means an aerosol product that is represented on the product container for use as both a disinfectant and an air freshener, or is so represented on any sticker, label, packaging, or literature attached to the product container.

(~~46~~ 45) "Dusting Aid" means a product designed or labeled to assist in removing dust and other soils from floors and other surfaces without leaving a wax or silicone based coating. "Dusting Aid" does not include "Pressurized Gas Duster."

(~~47~~ 46) "Electrical Cleaner" means a product labeled to remove heavy soils such as grease, grime, or oil from electrical equipment, including, but not limited to, electric motors, armatures, relays, electric panels, or generators. Electrical Cleaner does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Electronic Cleaner," "Energized Electrical Cleaner," "Pressurized Gas Duster," "Engine Degreaser," "Anti-Static Product," or products designed to clean the casings or housings of electrical equipment.

(~~48~~ 47) "Electronic Cleaner" means a product labeled for the removal of dirt, moisture, dust, flux, or oxides from the internal components of electronic or precision equipment such as circuit boards, and the internal components of electronic devices, including but not limited to, radios, compact disc (CD) players, digital video disc (DVD) players, and computers. "Electronic Cleaner" does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Pressurized Gas Duster," "Engine Degreaser," "Electrical Cleaner," "Energized Electrical Cleaner," "Anti-Static Product," or products labeled to clean the casings or housings of electronic equipment. "Electronic Cleaner" does not include any product that meets both of the following criteria:

1) the product is labeled to clean and/or degrease electronic equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component;

2) the product label clearly displays the statements: "Energized Electronic Equipment use only."

(~~49~~ 48) "Energized Electrical Cleaner" means a product that meets both of the following criteria:

1) the product is labeled to clean and/or degrease electrical equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component such as a capacitor;

2) the product label clearly displays the statements: "Energized Equipment use only. Not to be used for motorized vehicle maintenance, or their parts."

"Energized Electrical Cleaner" does not include "Electronic Cleaner."

(~~50~~ 49) "Engine Degreaser" means a cleaning product designed or labeled to remove grease, grime, oil and other contaminants from the external surfaces of engines and other mechanical parts.

(~~51~~ 50) "Executive Officer" means the Executive Officer of the Air Resources Board, or his or her delegate.

(~~52~~ 51) "Existing Product" means any formulation of the same product category and form sold, supplied, manufactured, or offered for sale in California prior to the following dates, or any subsequently introduced identical formulation:

(A) October 21, 1991, for all products listed in section 94509(a) that have initial effective dates of January 1, 1993, or January 1, 1994;

(B) January 6, 1993, for all products listed in section 94509(a) that have initial effective dates of January 1, 1995, or January 1, 1997, and charcoal lighter materials subject to section 94509(h);

(C) August 16, 1998, for all products listed in section 94509(a) that have initial effective dates of January 1, 2001, January 1, 2002, January 1, 2003, or January 1, 2005;

(D) November 19, 2000, for all products in the following product categories listed in section 94509(a): "Non-aerosol General Purpose Degreaser," "Sealant and Caulking Compound," and "Tire Sealant and Inflator."

(E) July 20, 2005, for all products listed in section 94509(a) that have an effective date of December 31, 2006, December 31, 2008, or December 31, 2009; and

(F) December 8, 2007, for all products listed in section 94509(a) that have an initial effective date of December 31, 2008, or December 31, 2010 for Brake Cleaner, Carburetor or Fuel-Injection Air Intake Cleaner, Aerosol Engine

Degreaser, Resilient Flooring Material, Nonresilient Flooring Material, Aerosol General Purpose Degreaser, and Aerosol Temporary Hair Color.

(G) July 18, 2009, for all products listed in section 94509(a) that have an initial effective date of December 31, 2010, or December 31, 2012, December 31, 2013, or December 31, 2014.

(H) October 20, 2010, for "Multi-purpose Solvent" and "Paint Thinner."

(I) [Effective Date] for "Special-purpose Lubricant."

(~~53~~ 52) "Fabric Protectant" means:

(A) for products manufactured before December 31, 2008: a product designed or labeled to be applied to fabric substrates to protect the surface from soiling from dirt and other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include "Waterproofers," products designed for use solely on leather, or products designed for use solely on fabrics which are labeled "for dry clean only" and sold in containers of 10 fluid ounces or less.

(B) for products manufactured on or after December 31, 2008: a product designed or labeled to be applied to fabric substrates to protect the surface from soiling from dirt or other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include "Waterproofers," or products labeled for use solely on leather. "Fabric Protectant" does not include pigmented products that are designed or labeled to be used primarily for coloring, products used for construction, reconstruction, modification, structural maintenance or repair of fabric substrates, or products that renew or restore fabric and qualifying as either "Clear Coating" or "Vinyl/Fabric/Leather/Polycarbonate Coating" under section 94521(a).

(~~54~~ 53) "Fabric Refresher" means a product labeled to neutralize or eliminate odors on non-laundered fabric including, but not limited to, soft household surfaces, rugs, carpeting, draperies, bedding, automotive interiors, footwear, athletic equipment, clothing and/or on household furniture or objects upholstered or covered with fabrics such as, but not limited to, wool, cotton, or nylon. "Fabric Refresher" does not include "Anti-static Product," "Carpet/Upholstery Cleaner," "Footwear or Leather Care Product," "Spot Remover," or "Disinfectant," or products labeled for application to both fabric and human skin.

(~~55~~ 54) "Fabric Softener-Single Use Dryer Product" means a laundry care product designed or labeled for single use in the clothes dryer to impart softness to, or control static cling of, a load of washable fabrics; and may impart a fragrance or scent. For the purpose of this definition only, "single use" means a product that is intended for one time use during a single drying cycle and is removed after

completion of the drying cycle. A "load" is the amount of washable fabrics in a single drying cycle. "Fabric Softener-Single Use Dryer Product" includes treated nonwoven sheets which are typically packaged in boxes with a multiple number of sheets. "Fabric Softener-Single Use Dryer Product" does not include products applied to washable fabrics prior to placing the washable fabrics in the clothes dryer.

(~~56~~ 55) "Facial Cleaner or Soap" means a cleaner or soap designed primarily to clean the face. "Facial Cleaner or Soap" includes, but is not limited to, facial cleansing creams, semisolids, liquids, lotions, and substrate-impregnated forms. "Facial Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "General-use Hand or Body Cleaner or Soap," "Medicated Astringent/Medicated Toner," or "Rubbing Alcohol."

(~~57~~ 56) "Fat Wood" means pieces of wood kindling with high naturally-occurring levels of sap or resin which enhance ignition of the kindling. "Fat wood" does not include any kindling with substances added to enhance flammability, such as wax-covered or wax-impregnated wood-based products.

(~~58~~ 57) "Flea and Tick Insecticide" means any insecticide product that is designed for use against fleas, ticks, their larvae, or their eggs. "Flea and Tick Insecticide" does not include products that are designed to be used exclusively on humans or animals and their bedding.

(~~59~~ 58) "Floor Coating" means an opaque coating that is labeled and designed for application to flooring, including but not limited to, decks, porches, steps, and other horizontal surfaces which may be subject to foot traffic.

(~~60~~ 59) "Floor Maintenance Product" means any product designed or labeled to restore, maintain, or enhance a previously applied floor finish. "Floor Maintenance Product" includes, but is not limited to, products that are labeled as Spray Buff products or Floor Maintainers or Restorers. "Floor Maintenance Product" does not include floor polish products, products designed solely for the purpose of cleaning, products designed or labeled exclusively for use on marble floors, or coatings subject to architectural coatings regulations.

(~~61~~ 60) "Floor Polish or Wax" means a product designed or labeled to polish, wax, condition, protect, temporarily seal, or otherwise enhance floor surfaces by leaving a protective finish that is designed or labeled to be periodically replenished. "Floor Polish or Wax" does not include "Floor Maintenance Products," "Floor Wax Stripper," or coatings subject to architectural coatings regulations.

"Floor Polish or Wax" is divided into three subcategories: products for resilient flooring materials, products for nonresilient flooring materials and wood floor wax. For the purposes of this article:

(A) "Resilient Flooring Material" means flexible flooring material including but is not limited to, asphalt, cork, linoleum, no-wax, rubber, seamless vinyl, and vinyl composite flooring.

(B) "Nonresilient Flooring Material" means flooring of a mineral content which is not flexible. "Nonresilient Flooring material" includes but is not limited to terrazzo, marble, slate, granite, brick, stone, ceramic tile, and concrete.

(C) "Wood Floor Wax" means any wax-based 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."

(~~62~~ 61) "Floor Seam Sealer" means any product designed and labeled exclusively for bonding, fusing, or sealing (coating) seams between adjoining rolls of installed flexible sheet flooring.

(~~63~~ 62) "Floor Wax Stripper" means a product designed to remove natural or synthetic floor polishes or waxes through breakdown of the polish or wax polymers, or by dissolving or emulsifying the polish or wax. "Floor Wax Stripper" does not include aerosol floor wax strippers or products designed to remove floor wax solely through abrasion.

(~~64~~ 63) "Flying Bug Insecticide" means any insecticide product that is designed for use against flying insects or other flying arthropods, including but not limited to flies, mosquitoes, moths, or gnats. "Flying Bug Insecticide" does not include "wasp and hornet insecticide," products that are designed to be used exclusively on humans or animals, or any moth-proofing product. For the purposes of this definition only, "moth-proofing product" means a product whose label, packaging, or accompanying literature indicates that the product is designed to protect fabrics from damage by moths, but does not indicate that the product is suitable for use against flying insects or other flying arthropods.

(~~65~~ 64) "Footwear or Leather Care Product" means any product designed or labeled to be applied to footwear or to other leather articles/components, to maintain, enhance, clean, protect, or modify the appearance, durability, fit, or flexibility of the footwear or leather article/component. Footwear includes both leather and non-leather foot apparel. "Footwear or Leather Care Product" does not include "Fabric Protectant," "General Purpose Adhesive," "Contact Adhesive," "Vinyl/Fabric/Leather/Polycarbonate Coating," as defined in section 94521(a), "Rubber/Vinyl Protectant," "Fabric Refresher," products solely for deodorizing, or sealant products with adhesive properties used to create external protective layers greater than 2 millimeters thick.

(~~66~~ 65) "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.

(~~67~~ 66) "Furniture Maintenance Product" means a wax, polish, conditioner, or any other product labeled for the purpose of polishing, protecting or enhancing finished wood surfaces other than floors, and other furniture surfaces including but not limited to acrylics, ceramic, plastics, stone surfaces, metal surfaces, and fiberglass. "Furniture Maintenance Product" does not include "Dusting Aid," "Wood Cleaner," and products designed solely for the purpose of cleaning, or products designed to leave a permanent finish such as stains, sanding sealers and lacquers.

(~~68~~ 67) "Furniture Coating" means any paint designed for application to room furnishings including, but not limited to, cabinets (kitchen, bath and vanity), tables, chairs, beds, and sofas.

(~~69~~ 68) "Gel" means a colloid in which the disperse phase has combined with the continuous phase to produce a semisolid material, such as jelly.

(~~70~~ 69) "General Purpose Adhesive" means any non-aerosol adhesive designed for use on a variety of substrates. "General Purpose Adhesive" does not include (A) contact adhesives, (B) construction, panel, and floor covering adhesives, (C) adhesives designed exclusively for application on one specific category of substrates (i.e., substrates that are composed of similar materials, such as different types of metals, paper products, ceramics, plastics, rubbers, or vinyls), or (D) adhesives designed exclusively for use on one specific category of articles (i.e., articles that may be composed of different materials but perform a specific function, such as gaskets, automotive trim, weather-stripping, or carpets).

(~~71~~ 70) "General Purpose Cleaner" means a ~~general purpose cleaning~~ product labeled to clean ~~for use on~~ a variety of hard surfaces~~, including small appliances~~. "General Purpose Cleaner" includes, but is not limited to, products designed or labeled for general floor cleaning, kitchen, countertop, or sink cleaning, and cleaners designed or labeled to be used on a variety of hard surfaces such as stovetops, cooktops, or microwaves.

(~~72~~ 71) "General Purpose Degreaser" means:

(A) for products manufactured before December 31, 2012: 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," and "Metal Polish/or Cleanser~~,~~." "General Purpose Degreaser" also does not include 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.

(B) for products manufactured on or after December 31, 2012: 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 "Adhesive Remover," "Electrical Cleaner," "Electronic Cleaner," "Energized Electrical Cleaner," "Engine Degreaser," "General Purpose Cleaner," "Metal Polish or Cleanser," or "Oven or Grill Cleaner." "General Purpose Degreaser" also does not include products used exclusively in "solvent cleaning tanks or related equipment," or products that are (A) exclusively sold directly or through distributors to establishments which manufacture or construct goods or commodities; and (B) labeled exclusively for "use in the manufacturing process only." "Solvent cleaning tanks or related equipment" includes, but is not limited to, cold cleaners, vapor degreasers, conveyorized degreasers, film cleaning machines, or products designed to clean miscellaneous metallic parts by immersion in a container.

(~~73~~ 72) "General-use Hand or Body Cleaner or Soap" means a cleaner or soap designed to be used routinely on the skin to clean or remove typical or common dirt and soils. "General-use Hand or Body Cleaner or Soap" includes, but is not limited to, hand or body washes, dual-purpose shampoo-body cleaners, shower or bath gels, and moisturizing cleaners or soaps. "General-use Hand or Body Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "Facial Cleaner or Soap," "Hand Dishwashing Detergent" (including antimicrobial), "Heavy-duty Hand Cleaner or Soap," "Medicated Astringent/Medicated Toner," or "Rubbing Alcohol."

(~~74~~ 73) "Glass Cleaner" means a cleaning product designed or labeled primarily for cleaning surfaces made of glass. "Glass Cleaner" does not include products designed or labeled solely for the purpose of cleaning optical materials used in eyeglasses, photographic equipment, scientific equipment and photocopying machines.

(~~75~~ 74) "Global Warming Potential (GWP)" means the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time.

(~~76~~ 75) "Global Warming Potential Value" or "GWP Value" means the global warming potential value of a chemical or compound as specified in the IPCC: 1995 Second Assessment Report (SAR), Table 2.14, in Climate Change 2007: The Physical Sciences Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, which is incorporated by reference herein.

If Table 2.14 does not contain a SAR 100-year GWP Value for a specific chemical or compound, then the 100-year GWP Value in Table 2.14 for that chemical or compound shall be used. If there is no 100-year GWP Value for a chemical or compound listed in Table 2.14 or GWP Value listed in Table 2.15, then the GWP Value is assumed to be equal to the GWP limit of the applicable product category.

(~~77~~ 76) "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."

(77) "Gum or Candle Wax Remover" means a product designed or labeled exclusively to remove chewing gum and/or candle wax from soft surfaces such as carpet, rugs, upholstery, or fabric.

(78) "Hair Mousse" means a hairstyling foam designed to facilitate styling of a coiffure and provide limited holding power.

(79) "Hair Shine" means any product designed for the primary purpose of creating a shine when applied to the hair. "Hair Shine" includes, but is not limited to, dual-use products designed primarily to impart a sheen to the hair. "Hair Shine" does not include "Hair Spray," "Hair Mousse," "Hair Styling Product," "Hair Styling Gel," or products whose primary purpose is to condition or hold the hair.

(80) "Hair Styling Gel" means a consumer product manufactured before December 31, 2006, that is a high viscosity, often gelatinous, product that contains a resin and is designed for the application to hair to aid in styling and sculpting of the hair coiffure.

(81) "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 does not provide finishing of a hairstyle.

For the purposes of this subchapter, "finish" or "finishing" means the maintaining and/or holding of previously styled hair for a period of time.

For the purposes of this subchapter, "styling" means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

(82) "Hair Styling Product" means a consumer product manufactured on or after December 31, 2006, that is designed or labeled for the application to wet, damp or dry hair to aid in defining, shaping, lifting, styling and/or sculpting of the hair. "Hair Styling Product" includes, but is not limited to hair balm, clay, cream, creme, curl straightener, gel, liquid, lotion, paste, pomade, putty, root lifter, serum, spray gel, stick, temporary hair straightener, wax, spray products that aid in styling but do not provide finishing of a hairstyle, and leave-in volumizers, detanglers and/or conditioners that make styling claims. "Hair Styling Product" does not include "Hair Mousse," "Hair Shine," "Hair Spray," or shampoos and/or conditioners that are rinsed from the hair prior to styling.

For the purposes of this subchapter, "finish" or "finishing" means the maintaining and/or holding of previously styled hair for a period of time.
For the purposes of this subchapter, "styling" means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

(83) "Heavy-Duty Hand Cleaner or Soap" means a product designed to clean or remove difficult dirt and soils such as oil, grease, grime, tar, shellac, putty, printer's ink, paint, graphite, cement, carbon, asphalt, or adhesives from the hand with or without the use of water. "Heavy-duty Hand Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "Facial Cleaner or Soap," "General-use Hand or Body Cleaner or Soap," "Medicated Astringent/Medicated Toner" or "Rubbing Alcohol."

(84) "Herbicide" means a pesticide product designed to kill or retard a plant's growth, but excludes products that are: (A) for agricultural use, or
(B) restricted materials that require a permit for use and possession.

(85) "High-Temperature Coating" means a high performance coating labeled and formulated for application to substrates exposed continuously or intermittently to temperatures above 204°C (400°F).

(86) "Household Product" means any consumer product that is primarily designed to be used inside or outside of living quarters or residences that are occupied or intended for occupation by individuals, including the immediate surroundings.

(87) "Industrial Maintenance Coating" means a high performance architectural coating, including primers, sealers, undercoaters, intermediate coats, and topcoats formulated for application to substrates, including floors, exposed to one or more of the following extreme environmental conditions listed below and labeled "For industrial use only;" "For professional use only;" "Not for residential use;" or "Not intended for residential use."

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

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

(C) Frequent exposure to temperatures above 121°C (250°F); or

(D) Frequent heavy abrasion, including mechanical wear and frequent scrubbing with industrial solvents, cleansers, or scouring agents; or

(E) Exterior exposure of metal structures and structural components.

(88) "Insect Repellent" means a pesticide product that is designed to be applied on human skin, hair or attire worn on humans in order to prevent contact with or repel biting insects or arthropods.

(89) "Insecticide" means a pesticide product that is designed for use against insects or other arthropods, but excluding products that are: (A) for agricultural use, or (B) for a use which requires a structural pest control license under Chapter 14 (commencing with Section 8500) of the Business and Professions Code, or (C) restricted materials that require a permit for use and possession.

(90) "Insecticide Fogger" means any insecticide product designed to release all or most of its content, as a fog or mist, into indoor areas during a single application.

(91) "Institutional Product" or "Industrial and Institutional (I&I) Product" means a consumer product that is designed for use in the maintenance or operation of an establishment that: (A) manufactures, transports, or sells goods or commodities, or provides services for profit; or (B) is engaged in the nonprofit promotion of a

particular public, educational, or charitable cause. "Establishments" include, but are not limited to, government agencies, factories, schools, hospitals, sanitariums, prisons, restaurants, hotels, stores, automobile service and parts centers, health clubs, theaters, or transportation companies. "Institutional Product" does not include household products and products that are incorporated into or used exclusively in the manufacture or construction of the goods or commodities at the site of the establishment.

(92) "Label" means any written, printed, or graphic matter affixed to, applied to, attached to, blown into, formed, molded into, embossed on, or appearing upon any consumer product or consumer product package, for purposes of branding, identifying, or giving information with respect to the product or to the contents of the package.

(93) "Laundry Prewash" means a product that is designed for application to a fabric prior to laundering in a wet-cleaning process, and that supplements and contributes to the effectiveness of laundry detergents and/or provides specialized performance.

(94) "Laundry Starch/Sizing/Fabric Finish Product" means a product that is labeled for application to a fabric, either during or after laundering, to impart and prolong a crisp, fresh look and may also act to help ease ironing of the fabric. "Laundry Starch/Sizing/Fabric Finish Product" includes, but is not limited to, starch, sizing, and fabric finish.

(95) "Lawn ~~and~~ or Garden Insecticide" means an insecticide product labeled primarily to be used in household lawn ~~and~~ or garden areas to protect plants from insects or other arthropods. Notwithstanding the requirements of section 94512(a) aerosol "Lawn ~~and~~ or Garden Insecticide" may claim to kill insects or other arthropods.

(96) "Liquid" means a substance or mixture of substances which is capable of a visually detectable flow as determined under ASTM D-4359-90 (May 25, 1990) Standard Test Method for Determining Whether a Material Is a Liquid or a Solid, which is incorporated by reference herein. "Liquid" does not include powders or other materials that are composed entirely of solid particles.

(97) "Lubricant" means:

(A) for products manufactured before December 31, 2012: a product that reduces friction, heat, noise, or wear between moving parts, or loosens rusted or immovable parts or mechanisms. "Lubricant" does not include automotive power steering fluids; products for use inside power generating motors, engines, and turbines, and their associated power-transfer gearboxes; two cycle oils or other products designed to be added to fuels; products for use on the human body or animals; or products that are (1) sold

exclusively to establishments which manufacture or construct goods or commodities, and (2) labeled "not for retail sale."

(B) for products manufactured on or after December 31, 2012: a product that reduces friction, heat, noise, or wear between moving parts, or loosens rusted or immovable parts or mechanisms. "Lubricant" does not include automotive power steering fluids; products for use inside power generating motors, engines, and turbines, and their associated power-transfer gearboxes; two cycle oils or other products designed to be added to fuels; products for use on the human body or animals; or products that are (1) exclusively sold directly or through distributors to establishments which manufacture or construct goods or commodities, and (2) labeled exclusively for "use in the manufacturing process only."

(98) "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."

(99) "Manufacturer" means any person who imports, manufactures, assembles, produces, packages, repackages, or relabels a consumer product.

(100) "Medicated Astringent/Medicated Toner" means any product regulated as a drug by the Food and Drug Administration (FDA) which is applied to the skin for the purpose of cleaning or tightening pores. "Medicated Astringent/Medicated Toner" includes, but is not limited to, clarifiers and substrate-impregnated products. "Medicated Astringent/Medicated Toner" does not include hand, face, or body cleaner or soap products, "Personal Fragrance Product," "Astringent/Toner," cold cream, lotion, antiperspirants, or products that must be purchased with a doctor's prescription.

(101) "Metal Polish/ or Cleanser" means any product designed ~~primarily~~ or labeled to improve the appearance and/or protect ~~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/ or Cleanser" includes, but is not limited to metal polishes used on brass, silver, chrome, copper, stainless steel and other ornamental metals. "Metal Polish/ or Cleanser" does not include "Automotive Wax, Polish, Sealant or Glaze," "General Purpose Cleaner," "Tire or Wheel Cleaner," "Paint Remover or Stripper," products designed and labeled exclusively for automotive and marine detailing, or products designed for use in degreasing tanks.

(102) "Mist Spray Adhesive" means any aerosol adhesive which is not a "Special Purpose Spray Adhesive" and which delivers a particle or mist spray, resulting in the formation of fine, discrete particles that yield a generally uniform and smooth application of adhesive to the substrate.

(103) "Motor Vehicle Wash" means a product designed or labeled to wash, wash and wax, wash and shine, or wash and/or clean the exterior surface of motor vehicles. "Motor Vehicle Wash" includes, but is not limited to, products for use in commercial, fleet, hand, and "drive through" car washes; commercial truck washing or large vehicle washing stations; vehicle dealers and repair shops as well as products intended for household consumer use. "Motor Vehicle Wash" does not include "Bug and Tar Remover," "Glass Cleaner," "Tire or Wheel Cleaner," and products labeled for use exclusively on locomotives or aircraft.

(104) "Multi-purpose Dry Lubricant" means any lubricant which is: (A) designed or labeled to provide lubricity solely by depositing a thin film of graphite, molybdenum disulfide ("moly"), or polytetrafluoroethylene or closely related fluoropolymer ("teflon") on surfaces, and (B) designed or labeled for general purpose lubrication, or for use in a wide variety of applications.

(105) "Multi-purpose Lubricant" means any lubricant designed or labeled for general purpose lubrication, or a lubricant labeled for use in a wide variety of applications. "Multi-purpose Lubricant" does not include "Multi-purpose Dry Lubricant," "Penetrant," or "Silicone-based Multi-Purpose Lubricant."

(106) "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, dissolving, or removing contaminants or other organic materials. "Multi-purpose Solvent" also includes: 1. products that do not display specific use instructions on the product container or packaging~~,~~; 2. products that do not specify an end-use function or application on the product container or packaging~~,~~; 3. solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories~~,~~; 4. "Paint clean-up" products~~,~~; and ~~(~~5.~~)~~ products labeled to prepare surfaces for painting. For the purposes of this definition only, "Paint clean-up" means any liquid product labeled for cleaning oil-based or water-based paint, lacquer, varnish, or related coatings from, but not limited to, painting equipment or tools, plastics, or metals. "Multi-purpose Solvent" does not include 1. solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines~~,~~; 2. solvents labeled exclusively for the clean-up of application equipment used for polyaspartic and polyurea coatings~~,~~; ~~or~~ 3. solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment~~.~~ ; 4. Products that are labeled exclusively to clean a specific contaminant, on a single substrate, in specific situations; ~~"Multi-purpose Solvent" also does not include~~ or 5. any product making any representation that the product may be used as, or is suitable for use as a consumer product which ~~qualifies under~~ meets another definition in section 94508(a); such products are not "Multi-purpose Solvents" and are subject to the "Most Restrictive Limit" provisions of section 94512(a).

(107) "Nail Polish" means any clear or colored coating designed for application to the fingernails or toenails and including but not limited to, lacquers, enamels, acrylics, base coats and top coats.

(108) "Nail Polish Remover" means a product designed to remove nail polish and coatings from fingernails or toenails.

(109) "Non-Carbon Containing Compound" means any compound which does not contain any carbon atoms.

(110) "Non-Selective Terrestrial Herbicide" means a terrestrial herbicide product that is toxic to plants without regard to species.

(111) "Odor Remover/Eliminator" means a product that is designed or labeled to be applied exclusively to hard surfaces to inhibit the ability of soils to create malodors, or functions to entrap, encapsulate, neutralize, convert or eliminate

malodor molecules. "Odor Remover/Eliminator" does not include products designed or labeled for use in cleaning soils from hard surfaces, laundering, softening, de-wrinkling or cleaning fabrics, or dishwashing, or products that are defined as "Air Freshener," "Bathroom and Tile Cleaner," "Carpet/Upholstery Cleaner," "Fabric Refresher," "General Purpose Cleaner," "Toilet/Urinal Care Product," "Disinfectant," or "Sanitizer."

(112) "Oven or Grill Cleaner" means ~~any cleaning~~ a product ~~designed or~~ labeled exclusively ~~to clean and~~ to remove ~~dried or~~ baked on greases and/or ~~food~~ deposits from ~~oven walls~~ food preparation and/or food cooking surfaces. A product that is labeled as an "Oven or Grill Cleaner" that makes claims that it is suitable for degreasing other hard surfaces is a "General Purpose Degreaser." A product that is labeled as an "Oven or Grill Cleaner" that makes claims that it is suitable for cleaning other hard surfaces is a "General Purpose Cleaner."

(113) "Paint" means any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate in a thin layer which is converted to an opaque solid film after application and is used for protection, decoration or identification, or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics.

(114) "Paint Remover or Stripper" means any product designed to strip or remove paints or other related coatings, by chemical action, from a substrate without markedly affecting the substrate. "Paint Remover or Stripper" does not include "Multi-purpose Solvent," paint brush cleaners, products designed and labeled exclusively as "Graffiti Remover," and hand cleaner products that claim to remove paints and other related coatings from skin.

(115) "Paint Thinner" means any liquid product used for reducing the viscosity of coating compositions or components, that prominently displays the term "Paint Thinner," "Lacquer Thinner," "Thinner," or "Reducer" on the front panel of its packaging. "Paint Thinner" does not include any of the following products:

(A) "Artist's Solvent/Thinner;"

(B) products that are sold in containers with a capacity of 5 gallons or more and labeled exclusively for the thinning of Industrial Maintenance Coatings, Zinc-Rich Primers, or High Temperature Coatings;

(C) products labeled and used exclusively as an ingredient in a specific coating or coating brand line, whereby the coating would not be complete or useable without the specific ingredient;

(D) products that meet both of the following criteria:

1. the Principle Display Panel of the product displays, in a font size as large as, or larger than, the font size of all other words on the panel, language that the product is used exclusively for the thinning of Industrial Maintenance Coatings, Zinc-Rich Primers, or High Temperature Coatings, and

2. no representation is made anywhere on the product container or packaging, or any label or sticker attached thereto, that the product is suitable for use or may be used for any other purpose except the thinning of Industrial Maintenance Coatings, Zinc-Rich Primers, or High Temperature Coatings.

(116) "Penetrant" means a lubricant designed or labeled primarily to loosen metal parts that have bonded together due to rusting, oxidation, or other causes. "Penetrant" does not include "Multi-purpose Lubricant" that claim to have penetrating qualities, but are not labeled primarily to loosen bonded parts.

(117) "Person" shall have the same meaning as defined in Health and Safety Code Section 39047.

(118) "Personal Fragrance Product" means any product which is applied to the human body or clothing for the primary purpose of adding a scent or masking a malodor, including, but not limited to, cologne, perfume, aftershave, toilet water, lotion, powder, body mist, and body spray. "Personal Fragrance Product" does not include: (A) Deodorant, as defined in section 94501(d); (B) medicated products designed primarily to alleviate fungal or bacterial growth on feet or other areas of the body; (C) mouthwashes, breath fresheners and deodorizers; (D) lotions, moisturizers, powders or other skin care products designed or labeled to be used primarily to alleviate skin conditions such as dryness and irritations; (E) products designed exclusively to be applied to human genitalia areas, undergarments, and any paper products, napkins or other products that are affixed to undergarments, such as sanitary pads; (F) soaps, shampoos, and products primarily used to clean the human body; and (G) fragrance products designed to be used exclusively on non-human animals.

(119) "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.

(120) "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."

(121) "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."

(122) "Product Brand Name" means the name of the product exactly as it appears on the principal display panel of the product.

(123) "Product Category" means the applicable category which best describes the product as listed in this Section 94508.

(124) "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

(125) "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.

(126) "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.

(127) "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.

(128) "Restricted Materials" means pesticides established as restricted materials under Title 3, California Code of Regulations, section 6400.

(129) "Retailer" means any person who sells, supplies, or offers consumer products for sale directly to consumers.

(130) "Retail Outlet" means any establishment at which consumer products are sold, supplied, or offered for sale directly to consumers.

(131) "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).

(132) "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.

(133) "Sanitizer" means a product that is labeled as a "sanitizer," or is labeled to reduce, but not necessarily eliminate, microorganisms in the air, on surfaces, or on inanimate objects, and whose label is registered as a "sanitizer" under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA; 7 U.S.C. section 136 et seq.). Products that are labeled as both a "sanitizer" and a "disinfectant" are considered disinfectants. "Sanitizer" does not include (A) "Disinfectant," (B) products labeled solely for use on humans or animals, (C) products labeled solely for agricultural use, (D) products labeled solely for use in swimming pools, therapeutic tubs, or hot tubs, (E) products which are labeled to be used on heat

sensitive critical or semi-critical medical devices or medical equipment surfaces, (F) products which are pre-moistened wipes or towelettes sold exclusively to medical, convalescent or veterinary establishments (G) products which are labeled to be applied to food-contact surfaces and are not required to be rinsed prior to contact with food, or (H) products which are labeled as "Bathroom and Tile Cleaner," "Glass Cleaner," "General Purpose Cleaner," "Toilet/Urinal Care Product," "Metal Polish," "Carpet Cleaner," or "Fabric Refresher" that may also make sanitizing or anti-microbial claims on the label.

(134) "Sealant or Caulking Compound" means any product with adhesive properties that is designed to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces. "Sealant or Caulking Compound" does not include pipe thread sealants or pipe joint compounds; roof cements and roof sealants; insulating foams; removable caulking compounds; clear/paintable/water resistant caulking compounds; floor seam sealers; products designed exclusively for automotive uses; or sealers that are applied as continuous coatings. "Sealant or Caulking Compound" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. For the purposes of this definition only:

"Removable caulking compounds" means a compound which temporarily seals windows or doors for three to six month time intervals.

"Clear/paintable/water resistant caulking compounds" means a compound which contains no appreciable level of opaque fillers or pigments; transmits most or all visible light through the caulk when cured; is paintable; and is immediately resistant to precipitation upon application.

"Sealant or Caulking Compound" is divided into two subcategories:

(A) "Chemically Curing Sealant or Caulking Compound" means any "Sealant or Caulking Compound" which achieves its final composition and physical form through a chemical curing process, where product ingredients participate in a chemical reaction in the presence of a catalyst that causes a change in chemical structure and leads to the release of chemical byproducts. "Chemically Curing Sealant or Caulking Compound" includes, but is not limited to, products that utilize silicone, polyurethane, silyl-terminated polyether, or silyl-terminated polyurethane reactive chemistries. "Chemically Curing Sealant or Caulking Compound" does not include products which are not solely dependent on a chemically curing process to achieve the cured state.

(B) "Non-Chemically Curing Sealant or Caulking Compound" means any "Sealant or Caulking Compound" not defined under "Chemically Curing Sealant or Caulking Compound."

(135) "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.

(136) "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."

(137) "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."

(138) "Silicone-based Multi-purpose Lubricant" means any lubricant which is:

(A) designed ~~and~~ or labeled to provide lubricity primarily through the use of silicone compounds including, but not limited to, polydimethylsiloxane, and

(B) designed ~~and~~ or 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.

(139) "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.

(140) "Solid" means a substance or mixture of substances which, either whole or subdivided (such as the particles comprising a powder), is not capable of visually detectable flow as determined under ASTM D-4359-90 (May 25, 1990) Standard Test Method for Determining Whether a Material Is a Liquid or a Solid, which is incorporated by reference herein.

(141) "Special-purpose Lubricant" means any lubricant that is designed or labeled as: a cutting or tapping oil; an anti-seize product; an open gear, chain or wire lubricant; or a rust preventative and/or rust control product that makes a lubricating claim. "Special-purpose Lubricant" does not include products that: (A) contain silicone compounds as the sole lubricating agent; (B) products labeled to provide lubricity solely by depositing a thin film of graphite, molybdenum disulfide, or polytetrafluoroethylene or closely related fluoropolymer ("teflon"); or (C) products designed and labeled exclusively to release manufactured products from molds. "Special-purpose Lubricant" also does not include "Multi-purpose Lubricant," "Silicone-based Multi-purpose Lubricant," or "Penetrant." A "Lubricant" product that makes claims that it is suitable for multiple applications that are different than those of a "Special-purpose Lubricant" is a "Multi-purpose Lubricant."

(~~141~~ 142) "Special Purpose Spray Adhesive" means an aerosol adhesive that meets any of the following definitions:

(A) "Mounting Adhesive" means an aerosol adhesive designed to permanently mount photographs, artwork, and any other drawn or printed media to a backing (paper, board, cloth, etc.) without causing discoloration to the artwork.

(B) "Flexible Vinyl Adhesive" means an aerosol adhesive designed to bond flexible vinyl to substrates. Flexible vinyl means a nonrigid polyvinyl chloride plastic with at least five percent, by weight, of plasticizer content. A plasticizer is a material, such as a high boiling point organic solvent, that is incorporated into a vinyl to increase its flexibility, workability, or distensibility, and may be determined using ASTM Method E260-91 (Jan. 25, 1991) Standard Practice for Packed Column Gas Chromatography, which is incorporated by reference herein, or from product formulation data.

(C) "Polystyrene Foam Adhesive" means an aerosol adhesive designed to bond polystyrene foam (e.g. Styrofoam®, expanded polystyrene foam, etc.) to substrates.

(D) "Automobile Headliner Adhesive" means an aerosol adhesive designed to bond together layers in motor vehicle headliners.

(E) "Polyolefin Adhesive" means an aerosol adhesive designed to bond polyolefins (e.g. polyethylene, polypropylene, etc.) to substrates.

(F) "Laminate Repair/Edgebanding Adhesive" means an aerosol adhesive designed for:

1. the touch-up or repair of items laminated with high pressure laminates (e.g. lifted edges, delaminations, etc.), or for
2. the touch-up, repair, or attachment of edgebanding materials, including, but not limited to, other laminates, synthetic marble, veneers, wood moulding, and decorative metals.

For the purposes of this definition "high pressure laminate" means sheet materials which consist of paper, fabric, or other core material that have been laminated at temperatures exceeding 265 degrees F, and at pressures between 1,000 and 1,400 psi.

(G) "Automotive Engine Compartment Adhesive" means an aerosol adhesive designed for use in motor vehicle under-the-hood applications which require oil and plasticizer resistance, as well as high shear strength, at temperatures of 200-275° F.

(~~142~~ 143) "Spot Remover" means any product labeled to clean localized areas, or remove localized spots or stains on cloth or fabric such as drapes, carpets, upholstery, or clothing, that ~~does~~ may or may not require subsequent laundering to achieve stain removal. "Spot Remover" includes spotting agents used by commercial dry cleaning and "laundering" operations. "Spot Remover" does not include ~~"Dry Cleaning Fluid,"~~ "Laundry Prewash~~,~~" or aerosol products labeled solely for gum removal.

(~~143~~ 144) "Spray Buff Product" means a product designed to restore a worn floor finish in conjunction with a floor buffing machine and special pad.

(~~144~~ 145) "Table B Compound" means any carbon-containing compound listed as an exception to the definition of VOC in Section 94508.

(~~145~~ 146) "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."

(~~146~~ 147) "Terrestrial" means to live on or grow from land.

(~~147~~ 148) "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.

(~~148~~ 149) "Tire Sealant and Inflator" means any pressurized product that is designed to temporarily inflate and seal a leaking tire.

(~~149~~ 150) "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."

(~~150~~ 151) "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.

(~~151~~ 152) "Type B Propellent" means any halocarbon which is used as a propellent including chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs).

(~~152~~ 153) "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).

(~~153~~ 154) "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.

(~~154~~ 155) "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.

(~~155~~ 156) "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).

(~~156~~ 157) "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).

(~~157~~ 158) "Wasp ~~and~~ or 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.

(~~158~~ 159) "Waterproofer" means a product designed and labeled exclusively to repel water from fabric or leather substrates. "Waterproofer" does not include "Fabric Protectant."

(~~159~~ 160) "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.

(~~160~~ 161) "Web Spray Adhesive" means any aerosol adhesive which is not a "Mist Spray Adhesive" or "Special Purpose Spray Adhesive."

(~~161~~ 162) "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."

(~~162~~ 163) "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.

(~~163~~ 164) "Zinc-Rich Primer" means a coating that meets all the following specifications: (A) coating contains at least 65 percent metallic zinc powder or zinc dust by weight of total solids; and (B) coating is formulated for application to metal substrates to provide a firm bond between the substrate and subsequent applications of coatings; and (C) coating is intended for professional use only and labeled "For Professional Use Only;" "For Industrial Use Only;" "Not for residential use;" or "Not intended for residential use."

NOTE: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38562, 38580, 39600, 39601 and 41712, Health and Safety Code. Reference: Sections 38501, 38510, 38560, 38560.5, 38562, 38580, 39002, 39600, 40000 and 41712, Health and Safety Code.

§ 94509. Standards for Consumer Products.

(a) Except as provided in Sections 94510 (Exemptions), 94511 (Innovative Products), 94514 (Variances), 94540 through 94555 (Alternative Control Plan), and 94567(a)(1) (Hairspray Credit Program), Title 17, California Code of Regulations, no person shall sell, supply, offer for sale, or manufacture for sale in California any consumer product which, at the time of sale or manufacture, contains volatile organic compounds in excess of the limits specified in the following Table of Standards after the specified effective dates.

Table of Standards
Percent Volatile Organic Compound by Weight

Product Category	***Effective Date*** [1]	***VOC Standard*** [2]
Adhesive *:		
Aerosol**	1/1/95	75
Mist Spray Adhesive**	1/1/2002	65
Web Spray Adhesive**	1/1/2002	55
Special Purpose Spray Adhesive**		
Mounting, Automotive Engine Compartment, and Flexible Vinyl Adhesive	1/1/2002	70

Polystyrene Foam and Automobile Headliner Adhesive	1/1/2002	65
Polyolefin and Laminate Repair/Edgebanding Adhesive	1/1/2002	60
[**See subsection 94509~~(i)~~(m)(1), and sections 94512(d), and 94513(d) for additional requirements that apply to aerosol adhesive.]		
Construction, Panel, and Floor Covering[#]	1/1/95 12/31/2002 12/31/2008	40 15 7
[#See section 94509(k) for the effective date of the VOC limit for certain types of "Construction, Panel, and Floor Covering Adhesive, and subsection 94509~~(p)~~(m)(1) for additional requirements that apply to Construction, Panel, and Floor Covering Adhesive.]		
Contact[##]	1/1/95	80
Contact Adhesive – General Purpose	12/31/2006	55
Contact Adhesive – Special Purpose	12/31/2006	80
[##See subsections 94509(m)(1) and section 94512(d) for additional requirements that apply to Contact Adhesive.]		
General Purpose	1/1/95	10
*See section 94510(i) for an exemption that applies to adhesives ~~sold in containers of one fluid ounce or less~~.		
Adhesive Remover*:		
Floor or Wall Covering Adhesive Remover	12/31/2006	5
Gasket or Thread Locking Adhesive Remover	12/31/2006	50
General Purpose Adhesive Remover	12/31/2006	20
Specialty Adhesive Remover	12/31/2006	70
[*See subsections 94509~~(n)~~(m)(1) and section 94512(d) for additional requirements that apply to Adhesive Remover.]		
Aerosol Cooking Spray	1/1/95	18
Air Freshener*:		

Double Phase Aerosol** ~~[*See section 94509(t) for additional requirements that apply to Double Phase Aerosol Air Freshener.]~~	1/1/93 12/31/2004 12/31/2012	30 25 20
Single Phase Aerosol	1/1/93 1/1/96	70 30
Dual Purpose Air Freshener/Disinfectant aerosol	1/1/94	60
liquid/pump spray	1/1/93	18
solid/semisolid	1/1/93	3
[*See sections 94510(f) and 94510(g)(2) for exemptions that apply to certain Air Fresheners, and subsection 94509~~(o)~~(m)(2) for additional requirements that apply to Air Freshener (solid).] [**See section 94509(n) for additional requirements that apply to Double Phase Aerosol Air Freshener.]		
Anti-static Product: aerosol	12/31/2008	80
~~non-aerosol~~ nonaerosol	12/31/2006	11
Astringent/Toner ~~(Non-FDA regulated)~~	12/31/2010	35
Automotive Rubbing or Polishing Compound all forms	1/1/2005	17
Automotive Wax/Polish/Sealant/Glaze: all other forms	1/1/2005	15
hard paste wax	1/1/2005	45
instant detailer	1/1/2001	3
Automotive Windshield Washer Fluid: Type "A" areas*	1/1/93 12/31/2008	35 25
All other areas**	1/1/93 12/31/2002	10 1
**See section 94508(a)(~~19~~ 20), section 94508(a)(~~20~~ 21), and section 94509(l) for provisions that apply to Automotive Windshield Washer Fluid.		

* Type "A" areas include only the following: Del Norte, Shasta and Trinity Counties; the Great Basin Valley, Lake Tahoe, Mountain Counties, and Northeast Plateau Air Basins, as defined in Title 17, California Code of Regulations, Sections 60105, 60108, 60111, and 60113.		
Bathroom and Tile Cleaner*: aerosol all other forms ~~non-aerosol~~ nonaerosol [*See subsection 94509~~(p)~~(m)(1) for additional requirements that apply to Bathroom and Tile Cleaner.]	 1/1/94 1/1/94 12/31/2008	 7 5 1
Brake Cleaner* [*See subsection 94509(m)(1) for additional requirements that apply to Brake Cleaner]	1/1/97 12/31/2002 12/31/2008 12/31/2010	50 45 20 10
Bug and Tar Remover	1/1/2002	40
Carburetor or Fuel-injection Air Intake Cleaner ** **See section 94509(k) for the effective date of the VOC limit for Carburetor or Fuel-injection Air Intake Cleaner and see subsection 94509(m)(1) for additional requirements that apply to Carburetor or Fuel-injection Air Intake Cleaner.	1/1/95 12/31/2002 12/31/2008 12/31/2010	75 45 20 10
Carpet /Upholstery Cleaner*: aerosol ~~non-aerosol~~ nonaerosol (dilutable) ~~non-aerosol~~ nonaerosol (ready-to-use) [*See subsection 94509~~(q)~~(m)(1) for additional requirements that apply to Carpet/Upholstery Cleaner]	 1/1/2001 12/31/2010 1/1/2001 1/1/2001 12/31/2010	 7 5 0.1 3 1
Charcoal Lighter Material	See Section 94509(h)	

Disinfectant: aerosol --- ~~non-aerosol~~ nonaerosol	12/31/2008 --- 12/31/2008	70 --- 1
Dusting Aid: aerosol --- ~~non-aerosol~~ nonaerosol	1/1/95 1/1/97 12/31/2010 --- 1/1/95 12/31/2010	35 25 17 --- 7 3
Electrical Cleaner* ========== [*See subsections 94509~~(n)~~(m(1)) and section 94512(d) for additional requirements that apply to Electrical Cleaner.]	12/31/2006 ==========	45 ==========
Electronic Cleaner* ========== [*See subsections 94509(m) and section 94512(d) for additional requirements that apply to Electronic Cleaner.]	12/31/2007 ==========	75 ==========
Engine Degreaser*: --- aerosol --- ~~non-aerosol~~ nonaerosol ========== [*See subsection 94509(m)(1) for additional requirements that apply to Engine Degreaser]	1/1/93 1/1/96 --- 12/31/2004 12/31/2010 --- 12/31/2004	75 50 --- 35 10 --- 5
Fabric Protectant* aerosol --- ~~non-aerosol~~ nonaerosol ========== [*See subsection 94509~~(q)~~(m)(1) for additional requirements that apply to Fabric Protectant]	1/1/95 1/1/97 --- 1/1/95 1/1/97 12/31/2010 ==========	75 60 --- 75 60 1 ==========
Fabric Refresher: aerosol --- ~~non-aerosol~~ nonaerosol	12/31/2006 --- 12/31/2006	15 --- 6
Fabric Softener – Single Use Dryer Product	See Section 94509~~(s)~~(o)	

Floor Maintenance Product	12/31/2010	1
Floor Polish or Wax: Resilient Flooring Material	1/1/94 12/31/2010	7 1
Nonresilient Flooring Material	1/1/94 12/31/2010	10 1
Wood Floor Wax	1/1/94 12/31/2010	90 70
Floor Wax Stripper: ~~non-aerosol~~ nonaerosol	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 subsection 94509(m)(1) for additional requirements that apply to Footwear or Leather Care Product.]		
Furniture Maintenance Product*: aerosol	1/1/94 12/31/2004 12/31/2013	25 17 12
all other forms (except solid/paste forms)	1/1/94	7
~~non-aerosol~~ nonaerosol (except solid/paste forms)	12/31/2008	3
[*See section 94509(n) for additional requirements that apply to Furniture Maintenance Product.]		
General Purpose Cleaner*: aerosol and ~~non-aerosol~~ nonaerosol	1/1/94	10
aerosol	12/31/2008	8
~~non-aerosol~~ nonaerosol	12/31/2004 12/31/2012	4 0.5
[*See subsections 94509~~(p)~~(m)(1) and (m)(3) for additional requirements that apply to General Purpose Cleaner.]		

General Purpose Degreaser*: aerosol --- ~~non-aerosol~~ nonaerosol ========== [*See subsections 94509(m)(1) and (m)(3) for additional requirements that apply to General Purpose Degreaser.]	1/1/2002 12/31/2008 12/31/2010 --- 12/31/2004 12/31/2012 ==========	50 20 10 --- 4 0.5 ==========
Glass Cleaner*: aerosol --- ~~non-aerosol~~ nonaerosol ========== [*See subsection 94509(m)(3) for additional requirements that apply to nonaerosol Glass Cleaner]	1/1/93 12/31/2012 --- 1/1/93 1/1/96 12/31/2004 12/31/2012	12 10 --- 8 6 4 3
Graffiti Remover*: aerosol --- ~~non-aerosol~~ nonaerosol ========== [*See subsection 94509~~(n)~~(m)(1) for additional requirements that apply to Graffiti Remover.]	12/31/2006 --- 12/31/2006 ==========	50 --- 30 ==========
Hair Mousse	1/1/94 12/31/2002	16 6
Hair Shine	1/1/2005	55
Hair Spray	1/1/93 6/1/99	80 55
Hair Styling Gel	1/1/94	6
Hair Styling Product: aerosol and pump spray --- all other forms	12/31/2006 --- 12/31/2006	6 --- 2
Heavy-duty Hand Cleaner or Soap* all forms nonaerosol ========== [*See subsection 94509(m)(3) for additional requirements that apply to nonaerosol Heavy-duty Hand Cleaner or Soap]	1/1/2005 12/31/2013	8 1

Insect Repellent: aerosol	1/1/94	65
Insecticide*: Crawling Bug Insecticide (all forms): aerosol Flea and Tick Insecticide Flying Bug Insecticide (all forms) **: aerosol Fogger Lawn ~~and~~ or Garden Insecticide (all forms) ~~non-aerosol~~ nonaerosol Wasp ~~and~~ or Hornet Insecticide** [*See sections 94510(g)(1) and 94510(k) for exemptions that apply to certain insecticides.] [**See subsection 94509(n) for additional requirements that apply to Flying Bug and Wasp or Hornet Insecticide]	1/1/95 1/1/98 12/31/2004 1/1/95 1/1/95 12/31/2003 12/31/2013 1/1/95 1/1/95 12/31/2003 1/1/2005 12/31/2013	40 20 15 25 35 25 20 45 20 3 40 10
Laundry Prewash: aerosol/solid all other forms	1/1/94 1/1/94	22 5
Laundry Starch/Sizing/Fabric Finish Product:	1/1/95 1/31/2008	5 4.5
Metal Polish~~/~~ or Cleanser*: aerosol ~~non-aerosol~~ nonaerosol [*See sections sub94509(m)(1) and 94509(n) for additional requirements that apply to Metal Polish or Cleanser.]	1/1/2005 12/31/2012 12/31/2012	30 15 3
Motor Vehicle Wash ~~non-aerosol~~ nonaerosol	12/31/2010	0.2

Multi-purpose Lubricant: (excluding solid or semisolid products) ========== [*See subsections 94509~~(q)~~(m)(1) and section 94513(f) for additional requirements that apply to Multi-purpose Lubricant.]	1/1/2003 12/31/2013 12/31/2015 ==========	50 25 10 ==========
Multi-purpose Solvent* ========== [*See subsections 94509~~(u)~~(m)(1), (n), and (p)~~,~~; 94512(e), and 94513(g) for additional requirements that apply to Multi-purpose Solvent.]	12/31/2010 12/31/2013 ==========	30 3 ==========
Nail Polish Remover	1/1/94 1/1/96 12/31/2004 12/31/2007	85 75 0 1
Non-selective Terrestrial Herbicide: ~~non-aerosol~~ nonaerosol	1/1/2002	3
Odor Remover/Eliminator aerosol --- ~~non-aerosol~~ nonaerosol	12/31/2010 --- 12/31/2010	25 --- 6
Oven or Grill Cleaner*: aerosol/pump spray aerosol --- liquid --- ~~non-aerosol~~ nonaerosol ~~(including pump spray and liquid)~~ ========== [*See subsection 94509(q) for the effective date of the VOC limit for certain types of Oven or Grill Cleaner products and [~~*See~~ subsection 94509~~(p)~~(m)(1) and (m)(3) for additional requirements that apply to Oven or Grill Cleaner.]	1/1/93 1/1/93 --- 1/1/93 --- 12/31/2008 [effective date] ==========	8 8 --- 5 --- 1 4 ==========
Paint Remover or Stripper	1/1/2005	50
Paint Thinner* ========== [*See subsections 94509~~(u)~~(m)(1),(n), and (p)~~,~~; ~~94510(m),~~ 94512(e), and 94513(g) for additional requirements that apply to Paint Thinner. See	12/31/2010 12/31/2013 ==========	30 3 ==========

subsection 94510(m) for an exemption that applies to Paint Thinner.]		
Penetrant* [*See subsection 94509~~(q)~~(m)(1) and subsection 94513(f) for additional requirements that apply to Penetrant]	1/1/2003 12/31/2013	50 25
Personal Fragrance Product*: products with 20% or less fragrance products with more than 20% fragrance *See sections 94510(h), 94510(j), and 94510(l) for exemptions and requirements that apply to Personal Fragrance Product.	1/1/95 1/1/99 1/1/95 1/1/99	80 75 70 65
Pressurized Gas Duster* [*See sections 94509~~(r)~~(n) and 94510(c) for additional provisions that apply to Pressurized Gas Duster]	12/31/2010	1
Rubber /Vinyl Protectant: aerosol ~~non-aerosol~~ nonaerosol	1/1/2005 1/1/2003	10 3
Sanitizer: aerosol ~~non-aerosol~~ nonaerosol	12/31/2008 12/31/2008	70 1
Sealant or Caulking Compound* all forms Chemically Curing ~~non-aerosol~~ nonaerosol Non-chemically Curing ~~non-aerosol~~ nonaerosol [*See subsections 94509~~(q)~~(m)(1) and section 94512(d) for additional requirements that apply to Sealant or Caulking Compound.]	12/31/2002 12/31/2012 12/31/2010	4 3 1.5
Shaving Cream	1/1/94	5

Shaving Gel	12/31/2006 12/31/2009	7 4
Silicone-based Multi-purpose Lubricant* (excluding solid or semisolid products) ========== [*See subsection 94509(m)(1) for additional requirements that apply to Silicone-based Multi-purpose Lubricant.]	1/1/2005	60
Special-purpose Lubricant*: aerosol ---------- nonaerosol ========== [*See sections 94509(m) and 94509(n) for additional requirements that apply to Special-purpose Lubricant.]	12/31/2012 ---------- 12/31/2012 ==========	25 ---------- 3 ==========
Spot Remover*: aerosol ---------- ~~non-aerosol~~ nonaerosol ========== [*See subsections 94509~~(q)~~(m)(1) and 94509(n) for additional requirements that apply to Spot Remover.]	1/1/2001 12/31/201~~0~~2 ---------- 1/1/2001 12/31/201~~0~~2 ==========	25 15 ---------- 8 3 ==========
Temporary Hair Color: Aerosol	12/31/2010	55
Tire or Wheel Cleaner aerosol ---------- ~~non-aerosol~~ nonaerosol	12/31/2010 ---------- 12/31/2010	8 ---------- 2
Tire Sealant and Inflator	12/31/2002	20
Toilet/Urinal Care Product*: aerosol ---------- ~~non-aerosol~~ nonaerosol ========== [*See subsection 94509~~(o)~~(m)(2) for additional requirements that apply to Toilet/Urinal Care Product]	12/31/2006 ---------- 12/31/2006 ==========	10 ---------- 3 ==========
Undercoating: Aerosol	1/1/2002	40
Windshield Water Repellent	12/31/2010	75
Wood Cleaner: aerosol ---------- ~~non-aerosol~~ nonaerosol	12/31/2006 ---------- 12/31/2006	17 ---------- 4

[1] See section 94509(d) for the effective date of the VOC standards for products registered under FIFRA, and section 94509(c) and (d) for the "sell-through" allowed for products manufactured prior to the effective date of standards.

[2] See section 94510(c) for an exemption that applies to fragrances in consumer products, and section 94510(d) for an exemption that applies to LVP-VOCs.

(b) *Products that are diluted prior to use*

(1) Except for "Automotive Windshield Washer Fluid (Dilutable)," for consumer products for which the label, packaging, or accompanying literature specifically states that the product should be diluted with water or non-VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the minimum recommended dilution has taken place. For purposes of this subsection (b), "minimum recommended dilution" shall not include recommendations for incidental use of a concentrated product to deal with limited special applications such as hard-to-remove soils or stains.

(2) For consumer products for which the label, packaging, or accompanying literature states that the product should be diluted with any VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the maximum recommended dilution has taken place.

(3) For "Automotive Windshield Washer Fluids (Dilutable)" for which the front panel of the product label specifically states that the product should be diluted (e.g. identified as a "concentrate") prior to use;

(A) the VOC limits specified in section 94509(a) shall apply to the product only after the minimum recommended dilution has taken place;

(B) for the purpose of complying with the VOC limits specified in section 94509(a), different dilution instructions for "Type A areas" and other areas of California may be specified on the product label if the dilution instructions meet the following criteria:

1. The instructions are readily visible, and

2. The instructions can be easily understood by the consumer, and

3. The instructions clearly specify the recommended dilutions to apply in "Type A areas" and in other areas of California, and

If the dilution instructions specified on the product label meet these criteria, the VOC limits specified in section 94509(a) shall apply to the product only after the minimum recommended dilution has taken place for the area in which the product is sold, supplied, or offered for sale.

(4) For products sold in pump spray containers, the VOC limits specified in section 94509(a) shall apply to the product prior to any minimum recommended dilution.

(c) *Sell-through of products.*

(1) *Sell-through period.* Notwithstanding the provisions of Sections 94509(a), ~~or~~ 94509(j), or 94509(o), a consumer product manufactured prior to each of the effective dates specified for that product in the Table of Standards may be sold, supplied, or offered for sale for up to three years after each of the specified effective dates. This subsection (c) does not apply to:

(A) any consumer product that does not display on the product container or package the date on which the product was manufactured, or a code indicating such date, or

(B) any consumer product on which the manufacturer has used a code indicating the date of manufacture that is different than the code specified in section 94512(b)(2), but an explanation of the code has not been filed with the ARB Executive Officer by the deadlines specified in section 94512(c)(1) or section 94512(c)(2), or

(C) Solid "Air Fresheners" and "Toilet/Urinal Care Product" that contain para-dichlorobenzene; these products are subject to the one-year sell-through period specified in section 94509~~(e)~~(m)(2).

(D) Products contained in multi-unit packages, as specified below:

1. Subsection (c)(1) does not apply to any individual consumer products unit contained within a multi-unit package that is produced or assembled after January 1, 2006, where the multi-unit package does not display the date(s) or date-code(s) of the individual product units, or display the date of assembly, such that the displayed information is not readily observable without irreversibly disassembling any portion of the container or packaging.

2. For the purposes of this section, "date of assembly" means the date that the individual product units are assembled into the finished multi-unit package.

3. For multi-unit packages that display the "date of assembly" instead of the date(s) or date-code(s) of the individual product units, the "date of assembly" shall be the "date of manufacture" for all of the product units contained within the multi-unit package. In other words, all of the product units shall be deemed to have been manufactured on the date these units are assembled into the multi-unit package, even if the individual product units show different date(s) or date-code(s).

(2) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product subject to the Table of Standards in section 94509 must notify the purchaser of the product in writing of the date on which the sell-through period for that product will end, provided, however, that this notification must be given only if all of the following conditions are met:

(A) the product is being sold or supplied to a distributor or retailer;

(B) the sell-through period for the product will expire 6 months or less from the date the product is sold or supplied;

(C) the product does not comply with the lowest VOC standard that applies on the date the sell-through period ends; and

(D) the product is subject to a VOC standard with an effective date on or after December 31, 2004.

(d) *Products registered under FIFRA.* For those consumer products that are registered under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA; 7 U.S.C. Section 136-136y), the effective date of the VOC standards specified in subsection (a) is one year after the date specified in the Table of Standards. For those consumer products that are registered under FIFRA, the three year period provided in subsection (c) shall also begin one year after the date specified in the Table of Standards.

(e) *Products containing ozone-depleting compounds.* For any consumer product for which VOC standards are specified under subsection (a), no person shall sell, supply, offer for sale, or manufacture for sale in California any consumer product which contains any of the following ozone-depleting compounds:

CFC-11 (trichlorofluoromethane),
CFC-12 (dichlorodifluoromethane),
CFC-113 (1,1,1-trichloro-2,2,2-trifluoroethane),
CFC-114 (1-chloro-1,1-difluoro-2-chloro-2,2-difluoroethane),
CFC-115 (chloropentafluoroethane), halon 1211 (bromochlorodifluoromethane),
halon 1301 (bromotrifluoromethane), halon 2402 (dibromotetrafluoroethane),
HCFC-22 (chlorodifluoromethane),
HCFC-123 (2,2-dichloro-1,1,1-trifluoroethane),
HCFC-124 (2-chloro-1,1,1,2-tetrafluoroethane),
HCFC-141b (1,1-dichloro-1-fluoroethane),
HCFC-142b (1-chloro-1,1-difluoroethane), 1,1,1-trichloroethane, and carbon tetrachloride.

(f) The requirements of section 94509 (e) shall not apply to any existing product formulation that complies with the Table of Standards or any existing product

formulation that is reformulated to meet the Table of Standards, provided the ozone depleting compound content of the reformulated product does not increase.

(g) The requirements of section 94509 (e) shall not apply to any ozone depleting compounds that may be present as impurities in a consumer product in an amount equal to or less than 0.01% by weight of the product.

(h) *Requirements for charcoal lighter materials.* The following requirements shall apply to all charcoal lighter material products as defined in section 94508(a):

(1) *Regulatory Standards*

(A) In all areas of California except the South Coast Air Quality Management District, no person shall sell, supply, or offer for sale after January 1, 1993 any charcoal lighter material product unless at the time of the transaction:

1. the manufacturer or distributor of the charcoal lighter material has been issued a currently effective certification pursuant to subsection (h)(2).

2. the charcoal lighter material meets the formulation criteria and other conditions specified in the applicable Executive Order issued pursuant to subsection (h)(2).

3. the product usage directions for the charcoal lighter material are the same as those provided to the Executive Officer pursuant to subsection (h)(2)(C).

(B) In the South Coast Air Quality Management District, the regulatory standards specified in subsection (h)(1)(A) shall be applicable upon the effective date of this subsection.

(2) *Certification Requirements*

(A) No charcoal lighter material formulation shall be certified under this subsection unless the applicant for certification demonstrates to the Executive Officer's satisfaction that the VOC emissions from the ignition of charcoal with the charcoal lighter material are less than or equal to 0.020 pound of VOC per start, using the procedures specified in the South Coast Air Quality Management District Rule 1174 Ignition Method Compliance Certification Protocol, dated February 27, 1991 (the "SCAQMD Rule 1174 Testing Protocol"). The provisions relating to LVP-VOC in sections 94508(a) and 94510(d) shall not apply to any charcoal lighter material subject to the requirements of sections 94509(a) and (h).

(B) The Executive Officer may approve alternative test procedures which are shown to provide equivalent results to those obtained using the SCAQMD Rule 1174 Testing Protocol.

(C) A manufacturer or distributor of charcoal lighter material may apply to the Executive Officer for certification of a charcoal lighter material formulation in accordance with this subsection (h)(2). The application shall be in writing and shall include, at a minimum, the following:

1. the results of testing conducted pursuant to the procedures specified in SCAQMD Rule 1174 Testing Protocol.

2. the exact text and/or graphics that will appear on the charcoal lighter material's principal display panel, label, and any accompanying literature. The provided material shall clearly show the usage directions for the product. These directions shall accurately reflect the quantity of charcoal lighter material per pound of charcoal that was used in the SCAQMD Rule 1174 Testing Protocol for that product, unless:

   i) the charcoal lighter material is intended to be used in fixed amounts independent of the amount of charcoal used, such as certain paraffin cubes, or

   ii) the charcoal lighter material is already incorporated into the charcoal, such as certain "bag light," "instant light," or "match light" products.

3. For a charcoal lighter material which meets the criteria specified in subsection (h)(2)(C)(2.)(i), the usage instructions provided to the Executive Officer shall accurately reflect the quantity of charcoal lighter material used in the SCAQMD Rule 1174 Testing Protocol for that product.

4. Any physical property data, formulation data, or other information required by the Executive Officer for use in determining when a product

   modification has occurred and for use in determining compliance with the conditions specified on the Executive Order issued pursuant to section (h)(2).

(D) Within 30 days of receipt of an application, the Executive Officer shall advise the applicant in writing either that it is complete or that specified additional information is required to make it complete. Within 30 days of receipt of additional information, the Executive Officer shall advise the applicant in writing either that the application is complete, or that specified additional information or testing is still required before it can be deemed complete.

(E) If the Executive Officer finds that an application meets the requirements of this subsection (h)(2), then he or she shall issue an Executive Order certifying the charcoal lighter material formulation and specifying such conditions as are necessary to insure that the requirements of this subsection (h) are met. The Executive Officer shall act on a complete application within 90 days after the application is deemed complete.

(3) *Notice of Modifications*

For any charcoal lighter material for which certification has been granted pursuant to subsection (h)(2), the applicant for certification shall notify the Executive Officer in writing within 30 days of: (i) any change in the usage directions, or (ii) any change in product formulation, test results, or any other information submitted pursuant to subsection (h)(2) which may result in VOC emissions greater than 0.020 pound of VOC per start.

(4) *Revocation of Certification*

If the Executive Officer determines that any certified charcoal lighter material formulation results in VOC emissions from the ignition of charcoal which are greater than 0.020 pound of VOC per start, as determined by the SCAQMD Rule 1174 Testing Protocol and the statistical analysis procedures contained therein, the Executive Officer shall revoke or modify the certification as is necessary to assure that the charcoal lighter material will result in VOC emissions of less than or equal to 0.020 pound of VOC per start. The Executive Officer shall not revoke or modify the prior certification without first affording the applicant for the certification an opportunity for a hearing in accordance with the procedures specified in Title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 1, Article 4 (commencing with section 60040), to determine if the certification should be modified or revoked.

(5) Notwithstanding any other provision of this subsection 94509(h), charcoal lighter material products manufactured prior to January 1, 1993, may be sold, supplied, or offered for sale until July 1, 1994, in all areas of California except the South Coast Air Quality Management District. Charcoal lighter material products subject to SCAQMD Rule 1174 and sold, supplied, or offered for sale in the South Coast Air Quality Management District shall meet the requirements of section 94509(h) upon the effective date of this subsection, regardless of the date on which the products were manufactured.

(i) *Requirements for aerosol adhesives* (as defined in sections 94508(a)(1) and 94508(a)(3)).

(1) As specified in Health and Safety Code section 41712(h)(2), the standards for aerosol adhesives apply to all uses of aerosol adhesives, including consumer,

industrial, and commercial uses. Except as otherwise provided in sections 94509(c), 94510, 94511, and 94514, no person shall sell, supply, offer for sale, use or manufacture for sale in California any aerosol adhesive which, at the time of sale, use, or manufacture, contains VOCs in excess of the specified standard.

(2)(A) In order to qualify as a "Special Purpose Spray Adhesive" the product must meet one or more of the definitions for "Special Purpose Spray Adhesive" specified in section 94508(a), but if the product label indicates that the product is suitable for use on any substrate or application not listed in one of the definitions for "Special Purpose Spray Adhesive," then the product shall be classified as either a "Web Spray Adhesive" or a "Mist Spray Adhesive."

(B) If a product meets more than one of the definitions specified in section 94508(a) for "Special Purpose Spray Adhesive," and is not classified as a "Web Spray Adhesive" or "Mist Spray Adhesive" under subsection (2)(A), then the VOC limit for the product shall be the lowest applicable VOC limit specified in section 94509(a).

~~(3) Effective 1/1/2002, no person shall sell, supply, offer for sale, or manufacture for use in California any aerosol adhesive which contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene, except that an aerosol adhesive manufactured before 1/1/2002 may be sold, supplied, or offered for sale until 1/1/2005, so long as the product complies with product dating requirements in section 94512(b).~~

~~(4)~~(3) All aerosol adhesives must comply with the labeling requirements specified in section 94512(d), and all manufacturers and responsible parties for aerosol adhesives must comply with the special reporting requirements specified in section 94513(d).

(j) *Requirements for Floor Wax Strippers.* After an effective date of January 1, 2002, no person shall sell, supply, offer for sale, or manufacture for use in California any floor wax stripper unless the following requirements are met:

(1) The label of each non-aerosol floor wax stripper must specify a dilution ratio for light or medium build-up of polish that results in an as-used VOC concentration of 3 percent by weight or less.

(2) If a non-aerosol floor wax stripper is also intended to be used for removal of heavy build-up of polish, the label of that floor wax stripper must specify a dilution ratio for heavy build-up of polish that results in an as-used VOC concentration of 12 percent by weight or less.

(3) The terms "light build-up," "medium build-up" or "heavy build-up" are not specifically required, as long as comparable terminology is used.

(k) *Effective dates of the VOC limits for "Carburetor or Fuel-injection Air Intake Cleaners" and "Construction, Panel, and Floor Covering Adhesives.* " "The definitions for the product categories of "Carburetor or Fuel-injection Air Intake Cleaners" and "Construction, Panel, and Floor Covering Adhesives" were modified as part of the "Mid-term Measures II" rulemaking action that was considered by the Board in October 1999. As a result of these modifications, certain types of consumer products were included in these definitions that had not previously been included. For those consumer products that were included in these definitions for the first time as a result of the "Mid-term Measures II" rulemaking action, the VOC limits (in section 94509(a)) applicable to these newly included products shall not become legally effective until December 31, 2002.

(l) *Automotive Windshield Washer Fluids.* The provisions of subsection 94509(b)(1) shall not apply to "Automotive Windshield Washer Fluid (Pre-Mixed)" as defined in section 94508(a).

~~(m) *Requirements for Contact Adhesives, Electronic Cleaners, Footwear or Leather Care Products, and General Purpose Degreasers.*~~

~~(1) Except as provided below in sections 94509(m)(2) and (m)(4), effective December 31, 2005, no person shall sell, supply, offer for sale, or manufacture for use in California any Contact Adhesive, Electronic Cleaner, Footwear or Leather Care Product, or General Purpose Degreaser that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.~~

~~(2) *Sell-through of Products.* Contact Adhesives, Electronic Cleaners, Footwear or Leather Care Products, and General Purpose Degreasers that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2005, may be sold, supplied, or offered for sale until December 31, 2008, so long as the product complies with product dating requirements in section 94512(b).~~

~~(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(m)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2008, provided, however, that this notification must be given only if both of the following conditions are met:~~

~~(A) the product is sold or supplied to a distributor or retailer; and~~

~~(B) the product is sold or supplied on or after June 30, 2008.~~

~~(4) *Impurities.* The requirements of section 94509(m)(1) and (m)(3) shall not apply to any Contact Adhesive, Electronic Cleaner, Footwear or Leather Care Product, or General Purpose Degreaser containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.~~

(m) *Requirements limiting the use of specific toxic compounds in specific consumer products categories.*

(1) *Requirements for products listed in Table (m)(1).*

Except as provided below in sections 94509(m)(4) and (m)(6), after the applicable effective date specified in Table 94509(m)(1) for each product category, no person shall sell, supply, offer for sale, or manufacture for use in California any consumer product listed in Table 94509(m)(1) that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

[Note: Table 94509(m)(1), (m)(2), and (m)(3) are new tables. For clarity, the table and categories where the specified toxics have already been prohibited, along with the effective date and sell-through date, are not shown in an underline format. Only those categories where toxic compound prohibitions are being proposed in this rulemaking are shown in underline format with their respective effective date and sell-through date.]

Table 94509(m)(1)
Product Categories in which Use of Methylene Chloride Perchloroethylene, and Trichloroethylene is Prohibited

Product Category	Effective Date	Sell-through Date
Adhesive: Aerosol • Mist Spray Adhesive • Web Spray Adhesive • Special Purpose Spray Adhesive • Mounting, Automotive Engine Compartment, and Flexible Vinyl Adhesive • Polystyrene Foam and Automobile Headliner Adhesive • Polyolefin and Laminate Repair/Edgebanding Adhesive	1/1/2002	1/1/2005
Construction, Panel and Floor Covering	12/31/2008	12/31/2011
Contact	12/31/2005	12/31/2008

Adhesive Remover • Floor or Wall Covering Adhesive Remover • Gasket or Thread Locking Adhesive Remover • General Purpose Adhesive Remover • Specialty Adhesive Remover	12/31/2006	12/31/2009
Automotive Consumer Products: See the Airborne Toxic Control Measure For Emissions Of Chlorinated Toxic Air Contaminants From Automotive Maintenance And Repair Activities, section 93111, title 17, California Code of Regulations for additional requirements that apply to the Automotive Consumer Products: Brake Cleaner, Carburetor or Fuel Injection Air Intake Cleaner, Engine Degreaser, and General Purpose Degreaser - intended for use in automotive maintenance or repair activities.		
Bathroom and Tile Cleaner	12/31/2008	12/31/2011
Carpet/Upholstery Cleaner	12/31/2010	12/31/2013
Electrical Cleaner	12/31/2006	12/31/2009
Electronic Cleaner	12/31/2005	12/31/2008
Electronic Cleaner labeled as energized electronic equipment use only	12/31/2008	12/31/2011
Fabric Protectant	12/31/2010	12/31/2013
Footwear or Leather Care Product	12/31/2005	12/31/2008
General Purpose Cleaner	12/31/2008	12/31/2011
General Purpose Degreaser	12/31/2005	12/31/2008
Graffiti Remover	12/31/2006	12/31/2009
Metal Polish or Cleanser	12/31/2012	12/31/2015
Multi-purpose Lubricant	12/31/2010	12/31/2013
Multi-purpose Solvent	12/31/2010	12/31/2013
Oven or Grill Cleaner	12/31/2008	12/31/2011
Paint Thinner	12/31/2010	12/31/2013
Penetrant	12/31/2010	12/31/2013
Pressurized Gas Duster (Trichloroethylene is not prohibited)	12/31/2010	12/31/2011
Sealant or Caulking Compound	12/31/2010	12/31/2013
Silicone-based Multi-purpose Lubricant	12/31/2012	12/31/2015
Special-purpose Lubricant	12/31/2012	12/31/2015
Spot Remover	12/31/2012	12/31/2015

(2) *Requirements for products listed in Table (m)(2).*

Except as provided below in sections 94509(m)(4) after the applicable effective date specified in Table 94509(m)(2) for each product category, no person shall sell, supply, offer for sale, or manufacture for use in California any consumer product listed in Table 94509(m)(2) that contains para-dichlorobenzene.

Table 94509(m)(2)
Product Categories in which Use of Para-dichlorobenzene is Prohibited

Product Category	Effective Date	Sell-through Date
Air Freshener (solid)	12/31/2005	12/31/2006
Toilet/Urinal Care Products	12/31/2005	12/31/2006

(3) *Requirements for products listed in Table (m)(3).*

Except as provided below in sections 94509(m)(4) and (m)(6), after the applicable effective date specified in Table 94509(m)(3) for each product category, no person shall sell, supply, offer for sale, or manufacture for use in California any consumer product listed in Table 94509(m)(3) that contains an alkylphenol ethoxylate surfactant compound.

Table 94509(m)(3)
Product Categories in which Use of Alkylphenol Ethoxylate Surfactants is Prohibited

Product Category	Effective Date	Sell-through Date
General Purpose Cleaner (nonaerosol)	12/31/2012	12/31/2015
General Purpose Degreaser (nonaerosol)	12/31/2012	12/31/2015
Glass Cleaner (nonaerosol)	12/31/2012	12/31/2015
Heavy-duty Hand Cleaner or Soap (nonaerosol)	12/31/2013	12/31/2016
Oven or Grill Cleaner	12/31/2012	12/31/2015

(4) *Sell-through of Products.* Consumer products listed in Table 94509(m)(1), (m)(2), or (m)(3) that were manufactured before the specified effective date listed in Table 94509(m)(1), (m)(2), or (m)(3), may be sold, supplied, or offered for sale until the corresponding "sell-through" date listed in Table 94509(m)(1), (m)(2), or (m)(3), so long as the product complies with the product dating requirements in section 94512(b).

(5) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified listed in section 94509(m)(1), (m)(2), or (m)(3) must notify the purchaser of the product of the sell-through period dates, 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 within 6 months of the specified effective date.

(6) *Impurities.* The requirements of section 94509(m)(1) and (m)(5) shall not apply to any consumer product listed in Table 94509(m)(1) 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 complies with product dating requirements in section 94512(b).~~

~~(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(n)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2009, provided, however, that this notification must be given only if both of the following conditions are met:~~

~~(A) the product is sold or supplied to a distributor or retailer; and~~

~~(B) the product is sold or supplied on or after June 30, 2009.~~

~~(4) *Impurities.* The requirements of section 94509(n)(1) and (n)(3) shall not apply to any Adhesive Remover, Electrical Cleaner, or Graffiti Remover containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.~~

(n) *Requirements limiting the use of any chemical compound that has a Global Warming Potential (GWP) Value of 150 or greater.*

(1) *Requirements for products listed in Table (n)(1)*

Except as provided below in sections 94509(n)(2) and (n)(3), after the applicable effective date specified in Table 94509(n)(1), no person shall sell, supply, offer for sale, or manufacture for use in California any consumer product listed in Table 94509(n)(1) that contains any chemical compound that has a GWP Value of 150 or greater.

[Note: Table 94509(n) is a new table. For clarity, the table and categories where the use of global warming compounds has previously been limited, along with the effective date and sell-through date, are not shown in an underline format. Only those categories where limitations on use of global warming compounds are being proposed in this rulemaking are shown in underline format along with their respective effective date and sell-through date.]

Table 94509(n)(1)
Product Categories in which Use of Any Chemical Compound that has a Global Warming Potential (GWP) Value of 150 or Greater is Prohibited

Product Category	Effective Date	Sell-through Date
Double Phase Aerosol Air Freshener	12/31/2012	12/31/2015
Flying Bug Insecticide	12/31/20123	12/31/20156
Furniture Maintenance Product	12/31/20123	12/31/20156
Metal Polish or Cleanser	12/31/2012	12/31/2015
Multi-purpose Solvents	12/31/2010	12/31/2013
Paint Thinners	12/31/2010	12/31/2013
Pressurized Gas Duster	12/31/2010	12/31/2011
Special-purpose Lubricant	12/31/2012	12/31/2015
Spot Remover	12/31/2012	12/31/2015
Wasp or Hornet Insecticide	12/31/2013	12/31/2016

(2) *Sell-through of Products.* Consumer products listed in Table 94509(n)(1) that were manufactured before the specified effective date listed in Table 94509(n)(1), may be sold, supplied, or offered for sale until the corresponding "sell-through" date listed in Table 94509(n)(1), 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 listed in section 94509(n)(1) must notify the purchaser of the product of the sell-through period dates, 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 within 6 months of the specified effective date.

(4) *Impurities.* The requirements of section 94509(n)(1), (n(2); and (n)(3) shall not apply to any consumer product listed in Table 94509(n)(1) containing any chemical compound 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 those Solid Air Fresheners and Toilet/Urinal Care Products that contain para-dichlorobenzene and were manufactured before December 31, 2005 may be sold, supplied, or offered for sale until December 31, 2006, so long as the~~

~~product container or package displays the date on which the product was manufactured, or a code indicating such date.~~

~~(2) *Notification for products sold during the sell-through period.* Any person who sells or supplies any Solid Air Freshener or Toilet/Urinal Care Product that contains para-dichlorobenzene must notify the purchaser of the product in writing that the sell-through period for the product will end on December 31, 2006, provided, however, that this notification must be given only if both of the following conditions are met:~~

~~(A) the product is sold or supplied to a distributor or retailer; and~~

~~(B) the product is sold or supplied on or after June 30, 2006.~~

~~(p) *Requirements for Bathroom and Tile Cleaners, Construction, Panel, and Floor Covering Adhesives, electronic cleaners labeled as energized electronic equipment use only, General Purpose Cleaners, and Oven Cleaners.*~~

~~(1) Except as provided below in sections 94509(p)(2) and (p)(4), effective December 31, 2008, no person shall sell, supply, offer for sale, or manufacture for use in California any Bathroom and Tile Cleaner, Construction, Panel, and Floor Covering Adhesive, electronic cleaners labeled as energized electronic equipment use only, General Purpose Cleaner, or Oven Cleaner that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.~~

~~(2) *Sell-through of Products.* Bathroom and Tile Cleaners, Construction, Panel, and Floor Covering Adhesives, electronic cleaners labeled as energized electronic equipment use only, General Purpose Cleaners, and Oven Cleaners that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2008, may be sold, supplied, or offered for sale until December 31, 2011, so long as the product complies with the product dating requirements in section 94512(b)~~

~~(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(p)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2011, provided, however, that this notification must be given only if both of the following conditions are met:~~

~~(A) the product is sold or supplied to a distributor or retailer; and~~

~~(B) the product is sold or supplied on or after June 30, 2011.~~

~~(4) *Impurities.* The requirements of section 94509(p)(1) and (p)(3) shall not apply~~

to any Bathroom and Tile Cleaner, Construction, Panel, and Floor Covering Adhesive, electronic cleaner labeled as energized electronic equipment use only, General Purpose Cleaner, or Oven Cleaner containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(q) *Requirements for Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, and Spot Remover.*

(1) Except as provided below in sections 94509(q)(2), (q)(4), and (q)(5), effective December 31, 2010, no person shall sell, supply, offer for sale, or manufacture for use in California any Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, or Spot Remover that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products.* Carpet/Upholstery Cleaners, Fabric Protectants, Multi-Purpose Lubricants, Penetrants, Sealant or Caulking Compound and Spot Removers that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2010, may be sold, supplied, or offered for sale until December 31, 2013, so long as the product complies with the product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(q)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2013, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2013.

(4) *Impurities.* The requirements of section 94509(q)(1) and (q)(3) shall not apply to any Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, or Spot Remover containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(5) The requirements of this section 94509(q) shall not apply to "Penetrant" products used on equipment when electrical current exists; residual electrical potential from a component exists; or an open flame exists, as long as the "Principal Display Panel" clearly displays the statement: "Non-flammable: For use on energized equipment only."

~~(r) *Requirements for Pressurized Gas Duster.*~~

~~(1) Except as provided below in sections 94509(r)(2) and (r)(3), effective December 31, 2010, no person shall sell, supply, offer for sale, or manufacture for use in California any Pressurized Gas Duster product that contains methylene chloride, perchloroethylene, or any chemical compound that has a Global Warming Potential (GWP) Value of 150 or greater.~~

~~(2) *Sell-through of Products.* Pressurized Gas Duster products that contain any chemical compound that has a GWP Value greater than 150, and were manufactured before December 31, 2010, may be sold, supplied, or offered for sale until December 31, 2011, so long as the product complies with the product dating requirements in section 94512(b).~~

~~(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a Pressurized Gas Duster identified above in section 94509(r)(2) must notify the purchaser of the product, in writing, that the sell-through period for that product will end on December 31, 2011, provided, however, that this notification must be given only if both of the following conditions are met:~~

~~(A) the product is sold or supplied to a distributor or retailer; and~~

~~(B) the product is sold or supplied on or after June 30, 2011.~~

~~(4) The provisions relating to fragrance in section 94510(c) shall not apply to any Pressurized Gas Duster subject to the requirements of this subsection 94509(r).~~

~~(5) *Impurities.* The requirements of section 94509(r)(1), (r)(2), and (r)(3) shall not apply to any chemical compound that is present as an impurity in a combined amount equal to or less than 0.1% by weight.~~

~~(s)~~(o) *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)~~(o)(1).

~~(t) *Requirements for Double Phase Aerosol Air Freshener.*~~

~~(1) Except as provided below in sections 94509(t)(2) and (t)(4), effective December 31, 2012, no person shall sell, supply, offer for sale, or manufacture for use in California any Double Phase Aerosol Air Freshener that contains any chemical compound that has a Global Warming Potential (GWP) Value of 150 or greater.~~

~~(2) *Sell-through of Products.* Double Phase Aerosol Air Fresheners that contain any chemical compound that has a GWP Value of 150 or greater, and were manufactured before December 31, 2012, may be sold, supplied, or offered for sale until December 31, 2015, so long as the product complies with the product dating requirements in section 94512(b).~~

~~(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a Double Phase Aerosol Air Freshener identified above in section 94509(t)(2) must notify the purchaser of the product, in writing, that the sell-through period for that product will end on December 31, 2015, provided, however, that this notification must be given only if both of the following conditions are met:~~

~~(A) the product is sold or supplied to a distributor or retailer; and~~

~~(B) the product is sold or supplied on or after June 30, 2015.~~

~~(4) *Impurities.* The requirements of section 94509(t)(1), (t)(2), and (t)(3) shall not apply to any chemical compound that is present as an impurity in a combined amount equal to or less than 0.1% by weight.~~

~~(u)~~(p) *Additional ~~R~~requirements for Multi-purpose Solvent and Paint Thinner.*

(1) Except as provided below in sections 94509~~(u)~~(p)(2) ~~and (u)(4)~~, effective December 31, 2010, no person shall sell, supply, offer for sale, or manufacture for use in California any Multi-purpose Solvent or Paint Thinner that contains ~~any of the following:~~

~~(A) chemical compounds that have a Global Warming Potential (GWP) Value of 150 or greater;~~

~~(B) methylene chloride, perchloroethylene, or trichloroethylene;~~

~~(C)~~ greater than 1% Aromatic Compound content by weight.

(2) *Sell-through of Products.* Multi-purpose Solvents and Paint Thinners that contain ~~any chemical compound that has a GWP Value of 150 or greater; methylene chloride, perchloroethylene, or trichloroethylene; or~~ greater than 1% Aromatic Compound content by weight; and were manufactured before December 31, 2010, may be sold, supplied, or offered for sale until December 31, 2013, so long as the product complies with the product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509~~(u)~~(p)(2) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2013, provided, however, this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2013.

~~(4) *Impurities.* The requirements of section 94509(u)(1), (u)(2) and (u)(3) shall not apply to any Multi-purpose Solvent, or Paint Thinner that contains any of the following:~~

~~(A) chemical compounds that have a Global Warming Potential (GWP) Value of 150 or greater and are present as impurities in a combined amount equal to or less than 0.1% by weight;~~

~~(B) methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.~~

(q) *Effective dates of the VOC limits for "Oven or Grill Cleaner."* The definition for the "*Oven or Grill Cleaner*" product category was modified as part of a rulemaking action to amend the California Consumer Products Regulation that was considered by the Board in November 2010. As a result of this modification, grill cleaning products were included in this definition that had not previously been included. For those grill cleaning products that were included in this definition for the first time as a result this rulemaking action, the VOC limits (in section 94509(a)) applicable to these newly included products shall not become legally effective until December 31, 2012.

NOTE: Authority cited: Sections 38500, 38501, 38510, 38560, 38560.5, 38562, 38580, 39600, 39601, 39650, 39658, 39659, 39666 and 41712, Health and Safety Code. Reference: Sections 38505, 39002, 39600, 39650, 39655, 39656, 39658, 39659, 39666, 40000 and 41712, Health and Safety Code.

§ 94510. Exemptions.

(a) This article shall not apply to any consumer product manufactured in California for shipment and use outside of California.

(b) The provisions of this article shall not apply to a manufacturer or distributor who sells, supplies, or offers for sale in California a consumer product that does not comply with the VOC standards specified in Section 94509, as long as the manufacturer or distributor can demonstrate both that the consumer product is intended for shipment and use outside of California, and that the manufacturer or distributor has taken reasonable prudent precautions to assure that the consumer product is not distributed to California. This subsection (b) does not apply to consumer products that are sold, supplied, or offered for sale by any person to retail outlets in California.

(c) Except for ~~Fabric Softener – Single Use Dryer Product and~~ Pressurized Gas Duster, the VOC limits specified in Section 94509(a) shall not apply to fragrances up to a combined level of 2 percent by weight contained in any consumer product.

(d) The VOC limits specified in Section 94509(a) shall not apply to any LVP-VOC.

(e) The requirements of Section 94512(b) shall not apply to consumer products registered under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA; 7 U.S.C. Section 136-36y).

(f) The VOC limits specified in Section 94509(a) shall not apply to air fresheners that are comprised entirely of fragrance, less compounds not defined as VOCs under Section 94508 or exempted under Section 94510(d).

(g) The VOC limits specified in Section 94509(a) shall not apply to:

(1) insecticides containing at least 98% para-dichlorobenzene.

(2) Until December 30, 2006, the VOC limits specified in Section 94509(a) shall not apply to solid air fresheners containing at least 98% para-dichlorobenzene. On or after December 31, 2006, the provisions of section 94509~~(e)~~(m)(2)apply to solid air fresheners containing para-dichlorobenzene.

(h) Except as specified in 94510(h)(3) below, the VOC limits specified in Section 94509(a) shall not apply to:

(1) existing personal fragrance products or personal fragrance products in development on or before April 1, 1992, provided that both (i) the registration data specified in section 94513 is submitted for every such product by the date specified in section 94513(a), or prior to July 1, 1993, whichever date occurs later, and (ii) such product is sold in California prior to January 1, 1994. For the purposes of this subsection, a product "in development" means:

(A) a product which a fragrance materials manufacturer is designing at the request of a personal fragrance product manufacturer, or

(B) a product which is the subject of a written marketing profile or other documentation authorizing the creation and marketing of the product.

(2) personal fragrance products in development may be registered to qualify for this exemption under hypothetical trade names or pseudonyms, provided that the actual trade name is supplied to the Executive Officer within 30 days of marketing such products, or January 1, 1994, whichever occurs first.

(3) Effective December 31, 2014, subsections 94510(h)(1) and 94510(h)(2) shall no longer apply to any "Personal Fragrance Product" that contains 20 percent or less fragrance. Products manufactured before December 31, 2014 may be sold, supplied, or offered for sale until December 31, 2017, so long as the product complies with the product dating requirements in Section 94512(b).

(i) The VOC limits specified in Section 94509(a) shall not apply to adhesives sold in containers of 1 fluid ounce or less.

(j) The VOC limits specified in Section 94509(a) shall not apply to any VOC which is a fragrance in a personal fragrance product.

(k) The VOC limits specified in Section 94509(a) shall not apply to bait station insecticides. For the purpose of this section, bait station insecticides are containers enclosing an insecticidal bait that is not more than 0.5 ounce by weight, where the bait is designed to be ingested by insects and is composed of solid material feeding stimulants with less than 5 percent (%) active ingredients.

(l) Except as specified in 94510(l)(1), the 1/1/99 VOC limits specified in Section 94509(a) for personal fragrance products shall not apply to such products which have been sold in California prior to 1/1/99.

(1) On or after December 31, 2014, the 75 percent by weight VOC limit shall apply to any "Personal Fragrance Product" that contains 20 percent or less fragrance. Products manufactured before December 31, 2014 may be sold, supplied, or offered for sale until December 31, 2017, so long as the product complies with the product dating requirements in Section 94512(b).

(m) Until December 31, 2013, the VOC limits specified in Section 94509(a), and the prohibition of Aromatic Compounds listed in section 94509~~(u)~~(p)(1), shall not apply to Paint Thinners that are packaged in containers with a capacity less than or equal to 8 fluid ounces.

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

No amendments are proposed to §94511, Innovative Products.

Amend §94512 to read as follows:

§ 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.)~~

(3) *Rule that applies when Product Category definitions exclude each other.*

When determining the applicable VOC limit for a product that meets the definition for Regulated Category A and Regulated Category B, in circumstances where the definition of Regulated Category A excludes Regulated Category B, and the definition of Regulated Category B excludes Regulated Category A, the product is subject to the VOC limit for whichever regulated category, A or B, has the lower VOC limit.

(b) *Product Dating*

(1) Each manufacturer of a consumer product subject to Section 94509 shall clearly display on each consumer product container or package, the day, month, and year on which the product was manufactured, or a code indicating such date. Codes that represent a sequential batch number, or that otherwise cannot be attributed to a specific day, month, and year, do not satisfy this requirement.

(2) A manufacturer who uses the following code to indicate the date of manufacture shall not be subject to the requirements of section 94512(c)(1), if the code is represented separately from other codes on the product container so that it is easily recognizable:

YY DDD = year year day day day

Where: "YY" = two digits representing the year in which the product was manufactured, and

"DDD" = three digits representing the day of the year on which the product was manufactured, with "001" representing the first day of the year, "002" representing the second day of the year, and so forth (i.e. the "Julian date").

(3) This date or code shall be displayed on each consumer product container or package no later than twelve months prior to the effective date of the applicable standard specified in Section 94509.

(4) Except as otherwise provided in subsection (b)(5), for products manufactured on or after January 1, 2006, the date or code shall be displayed on the product container such that it is readily observable without irreversibly disassembling any portion of the product container or packaging. For the purposes of this subsection, information may be displayed on the bottom of a container as long as it is clearly legible without removing any product packaging.

(5) *Products Sold in Multi-unit Packages.*

(A) Products sold, supplied, or offered for sale in multi-unit packages are not required to comply with subsection (b)(4).

(B) If a multi-unit package does not comply with subsection (b)(4), the "sell-through" provisions of section 94509(c)(1) shall not apply to the individual product units contained within the multi-unit package. In other words, if any multi-unit package produced or assembled after January 1, 2006, does not display the date(s) or date-code(s) of the product units, such that the displayed information is readily observable without irreversibly disassembling any portion of the container or packaging, the individual product units shall be subject to the VOC standards in effect when the multi-unit package is sold, supplied, or offered for sale, regardless of the date on which the product units were manufactured.

(C) A multi-unit package may comply with subsection (b)(4) by displaying the date of assembly instead of the date(s) or date-code(s) of the individual product units, so long as the date of assembly is readily observable without irreversibly disassembling any portion of the container or packaging. The "date of assembly" means the date that the individual product units are assembled into the finished multi-unit package. If the date of assembly is displayed instead of the individual date(s) or date-code(s), the "date of assembly" shall be the "date of manufacture" for all of the product units

contained within the multi-unit package. In other words, all of the product units shall be deemed to have been manufactured on the date these units are assembled into the multi-unit package, even if the individual product units show different date(s) or date-code(s), and the "date of assembly" shall be "date of manufacture" of each product unit for the purposes of applying the "sell-through" provisions of section 94509(c).

(6) The requirements of this subsection (b) shall not apply to:

(A) personal fragrance products of 2 milliliters or less, which are offered to consumers free of charge for the purpose of sampling the product; or

(B) products containing no VOCs (as defined in section 94508), or containing VOCs at 0.10% by weight or less.

(c) *Additional Product Dating Requirements*

(1) If a manufacturer uses a code indicating the date of manufacture, for any consumer product subject to section 94509 an explanation of the code must be filed with the Executive Officer of the ARB no later than twelve months prior to the effective date of the applicable standard specified in section 94509. Thereafter, manufacturers using a code must file an explanation of the code with the Executive Officer on an annual basis, beginning in 2006.

The explanation of the code must be received by the Executive Officer on or before January 31st of each year, with the first explanation due on or before January 31, 2006.

(2) If a manufacturer changes any code indicating the date of manufacture for any consumer product subject to subsection (c)(1), an explanation of the modified code must be received by the Executive Officer before any products displaying the modified code are sold, supplied, or offered for sale in California.

(3) No person shall erase, alter, deface, or otherwise remove or make illegible any date or code indicating the date of manufacture from any regulated product container without the express authorization of the manufacturer.

(4) Codes indicating the date of manufacture are public information and may not be claimed as confidential.

(d) *Additional Labeling Requirements for Aerosol Adhesive, Adhesive Remover, Electronic Cleaner, Electrical Cleaner, Energized Electrical Cleaner, Contact Adhesive, and Sealant or Caulking Compound (non-aerosol).*

(1) In addition to the requirements specified in subsections (a), (b), and (c), both the manufacturer and responsible party for each aerosol adhesive, adhesive remover, electronic cleaner, electrical cleaner, energized electrical cleaner, contact adhesive product, and sealant or caulking compound (non-aerosol) subject to this article shall ensure that all products clearly display the following information on each product container which is manufactured on or after the effective date for the category specified in section 94509(a), except that for non-chemically curing sealant or caulking compound (non-aerosol), the effective date of this requirement is December 31, 2010, and for chemically curing sealant or caulking compound (non-aerosol), the effective date of this requirement is December 31, 2012:

(A) The product category as specified in section 94509(a) or an abbreviation of the category shall be displayed;

(B) 1. The applicable VOC standard for the product that is specified in section 94509(a), except for Energized Electrical Cleaner, expressed as a percentage by weight, shall be displayed unless the product is included in an alternative control plan approved by the Executive Officer, as provided in Article 4, Sections 94540-94555, Title 17, California Code of Regulations, and the product exceeds the applicable VOC standard;

2. If the product is included in an alternative control plan approved by the Executive Officer, and the product exceeds the applicable VOC standard specified in section 94509(a), the product shall be labeled with the term "ACP" or "ACP product;"

(C) If the product is classified as a special purpose spray adhesive, the applicable substrate and/or application or an abbreviation of the substrate/application that qualifies the product as special purpose shall be displayed;

(D) If the manufacturer or responsible party uses an abbreviation as allowed by this subsection 94512(d)(1)(A), an explanation of the abbreviation must be filed with the Executive Officer before the abbreviation is used.

(2) The information required in section 94512(d)(1), shall be displayed on the product container such that it is readily observable without removing or disassembling any portion of the product container or packaging. For the purposes of this subsection, information may be displayed on the bottom of a container as long as it is clearly legible without removing any product packaging.

(3) No person shall remove, alter, conceal, or deface the information required in section 94512(d)(1) prior to final sale of the product.

(e) *Additional Requirements for Multi-purpose Solvent and Paint Thinner*

The following requirements apply in addition to the requirements specified in section 94512(a), (b), and (c):

(1) Except as provided below in section 94512(e)(2), effective December 31, 2010, until December 31, 2015, no person shall sell, supply, offer for sale, or manufacture for use in California any "Flammable" or "Extremely Flammable" Multi-purpose Solvent or Paint Thinner named, on the Principle Display Panel as "Paint Thinner," "Multi-purpose Solvent," "Clean-up Solvent," or "Paint Clean-up."

(2) Section 94512(e)(1) does not apply to products that meet either of the following criteria:

(A) Products which include an attached "hang tag," sticker, or contrasting square or rectangular area on the Principle Display Panel that displays, at a minimum, the following statements in a font size as large as, or larger than, the "signal word" (i.e., "DANGER," "WARNING," or "CAUTION") as specified in title 16, Code of Federal Regulations, section 1500.121:

"Formulated to meet California VOC limits; see warnings on label; Vea las advertencias en la etiqueta, formulado complacientes con leyes de California" or

(B) Products where the Principle Display Panel displays, in both English and Spanish and a font size as large as, or larger than, the font size of all other words on the panel, the common name of the chemical compound (e.g., "Acetone," "Methyl acetate," etc.) that results in the product meeting the criteria for "Flammable" or "Extremely Flammable."

(3) For the purposes of this subsection (e), a product is "Flammable" or Extremely Flammable" if it is labeled as "Flammable" or "Extremely Flammable" on the product container, or if the product meets the criteria for these terms specified in title16, Code of Federal Regulations, section 1500.3(c)(6).

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

No amendments are proposed to §94513, Reporting Requirements and §94514, Variances.

Amend §94515 to read as follows:

§ 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 ~~August 6, 2010~~ [Date of Amendment], which is incorporated herein by reference. Alternative methods which are shown to accurately determine the concentration of VOCs in a subject product or its emissions may be used upon approval of the Executive Officer.

(2) In sections 3.5, 3.6, and 3.7 of Air Resources Board (ARB) Method 310, a process is specified for the "Initial Determination of VOC Content" and the "Final Determination of VOC Content". This process is an integral part of testing procedure set forth in ARB Method 310, and is reproduced below:

Sections 3.5, 3.6, and 3.7 of Air Resources Board Method 310

3.5 *Initial Determination of VOC Content.* The Executive Officer will determine the VOC content pursuant to sections 3.2 and 3.3. Only those components with concentrations equal to or greater than 0.1 percent by weight will be reported.

3.5.1 Using the appropriate formula specified in section 4.0, the Executive Officer will make an initial determination of whether the product meets the applicable VOC standards specified in ARB regulations. If initial results show that the product does not meet the applicable VOC standards, the Executive Officer may perform additional testing to confirm the initial results.

3.5.2 If the results obtained under section 3.5.1 show that the product does not meet the applicable VOC standards, the Executive Officer will request the product manufacturer or responsible party to supply product formulation data. The manufacturer or responsible party shall supply the requested information. Information submitted to the ARB Executive Officer may be claimed as confidential; such information will be handled in accordance with the confidentiality procedures specified in Title 17, California Code of Regulations, sections 91000 to 91022.

3.5.3 If the information supplied by the manufacturer or responsible party shows that the product does not meet the applicable VOC standards, then the Executive Officer will take appropriate enforcement action.

3.5.4 If the manufacturer or responsible party fails to provide formulation data as specified in section 3.5.2, the initial determination of VOC content under this section 3.5 shall determine if the product is in compliance with the applicable VOC standards. This determination may be used to establish a violation of ARB regulations.

3.6 Determination of the LVP-VOC status of compounds and mixtures. This section does not apply to antiperspirant and deodorants or aerosol coating products because there is no LVP-VOC exemption for these products.

3.6.1 Formulation data. If the vapor pressure is unknown, the following ASTM methods, which are incorporated by reference herein, may be used to determine the LVP-VOC status of compounds and mixtures: ASTM D 86-01 (Aug. 10, 2001), ASTM D 850-00 (Dec. 10, 2000), ASTM D 1078-01 (June 10, 2001), ASTM D 2879-97 (April 10, 1997), as modified in Appendix B to this Method 310, ASTM D 2887-01 (May 10, 2001) and ASTM E 1719-97 (March 10, 1997).

3.6.2 LVP-VOC status of "compounds" or "mixtures." The Executive Officer will test a sample of the LVP-VOC used in the product formulation to determine the boiling point for a compound or for a mixture. If the boiling point exceeds 216°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 (April 10, 1997), as modified in Appendix B to this Method 310, and ASTM E 1719-97 (March 10, 1997), to determine if the compound or mixture meets the requirements of Title 17, CCR, section 94508(a)(98)(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 calulated 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) *Aromatic Compound content determination for Multi-purpose Solvent or Paint Thinner using ARB Method 310.* Testing to determine compliance with the requirements of section 94509~~(u)~~(p)(1)~~(C)~~, shall be performed using Air Resources

Board Method 310, Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products, adopted September 25, 1997 and as last amended on ~~August 6, 2010~~ [Date of Amendment], which is incorporated by reference herein. Alternative test methods that are demonstrated to be equally or more accurate than ARB Method 310 in determining the Aromatic Compound content in a product or its emissions may be used upon the written approval of the Executive Officer.

(d) *Aromatic Compound content determinations for Multi-purpose Solvent or Paint Thinner using product formulation and records.* Testing to determine compliance with the requirements of section 94509~~(u)~~(p)(1)~~(C)~~, may also be demonstrated through calculation of Aromatic Compound content from records of the amounts of constituents used to make the product pursuant to the following criteria:

(1) Compliance determination*s* based on these records may not be used unless the manufacturer of a Multi-purpose Solvent or Paint Thinner 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(d), the Aromatic Compound content shall be calculated according to the following equation:

$$\text{Aromatic Compound Content} = \frac{E}{D} \times 100$$

where,

D = total net weight of unit (excluding container and packaging)

E = total weight of all Aromatic Compounds, as defined in Section 94508(a), per unit

(3) If product records appear to demonstrate compliance with the Aromatic Compound limit, 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.

(e) Determination of liquid or solid. Testing to determine whether a product is a liquid or solid shall be performed using ASTM D4359-90 (May 25, 1990), which is incorporated by reference herein.

(f) Compliance determinations for charcoal lighter material products. Testing to determine compliance with the certification requirements for charcoal lighter material shall be performed using the procedures specified in the South Coast Air Quality

Management District Rule 1174 Ignition Method Compliance Certification Protocol (February 28, 1991), which is incorporated by reference herein.

(g) Testing to determine distillation points of petroleum distillate-based charcoal lighter materials shall be performed using ASTM D86-01 Aug. 10, 2001, which is incorporated by reference herein.

(h) Fragrance content determinations for personal fragrance products. Testing to determine the percent by weight of fragrance in personal fragrance products shall be performed according to the Association of Official Analytical Chemists (AOAC) Official Method of Analysis No. 932.11, 1990, "Essential Oil in Flavor Extracts and Toilet Preparations, Babcock Method" (AOAC Official Methods of Analysis, 15th Edition, 1990), which is incorporated by reference herein.

(i) 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.

No amendments are proposed to §94516, Severability and §94517, Federal Enforceability.

Appendix B

Proposed Amendments to Method 310: Determination of Volatile Organic Compounds in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products

Adopted: September 25, 1997
Amended: September 3, 1999
Amended: July 18, 2001
Amended: May 5, 2005
Amended: August 6, 2010
Amended: [Date of Amendment]

Proposed Amendments to Method 310

(Note: Proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions)

No amendments are proposed to section 1: Applicability.

Amend section 2 to read as follows:

No amendments are proposed to subsections 2.1 - 2.19. The following new subsections are proposed for addition:

2.20 ASTM D 3257-06: Standard Test Methods for Aromatics in Mineral Spirits by Gas Chromatography (April 1, 2006)

2.21 ASTM D 3606-07: Standard Test Method for Determination of Benzene and Toluene in Finished Motor and Aviation Gasoline by Gas Chromatography (Nov. 1, 2007)

2.22 ASTM D 3710-95 (Reapproved 2004): Standard Test Method for Boiling Range Distribution of Gasoline and Gasoline Fractions by Gas Chromatography (Nov. 1, 2004)

2.23 ASTM D 5443-04: Standard Test Method for Paraffin, Naphthene, and Aromatic Hydrocarbon Type Analysis in Petroleum Distillates Through 200° C by Multi-Dimensional Gas Chromatography (Nov. 1, 2004)

2.24 ASTM D 5580-02 (Reapproved in 2007): Standard Test Method for Determination of Benzene, Toluene, Ethylbenzene, p/m-Xylene, o-Xylene, C_9 and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography (Nov. 1, 2007)

2.25 ASTM E 1782-08: Standard Test Method for Determining Vapor Pressure by Thermal Analysis (March 1, 2008)

2.26 US EPA Method 602: Purgable Aromatics, 40 CFR Part 136 Appendix A, Method for Organic Chemical Analysis of Municipal and Industrial Wastewater (January 2008)

2.27 US EPA Method 625: Base/Neutrals and Acids, 40 CFR Part 136 Appendix A, Method for Organic Chemical Analysis of Municipal and Industrial Wastewater (January 2008)

2.28 US EPA SW-846 Method 8015B: Nonhalogenated Organics Using GC/FID (Rev 2, December 1996)

2.29 US EPA SW-846 Method 8020A: Aromatic Volatile Organics by Gas Chromatography (Rev 1, September 1994)

2.30 US EPA SW-846 Method 8270D: Semivolatile Organic Compounds by Gas Chromatography / Mass Spectroscopy (GC/MS) (Rev. 4, January 1998)

Amend Section 3: Consumer Products Testing Procedure, to read as follows:

No amendments are proposed to subsections 3.1 - 3.3.7. The following new subsection is proposed for addition:

3.3.8 For aromatic compound content determination, US EPA Method 602, US EPA SW-846 Method 8020A, US EPA SW-846 Modified Method 8015B, US EPA Method 625, US EPA Method SW-846 Method 8270D, ASTM D 5443-04, ASTM D 3257, ASTM D 3710-95, ASTM D3606-07, ASTM D 5580-02.

No amendments are proposed to sections 3.4 - 3.7.3.

Amend Section 4: Calculation of VOC Content to read as follows:

No amendments are proposed to sections 4.1-4.2.2. The following new subsection is proposed for addition:

4.2.3 For Fabric Softener – Single Use Dryer Product, the grams of VOC per sheet shall be calculated as follows:

$$\textit{Total Grams VOC per Sheet} = \frac{S - R}{S} \times D$$

Where:

S = mass, in grams, of the dryer sheet sample.

R = mass, in grams, of sample residue by gravimetric analysis.

D = mass, in grams, of the single dryer sheet.

No amendments are proposed to sections 4.3-4.3.2.

No amendments are proposed to sections 5-7.

Appendix C

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
6/16/89	Consumer Products Control Plan.	N/A	First Board action on consumer products. Board approved overall plan to fulfill H&SC Section 41712 mandate and a goal of achieving a 50 percent reduction in VOC emissions from consumer products.
11/8/89/ (2/27/91)	Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	Article 2, Sections 94500-94506, Title 17, CCR.	First consumer product regulation adopted pursuant to the CCAA. Established VOC content limits for aerosol and non-aerosol antiperspirants and deodorants.
6/15/90	Regulation for Reducing VOC Emissions from Consumer Products in the Bay Area AQMD.	Article 2, Consumer Products, Sections 94520-94527, Title 17, CCR.	This regulation was adopted to reduce VOC emissions from consumer products in the Bay Area AQMD and establishes VOC limits for 6 consumer products.
10/11/90/ (10/21/91)	Regulation for Reducing VOC Emissions from Consumer Products - Phase I.	Article 2, Consumer Products, Sections 94507-94516 and 94503.5, Title 17, CCR Amendments to Article 2, Section 94505, Title 17, CCR	Establishes VOC limits for 16 consumer products, repeals the Bay Area consumer product regulation, and amends the AP/DO regulation to include an innovative product provision and a revised variance procedure.
1/9/92/ (1/6/93)	Adoption of Amendments to the Regulation for Reducing VOC Emissions from Consumer Products - Phase II.	Article 2, Consumer Products, Sections 94507-94517, Title 17, CCR.	Establishes standards for 10 additional categories of consumer products and several amendments to the existing regulation for clarification and improvement.
9/22/94/ (9/9/95)	Adoption of the Alternative Control Plan Regulation for Consumer Products.	Article 4, Sections 94540-94555, Title 17, CCR.	A voluntary market-based regulation which supplements the existing consumer products regulation by providing manufacturers with additional flexibility for formulating products.
11/15/94/ (2/14/95)	Approval of the California State Implementation Plan for Ozone.	N/A	Board approval of Ozone SIP which includes consumer products element comprised of near, midterm, and long term measures.
3/23/95/ (1/8/96)	Regulation for Reducing VOC Emissions from Aerosol Coating Products and Amendments to the Alternative Control (ACP) Plan.	Article 3, Sections 94520-94528, Title 17, CCR Amendments to Article 4, Sections 94540 to 94543, 94547, 94550, 94551, and 94553, Title 17, CCR.	Establishes VOC content limits for 35 categories of aerosol paints. Amendments to ACP to incorporate aerosol coating products.

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
9/28/95/ (2/29/96)	Amendments to the California Regulations for Reducing VOC Emissions from Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products.	Amendments to Article 1, Sections 94500-94504, Title 17, CCR, Article 2, Section 94508(a)(90), Title17, CCR, and Article 3, Section 94521(a)(62), Title 17, CCR.	The amendments to the AP/DO regulation address fairness concerns, preserves projected emission reductions required by the SIP, ensures that manufacturers will continue their efforts to develop zero percent products and provides a vehicle to monitor progress and to make the VOC definition more consistent with EPA's VOC definition. The consumer products regulation and the aerosol coatings regulation is modified to revise the VOC definition consistent with EPA's.
11/21/96/ (11/18/97)	Amendments to the California Regulations for Reducing VOC Emissions from Consumer Products and Aerosol Coating Products.	Amendments to Article 2; Sections 94508, 94515 94517 and Article 3; Section 94521, Title 17, CCR.	The amendments to the consumer products regulation address postponement of the 25 percent standard for aerosol adhesives, modification to the VOC definition, amendment of various regulatory provisions to enhance clarity and compliance, and amendment to the test methods sections. The proposed amendments also modify the VOC definition in the aerosol coatings regulation.
3/27/97/ (8/24/98)	Amendments Pertaining to Hairspray in the California Consumer Products Regulation.	Amendments to Article 2, Sections 94509, 94513, and 94514,Title 17, CCR.	Postpones the hairspray 55 percent VOC standard from 1/1/98 to 6/1/99, require plans demonstrating progress toward compliance from manufacturers selling hairspray not meeting the 55 percent VOC standard from 1/1/98 to 6/1/99, and modifies the variance provision to include a requirement for VOC emissions mitigation when granting a variance request for hairsprays from the 6/1/99 standard.
7/24/97/ (7/1/98)	Amendments to the Consumer Products Regulation, Mid-term Measures I.	Amendments to Article 2, Sections 94508, 94509, 94510, 94512, 94513, and 94514, Title 17, CCR.	All VOC standards with 1/1/2000, effective dates were extended to 1/1/2001; First tiers of the two-tiered VOC standards and additional reporting requirements for four product categories were eliminated; Effective dates of the VOC standard were changed for five product categories.
11/19/98/ (6/24/99)	Amendments to the Aerosol Coating Products, the Antiperspirants and Deodorants Regulation, and the Consumer Products Regulation.	Amendments to Article 3, Section 94521, 94522, and 94524, Title 17, CCR; Article 1, Section 94501, Title 17, CCR; and to Article 2, Section 94508(a)(124), Title 17, CCR.	Relaxation of the second-tier VOC limits of the Aerosol Coating Products Regulation. Exemption of methyl acetate from the VOC definition in the Antiperspirants and Deodorants Regulation, the Consumer Products Regulation, and the Aerosol Coating Products Regulation.

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
10/28/99/ 11/19/2000	Amendments to the Consumer Products Regulation, Mid-term Measures II.	Amendments to Article 2, Section 94508, 94509, and 94513.	Amends the Consumer Products Regulation by adding product category definitions, VOC limits for two new categories, more stringent VOC limits for fifteen existing categories, and adding subcategories for some of the existing product categories with separate VOC limits for each subcategory. New or modified VOC limits become effective from 12/31/2000, to 12/31/2004. Amendments consolidates and expands the existing reporting requirements for products containing methylene chloride or perchloroethylene.
5/25/2000/ (5/18/2001)	Amendments to the Consumer Products Regulation relating to Aerosol Adhesives.	Amendments to Article 1, Sections 94508, 94509, 94512, and 94513, Title 17, CCR.	Amendments eliminate the 25 percent VOC limit and establish new VOC limits for three new categories of aerosol adhesives, effective January 1, 2002. Amendments also include labeling and other requirements to facilitate compliance and enforcement of the new standards. Effective 1/1/2002, amendments also prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene, which are toxic air contaminants, in aerosol adhesives manufactured for use in California.
6/22/2000/ (7/18/2001)	Consumer Products Relating to Aerosol Coating Products, Proposed Tables of Maximum Incremental Reactivity (MIR) Values, and Amendments to Method 310.	Amendments to Article 3, Sections 94521, 94522, 94523, 94524, and 94526. Added new sections 94700 and 94701, to Title 17, CCR.	Amendments replace the second tier mass-based VOC limits for 35 product categories with equivalent reactivity-based limits. In addition, a new subchapter, Subchapter 8.6, in title 17, CCR was adopted. New Subchapter 8.6, in sections 94700 and 94701, contains Tables of MIR Values that are used to set reactivity-based limits and determine compliance.
10/26/2000/ (4/24/2001)	Amendments to the Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	Amendments to Article 2, Sections 94502 and 94504, Title 17, CCR.	Amendments increased the HVOC limit for aerosol antiperspirants to 40 percent from the current zero percent limit, beginning 1/1/2001. The MVOC limit of 10 percent remains unchanged.
6/24/2004/ (7/20/2005)	Amendments to the Consumer Products, Test Method 310, Antiperspirants and Deodorants, Aerosol Coating Products, and an	Amendments to sections 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, title 17, California Code of	Amendments established new VOC limits for 15 product categories. Regulatory action also prohibited the use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in seven product categories. The ATCM prohibits the use of para-dicholorobenzene in toilet/urinal care products and solid air

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Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
Continued	Airborne Toxic Control Measure (ATCM) for Para-Dichlorobenzene	Regulations (CCR) and adoption of Amendments to ARB Method 310, which is incorporated by reference in sections 94506, 94515, and 94526, title 17, CCR.	fresheners. Amendments also modified and updated Method 310 used to determine the percent by weight of reactive organic compounds in aerosol coating products and VOCs in consumer products and AP/DO products.
11/16/2006/ (12/08/2007)	Amendments to the Aerosol Coating Products Regulation and the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94513, and 94523 to title 17, California Code of Regulations (CCR). Non-substantial or solely grammatical changes are also proposed to sections 94507, 94511, 94512, 94514, 94515, 94516, and 94517.	Consumer Products Regulation amended by adding and modifying product category definitions and by establishing new VOC limits for 16 product categories. For some of the categories, separate VOC limits are specified for different product forms. New or modified VOC limits become effective on December 31, 2008, remainder become effective on December 31, 2010. Regulatory action also prohibits use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in the following products categories: "Bathroom and Tile Cleaner," "Construction, Panel, and Floor Covering Adhesive," "General Purpose Cleaner," and "Oven Cleaner." Amendment was also adopted to section 94523 (Exemptions) of the Aerosol Coatings Regulation. Amendment clarifies several product categories are exempt from regulation under the Aerosol Coatings Regulation.
11/16/2006/ (12/08/2007)	Amendments to the Aerosol Coating Products Regulation and the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94513, and 94523 to title 17, California Code of Regulations (CCR). Non-substantial or solely grammatical changes are also proposed to sections 94507, 94511, 94512, 94514, 94515, 94516, and 94517.	Consumer Products Regulation amended by adding and modifying product category definitions and by establishing new VOC limits for 16 product categories. For some of the categories, separate VOC limits are specified for different product forms. New or modified VOC limits become effective on December 31, 2008, remainder become effective on December 31, 2010. Regulatory action also prohibits use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in the following products categories: "Bathroom and Tile Cleaner," "Construction, Panel, and Floor Covering Adhesive," "General Purpose Cleaner," and "Oven Cleaner." Amendment was also adopted to section 94523 (Exemptions) of the Aerosol Coatings Regulation. Amendment clarifies several product categories are exempt from regulation under the Aerosol Coatings Regulation.

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
6/26/2008/ (7/18/2009)	Amendments to the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94512, 94513, and 94515 to title 17, California Code of Regulations.	Regulation was amended by adding and modifying product category definitions and by establishing new or lower VOC limits for 19 product categories. A mass limit was adopted for fabric softener products used in clothes dryers. An additional amendment removed the "grandfather" clause that pertains to Personal Fragrance Products with 20 percent or less fragrance. Removal of this clause requires all Personal Fragrance Products with 20 percent or less fragrance to meet a single VOC limit. The new or modified VOC limits become effective between December 31, 2010 and December 31, 2015. This action also prohibits the use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in the following product categories: "Carpet/Upholstery Cleaner," "Fabric Protectant," "Multi-Purpose Lubricant," "Penetrant," "Sealant or Caulking Compound," and "Spot Remover." Use of methylene chloride and perchloroethylene are also prohibited in "Pressurized Gas Duster" products. To partially fulfill the Discrete Early Action Measure for consumer products, the amendments will reduce the use of compounds with high GWP in Pressurized Gas Duster products. These products can only use compounds with GWP factors below 150. The GWP values used to determine compliance are those set forth in the Intergovernmental Panel on Climate Change, Second Assessment Report. The Board also adopted a modification to the definition of VOC. This modification excludes hydrofluoroether 7200 from the definition based on its negligible impacts on ground-level ozone formation.
9/24/2009/ (Effective Date)	Amendments to the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94512, 94513, and 94515 to title 17, California Code of Regulations.	Amendments set new or lower VOC limits for three product categories: Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner. Amendments also set global warming potential (GWP) limits for the three subject categories. In addition, use of the toxic air contaminants (TAC) perchloroethylene, methylene chloride, and trichloroethylene was prohibited in Multi-purpose Solvent and Paint Thinner products. Other provisions included limiting the aromatic compound content of Paint Thinner and Multi-purpose Solvent products to 1 percent by weight; providing an exemption for 8 fluid

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Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
Continued			ounce containers of Paint Thinner from compliance with the VOC limits until 12/31/13; requiring labeling to address public safety for flammable and extremely flammable Paint Thinner and Multi-purpose Solvent products until 12/31/15; and requiring reporting of data for calendar year 2011 sales of Paint Thinner and Multi-purpose Solvent products. Other amendments are: minor labeling changes for dilutable Windshield Washer Fluid products; other language modifications to clarify and improve existing regulatory provisions; and various amendments to test Method 310, to clarify procedures.

Appendix D

Recurring Cost Estimates

Recurring Cost Estimates

For each category proposed for regulation staff evaluates formulations of complying and noncomplying products. These formulations are then used to develop example, nonconfidential formulas that are representative of products in the category. These representative complying and noncomplying formulas are used to estimate the cost of raw materials (*i.e.* recurring costs) to produce each formulation. They are used in our economic impacts analysis.

To assign costs, distributor-level ingredient prices from *ICIS Chemical Business* website (ICIS, 2008), and chemical materials distributors were used to calculate the baseline and compliant material costs for these formulations. Other than compounds that were to be quantified, the 2006 Survey and the 2008 Survey Update did not ask for specific ingredient details for exempt compounds, fragrance materials, 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), low and high cost for fragrance materials were estimated at $5.00 and $10.00 per pound respectively. Inorganic compounds were assigned a low and high cost of $0.09 and $0.91 per pound, respectively, based on the costs found of the most common inorganic compounds found in the product categories.

The costs calculated here are then copied into Table VIII-1a in Chapter VIII, Economic Impacts, to determine total costs of the proposed amendments.

The following Tables contain 'generic' complying and noncomplying formulations for each category. In categories where VOC limits are based on product form (*i.e.* aerosol and nonaerosol) formulations are provided for each form.

Furniture Maintenance Product (aerosol)

Category:	Furniture Maintenance Product	
Subcategory	Aerosol	
Typical noncompliant:	17	%VOC by weight
Proposed Limit:	12	%VOC by weight
Average Unit Size:	17	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	77.80	0.00	75.80	0.00
HC Propellant	0.700	10.00	0.07	10.00	0.07
Oil/Wax/resin/siloxane	3.500	5.00	0.18	5.00	0.18
Hydrocarbon VOC	0.540	7.00	0.04	2.00	0.01
Fragrance	5.000	0.20	0.01	0.20	0.01
LVP Hydrocarbon	0.950		0.00	7.00	0.07
		Total Cost, $/pound:	0.29		0.33
		Total Cost, $/Unit:	0.31		0.35
			Cost increase to comply, $/unit:		0.04

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	77.80	0.00	75.80	0.00
HC Propellant	1.050	10.00	0.11	10.00	0.11
Oil/Wax/resin/siloxane	7.000	5.00	0.35	5.00	0.35
Hydrocarbon VOC	0.800	7.00	0.06	2.00	0.02
Fragrance	10.000	0.20	0.02	0.20	0.02
LVP Hydrocarbon	1.050	0.00	0.00	7.00	0.07
		Total Cost, $/pound:	0.53		0.57
		Total Cost, $/Unit:	0.57		0.60
			Cost increase to comply, $/unit:		0.04

General Purpose Cleaner (nonaerosol)

Category:	General Purpose Cleaner	
Subcategory	Nonaerosol	
Typical noncompliant:	3	%VOC by weight
Proposed Limit:	0.50	%VOC by weight
Average Unit Size:	33.00	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	90.00	0.00	94.00	0.00
LVP-Solvent	0.950	5.00	0.05	3.00	0.03
LVP-Glycol Ether	1.150	2.00	0.02	2.50	0.03
Alcohol	0.457	1.00	0.00	0.50	0.00
Monoethanolamine	0.820	2.00	0.02	0.00	0.00
		Total Cost, $/pound:	0.09		0.06
		Total Cost, $/Unit:	0.19		0.13
				Cost increase to comply, $/unit:	(0.07)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	90.00	0.00	94.00	0.00
LVP-Solvent	1.050	5.00	0.05	3.00	0.03
LVP-Glycol Ether	1.760	2.00	0.04	2.50	0.04
Alcohol	0.940	1.00	0.01	0.50	0.00
Monoethanolamine	1.120	2.00	0.02	0.00	0.00
		Total Cost, $/pound:	0.12		0.08
		Total Cost, $/Unit:	0.25		0.17
				Cost increase to comply, $/unit:	(0.08)

General Purpose Degreaser (nonaerosol)

Category:	General Purpose Degreaser	
Subcategory	Nonaerosol	
Typical noncompliant:	4	%VOC by weight
Proposed Limit:	0.50	%VOC by weight
Average Unit Size:	23.00	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
2-butoxyethanol	1.300	4.00	0.05	0.00	0.00
surfactant	3.500	3.00	0.11	0.00	0.00
hydrocarbon LVP	0.950	8.00	0.08	0.00	0.00
LVP glycol ether	1.150	0.00	0.00	12.50	0.14
water	0.002	85.00	0.00	82.00	0.00
D-limonene	1.200	0.00	0.00	0.50	0.01
inorganic	0.090	0.00	0.00	5.00	0.00
		Total Cost, $/pound:	0.23		0.16
		Total Cost, $/Unit:	0.34		0.22
				Cost increase to comply, $/unit:	(0.11)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
2-butoxyethanol	1.340	4.00	0.05	0.00	0.00
surfactant	7.000	3.00	0.21	0.00	0.00
hydrocarbon LVP	1.050	8.00	0.08	0.00	0.00
LVP glycol ether	1.760	0.00	0.00	12.50	0.22
water	0.002	85.00	0.00	82.00	0.00
D-limonene	1.300	0.00	0.00	0.50	0.01
inorganic	0.910	0.00	0.00	5.00	0.05
		Total Cost, $/pound:	0.35		0.27
		Total Cost, $/Unit:	0.50		0.39
				Cost increase to comply, $/unit:	(0.11)

Glass Cleaner (nonaerosol)

Category:	Glass Cleaner	
Subcategory	Nonaerosol	
Typical noncompliant:	4	%VOC by weight
Proposed Limit:	3	%VOC by weight
Average Unit Size:	33	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	95.95	0.00	96.95	0.00
VOC Alcohol	0.457	2.00	0.01	1.50	0.01
VOC Glycol Ether	1.150	2.00	0.02	1.50	0.02
LVP Surfactant	3.500	0.05	0.00	0.05	0.00
	Total Cost, $/pound:		0.04		0.03
	Total Cost, $/Unit:		0.07		0.06
	Cost increase to comply, $/unit:				(0.02)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	95.95	0.00	96.95	0.00
VOC Alcohol	0.940	2.00	0.02	1.50	0.01
VOC Glycol Ether	1.200	2.00	0.02	1.50	0.02
LVP Surfactant	7.000	0.05	0.00	0.05	0.00
	Total Cost, $/pound:		0.05		0.04
	Total Cost, $/Unit:		0.10		0.08
	Cost increase to comply, $/unit:				(0.02)

Spot Remover (Dry Clean Only) (aerosol)

Category:	Spot Remover (Dry Clean Only)	
Subcategory	Aerosol	
Typical noncompliant:	25	%VOC by weight
Proposed Limit:	15	%VOC by weight
Average Unit Size:	20	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Methylene Chloride	0.810	70.00	0.57	0.00	0.00
Hydrocarbon Propellant	0.700	25.00	0.18	10.00	0.07
Inorganics (silica)	0.090	5.00	0.00	5.00	0.00
VOC solvent	0.540			5.00	0.03
LVP solvent	0.950			24.40	0.23
Surfactant	3.500			0.30	0.01
LVP Glycol Ether	1.150			25.30	0.29
Water	0.002			30.00	0.00
	Total Cost, $/pound:		0.75		0.64
	Total Cost, $/Unit:		0.93		0.79
			Cost increase to comply, $/unit:		(0.14)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Methylene Chloride	1.110	70.00	0.78	0.00	0.00
Hydrocarbon Propellant	1.050	25.00	0.26	10.00	0.11
Inorganics (silica)	0.910	5.00	0.05	5.00	0.05
VOC solvent	0.800			5.00	0.04
LVP solvent	1.050			24.40	0.26
Surfactant	7.000			0.30	0.02
LVP Glycol Ether	1.760			25.30	0.45
Water	0.002			30.00	0.00
	Total Cost, $/pound:		1.09		0.91
	Total Cost, $/Unit:		1.36		1.14
			Cost increase to comply, $/unit:		(0.21)

Spot Remover (Dry Clean Only) (nonaerosol)

Category:	Spot Remover (Dry Clean Only)	
Subcategory	Nonaerosol	
Typical noncompliant:	100	%VOC by weight
Proposed Limit:	3	%VOC by weight
Average Unit Size:	20	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Trichloroethylene	1.150	100.00	1.15	0.00	0.00
D-Limonene	1.200			3.00	0.04
LVP Hydrocarbon	0.950			60.00	0.57
LVP Glycol Ether	1.150			35.00	0.40
Surfactant	3.500			2.00	0.07
Total Cost, $/pound:			1.15		1.08
Total Cost, $/Unit:			1.44		1.35
Cost increase to comply, $/unit:					(0.09)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Trichloroethylene	1.450	100.00	1.45	0.00	0.00
D-Limonene	1.300			3.00	0.04
LVP Hydrocarbon	1.050			60.00	0.63
LVP Glycol Ether	1.760			35.00	0.62
Surfactant	7.000			2.00	0.14
Total Cost, $/pound:			1.45		1.43
Total Cost, $/Unit:			1.81		1.78
Cost increase to comply, $/unit:					(0.03)

Special Purpose Lubricant (aerosol)

Category:	Special Purpose Lubricant	
Subcategory	Aerosol	
Typical noncompliant:	36	%VOC by weight
Proposed Limit:	25	%VOC by weight
Average Unit Size:	14	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon propellant	0.700	18.00	0.13	15.00	0.11
LVP Hydrocarbon	0.950	20.00	0.19	23.00	0.22
Hydrocarbon solvent	0.540	18.00	0.10	10.00	0.05
Petroleum Base Oil	0.404	44.00	0.18	52.00	0.21
Total Cost, $/pound:			0.59		0.59
Total Cost, $/Unit:			0.52		0.51
Cost increase to comply, $/unit:					(0.00)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon propellant	1.050	18.00	0.19	15.00	0.16
LVP Hydrocarbon	1.050	20.00	0.21	23.00	0.24
Hydrocarbon solvent	0.800	18.00	0.14	10.00	0.08
Petroleum Base Oil	0.632	44.00	0.28	52.00	0.33
Total Cost, $/pound:			0.82		0.81
Total Cost, $/Unit:			0.72		0.71
Cost increase to comply, $/unit:					(0.01)

Special Purpose Lubricant (nonaerosol)

Category:	Special Purpose Lubricant	
Subcategory	Nonaerosol	
Typical noncompliant:	4	%VOC by weight
Proposed Limit:	3	%VOC by weight
Average Unit Size:	16	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon Solvent	0.600	2.50	0.02	2.00	0.01
Glycol Ether VOC	1.150	1.00	0.01	0.80	0.01
Monoethanolamine	0.820	0.50	0.00	0.20	0.00
LVP Glycol Ether	1.150	1.00	0.01	5.00	0.06
LVP Hydrocarbon Solvent	0.950	38.00	0.36	36.00	0.34
Petroleum Base Oil	0.404	57.00	0.23	56.00	0.23
	Total Cost, $/pound:		0.63		0.65
	Total Cost, $/Unit:		0.63		0.65
	Cost increase to comply, $/unit:				0.02

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon Solvent	0.850	2.50	0.02	2.00	0.02
Glycol Ether VOC	1.200	1.00	0.01	0.80	0.01
Monoethanolamine	1.120	0.50	0.01	0.20	0.00
LVP Glycol Ether	1.760	1.00	0.02	5.00	0.09
LVP Hydrocarbon Solvent	1.050	38.00	0.40	36.00	0.38
Petroleum Base Oil	0.632	57.00	0.36	56.00	0.35
	Total Cost, $/pound:		0.82		0.85
	Total Cost, $/Unit:		0.82		0.85
	Cost increase to comply, $/unit:				0.03

Metal Polish or Cleanser (aerosol)

Category:	Metal Polish or Cleanser	
Subcategory	Aerosol	
Typical noncompliant:	30	%VOC by weight
Proposed Limit:	15	%VOC by weight
Average Unit Size:	18	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon solvent	0.540	15.00	0.08	5.00	0.03
Hydrocarbon propellant	0.700	15.00	0.11	10.00	0.07
LVP Hydrocarbon	0.950	70.00	0.67	20.00	0.19
Water	0.002	0.00	0.00	65.00	0.00
Total Cost, $/pound:			0.85		0.29
Total Cost, $/Unit:			0.96		0.32
Cost increase to comply, $/unit:					(0.63)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon solvent	0.800	15.00	0.12	5.00	0.04
Hydrocarbon propellant	1.050	15.00	0.16	10.00	0.11
LVP Hydrocarbon	1.050	70.00	0.74	20.00	0.21
Water	0.002	0.00	0.00	65.00	0.00
Total Cost, $/pound:			1.01		0.36
Total Cost, $/Unit:			1.14		0.40
Cost increase to comply, $/unit:					(0.74)

Metal Polish or Cleanser (nonaerosol)

Category:	Metal Polish or Cleanser	
Subcategory	Nonaerosol	
Typical noncompliant:	30	%VOC by weight
Proposed Limit:	3	%VOC by weight
Average Unit Size:	32	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon VOC	0.540	20.00	0.11	2.50	0.01
D-limonene	1.200	10.00	0.12	0.00	0.00
LVP – Hydrocarbon	0.950	32.00	0.30	19.50	0.19
Water	0.002	38.00	0.00	77.50	0.00
Alcohol	0.457			0.50	0.00
	Total Cost, $/pound:		0.53		0.20
	Total Cost, $/Unit:		1.07		0.41
			Cost increase to comply, $/unit:		(0.66)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon VOC	0.800	20.00	0.16	2.50	0.02
D-limonene	1.300	10.00	0.13	0.00	0.00
LVP – Hydrocarbon	1.050	32.00	0.34	19.50	0.20
Water	0.002	38.00	0.00	77.50	0.00
Alcohol	0.940	0.00	0.00	0.50	0.00
	Total Cost, $/pound:		0.63		0.23
	Total Cost, $/Unit:		1.25		0.46
			Cost increase to comply, $/unit:		(0.79)

Flying Bug Insecticide (aerosol)

Category:	Flying Bug Insecticide	
Subcategory	Aerosol	
Typical noncompliant:	25	%VOC by weight
Proposed Limit:	20	%VOC by weight
Average Unit Size:	15	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon propellant	0.700	25.00	0.18	20.00	0.14
Water	0.002	57.00	0.00	65.00	0.00
LVP solvent	0.950	9.00	0.09	8.00	0.08
Surfactant	3.500	2.00	0.07	1.00	0.04
LVP Glycol Ether	1.150	5.00	0.06	4.00	0.05
Fragrance	5.000	1.00	0.05	1.00	0.05
Actives	3.500	1.00	0.04	1.00	0.04
		Total Cost, $/pound:	0.47		0.38
		Total Cost, $/Unit:	0.44		0.36
				Cost increase to comply, $/unit:	(0.09)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon propellant	1.050	25.00	0.26	20.00	0.21
Water	0.002	57.00	0.00	65.00	0.00
LVP solvent	1.050	9.00	0.09	8.00	0.08
Surfactant	7.000	2.00	0.14	1.00	0.07
LVP Glycol Ether	1.760	5.00	0.09	4.00	0.07
Fragrance	10.000	1.00	0.10	1.00	0.10
Actives	7.000	1.00	0.07	1.00	0.07
		Total Cost, $/pound:	0.76		0.61
		Total Cost, $/Unit:	0.71		0.57
				Cost increase to comply, $/unit:	(0.14)

Wasp or Hornet Insecticide (aerosol)

Category:	Wasp or Hornet Insecticide	
Subcategory	Aerosol	
Typical noncompliant:	40	%VOC by weight
Proposed Limit:	10	%VOC by weight
Average Unit Size:	14	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
LVP Hydrocarbon	0.950	56.00	0.53	86.00	0.82
VOC solvent	0.540	40.00	0.22	10.00	0.05
CO2	0.270	3.00	0.01	3.00	0.01
Actives	3.500	1.00	0.04	1.00	0.04
Total Cost, $/pound:			0.79		0.91
Total Cost, $/Unit:			0.69		0.80
Cost increase to comply, $/unit:					0.11

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
LVP Hydrocarbon	1.050	56.00	0.59	86.00	0.90
VOC solvent	0.800	40.00	0.32	10.00	0.08
CO2	0.270	3.00	0.01	3.00	0.01
Actives	7.000	1.00	0.07	1.00	0.07
Total Cost, $/pound:			0.99		1.06
Total Cost, $/Unit:			0.86		0.93
Cost increase to comply, $/unit:					0.07

Oven or Grill Cleaner (nonaerosol)

Category:	Oven or Grill Cleaner	
Subcategory	Nonaerosol	
Typical noncompliant:	40	%VOC by weight
Proposed Limit:	4	%VOC by weight
Average Unit Size:	144	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	65.00	0.00	71.00	0.00
Sodium Hydroxide	0.086	10.00	0.01		
Potassium Hydroxide	1.700	20.00	0.34		
Monoethanolamine	0.820	2.00	0.02	1.00	0.01
Butyl Cellosolve	1.300	3.00	0.04	3.00	0.04
Inorganics	0.090			10.00	0.01
LVP-Glycol Ether	1.150			15.00	0.17
		Total Cost, $/pound:	0.41		0.23
		Total Cost, $/Unit:	3.65		2.07
				Cost increase to comply, $/unit:	(1.58)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	65.00	0.00	71.00	0.00
Sodium Hydroxide	0.091	10.00	0.01		
Potassium Hydroxide	2.000	20.00	0.40		
Monoethanolamine	1.120	2.00	0.02	1.00	0.01
Butyl Cellosolve	1.340	3.00	0.04	3.00	0.04
Inorganics	0.910			10.00	0.09
LVP-Glycol Ether	1.760			15.00	0.26
		Total Cost, $/pound:	0.47		0.41
		Total Cost, $/Unit:	4.26		3.67
				Cost increase to comply, $/unit:	(0.59)

Heavy-Duty Hand Cleaner or Soap

Category:	Heavy-Duty Hand Cleaner or Soap	
Subcategory	Nonaerosol	
Typical noncompliant:	8	%VOC by weight
Proposed Limit:	1	%VOC by weight
Average Unit Size:	133.5	wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
LVP Solvent	0.950	13.00	0.12	19.00	0.18
Mineral Spirits	0.600	2.00	0.01	0.50	0.00
Fragrance	5.000	1.00	0.05	1.00	0.05
Water	0.002	59.00	0.00	56.00	0.00
Inorganic abrasive	0.090	8.00	0.01	10.00	0.01
D-Limonene	1.200	6.00	0.07	0.50	0.01
Surfactant	3.500	8.00	0.28	9.00	0.32
Propylene Glycol	0.840	3.00	0.03	4.00	0.03
		Total Cost, $/pound:	0.57		0.60
		Total Cost, $/Unit:	4.76		4.99
				Cost increase to comply, $/unit:	0.23

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Noncompliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
LVP Solvent	1.050	13.00	0.14	19.00	0.20
Mineral Spirits	0.850	2.00	0.02	0.50	0.00
Fragrance	10.000	1.00	0.10	1.00	0.10
Water	0.002	59.00	0.00	56.00	0.00
Inorganic abrasive	0.910	8.00	0.07	10.00	0.09
D-Limonene	1.300	6.00	0.08	0.50	0.01
Surfactant	7.000	8.00	0.56	9.00	0.63
Propylene Glycol	0.960	3.00	0.03	4.00	0.04
		Total Cost, $/pound:	0.99		1.07
		Total Cost, $/Unit:	8.30		8.93
				Cost increase to comply, $/unit:	0.64

Appendix E

Nonrecurring Cost Estimates

Nonrecurring Cost Estimates

Appendix E contains the methodology and costs staff used to assign nonrecurring costs for each category. Nonrecurring costs are those associated with research and development to reformulate complying products and are independent of, and in addition to, the costs of ingredients to produce a product. For each category proposed for regulation, staff estimated a low cost and a high cost.

For both low and high cost scenarios, the initial statement of product development goals, to final delivery of the new product to the marketplace 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.

1. Nonrecurring Costs Considered

A brief description of the nonrecurring cost factors considered is provided below.

Product Development

Given a set of new product requirements, in the product development phase a laboratory prototype for product evaluation and testing is produced. This includes formulating the contents and specifying the packaging and raw materials. New packaging and chemical formula components might need to be sourced.

Stability Testing

Stability testing ensures that the newly formulated chemical composition and/or packaging are compatible with each other and with product function for a reasonable period of time. Food and Drug Administration (FDA) and U.S. EPA regulated products require extra steps to ensure the stability of active ingredients and kill claims of products such as disinfectants and pesticides.

Efficacy Testing

Efficacy testing is the process to ensure that the product maintains the ability to perform label claims and to meet customer expectations. For U.S. EPA Federal Insecticide, Fungicide, and Rodenticide (FIFRA) registered products this would require extensive testing by a specialized laboratory to validate anti-microbial efficacy claims. The testing must be documented with and meet the approval of U.S. EPA.

Safety Test

Safety testing costs include testing of the new product to ensure safety to manufacturing personnel during fabrication, logistics personnel during transit, and to consumers during use and storage.

Labeling Modifications

Costs assigned for labeling modifications are those required when product qualities or use instructions change.

Registration Fees

Registration expenses are generally incurred for products requiring U.S. EPA registration or FDA regulation whenever changes are made to the label or formula.

Marketing

The costs for marketing consider: focus group testing, conducting surveys, advertising, and design and publication of print and Internet materials.

Manufacturing

The costs for manufacturing consider the technology and infrastructure required to mass-produce a product. A new VOC limit which must be met by changes to the production requirements would incur a manufacturing cost proportional to the magnitude of the change. Manufacturing costs to comply with proposed standards can include 'pilot plant' testing and/or retooling of production lines or construction of completely new facilities.

A pilot plant test is a small scale version of full scale production which is large enough to approximate the physical characteristics and challenges which will be encountered in the full-scale version. A pilot test run consumes considerably less resources and raw materials than a full scale run to produce a batch of product which will not necessarily be ready or suitable for a commercial market.

Literature

Literature costs are those incurred when new sales and marketing and/or technical literature need to be developed and distributed in order to inform customers of the attributes of a new product.

2. Assigning Costs

A set of per product reformulation costs in 1991 dollars has been established for each phase of bringing a reformulated product into the market. The costs are adjusted to

2010 dollars using a well-established method of rationing chemical engineering plant cost indices as follows (Peters and Timmerhaus, 1980):

$$\text{Non-Recurring Costs (in 2010 dollars)} = \text{Non-Recurring Costs (in 1991 dollars)} \times \frac{\text{C.E. 2010 Index}}{\text{C.E. 1991 Index}}$$

where,

C.E. 2010 index = 2010 Chemical Engineering Plant Cost Index = 539.1 (Chemical Engineering, 2010).

C.E. 1991 index = 1991 Chemical Engineering Plant Cost Index = 361.3 (Chemical Engineering, 1991).

Tables E-1 and E-2 show the costs assigned to each phase for the low and high cost scenarios for "household product" and "Pesticide and Disinfectant" product categories.

To develop the costs shown in Tables E-1 and E-2, personnel costs are assigned. Beyond personnel costs, additional cost elements were considered at each phase and added as appropriate. These cost elements are facility; equipment; tool; jig; fixture and miscellaneous materials handling equipment; purchased material; packaging; distribution; warehousing; technical data; research studies and tests; promotional literature; residual inventory and disposal; consumer tests; general and administrative expense; patent; registration fees; and computer support. The result of these considerations is a per-product nonrecurring cost for developing a reformulated product and bringing it to market.

The length of time in each phase was estimated based on an industry analysis of 80 new product innovations. Most of the phases occur in sequence; however, there is some time overlap in each phase.

Next, estimated personnel resources were allocated to each phase considering the most probable types of skills needed including general engineering; technician; drafting; packaging engineering; specification engineering; model making; chemical engineering; technical publication; production support; quality assurance; marketing; warehousing; word processing; and clerical. For high cost elements, additional personnel were allocated to each phase.

Staff used different assumptions for the low and high cost analyses, and considered the specific likelihood that each of the cost elements would occur for each product category individually.

Table E-1
Assigned Nonrecurring Costs for Product Development: Generic per Product Reformulation Costs (Low Cost Approach)

	Household	Pesticide & Disinfectant
Product Development Material	$149	$149
Computer Support	$149	$149
Personnel/Formulation	$5,521	$5,521
Personnel/Delivery System	$0	$0
Prototype Equipment	$0	$0
Testing Material	$448	$448
Computer Support	$0	$0
Personnel/Stability Test	$1,194	$1,194
Personnel/Efficacy Test	$1,194	$1,194
Personnel/Safety Test	$2,984	$2,984
Labeling Modifications Material	$149	$149
Technical Data	$298	$298
Personnel	$895	$895
Registration/Fees	$298	$298
Personnel	$597	$1,641
Manufacturing Equipment	$0	$0
Technical Data	$149	$149
Computer Support	$0	$0
Other	$0	$0
Personnel	$1,343	$1,343
Marketing Studies	$298	$298
Literature	$149	$149
Inventory	$0	$0
Computer Support	$0	$0
Personnel	$298	$298
TOTAL	**$16,113**	**$17,157**

2010 C.E. Plant Cost Index =539.1 (final February 2010)
1991 C.E. Plant Cost Index = 361.3

Table E-2
Assigned Nonrecurring Costs for Product Development:
Generic per Product Reformulation Costs (High Cost Approach)

	Household	Pesticide & Disinfectant
Product Development Material	$746	$895
Computer Support	$895	$746
Personnel/Formulation	$18,950	$18,950
Personnel/Delivery System	$24,172	$22,382
Prototype Equipment	$1,492	$1,492
Testing Material	$448	$448
Computer Support	$448	$448
Personnel/Stability Test	$6,715	$6,715
Personnel/Efficacy Test	$5,521	$5,521
Personnel/Safety Test	$9,997	$9,997
Labeling Modifications Material	$298	$298
Technical Data	$895	$895
Personnel	$5,372	$5,372
Registration/Fees	$448	$746
Personnel	$4,476	$4,924
Manufacturing Equipment	$37,303	$37,303
Technical Data	$746	$746
Computer Support	$149	$149
Other	$1,044	$1,044
Personnel	$30,738	$30,738
Marketing Studies	$1,492	$1,492
Literature	$746	$597
Inventory	$2,984	$2,984
Computer Support	$149	$149
Personnel	$12,235	$9,699
TOTAL	**$168,459**	**$164,730**

2010 C.E. Plant Cost Index = 539.1 (final February 2010)
1991 C.E. Plant Cost Index = 361.3

Low Cost Scenario

In the low cost scenario it is assumed that only minor modification to the current formulation is necessary to come into compliance. Therefore, for the low cost analysis no major costs were added for changing delivery systems or other product attributes.

In addition, it is common that large companies having significant market share and broad product lines offer both complying products and noncomplying products. In some cases, relatively low costs would be incurred where these companies could increase sales and distribution of complying products and discontinue sales of 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.

High Cost Scenario

Each category was analyzed individually to determine which of the elements, discussed above, and shown in Table E-2, manufacturers would likely incur in their reformulation efforts. High costs for specific steps of the reformulation process were only included in the cost analysis where staff believed they were likely to occur. If staff believed a markedly different product would be needed to comply with the proposed limit, such as a new delivery system, then high personnel and capital resources, especially in product development and manufacturing changes, were assumed. In addition, a new delivery system would require investment for prototypes, new filling machines training, and technical data, so these high costs were also included in these scenarios. Additional costs were also added for packaging, distribution and warehousing. In areas where it was expected that little or no reformulation would occur, or that the cost of reformulation would be minimal, the value for low cost was used.

For especially challenging limits, it was assumed for the high cost approach that, because of a markedly different product, there would also be additional marketing costs, including research studies and tests, promotional literature, and consumer tests. These costs vary by the type of product, however the household products being proposed for further regulation typically having a larger expense in this area. The cost analysis did not include the costs for an extensive advertising campaign. New products are regularly brought onto the market, and the advertising for a new product, whether reformulated or not, would replace the advertising for the existing product, and would be a normal cost. It was assumed that the new product would be marketed nationally.

The staff also recognized that development of a new product does not occur in isolation. Few companies have only one product line; for those that have more than one product line, the product lines can be very similar. Development and production tasks, from the initial concept through marketing, would be proceeding simultaneously on more than

one product line, with a transfer of information and work-sharing between the products. For these companies, this "technology transfer" would substantially reduce the cost of developing and marketing a new product on a per product basis. For categories where the majority of products were held by a few companies it was assumed that this "technology transfer" would occur, and high costs adjusted accordingly.

Other Assumptions

Staff 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.

REFERENCES

1. Chemical Engineering magazine. Chemical Engineering Plant Cost Index. February, 2010. (Chemical Engineering, 2010)

2. Chemical Engineering magazine. Chemical Engineering Plant Cost Index. April, 1997. (Chemical Engineering, 1997)

3. Peters, M. S. and Timmerhaus, K. D. Plant Design and Economics for Chemical Engineers. 3rd Edition, McGraw-Hill Book Company, 1980, pp. 159-162. (Peters and Timmerhaus, 1980)

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO HEAR A REPORT ON UPDATES TO EMISSIONS INVENTORIES FOR TRUCKS, BUSES, AND OFF-ROAD EQUIPMENT PRIOR TO CONSIDERING AMENDMENTS TO THE TRUCK AND BUS REGULATION AND THE OFF-ROAD REGULATION

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to provide an informational item on vehicle activity and emissions data for trucks, buses, and off-road equipment. This item is informational only and the Board will take no action. The presentation will discuss emission inventory methods and data used in support of two regulatory items scheduled for Board consideration at the following Board hearing (December 2010). The two regulatory items the Board will consider at the December hearing are titled: 1) "Rulemaking to Consider the Adoption of Proposed Amendments to the Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use On-Road Diesel-Fueled Vehicles, the Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure, and the Regulation To Control Emissions From In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks at Ports and Intermodal Rail Yard Facilities" (Truck and Bus rule) and 2), "Rulemaking to Consider the Adoption of Proposed Amendments to the Regulation for In-use Off-Road Diesel-fueled Fleets and Off-Road Large Spark Ignition Engine Fleet Requirements." (Off-Road rule)

This informational item for the November meeting focuses only on the emissions inventory activity and emissions data and methods and not the proposed regulatory amendments, which are scheduled for December. Information regarding the emissions inventory updates is available along with full information regarding the Truck and Bus rule at http://www.arb.ca.gov/regact/2010/truckbus10/truckbus10.htm and the Off-Road rule at http://www.arb.ca.gov/regact/2010/offroadlsi10/offroadlsi10.htm.

DATE: November 18, 2010

TIME: 9:00 a.m.

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

This item may be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., November 18, 2010, and may continue at 8:30 a.m., November 19, 2010. This item may not be considered until November 19, 2010. Please consult the agenda for the meeting, which will be available at least 10 days before November 18, 2010, to determine the day on which this item will be considered.

Background and Description

Each of the regulatory proposals for changes to the Truck and Bus and Off-Road rules relies on estimates of the number and types of vehicles in operation, how they are used, and how much they are used. This information is then used to develop an emissions inventory, which supports the proposed regulatory changes. During 2010, ARB staff revised the inventories supporting each of these rules to improve the quality and accuracy of emissions estimates.

Staff updated the Truck and Bus rule inventory to account for the economic recession, which reduced 2009 activity and emissions by 25 percent, and to reflect new data, which marginally reduced emissions estimates. The updated truck and bus inventory is about 35 percent lower than previously estimated, due primarily to the recession.

Staff updated the Off-Road rule inventory to account for the economic recession, which reduced 2010 activity and emissions in the construction sector by more than 50 percent, and to reflect new information, which indicated several assumptions had previously been overestimated. As a result, the updated off-road inventory in 2010 is about 80 percent lower than previously estimated, with half the change attributable to the recession and half attributable to new data and assumptions.

For this informational item, scheduled for November 18th or 19th, staff will present the updates and changes to the truck and bus and off-road emission inventories, why the changes were made, and the results of the changes. Staff will also provide, at the time of the meeting, a brief written report summarizing the inventory updates. Because this is an informational item only, the Board will not take any action on the item.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

Staff has prepared two Staff Reports, Initial Statement of Reasons (ISOR), for the proposed regulatory actions the Board will consider in December. Detailed information regarding the inventory changes is available as technical appendices to the ISORs. The technical appendix for the truck and bus inventory is available at: http://www.arb.ca.gov/regact/2010/truckbus10/truckbusappd.pdf. The technical appendix for the off-road inventory is available at: http://www.arb.ca.gov/regact/2010/offroadlsi10/offroadappg.pdf.

Copies of the ISOR and the full text of the proposed regulatory language being proposed in December may be accessed on ARB's website listed above, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, or by calling (916) 322-2990.

Inquiries concerning the substance of the updated emission inventories may be directed to the designated agency contact person, Dr. Todd Sax, Chief of the Mobile Source Analysis Branch at (916) 322-5474.

SUBMITTAL OF COMMENTS

The Board will not take any action on this informational item at the November 18th meeting. The informational item will support the Board's rulemaking action in December. Any public comments received, either written or oral, on this item will be considered as part of the official record for the proposed regulatory amendments to the Truck and Bus and Off-Road regulations in December.

Interested members of the public may present comments relating to this matter orally or in writing at the meeting, and comments may also be submitted by postal mail or electronic submittal before the meeting. The public comment period for this informational matter is now open. To be considered by the Board at the November hearing, written submissions not physically submitted at the meeting must be received **no later than 12:00 noon, November 17, 2010**, and must be 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

As indicated above, detailed information regarding the truck and bus and off-road inventory changes are available as appendices to the respective ISORs for the Truck and Bus and Off-Road rules, which will be heard on December 16 or 17, 2010. Comments regarding the inventories and the changes made thereto may be physically submitted to the Clerk of the Board on the day of the hearing or by mail at the above postal and electronic addresses. If mailed or electronically submitted, the comments must be received by the Clerk of the Board by no later than 12:00 noon on December 15, 2010.

To ensure that your comment will be available for consideration it is important that your comment is received by the deadline.

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 20 copies of any written submission. Also, 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.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format (i.e., Braille, large print, etc.) or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at 916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno (por decir, sistema Braille, o en impresión grande) u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: November 2, 2010

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.