California Environmental Protection Agency

Air Resources Board

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

PUBLIC MEETING AGENDA

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

January 25, 2007
9:00 a.m.

Item #

07-1-1: Report to the Board on ARB's Action Plan for 2007

ARB Executive Officer Catherine Witherspoon will brief the Board on major initiatives, rulemakings, and other activities scheduled for 2007.

07-1-2: Report to the Board on the State of the State's Air Quality

ARB staff will brief the Board on the progress that has been achieved in meeting federal ozone and particulate matter standards in California and the remaining challenges.

07-1-3: Report to the Board on a Health Update: The Impacts of Coarse Particulate Matter Cardiovascular Effects

Most of the health effects seen with exposure to particulate matter are associated with fine particulate, but recent study has shown impacts from coarse particles as well. This study investigated the effects of coarse particles in older adults with coronary heart disease residing in the Coachella Valley. Changes in heart rate variability were associated with exposure to coarse particulate matter and particulate matter ≤ 10 microns. Heart rate variability changes are a known risk factor for death from cardiovascular disease.

07-1-4: Public Hearing to Consider Research Proposals

1. *"Spatiotemporal Analysis of Air Pollution and Mortality in California Based on the American Cancer Society Cohort," University of California, Berkeley, $749,706, Proposal No. 2624-254.*
2. *"Emissions of HFC-134a from Auto Dismantling and Recycling," Foundation for California Community Colleges, $159,578, Proposal No. 2623-254.*
3. *"Inventory of Direct and Indirect GHG Emissions from Stationary Air Conditioning and Refrigeration Sources, with Special Emphasis on Retail Food Refrigeration and Unitary Air Conditioning," ARMINES, $225,060, Proposal No. 2622-254.*
4. *Contract Augmentation "Extended Analyses of Air Pollution and Cardiopulmonary Disease in the California Teachers Study Cohort," Department of Health Services, 284,652, Contract No. 03-313.*
5. *Toxicity of Source-Oriented Ambient Aerosols, University of California, Davis, $838,934, Proposal No. 2617-254.*

07-1-5: Public Hearing to Consider Amendments to the Dry Cleaning ATCM

ARB staff is proposing amendments to the Dry Cleaning ATCM. The proposed amendments are designed to further protect public health by phasing out the use of Perc dry cleaning machines by 2023, with earlier compliance dates for coresidential facilities and older machines.

07-1-6: Appointment of the Members of the AB 32 Environmental Justice Advisory Committee and the AB 32 Economic & Technology Advancement Advisory Committee

The Global Warming Solutions Act of 2006 (AB 32) requires ARB to appoint an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee. At the January 25, 2007 public meeting the Board will appoint the members of these Committees.

07-1-7: Report to the Board on Recent Scientific Findings from Climate Change Studies

Staff will provide an update on important recent work in the field of climate change. Topics to be covered include stronger evidence of changes to global climate, observed impacts on the earth's ecosystems and recent economic studies.

07-1-8: Report to the Board on the Status of Harbor Communities Monitoring Studies

Multiple monitoring techniques are being used to gauge the air quality impacts of port related activities, cars, trucks, refineries, and other industrial activities in the region surrounding the Ports of Los Angeles and Long Beach. The results will allow ARB to better evaluate where localized high concentrations are occurring, when they are occurring, and what are the primary sources. The results will also allow us to separate the air pollution contributions of regional, community, and fence-line sources on the air pollution burden to residents in Wilmington, San Pedro, and West Long Beach. In addition, we will be testing low-cost, easy-to-use monitors for future deployment in other air pollution impacted communities. And finally, these results will also establish a baseline from which to judge the success of potential mitigation methods and regulations. Staff will present an overview of the studies and preliminary results from recently completed pilot studies.

07-1-9: Update the Board on the 2005 ARB / Railroad Statewide Agreement

Staff will provide an update to the Board on the implementation efforts for the Statewide Railyard Agreement. The last update was provided at the July 20, 2006 ARB board meeting.

07-1-10: Update the Board on the Carl Moyer Program 2006 Status Report

This report updates the Board on Carl Moyer Program implementation in Years 1-6 and changes to the program since the last Status Report in February 2004. The report describes types of projects funded, emission reductions achieved, program cost-effectiveness, and summarizes Carl Moyer Program accomplishments and challenges.

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 folllowing pending litigation:

Central Valley Chrysler-Jeep, Inc. et al. v. Witherspoon, U.S. District Court (E.D. Cal. – Fresno), No. CIV-F-04-6663 REC LJO.

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

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

Massachusetts v. E.P.A., 415 F. 3d 50 (D.C. Circ. 2005), Certiorari granted, 126 S. Ct. 2960 (June 26, 2006.)

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

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

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

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

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

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

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

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

- **For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services.**

- **If you are a person with limited English and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at 916-323-7053.**

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

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

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

INDEX

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

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

January 25, 2007
9:00 a.m.

		Pages
07-1-1:	Report to the Board on ARB's Action Plan for 2007	---
07-1-2:	Report to the Board on the State of the State's Air Quality	---
07-1-3:	Report to the Board on a Health Update: The Impacts of Coarse Particulate Matter Cardiovascular Effects	---
07-1-4:	Public Hearing to Consider Research Proposals	---
07-1-5:	Public Hearing to Consider Amendments to the Dry Cleaning ATCM	1-236
07-1-6:	Appointment of the Members of the AB 32 Environmental Justice Advisory Committee and the AB 32 Economic & Technology Advancement Advisory Committee	---
07-1-7:	Report to the Board on Recent Scientific Findings from Climate Change Studies	---
07-1-8:	Report to the Board on the Status of Harbor Communities Monitoring Studies	---
07-1-9:	Update the Board on the 2005 ARB / Railroad Statewide Agreement	---
07-1-10:	Update the Board on the Carl Moyer Program 2006 Status Report	237-510

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CONTROL MEASURE FOR PERCHLOROETHYLENE DRY CLEANING OPERATIONS AND ADOPTION OF REQUIREMENTS FOR MANUFACTURERS AND DISTRIBUTORS OF PERCHLOROETHYLENE

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider amendments to the existing dry cleaning regulation that would phase out the use of perchloroethylene (Perc) from dry cleaning operations and to consider the adoption of requirements for manufacturers and distributors of Perc.

DATE: January 25, 2007

TIME: 9:00 a.m.

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

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m. on January 25, 2007, and may continue to 8:30 a.m., January 26, 2007. This item may not be considered until January 26, 2007. Please consult the agenda for the meeting, which will be available at least ten days before January 25, 2007, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette, or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. An interpreter will be available at the public hearing for those who wish to give testimony in Korean. For Korean translation, please contact Ms. Linda Keifer at (916) 323-4327 or lkeifer@arb.ca.gov. If you are a person with limited English in a language other than Korean and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to section 93109, title 17, California Code of Regulations (CCR); and proposed adoption of sections 93109.1 and 93109.2, title 17, CCR.

Background: In 1991, ARB identified Perc as a toxic air contaminant (TAC). As required by state law, ARB then evaluated the need to reduce the emissions of Perc. In

표제 17. 캘리포니아 공기자원협의회

퍼클로로에틸렌 드라이클리닝 작업 통제 조치에 대한 수정안 및 퍼클로로에틸렌 제조업자와 유통업자의 요구조건 채택을 검토하기 위한 공청회 통지

공기자원협의회(Air Resources Board, 이하 'ARB' 또는 '협의회')는 드라이클리닝 작업에서 퍼클로로에틸렌(퍼크) 사용을 단계적으로 금지하는 기존의 드라이클리닝 규정에 대한 수정안을 검토하고 퍼크 제조업자와 유통업자의 요구조건을 채택하는 안건을 검토하고자 다음 일시 및 장소에서 공청회를 개최합니다.

날짜: 2007 년 1 월 25 일

시간: 오전 9 시

장소: 캘리포니아환경보호청(California Environmental Protection Agency)
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

이 안건은 이틀 일정으로 잡혀 있는 협의회 회의에서 검토될 예정으로, 회의는 2007 년 1 월 25 일 오전 9 시에 시작하여 다음날인 2007 년 1 월 26 일 오전 8:30 에 속개될 수도 있습니다. 그러나 다음날인 2007 년 1 월 26 일까지 연장되지 않을 수도 있습니다. 안건이 검토되는 날을 알려면 개회일인 2007 년 1 월 25 일에서 적어도 10 일 전에는 입수할 수 있는 회의 의제를 참고하시기 바랍니다.

이 문서는 감각 계통에 장애가 있는 분들을 위하여 점자, 큰 글씨, 카세트 테이프, 컴퓨터 디스크 등으로도 제공됩니다. 장애인 서비스를 요청하려면 ARB 의 장애인 담당 코디네이터(Disability Coordinator)에게 연락하시기 바랍니다. 육성 전화는 (916) 323-4916 이며, 캘리포니아 중계서비스(California Relay Services)를 통할 때에는 711 번입니다. 공청회에서 한국어로 발언하실 분들은 통역사의 도움을 받을 수 있습니다. 한국어 통역을 원하시면 Linda Keifer(린다 카이퍼)에게 (916) 323-4327 또는 lkeifer@arb.ca.gov 로 연락하시기 바랍니다. 한국어 이외의 언어를 사용하고 영어에 어려움이 있어 통역 서비스를 요청하실 분들은 (916) 323-7053 ARB 이중언어 담당 매니저(Bilingual Manager)에게 연락하십시오.

<u>제안된 조치의 중요 요지 및 정책 기조문 개요</u>

<u>관련 조항:</u> '캘리포니아 제규정집'(California Code of Regulations, CCR) 표제 17, 제 93109 조에 대한 수정안 제안 및 CCR 표제 17, 제 93109.1 조와 93109.2 조의 채택을 제안.

<u>배경 설명:</u> 1991 년, ARB 는 퍼크를 '유독성 대기 오염물질'(toxic air contaminant, TAC)로 확인했습니다. 주법의 규정에 따라 ARB 는 그 다음 단계로 퍼크 배출가스의 감축 필요성을

1993, the Board found there was a need to reduce Perc emissions and approved a regulation to reduce emissions from Perc dry cleaning operations (title 17, CCR, section 93109). In general, control measures are based on the best available control technology (BACT) or a more effective control method in consideration of cost and risk, among other factors. The existing regulation sets forth the requirements for Perc dry cleaning equipment, operations and maintenance, recordkeeping, and reporting.

As permitted under state law, in 2002, the South Coast Air Quality Management District (South Coast AQMD) amended its Rule 1421, Control of Perchloroethylene Emissions from Dry Cleaning Systems (Rule 1421). These amendments prohibit new or relocated Perc dry cleaning facilities and will phase out the use of Perc in existing dry cleaning operations by December 1, 2020 within the South Coast AQMD. Rule 1421 required converted machines to be phased out by July 1, 2004. In addition, all existing Perc dry cleaners in the South Coast AQMD are required to use secondary control and comply with Rule 1402, Control of Toxic Air Contaminants from Existing Sources, which limits the lifetime cancer risk from a facility to no more than 25 in a million, by November 1, 2007. Prior to December 1, 2020, if an existing facility chooses to replace its existing machine with a new Perc machine, the facility would need to purchase a secondary control machine and comply with Rule 1401, New Source Review of Toxic Air Contaminants. Rule 1401 limits the lifetime cancer risk from a facility to less than 10 in a million.

From 2003 to 2005, staff performed an evaluation of the effectiveness of the Dry Cleaning ATCM. Although the evaluation showed that Perc emissions from dry cleaning decreased by about 70 percent, ARB staff found that more can be done to reduce emissions of Perc from dry cleaning operations. As a result of this evaluation, the staff developed proposed amendments to the Dry Cleaning ATCM, which the Board considered on May 25, 2006.

At the May 25, 2006 hearing, the Board heard testimony from many interested parties, including the affected industries, industry associations, environmental groups, local air pollution control districts, and other interested individuals. Although some of the testimony was supportive of ARB staff's proposal, many commenters suggested that ARB phase out the use of Perc in dry cleaning operations. The commenters based their recommendation primarily on the toxic effects of Perc and that there are available alternative dry cleaning technologies.

After hearing the public comments and considering the staff's proposal, the Board made a decision not to proceed with the proposed rulemaking and directed staff to return to the Board with a new proposal to phase out the use of Perc in dry cleaning operations. The Board also directed staff to consider the cost impacts of the proposal and evaluate ways to minimize these through possible financial assistance programs.

Description of the Proposed Regulatory Action: The proposed regulatory amendments announced in this Notice are designed to phase out the use of Perc from dry cleaning operations. The amended regulation would impact the type of equipment

평가했습니다. 1993 년, 협의회는 퍼크 배출가스를 감축할 필요성이 있음을 알게 되어 퍼크 드라이클리닝 작업에서 발생하는 배출가스를 줄이는 규정을 승인했습니다(CCR 표제 17, 제 93109 조). 일반적으로, 통제 조치의 근거가 되는 것은 '이용 가능한 최선의 통제기술'(the best available control technology, BACT) 또는, 다른 무엇보다도, 비용 및 위험 요인을 감안한 보다 효과적인 통제 방법입니다. 기존 규정에는 퍼크 드라이클리닝 장비, 작업, 유지관리, 기록유지, 보고 등에 대한 요구조건이 기술되어 있습니다.

주법에 허가된 바와 같이, '남부연안 대기질 관리국'(South Coast Air Quality Management District, 이하 '남부연안 AQMD')은 2002 년에 '규칙 1421, 드라이클리닝 시스템에서 발생하는 퍼클로로에틸렌 배출가스 통제'(Rule 1421, Control of Perchloroethylene Emissions from Dry Cleaning Systems)(이하 '규칙 1421')라는 자체 규칙을 수정했습니다. 이 수정안은 현재 퍼크 드라이클리닝 시설의 신규 개설 또는 이전을 금지하고 있으며, '남부연안 AQMD' 내에서 행해지는 기존의 드라이클리닝 작업에서 퍼크의 사용을 2020 년 12 월 1 일까지 단계적으로 금지할 예정입니다. 규칙 1421 은 개조한 기계를 2004 년 7 월 1 일까지 단계적으로 금지하도록 했습니다. 이외에도, 남부연안 AQMD 에 있는 기존의 모든 퍼크 드라이클리닝 업소들은 이차 제어 기계를 사용하여야 하며, '규칙 1402, 기존 오염원에서 방출되는 유독성 대기 오염물질 통제'(Rule 1402, Control of Toxic Air Contaminants from Existing Sources)라는 규칙을 준수하여야 합니다. 이 규칙은 시설의 평생 암발병률을 2007 년 11 월 1 일까지 1 백만분의 25 이하로 제한하고 있습니다. 기존 시설이 2020 년 12 월 1 일 전에 기존 기계를 새 퍼크 기계로 대체하기로 하면, 해당 시설은 이차 제어 기계를 구입하고 '규칙 1401, 유독성 대기 오염물질 신규 오염원 검토'(Rule 1401, New Source Review of Toxic Air Contaminants)라는 규칙을 준수하여야 합니다. 규칙 1401 은 시설의 평생 암발병률을 1 백만분의 10 미만으로 제한하고 있습니다.

2003 년부터 2005 년까지, 실무진은 드라이클리닝 ATCM 의 효율성을 평가했습니다. 평가 결과 드라이클리닝 작업에서 발생하는 퍼크 배출가스가 70% 정도 감소되었으나, ARB 실무진은 더 노력을 기울이면 드라이클리닝 작업에서 발생하는 퍼크 배출가스를 더 줄일 수 있다는 것을 알게 되었습니다. 이 같은 평가를 토대로 실무진은 드라이클리닝 ATCM 에 대하여 수정안을 제안하였고, 협의회는 이 수정안을 2006 년 5 월 25 일에 검토하였습니다.

2006 년 5 월 25 일에 있은 공청회에서, 협의회는 이 조치의 영향을 받는 관련 산업계, 업계 연합회, 환경단체, 지역 대기오염 통제국, 이해 관계에 있는 그 밖의 개인들을 비롯한 수많은 이해 당사자들의 의견을 청취하였습니다. 이 중에는 ARB 실무진의 제안을 지지하는 발언도 있었으나, 논평자들은 ARB 가 드라이클리닝 작업에서의 퍼크 사용을 단계적으로 금지해야 한다는 의견을 제시한 사람들이 많았습니다. 논평자들이 이렇게 권고한 주된 근거는 퍼크의 폐해가 크다는 것과 드라이클리닝을 대체할 기술이 존재한다는 것이었습니다.

협의회는 대중의 의견을 청취하고 실무진의 제안을 검토한 후 제안 수정안의 입법을 추진하지 않기로 했으며, 실무진에게 드라이클리닝 작업에서 퍼크의 사용을 단계적으로 금지시키는 새로운 제안을 마련하여 협의회에 다시 제출하라고 지시하였습니다.
또한 그 제안으로 인하여 가중되는 비용 부담을 고려하고, 재정 지원 프로그램을 통하여 그러한 부담을 최소화할 방안을 아울러 검토하라고 지시하였습니다.

<u>제안된 규제 조치의 내용:</u> 이 통지문에 소개되어 있는 규제적인 제안 수정안은 드라이클리닝 작업시 퍼크의 사용을 단계적으로 금지하려고 마련된 것입니다. 수정 규정은 퍼크 드라이클리닝

being used in the Perc dry cleaning industry. The existing regulation prohibits the use of transfer, vented, and self-service machines. The proposed amended regulation would, over time, expand this prohibition to include: 1) the sale or lease of any new Perc machine; 2) drying cabinets; and 3) dip tank operations in Perc dry cleaning facilities. In addition, for a new facility, no person would be permitted to install or operate any Perc dry cleaning machine or engage in Perc water-repelling operations.

Over time, all operators of existing Perc facilities would be required to remove from service their existing machines by a specified date. The proposed amendments to the existing regulation would also require some additional recordkeeping and reporting, and good operating practices.

The proposal also includes requirements for Perc solvent manufacturers and distributors in new sections 93109.1 and 93109.2, title 17, CCR. The requirements relate to information that will be used to facilitate the implementation of Health and Safety Code, section 41998 (Assembly Bill 998, chapter 821, statutes of 2003).

The staff will present the proposal to the Board for consideration at a public hearing. After considering the proposal, the alternatives discussed below, and the public comments, the Board may choose to adopt these provisions or alternative requirements.

Description of Alternatives: The Board may consider alternative approaches to the proposal. These alternatives span a range of approaches. Since one common solvent that could be used in place of Perc causes the release of smog-forming emissions, the Board could also prohibit the use of machines that emit smog-forming emissions as a mitigating action associated with restricting the use of Perc. Non-toxic and non-smog forming alternatives are also available (for example, water-based cleaning and carbon dioxide cleaning). Given these alternatives, the Board could consider requirements related to the use of only non-toxic and non-smog forming emissions by specified dates. The Board could also consider increasing or shortening specified dates in the regulation which require the phase out of Perc dry cleaning operations. Finally, the Board could consider specifying risk thresholds above which Perc dry cleaning facilities could not operate, similar to the South Coast AQMD requirements.

COMPARABLE FEDERAL REGULATIONS

The United States Environmental Protection Agency (U.S. EPA) first promulgated technology-based emissions standards to control emissions of Perc from dry cleaning facilities in 1993. The current California regulation was granted federal equivalency on May 21, 1996 (Volume 61, Federal Register, page 25397). Effective July 27, 2006, U.S. EPA promulgated revisions to their 1993 standards to further limit emissions of Perc from existing and new dry cleaning facilities. Based on a review of U.S. EPA's final rule, staff is confident that the emissions-related requirements of the proposed amended regulation are more stringent than U.S. EPA's 2006 final rule. However, if

업계에서 사용하는 장비의 유형에 영향을 미칠 것입니다. 기존 규정은 일괄작업 기계(transfer machine), 통풍구가 달린 기계(vented machine), 셀프 서비스 기계(self-service machine) 등의 사용을 금지하고 있습니다. 제안된 수정 규정은 시간이 지나면 이 같은 금지 조치를 다음 사항에까지 확대할 것입니다: 1) 신규 퍼크 기계의 판매 또는 리스, 2) 건조 캐비닛, 3) 퍼크 드라이클리닝 시설에서의 세척조 작업. 이 밖에도, 신규 시설에서는 아무도 퍼크 드라이클리닝 기계를 설치 또는 가동하지 못하거나 퍼크 발수처리 작업(Perc water-repelling operations)을 하지 못하게 될 것입니다.

시간이 지나면 기존의 퍼크 시설에서 일하는 모든 작업자는 명시된 날짜까지 기존 기계를 사용하는 작업에서 완전히 손을 떼어야 할 것입니다. 또한 기존 규정에 대한 제안 수정안은 기록유지, 보고, 우량 작업 관행 등을 추가로 의무화할 것입니다.

이번 제안에 아울러 포함된 것은 CCR 표제 17 에 신설된 제 93109.1 조 및 제 93109.2 조에 규정된 퍼크 솔벤트 제조업자와 유통업자의 요구조건입니다. 이 요구조건은 보건안전법(Health and Safety Code) 제 41998 조(입법안 998, 제 821 장, 2003 년 법령)의 시행을 촉진하는 데 사용될 정보와 관련이 있습니다.

실무진은 이 제안을 협의회에 제출하여 공청회의 검토를 거칠 예정입니다. 협의회는 이 제안과 아래에 논의된 대안 및 대중의 의견을 검토한 후 이 규정 또는 대안적 요건을 채택할 수도 있습니다.

<u>대안의 내용:</u> 협의회는 이 제안에 대한 대안적 접근방법을 검토할 수도 있습니다. 이 대안적 접근방법의 범위는 넓습니다. 퍼크 대신 사용할 수 있는 한 가지 흔한 솔벤트는 스모그를 만드는 배출가스를 방출하기 때문에, 협의회는 퍼크 사용 규제와 관련한 경감 조치로 스모그를 만드는 배출가스를 방출하는 기계도 사용하지 못하도록 금지시킬 수 있습니다. 독성도 없고 스모그도 만들지 않는 대안도 있습니다(예: 습식 세탁과 이산화탄소 세탁). 협의회는 이 같은 대안들을 감안하여 특정 시한까지 독성도 없고 스모그도 만들지 않는 배출가스만 허용하게 하는 요구조건을 고려해 볼 수도 있습니다. 또한 드라이클리닝 작업에서 퍼크 사용을 단계적으로 금지하는 규정에서 특정 시한을 연장하거나 단축하는 방안도 고려할 수 있습니다. 마지막으로, 협의회는 남부연안 AQMD 요건과 유사하게 퍼크 드라이클리닝 시설이 영업할 수 없는 위험 임계값을 명시하는 방안을 고려할 수 있습니다.

<u>비교 가능한 연방 규정</u>

미국 환경보호청(United States Environmental Protection Agency, U.S. EPA)은 드라이클리닝 시설에서 발생하는 퍼크 배출가스를 통제할 목적으로 1993 년에 기술을 기반으로 하는 배출가스 기준을 우선 공포했습니다. 현행 캘리포니아 규정은 1996 년 5 월 21 일부로 연방 규정 합치 판정을 받았습니다(연방 등재부 제 61 권 25397 면). 2006 년 7 월 27 일부로 미국 EPA 는 1993 년 기준에 대한 개정 기준을 공포함으로써 기존 및 신규 드라이클리닝 시설에서 발생하는 퍼크 배출가스를 더욱 제한하였습니다. 미국 EPA 의 최종 규칙을 검토하고 나서, 실무진은 제안된 수정 규정의 배출가스 관련 요건이 미국 EPA 의 2006 년 최종 규칙보다 더욱 엄격한 것이라고 확신하고 있습니다. 그러나 제안된 드라이클리닝 ATCM 수정안은 협의회가 채택할 경우 미국 EPA 에 제출하여 연방 규정 합치 여부를 판정 받아야 합니다.

adopted by the Board, the proposed amended Dry Cleaning ATCM will need to be submitted to U.S. EPA for a federal equivalency determination.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a "Staff Report: Initial Statement of Reasons for the Proposed Amendments to the Control Measure for Perchloroethylene Dry Cleaning Operations and Adoption of Requirements for Manufacturers and Distributors of Perchloroethylene" (Staff Report) for the proposed regulatory action, which includes a summary of the potential environmental and economic impacts of the proposal, if any.

Copies of the Staff Report and the full text of the proposed regulatory language may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center,1st Floor, Sacramento, California 95814, (916) 322-2990 at least 45 days prior to the January 25, 2007 hearing. In addition, copies of the Executive Summary and the full text of the proposed regulatory language will be available in Korean. The Staff Report is also available on the internet at the website listed below, or by contacting the staff listed below.

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 the website listed below.

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Robert Krieger, Manager of the Emissions Evaluation Section, at (916) 323-1202 or by email at rkrieger@arb.ca.gov, or Mei Fong, Air Resources Engineer, at (916) 324-2570 or by email at sfong@arb.ca.gov.

Further, the agency representative and designated back-up contact persons to whom nonsubstantive inquiries concerning the proposed administrative action may be directed are Lori Andreoni, Clerk of the Board, (916) 322-5594, or Alexa Malik, Regulations Coordinator, (916) 322-4011. 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 Staff Report, and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB Internet site for this rulemaking at www.arb.ca.gov/regact/perc07/perc07.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 and in specific detail in the Staff Report.

관련 서류 입수 및 담당관 연락처

협의회 실무진은 제안된 규제 조치에 대한 '실무진 보고서: 퍼클로로에틸렌 드라이클리닝 작업 통제 조치에 대한 제안 수정안 및 퍼클로로에틸렌 제조업자와 유통업자의 요구조건 채택에 대한 일차 사유서'(Staff Report: Initial Statement of Reasons for the Proposed Amendments to the Control Measure for Perchloroethylene Dry Cleaning Operations and Adoption of Requirements for Manufacturers and Distributors of Perchloroethylene, 이하 '실무진 보고서')를 작성했습니다. 이 보고서에는 이 제안이 가져올 수 있는 환경적, 경제적 영향을 요약한 내용이 포함되어 있습니다.

이 실무진 보고서의 사본 및 제안된 규제 조치의 전문을 입수할 수 있는 곳은 다음과 같으며, 2007 년 1 월 25 일에 있을 공청회로부터 최소한 45 일 전에 구할 수 있습니다: Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, 전화 (916) 322-2990. 이 밖에도, 개요서(Executive Summary) 사본 및 제안된 규제 조치의 전문이 한국어로 제공될 예정입니다. 실무진 보고서는 아래에 소개된 인터넷 웹사이트에서도 구할 수 있으며, 아니면 아래에 기재된 실무진에게 연락하여도 입수할 수 있습니다.

'최종 사유서'(Final Statement of Reasons, FSOR)는 완성되는 대로 입수가 가능합니다. 이 통지에 기재된 담당관들에게 연락하여 요청하시거나, 아래에 소개된 웹사이트에서 구하시면 됩니다.

제안된 규정의 내용에 관한 문의는 지정된 다음 담당관들에게 하시기 바랍니다: Robert Krieger(로버트 크리거) – 배출가스평가과 과장(Manager of the Emissions Evaluation Section), (916) 323-1202 또는 rkrieger@arb.ca.gov, 혹은 Mei Fong(메이 퐁) – 공기자원 엔지니어(Air Resources Engineer), (916) 324-2570 또는 sfong@arb.ca.gov.

아울러, 제안된 행정조치의 내용이 아닌 일반적인 사항에 관한 문의는 당기관을 대표하는 지원 인력으로 지정된 다음 직원들에게 하실 수 있습니다: Lori Andreoni(로리 안드레오니) – 협의회 서기(Clerk of the Board), (916) 322-5594, 또는 Alexa Malik(알렉사 말리크) – 규제 조정관(Regulations Coordinator), (916) 322-4011. 협의회는 이 규칙 제정 조치에 대한 기록을 편찬했습니다. 여기에는 해당 제안의 토대가 되는 모든 정보가 실려 있습니다. 이 자료의 열람은 위 담당관들에게 요청하시면 됩니다.

이 통지와 실무진 보고서 그리고 FSOR 을 비롯한 모든 후속 규제 서류는 완성되는 대로 규칙 제정과 관련한 ARB 인터넷 사이트인 www.arb.ca.gov/regact/perc07/perc07.htm 에서 구할 수 있습니다.

영향을 받는 공공 기관과 업소 및 개인에게 드는 비용

제안된 규정을 정히 준수함으로써 공공 기관과 일반 개인에게 불가피하게 발생하는 비용 또는 절감액에 관한 협의회 집행관(Executive Officer)의 판정사항은 아래에 제시되어 있으며 실무진 보고서에는 더욱 자세하게 기술되어 있습니다.

정부법(Government Code) 제 11346.5 조 (a)(5)항 및 제 11346.5 조 (a)(6)항에 의하여, 집행관은 제안된 규제 조치로 인하여 아래의 설명과 같이 주정부 기관 또는 주정부에 대한 연방정부의

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will create costs or savings, as explained below, to a state agency or in federal funding to the state, costs or mandates to local agencies whether or not reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, or other nondiscretionary costs or savings to state or local agencies.

The Department of Corrections may incur a capital cost for purchasing a spare set of gaskets and a spare lint filter while they are still operating their Perc machines and for replacing their Perc machines. The Department of Corrections operates 12 dry cleaning machines at 12 correctional facilities in California. Eleven of the 12 dry cleaning machines are Perc machines and will need to be replaced by non-Perc dry cleaning systems. During the first three years of implementation, a total of 7 of the machines will need to be replaced because they will be 15 years old or older. The remaining 5 Perc machines will need to be replaced as they reach 15 years of age. Based on the spare gaskets, spare lint filter, installation and machine costs, the estimated fiscal cost impact to the Department of Corrections during the first three years will range from $169,500 to $522,000, and the total cost to comply with the proposed amendments over its lifetime ranges from $268,000 to $892,000. The proposed regulatory action will not affect federal funding to the State.

The ARB's staff will be preparing an implementation guidance document and assisting the local air pollution control and air quality management districts (local air districts) with implementation and technical issues related to the amended control measure. The development of the guidance document and most of the assistance to the local air districts will be a one-time cost that will be incurred during fiscal year 2008-2009 or 2009-2010. The estimated cost to ARB would be one quarter of a person/year, or approximately $25,000. In addition, ARB will see a loss of revenue from fees collected under the "Hot Spots" program due to the proposed amendments. During the first three years, ARB will see an estimated loss of $22,000 and at full implementation $355,000. However, this fee may be offset if alternatives are required to report under the "Hot Spots" program. All implementation costs from this rulemaking action would be absorbed within the existing ARB budget.

There is no additional enforcement cost associated with the proposed amendments because the proposed amendments do not require additional oversight from the local air districts. In fact, because the enforcement cost is directly proportional to the number of Perc facilities and/or equipment, as the Perc facilities discontinue the use of Perc equipment, there will be a decrease in the number of hours the local air districts will have to spend on annual inspection of facilities. In addition, because of the discontinued use of Perc in the dry cleaning facilities, local air districts will lose the fees that are being collected from the Perc facilities under the "Hot Spots" program as a source of revenue. However, during the first three years, local air districts will see a net cost savings that will range from $30,000 to $70,000. Overall, there will be net cost savings for local air districts that range from $1,769,000 to $3,301,000 over the lifetime of the proposed regulation.

지원금에 비용 또는 절감액이 발생하든가, 지역 기관에 정부법 표제 2 제 4 절 제 7 부(제 17500 조부터 시작)에 의하여 주정부가 배상할 수 있든 없든 비용 또는 의무가 발생하든가, 주정부 또는 지방 기관에 기타 비임의적인 비용 또는 절감액이 발생할 것이라고 판정하였습니다.

교정국(Department of Corrections)은 퍼크 기계를 여전히 가동하는 한편 예비 개스킷 세트와 예비 린트 필터를 구입하고 퍼크 기계를 교체하려면 자본 비용이 발생할 수도 있습니다. 교정국은 캘리포니아 내 12 개 교정 시설에서 12 대의 드라이클리닝 기계를 가동하고 있습니다. 12 대의 드라이클리닝 기계 중 11 대는 퍼크 기계이므로 퍼크를 쓰지 않는 드라이클리닝 시스템으로 교체하여야 할 것입니다. 시행 후 처음 3 년간 총 7 대의 기계가 교체돼야 하는데 그 때까지 기계의 사용 연한이 15 년 이상이 되기 때문입니다. 나머지 5 대의 퍼크 기계는 사용 연한이 15 년이 되면 교체해야 합니다. 예비 개스킷, 예비 린트 필터, 설치 및 기계 비용 등을 기준으로, 처음 3 년간 교정국이 부담해야 할 예상 재정 비용은 $169,500 ~ $522,000 이며, 제안 수정안이 시한까지 시행되는 동안 이를 준수하는 데 드는 비용 총액은 $268,000 ~ $892,000 입니다. 제안된 규제 조치는 주정부에 대한 연방정부의 지원금에 영향을 주지 않을 것입니다.

ARB 실무진은 시행 지침 서류를 작성하고 지역 대기오염 통제국과 대기질 관리국(지역 대기국)의 수정 통제 조치 시행 및 관련 기술 문제를 지원할 예정입니다. 지침 서류를 작성하고 지역 대기국을 지원하는 대부분의 업무에는 일회 비용이 들며, 이 비용은 2008~2009 또는 2009~2010 회계연도 중에 발생할 것입니다. ARB 에 드는 예상 비용은 1/4 인년(person/year) 또는 약 $25,000 입니다. 이 밖에도, ARB 는 제안 수정안으로 인하여 '핫스폿'(Hot Spot) 프로그램으로 징수하는 수수료 수입에 손실을 보게 될 것입니다. 처음 3 년 동안 ARB 는 $22,000 의 손실을 보고, 전면 시행시에는 $355,000 의 손실을 볼 것으로 추산됩니다. 그러나 이 같은 수수료 손실은 '핫스폿' 프로그램으로 대안 보고를 의무화하면 상쇄될 수도 있습니다. 이 규칙 제정 조치로 발생하는 모든 시행 비용은 ARB 의 기존 예산 한도 내에서 흡수될 것입니다.

제안 수정안과 관련하여 추가로 드는 집행 비용은 없습니다. 이는 제안 수정안이 시행되어도 지역 대기국이 추가로 감독할 일은 없기 때문입니다. 사실, 집행 비용은 퍼크 시설 및/또는 장비의 숫자에 직접적으로 비례하기 때문에, 퍼크 시설에서 퍼크 장비 사용을 중단하면 할수록 지역 대기국이 연례 시설 검사에 들여야 하는 시간은 줄어들 것입니다. 이 밖에도, 드라이클리닝 시설에서 퍼크 사용이 중단되기 때문에 지역 대기국은 '핫스폿' 프로그램을 통해 퍼크 시설에서 거둬들이고 있는 수수료 수입을 잃게 될 것입니다. 그러나 처음 3 년 동안 지역 대기국이 올릴 수 있는 순전한 비용 절감액만 해도 $30,000~$70,000 에 이를 것입니다. 전반적으로, 제안된 규정이 시한까지 시행되는 동안 지역 대기국이 올릴 수 있는 순전한 비용 절감액은 $1,769,000~$3,301,000 이 될 것입니다.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The cost impact on the businesses varies depending on the non-Perc dry cleaning technology chosen by the facility and the decision of the Board. However, the ARB staff has estimated the cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed requirements.

The capital expenditure required by the proposed amendments is the incremental capital cost of purchasing alternative dry cleaning equipment compared to a Perc dry cleaning machine at the end of the useful life of the Perc machine. The useful life of a Perc machine, based on surveys of the industry, has been established to be 15 years. Because of the range of alternatives that are available, staff estimates the proposed amendments to the Dry Cleaning ATCM will require an additional incremental capital investment ranging from $1,000 (water-based cleaning system) to $144,350 (Carbon Dioxide system) for a facility. When replacing a Perc machine with the most popular alternative technology, a high flash point hydrocarbon process, the additional capital investment will range from $18,500 to $24,350.

The annual recurring costs for the alternative technologies are generally similar to or slightly higher than the recurring costs for operating and maintaining a Perc dry cleaning machine. A key variable in recurring cost is labor costs which tend to be somewhat higher for the alternative technologies. However, with proper training, experience, and advances in the technologies, it is possible that the differences in labor costs will be significantly reduced in future years.

The primary customers of dry cleaning facilities are individual consumers. Most dry cleaning businesses are likely to pass their compliance costs onto their customers in the form of higher prices for their services. To the extent that dry cleaning businesses are able to pass all of the cost increase onto their customers, ARB staff has estimated the potential cost increase to consumers based on the facility owners' recovery of their short term (five years) net cash outflow. For those facilities that replace their existing machine with a hydrocarbon machine when the existing machine is 15 years old, ARB staff estimates that the typical owner would have to charge an additional $0.56 per garment. The owners of co-residential facilities, because they are estimated to lose three years of the useful life for their machines, would have to increase their cost per garment by about $0.63.

Perc distributors and manufacturers are required under the proposed provisions to keep records of their Perc purchases and Perc sales to dry cleaners. They are also required to report to ARB the annual Perc sales to dry cleaners, if applicable, and to report to ARB the contact information of any new Perc distributor. Because record keeping is a routine part of doing business, staff anticipates the record keeping and reporting requirements to result in minimal cost based on additional labor of approximately eight hours or less per year per Perc distributor and manufacturer.

ARB 실무진은 이 규제 제안을 개발하면서 전형적인 일반 개인 또는 업소에 잠재적으로 미칠 경제적인 영향을 평가하였습니다. 업소에 미치는 비용 부담은 해당 시설이 선택하는 비(非)퍼크계 드라이클리닝 기술 및 협의회의 결정에 따라 다릅니다. 그러나 ARB 실무진은 전형적인 일반 개인 또는 업소가 제안된 요건을 정히 준수함으로써 필연적으로 부담하게 될 비용 부담액을 산정하였습니다.

제안 수정안으로 인하여 부담해야 하는 자본적 지출(capital expenditure)은 퍼크 드라이클리닝 기계가 통상적인 수명이 다 되었을 때에 그 퍼크 기계에 비하여 대안적 드라이클리닝 장비를 구입하는 데 드는 증가 자본 비용입니다. 퍼크 기계의 통상적인 수명은 업계의 조사를 토대로 15 년으로 정해져 있습니다. 사용 가능한 대안의 범위가 제한되어 있기 때문에, 실무진은 드라이클리닝 ATCM 에 대한 제안 수정안이 시행되면 시설당 $1,000(습식 세탁 시스템)에서 $144,350(이산화탄소 시스템)에 이르는 추가 증분 자본투자가 이루어져야 할 것으로 추산하고 있습니다. 가장 보편적인 대안 기술인 발화점 높은 탄화수소 프로세스를 사용하는 퍼크 기계로 대체할 경우, 추가로 들어가는 자본 투자액은 $18,500~$24,350 에 이를 것입니다.

대안 기술에 드는 연간 경상비는 퍼크 드라이클리닝 기계를 가동, 유지하는 데 드는 경상비와 같거나 약간 높은 것이 보통입니다. 경상비의 핵심적인 변수는 인건비로, 대안 기술 쪽이 다소 높은 경향이 있습니다. 그러나 적절히 훈련하고 경험을 축적하며 기술이 진보하면 장래에는 인건비 차이가 큰 폭으로 줄어드는 것이 가능합니다.

드라이클리닝 시설의 주된 고객은 개인 소비자들입니다. 대부분의 드라이클리닝 업소가 법규 준수에 따르는 추가 비용을 세탁료 인상이라는 형식으로 소비자에게 전가할 가능성이 있습니다. ARB 실무진은 드라이클리닝 업소들이 비용 증가분 전액을 소비자에게 전가할 수 있다고 보고, 시설 소유주가 단기간(5 년)에 순현금 지출분을 회수한다는 가정 아래 소비자들에게 가중될 수 있는 비용 부담액을 추산해 보았습니다. 기존 기계의 사용 연한이 15 년이 되어 이를 탄화수소 기계로 교체하는 시설의 경우, ARB 실무진의 추산으로는 평균적인 업소의 소유주라면 소비자에게 의복당 $0.56 의 추가 요금을 부과해야 할 것으로 보고 있습니다. 주거 공존 시설 소유주의 경우는 기계의 통상 수명이 3 년 단축될 것으로 추정되므로 비용을 의복당 약 $0.63 인상해야 할 것으로 보입니다.

퍼크 유통업자와 제조업자들은 제안된 규정에 의하여 퍼크 구입 기록 및 드라이클리닝 업소에 대한 퍼크 판매 기록을 유지하고 있어야 합니다. 또한 이들은 해당시 드라이클리닝 업소에 대한 연간 퍼크 판매액을 ARB 에 보고하여야 하며, 신규 퍼크 유통업자는 모두 그 연락처를 ARB 에 보고하여야 합니다. 기록유지는 어차피 사업의 일상적인 일부이기 때문에, 실무진의 예상으로는 개개의 퍼크 유통업자와 제조업자가 일년에 불과 8 시간 안팎의 시간을 들여 기록을 유지하고 보고하는 등 관련 요건을 충족할 경우 오히려 비용을 최소화할 것으로 예상하고 있습니다.

The Executive Officer has made an initial determination that the proposed regulatory action will not have a significant statewide adverse economic impact, apart from the impacts described above, 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 may have a significant effect on 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. Some marginal dry cleaning businesses may not have the capital necessary to comply with the amendments, which may result in closure. In order to minimize the economic impact to dry cleaners and minimize the likelihood of facility closures, the proposed amendments to the regulation include a phase-out period which allows dry cleaners, in most cases, to maximize the remaining useful life of their non-complying dry cleaning machines.

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

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 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.

A detailed assessment of the economic impacts of the proposed regulatory action can be found in the Staff Report.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the hearing, and in writing or by email before the hearing. To be considered by the Board, written submissions must be received **no later than 12:00 noon, January 24, 2006**, and addressed to the following:

집행관(Executive Officer)은 당초 판단하기를 제안된 규제 조치가 주 전역에 경제적으로 상당한 역효과를 내지는 않을 것이며, 위에서 언급한 영향, 즉 타주 업소들에 대한 캘리포니아 업소들의 경쟁력 등 업소에 직접적으로 미치는 영향 내지는 전형적인 일반 개인에게 미치는 영향에 불과할 것이라고 했습니다.

정부법 제 11346.3 조에 따라, 집행관은 제안된 규제 조치가 캘리포니아 주 내에서 일자리를 창출하거나 제거하든가, 캘리포니아 주 내에서 신규 업소를 칭출하거나 기존 업소를 제거하든가, 캘리포니아 주 내에서 현재 사업 중인 업소를 팽창시키는 데 상당한 영향을 줄 수도 있다고 판단하였습니다. 사정이 빠듯한 일부 드라이클리닝 업소들은 수정안 준수에 필요한 자본이 없어 문을 닫게 될 수도 있습니다. 제안된 규정 수정안은 드라이클리닝 업소들에 미치는 경제적 영향을 최소화하고 시설 폐업의 가능성을 최소화하기 위하여 단계적 기간을 두어 대부분의 경우 드라이클리닝 업소들이 요건에 맞지 않는 드라이클리닝 기계의 잔존 수명을 최대한 활용할 수 있게끔 하고 있습니다.

또한 집행관은 CCR 표제 1, 제 4 조에 의하여, 제안된 규제 조치가 소규모 업소에 영향을 미칠 것으로 판정하였습니다.

정부법(Government Code) 제 11346.3 조 (c)항 및 제 11346.5 조 (a)(11)항에 따라, 집행관은 업소에 적용되는 규정의 보고 요건이 캘리포니아 주민의 건강과 안전, 안녕에 필요하다는 사실을 알게 되었습니다.

협의회는 제안된 규제 조치에 관하여 최종 결정을 내리기 전에, 협의회가 고려하였거나 협의회가 분별하여 관심을 가졌던 대안 중에는 해당 조치가 의도하는 목적을 수행함에 있어 제안된 조치보다 더 효과적인 합리적인 대안은 전혀 없거나, 그만큼 효과적이면서 영향을 받는 일반 개인에게는 부담이 덜 가는 합리적인 대안은 전혀 없다는 사실을 확실히 하여야만 합니다.

제안된 규제 조치가 미치는 경제적 영향에 관한 자세한 평가 내용은 실무진 보고서에서 찾아 볼 수 있습니다.

<u>의견 제출</u>

일반인도 본건과 관련한 의견을 공청회에서 구두 또는 서면으로 제시할 수 있으며, 공청회 전에는 서면이나 전자우편으로 제시할 수 있습니다. 협의회의 검토를 요하는 서면 의견은 **늦어도 2007 년 1 월 24 일 정오 전까지** 다음 주소로 접수되어야 합니다.

Postal mail: Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, California 95814

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

Facsimile submittal: (916) 322-3928

The Board requests but does not require 30 copies of any written submission. Also ARB requests that written, facsimile, and email statements be filed at least ten days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The ARB 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.

Additionally, the Board requests but does not require, that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted to the ARB in Health and Safety Code sections 39600, 39601, 39650, 39655, 39656, 39658, 39659, 39665, 39666, and 41998; and sections 7412 and 7416, title 42, United States Code. This action is proposed to implement, interpret, and make specific Health and Safety Code sections 39650, 39655, 39656, 39658, 39659, 39666, 39674, 41998, and 42402.4; sections 7412 and 7414, title 42, United States Code; and sections 63.14, 63.99, 63.320, 63.321, 63.322, 63.323, and 63.324, title 40, Code of Federal Regulations.

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, ARB may adopt the regulatory language as originally proposed or with nonsubstantial 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 the event that such modifications are made, 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.

우편주소: Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, California 95814

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

팩스 접수: (916) 322-3928

서면 의견서는 30 부를 협의회로 보내주실 것을 요청하오나 의무 사항은 아닙니다. 또한 ARB 는 서면, 팩스, 전자우편 등의 진술서의 경우 최소한 공청회 10 일 전까지 접수시켜 주셔서 ARB 실무진과 협의회 위원들이 각 의견을 시간 여유를 갖고 충분히 검토할 수 있도록 하여 주실 것을 요청합니다. ARB 는 일반인들도 제안된 규제 조치 변경을 위한 제언을 공청회 전에 미리 준비하여 실무진의 관심을 유도하여 주실 것을 권합니다.

아울러, 협의회는 서면 의견을 제출하는 분들의 경우 검토의 편의를 위하여 의견서에 제안의 제목을 달아주실 것을 요청하오나 의무 사항은 아닙니다.

권한의 근거가 되는 법규 및 참고 조항

본 규제 조치는 다음 법규에서 ARB 에게 부여된 권한에 의하여 제안된 것입니다: 보건안전법(Health and Safety Code) 제 39600, 39601, 39650, 39655, 39656, 39658, 39659, 39665, 39666 및 41998 조, 미국연방법전(United States Code) 표제 42, 제 7412 조 및 제 7416 조. 본 조치는 다음 법규의 시행, 해석 및 구체화를 위하여 제안된 것입니다: 보건안전법 제 39650, 39655, 39656, 39658, 39659, 39666, 39674, 41998 및 42402.4 조, 미국연방법전 표제 42, 제 7412 조 및 제 7414 조, 연방규정집(Code of Federal Regulation) 표제 40, 제 63.14, 63.99, 63.320, 63.321, 63.322, 63.323 및 63.324 조.

공청회 절차

공청회는 정부법(Government Code) 중 캘리포니아행정절차법(California Administrative Procedure Act) 표제 2, 제 3 절, 제 1 부, 제 3.5 장(제 11340 조부터 시작)에 의거하여 수행됩니다.

공청회 후 ARB 는 원안대로 또는 비실질적이거나 문법적인 변경을 가하여 규제 용어를 채택할 수도 있습니다. 또한 협의회는 변경된 규제 용어가 제안된 규제 조치에서 비롯한 것임을 일반인이 알 수 있도록 적절히 통지하여 변경된 본문이 제안된 원래의 본문과 충분히 연관되어 있는 경우, 기타 변경을 가한 제안된 규제 용어를 채택할 수도 있습니다. 그러한 변경이 이루어지는 경우, 변경 사항을 분명히 표시한 규제 본문의 전문은 서면 의견을 받기 위하여, 채택되기 최소한 15 일 전에 일반에게 공개됩니다.

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

CALIFORNIA AIR RESOURCES BOARD

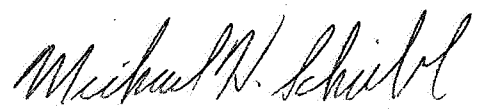
Catherine Witherspoon
Executive Officer

Date: November 28, 2006

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

일반인은 변경된 규제 조치의 본문 사본을 다음 주소로 ARB 에 요청할 수 있습니다: Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, 전화 (916) 322-2990.

캘리포니아 공기자원협의회



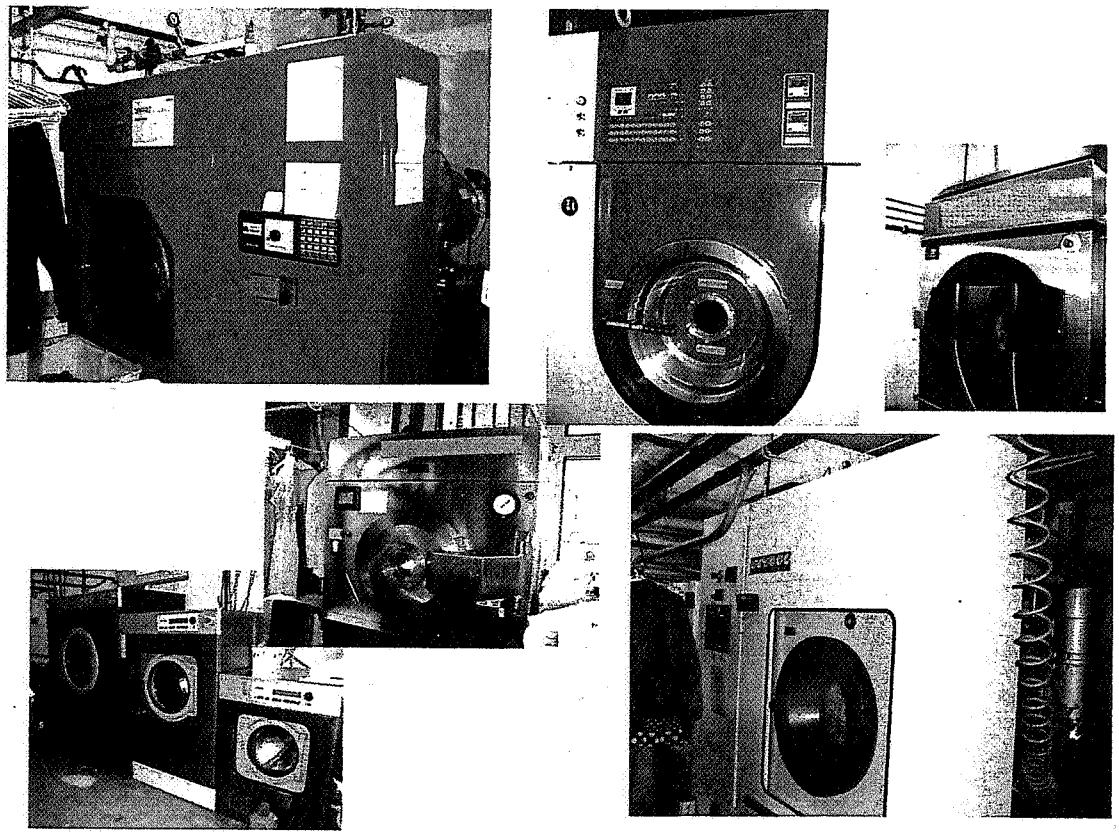
for Catherine Witherspoon(캐서린 위더스푼)
집행관

날짜: 2006 년 11 월 28 일

캘리포니아가 직면하고 있는 에너지난은 현실입니다. 모든 캘리포니아 주민은 에너지 소비를 줄이기 위하여 즉각적인 조치를 취해야 합니다. 에너지 수요를 줄이고 비용을 절감할 수 있는 간단한 방법들을 알려면 저희 웹사이트 www.arb.ca.gov 를 보십시오.

California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR THE PROPOSED AMENDMENTS TO THE CONTROL MEASURE FOR PERCHLOROETHYLENE DRY CLEANING OPERATIONS AND ADOPTION OF REQUIREMENTS FOR MANUFACTURERS AND DISTRIBUTORS OF PERCHLOROETHYLENE



Stationary Source Division
Emissions Assessment Branch

Release Date: December 8, 2006

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

ADOPTION OF THE PROPOSED AMENDMENTS TO THE CONTROL MEASURE FOR PERCHLOROETHYLENE DRY CLEANING OPERATIONS AND ADOPTION OF REQUIREMENTS FOR MANUFACTURERS AND DISTRIBUTORS OF PERCHLOROETHYLENE

To be considered by the Air Resources Board on January 25, 2007 at:

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

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

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

State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE CONTROL MEASURE FOR PERCHLOROETHYLENE DRY CLEANING OPERATIONS AND ADOPTION OF REQUIREMENTS FOR MANUFACTURERS AND DISTRIBUTORS OF PERCHLOROETHYLENE

Staff Report

Prepared by:

Mei Fong (Lead)
Hafizur R. Chowdhury, P.E.
Sonia Villalobos
Michele Houghton
Greg Harris
Michelle Komlenic

Reviewed by:

Robert Krieger, Manager, Emissions Evaluation Section
Daniel E. Donohoue, Chief, Emissions Assessment Branch
Robert D. Barham, Ph.D., Assistant Chief, Stationary Source Division
Robert D. Fletcher, Chief, Stationary Source Division

December 2006

ACKNOWLEDGMENTS

The ARB would like to acknowledge the assistance of the following individuals, agencies, and organizations for their participation and assistance:

Office of Legal Affairs, ARB	Diane Moritz Johnston
Monitoring and Laboratory Division, ARB	Micheal Orbanosky
Monitoring and Laboratory Division, ARB	Angus Macpherson
Monitoring and Laboratory Division, ARB	David Todd
Planning and Technical Support Division, ARB	Larry Larsen
Research Division, ARB	Reza Mahdavi
Stationary Source Division, ARB	Carolyn Suer
Stationary Source Division, ARB	Susie Chung
Stationary Source Division, ARB	Steven Yee
Office of Environmental Health Hazard Assessment	Dr. James Collins
Department of Health Services	Dr. Julia Quint
Sanitation District of Los Angeles County	Ann Heil
Institute for Research and Technical Assistance	Dr. Katy Wolf
California Cleaners Association	Sandra Giarde
Blackburn's Consulting & Training	Bob Blackburn
Halogenated Solvents Industry Alliance	Stephen P. Risotto
Urban & Environmental Policy Institute	Peter Sinsheimer
GreenEarth® Cleaning	James E. Douglas
ExxonMobil Chemical	Arlean Medeiros
Kelleher Equipment Supply, Inc.	Kelly Kelleher Casares

The ARB staff would also like to extend their gratitude to the numerous dry cleaners that provided ARB staff with dry cleaning information, participated in meetings, and demonstrated dry cleaning operations to ARB staff.

ARB staff would also like to recognize all of the local air pollution control and air quality management districts (air districts) and would especially like to thank the following air districts for their assistance during the regulatory process.

Bay Area Air Quality Management District
Mojave Desert Air Quality Management District
Santa Barbara County Air Pollution Control District
South Coast Air Quality Management District
Sacramento Metropolitan Air Quality Management District
The California Air Pollution Control Officers Association Enforcement Managers Committee
The California Air Pollution Control Officers Association Air Toxics and Risk Managers Committee

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR THE PROPOSED AMENDMENTS TO THE CONTROL MEASURE FOR PERCHLOROETHYLENE DRY CLEANING OPERATIONS AND ADOPTION OF REQUIREMENTS FOR MANUFACTURERS AND DISTRIBUTORS OF PERCHLOROETHYLENE

TABLE OF CONTENTS

Section			Page
Executive Summary			ES-1
I.	**INTRODUCTION**		I-1
	A.	Overview	I-1
	B.	Purpose	I-1
	C.	Non-Toxic Dry Cleaning Grant and Demonstration Programs	I-3
	D.	Regulatory Authority	I-4
	E.	Summary of Regulations Affecting Dry Cleaners	I-4
II.	**SUMMARY OF THE PROPOSED AMENDED CONTROL MEASURE**		II-1
	A.	Basis and Rationale for the Proposed Amended Control Measure	II-1
	B.	Changes to the Existing Dry Cleaning ATCM	II-2
	C.	Summary of the Proposed Amended Control Measure	II-2
	D.	Regulatory Alternatives	II-8
III.	**SUMMARY OF THE DRY CLEANING INDUSTRY**		III-1
	A.	Dry Cleaning Technologies	III-1
	B.	Emission Control and Ventilation Technologies	III-6
	C.	Dry Cleaning Evaluation	III-11
	D.	Ambient Air Monitoring of Perchloroethylene	III-14
IV.	**POTENTIAL HEALTH IMPACTS FROM EXISTING PERCHLOROETHYLENE DRY CLEANING FACILITIES**		IV-1
	A.	Overview of Health Risk Assessment	IV-1
	B.	Tools and Information Used for this Risk Assessment	IV-2
	C.	Potential Health Effects of Perchloroethylene	IV-5
	D.	Factors that Affect the Health Risk Assessment Results	IV-7
	E.	Summary of the Risk Assessment Results from Generic Dry Cleaner Scenarios	IV-7

V. POTENTIAL HEALTH IMPACTS OF THE PROPOSED AMENDED DRY CLEANING ATCM V-1

A. Emissions and Risk Reduction Benefits V-1
B. Potential Adverse Health Impacts from Perchloroethylene Alternatives V-2
C. Interim Health Values V-7
D. Potential Health Impacts of Volatile Organic Compounds V-8

VI. PUBLIC OUTREACH AND REPORT PREPARATION VI-1

A. Outreach Efforts VI-1
B. Public Involvement VI-1
C. Data Collection Tools Used to Assist in Report Preparation VI-3

VII. ECONOMIC IMPACTS OF THE PROPOSED AMENDED ATCM VII-1

A. Summary of the Economic Impacts VII-1
B. Economic Impacts Analysis on California Businesses as Required by the California Administrative Procedure Act (APA) VII-3
C. Costs to State Agencies VII-18
D. Costs to Local Air Districts VII-21
E. Total Cost of the Proposed Amendments VII-22
F. Cost Effectiveness of the Amended ATCM VII-24

VIII. ENVIRONMENTAL IMPACTS OF THE PROPOSED AMENDED AIRBORNE TOXIC CONTROL MEASURE VIII-1

A. Legal Requirements Applicable to the Analysis VIII-1
B. Potential Wastewater Impacts VIII-1
C. Potential Groundwater Contamination Impacts VIII-2
D. Potential Hazardous Waste Impacts VIII-3
E. Potential Soil Impacts VIII-4
F. Potential Flammability of Alternative Solvents VIII-5
G. Potential Energy Usage Impacts VIII-6
H. Potential Air Pollution Impacts VIII-7
I. Reasonably Foreseeable Feasible Mitigation Measures VIII-10
J. Reasonably Foreseeable Alternative Means of Compliance with the Amended ATCM VIII-10
K. Environmental Justice VIII-10

IX. REFERENCES IX-1

APPENDICES

Appendix A:	Proposed Amended Regulation Order: Proposed Amendments to the Airborne Toxic Control Measure for Emissions of Perchloroethylene Associated with Dry Cleaning Operations and Proposed Adoption of Requirements for Manufacturers and Distributors of Perchloroethylene
Appendix B:	Health Risk Assessment Methodology for Dry Cleaning Operations
Appendix C:	Summary of the Differences between the Current and Proposed Amended Airborne Toxic Control Measure
Appendix D:	Summary of Gas and Electricity Cost Survey
Appendix E:	Compliance Cost Estimate of Proposed Amended Dry Cleaning ATCM
Appendix F:	Glossary of Definitions, Selected Terms, and Acronyms

LIST OF TABLES

Table Title		Page
Table ES-1	Summary of Major Requirements of the Proposed Amendments	ES-3
Table ES-2	Dry Cleaning Technologies and Market Share	ES-4
Table ES-3	Change in Market Share of Perc and Non-Perc Machines between 2003 and 2006	ES-6
Table ES-4	Potential Cancer Risk for High Perc Use Dry Cleaning Facilities	ES-7
Table II-1	Summary of Perc Equipment Compliance Times for Existing Facilities	II-4
Table II-2	Perc Fee Invoice Schedule	II-8
Table III-1	Summary of Cleaning Performance of Dry Cleaning Solvents	III-5
Table III-2	Statewide Estimates – Dry Cleaning Machines in Operation	III-11
Table III-3	Perc Dry Cleaning Machines In Operation (2006)	III-12
Table III-4	Summary of Leak Detector Evaluation	III-13
Table IV-1	Emissions Rates	IV-4
Table IV-2	Pollutant-Specific Health Effects Values Used for Determining Potential Health Impacts	IV-5
Table IV-3	Potential Cancer Risk for the High Perc Use Dry Cleaning Facilities	IV-8
Table IV-4	Percent of Perc Machines at Various Distances from Residences	IV-8
Table IV-5	Potential Cancer Risk at Residential and Off-site Worker Receptors from a Generic Dry Cleaner Emitting at the High-End (90th Percentile) and Average Emission Rates Using Secondary Control	IV-11
Table V-1	Summary of Interim Health Values	V-8

Table VII-1 Estimates of Perc Dry Cleaning Machines Subject to the Proposed Amended ATCM VII-5
Table VII-2 Current Amount of Alternative Technology in Operation VII-5
Table VII-3 Updated Machine and Installation Cost Comparison VII-8
Table VII-4 Comparison of Annual Recurrent Costs for Perc and Hydrocarbon Dry Cleaning VII-9
Table VII-5 Potential Capital Costs for Co-residential Dry Cleaning Facilities VII-10
Table VII-6 Decline in Return on Owner's Equity (ROE) for Co-residential Facilities VII-11
Table VII-7 Potential Increase in Capital Costs for a Facility Replacing a Converted or a Primary Control Perc Machine VII-12
Table VII-8 Decline in Return on Owner's Equity (ROE) for Facilities Replacing a Converted or a Primary Control Perc Machine VII-13
Table VII-9 Potential Increase in Capital Costs for a Facility Replacing a Secondary Control Perc Machine VII-13
Table VII-10 Decline in Return on Owner's Equity (ROE) for Facilities Replacing a Secondary Control Perc Machine VII-14
Table VII-11 Summary of Cost Recovery Price Increase for the Three Facility Types Over Loan Period VII-17
Table VII-12 List of Facilities at the Department of Corrections with Dry Cleaning Machines VII-20
Table VII-13 Cost Impacts to the Department of Corrections VII-21
Table VII-14 Estimated Cost Savings for the Local Air Districts VII-22
Table VII-15 Overview of the Total and Annual Costs of Proposed Amended ATCM by Machine and Facility Type VII-23
Table VII-16 Projected Percentage of Non-Smog-Forming Technologies ... VII-25
Table VII-17 Cost Effectiveness Comparison of the Proposed Amended ATCM and the Selected Alternatives VII-26
Table VII-18 Cost-Effectiveness Comparison – Dry Cleaning ATCM, Proposed Amendments and Three Other Major Regulations .. VII-27
Table VIII-1 Summary of Flash Points and Classification for Commonly Used Solvents VIII-6
Table VIII-2 Estimated Monthly Electricity Usage VIII-7
Table VIII-3 Potential Health Impacts and Permissible Exposure Limit (PEL) VIII-9

LIST OF FIGURES

Figure Title		Page
Figure ES-1	Potential Cancer Risk at Perc Dry Cleaners Subject to the Proposed Amended ATCM	ES-9
Figure III-1	Secondary Control	III-7
Figure III-2	Natural Ventilation	III-8
Figure III-3	Window Fan	III-8
Figure III-4	General Ventilation	III-8
Figure III-5	Local Ventilation	III-9
Figure III-6	Partial Vapor Barrier Room	III-9
Figure III-7	Full Vapor Barrier Room	III-10
Figure III-8	Statewide Annual Average Monitored Values for Perchloroethylene	III-15
Figure V-1	Potential Cancer Risk at Perc Dry Cleaners Subject to the Proposed Amended ATCM	V-2

State of California
AIR RESOURCES BOARD

Staff Report: Initial Statement of Reasons for the Proposed Amendments to the Control Measure for Perchloroethylene Dry Cleaning Operations and Adoption of Requirements for Manufacturers and Distributors of Perchloroethylene

Executive Summary

I. INTRODUCTION

This Executive Summary presents a summary of the Air Resources Board (ARB or Board) staff's proposed amendments to the Airborne Toxic Control Measure for Emissions of Perchloroethylene (Perc) from Dry Cleaning Operations (Dry Cleaning ATCM or Perc ATCM). The proposed amendments are designed to further protect public health by prohibiting the use of Perc dry cleaning machines at new facilities and phasing out Perc machines at existing facilities. The staff will be presenting these proposed amendments to the Board for consideration on January 25, 2007. After considering the proposed amendments, the alternatives discussed below, and the public comments, the Board may choose to adopt these amendments or alternative requirements.

In 1991, the Board identified Perc as a toxic air contaminant (TAC) under California's Toxic Air Contaminant Identification and Control Program (Health and Safety Code (HSC) section 39650 *et. seq.*). In that process, the Board found that no threshold exposure level could be identified below which adverse health effects would not be expected. As a result of its identification, HSC section 39665(a) requires ARB to prepare a report on the need to control Perc and adopt appropriate measures. On October 14, 1993, the Board adopted the Dry Cleaning ATCM. This regulation is codified in title 17 of the California Code of Regulations, section 93109. The Dry Cleaning ATCM sets forth the equipment, operations and maintenance, recordkeeping, and reporting requirements for dry cleaning operations.

In 2003, staff began an evaluation of the effectiveness of the Dry Cleaning ATCM. The evaluation found that, as a result of the Dry Cleaning ATCM, Perc emissions from dry cleaning operations have been reduced by about 70 percent. However, the evaluation also showed that there are residual health risks associated with Perc emissions from dry cleaning operations, the best available control technology (BACT) for Perc dry cleaning operations has improved, more effective ventilation systems exist, and alternative technologies are available and viable.

As a result of this evaluation, staff proposed amendments to the Dry Cleaning ATCM for the Board's consideration. Staff's initially proposed amendments were presented in a staff report released April 7, 2006 and considered at the Board's May 25, 2006 public hearing. After hearing the public comments and considering staff's proposal, the Board voted unanimously not to proceed with the rulemaking and directed staff to return to the Board at a future date with a proposal that would phase out the use of Perc in dry cleaning operations. The proposed amendments presented herein are staff's response to the Board's direction.

Presented below is a summary which briefly describes the proposed amendments to the Dry Cleaning ATCM, provides an overview of the dry cleaning industry and technologies, presents emissions and risk from dry cleaning operations, and discusses the potential impacts from implementation of the proposed amendments. For simplicity, the discussion below is presented in question and answer format using commonly asked questions about the proposed amendments to the Dry Cleaning ATCM. This summary provides only a brief discussion on the topics. The reader is directed to subsequent chapters in the main body of the report for more detailed information.

II. SUMMARY OF PROPOSED ATCM

1. What would the proposed amended Dry Cleaning ATCM require for Dry Cleaners?

The proposed amended Dry Cleaning ATCM requires the complete phase out of Perc machines in dry cleaning operations by January 1, 2023. A summary of the major requirements of the proposed amended Dry Cleaning ATCM are presented below and in Table ES-1.

The proposed amendments prohibit any new installation of Perc machines beginning on January 1, 2008. Perc machines at existing co-residential facilities (facilities that share a wall with, or are located in the same building, as a residence), must be removed from service by July 1, 2010. Converted machines, and machines that are 15 years or older, must be removed from service by July 1, 2010. The remaining Perc machines must be removed from service once they become 15 years old. As a result of these requirements, the complete phase out of Perc machines in dry cleaning operations will occur by January 1, 2023.

Table ES-1. Summary of Major Requirements of the Proposed Amendments

Applicability	Facility Type	Requirements
Applies to any person who sells or distributes Perc and who installs, owns, operates, or distributes dry cleaning equipment in California that uses any solvent that contains Perc.	**New Facility**	No new installation of Perc machines starting on January 1, 2008.
	Co-residential Facility (Any facility that shares a wall with a residence or is located within the same building.)	Perc machines will need to be removed from service by July 1, 2010.
	Existing Facility (Any facility that operated Perc dry cleaning equipment prior to January 1, 2008.)	No new installation of Perc machines starting on January 1, 2008. Converted Perc machines will need to be removed from service by July 1, 2010. On July 1, 2010, all other Perc machines that are 15 years or older will need to be removed from service. After 2010, Perc machines will need to be removed from service when they are 15 years old.
	All Facilities	Completed phase out of all Perc machines by January 1, 2023.

2. What would the proposed requirements for manufacturers and distributors of perchloroethylene require?

Any Perc manufacturer that sells Perc into California is required to keep monthly sales records of gallons of Perc sold for use in dry cleaning in California. In addition, there is a one time reporting requirement of their distributors' contact information and a requirement to report changes to the contact information provided.

Any solvent distributor that sells Perc or recycled Perc to a California dry cleaning facility or to others for sale in dry cleaning in California (Perc distributor) is required to retain records of the Perc purchased and sold, the dry cleaner's contact information, and the contact information of their Perc distributor(s), if applicable. In addition, there is a one time reporting requirement of their Perc distributors' contact information, a requirement to report changes to the contact information provided and an annual reporting requirement of the gallons of Perc and recycled Perc sold to California dry cleaning facilities.

III. OVERVIEW OF THE DRY CLEANING INDUSTRY

This section contains a brief description of dry cleaning industry, a discussion of the technologies being used, and the market share of these technologies.

1. What is a "typical" dry cleaning business?

Typically, dry cleaners are small, owner-operated businesses that employ fewer than five employees. Over half of all dry cleaners in California employ two or less full-time employees. Dry cleaners are typically located in shopping centers or strip malls. Perc is the solvent most widely used by the dry cleaning industry in California. Over 70 percent of all dry cleaners in California use Perc.

2. What types of dry cleaning technologies are used in California?

Table ES-2 shows the types of commercial dry cleaning technologies used in California and the current market share for each technology. As shown in Table ES-2, Perc is the most widely used commercial dry cleaning technology. Of the estimated 5,210 dry cleaning machines, about 3,660 (70 percent) are Perc dry cleaning machines.

Table ES-2. Dry Cleaning Technologies and Market Share[1]

Type of Dry Cleaning Machines	Number of Machines (2006)	Percent Market Share (Total)	Percent Market Share (Non-Perc)
Perc	3,660	70	
Hydrocarbon (High Flash Point)	1,100	21	71
GreenEarth	190	4	12
Water Based Cleaning Systems[2]	170	3	11
Carbon Dioxide	10	<1	<1
Others[3]	80	2	5
Total	5,210		

1. Source: ARB 2006 Facility Survey, values are rounded to nearest 10.
2. Includes mixed shops.
3. Others include Rynex 3 (a propylene glycol ether solvent), as well as other hydrocarbon solvents.

As shown in Table ES-2, the fastest growing and second most commonly used cleaning technology is a high flash point synthetic hydrocarbon solvent technology. Most advanced hydrocarbon machines can use any of several different hydrocarbon solvents. Staff estimates that about 1,100 dry cleaning machines in California are currently using high flash point hydrocarbon solvents. This represents about 21 percent of all commercial dry cleaning machines and over 70 percent of the all non-Perc machines. Hydrocarbon solvents are classified as volatile organic compounds (VOCs).

The next most commonly use dry cleaning technology used in California is GreenEarth® (GreenEarth). GreenEarth uses methyl siloxane or D_5 as the cleaning

solvent. GreenEarth solvent is being used in about 190 machines and makes up approximately 4 percent of all dry cleaning machines and 12 percent of all non-Perc machines. GreenEarth is not classified as a VOC. The Office of Environmental Health Hazard Assessment (OEHHA) is currently evaluating the solvent's toxicity based on testing data submitted by GreenEarth.

Professional wet cleaning (wet cleaning) is the next most widely used cleaning technology. This alternative to dry cleaning was first introduced in 1991. Wet cleaning uses computer-controlled washers and dryers. Finishing equipment includes pressing and tensioning units. This equipment is used to touch-up, stretch, reform, and finish garments. Wet cleaning systems use non-toxic, biodegradable detergents, which are approved for disposal into the sewer. Wet cleaning is being used in about 170 machines and makes up approximately 3 percent of all dry cleaning machines and 11 percent of all non-Perc machines.

Cleaning with CO_2 is a process that operates within a pressurized machine. The CO_2 used in this process is an industrial by-product from existing operations, primarily anhydrous ammonia (fertilizer) production. There is no net increase in the amount of CO_2 emitted; therefore, this process does not contribute to global warming. CO_2 is being used in about 10 machines and makes up less than 1 percent of all dry cleaning machines.

There are a variety of other dry cleaning technologies that use hydrocarbon cleaning solvents different from the high flash point solvents mentioned earlier. The solvents include Rynex™ (Rynex 3), a glycol ether, and other speciality hydrocarbon formulations. These solvents are listed in Table ES-2 as "Other." There are about 80 machines currently in this category and they make up approximately 2 percent of all dry cleaning machines and 5 percent of all non-Perc machines.

3. How has the market share of Perc dry cleaning changed over the past several years?

Table ES-3 shows the change in market share of Perc dry cleaning machines between 2003 and 2006. As shown in Table ES-3, from 2003 to 2006, the market share of Perc machines decreased from 86 percent to 70 percent. During the same period, the number of non-Perc machines increased from 14 percent to 30 percent.

Table ES-3. Change in Market Share of Perc and Non-Perc Machines between 2003 and 2006[1]

Type of Dry Cleaning Machines	Estimated Number of Machines (2003)	Estimated Number of Machines (2006)	Market Share (2003)	Market Share (2006)
Perc	4670	3660	86%	70%
Non-Perc	770	1550	14%	30%

1. Values rounded to the nearest 10.

Part of this downward trend in Perc machines is due to the South Coast Air Quality Management District (South Coast AQMD) rule for dry cleaning. South Coast AQMD amended its dry cleaning rule (Rule 1421) in December 2002. These amendments will phase out the use of Perc in the South Coast AQMD by December 2020.

IV. POTENTIAL EMISSIONS AND RISK

This section includes a brief discussion of the emissions, the potential health effects, and health impacts from Perc use in the dry cleaning industry.

1. How much Perc is being emitted by dry cleaning machines?

Based on ARB's 2006 survey of dry cleaning operations, staff estimates that approximately 3.0 tons/day of Perc were emitted from dry cleaning in 2006. This represents a decrease of approximately 1.1 tons/day from the estimated 2003 emissions of 4.1 tons/day. About 80 percent of Perc sold for use in California is used in dry cleaning operations.

2. What are the potential health effects associated with exposure to Perc?

Exposure to Perc may result in both cancer and noncancer (acute and chronic) health effects. The primary route of human exposure for these compounds is inhalation. In 1991, OEHHA concluded that Perc is a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. In 1998, the State of California, under Proposition 65, listed Perc as a carcinogen. Noncancer health effects associated with exposure to Perc include headache, dizziness, rapid heartbeat, and liver and kidney damage.

In 1990, the U.S. Congress listed Perc as a hazardous air pollutant (HAP) in subsection (b) of section 112 of the Federal Clean Air Act. The United States Environmental Protection Agency (U.S. EPA) has classified Perc in Group B2/C as a probable human carcinogen. The International Agency for Research on Cancer (IARC) has also classified Perc as a probable human carcinogen.

3. What are the potential health impacts to individuals from existing Perc dry cleaning operations?

To estimate the potential health impacts to the public due to Perc emissions from existing dry cleaning operations, ARB staff conducted a health risk assessment using the methodology outlined in *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003* (OEHHA Guidelines).

Table ES-4 provides estimates of the potential cancer risk for a resident living near a typical Perc dry cleaning facility. The estimated cancer risk for the current Perc technology (secondary controls) ranges from 40 chances per million at 20 meters, to about 4 chances per million at 100 meters.

Table ES-4. Potential Cancer Risk for High Perc Use Dry Cleaning Facilities[1]

Distance [meters (feet)][2]	Range of Potential Cancer Risk (chances per million)		
	Converted Machine with General Ventilation	Primary Control Machine with General Ventilation	Secondary Control Machine with General Ventilation
20 (66)	75	60	40
30 (100)	45	40	25
100 (330)	8	6	4

1. Assumes high-end (90%) Perc emissions rates of 113 gallons per year for converted machines, 94 gallons per year for primary machines, and 61 gallons per year for secondary machines. The results in this table are taken from Tables B-4 to B-6 in Appendix B. The results are adjusted for emission rates and averaged across three meteorological data sets (Fresno, Oakland (port), and San Diego (Miramar)). Calculations assume a 70-year exposure duration and use the 80th percentile daily breathing rate. Building size is assumed to be approximately 1,100 square feet. Results are for the inhalation pathway. All results are rounded.
2. Distances are presented from the building edge.

The maximum anticipated noncancer impacts for all generic dry cleaning scenarios, as represented by the hazard index, are less than 0.4 at residential receptor locations and less than 1.5 at adjacent worker locations. The adjacent workers' hazard index decreases to less than 1.0 within 30 meters of the dry cleaner. The noncancer acute hazard indices are less than 0.2 at any receptor location. Hazard indices less than 1.0 are not considered to be a concern to public health.

V. IMPACTS OF THE PROPOSED AMENDMENTS

In this section, we will discuss the potential environmental, health, and economic impacts that may result from implementation of the proposed dry cleaning ATCM.

1. What are the environmental impacts of the proposed Dry Cleaning ATCM?

The proposed amendments will practically eliminate all Perc emissions from dry cleaning operations. At full implementation, the proposed amendments will reduce Perc emissions by about 1.8 tons per day outside of the South Coast AQMD. Statewide, the proposed amendments and the South Coast AQMD rule will result in 3.0 tons per day

reduction in Perc emissions. The only remaining sources of Perc emissions may come from the intermittent and limited use of spotting agents containing Perc or residual Perc from clothes last cleaned outside California. In addition, the amount of hazardous waste produced will be reduced and the potential for Perc soil and water contamination will be nearly eliminated.

With full implementation, there will be an increase in VOCs due to the increased use of hydrocarbon solvents. If all Perc facilities switch to hydrocarbon, an increase in hydrocarbon emissions of about 0.7 ton per day would occur outside of the South Coast AQMD.

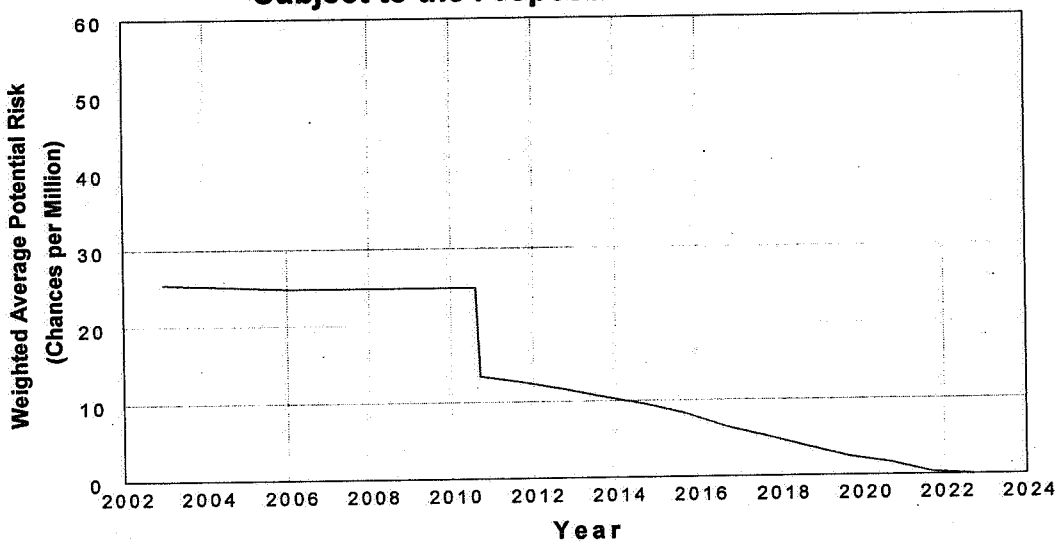
2. <u>What are the potential health impacts to individuals after implementation of the proposed amended Dry Cleaning ATCM</u>?

At full implementation, the proposed amended Dry Cleaning ATCM will virtually eliminate Perc exposure and resulting potential health risk due to dry cleaning operations. Figure ES-1 shows the current and projected average potential cancer risk after implementation of the proposed amended Dry Cleaning ATCM for facilities outside the South Coast AQMD that use Perc in California. The figure uses potential risk results for a receptor at 20 meters.

On a regional basis, the average population weighted cancer risk from exposure to ambient levels of Perc is estimated between 1 and 2 chances per million. After full implementation of the proposed Perc ATCM and with other Perc measures in place, the average potential statewide cancer risk from exposure to ambient Perc levels is expected to drop below 1 chance per million.

The proposed amendments are expected to result in increased usage of alternative technologies and solvents. No adverse emission-related health impacts are expected with the use of wet cleaning or CO_2. There is relatively little health data available on some of the other alternatives to Perc and no California health values have been adopted for solvents used in these alternatives. Based on a literature review, OEHHA has estimated several interim chronic noncancer reference exposure levels (RELs) and is continuing to follow the peer-reviewed literature on toxicity studies for the alternative solvents. The interim health values are not expected to result in adverse chronic noncancer impacts from the use of the alternatives. Currently, there are no cancer potency factors for Perc alternatives.

Figure ES-1. Potential Cancer Risk at Perc Dry Cleaners Subject to the Proposed Amended ATCM[1]



1. Excludes all dry cleaners within South Coast AQMD since they have their own dry cleaning rule. Figure is based on potential risk estimates at 20 meters.

The most popular Perc alternative is a high flash point hydrocarbon solvent. The switch to hydrocarbon solvents will result in increased VOC emissions. VOC emissions contribute to the formation of ozone. Ozone is linked to adverse health effects including respiratory irritation, asthma, and premature death.

3. How does the proposed amended Dry Cleaning ATCM impact the dry cleaners in the South Coast Air Quality Management District?

The proposed amendments are not expected to impact the dry cleaners in the South Coast AQMD. In 2002, the South Coast AQMD amended Rule 1421, Control of Perchloroethylene Emissions from Dry Cleaning Systems (Rule 1421). These amendments prohibit new Perc dry cleaning facilities and phase out the use of Perc in existing dry cleaning operations by December 1, 2020. In addition, all existing Perc dry cleaners in the South Coast AQMD are required to use secondary control and comply with the South Coast AQMD Rule 1402, Control of Toxic Air Contaminants from Existing Sources, which limits the lifetime cancer risk from a facility to no more than 25 in a million, by November 1, 2007.

There are differences between the South Coast AQMD rules and the proposed amendments. These differences pertain to the use of Perc dry cleaning machines. Under the South Coast AQMD rules, an existing facility is allowed to continue using their Perc secondary control machine providing it meets the requirement under Rule 1402 which limits the lifetime cancer risk from a facility to not more than 25 in a million. Additionally, an existing facility is allowed to replace their existing Perc machine with secondary control Perc machine if the facility meets a 10 in a million requirement for lifetime cancer risk. Overall, ARB staff believes that the proposed amendments and South Coast AQMD rules will achieve the same level of emission reductions.

4. What are the estimated economic impacts of the proposed amendments?

The ARB staff estimates the statewide cost for compliance with the proposed amendments to be approximately $41 million over 15 years. This corresponds to an annualized cost (in 2006 dollars) of $4 million per year from 2008 through January 2023. And, it corresponds to an annual cost of about $1,960 per year over 15 years for the 2,020 affected facilities. The statewide costs are based on 2006 dollars and represent the capital cost of new alternative equipment, and change in recurrent costs from 2008 through January 2023.

The cost for a typical business to comply with the proposed amendments varies and depends largely on the alternative technology that is chosen. The timing of when the cost will be incurred depends on facility type, machine type, and machine age. The total annual net increase in cost relative to using Perc technology typically ranges from $1,000 to $3,020 per year over 15 years. For facilities that operate with a primary control machine and opt to use carbon dioxide, the most expensive technology, the annual net increase is $14,530 per year over 15 years. Staff estimates the overall cost-effectiveness of the proposed amendments to be about $3.10 per pound of Perc reduced.

5. Are these economic impacts considered to be significant to individual dry cleaners?

Staff estimates that the typical Perc facility owner would have to charge an additional $0.41 (41 cents) to $0.57 (fifty-seven cents) per garment to recover the cost of a new alternative dry cleaning technology within 5 years. The ability to pass on these costs would be dependent on local competition for dry cleaning services. If there is a relatively high density of dry cleaners in one area, and all of them do not have to upgrade their equipment, then the ability to recover cost may be constrained.

To look at the impact of the proposed ATCM on dry cleaning profits, staff used the change in the return on owner's equity (ROE). A decline in ROE of 10 percent or more is considered to indicate a significant adverse impact. Without accounting for grants or financial incentives that are available to some qualified facilities, the calculated ROEs are all greater than 10 percent independent of technology type and may have a significant adverse economic impact to a typical facility. The range of decline in ROE due to the proposed amended Dry Cleaning ATCM is from 18 percent (when switching from a secondary control Perc machine to a professional wet cleaning system) to about 55 percent (when switching from a primary control Perc machine to a hydrocarbon machine).

The ROE calculations assume that the facilities are unable to pass costs onto its customers. In addition, the ROE calculations are based on financial data obtained from the staff's evaluation and financial ratios from Dunn and Bradstreet for a typical dry cleaner. For this evaluation, staff calculated that the typical dry cleaner's total gross revenue is $250,000 per year, and that the total net profit after tax is about $3,300 per

year. Using the most likely scenario of switching from a primary control Perc machine to a hydrocarbon machine, the net profit for the facility will be reduced to about $1,800 per year.

6. Is there financial assistance for dry cleaners who would like to replace their Perc dry cleaning systems?

The California State Legislature enacted Assembly Bill (AB) 998, which established the Non-Toxic Dry Cleaning Incentive Program. The Non-Toxic Dry Cleaning Incentive Program is composed of a grant program and a demonstration program. The grant program provides financial assistance ($10,000) to California dry cleaners who replace their existing Perc dry cleaning systems with non-toxic and non-smog forming systems such as water-based (i.e., professional wet cleaning, Green Jet®, and cold water cleaning) and carbon dioxide (CO_2) cleaning systems.

The grant program for the dry cleaning industry began in April 2005. To date, ARB has awarded 23 grants to eligible dry cleaning recipients which total $230,000 in grant awards. The grant guidelines and application package are made available to all dry cleaners annually. Grant applications and approval are made on a continuous basis. Staff anticipates being able to fund approximately 20 grants per year. However, the funds available will significantly decrease beginning in 2010 due to the phase out of Perc.

VI. REGULATORY ALTERNATIVES

After considering the proposed amendments, the four alternatives discussed below, and the public comments, the Board may choose to adopt the proposed amendments or alternative requirements or any combination thereof. Possible alternative approaches include changes to the phase out period or a risk-based threshold.

1. Phase Out the Use of Perc and Prohibit Use of New Machines that Emit Smog-forming Emissions

This alternative would phase out Perc machines as staff is proposing with the inclusion of a provision to prohibit the use of hydrocarbon solvents. This option would provide the maximum protection from emissions of Perc while preventing an increase in volatile organic compound (VOC) emissions from hydrocarbon solvents. Staff is not recommending this option primarily because of cost, 17 percent more than the proposed amendments, and district opposition.

2. Increase the Phase Out Period

Under this alternative, the phase out period would be extended by 2 years. Extending the phase out period would lessen the economic burden on the dry cleaning facility owners by allowing more time for the facility to replace their existing machines.

Staff does not recommend this option because of the adverse health impacts associated with delaying the reduction of Perc.

3. Decrease the Phase Out Period

This alternative would shorten the time frames in the regulation which require facilities to phase out the use of Perc in dry cleaning five years earlier. Shortening the time frames in the regulation would significantly increase the cost of compliance. The amount of the increase would depend on which requirement is adjusted and how significant the change is in the compliance date. The main cost impacts beyond the proposed ATCM would be associated with the loss of residual value in existing machines due to accelerated replacement of non-Perc alternative machines. For example, a 5 year decrease in phase out time would result in potential statewide cost of $59 million over 15 years, which is about 44 percent higher compared to the proposed amendments. Staff is not recommending this option because of the increased costs.

4. Phase Out Use of Perc and Require Add-On Secondary Control for Primary Control Machines

This alternative would phase out Perc machines as staff is proposing with the inclusion of a requirement for add-on secondary control devices for existing primary control machines. This option would reduce the amount of Perc emitted from primary control machines by an additional 46 percent at a cost of about $6,000 per machine. This option would be about 14 percent more costly than the proposed amendments. Under the staff proposal, beginning July 1, 2010, primary machines must be removed from service when they are 15 years old. This provision will result in almost 50 percent of the all primary control Perc machines being removed from service by July 1, 2010 and almost all primary control machines removed from service by 2016. Given this rapid phase out of primary machines, staff believes that this alternative is impractical and not cost effective.

VII. PUBLIC OUTREACH AND ENVIRONMENTAL JUSTICE

Below is a brief summary of the actions taken during this rulemaking by ARB staff to work with the public and affected parties and to address ARB's goals on Environmental Justice.

1. What actions did ARB staff take to ensure that the public and affected parties participated in the rulemaking process?

A public process that involves all parties affected by the proposed ATCM is an important component of the ARB actions. As part of ARB's outreach program, staff made extensive personal contacts with industry representatives, state and local regulatory agencies, environmental/pollution prevention and public health advocates, and other interested parties through site visits, meetings, telephone calls, and electronic mail. Staff developed a workgroup consisting of industry and environmental group representatives. Staff visited over 100 dry cleaning facilities, attended several

water-based cleaning and CO_2 technology demonstrations, held 17 workgroup meetings, attended three evening meetings with the Northern California Korean Dry Cleaners-Laundry Association, conducted five public workshops, and attended the Fabricare 2006 Show.

Staff made special efforts to have key materials translated into Korean and to have translator services available at the workshops. The materials translated included the proposed regulation, this Executive Summary, and the Hearing Notice. Additionally, to further increase the general public's participation in this assessment, staff made information available via ARB's website (*www.arb.ca.gov/toxics/dryclean/dryclean.htm*).

2. How does the proposed amended Dry Cleaning ATCM relate to ARB's goals on Environmental Justice?

ARB is committed to evaluating community impacts of proposed regulations including environmental justice concerns. Given that some communities experience higher exposure to toxic pollutants, it is a priority of ARB to ensure that full protection is afforded to all Californians. The proposed amended Dry Cleaning ATCM is not expected to result in significant negative impacts in any community. The proposed amended Dry Cleaning ATCM is designed to further reduce emissions of TACs, such as Perc, to residents and off-site workers living or working in communities near the affected facilities.

VIII. RECOMMENDATION

We recommend the Board approve the proposed amended Dry Cleaning ATCM presented in this report (Appendix A). The proposed amended Dry Cleaning ATCM will, in time, eliminate Perc emissions from dry cleaning operations. The proposed amended regulation will provide air quality benefits for all Californians, particularly those living near dry cleaning facilities. ARB staff believes the proposed amended regulation is technologically feasible and necessary to carry out the Board's responsibilities under State law.

STAFF REPORT: INITIAL STATEMENT OF REASONS

I. INTRODUCTION

A. Overview

Perchloroethylene (Perc) is the solvent most commonly used by the dry cleaning industry to clean clothes or other materials, such as curtains, sleeping bags, blankets, comforters, and leather goods. Perc is emitted to the air from dry cleaning operations, which contribute to the public's exposure to Perc.

In 1991, the Air Resources Board (ARB or Board) identified Perc as a toxic air contaminant (TAC) under California's Toxic Air Contaminant Identification and Control Program (Health and Safety Code (HSC) section 39650 *et. seq.*). Once Perc was identified as a TAC, the ARB was required under HSC section 39666 to evaluate the need for a regulation to reduce emissions from Perc. State law requires that control measures for TACs without a Board-specified health based threshold exposure level be based on the best available control technology (BACT) or a more effective control method in consideration of cost and risk. Accordingly, on October 14, 1993, the Board adopted the Airborne Toxic Control Measure for Emissions of Perchloroethylene from Dry Cleaning Operations (Dry Cleaning ATCM). This regulation is codified in title 17 of the California Code of Regulations (CCR), section 93109. The Dry Cleaning ATCM sets forth the equipment, operations and maintenance, recordkeeping, and reporting requirements for dry cleaning operations.

From 2003 to 2005, staff performed an evaluation of the effectiveness of the Dry Cleaning ATCM. Although the evaluation showed that Perc emissions from dry cleaning decreased by about 70 percent, residual health risks remained associated with Perc dry cleaners. Also, in the years since 1993, BACT has improved and alternative technologies are available and viable. As a result of the evaluation, the staff developed proposed amendments to the Dry Cleaning ATCM which the Board heard on May 25, 2006.

After hearing the public comments and considering staff's proposal, the Board made a decision not to proceed with the proposed rulemaking and directed staff to return to the Board with a new proposal to phase out the use of Perc in dry cleaning operations. This report presents the staff's proposal to virtually eliminate Perc use in dry cleaning operations by January 2023.

B. Purpose

ARB continues to take actions to eliminate or reduce emissions of TACs to protect public health. These actions are important because sources of TACs are often located near homes or schools. While the ARB is developing new measures to continue the progress in reducing health risks from toxics in the air, we are also re-evaluating whether some of the control measures adopted in the past can be even

more protective. ARB lists Perc as one of the top ten TACs that contribute the most to our overall statewide cancer risk. This ranking is based on ambient air measurements from ARB's monitoring network. Since Perc can be emitted from neighborhood dry cleaning shops and new cleaning technologies have emerged, a complete review of the existing Dry Cleaning ATCM has been conducted to assess the need for revisions to further protect public health.

The technical evaluation of the existing Dry Cleaning ATCM conducted by ARB staff from 2003 to 2005 led to the release of the report entitled California Dry Cleaning Industry Technical Assessment Report (Technical Assessment Report). This report discusses the dry cleaning technology assessment and provides the basis of our efforts to determine the effectiveness of the existing Dry Cleaning ATCM.

Information regarding the California dry cleaning industry was obtained from several surveys of the dry cleaning industry. The ARB staff developed the Dry Cleaning Facility Survey (Facility Survey) in cooperation with the California Cleaners Association, the Korean Dry Cleaners-Laundry Association, other industry representatives, and the local air pollution control and air quality management districts (local air districts). The Machine Manufacturers Survey was used to collect information about equipment and operation costs and other machine information. The Perc Solvent Distributor's Survey was used to collect information on the percentage of Perc that is used by the dry cleaning industry and to confirm Perc usage obtained from the dry cleaning facilities survey. Additionally, the Dry Cleaning Solvent Manufacturers Survey was used to obtain formulation information, which was shared with the Office of Environmental Health Hazard Assessment (OEHHA). Using this information, OEHHA provided ARB with its review of the health effects and toxicity of other alternative cleaning solvents that are discussed in this report.

ARB staff conducted site visits of dry cleaning facilities and conducted emissions testing to enhance understanding of the California dry cleaning industry and the dry cleaning process. Staff visited several facilities in the State and collected relevant information (e.g., distance to receptors, ventilation practices, and solvent usage). Our testing included collecting and testing sludge from Perc and DF-2000™ Fluid (DF-2000) dry cleaning facilities, evaluating the effectiveness of Perc detectors, and measuring Perc concentrations around Perc dry cleaning machines and other locations in the facilities.

As a result of this evaluation, the staff developed proposed amendments to the Dry Cleaning ATCM which the Board heard on May 25, 2006. After hearing the public comments and thorough discussion with staff, the Board stated that more should be done to reduce exposures to Perc for dry cleaning operations. By a unanimous vote, the Board directed staff to return to them with a proposal for their consideration to phase out Perc from dry cleaning operations. The Board also directed staff to consider the cost impacts of the proposal and evaluate ways to minimize these through possible financial assistance programs.

The Board's directions led staff to obtain additional information on the alternative technologies and update cost information on machines and technology operations. This information was gathered through additional workgroup meetings, industry meetings, staff's attendance at the Fabricare 2006 show, and various surveys of the dry cleaning industry, including facilities, machine manufacturers, and solvent distributors.

This Initial Statement of Reasons (ISOR) for the proposed amendments to the existing Dry Cleaning ATCM presents current information on the dry cleaning industry in California. It also presents the exposure and health effects from the use of Perc in the dry cleaning industry. Finally, it will present the proposed amendments to the existing ATCM and the health, economic, and environmental impacts of these proposed amendments.

C. Non-Toxic Dry Cleaning Grant and Demonstration Programs

The California State Legislature enacted Assembly Bill (AB) 998, which establishes the Non-Toxic Dry Cleaning Incentive Program. One objective of this program is to provide financial assistance to California dry cleaners who replace their existing Perc dry cleaning systems with non-toxic and non-smog forming systems such as water-based and carbon dioxide (CO_2) cleaning systems. Another objective of this program is to provide 50 percent matching funds to cover the costs of a demonstration program to showcase professional non-toxic and non-smog forming dry cleaning technologies in the State.

AB 998 requires the ARB to assess a three-dollar ($3) per gallon fee on the importers of Perc for dry cleaning operations beginning January 1, 2004. This fee will increase one dollar ($1) per gallon per year from 2005 through 2013. As required by the legislation, the majority of these funds will be used to establish a grant program to provide $10,000 grants to assist dry cleaners in switching to non-toxic and non-smog forming cleaning technologies. The balance of funds will be used to establish a demonstration program to showcase these technologies statewide. ARB is to ensure that at least 50 percent of the grant funds provided are awarded in a manner that directly reduces the public health risk associated with air contaminants in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, or both.

The grant program for the dry cleaning industry began in April 2005. The 2006 grant guidelines and application package was made available to all dry cleaners to apply in April 2006 with an application deadline of May 5, 2006. To date, ARB has awarded 23 grants to eligible dry cleaning recipients for a total of $230,000. Among these grants, 20 dry cleaners replaced their Perc machines with water-based cleaning systems and 3 dry cleaners installed CO_2 cleaning systems.

Due to insufficient funding from Perc fee collections for the first year, ARB was unable to implement the demonstration program until mid-2006. The 2006 Non-Toxic

Dry Cleaning Incentive Program Demonstration Guidelines were made available for the California Dry Cleaning Industry in May 2006. The final deadline for submitting applications for the newly established demonstration program was June 30, 2006. To date ARB has received two demonstration proposals for consideration. Information for both the grant and demonstration program is available on our website at *www.arb.ca.gov/toxics/dryclean/ab998.htm.*

D. Regulatory Authority

California's air toxics program, established under California law by Assembly Bill 1807 (Statutes 1983, Chapter 1047) and set forth in HSC sections 39650 through 39675, mandates the identification and control of air toxics in California. The identification phase of the air toxics program requires the ARB, with participation of other State agencies, such as OEHHA, to evaluate the health impacts of, and exposure to, substances and to identify those substances that pose the greatest health threat as TACs. The ARB's evaluation is made available to the public and is formally reviewed by the Scientific Review Panel (SRP) on Toxic Air Contaminants established under HSC section 39670. Following the ARB's evaluation and the SRP's review, the Board may formally identify a substance as a TAC at a public hearing. Following the identification of a substance as a TAC, HSC sections 39658, 39665, 39666, and 39667 require ARB, with the participation of the local air districts, and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for the substance.

E. Summary of Regulations Affecting Dry Cleaners

1. Airborne Toxic Control Measures

Once ARB has evaluated the need and appropriate degree of regulation for a TAC, State law (HSC section 39666) requires ARB to evaluate the need for regulations to reduce TAC emissions to the maximum extent feasible in consideration of cost, risk, and other factors specified in HSC section 39665. To date ARB has adopted two ATCMs that pertain to Perc dry cleaning operations: the ATCM for Emissions of Perc from Dry Cleaning Operations (Dry Cleaning ATCM); and the Environmental Training Regulation for Perc Dry Cleaning Operations. Both regulations were adopted on October 14, 1993.

2. AB 2588 "Hot Spots" Program

Assembly Bill (AB) 2588 (Statutes 1987, Chapter 1252), *Air toxics "Hot Spots" Information and Assessment Act* ("Hot Spots" Program), was enacted in September 1987. This Hot Spots Program supplements the Air Toxics Program by requiring stationary sources to report the types and quantities of substances routinely released into the air, to identify facilities having localized impacts, to ascertain health risks, and to notify nearby residences of significant risks.

In September 1992, the "Hot Spots" Act was amended by Senate Bill (SB) 1731 (Statutes 1992, Chapter 1162) to address the reduction in significant risks caused by a facility. The bill requires that owners of significant risk facilities reduce their risks below the local air district established level of significance. SB 1731 further requires ARB to provide assistance to smaller businesses.

Information gathered from this program has complemented ARB's existing TAC program by locating sources of substances that were not under evaluation and by providing exposure data needed to develop regulations for control of toxic pollutants. Additionally, the program has been a motivating factor for facility owners to voluntarily reduce their facility's toxic emissions. Dry cleaners have been identified as facilities subject to the Air Toxics Hot Spots Program. Currently, the California Air Pollution Control Officers Association is developing an industry-wide risk assessment for dry cleaners. The purpose of this industry specific assessment is to assist both the local air districts and facilities with the emissions inventory and risk assessment requirements of the Hot Spots program.

3. National Emission Standards for Hazardous Air Pollutants

In the federal Clean Air Act Amendments of 1990, the United States Environmental Protection Agency (U.S. EPA) identified Perc as a hazardous air pollutant (HAP) because of its known or possible adverse effects on human health or the environment. In 1993, and as a result of State legislation AB 2728, the Board designated federal HAPs as TACs (HSC section 39658(b)). Therefore, Perc is a TAC both because it has been identified by the Board through the TAC identification and control program and because it is a HAP.

In 1993, the U.S. EPA promulgated technology-based emissions standards to control emissions of Perc from dry cleaning facilities. The National Emission Standards for Hazardous Air Pollutants was based on the application of equipment and work practice standards. On May 21, 1996, the current California Dry Cleaning ATCM was granted federal equivalency (Volume 61, Federal Register, page 25397). Federal equivalency means that the U.S. EPA has determined that the California Dry Cleaning ATCM is equivalent to, or more effective than, the federal dry cleaning regulation. As a result, Perc dry cleaners in California need only comply with the California Dry Cleaning ATCM. Effective July 27, 2006, U.S. EPA promulgated revisions to their 1993 standards to limit emissions of Perc from existing and new dry cleaning facilities. Based on a review of U.S. EPA's final rule, staff is confident that the emissions-related requirements of the proposed amended Dry Cleaning ATCM are more stringent than U.S. EPA's final rule. However, if approved, the proposed amended Dry Cleaning ATCM will need to be submitted to U.S. EPA for a federal equivalency determination.

4. Other State Regulations

California dry cleaners are regulated either directly or indirectly by other government environmental agencies in addition to ARB and the local air districts. The

Regional Water Quality Control Boards regulate Perc discharges into State waters from local sanitation districts that process wastewater discharge by dry cleaners. The California Department of Industrial Relations/Division of Occupational Safety and Health (CAL/OSHA) regulates Perc in the workplace environment.

Dry cleaners are also regulated by DTSC for the storage, disposal, and treatment of hazardous waste. As mentioned earlier, DTSC is given the responsibility to regulate hazardous waste in California as a federally authorized State program. Solid waste consists of cartridge filters and spent carbon; liquid wastes consist of separator water, still bottoms, and condensate from steam presses and from the carbon desorption process. Typically, hazardous wastes are picked up by a licensed hazardous waste hauler or Perc recycler for disposal or treatment.

To protect worker safety, CAL/OSHA has established a permissible exposure limit (PEL) for Perc of 25 parts per million by volume (ppmv). The PEL is the maximum, eight-hour, time-weighted average Perc concentration for occupational exposure. CAL/OSHA also requires employee training on procedures for the safe handling of hazardous substances in the workplace and the health effects of those substances. However, the CAL/OSHA requirements do not apply to the smallest owner-operated facilities with no employees.

5. Local Agencies

a. Local Air Districts

In California, 14 out of 35 local air districts have specific regulations for Perc dry cleaners. The remaining local air districts have adopted or implemented the existing ARB Dry Cleaning ATCM. As required, all local air district rules are at least as stringent as the ARB Dry Cleaning ATCM. The local air districts with Perc dry cleaning regulations are: Antelope Valley Air Quality Management District (AQMD), Bay Area AQMD, El Dorado County AQMD, Imperial County Air Pollution Control District (APCD), Kern County APCD, Lake County APCD, Mendocino County APCD, North Coast Unified AQMD, Northern Sonoma County APCD, San Joaquin Valley APCD, San Luis Obispo County APCD, South Coast AQMD, Ventura County APCD, and Yolo-Solano AQMD. Some of these local air districts, plus a number of other local air districts, also have rules or policies that affect the permitting of new sources of air toxics, including Perc dry cleaning facilities.

The Bay Area AQMD has adopted Regulation 11, Rule 16, a specific regulation for dry cleaners using halogenated solvents such as Perc. Under the Bay Area rule, dry cleaners in co-residential facilities are required to use secondary control and install vapor barrier rooms. In addition, existing and new non-residential facilities may be required to install enhanced ventilation depending on facility type and potential health risk caused by the facility.

In 2002, the South Coast AQMD amended its Rule 1421, Control of Perchloroethylene Emissions from Dry Cleaning Systems (Rule 1421). These amendments prohibit new or relocated Perc dry cleaning facilities and will phase out the use of Perc in existing dry cleaning operations by December 1, 2020, within the South Coast AQMD. Rule 1421 required converted machines to be phased out by July 1, 2004. In addition, all existing Perc dry cleaners in the South Coast AQMD are required to use secondary control and comply with Rule 1402, Control of Toxic Air Contaminants from Existing Sources, which limits the lifetime cancer risk from a facility to no more than 25 in a million, by November 1, 2007. Prior to December 1, 2020, if an existing facility chooses to replace its existing machine with a new Perc machine, the facility would need to purchase a secondary control machine and comply with Rule 1401, New Source Review of Toxic Air Contaminants. Rule 1401 limits the lifetime cancer risk from a facility to less than 10 in a million.

b. Local Publicly-Owned Treatment Works

The dry cleaning process generates wastewater containing trace amounts of Perc. This waste is generated from water separators, steam presses, and desorption of carbon adsorbers. In the past, the Perc-laden water was discharged into the sewer. However, that practice has been phased out by the local publicly-owned treatment works (POTWs) in the State. A dry cleaner may be held liable for direct Perc discharges if Perc escapes from the sewer system and migrates into the groundwater. In this situation, dry cleaners and local POTWs can be held liable for cleanup and abatement under the California Water Code. In most areas of the State, local POTWs have established their own Perc discharge limits to avoid possible liability resulting from Perc contaminated wastewater entering groundwater via the sewer collection system (ARB, 2006a).

II. SUMMARY OF THE PROPOSED AMENDED CONTROL MEASURE

This chapter provides the basis for the proposed amendments and summarizes the proposed changes to the Dry Cleaning ATCM, including new requirements for the Perc manufacturers and distributors. The complete text of the proposed Dry Cleaning ATCM and the new requirements are provided in Appendix A.

A. Basis and Rationale for the Proposed Amended Control Measure

The Board approved the current Dry Cleaning ATCM in 1993. The measure reduced public exposure to Perc emissions from dry cleaning facilities through the use of BACT and operator training. The Dry Cleaning ATCM phased out the more emissive Perc technologies (i.e., transfer and vented machines), set requirements for training, good operating and maintenance practices, and recordkeeping and reporting. The implementation of the Dry Cleaning ATCM resulted in lower Perc emissions from dry cleaning facilities and, in turn, reduced public exposure to Perc in California by 70 percent.

California HSC section 39658(b)(3) states that if the Board implements an ATCM applicable to the substances and later finds that the purposes set forth are not achieved by the ATCM, the Board may revise the ATCM to achieve those purposes. The Board may revise an ATCM only if it finds that the reduction in risk to the public health that will be achieved by the revision justifies the burden that will be imposed on persons who are in compliance with the ATCM previously implemented.

From 2003 through 2005, the ARB staff conducted an evaluation of the Dry Cleaning ATCM to compare Perc dry cleaning to the available alternatives and determine whether the Dry Cleaning ATCM continues to adequately protect public health. The evaluation showed that some members of the public that live very close to Perc dry cleaning facilities continue to be exposed to elevated levels of Perc. The evaluation also showed that less emissive Perc dry cleaning technology has been proven and is available, that enhanced ventilation systems have been proven and are effective to reduce near source Perc exposure, and alternatives to Perc dry cleaning are available and viable. The result of this evaluation led the staff to develop a proposal to amend the Dry Cleaning ATCM to further reduce risk from Perc in dry cleaning operations.

On May 25, 2006, staff presented to the Board proposed amendments to the Dry Cleaning ATCM. The Board heard testimony from many interested parties, including the affected industries, industry associations, environmental groups, local air districts, and other interested individuals. After hearing the public comments and considering staff's proposal, the Board made a decision not to proceed with the proposed rulemaking and directed staff to return to them with a proposal for their consideration to phase out Perc from dry cleaning operations.

Following the Board's direction, staff is proposing revised amendments to the Dry Cleaning ATCM. The proposed amendments will further reduce potential health impacts for all California residents and off-site workers by eliminating the use of Perc in dry cleaning operations and requiring the use of non-Perc alternatives. These amendments will prohibit the use of Perc in new dry cleaning facilities and will require the phase out of Perc in existing dry cleaning facilities. The amendments will also require co-residential facilities to remove from service any currently installed Perc dry cleaning machine on an expedited.

B. Changes to the Existing Dry Cleaning ATCM

The proposed amendments prohibit the new sales or leases of Perc dry cleaning machines for use in California effective January 1, 2008. For existing co-residential facilities (those that share a common wall, floor, or ceiling with a residence, or located within the same building with a residence), the proposed amendments will require replacement of Perc dry cleaning machines by July 1, 2010. This requirement will virtually eliminate the Perc risk from co-residential facilities, where elevated Perc levels in residential areas have been attributed to the co-residential Perc facilities.

For other existing facilities (those that started Perc dry cleaning operations before January 1, 2008), the proposed amendments will phase out Perc machines (i.e., converted machines, primary machines, and secondary control machines) over a set period of time. Existing facilities that currently run a converted Perc machine will be required to replace their machine with a non-Perc alternative machine by July 1, 2010. For all other existing facilities, the proposed amendments will require them to replace their Perc dry cleaning machine with a non-Perc alternative by July 1, 2010, or when the machine is 15 years of age, whichever comes later. By January 1, 2023, all Perc dry cleaning machines must be removed from service. Beginning January 1, 2008, no existing facility may install or operate a new Perc dry cleaning machine.

Good operating practices and recordkeeping and reporting requirements are included for existing facilities that use Perc. All Perc facilities will also be required to have a spare lint filter and a spare set of gaskets on site. This requirement should eliminate delays in replacing parts where the most common leaks can occur.

For all new dry cleaning facilities (those that start operations on or after January 1, 2008), the proposed amendments will prohibit the installation or use of Perc dry cleaning machines.

C. Summary of the Proposed Amended Control Measure

This section summarizes the proposed amendments to the Dry Cleaning ATCM. The complete text of the proposed amended ATCM is provided in Appendix A. For a summary of the differences between the current and proposed amended ATCM, see Appendix C.

1. Applicability

The proposed amendments apply to any person who sells or distributes Perc and who sells, distributes, installs, owns, or operates dry cleaning equipment in California that uses any solvent that contains Perc.

2. Prohibitions

No person shall sell, offer for sale, or initiate a new lease of any Perc dry cleaning machine for use in California on or after January 1, 2008. This provision applies to both existing and new facilities.

Under the proposed amendments to the Dry Cleaning ATCM, and as stated in the original Dry Cleaning ATCM, the owner/operator of a facility shall not operate any equipment related to Perc dry cleaning operations, such as: a transfer machine, any reclaimer or other device in which materials that have been previously dry cleaned with Perc are placed to dry; a vented machine; a self-service dry cleaning machine; a drying cabinet; or dip tanks. In addition, the owner/operator of a facility may no longer use a converted machine after July 1, 2010.

3. Requirements for Co-residential Facilities

A "co-residential" facility is any dry cleaning facility that shares a common wall, floor, or ceiling with a residence or is located within the same building as a residence. For the purposes of this regulation, residence means any dwelling or housing which is owned, rented, or occupied by the same person for a period of 180 days or more, excluding short-term housing such as a motel or hotel room rented and occupied by the same person for a period of less than 180 days.

For co-residential facilities, the proposed amendments will prohibit the use of Perc in dry cleaning machines. Existing co-residential facilities shall remove any currently installed Perc dry cleaning machines by July 1, 2010. However, prior to this phase out date, all Perc co-residential facilities are required to follow good operating practices as specified in the proposed regulation and outlined in Part 6 of this section.

4. New Facilities

A new facility is defined as a facility that did not operate any dry cleaning equipment using Perc prior to January 1, 2008. For all new dry cleaning facilities, the proposed amendments will prohibit the use of Perc in dry cleaning machines and in water-repelling operations.

5. Requirements for Existing Facilities

Existing facilities, defined as any facility that operated Perc dry cleaning equipment prior to January 1, 2008, are prohibited from installing a new Perc dry cleaning machine after this date. A relocated facility which is defined as a facility that moves from one location to another location within the boundaries of the same local air district will be considered an existing facility for the purposes of the proposed regulation. Therefore, all relocated facilities will be subject to the requirements for existing facilities.

For existing facilities, the proposed amendments require that the more emissive technologies (i.e., converted machines) be replaced with a non-Perc alternative by July 1, 2010. For all other existing facilities, the compliance schedule is as follows:

- A facility that operates a primary control, add-on, or secondary control machine must remove from service their Perc dry cleaning equipment by July 1, 2010, or when the machine is 15 years of age, whichever comes later. If the age of the machine cannot be obtained, the machine must be removed from service by July 1, 2010.

- All existing facilities that have not already replaced their machines in accordance with the above schedule, must remove from service their dry cleaning equipment by January 1, 2023.

A summary of Perc equipment compliance times for existing facilities can be found in Table II-1.

Table II-1. Summary of Perc Equipment Compliance Times for Existing Facilities

FACILITY OR EQUIPMENT TYPE	DATE OF COMPLIANCE[1]
Drying Cabinet, or Dip Tank	January 1, 2008
Converted Machine	July 1, 2010
Dry Cleaning Machines at Co-residential Facility	July 1, 2010
Closed-loop Machines: Primary Control Machine; Add-on Secondary Control Machine; or Integral Secondary Control Machine	July 1, 2010 or 15 years after the date of manufacture, whichever comes later. July 1, 2010 if age of machine cannot be determined.
All Perc Dry Cleaning Machines	January 1, 2023

1. Final date(s) by which dry cleaning equipment shall be removed from service or use.

6. Good Operating Practices

The proposed amendments strengthen the good operating practices outlined in the Dry Cleaning ATCM to further reduce fugitive emissions. All facilities are required to follow the good operating practices outlined in the proposed amendments. These include trained operators, operation and maintenance requirements, and leak check requirements.

a. Trained Operators

In the current Dry Cleaning ATCM, each facility is required to have one or more operators who have completed the environmental training requirements. Under the proposed amendments, the length of time to notify the local air district when a trained operator leaves the employment of the facility has been reduced from 30 days to 15 days of the departure. To ensure proper equipment operation, the trained operators must be on-site whenever the dry cleaning machine is operating.

b. Operation and Maintenance Requirements

Since transfer and vented machines are no longer permitted, all language pertaining to these machines has been deleted. To shorten repair time, the facility owner/operator is required to keep on-site a spare set of gaskets for the loading door, still, lint trap, button trap, and water separator. They are also required to keep a spare lint filter on-site. Carbon adsorbers in integral secondary control systems must be designed for non-contact steam or hot air stripping operation, and must be stripped or desorbed in accordance with manufacturer's instructions or at least weekly, whichever is more frequent.

c. Leak Check Requirements

The proposal reduces the timeframe to repair a leak. Since the facility is required to keep spare gaskets and filters on hand, repairs should take less time. Liquid leaks or vapor leaks shall be repaired immediately upon detection. If a facility with a leak does not have parts available, the parts need to be ordered within the next business day of detecting the leak and the part installed within two business days after receipt. A facility with a leak that has not been repaired by the end of the seventh business day, after detection, shall not operate the dry cleaning machine until the leak is repaired.

In addition to the weekly leak checks, a dry cleaning system shall be inspected at least once a year for liquid and vapor leaks using a Perc detector which gives quantitative results with less than ten percent uncertainty at 50 ppmv of Perc. There are several suggested ways a facility can comply with this requirement.

- Purchase a Perc detector that gives quantitative results. See Chapter III for a discussion of Perc detectors.

- Solicit service from an individual or organization to conduct the annual leak check.

- Fulfill this requirement during a local air district inspection. However, a local air district inspector is not prevented from writing a notice of violation if a leak is detected in this circumstance.

7. Recordkeeping Requirements

The retention time to maintain records has been amended from 2 years to 5 years. Also, recordkeeping requirements have been amended to include the additional item listed below.

- For secondary control machines, the start and end time of each regeneration, and temperature of the chilled air on the outlet side of the refrigerated condenser.

8. Reporting Requirements

The reporting requirements are the same as in the Dry Cleaning ATCM with the addition that the annual report submitted by the facility must cover the period of January 1st through December 31st of each year. In addition to the existing reporting requirements, the facility must include the make, model, serial number, and the age of the dry cleaning machine. The owner/operator shall furnish this annual report to the local air district by the date specified by the local air district. Although the average facility mileage is no longer a reporting requirement, facility owners are encouraged to keep mileage records to assist them in determining the efficiency of their equipment.

9. Water-repelling Operations

All materials to be treated with Perc water-repelling solutions can only be treated in a converted, primary control, add-on secondary control, or integral secondary control machine. However, the machine used will be required to follow the prohibitions and requirements specified in the proposed Dry Cleaning ATCM (see Appendix A).

10. Requirements for Perc Manufacturers and Distributors

Information gathered under the following two new sections in the proposed Dry Cleaning ATCM will be used by ARB staff and the local air districts to facilitate implementation of the requirements under Health and Safety Code section 41998 (AB 998). In addition, this will allow ARB to track the sales and eventual phase out of Perc from dry cleaning operations.

a. Perc Manufacturers

Any solvent manufacturer that sells Perc to a distributor in California is required to keep monthly sales records (with invoices) of the gallons of Perc sold for use in dry cleaning in California. These records shall be retained for at least 5 years and shall be made available to ARB or the local air districts upon request.

In addition, by January 1, 2008, Perc manufacturers shall report to ARB contact information for all their distributors who sell Perc for use in dry cleaning in California. If there are changes to their list of distributors, the manufacturers are required to report the change(s) to ARB within 30 calendar days after the change has occurred.

b. Perc Distributors

Any solvent distributor that sells Perc or recycled Perc to a facility for the use of dry cleaning in California is required to retain the records listed below for at least 5 years. These records shall be made available to the ARB or the local air district upon request.

- For each dry cleaning facility, Perc distributors shall keep monthly sales records (with invoices) of the gallons of Perc and recycled Perc sold for the use of dry cleaning in California.
- Perc distributors shall keep monthly purchase records (with invoices) of the gallons of Perc purchased for the use of dry cleaning in California.
- Perc distributors shall keep contact information for each California dry cleaner that purchased Perc and recycled Perc.
- Perc distributors shall keep contact information for all their distributors who sell Perc and recycled Perc in California.

Additionally, by specified dates, Perc distributors will be required to report to ARB the following information:

- By January 1, 2008, Perc distributors shall report to ARB contact information for all their distributors who sell Perc in California. If there are changes to their list of distributors, Perc distributors shall report the change(s) to ARB within 10 workdays after the change has occurred.
- Perc distributors shall report to ARB any change(s) in their contact information within 30 calendar days after the change has occurred.
- By January 31 of each year, Perc distributors shall report to ARB the annual gallons of Perc and recycled Perc sold to California dry cleaners from January 1 through December 31 of the previous year.

The proposed amendments require Perc manufacturers and distributors to submit a fee that is based on the fee schedule shown in Table II-2 and the annual amount of Perc sold by the manufacturer or distributor in California. Payment is due upon receipt of an invoice from ARB. A violation of this section of the regulation, which would include the nonpayment of the Perc fee, could result in a penalty of up to $35,000.

Table II-2. Perc Fee Invoice Schedule

Year	*Perc Fee per Gallon Sold* (in U.S. Dollars)	Invoice Cycle	Approximate Invoice Date
2004	$3.00	August 16, 2004 *through* December 31, 2004	January 2005
2005	$4.00	January 1, 2005 *through* June 30, 2005 July 1, 2005 *through* December 31, 2005	July 2005 January 2006
2006	$5.00	January 1, 2006 *through* December 31, 2006	January 2007
2007	$6.00	January 1, 2007 *through* December 31, 2007	February 2008
2008	$7.00	January 1, 2008 *through* December 31, 2008	February 2009
2009	$8.00	January 1, 2009 *through* December 31, 2009	February 2010
2010	$9.00	January 1, 2010 *through* December 31, 2010	February 2011
2011	$10.00	January 1, 2011 *through* December 31, 2011	February 2012
2012	$11.00	January 1, 2012 *through* December 31, 2012	February 2013
2013	$12.00	January 1, 2013 *through* December 31, 2013	February 2014
2014-2022	$12.00	January 1, 2014 *through* December 31, 2014, and each subsequent calendar year *through* 2022	February 2015 and each February thereafter *through* February 2023

D. Regulatory Alternatives

The Board may choose to adopt the staff's proposed amendments or alternative requirements or any combination thereof. The alternative approaches to the proposed amendments to the Dry Cleaning ATCM span a wide range of requirements. The Board is not limited to, but could consider, the following approaches.

ARB staff has identified several alternatives to the proposed regulatory action based on comments and suggestions received during the rulemaking process. In considering these alternatives, ARB staff evaluated the current state of non-Perc alternative technologies, the impacts on public health, and the impact on the economic vitality of the dry cleaning industry. A summary of the more likely alternatives follows.

1. Total Phase Out of Perc and New VOC-Containing Systems

This option would phase out Perc as staff is proposing and include a prohibition on the use of hydrocarbon solvents. This option would provide the maximum protection from emissions of Perc while preventing an increase in volatile organic compound (VOC) emissions from hydrocarbon solvents. This option would have a great economic impact and would result in an industry-wide conversion in California to non-smog-forming technologies such as GreenEarth, water-based cleaning, and CO_2. For this option, the ARB staff estimates that the potential statewide cost is about $48 million over 15 years, with the annualized cost being $4.6 million. This is about 17 percent higher in potential statewide cost compared to the proposed amendments.

Although ARB staff expects that, under this option, most facilities would migrate toward GreenEarth, there could be a considerable number of facilities that choose water-based cleaning. The motivation for the choice of water-based cleaning may come from the unresolved question of the toxicity of GreenEarth and the availability of grant programs, such as AB 998, which provide monetary resources to non-toxic and non-smog-forming alternatives to Perc.

2. Increase the Phase Out Period

The proposed amendments phase out the use of Perc dry cleaning machines based on machine age. Under the proposed amendments, an existing facility with a converted machine will be required to remove any Perc dry cleaning machine by July 1, 2010. All other existing facilities will be required at the earliest date to install, operate and maintain a non-Perc alternative machine by July 1, 2010, or when the primary, converted, or add-on secondary control machine is 15 years of age, whichever comes later. Extending the phase out period would lessen the economic burden on the dry cleaning facility owners by allowing more time for the facility to replace their existing machines with integral secondary control machines during the interim before phase out of all Perc machines or with non-Perc machines during the extended phase out scheduled.

3. Decrease the Phase Out Period

This alternative would shorten the time frames in the regulation which require facilities to phase out the use of Perc in dry cleaning. By decreasing the phase out periods, the emission and risk reduction benefits of the proposed amendments would be realized more expeditiously. However, shortening the time frames in the regulation would increase the cost of compliance. The amount of the increase would depend on which requirement is adjusted and how significant the change is in the compliance date. The main cost impacts beyond the staff's proposed ATCM would be associated with the loss of residual value in existing machines due to accelerated replacement of non-Perc alternative machines. For example, a 5 year decrease in phase out time would result in potential statewide cost of $59 million over 15 years, which is about 44 percent higher compared to the proposed amendments.

4. Total Phase Out of Perc and Require Add-on Secondary Control for Primary Control Machines

This alternative would phase out Perc machines as staff is proposing and require the installation of add-on secondary control devices for existing primary control machines prior to their phase out. This option would reduce the amount of Perc emitted from primary control machines by an additional 46 percent at a cost of about $6,000 per machine. This option would be about 14 percent more costly than the proposed amendments. Under the staff proposal, beginning July 1, 2010, primary machines must be removed from service when they are 15 years old. This provision would likely result in almost 50 percent of the all primary control Perc machines being removed from service by July 1, 2010 and almost all primary control machines removed from service by 2016.

III. SUMMARY OF THE DRY CLEANING INDUSTRY

Typically, dry cleaners are considered small businesses and most employ less than 5 employees. Currently, Perc solvent is the most widely used solvent by the dry cleaning industry in the State of California. About 70 percent of the dry cleaning facilities use Perc as the cleaning solvent. The Facility Survey was conducted in 2003 and designed to collect information from dry cleaning facilities. Based on the Facility Survey, staff estimated that there were about 5,500 dry cleaning machines in California, of which, about 4,670 were Perc machines about 2 percent are co-residential facilities. In 2006, ARB staff conducted an update to the 2003 survey data to estimate the number of Perc and the alternative dry cleaning machines that are currently in operation. Based on information provided by the local air districts and industry, the number of Perc machines in operation in California in 2006 is estimated to be 3,660.

A. Dry Cleaning Technologies

1. Types of Cleaning Technologies

Although Perc is the most widely used dry cleaning solvent in California it is also used in other industry sectors including degreasing operations, industrial products, and some consumer products. The Dry Cleaning ATCM currently permits the use of closed-loop, dry-to-dry machines when Perc is the solvent of choice. The vast majority of California dry cleaners are familiar with the operation of this technology. Vented and transfer machines are prohibited under the current Dry Cleaning ATCM and no Perc dry cleaners should be using these systems at this time.

All hydrocarbon solvents used in dry cleaning consist of aliphatic hydrocarbons, meaning they are straight-chained, branched, or cyclic as opposed to aromatics, which contain stable carbon-ring structures called benzene rings. Hydrocarbon solvents are combustible. Inherent properties of these petroleum-based solvents include high flammability, volatility, odor, and toxicity. Toxicity varies by compound. However, none of the petroleum-based solvents have been evaluated by ARB and OEHHA for their potential to be toxic air contaminants. All of the solvents are VOCs. The machines predominately used for petroleum solvents are closed-loop machines equipped with primary control. Solvent technologies used for these types of equipments are DF-2000™ Fluid, PureDry®, EcoSolv®, Shell Sol 140 HT, and Stoddard Solvent. These technologies are described below.

a. DF-2000™ Fluid

DF-2000™ Fluid (DF-2000) was introduced in 1994 by ExxonMobil as an alternative solvent to Stoddard and Perc. Currently, it is the most popular alternative to Perc. Consisting of C_{11} to C_{13} aliphatic hydrocarbons, it is a synthetic mix of isoparaffins and cycloparaffins (naphthenes) that boils between 185 and 211 degrees Centigrade

(OEHHA, 2003). Machines designed for DF-2000 and other hydrocarbon solvents offer closed-loop, dry-to-dry operation. Most include a primary control device (refrigerated condenser) and offer computerized control.

b. PureDry®

PureDry® (PureDry) was developed as a replacement for Perc. It is a blend of isoparaffinic hydrocarbon and a chemical additive produced by 3M. The mixture contains about 95 percent odorless mineral spirits. The odorless mineral spirits are a mixture of aliphatic hydrocarbons (C_9 to C_{12}). Mineral spirits can cause neurotoxicity, and eye and respiratory irritation at high concentrations. It also contains HFE-7200 (a mixture of ethyl perfluoroisobutyl ether and ethyl perfluorobutyl ether), FC-43 (perfluoro compounds of primarily 12 carbons), PF-5070 (perfluoro compounds of primary seven carbons), and PF-5060 (perfluoro compounds of primarily six carbons) (OEHHA, 2003). The flash point of PureDry is 350°F with a boiling point temperature of 298°F. The flash point of a solvent is the temperature at which vapor given off will ignite when an external flame is applied under specified test conditions. A flash point is defined to minimize fire risk during normal storage and handling. Flash points for all dry cleaning solvents range from 110°F to 350°F.

c. EcoSolv®

Chevron Phillips Chemical Company LP manufactures EcoSolv® (EcoSolv). This dry cleaning fluid is 100 percent isoparaffin with carbon numbers ranging from C_9 through C_{13}. The manufacturer formulated this product by adding butylated hydroxytoluene at 10 parts per million (ppm) to act as an oxygen stabilizer. This solvent is a high purity aliphatic mixture with minimum in aromatics. The isoparaffin is a branched hydrocarbon that is also used for food processing, cosmetic and personal care formulations, and as a solvent for a number of industrial products. EcoSolv has a flash point between140°F and 200°F, and is classified as Class IIIA solvent (ARB, 2004e).

d. Shell Sol 140 HT

Shell Sol 140 HT (Shell 140) is a high flash point hydrocarbon solvent. Shell 140's flash point is 145°F.

e. Stoddard Solvent

Stoddard Solvent (Stoddard), a class of petroleum solvents, consists of a blend of C_8 to C_{12} hydrocarbons and is similar to kerosene. Its flash point is 110°F. Stoddard contains small amounts of chemicals known to be carcinogenic but are not classified as toxic. Stoddard also contains benzene, which has been identified as a toxic air contaminant. It also gives off an irritating odor.

The technologies described above are used as alternatives to Perc dry cleaning. ARB staff estimates that about 1100 dry cleaners in California are currently using hydrocarbon technology. In the South Coast AQMD grant program, about 80 percent of the dry cleaners received grants to switch from Perc to hydrocarbon technologies. In addition to hydrocarbon technologies, dry cleaners are also using other technologies such as decamethylcyclopentasiloxane (D_5), Rynex™, CO_2, Professional Wet Cleaning (wet cleaning), and Green Jet®. These technologies are described below.

f. Volatile Methyl Siloxane Cleaning

Decamethylcyclopentasiloxane (D_5) or volatile methyl siloxane is an odorless, colorless liquid that has many consumer and industrial applications. D_5 is used as an ingredient in a number of personal health and beauty products, including deodorants, antiperspirants, cosmetics, shampoos, and body lotions. It is also used as a dry cleaning solvent.

D_5 is present in the GreenEarth® (GreenEarth) dry cleaning solvent. GreenEarth solvent is mostly being used in hydrocarbon machines and has a flash point of 170°F. Although, GreenEarth is used in some converted Perc machines, the manufacturer does not recommend this option. In order for Perc machines to be converted, the following assemblies must be installed by manufacturer: filtration system; temperature control sensors; pre-water separator filter; water separator; and electrical control panel. GreenEarth solvent is distributed by Dow Corning, General Electric, and Shin-Etsu.

g. Rynex™ (Propylene Glycol Ether) Cleaning

Rynex™(Rynex 3) is an organic and biodegradable solvent with low volatility and a high flash point (>200°F) and is classified as a Class IIIB solvent. Rynex 3 is lighter than water and, therefore, floats on water after separation. It is a mixture of substituted aliphatic glycol ethers. It is also considered a VOC.

Rynex 3 can be used in most hydrocarbon machines with some temperature and timing adjustment. Converting Perc machines to use Rynex 3 is not recommended by the solvent manufacturer. It is not an economically prudent exercise due to the differences in physical properties of Perc and Rynex 3.

h. Carbon Dioxide (CO_2) Cleaning

CO_2 is a process that has been developed for use by commercial and retail dry cleaners. CO_2 is a non-flammable, non-toxic, colorless, tasteless, odorless naturally-occurring gas that, when subjected to pressure, becomes a liquid solvent. The CO_2 used in this process is an industrial by-product from existing operations, primarily anhydrous ammonia (fertilizer) production. There is no net increase in the amount of

CO_2 emitted; therefore, this process does not contribute to global warming. CO_2 is naturally occurring and is also used in other applications such as carbonating soft drinks. To date, there are about 10 CO_2 cleaning systems installed in California.

i. Professional Wet Cleaning

Professional Wet Cleaning (wet cleaning), an alternative to dry cleaning that was first introduced in 1991, is different than commercial laundering in several aspects. Wet cleaning uses computer-controlled washers and dryers with detergents that have been specially formulated for the process. Specialized equipment is used because ordinary washers and dryers lack the control needed to ensure that garments are processed properly. Finishing equipment includes pressing and tensioning units. The tensioning units are used to touch-up, stretch, reform, and finish the garments. Wet cleaning systems use non-toxic, biodegradable detergents, which are approved for disposal into the sewer system.

j. Green Jet®

The Green Jet® (Green Jet) machine cleans and dries garments in a single computer-controlled unit. The process involves using a mist of water and detergent to clean the garments. They are not immersed in liquid. The machine is designed to receive a full 45 pound load of garments. It then dehydrates the garments to remove humidity and reduce surface tension, which allows mechanical action and pulsating air jets to dislodge and remove non-soluble soil from the garments. This soil is then collected in a lint chamber. Next, a pre-determined amount of water-based cleaning solution is injected through air jet nozzles to re-hydrate the fabric. After about a pint of solution has been injected, heavy felt pads attached to the ribs and the cylinder absorb the soluble soil. After the cleaning process, the unit goes into a conventional dry cycle and then a cool-down cycle.

2. Efficacy of Various Technologies

Efficacy, or the ability to effectively clean clothes, is an important factor when considering dry cleaning alternatives. Properties to be considered include: cleaning ability, evaporation rate, and ease of purification of the cleaning solution through distillation. The solvent should not cause fabric to unnecessarily fade, shrink, weaken, or bleed color, and should be compatible with detergents. The overall cleaning ability of a process depends on soil chemistry, textile fabric type, transport medium (aqueous vs. non-aqueous), chemistry of the additives (detergents, surfactants), the use of spotting agents, and process considerations (e.g., time, temperature, and mechanical actions) (U.S. EPA, 1998). Over 95 percent of all soils are water soluble (Cleaners Family, 2004). Table III-1 summarizes the cleaning performance for Perc and the alternatives.

Table. III-1. Summary of Cleaning Performance of Dry Cleaning Solvents

Solvent	Cleaning Performance
Perc	Aggressive, oil-based stains, most water-based stains, silks, wools, rayons. Not good for delicates.
Stoddard	Less aggressive than Perc for oil-based stains. Can handle delicate garments.
PureDry	Less aggressive than Perc for oil-based stains. Can handle delicate garments.
Shell 140	Less aggressive than Perc for oil-based stains. Can handle delicate garments.
EcoSolv	Less aggressive than Perc for oil-based stains. Can handle delicate garments.
DF-2000	Less aggressive than Perc for oil-based stains. Can handle delicate garments
Green Jet (DWX-44 detergent)	Less aggressive than Perc. More effective in cleaning sugar, salt, perspiration stains. Good for delicates. Not good for heavily soiled garments.
Rynex 3	Aggressive, cleans water-soluble and oil-based stains.
GreenEarth	Less aggressive than Perc for oil-based stains. Good for water-based stains, delicates.
CO_2	Good for all stains and most fabrics. Very effective in removing oils, greases, sweats.
Wet cleaning	Aggressive, good for both oil and water-based stains. Can handle delicate garments. Requires tensioning equipment and training for successful operation.

3. Emerging Cleaning Technologies

There are five emerging technologies which are expected to be available to the dry cleaning industry within the next few years. These technologies are: 1) cold water cleaning systems; 2) the Resolve™ Dry Cleaning System; 3) the Impress™ Solvent, 4) Hydroclene Fluids, and 5) 1-Bromopropane (n-propyl bromide). Most of these technologies are still under research and development phase. However, a few cold water cleaning systems are currently in use. More detail about these emerging technologies is described in Chapter II of the Technical Assessment Report (CARB, 2006).

There are two dry cleaning facilities in North Carolina who are using 1-Bromopropane (n-propyl bromide) – a potential dry cleaning solvent. According to the California Department of Health Services (CDHS), this product can harm the reproductive system and the nervous system. 1-Bromopropane is a new solvent intended to replace solvent like Perc in dry cleaning industry. 1-Bromopropane is further discussed in Chapter V of this report.

There are new machines that can operate without a distillation system and/or a refrigerated condenser by using Tonsil® or another bleaching clay mixture. These machines have been in operation using hydrocarbon or GreenEarth solvent. Because these are new technologies, their performance is not well known. However, these new

technologies seem to be energy efficient and the costs of the machines are lower than the traditional hydrocarbon machines.

B. Emission Control and Ventilation Technologies

1. Emission Control Technologies

In dry cleaning operations, the majority of solvent is lost either through emissions to the atmosphere or via waste products. Furthermore, with Perc, a very small amount is also retained in clothes (relative to the total Perc emitted from dry cleaning operations). Some of the fugitive emissions can be controlled by using proper emission control and ventilation technologies to further reduce or capture emissions.

Over the past several years, the use of Perc recovery devices has become common in the dry cleaning industry because of economic considerations, environmental concerns, worker exposure concerns, and regulatory actions. Emission reductions from the dry cleaning industry can be attained through the use of proper operating practices and control equipment. These greatly increase the amount of solvent being recycled while at the same time minimizing the solvent loss to the atmosphere. Housekeeping measures include promptly repairing any worn or cracked gaskets, covering all solvent and waste containers, identifying and repairing any leaking equipment, and removing any lint build-up from the steam or water coils. Control devices such as carbon adsorbers, refrigerated or chilled water condensers, and distillation units have proven to be very effective for reducing emissions and recovering the solvent for reuse.

a. Primary Controls

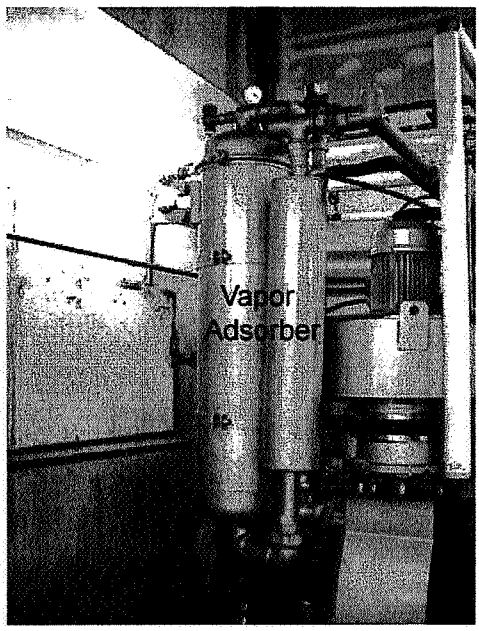
Primary control systems operate during the heating and cool-down phases of the drying cycle. They are designed such that they neither exhaust to the atmosphere nor generate additional solvent-contaminated waste water (where applicable). Today, the most commonly used primary control device is the refrigerated condenser. In the past, carbon adsorbers and polymeric vapor adsorbers (a largely unproven technology) were also considered but could not compete with the overall efficiency of the refrigerated condenser.

Refrigerated condensers operate throughout the drying cycle, in which solvent-laden air is continually recirculated through the condenser. The condenser recovers both the solvent and water vapors from the air stream, sending a liquid solvent and water mixture to a water separator. The solvent is recovered by the water separator then goes to the solvent storage tank. During the drying cycle, the air stream circulates past the refrigerated condenser, is reheated by the heating coils, circulates through the drum evaporating more solvent from the materials, and then flows through the condenser again where the solvent is recovered. The refrigerated condenser keeps the temperature low during the drying cycle (ARB, 1996). A detailed discussion on primary controls is presented in Chapter III of the Technical Assessment Report (CARB, 2006).

b. Secondary Controls

A significant source of solvent emissions from closed-loop machines is from opening the drum at the end of the drying cycle to remove materials. For example, the concentration of Perc in the drum at the end of the drying cycle can be as high as 8,600 ppmv (ARB, 1993). The operation of a secondary control device (typically a carbon adsorber - an activated carbon bed contained in a housing), which operates in series with a refrigerated condenser, can further reduce solvent vapor concentrations in the drum and, therefore, reduce fugitive emissions and solvent consumption. Secondary control devices are activated at the end of the cool down step before the machine door is opened. These devices route solvent vapors from the drum and button and lint traps through the refrigerated condenser, then through a vapor adsorber (see Figure III-1), which strips solvent vapors from the air. In order to keep operating efficiently, the carbon must be periodically regenerated. The regeneration process typically uses heat to strip and recover the adsorbed solvent. This desorption process usually occurs after a specific number of loads or according to the manufacturer's recommended schedule (ARB, 1996).

Figure III-1. Secondary Control



The Dry Cleaning ATCM requires that closed-loop machines with secondary control systems reduce the concentration of Perc in the drum to less than 300 ppmv at the end of the drying cycle. Based on source test results submitted to ARB for the approval of the secondary control systems, some systems can reduce the Perc concentration to below 100 ppmv. There are no similar statewide requirements for other solvents.

2. Ventilation Technologies

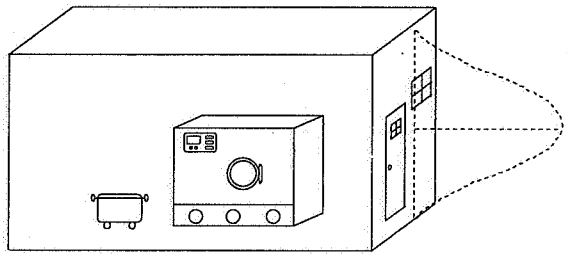
There are different types of ventilation systems in use at dry cleaning facilities. Ventilation affects the dispersion of solvent vapors and other airborne compounds in the facility and impacts the potential health risk to nearby residences and businesses. In many cases, the type of ventilation system found at a facility is a function of its construction. The facility owner most likely had little or no input into the design and construction of the ventilation system. Newer facilities tend to have more aggressive (or "active") systems compared to the relatively passive system used in older facilities. Many facilities do not have active ventilation systems. This means that solvent vapors, such as Perc, are emitted from the doors, windows, roof vents, and other openings throughout the facility. Natural ventilation, window fans, and general ventilation are examples of passive system. Aggressive or enhanced ventilation systems include: local ventilation, partial vapor barrier rooms, and full vapor barrier rooms.

The proposed amendments do not contain requirements for enhanced ventilation systems due to high cost. However, local air districts may require enhanced ventilation to further reduce potential health risks associated with Perc facilities. Enhanced ventilation system should have adequate airflow (minimum 1,000 cubic feet per minute (CFM) but likely much higher: 2,500-10,000 CFM) to maintain a capture velocity greater than 100 feet per minute at any fugitive capture structure (such as a shroud at the loading door and the fume hood). An air change rate of at least once every 10 minutes is generally adequate in a stand-alone building, but greater air change is recommended for mixed-use buildings. The exhaust fan(s) may be installed inside the full vapor barrier rooms, partial vapor barrier rooms or local ventilation systems or outside the facility on a wall or on the roof; should be a high pressure (1-3" H_2O) design with a minimum capacity of 1,000 CFM and should be run whenever the dry cleaning machine is operating or being maintained (BAAQMD, 2001).

a. Natural Ventilation

Natural ventilation depends upon wind and convective forces to move air and is typically considered the least effective. Figure III-2 shows a typical natural ventilation.

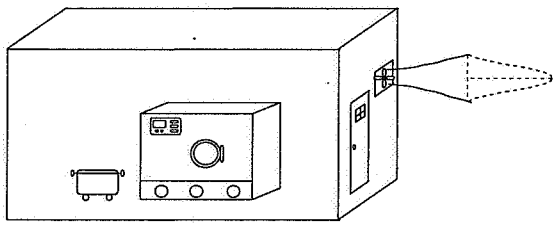
Figure III-2. Natural Ventilation



b. Window Fans

Window fans or wall fans are high flow rate propeller type fans that are installed vertically in a wall (window-type-opening). The air is exhausted horizontally, typically near ground level. These also provide an improvement to a facility with only natural ventilation. Figure III-3 shows a typical window fan configuration.

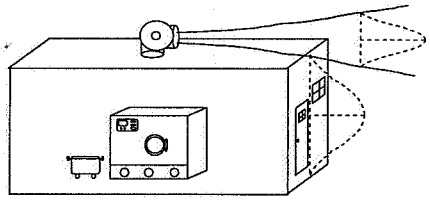
Figure III-3. Window Fan



c. General Ventilation

General ventilation systems typically have one or more large capacity fans on the roof of the facility. Capture efficiency depends on the air exchange rate inside the facility and is a function of the fan air flow rate and the size of the facility. General ventilation is considered an upgrade from natural ventilation. Figure III-4 shows a typical general ventilation configuration.

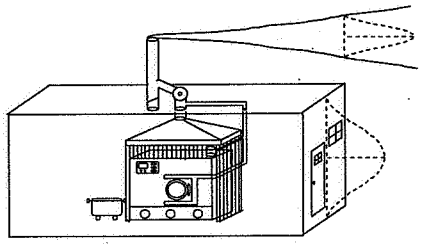
Figure III-4. General Ventilation



d. Local Ventilation System

A Local ventilation system is a ventilation system with a high capacity fan, exhaust stack (5 feet from the roof top), and physical apparatus/structure (fume hoods, shrouds, flexible walls, vertical plastic strips) near the dry cleaning machine. This system is designed to capture fugitive emissions. Emissions are then exhausted through a stack on the roof of the facility. Fume hoods should have plastic curtains on the sides (or a combination of walls and curtains) to minimize cross-flow drafts and provide better capture of fugitive emissions.

Figure III-5. Local Ventilation

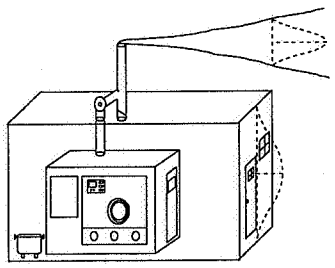


Based on Bay Area AQMD experience, the ventilation duct or fan intake should be placed near the ceiling directly above the back of the machine or at the rear of the local ventilation system. Walls or plastic strip curtains should extend at least 3 feet in front and back of the machine. The exhaust fan should be mounted above or behind the machine near the ceiling. The exhaust point should be at least 5 feet above the building or adjacent building and 30 feet from any window or air intake. According to ventilation specifications, a minimum of 1,000 cubic feet per minute airflow with a capture velocity greater than 100 feet per minute is required for ventilation. In addition, for a stand-alone building, an air change rate of at least once every 5 minutes is required. Figure III-5 shows a typical local ventilation system (BAAQMD, 2001).

e. Partial Vapor Barrier Rooms

A partial vapor barrier room encloses the back of a dry cleaning machine in a small room with the front panel and loading door exposed for convenient loading and unloading. As a result, partial vapor barrier rooms are able to more effectively capture fugitive emissions from leaks and maintenance activities when compared to local or general ventilation systems. Maintenance doors are normally closed and can be equipped with a self-closing device or alarm. Additionally, any windows are typically constructed of Plexiglas or tempered glass (for safety reasons). Figure III-6 shows a typical vapor barrier room configuration.

Figure III-6. Partial Vapor Barrier Room



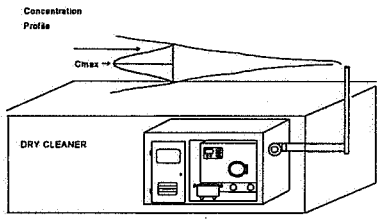
The ventilation duct or fan intake should be placed near the ceiling directly above the back of the machine or at the rear of the partial vapor barrier rooms. The stack should extend at least 5 feet above the building's roofline or any adjacent roof and at least 30 feet from any air intake or window. Emissions must be exhausted vertically (no rain caps). Proper stack design eliminates rain intrusion with offset legs, drains, and internal deflectors. External fans may also have drain holes. In addition, there should be one air exchange rate every 5 minutes. The diameter of the stack should generally

be 8 to 14 inches with an air flow rate of 1,000 to 2,500 CFM to provide good dispersion (BAAQMD, 2001).

f. Full Vapor Barrier Rooms

A full vapor barrier room is more efficient in capturing vapors then a partial vapor barrier room. A full vapor barrier room is able to restrict the diffusion and transport of solvent vapors that escape from a dry cleaning machine because a ventilation fan collects virtually all the vapors and exhausts them through a stack above the building. The door(s) to vapor barrier rooms are normally equipped with a self-closing device. Design features may vary, but normally include a "swinging" design that opens both ways or a sliding door. Additionally, any windows are typically constructed of Plexiglas or tempered glass (for safety reasons). Full vapor barrier rooms are currently required for co-residential dry cleaning facilities in the San Francisco Bay Area and for all dry cleaners in mixed-use buildings in the State of New York. Figure III-7 shows a typical full vapor barrier room configuration.

Figure III-7. Full Vapor Barrier Room



Full vapor barrier rooms are constructed of material resistant to diffusion of solvent vapors such as sheet metal (recommended), metal foil faced insulation sheets, or heavy plastic sheeting sandwiched between dry wall (gypsum) sheets. Seams should be offset for multiple layers of material. Seams and gaps should be sealed with aluminized tape (not standard duct tape) at each layer. The ventilation duct or fan intake should be placed near the ceiling directly above the back of the machine or at the rear of the full vapor barrier room. Warm air rises transporting solvent vapors towards the ceiling, placing the fan near the ceiling will effectively remove warm air and solvent vapors. The fan should produce an adequate air flow (minimum 1,000 CFM) to maintain a capture velocity greater than 100 feet per minute at any intentional gap or opening or about 50 feet per minute at the entry door when temporarily opened (plastic strips covering doorway will enhance capture). An air change rate of once a minute is recommended. For example a small 10' X 10' room would require a 1,000 CFM fan which would provide an air change rate of once a minute, for larger rooms a proportionally larger fan should be considered.

The exhaust fan may be installed inside the full vapor barrier rooms or near the ceiling at the back of the machine or outside the facility on a wall or on the roof; should be of a high pressure (1-3" H_2O) design with a minimum capacity of 1,000 CFM; and should be run continuously (24 hours a day, 365 days a year) in a co-residential facility and whenever the dry cleaning machine is operating or being maintained in a non-residential facility (interlock fan motor to dry cleaning machine). The stack should extend at least 5 feet (a 10 foot stack is recommended) above the roofline or any adjacent roof and at least 30 feet from any air intake or window. Emissions must be exhausted vertically (no rain caps). Proper stack design eliminates rain intrusion with offset legs, drains, and internal deflectors. External fans may also have drain holes. In

addition, there should be one air exchange every 5 minutes. The diameter of the stack should generally be 8 to 14 inches with an air flow rate of 1,000 to 2,500 CFM to provide good dispersion. Spotting using Perc containing solvents should be done within the full vapor barrier rooms for co-residential facilities. In addition, solvent and waste drums may be stored in a full vapor barrier room (BAAQMD, 2001).

C. Dry Cleaning Evaluation

The state of the current dry cleaning industry was assessed based on several surveys, site visits of dry cleaning facilities, and emission testing. More detail information is presented in the Technical Assessment Report (CARB, 2006). In 2006, an updated assessment of the number and types of dry cleaning machines in operation was made based on input from the local air districts and industry.

1. Dry Cleaning Facility Survey Update (2006)

The Facility Survey was conducted in 2003 and designed to collect information from dry cleaning facilities. Based on the original Facility Survey, staff estimated that there were about 5,440 dry cleaning machines in California, of which, about 4,670 were Perc machines. In addition to Perc, the second and the third solvent of choice are DF-2000 and GreenEarth. In 2006, ARB staff conducted on update to the 2003 survey data to estimate of the number of Perc and the alternative dry cleaning machines that are currently in operation. Based on information provided by the local air districts and industry, the number of dry cleaning machines in operation in California in 2006 is estimated to be 5,210, with the number of Perc machines estimated to be 3,660.

This represents about a 20 percent decrease in Perc machines over the last three years. The use of alternative dry cleaning machines have increased during the same period, with the high flash point hydrocarbon technology experiencing the largest growth. A comparison of the number of dry cleaning machines in operation estimated by the 2003 Facility Survey and the 2006 update is shown in Table III-2.

Table III-2. Statewide Estimates - Dry Cleaning Machines in Operation[1]

Statewide Estimates	Number of Machines (2003 Survey)	Number of Machines (2006 Update)
Perc Machines	4,670	3,660
High Flash Point Hydrocarbon	460	1,100
GreenEarth	90	190
Water Based Cleaning Systems[2]	150	170
Carbon Dioxide	3	10
Others (Rynex 3, PureDry, and Stoddard)	60	80

1. Source: 2003 Facility Survey; values are rounded to nearest 10 except for carbon dioxide machines.
2. Includes mixed shops.

For the Perc machines, the machine types were estimated based on input from the local air districts and industry. All Perc machines operating within the South Coast AQMD are required to be integral secondary control machines by November 2007. A summary of the results are shown in Table III-3 below:

Table III-3. Perc Dry Cleaning Machines in Operation (2006)[1]

Facility Description	Number of Machines (2006 Update)
Facilities with Converted and Primary Control Machines	1,240
Facilities with Add-on and Integral Secondary Control Machines	880
Co-residential Facilities with Perc Machines	50
Total Perc Machines in South Coast	1,540
Total Statewide Perc Machines	3,660

1. Values are rounded.

2. Leak Detector Evaluation

Based on observations during site visits and conversations with ARB training staff and local air districts, some Perc facility operators do not use their halogenated hydrocarbon detector (HHD) as often as they are required. The reason is that most of the HHDs do not give quantitative results. A majority of the Perc facilities use HHDs made by TIF™ Instruments, Inc. (TIF detectors) that would beep when Perc or other VOCs were detected. The threshold level for beeping to begin is around eight ppm (ARB, 2004c). The TIF detectors cannot be easily used to accurately determine whether a facility is in violation because the Dry Cleaning ATCM requirement for the facility to fix the leak is at 50 ppmv.

ARB staff looked at what is available in the industry for Perc detection and conducted a limited evaluation. The staff evaluated 12 portable detectors, including a TIF detector; a photoionization detector (PID) was available and served as a reference analyzer. The range of technologies tested included: PID, gas sensitive semiconductor, colorimetric tube, infrared, and heated diode sensor technology. Cost information for the detectors is discussed in Chapter VII of the Technical Assessment Report (CARB, 2006). A summary of the evaluation results is shown in Table III-4.

Table III-4. Summary of Leak Detector Evaluation

Model and (Manufacturer)	Detection Principle	Sample Delivery	Display	Response Time[1] (sec)	Leak Check Suitability[2]
Gas Alert Micro 5 (BW Technologies)	Photoionization	Diffusion	LCD with audio and visual alarms	5 – 10	No
PhoCheck 1000 (Ion Science)	Photoionization	Internal pump	LCD	<5	Yes
MiniRAE 2000 (Rae Systems)	Photoionization	Internal pump	LCD with visual alarms	<5	Yes
Aeroqual 200 Leak Detector (Aeroqual)	Gas Sensitive Semiconductor	Internal fan	LCD with audible alarms	<5	Yes
Aeroqual 500 (Aeroqual)	Gas Sensitive Semiconductor	Diffusion	LCD with audio alarm	20 – 30	No
Aeroqual 500 with build-in fan (Aeroqual)	Gas Sensitive Semiconductor	Internal fan	LCD with audio alarm	5 – 10	No
C-21 (Eco Sensors,Inc.)	Gas Sensitive Semiconductor	Diffusion	LED bar with audible alarm	No Response[3]	No
D-Tek (Inficon)	Infrared	Internal pump	Audible with LED bar	No Response	No
Tek-Mate (Inficon)	Heated Diode Sensor Technology	Internal pump	Audible with low and high sensitivity options	<5	Yes
TIF-5100 (TIF Instruments)	Heated Diode Sensor Technology	Diffusion	Audible	<5	Yes
Draeger CMS (Draeger)	Colorimetric	Internal pump	LCD	110	No
HW 101 reference analyzer (h-nu Systems)	Photoionization	Internal pump	Analog Potentiometer	<5	No

1. Response time is the approximate time needed for the detector to display a stable concentration.
2. Leak check suitability based on response time of less than five seconds in the field.
3. No response to calibrated standards, may require humidified gas sample.

As shown in Table III-4, in all cases, the PID detectors with an internal pump or fan performed well and provided quantitative results. The Aeroqual 200 Leak Detector technology (different from the Aeroqual 200 used for monitoring purposes) was also deemed suitable for leak checks and provided quantitative results within 10 percent uncertainty at a 50 ppmv Perc level. With the exception of the TIF-5100, the detectors that used diffusion for sample delivery had response times of five seconds or more in the field and were deemed not suitable for leak detection. The Tek-Mate and the TIF-5100 were sensitive to Perc and will indicate leaks at levels below 50 ppm. The facility background concentrations were mostly non-detectable with the limit of detection of the PID detectors at around one or two ppmv; the largest background concentration reading was between 5 to 10 ppmv.

3. Statewide Estimates of Emissions from Dry Cleaning Operations

Statewide estimates are made based on the 2006 updated number and type of Perc machines in operation and the usage and emission information obtained during the evaluation process and discussed in the Technical Assessment Report. The Perc machines currently in operation statewide are estimated to be emitting about 3.0 tons per day of Perc, with 1.8 tons per day of that being emitted outside of the South Coast AQMD. Upon full implementation of the proposed amendments and the South Coast AQMD's Rule 1421, all of the Perc emissions from Perc machines will be eliminated and there will be a reduction of 3.0 tons per day of Perc statewide.

D. Ambient Air Monitoring of Perchloroethylene

In 1985, the ARB established a 20 station toxic monitoring network to provide data to determine annual average concentrations of toxic air contaminants. This monitoring data is used to prioritize substances for the identification process, and to help assess the effectiveness of controls. The ARB routinely monitors Perc in the ambient air throughout the State.

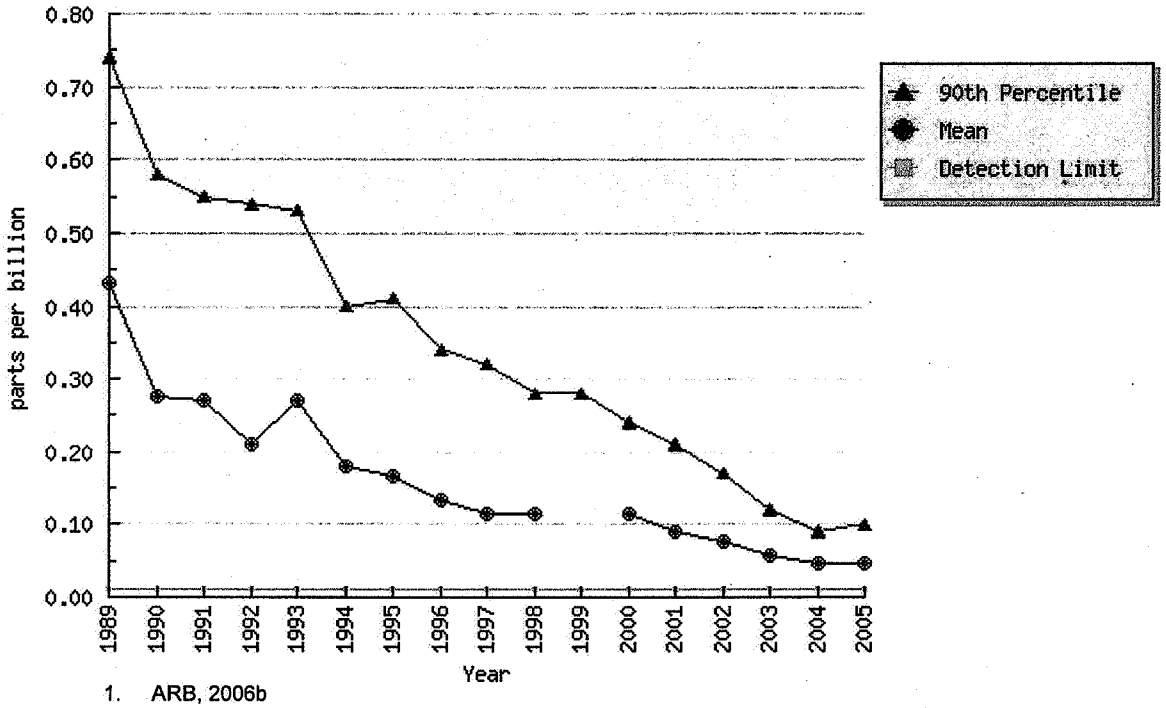
Prior to development of the Dry Cleaning ATCM, the statewide annual average concentration from July 1988 to December 1991 was 0.28 ppb (ARB, 1993a). The statewide annual Perc average for the years 2003 to 2005 is 0.05 ppb (ARB, 2006c). This data shows that the ambient levels of Perc have decreased approximately 80 percent. Figure III-8 on page shows that, overall, there has been a downward trend in the statewide annual averages for Perc.

As mentioned in the previous section, ARB staff expects that upon full implementation of the proposed amendments to the Dry Cleaning ATCM and the effects of the South Coast AQMD Rule, Perc emissions would be reduced to near zero by January 2023. Therefore, we expect that ambient levels will continue to decrease since dry cleaning operations account for the majority of Perc emissions. According to Perc solvent manufacturers, about 80 percent of the Perc is used in the dry cleaning industry and the remaining 20 percent is used in other industries.

On a regional basis, the proposed Dry Cleaning ATCM will eliminate Perc from Perc dry cleaning operations. Based on recent monitoring data (2005), the average population weighted cancer risk from exposure to Perc is estimated between 1 and 2 chances per million[1]. After full implementation of the proposed Perc ATCM and with other Perc measures in place, the average potential cancer risk from exposure to ambient Perc is expected to drop below 1 chance per million.

[1] Excludes the SCAQMD which is applying its own measure.

Figure III-8. Statewide Annual Average Monitored Values for Perchloroethylene[1,2]



1. ARB, 2006b
2. There is no data point for the mean value in 1999 because there was insufficient data or no data to determine the value.

IV. POTENTIAL HEALTH IMPACTS FROM EXISTING PERCHOLOROETHYLENE DRY CLEANING FACILITIES

A. Overview of Health Risk Assessment

A health risk assessment (HRA) is an evaluation that a risk assessor (e.g., ARB, local air district, consultant, or facility operator) develops to describe the potential a person or population may have of developing adverse health effects from exposure to a facility's emissions. Some health effects that are evaluated could include cancer, developmental effects, or respiratory illness. The pathways of exposure can include breathing; dermal exposure; and the ingestion of soil, water, crops, fish, meat, milk, eggs, and mother's (breast) milk.

For this HRA, we are evaluating the health impacts from Perc for the inhalation pathway only. We are not evaluating other pathways of exposure for Perc because OEHHA does not currently recommend using a multipathway methodology when assessing the exposure to volatile compounds such as Perc. Such multiple exposure pathway (multipathway) assessments are traditionally used for lipophilic (fat-loving), semivolatile, or low volatility compounds such as polychlorinated dibenzodioxins (PCDDs or dioxins) and dibenzofurans (PCDFs or furans), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

Generally, to develop an HRA, the risk assessor would perform or consider information developed under the following four steps: hazard identification, dose-response assessment, exposure assessment, and risk characterization.

1. Hazard Identification

In the first step, the risk assessor would determine if a hazard exists, and if so, would identify the pollutant(s) of concern and the type of effect, such as cancer or respiratory effects.

Perc has been formally identified as a TAC under the California Toxic Air Contaminant Program (Assembly Bill 1807: HSC sections 39660-39662). In addition, Perc is listed as a HAP by U.S. EPA under the Federal Clean Air Act (42 U.S.C. 7412). The ARB identified HAPs as TACs pursuant to HSC section 39657(b).

2. Dose-Response Assessment

In this step of risk assessment, the assessor would characterize the relationship between a person's exposure to a pollutant and the incidence or occurrence of an adverse health effect.

This step of the HRA is performed by OEHHA. OEHHA supplies these dose-response relationships in the form of cancer potency factors (CPF) for carcinogenic effects and reference exposure levels (RELs) for non-carcinogenic effects.

The CPFs and RELs that are used in California and those that are used for Perc in this HRA are presented in Section B, part 2 of this chapter.

3. Exposure Assessment

In this step of the risk assessment, the risk assessor estimates the extent of public exposure by looking at who is likely to be exposed, how exposure will occur (e.g., inhalation and ingestion), and the magnitude of exposure.

For dry cleaning activities, the receptors (people) that are likely to be exposed include residents and off-site workers located near the facility. On-site workers are not included in this HRA because Cal/OSHA has jurisdiction over on-site workers. To protect worker safety, Cal/OSHA has established a PEL for Perc. The PEL is the maximum, eight-hour, time-weighted average concentration for occupational exposure and it is 25 ppmv for Perc (Cal/OSHA, 2004). Since the proposed amendments to the Dry Cleaning ATCM will phase out the use of Perc machines in all dry cleaning facilities, on-site worker exposure to Perc at those facilities will be virtually eliminated.

Exposure to Perc at residential and off-site work locations was evaluated via the inhalation exposure pathway. Emission estimates and release parameters for the generic release scenarios were designed from previous work on dry cleaners, data taken from over 100 site visits, evaluation of over 1,600 survey responses, and input from industry representatives and the local air districts. Computer air dispersion modeling was used to provide downwind ground-level concentrations of the Perc at near-source locations.

4. Risk Characterization

This is the final step of risk assessment. In this step, the risk assessor combines information derived from the previous steps. Modeled concentrations, which are determined through exposure assessment, are combined with the CPFs (for cancer risk) and RELs (for noncancer effects) determined under the dose-response assessment. This step integrates this information to quantify the potential cancer risk and noncancer health impacts.

B. Tools and Information Used for this Risk Assessment

The tools and information that are used to estimate the potential health impacts from a source include an air dispersion model and pollutant-specific health values. Information required for the air dispersion model includes emission estimates, meteorological data, physical descriptions of the source, and emission release parameters. Combining the output from the air dispersion model and the pollutant-specific health values provides an estimate of the off-site potential cancer and noncancer health impacts from the emissions of a TAC.

For this assessment, ARB staff is estimating the potential health impacts from Perc emitted during dry cleaning activities. A brief description of the emission estimates, air dispersion modeling, and pollutant-specific health values is provided in this chapter. Additional information on the generic release scenarios used in the air dispersion modeling can be found in Appendix B. This risk assessment is based on the methodology outlined in *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003* (OEHHA Guidelines) (OEHHA, 2003a). In conjunction with the OEHHA Guidelines, staff also followed the ARB's *Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk* (ARB Interim Risk Management Policy) (ARB, 2003a).

1. Air Dispersion Modeling

Air dispersion models are used to estimate the downwind, ground-level concentrations of a pollutant after it is emitted from a facility. The downwind concentration is a function of the quantity of emissions, release parameters at the source, and appropriate meteorological conditions. The model that was used during this HRA was the Hot Spots Analysis and Reporting Program (HARP) (ARB, 2005h). HARP includes the Industrial Source Complex Short Term (ISCST3) air dispersion model, which is recommended by U.S. EPA for refined air dispersion modeling (U.S. EPA, 1995). HARP is a recommended tool for risk analysis in California that can be used for most source types (e.g., point, area, and volume sources) and is currently used by ARB, local air districts, and other states.

a. Emission Estimates

Risk assessment results are based on unit emission rates and can be easily adjusted to reflect any emission rate scenario. Therefore, emissions of Perc from dry cleaning activities for the risk assessment were based on unit emission rates of 100 gallons per year (1,350 pounds per year) for annual emissions and 0.1 gallons per hour (1.35 pounds per hour) for hourly emissions.

Emissions for this assessment were based on data taken from site visits and the evaluation of responses to an ARB facility survey. Table IV-1 shows the high-end (90th percentile) and average annual emission rates and the hourly emission rates that were used in this report for dry cleaners with converted machines, primary control, and secondary control. According to the dry cleaner survey results and our site visits, approximately 90 percent of dry cleaners emit below the high-end annual emission rate.

Table IV-1. Emissions Rates

Scenario	Annual (gallons/year)		Hourly (gallons/hour)[2]
	High-End Emissions[1]	Average Emissions	
Converted Machine	113	76	0.45
Primary Control	94	52	0.13
Secondary Control	61	34	0.06

1. High–end emissions is defined by the 90th percentile of emissions.
2. The hourly emissions are based on the 10th percentile of mileage and 90th percentile for machine capacity from our survey results.

b. Meteorological Data

This assessment uses meteorological data sets from four locations in California. Those locations are Anaheim (81), Fresno (85-89), Oakland (port) (98-00), and San Diego (Miramar) (67-71). The year(s) of meteorological data used at each location are listed in the parenthesis.

c. Physical Descriptions of the Source and Emission Release Parameters

Eight generic dry cleaner scenarios were used for the air dispersion modeling. These generic facilities were created from survey information, information obtained during site visits, and input from draft industry-specific reports, industry representatives, and from local air districts regarding dry cleaning operations. The generic release scenarios address the physical dimensions and emission release parameters used in the HRA. The generic release scenarios are presented in Appendix B.

2. Pollutant-Specific Health Effects Values

Dose-response or pollutant-specific health values are developed to characterize the relationship between a person's exposure to a pollutant and the incidence or occurrence of an adverse health effect. A CPF is used when estimating potential cancer risks and a REL is used to assess potential noncancer health impacts.

As presented in Section C, exposure to Perc may result in both cancer and noncancer health effects. The inhalation CPF and noncancer acute and chronic RELs that are used for this HRA are listed in Table IV-2. Also included in Table IV-2 are the noncancer acute and chronic target organs for Perc. Table IV-2 reflects the most current OEHHA-adopted health effects values for Perc.

Table IV-2. Pollutant-Specific Health Effects Values used for Determining Potential Health Impacts[1]

Compound	Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Noncancer Reference Exposure Levels (ug/m3)		Target Organs	
		Acute	Chronic	Acute	Chronic
Perchloroethylene (Perc)	2.1×10^{-2}	20,000	35	Nervous System; Eye, & Respiratory	Kidney and Alimentary

1. Health effects values were obtained from: a)The OEHHA Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part I, The Determination of Acute RELs for Airborne Toxicants, March 1999, (OEHHA, 1999); b) The OEHHA Air Toxics "Hot Spots" Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors (Revised), December 2002, (OEHHA, 2002); c) The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part III; Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels, April 2000, (OEHHA, 2000a); d) The Air Toxics Hot Spots Risk Assessment Guidelines; Part IV; Exposure Assessment and Stochastic Analysis Technical Support Document, September 2000, (OEHHA, 2000b); and e) The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. August 2003, (OEHHA, 2003a).

The CPF, which is currently used for health risk assessment, describes the excess cancer risk associated with exposure to one milligram of a given chemical per kilogram of body weight. The inhalation unit risk factor (URF), which was used in the past for health risk assessment, is defined as the estimated upper-confidence limit (usually 95th percentile) probability of a person contracting cancer as a result of constant exposure to a concentration of 1.0 microgram per cubic meter ($\mu g/m^3$) over a 70-year lifetime. The URF of 5.9×10^{-6} $(\mu g/m^3)^{-1}$ is converted to the cancer potency factor of 2.1×10^{-2} $(mg/kg - day)^{-1}$ by multiplying the URF by 3500 and rounding to two significant figures. The factor of 3500 is derived from a 70 kilogram (kg) human body weight, 20 m^3 inhalation rate, and 1000 factor unit conversion.

Reference exposure levels are defined as a concentration level at or below which no adverse health effects are anticipated and is used as an indicator of potential noncancer adverse health effects. Reference exposure levels are designed to protect sensitive individuals in the population by including safety factors in their development and can be created for both acute and chronic exposures. An acute exposure is defined as one or a series of short-term exposures generally lasting less than 24 hours. Consistent with risk guidelines, a one-hour exposure is used to determine acute noncancer impacts. Chronic exposure is defined as long-term exposure usually lasting from one year to a lifetime.

C. Potential Health Effects of Perchloroethylene

This section summarizes the cancer and noncancer impacts that can result from exposure to Perc. Exposure to Perc may result in both cancer and noncancer health effects. The probable route of human exposure to Perc is inhalation (ARB, 1997).

1. Cancer

The OEHHA staff has performed an extensive assessment of the potential health effects of Perc, reviewing available carcinogenicity data. OEHHA concluded that Perc is a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified Perc as a TAC in October 1991 (ARB, 1991). The State of California, under Proposition 65, listed Perc as a carcinogen in April 1988 (OEHHA, 2006). Table IV-2 presents the current health effects values that are used in this HRA for determining the potential health impacts.

In 1990, the U.S. Congress listed Perc as a HAP in subsection (b) of section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified Perc in Group B2/C, as a probable human carcinogen, on the basis of sufficient evidence for carcinogenicity in animals and inadequate evidence in humans. The International Agency for Research on Cancer (IARC) has classified Perc in Group 2A, as a probable human carcinogen, based on sufficient evidence in animals and limited evidence in humans (ARB, 1997). The ARB identified these HAPs as TACs pursuant to HSC section 39657(b).

Epidemiological studies have provided some indication that the use of dry cleaning solvents, primarily Perc, poses an increased risk of cancer for exposed workers. However, investigators were unable to differentiate among exposures to various solvents, and other possible confounding factors, like smoking, were not evaluated. Perc increased the incidence of hepatocellular tumors in laboratory mice after oral and inhalation exposure and mononuclear cell leukemia and kidney tumors in rats after inhalation (ARB, 1997).

2. Noncancer

Short-term (acute) and long-term (chronic) exposure to Perc may result in noncancer health effects. Acute toxic health effects resulting from short-term exposure to high levels of Perc may include headaches, dizziness, rapid heartbeat, and irritation or burns on the skin, eyes, or respiratory tract. Massive acute doses can induce central nervous system depression resulting in respiratory failure. Chronic exposure to lower Perc concentration levels may result in dizziness, impaired judgement and perception, and damage to the liver and kidneys (ARB, 1996). Workers have shown signs of liver toxicity following chronic exposure to Perc, as well as kidney dysfunction and neurological effects. Effects on the liver, kidney, and central nervous systems from chronic inhalation exposure to Perc have been reported in animal studies (ARB, 1997).

In addition to OEHHA listing Perc as having acute and chronic noncancer RELs (OEHHA, 1999, OEHHA 2000a), the U.S. EPA established an oral Reference Dose (RfD) for Perc of 0.01 milligrams per kilogram per day based on hepatotoxicity in mice and weight gain in rats. The U.S. EPA has not established a Reference Concentration (RfC) for Perc (ARB, 1997). Table IV-2 presents the current health effects values that are used in this HRA for determining the potential health impacts.

Epidemiological studies of women working in the dry cleaning industry showed some adverse reproductive effects, such as menstrual disorders and spontaneous abortions, but study design prevented significant conclusions. Women exposed to drinking water contaminated with solvents including Perc, showed some evidence of birth defects. Inhalation exposure of pregnant rodents to 300 ppmv Perc produced maternal toxicity and fetotoxicity manifested as developmental delays and altered performance in behavioral tests in the offspring of exposed mice and rats. However, Perc is not considered to be a teratogen (ARB, 1997).

D. Factors that Affect the Health Risk Assessment Results

Risk assessment is a complex process that requires the analysis of many variables to simulate real-world situations. There are a few factors that can affect the results of a health risk assessment at a dry cleaner, including: 1) the amount of (Perc) emissions released from the operation; 2) the source release characteristics (e.g., height of stack, stack configuration, flow rate, and building dimensions); 3) local meteorological conditions; 4) the distance to the receptor; 5) the duration of exposure; and 6) the inhalation rate of the receptor. A combination of these factors will determine the potential health impacts.

In this report, potential health impacts are presented for generic facilities. Therefore, the potential health impacts at an actual facility may vary due to that facility's individual characteristics. The generic release scenarios used in the HRA are presented in Appendix B.

E. Summary of the Risk Assessment Results from Generic Dry Cleaner Scenarios

This section presents a summary of the risk assessment results from eight generic dry cleaning facility configurations. This assessment uses meteorological data sets from four locations in California. Those locations are Anaheim, Fresno, Oakland (port), and San Diego (Miramar). The risk assessment used the Tier 1 methodology outlined in the OEHHA Guidelines (OEHHA, 2003a). In conjunction with the OEHHA Guidelines, staff also followed the ARB Interim Risk Management Policy (ARB, 2003a).

Table IV-3 provides estimates of the potential cancer risk for a resident living at 20, 30, or 100 meters from a sample of generic Perc dry cleaning facilities outside the South Coast AQMD. Risk estimates are presented for converted machines, primary control machines, and secondary control machines with general ventilation. Staff used emission rates that will likely include 90 percent of the Perc facilities.

For any receptor located closer than 20 meters from a dry cleaner, it is possible that their potential health impacts may be either higher or lower than the results presented in this report. Factors that may contribute to this variation include meteorology (wind and weather) and the individual release characteristics at each

facility. Currently, 20 meters is the minimum air dispersion modeling distance used by the ARB in their Air Toxics Program. Since 1997, the local air districts have used 20 meters as the minimum modeled distance in the industry-wide risk assessment guidelines for sources in the Air Toxics Hot Spots Program. The impacts at the 100 meter distance are identified to provide perspective for potential health impacts at distances further away from a dry cleaning facility.

Table IV-3. Potential Cancer Risk for High Perc Use Dry Cleaning Facilities[1]

Distance [meters (feet)][2]	Range of Potential Cancer Risk (chances per million)		
	Converted Machine with General Ventilation	Primary Control Machine with General Ventilation	Secondary Control Machine with General Ventilation
20 (66)	75	60	40
30 (100)	45	40	25
100 (330)	8	6	4

1. Assumes high-end (90%) Perc emissions rates of 113 gallons per year for converted machines, 94 gallons per year for primary machines, and 61 gallons per year for secondary machines. The results in this table are taken from Tables B-4 to B-6 in Appendix B. The results are adjusted for emission rates and averaged across three meteorological data sets (Fresno, Oakland (port), and San Diego (Miramar)). Calculations assume a 70-year exposure duration and use the 80th percentile daily breathing rate. Building size is assumed to be approximately 1,100 square feet. Results are for the inhalation pathway. All results are rounded.
2. Distances are presented from the building edge.

Table IV-4 provides an estimate of the percentage of facilities that have residents located within 20, 30, or 100 meters from the facility. As can be seen in the table, about 22 percent of the machines are at facilities that have a residence within 20 meters of the facility, 36 percent of machines are at facilities that have a residence within 30 meters, and 66 percent of all machines are at facilities that are within 100 meters of a residence.

The proposed amendments will practically eliminate all Perc emissions from dry cleaning operations. The only remaining Perc emissions may come from the intermittent and limited use of spotting agents. The ARB staff estimates that Perc emissions from facilities will be reduced by nearly 100 percent with full implementation of the proposed amended Dry Cleaning ATCM.

Table IV-4. Percent of Perc Machines at Various Distances from Residences

Distance [meters (feet)]	Percent of Machines
< 20m (66ft)	22%
< 30m (100ft)	36%
<100m (330ft)	66%

Table IV-5 presents a summary of the potential health impacts from the generic scenarios across the four meteorological data sets. Those locations are Anaheim,

Fresno, Oakland (port), and San Diego (Miramar). This table provides a summary of the potential cancer risk for both residential and off-site (adjacent) worker receptors exposed to high-end (90th percentile) and average emissions of Perc at existing dry cleaners with secondary control. The purpose for showing the potential health impacts at these two emission levels is to provide a perspective for Perc emissions at dry cleaning facilities in California. According to the dry cleaner survey results and our site visits, approximately 90 percent of dry cleaners emit below the high-end annual emission rate. Appendix B contains more detailed risk assessment results for dry cleaners with secondary control technology using generic unit emission rates that are broken down by meteorological data set, generic source configuration, and receptor breathing rates.

The upper section of Table IV-5 provides a summary of the potential cancer risk for a residential receptor exposed to high-end (90th percentile) and average emissions of Perc at dry cleaners using secondary control. Residential receptor results use the 80th percentile daily breathing rate and a 70-year exposure duration. If a dry cleaner was using a machine with primary control equipment instead of secondary control, then the potential cancer risks discussed below and presented in Table IV-5 are anticipated to increase by approximately 50 percent across all configurations.

Depending on the meteorological data set and the dry cleaner configuration, the potential cancer risk for a residential receptor exposed to the high-end (90th percentile) Perc emissions scenario is estimated to range between approximately 75 chances per million at 20 meters and 3 chances per million at 100 meters. Under the average emissions scenario, the residential receptor potential cancer risk is estimated to range between approximately 42 chances per million at 20 meters and 2 chances per million at 100 meters.

The lower section of Table IV-5 provides a summary of the potential cancer risk for an off-site worker receptor exposed to high-end (90th percentile) and to average emissions of Perc at dry cleaners using secondary control. The exposure duration for a worker is assumed to be 40 years.

Depending on the meteorological data set and the dry cleaner configuration, the potential cancer risk for an off-site worker receptor exposed to the high-end (90th percentile) Perc emissions scenario is estimated to range between approximately 62 chances per million at 20 meters and 2 chances per million at 100 meters. Under the average emissions scenario, the off-site worker potential cancer risk is estimated to range between approximately 35 chances per million at 20 meters and 1 chance per million at 100 meters.

The chronic hazard indices under the high-end (90th percentile) emissions scenario are less than 0.4 at residential receptor locations and less than 1.5 at adjacent worker locations. The adjacent workers' hazard index decreases to less than 1.0 within 30 meters of the dry cleaner. Under the average emissions scenario, chronic hazard indices are less than less than 0.2 at residential receptor locations and less than or

equal to 0.8 at adjacent worker locations. The noncancer acute hazard indices are less than 0.2 at any receptor location. All noncancer health impacts would be virtually eliminated under the proposed amendments.

Table IV-5. Potential Cancer Risk at Residential and Off-site Worker Receptors from a Generic Dry Cleaner Emitting at the High-End (90th Percentile) and Average Emission Rates Using Secondary Control [1, 2]

Source Types	RESIDENTIAL Potential Cancer Risk (chances per million) (Based on High-end Emissions) Distance (meters)[3]						(Based on Average Emissions) Distance (meters)[3]					
	20	40	60	80	100	120	20	40	60	80	100	120
Natural Ventilation	40-75	17-31	9-17	6-11	4-8	3-6	22-42	9-18	5-10	3-5	2-4	1-3
Natural Ventilation (B)[4]	29-53	13-24	8-14	5-9	3-7	3-5	16-29	7-13	4-8	3-6	2-4	2-3
General Ventilation (60/40)[5]	39-77	16-30	9-17	6-11	4-8	3-6	22-43	9-17	5-9	3-6	2-4	2-3
General Ventilation (B)[4] (60/40)[5]	25-51	12-24	8-14	5-9	3-7	3-5	14-28	7-13	4-8	3-5	2-4	1-3
Local Ventilation (80/20)[5]	22-29	11-15	7-10	4-7	3-5	2-4	12-16	6-9	4-6	2-4	2-3	1-2
Partial Vapor Barrier Room (95/5)[5]	22-34	12-19	7-12	4-8	3-6	2-4	12-19	7-11	4-7	2-4	2-3	1-2
Full Vapor Barrier Room	21-32	11-19	7-12	4-8	3-6	2-4	12-18	6-10	4-7	2-4	2-3	1-2

Source Types	OFF-SITE WORKER Potential Cancer Risk (chances per million) (Based on High-end Emissions)) Distance (meters)[3]						(Based on Average Emissions) Distance (meters)[3]					
	20	40	60	80	100	120	20	40	60	80	100	120
Natural Ventilation	33-62	14-26	7-14	5-9	3-6	2-5	18-35	8-15	4-8	3-5	2-3	1-3
Natural Ventilation (B)[4]	24-44	10-20	6-12	4-8	3-5	2-4	13-24	6-11	3-6	2-4	2-3	1-2
General Ventilation (60/40)[5]	32-64	14-25	8-14	5-9	3-6	2-5	18-36	8-14	4-8	3-5	2-3	1-3
General Ventilation (B)[4] (60/40)[5]	21-42	10-20	6-11	4-7	3-5	2-4	11-23	5-11	3-6	2-4	2-3	1-2
Local Ventilation (80/20)[5]	18-24	9-13	5-9	3-6	2-4	2-3	10-13	5-7	3-5	2-3	2-2	1-2
Partial Vapor Barrier Room (95/5)[5]	18-28	10-16	5-10	4-7	3-5	2-3	10-16	5-9	3-6	2-4	1-3	1-2
Full Vapor Barrier Room	17-26	9-16	5-10	3-7	2-5	2-3	10-15	5-9	3-5	2-4	1-3	1-2

1. All results are rounded and represent generic dry cleaning scenarios using secondary control technology and four meteorological data sets (Anaheim, Fresno, Oakland (port), and San Diego (Miramar). The high-end (90th percentile) and average emissions of Perc equate to approximately 61 and 34 gallons per year, respectively.
2. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the 80th percentile daily breathing rate. Workers assume a 40-year exposure duration.
3. Distances are presented from the building edge.
4. Building is approximately 2,500 square feet and 18 feet high. Other scenarios use a building approximately 1,100 square feet and 12 feet high.
5. Values identified within the parenthesis identify the ratio that emissions are modeled from a point and volume source.

V. POTENTIAL HEALTH IMPACTS OF THE PROPOSED AMENDED DRY CLEANING ATCM

A. Emissions and Risk Reduction Benefits

At full implementation, the proposed amended Dry Cleaning ATCM, excluding facilities in South Coast AQMD, will reduce the emissions of Perc from dry cleaning facilities by approximately 1.8 tons per day. Based on the 2006 updated information, the proposed ATCM and the South Coast AQMD rule will result in a 3.0 tons per day reduction statewide in Perc emissions. This emission reduction will lead to reductions in exposure and decrease the potential health impacts from Perc exposure.

The proposed amendments will completely phase out all Perc machines by January 1, 2023. The potential cancer risk for any receptor [i.e., resident or off-site (adjacent) worker] will be reduced to essentially zero. The only remaining Perc emissions may come from the intermittent and limited use of spotting agents containing Perc or residual Perc from clothes last cleaned outside California.

On a regional basis, the average population weighted cancer risk from exposure to ambient levels of Perc is estimated between 1 and 2 chances per million[1]. After full implementation of the proposed Perc ATCM and with other Perc measures in place, the average potential statewide cancer risk from exposure to ambient Perc levels is expected to drop below 1 chance per million.

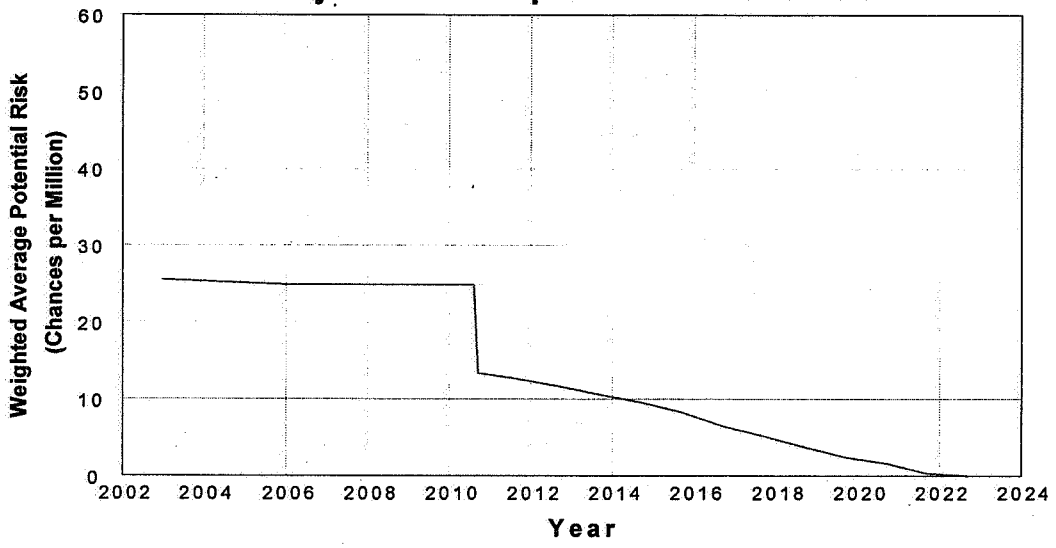
Appendix B contains more detailed risk assessment results for dry cleaners with secondary control technology using generic unit emission rates that are broken down by meteorological data set, generic source configuration, and receptor breathing rates.

Figure V-1 shows the current and projected average potential cancer risk after implementation of the proposed amended Dry Cleaning ATCM for facilities outside the South Coast AQMD that use Perc in California. The figure uses potential risk results for a receptor at 20 meters.

On July 1, 2010, the proposed Dry Cleaning ATCM will phase out all converted Perc machines, Perc machines that are in excess of 15 years old, and Perc machines in all co-residential buildings. Removal of these initial Perc machines will reduce the overall weighted cancer risk by about 36 percent. After 2010, the steady decline in weighted cancer risk is attributed to the continual phase out of Perc machines as they reach 15 years of age. On January 1, 2023, the weighted cancer risk will be near zero due to full implementation of the proposed ATCM. As shown in Figure V-1, at full implementation, the overall weighted average risk reduction is expected to be about 100 percent.

[1] Excludes the SCAQMD which is applying it's own measure.

Figure V-1. Potential Cancer Risk at Perc Dry Cleaners Subject to the Proposed Amended ATCM[1]



1. Excludes all dry cleaners within South Coast AQMD since they have their own dry cleaning rule. Figure is based on potential risk estimates at 20 meters.

B. Potential Adverse Health Impacts from Perchloroethylene Alternatives

The proposed amendments are expected to result in increased usage of Perc alternatives. The most popular Perc alternative is a high flash point hydrocarbon solvent. A significant issue associated with increased usage of hydrocarbon solvents is increased VOC emissions. VOC emissions contribute to the formation of ozone. Ozone formation in the lower atmosphere results from a series of chemical reactions between VOCs and nitrogen oxides in the presence of sunlight. Ozone is linked to a myriad of health effects including respiratory irritation, asthma, and premature death. Section D contains more information on the health impacts of ozone. See Chapter 3 for more discussion on current emissions and trends of Perc alternatives.

While the impacts of ozone are well documented, there is relatively little health data available on the specific alternatives and no California health values have been adopted. As a result, ARB staff requested OEHHA to review the health effects of alternative dry cleaning solvents as they are used in the dry cleaning industry. The California Dry Cleaning Industry Technical Assessment Report (CARB, 2006), which is available under separate cover, contains a copy of OEHHA's December 2003 memorandum to ARB which provides both a summary of their literature review and toxicity data summaries for many of these compounds. Based on their literature review, OEHHA has estimated several interim chronic noncancer reference exposure levels (RELs) and is continuing to follow the peer-reviewed literature on toxicity studies for the alternative solvents. Currently, there are no cancer potency factors or acute RELs for Perc alternatives.

1. Hydrocarbon Solvent Cleaning (DF-2000, PureDry, EcoSolv, Shell 140, Stoddard)

Hydrocarbon solvents, sometimes referred to as mineral spirits and petroleum solvents, are mixtures of hydrocarbons with or without other materials. Hydrocarbons have been used in the dry cleaning industry for many years and are some of the more common alternatives to Perc dry cleaning. The hydrocarbon solvents are a unique mixture of carbon and hydrogen molecules that co-exist as linear and branched chains, as well as in cyclic forms (U.S. EPA, 1998).

A recent two-year inhalation study of Stoddard solvent conducted by the National Toxicology Program (NTP) concluded that there was some evidence of carcinogenic activity in male rats (NTP, 2004). In general, this study confirmed previous studies on toxicity for Stoddard. Most of the studies found in the literature for short and long-term toxicity identified the kidney and liver as the major target organs (NTP, 2004). Additionally, stoddard solvent can be irritating to the eyes, nose, throat, and can also have effects on the nervous system (U.S. EPA, 1998).

There is also very limited health information on other hydrocarbon mixtures. DF-2000 contains C_{11} to C_{13} synthetic isoparaffin aliphatic hydrocarbons. PureDry contains 95 percent mineral spirits, which can cause neurotoxicity, and eye and respiratory irritation at high concentrations (OEHHA, 2003). EcoSolv and Shell 140 have similar hydrocarbon properties. ARB staff has not received information indicating that TACs or HAPs are present in hydrocarbon mixtures.

Most information is lacking on the environmental persistence of these and other hydrocarbon mixtures; however the manufacturer of DF-2000 indicated that their solvent can exhibit moderate rates of biodegradation (ExxonMobil, 2003). The manufacturer of EcoSolv indicated their solvent can exhibit moderate to rapid rates of biodegradation (Chevron Phillips, 2005).

For hydrocarbon mixtures, OEHHA has developed an interim chronic REL of 1,200 $\mu g/m^3$. The development of this interim value, which has not been through scientific peer review, is based on a study by Phillips and Egan on male and female rats. Additional information on this study can be found in the Technical Assessment Document (CARB, 2006).

An occupational exposure limit (OEL) can be calculated for various hydrocarbon solvents. Guidance values for individual hydrocarbon constituents or groups of constituents were recently published in the Journal of Occupational and Environmental Hygiene article, *A Proposed Methodology for Setting Occupational Exposure Limits for Hydrocarbon Solvents*, October 2005 (JOEH, 2005). Information on calculating OELs and guidance values for other substance groups can be found in this article. Note however, these guidance values have not been approved for use in California's regulatory programs.

One detrimental environmental and secondary health effect of hydrocarbon solvents is their contribution to the formation of ozone. See Section D for more discussion on the health impacts of ozone.

2. Volatile Methyl Siloxane Cleaning

D_5 is a cyclosiloxane which is now being used as a dry cleaning solvent. Historically, it has been used as an ingredient in many personal health and beauty products. D_5 is present in GreenEarth solvent. Dow-Corning, who manufacturers the solvent, conducted a two-year study with rats in which preliminary data showed an increase in tumors of the uterine endometrium. Preliminary findings may indicate that there is a potential carcinogenic hazard associated with D_5 (U.S. EPA, 2003). The observance of adverse effects on the uterus by D_5 is of concern (OEHHA, 2003). Because D_5 is lipophilic there is also concern that D_5 may bioaccumulate in the food chain.

A study by Burns-Naas *et al.* (1998) evaluated the subchronic toxicity of D_5. This study showed there were several minor changes observed in clinical biochemistry parameters; the most notable was an increase in gamma glutamyl transferase (a liver enzyme) in both sexes at the high dose. This study also showed that there was an increase in liver weight in rats. McKim et al. (1999) investigated the effects of D_5 on the expression and activity of selected rat hepatic phase I and phase II enzymes. Additional information on the Burns-Naas *et al.* and McKim *et al.* studies can be found in the Technical Assessment Document (CARB, 2006).

In June 2005, D_5 manufacturers submitted final toxicity testing data to ARB, OEHHA, Department of Health Services (DHS), and U.S. EPA. After these agencies review the data, a better assessment of the public health impacts from GreenEarth emissions can be made.

3. Propylene Glycol Ether (Rynex 3)

Rynex 3 is a form of propylene glycol ether and water. This solvent had some changes in formulation since its inception. Rynex 3 represents the current formulation for Rynex™. Currently, there is limited toxicity data on Rynex 3.

Based on a recent study by NTP on a previous formulation for Rynex™, propylene glycol t-butyl ether, OEHHA expressed concerns over its toxicity and carcinogenic potential. Of particular concern was the presence of tumors in mice. OEHHA has developed an interim chronic REL for propylene glycol t-butyl ether of 200 $\mu g/m^3$ to prevent adverse effects in the respiratory system. In addition, an interim inhalation unit risk factor for cancer was estimated to be 5.2×10^{-7} $(\mu g/m^3)^{-1}$, about one-tenth that of Perc. There are no developmental or reproductive studies on the chemical. The Technical Assessment Document (CARB, 2006) has more detailed information on the toxicological studies for the previous formulation of Rynex™, propylene glycol t-butyl ether.

The manufacturer of Rynex 3 has indicated that Rynex 3 is not carcinogenic and has low toxicity. A Rynex 3 fact sheet states that, based on laboratory animal studies, propylene glycol ethers do not cause the type of toxicological effects that are associated with exposure to ethylene glycol ethers (Rynex, 2005a). It is unknown if the interim health number or previous studies are still appropriate for Rynex 3. ARB staff has requested the studies on Rynex 3. However, neither ARB nor OEHHA staff have received these toxicological studies and cannot verify the manufacturer's claim for Rynex 3.

4. Carbon Dioxide Cleaning

As discussed in Chapter III, CO_2 cleaning uses liquid CO_2. The CO_2 used in this process is an industrial by-product. There is no net increase in the amount of CO_2 emitted; therefore, this process does not contribute to global warming. CO_2 is naturally occurring and is routinely ingested in food products such as soft drinks. CO_2 is also used in packaging for many foods such as salads, potato chips, and cookies.

5. Professional Wet Cleaning (Wet Cleaning)

Most detergents used in wet cleaning are a complex mixture of water and a variety of chemicals. Most formulations are trade secrets. Because there are a wide variety of formulations, there is difficulty with determining toxicity of these substances. Chemicals used in wet cleaning process commonly include spotting agents, detergents, fabric conditioners and sizing products. Other products may be used for cleaning leather and suede including water repellants.

In general, detergents are approved for disposal into the sewer system by the sanitation districts. U.S. EPA examined the human health and environmental hazards of surfactants because they are the primary components of detergents. In general, they found that there was no expected health risk to the general public. (U.S. EPA, 1998). In addition, the report by the Institute for Research and Technical Assistance, *Evaluation of New and Emerging Technologies for Textile Cleaning,* indicates that detergents are low in toxicity (IRTA, 2005).

In U.S. EPA's *Cleaner Technologies Substitute Assessment: Professional Fabricare Processes* (CTSA), U.S. EPA provided health hazard summaries on surfactants and surfactant aids for some example detergents. The following surfactants were included in their example detergents: cellulose gum (CG), cocamidopropyl betaine (CAPB), ethoxylated sorbitan monodecanoate (P-20), lauric acid diethanolamide (Lauramide DEA), sodium laureth sulfate (SLS), sodium lauryl isethionate (SLI). Surfactant aids include: acetic acid, citric acid, sodium citrate, and sodium carbonate. It is unknown how representative these example detergents were for detergents currently being used. Below is some health information on some of the surfactant and surfactant aids presented in the CTSA.

a. Surfactants

Several studies have been conducted on CG, a water-soluble cellulose ether. This and other water-soluble cellulose ethers exhibit very low oral toxicity, and no neurologic, reproductive, or mutagenic effects (U.S. EPA, 1998).

CAPB is reported as a potentially irritating substance. CAPB has limited data on chronic studies of systemic effects. One study suggests that CAPB does not increase systemic tumors above background, but there are not enough studies to be conclusive. CAPB does not have any studies on neurotoxicity or reproductive and developmental toxicity (U.S. EPA, 1998).

In both animals and humans, P-20 has been found to be essentially nontoxic following acute and long-term oral ingestion and to exhibit little or no potential for skin irritation and sensitization (U.S. EPA, 1998).

No human studies were located regarding the potential toxicity of lauramide DEA following oral or inhalation exposure. Lauramide DEA was not found to be mutagenic. The carcinogenic potential of lauramide DEA is currently being investigated (U.S. EPA, 1998).

SLS, following oral exposures, was found to be "moderately to slightly toxic" in acutely exposed animals and virtually non-toxic in chronically exposed animals. SLS does not appear to exhibit any reproductive, developmental, or carcinogenic effects in animals (U.S. EPA, 1998).

Limited information on SLI suggests that this chemical may not be a skin irritant and is not mutagenic (U.S. EPA, 1998).

b. Surfactant Aids

At high concentrations, acetic acid can result in severe irritation in both humans and animals. Based on short-term mutagenicity tests, acetic acid does not interact with genetic material. Although no direct information on the carcinogenicity of acetic acid was located, one chronic study in rats found no evidence of tumors (U.S. EPA, 1998).

Citric acid is generally considered to be innocuous except in the case of ingestion of large quantities or chronic exposures. Citric acid has been shown to be a mild to moderate skin and eye irritant in humans following inhalation or dermal exposure. No information has been located discussing neurotoxic, mutagenic, or carcinogenic effects associated with citric acid exposures in animals or humans. Sodium citrate is expected to behave chemically like citric acid systemically, but may not have the irritant properties (U.S. EPA, 1998).

Sodium carbonate is a skin and eye irritant. Sodium carbonate is not developmentally toxic to mice, rats, or rabbits. No information was available discussing

reproductive, neurotoxic, mutagenic, or carcinogenic toxicity from exposure to humans or animals (U.S. EPA, 1998).

6. Green Jet

The detergent used in the Green Jet system is called DWX-44. The material safety data sheet (MSDS) states that the product is 100 percent biodegradable. It also states that it contains no petroleum solvents, volatile organic compounds, or products from the federal hazardous air pollutant list. ARB staff is not aware of any health studies on this detergent.

7. 1-Propyl Bromide

Although currently not in use in California, 1-propyl bromide, also known as 1-bromopropane, is a solvent that is currently being considered as an alternative to dry cleaning. This compound is a neurotoxicant and reproductive toxicant (OEHHA, 2003) and was listed under Proposition 65 as a reproductive toxicant in December 2004. It causes sterility in both male and female test animals, and harms developing fetuses when tested in pregnant animals. It can damage nerves, causing weakness, pain, numbness, and paralysis (CDHS, 2003).

OEHHA developed an interim chronic REL of 1100 $\mu g/m^3$ (220 parts per billion) for 1-propyl bromide from the reproductive toxicity data in the Ichihara (et.al.) study (OEHHA, 2003). Based on current toxicity data, OEHHA staff is concerned about its use as a dry cleaning solvent (OEHHA, 2003).

C. Interim Health Values

As mentioned earlier in this chapter, OEHHA has developed interim values for some of the dry cleaning alternatives. Interim RELs are estimates based on approved OEHHA procedures; however, interim values have not gone through public comment and scientific peer review. OEHHA is continuing to follow the peer-reviewed literature on toxicity studies for the alternative solvents. Table V-1 summarizes these values. The Technical Assessment Document (CARB, 2006) has a more detailed discussion on the applicability of these values to specific compounds.

As previously stated, the interim health values are not approved for use in a quantitative health risk assessment. However, from a qualitative standpoint and assuming these chronic noncancer values remain unchanged, it would be unlikely that adverse chronic noncancer impacts will result from use of the alternatives. This observation is based on the premise that the interim chronic RELS for the Perc alternatives are at least 20 times higher than the REL for Perc. This increase in the RELs will result in lower chronic hazard indices. As presented in Chapter IV and Appendix B, the chronic hazard indices under the high-end (90th percentile) emissions scenario are less than 0.4 at residential receptor locations and less than 1.5 at adjacent worker locations. The adjacent workers' hazard index decreases to less than 1.0 within

30 meters of the dry cleaner. Because there are no interim acute RELs or CPF factors for Perc alternatives, no qualitative comparison regarding the acute noncancer or cancer impacts for Perc alternatives can be made.

Table. V-1. Summary of Interim Health Values

Compound	Acute REL[1]	Chronic REL	Cancer Potency Factor[1]
D5 (GreenEarth)	N/A	700 $\mu g/m^3$	N/A
1-Propyl bromide	N/A	1,100 $\mu g/m^3$	N/A
Hydrocarbon mixtures	N/A	1,200 $\mu g/m^3$	N/A
Hydrofluoroether (HFE 7200) (a compound in PureDry)	N/A	19,000 $\mu g/m^3$	N/A
Perc[2]	$2.0x10^4$ $\mu g/m^3$	35 $\mu g/m^3$	$2.1x10^{-2}$ $(mg/kg-d)^{-1}$

1. N/A means not available - not enough health data is available to determine a health value for this compound.
2. The values for Perc are approved by OEHHA and are included for comparison.

D. Potential Health Impacts of Volatile Organic Compounds

As previously mentioned, increased usage of hydrocarbon solvents will lead to increased VOC emissions. VOC emissions contribute to the formation of ozone. Ozone formation in the lower atmosphere results from a series of chemical reactions between VOCs and nitrogen oxides in the presence of sunlight.

Ozone adversely affects the respiratory functions of humans and animals. Human health studies show that short-term exposure to ozone injures the lung. In some animal studies, permanent structural changes with long-term exposures to ozone concentrations considerably above ambient levels were noted; these changes remain even after periods of exposure to clean air. Ozone is a strong irritant that can cause constriction of the airways, forcing the respiratory system to work harder in order to provide oxygen to the body. Ozone is a powerful oxidant that can damage the respiratory tract, causing inflammation and irritation, and induces symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthma symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms.

The greatest risk is to those who are more active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Exposure to levels of ozone above the current ambient air standard leads to lung inflammation and lung tissue damage, and a reduction in the amount of air inhaled into the lungs. Recent evidence has, for the first time, linked the onset of asthma to exposure to elevated ozone levels in exercising children (ARB, 2004b). Ozone is also associated with premature death. In 2005, premature deaths from ozone exposure in California are estimated at 630 deaths per year (ARB, 2005i).

VI. PUBLIC OUTREACH AND REPORT PREPARATION

A. Outreach Efforts

A public process that involves all parties affected by the proposed ATCM is an important component of ARB's actions. As part of ARB's outreach program, staff made extensive personal contacts with industry representatives, state and local regulatory agencies, environmental/pollution prevention and public health advocates, and other interested parties through meetings, telephone calls, and electronic mail. Staff developed a workgroup consisting of industry, state and local regulatory agencies, environmental group representatives and other interested parties. Staff held many workgroup meetings, conducted five public workshops and participated in three meetings with the Korean Dry Cleaners Associations in the Bay Area. Staff made special efforts to have key materials translated into Korean and have translator service available at the workshops and the meetings with the Korean Dry cleaners Association. The materials translated included the workshop notices, the proposed regulations, the Executive summary, and the Hearing Notice.

On May 25, 2006, the staff presented its initial proposed rulemaking to amend the Dry Cleaning ATCM to the Board. The Board heard testimony from many interested parties, including the affected industries, industry associations, environmental groups, local air districts, and other interested individuals. Although some of the testimonies were supportive of ARB staff's proposal, others suggested that ARB phase out the use of Perc in dry cleaning operations all together. After hearing the public comments and considering staff's proposal, the Board unanimously voted not to proceed with the proposed rulemaking and directed staff to return to them with a proposal for their consideration to phase out Perc from dry cleaning operations.

B. Public Involvement

As described below, affected industries, other government agencies, and organizations interested in minimizing public health impacts from the use of Perc in dry cleaning industries have been involved in the development of the proposed amended Dry Cleaning ATCM. All members of the public were invited to join the workgroup. ARB staff conducted a total of five public workshops in the following areas: Sacramento, the San Francisco Bay Area, and Southern California. Staff also attended three evening meetings with the Northern California Korean Dry Cleaners-Laundry Association, conducted 17 workgroups meetings, and attended the Fabricare 2006 show. ARB staff also conducted over 100 site visits to various dry cleaners in the State to get a better understanding of existing Perc and available alternative dry cleaning technologies. These facilities were located in 66 cities and covered nine local air districts. Staff further attended water-based cleaning and CO_2 cleaning technology demonstrations throughout the State. Additionally, to further increase the general public's participation in this assessment, staff made information available via ARB's website (*www.arb.ca.gov/toxics/dryclean/dryclean.htm*).

1. Industry Involvement

Industry involvement included but was not limited to, dry cleaning operators, cleaners associations, machine manufacturers, solvent manufacturers, Perc distributors, and environmental groups. They have actively participated in the development of the Dry Cleaning ATCM amendment process providing technical information. They have provided comments and suggestions during the development of our surveys and the Technical Assessment Report (CARB, 2006). They also submitted comments for, and provided testimony at, the Board's May 25, 2006 public hearing on the initial proposal for amendments to the Dry Cleaning ATCM. ARB staff has also had discussions with dry cleaning operators during site visits.

2. Government Agency Involvement

Other local, state, and federal agencies with an interest in potential emissions of, or soil/groundwater contamination by, Perc have been involved in the assessment process to promote statewide consistency in addressing public health concerns and provide a multi-media perspective. These agencies include: air and sanitation districts, Cal/OSHA, OEHHA, DHS, DTSC, and U.S. EPA.

We have kept the local air districts informed of our activities through the California Air Pollution Control Officers Association's (CAPCOA). This work has included telephone calls to the local air districts and presentations at the CAPCOA Toxics and Risk Managers Committee and the CAPCOA Enforcement Managers Committee.

We have reviewed information provided to us by the sanitation districts on increasing concentrations of Perc in the influent to publicly owned treatment works (POTWs). We have also requested information that other agencies may have on Perc and alternative technologies in the dry cleaning industry.

3. Private Organization Involvement

The Institute for Research and Technical Assistance (IRTA) recently partnered with ARB and U.S. EPA (the study's sponsor) to conduct a study of the alternative dry cleaning technologies. IRTA is a non-profit organization that assists industries, primarily small businesses, in reducing or eliminating their use of ozone depleting substances and chlorinated solvents through demonstration and evaluation of new technologies, solvent substitutes, and process modifications. IRTA invited ARB staff to visit facilities in the Los Angeles area and demonstrated how alternative technologies work to clean various types of garments. These facilities were participants in a study of alternative dry cleaning technologies. Some of the data was used in the ARB's evaluation of the dry cleaning industry. IRTA's study, the *Evaluation of New and Emerging Technologies for Textile Cleaning*, is available via IRTA's website (www.irta.us).

C. Data Collection Tools Used to Assist in Report Preparation

1. Dry Cleaning Surveys

ARB staff conducted several surveys, namely: the Facility Survey, Machine Manufacturer Survey, Solvent Manufacturers Survey, and Solvent Distributors Survey to gather information for the evaluation of the current Dry Cleaning ATCM. The Facility Survey was designed to collect information from the dry cleaning facilities. Many questions were asked on the Facility Survey to gather information concerning: operating information, facility information, potential future machine purchase/replacement, machine(s) type, solvent usage, waste produced, and maintenance information. The Facility Survey and the cover letter were also translated into Korean. The Machine Manufacturers Survey was developed to obtain the list price of the dry cleaning machines. The list prices were used to assess the cost of purchasing a new dry cleaning machine. The survey also, provided information on recommended maintenance schedules, maintenance costs, latest technologies available on the machines, and machine brochures. In addition, a Dry Cleaning Solvent Manufacturers Survey was sent to some of the alternative dry cleaning solvent manufacturers to obtain information on solvent formulation associated with hydrocarbon solvent cleaning (DF-2000, PureDry, EcoSolv, Shell 140, Stoddard), GreenEarth, Rynex 3, CO_2 cleaning, and water-based cleaning technologies. A Perc Solvent Distributors Survey (Distributors Survey) was also developed to assess the amount of Perc that is sold to the California dry cleaning industry. Information for years 2001, 2002, and 2003 were gathered from the distributors. More detailed discussion on the results of the surveys is available in Chapter IV of the Technical Assessment Report (CARB, 2006).

2. Sludge and Leak Detector Test

To support emission analysis of the dry cleaning processes, liquid sludge from Perc and DF-2000 machines was tested for solvent content. Based on observations during site visits and conversations with ARB training staff and local air districts, Perc facility operators do not use their HHD as often as they are required. The reason given for the infrequency is that most of the HHDs do not give quantitative results. Detailed discussion on sludge test and leak detector evaluation is presented in Chapter IV of the Technical Assessment Report (CARB, 2006).

3. Dry Cleaning Site Visits

ARB staff conducted numerous site visits to dry cleaning facilities in addition to obtaining some feedback on the Facility Survey. After the Facility Survey was mailed in September 2003, staff visited over 100 facilities around the State to get more detailed data. The facilities were located in 66 cities and covered the area over nine local air districts. The local air districts visited include: Bay Area AQMD, Butte County AQMD, San Diego County APCD, Sacramento Metro AQMD, San Joaquin Valley Unified APCD, Shasta County AQMD, South Coast AQMD, Ventura County APCD, and

Yolo/Solano AQMD. In addition, staff requested facility data from Monterey Bay Unified APCD and Santa Barbara County APCD. In all, 11 local air districts, encompassing about 97 percent of the facilities statewide, are represented in the site visit analysis. Detailed information on the site visits are presented in Chapter IV of the Technical Assessment Report (CARB, 2006).

4. Dry Cleaning Machines Update

ARB staff updated the data for the number and type of dry cleaning machines in operation based on input from the local air districts and industry in 2006. District staff from a majority of the 35 local air districts which represented an estimated 99 percent of the dry cleaning facilities located in California provided the number and type of dry cleaning machines that were in operation within the local air districts. Some of the facilities that operate with an alternative dry cleaning system are not required to obtain a permit from their local air districts. The number for each type of alternative dry cleaning machines in operation is provided by the industry.

5. Cost Update

Various cost data were updated in 2006. These included: list prices for the dry cleaning machines and solvent costs. New cost information was obtained to provide a more comprehensive comparison of the operating and maintaining costs for Perc and the dry cleaning alternatives. These included the costs of permit renewal and environmental training. The list prices for Perc and for the alternative dry cleaning technologies are updated based on communication with the machine manufacturers and distributors. The number for each type of alternative dry cleaning machines in operation is provided by the industry.

VII. ECONOMIC IMPACTS OF THE PROPOSED AMENDED ATCM

In this chapter, ARB staff presents the updated costs and economic impacts associated with implementation of the proposed amendments to the Dry Cleaning ATCM. As directed by the Board at its May 25, 2006 meeting, the proposed amendments to the Dry Cleaning ATCM, now focus on the phase out of Perc use in dry cleaning machines in California. The information presented in this chapter includes recent survey data of the number and type of dry cleaning machines in operation, and the operating and maintenance costs associated with the dry cleaning processes being used by most of the dry cleaners in California. The expected initial capital costs and annual recurrent costs for potential compliance options are discussed. The costs and associated economic impacts are given for private businesses, individuals, and governmental agencies.

A. Summary of the Economic Impacts

Staff estimates that the total statewide cost of the proposed amended Dry Cleaning ATCM to affected businesses will be approximately $41 million over 15 years. This corresponds to an average annual statewide cost of approximately $4 million for the 2,020 affected dry cleaning facilities that operate 2,120 machines. The cost of the proposed amended Dry Cleaning ATCM was estimated in 2006 dollars after accounting for the number of machines that will be required to be replaced each year. Other California businesses that will be impacted by the proposed amended Dry Cleaning ATCM (including those that sell Perc to dry cleaners) are estimated to experience minimal economic impact. The proposed amendments are not expected to impact dry cleaning facilities located in the South Coast AQMD, because South Coast AQMD already has a dry cleaning rule (Rule 1421) that will phase out the use of Perc in dry cleaning by December 2020.

The capital expenditure required by the proposed amendments is the incremental capital cost of purchasing an alternative technology compared to a Perc technology at the end of the useful life of the Perc machine. The useful life of a Perc machine, based on surveys of the industry, has been established to be 15 years. Because of the range of alternatives that are available, staff estimates the proposed amendments to the Dry Cleaning ATCM will require an increase in capital investment, compared to what would be required to purchase a Perc machine, ranging from $1,000 (water-based cleaning system) to $144,350 (Carbon Dioxide system) for a facility. When replacing a Perc machine with the most popular alternative technology, a high flash point hydrocarbon process, the additional capital investment will range from $18,500 to $24,350.

Incremental recurrent costs due to the proposed amendments are the cost differences in operating and maintaining the alternative dry cleaning processes compared to Perc dry cleaning processes. For high flash point hydrocarbon machines, staff estimates that the annual incremental recurring cost will range from $660 to $900 per year greater than for a Perc machine. The annual recurring costs for the other alternative technologies (GreenEarth, wet cleaning, and carbon dioxide) are generally

similar to or slightly higher than the recurring costs for operating and maintaining a hydrocarbon machine. One of the key variables in recurring cost is labor costs which tend to be somewhat higher for the newer alternative technologies. However, with proper training, experience, and advances in the technologies, it is possible that the differences in labor costs will be significantly reduced in future years.

The economic impact analysis separates the Perc dry cleaning facilities into three categories: 1) co-residential facilities; 2) facilities that operate with a converted or a primary machine; and 3) facilities that operate with an add-on or an integral secondary control machine. Of the approximately 2,020 Perc facilities affected by the proposed amended Dry Cleaning ATCM, it is estimated that about 50 are co-residential facilities. Approximately 1130 Perc facilities are operating 50 converted and 1130 primary control machines. And, approximately 840 Perc facilities operate with 880 add-on or integral secondary control machines.

The proposed amended ATCM will require Perc machines in co-residential facilities and converted Perc machines be removed from service by July 1, 2010. In addition, starting on July 1, 2010, all dry cleaning facilities will need to remove their Perc machines from service when the machines are 15 years old. When the age of the Perc machine cannot be determined, it will need to be removed from service by July 1, 2010.

Two State agencies, ARB and the Department of Corrections, will be impacted by the proposed amendments. Because of the phase out of Perc machines, ARB will see a reduction of fees for the Hot Spots Program. The current statewide Hot Spots Program fee is $35 per year for a Perc facility, the total amount of fee reduction is estimated to be $355,000 for the lifetime of the proposed amendments. This fee may be offset if alternatives are required to report under the Hot Spots Program. The Department of Corrections operates twelve Perc dry cleaning machines at twelve correctional facilities throughout California. The twelve facilities will need to replace these dry cleaning machines when they are 15 years old. If the Department of Corrections chooses the most popular alternative technology of high flash point hydrocarbon, the cost impact during the first three years of implementation of the amendments is estimated to range from $169,500 to $522,000 and the eventual cost impact will range from $268,000 to $892,000 to comply with the proposed amendments over 15 years.

Profitability impacts for dry cleaning facilities were estimated by calculating the change in the return on owner's equity (ROE) for a typical facility with average income. Assuming that all costs are absorbed by the affected businesses, the change in ROE was estimated. A decline in ROE of 10 percent or more is considered to indicate a significant adverse impact. Depending on the facility type, the machine type and the alternative technology that the facility owner chooses when the machine is 15 years old, the proposed amended Dry Cleaning ATCM is expected to result in ROE declines ranging from 18 percent to 264 percent.

The large range of estimated changes in ROEs reflects the differences in machine costs of the alternatives. Some alternatives, if chosen by a typical dry cleaner, are calculated to result in a decline of ROE of over 100 percent, meaning that the business will operate at a loss if cost is not passed on to its customer. For all of the alternatives available to the dry cleaner (except for possibly certain emerging technologies), the proposed amended Dry Cleaning ATCM is estimated to result in ROE declines that are higher than 10 and may have a significant adverse impact on the profitability of the operators of the dry cleaning businesses in California (e.g., facilities with marginal profitability).

It is important to note that some technologies may qualify for grants (e.g., non-toxic and non-smog forming grant administered by the ARB). For those who will receive grants, the profitability of the facility will improve accordingly. However, some of the marginal operators may still have difficulty securing the required capital to finance the purchase of the alternative dry cleaning equipment required by the proposed amendments. These businesses may choose to operate with a less costly alternative such as certain professional wet cleaning systems, the Green Jet® process, or the emerging hydrocarbon or GreenEarth technologies that can operate without distillation systems and/or refrigerated condensers, or cease their dry cleaning operations altogether. For those that cease their dry cleaning operations, a small number of employees could be adversely affected. Therefore, staff expects the proposed amendments to have a small impact on employment, business creation, and expansion. We do not expect the proposed amendments to have any significant impact on California interstate business competitiveness because these businesses operate locally and are not subject to competition with businesses in other states.

The primary customers of dry cleaning facilities are individual consumers. Most dry cleaning businesses are likely to pass their compliance costs onto their customers in the form of higher prices for their services. To the extent that dry cleaning businesses are able to pass all of the cost increase onto their customers, ARB estimated the potential cost increase to consumers based on the facility owners' recovery of their short term (five years) net cash outflow. For those facilities that replace their existing machine with a hydrocarbon machine when the existing machine is 15 years old, we estimate that the typical owner would have to charge an additional $0.56 per garment. The owners of co-residential facilities, because they are estimated to lose 3 years of useful life of their machines, would have to increase their cost per garment by about $0.63.

B. Economic Impacts Analysis on California Businesses as Required by the California Administrative Procedure Act (APA)

1. Legal Requirements

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The

assessment shall include a consideration of the impact of the proposed amended Dry Cleaning ATCM on California's jobs, business expansion, elimination or creation, and the ability of California businesses to compete with businesses in other states.

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

Section 57005 of the Health and Safety Code requires the ARB to perform an economic impact analysis of submitted alternatives to a proposed amended regulation before adopting any major regulation. The proposed amendments to the Dry Cleaning ATCM are considered to be a "major regulation", because the estimated cost to California dry cleaners exceeds $10 million in 2010. Staff has conducted an economic analysis of two alternatives. The alternatives considered were: 1) phase out Perc machines and prohibit hydrocarbon usage in new dry cleaning machines, and 2) accelerate the phase out of Perc machines to 10 years of age instead of 15 years.

2. Affected Businesses

Any dry cleaning business with an operating Perc dry cleaning machine, any person or organization selling Perc (Perc distributor) to dry cleaners, businesses that remove or install Perc dry cleaning machines within California, and businesses that sell Perc machines within California, are affected by the proposed amended Dry Cleaning ATCM. Other potentially affected businesses include alternative solvent suppliers and businesses that supply alternative dry cleaning machines to the dry cleaning facilities. The focus of this analysis, however, will be on dry cleaning facilities and Perc distributors because these businesses would be most extensively affected by the proposed amendments while all the other businesses that will be impacted are estimated to experience minimal economic impact.

For the dry cleaning facilities, the economic impact analysis is separated into three categories: 1) co-residential facilities; 2) facilities that operate with a converted or a primary control machine; and 3) facilities that operate with an add-on or an integral secondary control machine. The reason for this separation is because the incremental costs for these facilities to comply with the requirements are different. The estimated number of Perc machines in operation in each type of dry cleaning facility is shown in Table VII-1.

As shown on Table VII-1, it is estimated that about 50 secondary control machines are in co-residential facilities and about 50 are converted machines. These machines will need to be phased out of Perc use by July 1, 2010. Out of the remaining operating Perc machines, it is estimated that there will be about 830 integral or add-on secondary control machines, and about 1190 primary control machines in operation. The facilities will need to replace these Perc machines when the machines reach the end of their useful life of 15 years. In all, it is estimated that there are about 2,120 Perc

machines in operation at 2,020 dry cleaning facilities statewide outside of the South Coast AQMD.

Table VII-1. Estimates of Perc Dry Cleaning Machines Subject to the Proposed Amended ATCM[1]

Machine Type	Number of Machines[2]
Converted Machines	50
Primary Control Machines	1,190
Integral and add-on Secondary Control Machines	880
Perc machines in Co-residential Facilities	50
Total Amount of Machines Subject to the ATCM[3]	2,120

1. Values are rounded to the nearest ten.
2. Did not include machines within the South Coast AQMD.
3. Total number of machines is the sum of the first three rows because Perc machines in co-residential facilities are included in the count of machines in the three machine categories.

The dry cleaning alternative technologies in use today can be classified into five categories: 1) high flash point hydrocarbon, 2) GreenEarth, 3) water based cleaning systems, 4) carbon dioxide cleaning, and 5) other alternatives such as: Rynex™ (Rynex 3), other hydrocarbon solvents, and emerging technologies. Table VII-2 provides a summary of the estimated percentage of alternative dry cleaning technologies in use in 2003 and in 2006 based on input from the districts and industry representatives.

Table VII-2. Current Amount of Alternative Technology in Operation[1]

Type of Alternative Technology	Estimated Number of Machines (2003 Survey)	Estimated Number of Machines (2006 Survey)	Percent Increase in Alternatives (2003 to 2006)
High Flash Point Hydrocarbon	460	1110	82%
GreenEarth	90	190	13%
Water Based Cleaning Systems[2]	150	175	3%
Carbon Dioxide	3	12	1%
Other Alternatives[3]	70	80	1%

1. Values rounded.
2. Mostly professional wet cleaning systems and includes mixed shops (facilities that use wet cleaning together with another type of dry cleaning process).
3. Other alternatives may include: Rynex 3, other hydrocarbon, or emerging technologies.

There has been an increase in the use of the alternatives and the percent of increase attributed to each of the alternatives is calculated and tabulated in Table VII-2.

The calculated percent of increase of each alternative is then used to estimate the proportion of alternative technologies that will be chosen by dry cleaners to comply with the proposed amended Dry Cleaning ATCM and to estimate statewide cost of the proposed amendments.

3. Methodology for Determining the Potential Impacts on Profitability for Affected Businesses

The potential economic impact of the proposed amended Dry Cleaning ATCM on dry cleaning facilities is based on the following assumptions:

- Facilities that responded to the Facility Survey are representative of all affected California dry cleaning facilities.
- The Facility Survey results show that about 40 percent of the facilities have gross sales that are less than $100,000, about 55 percent of the facilities have gross sales in the range of $100,000 to $500,000, and about 5 percent of the facilities gross over $500,000.
- Based on the above Facility Survey information, we estimated a typical dry cleaner has an average gross sale of about $250,000 per year.
- Using three-year (2002-2004) Dunn and Bradstreet financial ratios, we estimated financial data at a typical dry cleaner (DB, 2006).
- The annual cost of compliance is estimated for the Perc dry cleaning facilities.
- The annual cost of compliance for a typical facility is adjusted for both federal and State taxes.
- These adjusted business costs are subtracted from net profit data and the results are used to recalculate the ROE.

The resulting ROE is then compared with the ROE before the subtraction of the adjusted costs to determine the impact on the profitability of the businesses. A reduction of more than 10 percent in profitability is considered to indicate a potential for significant adverse economic impacts. This threshold is consistent with the thresholds used by U.S. EPA and ARB in previous regulations. The impact on profitability was calculated for dry cleaners only because the economic impact on Perc distributors is anticipated to be relatively small.

4. Assumptions for Business Profitability Analysis

The business profitability ROE calculations were based on the following assumptions.

- All affected businesses are subject to federal and State tax rates of 35 percent and 9.3 percent, respectively.
- Affected businesses absorb the costs of the proposed amended Dry Cleaning ATCM instead of increasing the prices of their products or lowering their costs of doing business through cost-cutting measures.

5. Potential Economic Impacts for Individual Dry Cleaning Facilities

Because the proposed amended Dry Cleaning ATCM will phase out the use of Perc machines in dry cleaning processes, the economic impacts will depend on the type of alternative technology that the Perc facility owners choose and how that compares with costs of Perc operations. Costs of Perc operations are calculated assuming the facilities will purchase a new compliant Perc machine at the end of its useful life of 15 years. Costs associated with the change to alternative technologies and Perc machine replacement includes: costs of machines and machine installations, and recurrent costs due to the operation and maintenance of these machines. A general overview of capital and recurrent costs and estimation of potential economic impacts for the three facility types will be discussed below.

a. Capital and Recurrent Cost Estimations

Machine costs are based on manufacturer's input on list price of the machines and were updated in 2006. A summary of the installation and machine costs for selected dry cleaning processes to represent a range of available technologies is shown in Table VII-3. Costs shown in Table VII-3 are average costs; therefore, costs for a specific facility will vary. The machine cost for the professional wet cleaning systems reflect the average price of systems that have been placed in operation by 2004 AB 998 grant recipients. In addition, these costs do not reflect grants that are available to approved dry cleaners because not all technologies can qualify for the grants and the projected quantity of grants is limited.

For the purpose of comparing Perc operation to the alternatives, the annual recurrent costs associated with operating and maintaining Perc and hydrocarbon dry cleaning systems were estimated. The recurrent costs considered include: solvent cost, cost of detergent and spotting agents, gas and electricity cost, cost for applicable air permits, and other costs incurred to comply with the Dry Cleaning ATCM, licensing fees where applicable, maintenance cost, delta labor cost, and waste disposal cost. As with capital costs, recurrent costs for a specific facility may vary due to differences in operating and maintenance practices as well as the amount of garments dry cleaned. They may also vary as a function of time due to technology improvement.

Table VII-3. Updated Machine and Installation Cost Comparison[1]

Machine Type	Installation Cost[3]	Typical Machine or System Cost[2]	Machine and Installation Cost Difference Perc Primary Control to Alternative	Machine and Installation Cost Difference Perc Secondary Control to Alternative
Perc-Primary Control (40-lb. capacity)	$3,800	$44,000	-	-
Perc-Secondary Control (45-lb. capacity)	$3,800	$50,000	-	-
Hydrocarbon (50-lb. capacity)[4]	$4,300	$68,000	+$24,500	+$18,500
GreenEarth (50-lb. capacity)[4]	$4,300	$68,000	+$24,500	+$18,500
Professional Wet Cleaning System[5]	$3,800	$51,000	+$7,000	+$1,000
CO_2 (60-lb. capacity)[6]	$48,800	$143,000	+$144,000	+$138,000

1. Values are rounded to the nearest hundred and are updated in 2006.
2. Costs are based on average list prices and do not include cost for installation.
3. Installation cost is the calculated mid range of cost published in the Technical Assessment Report except as noted for the professional wet cleaning system.
4. Closed loop machine designed for high flash point hydrocarbon, GreenEarth, and Rynex3 solvents and include machines that operate with Tonsil™ or bleaching clay and without a distillation system.
5. Average cost of systems chosen by 2004 AB 998 grant recipients including washer, dryer and tensioning equipment.
6. Source: ARB, 2005c.

Table VII-4 shows the recurrent costs for Perc and for the most popular alternative dry cleaning process, the hydrocarbon process. The annual recurrent costs estimates shown in Table VII-4 are based on information contained in the Technical Assessment Report and additional information collected since the May 2006 hearing. The additions include: updated solvent costs, survey results of gas and electricity cost for Perc and alternative dry cleaning facilities, the inclusion of costs for appropriate air permit fees and compliance costs as required by the Dry Cleaning ATCM, the inclusion of delta labor cost, and updated waste disposal cost for Perc operations.

As shown in Table VII-4, the estimated annual recurrent costs for a typical hydrocarbon machine are $900 per year more than for a Perc secondary control machine and $660 per year more than for a Perc primary control machine. The two key areas of increased cost for the hydrocarbon machine are waste disposal cost and increased labor cost.

Staff collected data on the other three leading alternative technologies, GreenEarth, wet cleaning, and CO_2. Due to considerable variation in information collected for several cost categories, staff was unable to provide a detailed cost comparison for these three alternative technologies. However, based on the review of all available information staff believes that the annual recurrent costs for the alternatives will be about the same or up to 10 percent greater than the costs estimate for the hydrocarbon machine. For estimating economic impacts, we assumed that annual recurrent costs for all of the alternatives were the same as for a hydrocarbon machine.

Table VII-4. Comparison of Annual Recurrent Costs for Perc and Hydrocarbon Dry Cleaning [1]

Technology	Annual Solvent Cost[2]	Cost of Detergent/ Spotting Agents	Gas and Electricity Costs[3]	Permit and Other Costs[4]	Licensing Fee	Average Maintenance[5]	Delta Labor Cost[6]	Waste Disposal Cost[7]	Total Annual Recurrent Cost
Perc (Primary)	$1,600	$1,500	$12,710	$1,300	N/A	$700	N/A	$1,480	$19,330
Perc (Secondary)	$1,360	$1,500	$12,710	$1,300	N/A	$700	N/A	$1,480	$19,090
Hydrocarbon	$650	$1,500	$12,710	$560	N/A	$620	$1,300	$2,640	$19,980

1. Values are rounded and are normalized to overall average of 46,600 pounds of garment dry cleaned per year. Cost for a specific dry cleaning facility may vary due difference in the clothing volume, air district, and operation and maintenance.
2. Solvent costs are based on 2006 updated cost and solvent usage from Facility Survey.
3. Costs are based on phone survey shown in Appendix D.
4. Permit and other costs include average cost for air permits, cost for implementation of the hot spots program, and compliance costs including average environmental training costs, and estimated cost for recordkeeping, reporting, and operation and maintenance as required by the Dry Cleaning ATCM. See Appendix E for details
5. Costs include cost of filters.
6. Delta labor cost is the cost difference between Perc and the alternative processes.
7. Waste disposal cost accounts for waste water treatment units that are being used by Perc facilities to treat separator water.

b. Cost Impacts for Individual Facilities

Other factors that affect the economic impacts for individual dry cleaning facilities include: facility type, machine age, and whether the facility already has a spare set of gaskets and a spare lint filter on site. The economic impacts for each of the three facility types: co-residential facilities, facilities that operate with a converted machine or a primary control machine, and facilities that operate with an add-on secondary control machine or an integral secondary control machine are discussed.

i. Co-residential Facilities

Co-residential facilities are defined as facilities that share a wall, floor, or ceiling with a residence or are located in the same building with a residence. Most of these facilities are located in the Bay Area AQMD. The proposed amendments will require approximately 50 co-residential facilities to remove their Perc machines from service by July 1, 2010.

The potential capital costs for co-residential facilities include the incremental cost of the machine, purchase of a spare set of gaskets and a lint filter before removal of the Perc machine, and the possible loss of useful life of the Perc machine. The potential capital costs for the facilities are shown in Table VII-5. The total potential cost impacts were then calculated based on the applicable capital costs and the annual recurrent costs shown in Table VII-5 and VII-4 respectively.

Table VII-5. Potential Capital Costs for Co-residential Dry Cleaning Facilities[1]

Potential Actions	Capital Costs	
	Facility with Converted or Primary Control Machines	Facility with Add-on or Integral Secondary Control Machines
Switch to a New Hydrocarbon Machine[2]	$24,500	$18,500
Purchase a Spare Set of Gaskets and a Lint Filter	$0 to $350	$0 to $350
Loss of Useful Life of Machine[3]	$0 to $10,000	$0 to $10,000
Range of Total Capital Cost	$24,500 to $34,350	$18,500 to $28,350

1. Totals are rounded.
2. Assumed that co-residential facility owners will choose the most popular alternative.
3. Assumed maximum of 3 years.

Certain assumptions were made for cost impact and ROE calculations in addition to the discussions in subsections 3 and 4 of this chapter. Because of the small quantity of co-residential facilities, it is assumed that there is one dry cleaning machine in each co-residential facility and that the co-residential facility owners would choose to replace their machines with a high flash point hydrocarbon technology, the most popular alternative dry cleaning technology. Bay Area facilities had to comply with Bay Area's dry cleaning rule in 1998. Therefore, it is assumed that the co-residential facilities will lose a maximum of three years of useful life when their Perc machines are replaced in 2010. The actual cost impact for a co-residential facility will depend on the actual machine type (converted, primary control, add-on secondary or integral secondary control), machine age, and the alternative technology that is chosen by the facility owner to replace the Perc technology. The calculated annualized costs and the resulting decline in ROEs are shown in Table VII-6.

As shown in Table VII-6, total annual net cost for purchasing and operating a hydrocarbon machine compared to a secondary control machine is $2,680, with a calculated decline in ROE of 49 percent. If the facility loses three years of the useful life of the existing Perc machine, the total annual net cost would increase to $3,650, with a calculated decline in ROE of 66 percent. The net cost for facilities that are operating with a converted or primary control Perc machine would be higher compared with those that are operating with a secondary control machine. Therefore, the changes in the calculated ROEs are higher. In the cases considered, the declines in ROEs calculated are all greater than 10, ranging from 49 to 70 percent, indicating the potential for the proposed amendments to cause significant adverse economic impacts on co-residential facilities. Alternatively, the facility owner might consider choosing another alternative that can be lower in cost, i.e. the emerging hydrocarbon or GreenEarth machines that do not use distillation system and/or refrigerated condenser. Or, if it is deemed suitable for the facility, the facility owner might opt to choose professional wet cleaning systems.

Table VII-6. Decline in Return on Owner's Equity (ROE) for Co-residential Facilities[1]

Machine Type	Equipment Cost Due to Early Replacement of machine	Incremental Machine and Installation Cost[2]	Annualized Incremental Machine and Equipment Cost[3]	Delta Total Annual Recurrent Cost[4]	Total Annual Net Cost[5]	Percent Decline in ROE
Converted or Primary Control to Hydrocarbon	$0 to $8,800	$24,500	$2,360 to $3,210	$660	$3,020 to $3,870	55 to 70
Secondary Control to Hydrocarbon[6]	$0 to $10,000	$18,500	$1,780 to $2,750	$900	$2,680 to $3,650	49 to 66

1. Cost values rounded off to the nearest $10.
2. Cost differential between purchasing and installing a new hydrocarbon machine and a new primary control or a new secondary control machine.
3. The incremental machine and equipment cost were annualized based on a 15-year useful life and a real interest rate of five percent.
4. Delta total annual recurrent cost is the difference in the total annual recurring cost between the two dry cleaning technologies.
5. Total Annual Net Cost is the sum of Annualized Initial Cost and Total Annual Recurrent Cost.
6. Most likely machine type for a co-residential facility.

ii. Facilities that Operate a Converted or a Primary Control Machine

Based on the 2006 assessment of the dry cleaning machines in operation in California, there are 1,130 primary control machines and about 50 converted machines operating in facilities outside of the South Coast AQMD. Most of these facilities operate with a single machine. These facilities are required to remove their machines from service when they have been in service for 15 years starting on July 1, 2010. It is assumed that these facilities will choose to replace their Perc machines with an alternative technology and stay in operation.

The estimated capital costs for a facility that will replace a converted or a primary control machine depends largely on the dry cleaning alternative technology that the facility owner/operator will choose and, to a small extent, whether they will need to purchase a spare set of gaskets and a spare filter while they are operating their existing Perc machine. Because there is not a big used machine market for the dry cleaning machines, it is assumed that facility owners will be buying new machines. In addition, because most manufacturers are now producing machines that can be used for multiple solvents, including hydrocarbons, GreenEarth, and Rynex solvents, the machine cost for these solvents are grouped as the cost for a new multi-solvent machine. All potential capital costs are listed in Table VII-7. As shown in Table VII-7, the estimated capital costs for a facility range from $7,000 to $144,350.

Table VII-7. Potential Increase in Capital Costs for a Facility Replacing a Converted or a Primary Control Perc Machine[1]

Potential Actions	Capital Costs[2]
Switch to a New Multi-Solvent Machine[3]	$24,500
Switch to a New Professional Wet Cleaning System	$7,000
Switch to a Carbon Dioxide System	$144,000
Purchase a Spare Set of Gaskets and a Lint Filter	$0 to $350
Range of Total Initial Cost	$7,000 to $144,350

1. Totals are rounded.
2. Capital costs did not include grants that may be available to some dry cleaners and include both incremental machine and installation costs.
3. Multi-Solvent machines can be used for hydrocarbon, GreenEarth, and Rynex solvents and include machines that operate with Tonsil™ or bleaching clay and without a distillation system.

The estimated annual total net costs and the calculated ROEs, which indicate the potential impact on profitability of the proposed amendments, are shown for selected alternative technologies in Table VII-8. As shown in Table VII-8 all calculated ROEs are greater than 10 percent, with a 10 percent decline in ROE indicating a potential adverse economic impact. The typical costs associated with a switch to a professional wet cleaning technology results in the lowest decline in ROE of 24 percent. The highest decline in ROE of 264 percent occurs for the facilities that choose to operate with the carbon dioxide technology because of its high capital cost. A decline in ROE of greater than 100 percent means that the business will operate at a loss if cost is not passed on to its customer. The magnitude of ROE decline for switching to the carbon dioxide technology indicates that for a typical dry cleaner, switching to a carbon dioxide technology would be prohibitively expensive. Dry cleaners that have switched to carbon dioxide technology in California have high gross income compared to the typical dry cleaner.

It is important to note that certain technology types may qualify for grants (e.g. non-toxic and non-smog forming grant administered by the ARB, local air district's grant programs, and grants given by public utility companies). For those who will receive grants, the ROE will change accordingly. For example, with a $10,000 grant, the resulting decline in ROE for a typical professional wet cleaning facility is calculated to be 7 percent, and the resulting decline in ROE for a carbon dioxide facility is 246 percent.

Table VII-8. Decline in Return on Owner's Equity (ROE) for Facilities Replacing a Converted or a Primary Control Perc Machine[1]

Technology Type	Incremental Machine and Installation Cost[2]	Annualized Incremental Cost	Delta Total Annual Recurrent Cost/Savings[3]	Total Annual Net Cost/Savings[4]	Percent Decline in ROE
Hydrocarbon	$24,500	$2,360	$660	$3,020	55
GreenEarth	$24,500	$2,360	$660	$3,020	55
Professional Wet Cleaning System	$7,000	$670	$660	$1,330	24
Carbon Dioxide	$144,000	$13,870	$660	$14,530	264

1. Cost values rounded off to the nearest $10. Costs occur at time of purchase.
2. Cost differential between purchasing and installing a new primary control machine and a new alternative technology machine/system.
3. Delta total annual recurrent cost is the difference in total annual recurring cost between the use of Perc and that of the elected alternative technologies and is assumed to be the same as that of hydrocarbon.
4. Total Annual Cost is the sum of Annualized Initial Cost and Total Annual Recurrent Cost.

iii. Facilities that Operate a Secondary Control Machine

There are about 880 add-on or integral secondary control machines in California that are subject to the proposed amendments. These secondary control machines will need to be removed from service when they are 15 years old starting in 2010. The potential actions that a facility owner will take to comply with the proposed amended ATCM include the type of alternative technology that is chosen and whether a spare set of gaskets and a spare lint filter needs to be purchased. The potential capital costs associated with these potential actions for a facility with a secondary control machine are listed in Table VII-9. As shown in Table VII-9, the resulting increase in capital costs (compared to a Perc machine) ranges from $1,000 to $138,350.

Table VII-9. Potential Increase in Capital Costs for a Facility Replacing a Secondary Control Perc Machine[1]

Potential Actions	Capital Costs[2]
Switch to a New Multi-Solvent Machine[3]	$18,500
Switch to a New Professional Wet Cleaning System	$1,000
Switch to a Carbon Dioxide System	$138,000
Purchase a Spare Set of Gaskets and a Lint Filter	$0 to $350
Range of Total Initial Cost	$1,000 to $138,350

1. Totals are rounded.
2. Initial costs did not include grants that may be available to some dry cleaners and include both incremental machine and installation costs.
3. Multi-Solvent machines can use hydrocarbon, GreenEarth, and Rynex solvents.

The estimated annualized costs and the calculated ROE, indicating the potential impact of the proposed amendments on profitability, are shown for selected alternative technologies in Table VII-10.

Table VII-10. Decline in Return on Owner's Equity (ROE) for Facilities Replacing a Secondary Control Perc Machine[1]

Technology Type	Incremental Machine and Installation Cost[2]	Annualized Incremental Machine and Equipment Cost	Delta Total Annual Recurrent Cost/Saving[3]	Total Annual Net Cost/Saving[4]	Percent Decline in ROE
Hydrocarbon	$18,500	$1,780	$900	$2,680	49
GreenEarth	$18,500	$1,780	$900	$2,680	49
Professional Wet Cleaning System	$1,000	$100	$900	$1,000	18
Carbon Dioxide	$138,000	$13,380	$900	$14,280	259

1. Cost values rounded off to the nearest $10.
2. Cost differential between purchasing and installing a new primary control machine and a new alternative technology.
3. Delta total annual recurring cost is the difference in total annual recurring cost between the use of Perc and that of the selected alternative technologies. The total annual recurring cost is shown in Table VII-4.
4. Total Annual Cost is the sum of Annualized Initial Cost and Total Annual Recurring Cost.

As shown in Table VII-10, there is a decline in ROE for all technology types and the declines are all over 10. The typical costs associated with a switch to a professional wet cleaning technology results in the smallest decline of 18 percent. The largest decline in ROE occurs for the facilities that choose to operate with the carbon dioxide technology because of its high capital cost.

It is important to note that certain technology types may qualify for grants (e.g., non-toxic and non-smog forming grant administered by the ARB, local air district's grant programs, and grants given by public utility companies). For those who will receive grants, the ROE change accordingly. For example, with a $10,000 grant, the resulting decline in ROE for typical professional wet cleaning facilities is calculated to be about 1 percent, or minimal impact on profitability of the facility.

6. Assumptions for Facility Cost Estimates

Several assumptions were made for the facility cost estimates. For machine usage, we assumed that the owners of the co-residential facilities will choose to purchase and operate a hydrocarbon machine when they need to replace their Perc machines. For the co-residential facilities that will lose some of the useful life of their Perc machines, the loss was estimated using straight line depreciation. For the other facilities, it is assumed that the proportion of alternatives chosen will mirror the growth of the technologies between 2003 and 2006. The statewide costs of the proposed amendments were calculated in 2006 dollars and used the same assumptions as the facility cost calculations. Additional factors taken into consideration included: when

costs are incurred, the number of facilities for each facility type, the number and age of the machines, and the number of spare gaskets and lint filters needed to be purchased.

We annualized non-recurring fixed costs using the Capital Recovery Method. Using this method, we multiplied the non-recurring fixed costs by the Capital Recovery Factor (CRF) to convert these costs into equal annual payments over a project horizon at a discount rate of 5 percent. The Capital Recovery Method for annualizing fixed costs is recommended by Cal/EPA (Cal/EPA, 1996), and is consistent with the methodology used in previous cost analyses for ARB regulations.

The CRF is calculated as follows:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where,

CRF	=	Capital Recovery Factor
i	=	discount interest rate (assumed to be 5 percent)
n	=	project horizon or useful life of equipment

All costs of equipment were annualized over 15 years, based on the expected lifetime of a dry cleaning machine. The total annual cost was obtained by adding the annual recurring costs to the annualized fixed costs derived by the Capital Recovery Method.

7. Potential Impact on Perc Distributors and Manufacturers

The economic impact analysis for Perc distributors is based on time needed for the recordkeeping and reporting requirements of the proposed amended ATCM. The recordkeeping keeping requirements include: the gallons of Perc purchased, the gallons of Perc sold to dry cleaners, and the contact information of the dry cleaners that bought Perc. The reporting requirements include: annual reporting of gallons of Perc sold to dry cleaners, initial reporting of contact information, and reporting of any change in contact information.

Perc distributors and manufacturers are required under the proposed amendments to keep records of their Perc purchases and Perc sales to dry cleaners. They are also required to report to ARB the annual Perc sales to dry cleaners if applicable and report to ARB the contact information of any new Perc distributor. Because record keeping is a routine part of doing business, staff anticipates this record keeping and reporting to incur minimal cost of approximately eight hours per year or less per Perc distributor and manufacturer.

Perc distributors and manufacturers will be losing revenue from the sale of Perc to dry cleaners as Perc machines are being phased out. Based on the 2006 survey of machines in operation, staff estimates that Perc dry cleaning facilities outside of the South Coast AQMD use about 159,000 gallons/year of Perc. Approximately 600 (about

28 percent) Perc machines are estimated having to be removed from service by July 1, 2010. Since most of these are primary control machines, it is estimated that there will be a decrease of about 48,000 gallons/year of Perc sales from July 1, 2010 to July 1, 2011, with the total decrease of 159,000 gallons/year on January 1, 2023. Because most, if not all, Perc distributors also sell other solvents, it is expected that the loss of revenue from Perc sales will be offset by increase in the sale of other solvents.

8. Potential Impact on Manufacturers of Dry Cleaning Machines and Related Equipment Required by the Proposed Amended ATCM

Many manufacturers or distributors of alternative dry cleaning machines are also manufacturers or distributors of Perc machines. Therefore, even though the proposed amendments will phase out the use of Perc machines and these manufacturers or distributors will cease to have business in the sale of Perc machines, they will have increase business selling alternative dry cleaning machines. Although the useful life of a dry cleaning machine has been recognized as 15 years, many facilities still operate with machines that are older than 15 years. Therefore, staff expects the proposed amendments will cause a net increase in new machine purchases and a net increase in business for the dry cleaning machine manufacturers or distributors.

9. Potential Impact on Consumers

The potential impact of the proposed amended Dry Cleaning ATCM on consumers depends upon the expected payback period for the cost incurred by the proposed amendments. Two types of calculations were made to estimate the potential cost recovery price increase. These are not predictions of actual price increases because actual increases are determined by economic "market" factors that would be affected only indirectly by the proposed regulation.

The first calculation for price increase assumes that the dry cleaning facilities will need to obtain a five year loan at ten percent interest for the purchase of new dry cleaning equipment. Therefore, a payback period of five years is used. This is a reasonable assumption because most dry cleaning businesses are small businesses. In addition, the potential impact calculation assumes the cost of the regulation to the dry cleaners will be passed on to their customers.

To completely offset the net cash outflow over the five years, a dry cleaner would have to increase its annual revenues by loan repayment, interest payment, additional tax due to price increase, cost (loss) of early replacement of machine if applicable, and accounting for tax deduction for equipment depreciation, interest payment and cost of operation. A depreciation of $25,000 a year is used based on the allowed equipment depreciation for year 2010. The calculation for price increase is based on the cost of the regulation for the three typical facilities divided by the median annual amount of material dry cleaned per facility. Table VII-11 shows a summary of the estimated price increase for the three facility types over the five-year loan period.

Table VII-11. Summary of Cost Recovery Price Increase for the Three Facility Types Over Loan Period[1]

Facility Type	Alternative Technology Chosen	Machine Cost[2]	Annual Machine Loan Cost[3]	Income Tax Savings[4]	Delta Total Annual Recurring Cost	Total Annual Net Cost	Revenue Increase Needed[5]	Cost of Loss of Useful Life[6]	Cost Recovery Price Increase ($/garment)
Co-residential (Secondary Control)	Hydrocarbon	$75,000	$19,790	($9,160)	$900	$11,520	$20,000	$2,000	$0.63
Facility with Converted, or Primary Control Machine	Hydrocarbon	$75,000	$19,790	($9,060)	$660	$11,390	$19,760	N/A	$0.56
	GreenEarth	$75,000	$19,790	($9,060)	$660	$11,390	$19,760	N/A	$0.56
	Professional Wet Cleaning	$57,000	$15,040	($7,360)	$660	$8,340	$14,240	N/A	$0.41
	Carbon Dioxide	$194,000	$51,180	($16,820)	$660	$35,010	$62,580	N/A	$1.79
Facility with Add-on or Integral Secondary Control machine	Hydrocarbon	$75,000	$19,790	($9,160)	$900	$11,520	$20,000	N/A	$0.57
	GreenEarth	$75,000	$19,790	($9,160)	$900	$11,520	$20,000	N/A	$057
	Professional Wet Cleaning	$57,000	$15,040	($7,470)	$900	$8,490	$14,480	N/A	$0.41
	Carbon Dioxide	$194,000	$51,180	($16,930)	$900	$34,990	$62,820	N/A	$1.80

1. Values are rounded. Cost recovery price increase is calculated using a median amount of material dry cleaned per facility of 35,000 lbs, assuming 1 lb per garment, and rounded.
2. Machine cost includes installation and removal costs assuming $1,000 for removal costs.
3. Assuming a 5-year loan at an interest rate of 10 percent.
4. Tax savings are due to deduction of depreciation, operating cost and loan interest and are averaged over the 5 yr period.
5. Revenue increase needed, or total annual net cost before tax, is the total annual net cost multiply by 1/(1-0.093)*1/(1-0.35) to account for a 9.3 percent State tax rate and a 35 percent federal tax rate after discounting costs to the year the loan is incurred.
6. Cost due to loss of useful life is for co-residential facilities only and is spread out evenly over the 5 year loan period.

As shown on Table VII-11, for the co-residential facilities that will lose three years of useful life of their existing secondary control Perc machine and will purchase, install, and maintain a hydrocarbon machine, the increase in price needed to offset the cost of the proposed amendment completely would be 63 cents per garment. For a facility that is operating with a primary control machine, the increase in price spanning the selected available alternatives would range from $0.41 to $1.79 per garment. For a facility that is operating with a secondary control machine, the price increase would similarly range from $0.41 to $1.80 per garment.

The estimation of cost recovery price increase shown in Table VII-11 is valid for the immediate economic effect on the dry cleaner but does not represent a facility's long-term cost or the true cost of the proposed amendments to the economy. The second estimation of cost recovery price increase due to the proposed amendments is calculated based on a 15-year lifetime of the machines, accounting for cost of reduced useful life when applicable and when various expenses are to occur. The statewide

regulation cost is shown in Section E to be $41 million and do not include additional interest that a dry cleaner may have to pay for getting a loan. The cost recovery price increase is then calculated assuming all the dry cleaning facilities will need to recover the average amount of expense based on the total amount of material dry cleaned outside of the South Coast AQMD statewide. In this case, the theoretical resulting cost to the dry cleaning customers is about 7 cents ($0.07) per garment.

10. Potential Impact on Employment

We expect the proposed amended Dry Cleaning ATCM to have a minor impact on employment of the dry cleaning facilities. It is possible that some marginal dry cleaning businesses may not have the capital necessary to comply with the proposed amendments and may elect to close resulting in some employee lay-offs. Also, the proposed amended Dry Cleaning ATCM will likely result in increased business for alternative dry cleaning machine manufacturers, distributors, and waste water treatment unit manufacturers and distributors. In these cases, it may result in increased employment.

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

Assuming that the compliance costs of the proposed amended Dry Cleaning ATCM may be absorbed for most dry cleaning operators or passed on to their customers; the proposed amended Dry Cleaning ATCM will have no noticeable impact on the status of California businesses. Some marginal dry cleaning businesses may not have the capital necessary to comply with the proposed amendments. These businesses may choose to operate with a less costly alternative dry cleaning process or cease their dry cleaning operations altogether.

12. Potential Impact on Business Competitiveness

The proposed amended Dry Cleaning ATCM is not expected to have a significant impact on the ability of California businesses to compete with businesses from other states. Most dry cleaning businesses are independent operations that compete for local business within their region and rarely seek business from outside the State.

C. Costs to State Agencies

Section 39666 of the Health and Safety Code requires that after the adoption of the proposed amended Dry Cleaning ATCM by the Board, the local air districts must implement and enforce the ATCM or adopt an equally effective or more stringent regulation. Because the local air districts will have primary responsibility for implementing and enforcing the proposed amended Dry Cleaning ATCM, we evaluated the potential costs to the local air districts. We also evaluated the potential costs to local and State agencies. Two State agencies, the ARB and the Department of Corrections, will be impacted by the adoption of the proposed amended

Dry Cleaning ATCM. This section provides the conclusions we reached and the basis for those conclusions.

1. Costs to the Air Resources Board

The ARB recovers the cost to implement the Hot Spots Program through the fees from facilities that emit air toxics such as the Perc dry cleaning facilities. The current annual fee is $35 per facility. Due to the phase out of Perc machines, ARB will eventually not receive fees from the dry cleaning industry due to the use of Perc. The total amount of fee reduction, although no longer needed due to the phase out of Perc machines, is estimated to be about $355,000 for the lifetime of the proposed amendments. In addition, this fee may be offset if the alternative dry cleaning technologies are required to report under the Hot Spots Program.

2. Costs to the Department of Corrections

The Department of Corrections operates twelve Perc dry cleaning machines and one hydrocarbon dry cleaning machine at thirteen correctional facilities in California. The one facility that is operating a hydrocarbon dry cleaning machine will not be impacted by the proposed amendments. The remaining twelve Perc machines will need to be replaced according to the schedule specified by the proposed amendments. In addition, a spare set of gaskets and a spare lint filter will need to be purchased per operating Perc machine if the facilities do not have them. Table VII-12 shows the facilities at the Department of Corrections that have dry cleaning on-site, their machine type, and age.

The Department of Corrections may incur a capital cost for purchasing a spare set of gaskets and a spare lint filter while they are still operating their Perc machines and for replacing their Perc machines. During the first three years of implementation, a total of seven of the machines will need to be replaced because they will be 15 years old or older. The remaining five Perc machines will need to be replaced as they reach 15 years of age. Based on the machine and installation costs shown in Table VII-3 and assuming the Department of Corrections will replace the Perc machines with an alternative technology and choose the most popular alternative, the high flashpoint hydrocarbon process, the additional fiscal impact is estimated to range between $18,500 and $74,000 per machine purchased. The lower end of the range represents the cost of the proposed regulation and is the calculated incremental machine and installation cost between the Perc and the hydrocarbon processes. Assuming the Department of Corrections had allocated funding needed to replace the Perc machines, the lower range represents the additional funding needed per machine replacement due to the proposed amendments. The upper end of the range represents the total capital expenditure of machine purchase and installation and reflects an estimate of budget needed per machine replacement.

Table VII-12. List of Facilities at the Department of Corrections With Dry Cleaning Machines[1]

Facility Name	Machine Type		Machine Age (years)
	Solvent Type	# of Machines	
CA Correctional Center Susanville	Perc Primary	1	14
CA Correctional Institution Tehachapi	Perc Primary	1	Approx.10
CA Mens Colony San Luis Obispo	Hydrocarbon	1	Installed June 2005
CA Rehab. Center Norco	Perc Secondary	1	Installed Dec. 2005
CA State Prison San Quentin	Perc Primary	1	18
CA Substance Abuse Treatment Facility	Perc Secondary	1	8
Calipatria State Prison	Perc Secondary	1	13
Centinela State Prison	Perc Primary	1	9
Chuckawalla Valley State Prison Blythe	Perc Secondary	1	6
Correctional Training Facility Soledad	Perc Primary	1	12 to 15
Kern Valley State Prison	Perc Secondary	1	1
Mule Creek State Prison	Perc Primary	1	18
Valley State Prison for Women	Perc Primary	1	10

1. Information for the table was obtained between November 2005 and July 2006.

Alternatively, the Department of Corrections can also comply with the proposed amendments by replacing the Perc machines with an alternative dry cleaning technology that is lower in capital cost. In summary, the fiscal cost impact to the Department of Corrections during the first three years ranges from $169,500 to $522,000, and the total cost to comply with the proposed amendments over its lifetime ranges from $268,000 to $892,000. The estimated lower range of costs reflects additional funding required due to the proposed amendments if the Department of Corrections had allocated funds for Perc machine replacements. And, the upper range of costs reflect total budgetary requirement estimated for replacing the Perc machines with hydrocarbon machines. Table VII-13 lists the estimated cost impacts to the Department of Corrections.

Table VII-13. Cost Impacts to the Department of Corrections[1]

Time	Number and Type of Machines to be Replaced	Cost Impact Due to Change of Machines[2]	Cost for Extra Set of Gaskets and Filter[3]	Total Cost Impact[4]
First Year	0	$0	$4,000	$4,000
First Three Years	6 Primary, 1 Secondary	$165,500 - $518,000	$4,000	$169,500 - $522,000
Lifetime of the Regulation	7 Primary, 5 Secondary	$264,000 - $888,000	$4,000	$268,000 - $892,000

1. Costs rounded off to nearest $100.
2. Cost impact for switching to hydrocarbon process.
3. Assumed the Department of Corrections does not currently have extra sets of gaskets and lint filters for the Perc machines.
4. Total cost impact equals the sum of cost impact due to change of machines and purchase of gaskets and filters.

D. Costs to Local Air Districts

The dry cleaning facilities affected by the proposed amended Dry Cleaning ATCM are located in all but five local air districts. Four of the local air districts do not have dry cleaning facilities. The fifth, South Coast AQMD, has a rule that is generally equivalent to the proposed amended Dry Cleaning ATCM. Therefore, the dry cleaning facilities that are located in the South Coast AQMD are not expected to be impacted by this proposed amended Dry Cleaning ATCM. Over 95 percent of the rest of the dry cleaning facilities are located in the following six districts: Bay Area AQMD, Monterey Bay Unified APCD, Sacramento Metropolitan AQMD, San Diego County APCD, and San Joaquin Valley Unified APCD.

There is no additional enforcement cost associated with the proposed amendments because the proposed amendments do not require additional oversight from the local air districts. In fact, because the enforcement cost is directly proportional to the number of Perc facilities and/or equipment, as facilities discontinue the use of Perc equipment, there will be a decrease in the number of hours the local air district will have to spend on inspections and other oversight associated with Perc facilities. Based on input from local air districts, most districts conduct annual inspections of Perc dry cleaning facilities. These inspections last about four hours per facility. To verify the discontinued use of Perc machines, the local air districts might need to have a shortened inspection lasting about two hours per facility impacted.

In addition, because of the discontinued use of Perc machines in the dry cleaning facilities, the local air districts will lose fees that are being collected from the Perc facilities for the Hot Spots Program. Based on input from the local air districts, the weighted average of the Hot Spots Fee is $92. Table VII-14 shows the estimated net cost savings for the first three years and for the lifetime of the regulation for the local air districts. As shown on Table VII-14, there will be a net cost savings for the local air districts that range from $1,769,000 to $3,301,000 over the lifetime of the proposed regulation.

Table VII-14. Estimated Cost Savings for the Local Air Districts[1]

Time	Number of Facilities Impacted	Cost Savings Due to Reduced Facilities[2]	Reduced Revenue from Hotspots Fee[3]	Net Savings[2]
First Year	0	$0	$0	$0
First Three Yrs	624	$87,000 - $137,000	$57,000	$30,000 - $70,000
Lifetime of the Proposed Reg. (2008 to 2023)	2022	$2,577,000 - $4,109,000	$808,000	$1,769,000 - $3,301,000

1. Costs rounded off to nearest $1000.
2. Range due to range of labor cost.
3. Hotspots fees may be offset if the alternative dry cleaning technologies are required to report under the Hot Spots Program.

E. Total Cost of the Proposed Amendments

The statewide cost of the proposed amendments was calculated in 2006 dollars and used the same assumptions as the facility cost calculations. Other considerations and assumptions specific to the statewide cost estimate include: the number of machines impacted for each facility type, the number and age of the machines, and when costs are incurred.

The number of machines impacted is shown in Table VII-1. The age of the machines is assumed to be the same as what was obtained in the 2003 survey and published in the Technical Assessment Report and no machine purchases in 2006 and 2007. For the statewide cost calculation, it was assumed that: 1) cost of alternative machine purchase will occur when the Perc machines are required to be removed by the proposed amendments, 2) costs for switching to a professional wet cleaning system is the average of the cost range where applicable, and 3) that all Perc facilities would purchase a spare lint filter and a spare set of gaskets. Table VII-15 contains an overview of the annual costs of proposed amended Dry Cleaning ATCM without adjustment to time of machine purchase and cost for a spare lint filter and a spare set of gaskets and the total cost with all considerations discussed.

The calculated statewide cost of the amendments is $41 million over 15 years to private dry cleaning businesses. The annualized statewide cost of the amendments is $4 million per year. To the extent that dry cleaning facilities are unable to pass on the compliance costs of the proposed amendments to their customers, some may experience a significant adverse economic impact. The proposed amended Dry Cleaning ATCM will impact two State government agencies (ARB and Department of Corrections). ARB might experience about $355,000 reduction of fees from Perc facilities over the lifetime of the propose amendments. And, the Department of Corrections is estimated to incur an estimated maximum $892,000 in capital costs over the lifetime of the proposed amendments.

Table VII-15. Overview of the Total and Annual Costs of Proposed Amended ATCM by Machine and Facility Type[1]

Machine Type	Number of Machines	Incremental Machine Cost	Cost of Early Machine Replacement	Annualized Incremental Machine and Equipment Cost	Total Annual Recurrent Costs[3]	Total Annual Net Cost[4]	Percent Decline in ROE[5]
Co-res. Primary Control to Hydrocarbon	0	$24,500	$0 to $8,800	$2,360 to $3,210	$660	$3,020 to $3,870	55 to 70
Co-res. Secondary Control to Hydrocarbon	50	$18,500	$0 to $10,000	$1,780 to $2,750	$900	$2,680 to $3,650	49 to 66
Converted or Primary Control to Hydrocarbon[6]	1050	$24,500	N/A	$2,360	$660	$3,020	55
Converted or Primary Control to GreenEarth	160	$24,500	N/A	$2,360	$660	$3,020	55
Converted or Primary Control to Professional Wet Cleaning	20	$7,000	N/A	$670	$660	$1,330	24
Converted or Primary Control to Carbon Dioxide	10	$144,000	N/A	$13,870	$660	$14,530	264
Secondary Control to Hydrocarbon[6]	700	$18,500	N/A	$1,780	$900	$2,680	49
Secondary Control to GreenEarth	110	$18,500	N/A	$1,780	$900	$2,680	49
Secondary Control to Professional Wet Cleaning	10	$1,000	N/A	$100	$900	$1,000	18
Secondary Control to Carbon Dioxide	10	$138,000	N/A	$13,380	$900	$14,280	259
Sub-Total[7]	2120	N/A	N/A	N/A	N/A	41 million	N/A

1. Cost values are rounded and occur at time of purchase/use.
2. Other Equipment Cost is the cost of a spare set of gaskets and a spare lint filter.
3. Annual Recurring Cost is the cost due to reduced Perc usage, annual leak and drum concentration checks, and carbon replacement.
4. Total Annual Net Cost is the sum of Annualized Initial Cost and Total Annual Recurring Cost.
5. A negative decline in ROE means an increase in ROE.
6. Cost associated with operating "another" alternative is estimated to be the same as hydrocarbon.
7. Sub-total of total annual net cost discounts to 2006 dollars after consideration for when various costs are to occur.

Cost impact calculations may result in higher or lower estimates than that are actually realized because it was not possible to account for the dry cleaning facilities that had used Perc primary control machines when the latest update was conducted and have since voluntarily changed to either an alternative technology or to a secondary control machine.

F. Cost Effectiveness of the Amended ATCM

1. Estimated Benefits

All Californians will benefit from the adoption of the proposed amendments to the Dry Cleaning ATCM because of the nearly complete elimination of exposure to Perc, an identified toxic air contaminant, from dry cleaning operations. This will result in decreases in incidences of cancer, as well as Perc related noncancer adverse health effects including: headache, dizziness, rapid heartbeat, and liver and kidney damage. Implementation of the proposed amendments is estimated to produce a reduction of 650 tons/year. In terms of pounds (lbs) per year, the result is about 1.3 million lbs per year in Perc reduction.

2. Cost Effectiveness

The cost effectiveness analysis in this section compares the cost of the proposed amended ATCM to two other alternatives that will eliminate Perc use with dry cleaning machines upon full implementation of the alternatives. Each cost quoted below is in 2006 dollars using a 15 year of useful life for the machines. Two alternatives have been evaluated. Alternative 1 would phase out Perc use and prohibit hydrocarbon usage in new dry cleaning machines. Alternative 2 would shorten the time before a Perc machine is phase out from the proposed 15 years to 10 years. In addition, the cost effectiveness of the proposed amended ATCM is compared with three other major ARB regulations.

a. Cost Effectiveness of the Amended Dry Cleaning ATCM

The cost effectiveness of the proposed amended Dry Cleaning ATCM is evaluated by calculating the cost per pound of Perc reduced. Assuming no facility closures due to economic hardship and all the facilities that operate with Perc would continue to do so absent this rulemaking, the amended ATCM will reduce Perc emission by about 1.3 million lbs per year from all impacted facilities by January 1, 2023, when all the dry cleaning facilities are in full compliance of the proposed amended Dry Cleaning ATCM. The cost effectiveness of the proposed amended Dry Cleaning ATCM can then be calculated by dividing the annualized cost of the regulation of $4 million by the 1.3 million lbs of Perc reduced per year. The result is about $3.10 per pound of Perc reduced.

b. Cost Effectiveness of Alternative 1

Alternative 1 would phase out Perc as staff is proposing and would also prohibit the use of hydrocarbon solvents in new dry cleaning machines. This option would provide the maximum protection from emissions of Perc while preventing an increase in volatile organic compound (VOC) emissions from hydrocarbon solvents. To the extent that the facilities are financially able, this option might result in a total of 2120 machines being replaced with non-smog-forming technologies such as GreenEarth, water-based

cleaning, and Carbon Dioxide. Based on the trend shown in Table VII-2, the relative percentage of the three technologies is shown in Table VII-16.

Based on the percentages shown on Table VII-16, the potential statewide cost for alternative 1 was calculated to be $48 million over 15 years, with the annualized cost being $4.6 million. This alternative will reduce Perc emission by about 1.3 million lbs per year from all impacted facilities. The cost effectiveness of alternative one is then calculated to be $3.60 per pound of Perc reduced. If the amount of VOC reduced of 0.5 million lbs is taken into account, then the cost effectiveness will be lowered to $2.60 per pound of Perc and VOC reduced.

Table VII-16. Projected Percentage of Non-Smog-Forming Technologies[1]

Non-Smog-Forming Technologies	Percent Increase in Alternatives (2003 to 2006)	Projected Percentage
GreenEarth	13%	76%
Water Based Cleaning Systems[2]	3%	18%
Carbon Dioxide	1%	6%

1. Values rounded.
2. Mostly professional wet cleaning systems and includes mixed shops (facilities that use wet cleaning together with another type of dry cleaning process).

Although ARB staff expects that, under this option, most facilities would migrate toward GreenEarth, there could be a considerable number of facilities that choose water-based cleaning. The motivation for such a move may reflect the unresolved toxicity of GreenEarth and the availability of grant programs, such as AB 998, which provide monetary resources to switch from Perc. If this is the case, it is likely that many may not receive adequate training required for successful operation of the professional wet cleaning systems and may need to out-source 10 percent or more of their garment stream and experience the associated reduction in gross sales. This is based on experience of some owner/operators that have participated in a demonstration program by the Pollution Prevention Education and Research Center and therefore have proper training. The cost impact in this case is hard to estimate but is likely to be higher than $4.6 million per year.

c. Cost Effectiveness of Alternative 2

Alternative 2 would shorten the time before the phase out of Perc machine from the proposed 15 years to 10 years. The proposed 15 years of useful life of a Perc machine is based on results of dry cleaning facility survey, site visits conducted by ARB staff, discussions with local district staff and committees, and discussions with the Dry cleaning ATCM workgroup. Therefore, the accelerated phase out will incur additional cost due to the lost of five years of useful life. The statewide cost impact of this

alternative is calculated by using straight line appreciation method to estimate the cost due to the lost of useful life.

The potential statewide cost for alternative 2 was calculated to be $59 million over 15 years, with the annualized cost being $5.7 million. This alternative will reduce Perc emission by about 1.3 million lbs per year from all impacted facilities. The cost effectiveness of alternative one is then calculated to be $4.40 per pound of Perc reduced.

d. Cost Effectiveness Comparison

The cost effectiveness of the proposed amended ATCM and the two alternatives are shown in Table VII-17. As shown in Table VII-17, the two alternatives will be more costly.

Table VII-17. Cost Effectiveness Comparison of the Proposed Amended ATCM and the Selected Alternatives[1]

	Annualized Cost ($)	Cost Effectiveness ($/ lb of Perc reduced)
Proposed Amended ATCM	4.0 million	3.1
Alternative 1	4.6 million	3.6
Alternative 2	5.7 million	4.4

1. Values are rounded.

The cost effectiveness of the proposed amended ATCM is also compared with two other major ARB regulations in Table VII-18. These other regulations include the 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 ATCM and the Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation. As shown in Table VII-18, the cost effectiveness of the proposed amended ATCM is similar to these ARB regulations.

Table VII-18. Cost-Effectiveness Comparison – Dry Cleaning ATCM Proposed Amendments and Three Other Major Regulations

Regulation	Cost-Effectiveness
Proposed Amended ATCM	$3.10 per pound of Perc reduced
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 ATCM (2004)	$2.01 to $2.34 per pound of VOC reduced
Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation (2006)	$2.35 per pound of VOC reduced

Source: ARB, 2004b; ARB, 2006d

VIII. ENVIRONMENTAL IMPACTS OF THE PROPOSED AMENDED DRY CLEANING ATCM

The intent of the proposed amended ATCM is to protect public health by reducing the public's exposure to potentially harmful emissions of Perc. An additional consideration is the impact that the proposed amended ATCM may have on other areas of the environment.

This chapter describes the potential impacts that the proposed amended ATCM may have on wastewater, groundwater contamination, hazardous waste disposal, soil, flammability, energy usage, and other air pollution impacts. The ARB staff expects that the only significant adverse environmental impact should occur in air pollution due to the expected increase in the use of solvents containing VOCs.

A. Legal Requirements Applicable to the Analysis

The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential adverse environmental impacts of proposed regulations. Since the 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 the Initial Statement of Reasons for a rulemaking in lieu of preparing an environmental impact report or negative declaration. In addition, the ARB will respond in writing to significant environmental issues raised by the public during the public review period or at the Board hearing. These responses will be contained in the Final Statement of Reasons for the ATCM.

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 ATCM. Regarding reasonably foreseeable mitigation measures, CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis.

B. Potential Wastewater Impacts

Sanitation districts have been concerned about the amount of chlorinated compounds found in the waste effluent at treatment plants and the potential for illegal disposal of Perc dry cleaning wastes down the sewers. Many treatment plants do not have the equipment necessary to process industrial wastes such as chlorinated solvents that have been detected at elevated levels at some facilities. The impact of influent concentrations of Perc from the dry cleaning industry appears to be low due to the changes in dry cleaning operations and the implementation of environmental regulations (NC, 2001). It should be noted that spotting chemicals can also be a source

of Perc in wastewater. Based on information gathered from the Dry Cleaning Facility Survey, dry cleaning facilities using Perc either use a wastewater treatment unit to recycle their Perc or they have their wastewater picked up by a registered hazardous waste transporter. (Note: In California, all hazardous waste must be managed offsite by a transporter that is registered with DTSC.) ARB staff has determined that there will be nearly 100 percent reduction of Perc to wastewater due to the more stringent proposed amended ATCM which will, in time, eliminate the use of Perc dry cleaning machines.

In general, it is prudent to check with the local publicly owned treatment works in the State before discharging any wastewater into the sewer. However, potential wastewater impacts of the alternative solvents were assessed based on available information. The CO_2 cleaning process does not generate wastewater and would not have an impact. Dry cleaners that use other alternative solvents, including GreenEarth, hydrocarbon, and glycol ethers, can release the solvents to water, mainly in the form of separator water. Separator water was analyzed in a project conducted by the IRTA and the Los Angeles County Sanitation District (LACSD). Separator water from three facilities, each using one of the alternative solvents mentioned, was analyzed for certain metals, toxic organics, and aquatic toxicity (IRTA, 2005). In all cases, the metal concentrations and the toxic organic concentrations were below health-protective detection limits. Additionally, in all three cases, the separator water did not exhibit aquatic toxicity (IRTA, 2005).

In addition, IRTA and LACSD analyzed the wash and rinse effluents from four wet cleaning facilities for certain metals, toxic organics, and aquatic toxicity. None of the samples contained metal concentrations that exceeded hazardous waste levels that are set by title 22 of the California HSC. Perc and/or trichloroethylene (TCE) were found in the effluent from three of the wet cleaning facilities. In some cases, the concentrations of these toxics exceeded hazardous waste levels. The origin of the TCE and at least some of the Perc is most likely spotting chemicals that are used to pre-spot garments. A few of the facilities had both wet cleaning and Perc machines and the Perc may have also been entrained in garments cleaned in the wet cleaning machine. The analysis indicated that effluent samples from all four facilities did not exhibit aquatic toxicity despite the presence of Perc and/or TCE (IRTA, 2005).

C. Potential Groundwater Contamination Impacts

One of the concerns with the use of Perc is groundwater contamination. Perc is known to pass through porous surfaces, such as building walls, sewer lines, and cement floors (ARB, 1993). Therefore, Perc usage poses a significant threat to the safety of groundwater. Perc has been detected in both wastewater and groundwater in the South Coast Air Basin, with some levels in excess of the current drinking water standard of five parts per billion (South Coast, 2002). Perc has also been detected in 968 wells or approximately ten percent of the 9,500 wells tested in California as of March 1996. Cleanup cost for these wells have been estimated at $3 billion dollars (CFCA, 2002). The implementation of this dry cleaning regulation and resulting

changes in the dry cleaning industry will eliminate the use of Perc dry cleaning machines and provide nearly 100 percent reduction in the potential impact on groundwater contamination from Perc.

Based on information available for the alternative solvents, groundwater contamination is not as large an issue compared to Perc. When DF-2000, the more commonly used hydrocarbon solvent, is released into the environment, volatilization from water to the air is calculated to occur at a relatively rapid rate, i.e., a few days. Non-volatized product in the natural environment will biodegrade at a moderate rate and not persist (ExxonMobil, 2003). Other high flash point hydrocarbon solvents are expected to behave similarly.

The GreenEarth solvent is unlikely to leach into groundwater because it is not very soluble in water and readily sticks to soil particles (GreenEarth, 2003). Based on test data with other silicone materials, if spilled on the ground, D_5 is expected to decompose to carbon dioxide, silicon dioxide (sand), and water. According to a study conducted by the International Fabricare Institute (IFI), GreenEarth solvent has low solubility in water (<100 parts per billion (ppb)) and is very close in density to water; therefore, if it is discharged to water, it will initially form a surface film and then will rapidly evaporate into the air. The half-life for GreenEarth in surface water is estimated at between one to five days. Acute studies with trout, daphnia, and algae show no significant effects at the highest doses prescribed by the test methodology. If larger amounts of GreenEarth solvent are kept in contact with soil, it will also be expected to decompose to carbon dioxide, silicon dioxide (sand), and water (IFI, 2002).

Groundwater contamination is not a concern using the CO_2 process. At room temperature, CO_2 can exist as a liquid if kept in a closed system at an elevated pressure. The cleaning systems used for CO_2 are able to efficiently convert CO_2 from a gas to a liquid. One of these systems permits 98 percent of the CO_2 to be recycled (U.S. EPA, 1999). In general, only a nominal amount of CO_2 is then vented to the atmosphere.

Environmental fate on the Rynex 3 solvent is not readily available, but the Rynex 3 formulation is a type of propylene glycol ether. Proplylene glycol ethers are known to be biodegradable. All propylene glycol ethers are liquid at room temperature and all are water-soluble. Propylene glycol ethers are unlikely to persist in the environment. Two specific types of glycol ethers, proplylene methyl ether and propylene glycol methyl ether acetate, have shown rapid biodegradation in soil (SIDS, 2003).

D. Potential Hazardous Waste Impacts

Hazardous waste is regulated in California by a federally authorized State program under the responsibility of DTSC. Under this program, Perc is classified as hazardous waste. In California, all hazardous waste at a facility must be transported

off-site by a registered hazardous waste transporter. In general, it is the facility owner's responsibility to determine whether the waste from the facility is hazardous.

Waste generated by the use of Perc in dry cleaning includes the still bottoms from solvent distillation and the spent cartridge filters used to remove lint and insoluble soil from the extracted Perc. Cartridge filters are typically replaced every six months or less, depending on workload and manufacturer recommendation. Reusable spin disc filters are also used and the removed lint and dirt from the spin disc filters generate perc-contaminated waste (JE, 2004).

According to the Facility Survey, the change in the amount of waste generated from hydrocarbon and GreenEarth technologies is relatively small compared to Perc. In terms of waste volume, the CO_2 and Rynex 3 cleaning processes are expected to generate the least amount of waste compared to Perc and the other alternative technologies. In general, wastes from the mentioned alternative processes include spent filters and still bottoms. The still bottoms from four dry cleaning facilities that used hydrocarbon solvents, GreenEarth, Rynex 3 and CO_2, were analyzed in a study IRTA conducted with LACSD. The results of these tests showed excess levels of lead for one of the still bottom samples and three out of four of the still bottom samples exhibited aquatic toxicity (IRTA, 2005). Given that the solvents do not contain lead and are not expected to exhibit aquatic toxicity, the results indicate that the spotting chemicals and detergents used may alter the characteristics of the waste streams. Alternately, waste streams from alternative processes can be handled as hazardous waste. Currently, registered hazardous waste transporters remove the wastes from hydrocarbon dry cleaning facilities as hazardous waste (ARB, 2004i).

The water-based cleaning technologies also generate spent filters. Again, in the absence of contamination from hazardous compounds, handling as municipal solid waste is an option. Additionally, the detergents that are used are biodegradable and designed for discharge via the sanitary sewer. These detergents should be readily removed at the local treatment plant (JE, 2004).

E. Potential Soil Impacts

Soil contamination has been a problem with Perc use. According to one report, Perc is found in more than 50 percent of the Superfund sites in the United States (CFCA, 2002). The DTSC identified Perc as a solvent that has contaminated one out of every ten public drinking water wells in California, creating a need for a state cleanup effort. Concern for soil contamination is ongoing in all dry cleaning processes. Soil contamination can occur through accidental releases, such as spills, or during the distillation process from a boil-over. Although federal, state, and local environmental regulations have been developed to help minimize soil contamination, dry cleaners should take all necessary steps to contain spills and clean them up quickly. Again, these impacts will be reduced significantly due to the results of this regulation.

F. Potential Flammability of Alternative Solvents

The use of alternative solvents may cause a potential fire hazard to the environment. Flammable or combustible liquids are listed in different classes. The combustible liquids used in the dry cleaning industry are listed under classifications based on their flash point. Flash point is defined as the temperature at which a flame will ignite the solvent vapors. The vapor burns, not the liquid itself. The range at which a liquid produces flammable vapors depends upon its vapor pressure. The vaporization rate increases as the temperature increases. Therefore, flammable and combustible liquids are more hazardous at elevated temperatures than at room temperature (UCSD, 2005). The combustible liquids used in dry cleaning are classified as Class II, Class IIIA, or Class IIIB in accordance with the National Fire Protection Association (NFPA). The use of these combustible liquids may require the issuance of fire permits. Class II liquids, like the Stoddard solvent, have a flash point at or above 100 degrees Fahrenheit (°F) and below 140°F. Class IIIA liquids have a flash point at or above 140°F and below 200°F. The hydrocarbon solvents are an example of the Class IIIA liquids. Class IIIB liquids, like the Rynex 3 solvent, have a flash point at or above 200°F. Class IV liquids, such as Perc, are considered noncombustible and, therefore, are not potential fire hazards (JE, 2004).

In the past, Stoddard was a popular dry cleaning solvent that saw a significant decrease in usage due to fire hazard concerns. As mentioned above, this solvent is classified as a Class II liquid and has a flash point of 110°F. The flash point hazard encouraged the petroleum industry to develop a new group of solvents that have a higher flash point. The newer solvents are classified as Class IIIA and IIIB liquids and have a flash point above 140°F. It is important to know that these hydrocarbon solvents are still considered hazardous materials by CAL/OSHA standards because they are classified as combustible liquids. This group of solvents includes DF-2000, PureDry, Shell 140, and EcoSolv (South Coast, 2002). The solvent DF-2000, with a flash point of 147°F, is currently the most popular hydrocarbon solvent being used.

A few more alternative solvents are being used in the garment industry today. They are GreenEarth, Rynex 3, and CO_2. The GreenEarth solvent is classified as a Class IIIA liquid and has a flash point of 170°F. Like the hydrocarbon solvents, GreenEarth is considered a combustible liquid. Rynex 3, which has a flash point greater than 200°F, is classified as a Class IIIB liquid, which is also considered a combustible liquid (JE, 2004). Based on a study conducted by the North Carolina Department of Environment and Natural Resources, CO_2 is a weak solvent; therefore, a detergent mixture is used as a supplement to the base solvent. Some of the detergent mixtures contain hydrocarbon chemicals in order to dissolve certain soils. The hydrocarbon compounds used in these detergent mixtures have a flash point above 140°F and are classified as a Class IIIA liquid. While the CO_2/detergent mixture is not expected to be a fire safety hazard, the detergent mixture by itself could be a potential fire safety hazard (NC, 2001).

The water-based cleaning processes use detergents that are not considered a fire hazard. Therefore, there is no potential flammability risk associated with these processes. For comparison purposes, Table VIII-1 below gives you a summary of the flash points and classifications of the commonly used solvents in the dry cleaning industry.

Table VIII-1. Summary of Flash Points and Classification for Commonly Used Solvents[1]

Solvent	Flash Point	Classification[5]
Perc	N/A	IV
Stoddard (hydrocarbon)	110°F	II
DF-2000 (hydrocarbon)	147°F	IIIA
PureDry[2] (hydrocarbon)	350°F	IIIB/IIIA
Shell 140 (hydrocarbon)	>143°F	IIIA
EcoSolv (hydrocarbon)	>140°F	IIIA
Rynex 3	>200°F	IIIB
GreenEarth[3]	170°F	IIIA
CO_2[4]	N/A	N/A

1. Source: Material Safety Data Sheet, unless otherwise noted.
2. Dry cleaners and vendors have reported that the flash point can decline to the 140°F range during use because of the perfluorocarbon that is in the Pure Dry mixture. If this is the case, it is classified as a IIIA solvent.
3. Source: Cleaners Family, Volume 4.
4. The detergent mixture used as a supplement with the CO_2 solvent is a hydrocarbon and is classified as a IIIA solvent, but when used together with the CO_2 it is not considered a fire hazard.
5. Source: UCSD, 2005.

G. Potential Energy Usage Impacts

According to a report prepared by Jacobs Engineering for the City of Los Angeles, the overall amount of electricity used by a shop running either a new Perc system or a solvent-based technology (hydrocarbon, GreenEarth, Rynex 3) is about 1,100 Kilowatt-hour (kWh) per month. For water-based technologies, tests conducted by the Pollution Prevention Education and Research Center (PPERC) at a facility that switched from Perc to professional wet cleaning found a reduction in electricity use (to approximately 600 kWh per month). The CO_2 system requires a 70 to 150-amp service to operate the refrigeration system necessary to maintain the CO_2 in a liquid state. Peak load for the pumps and compressor could be up to 20 kWh. This is twice the peak load reported for the other alternative technologies and it could result in increased peak load demand charges. Therefore, the assumption is made that a CO_2 shop will utilize 30 percent more power than a shop using Perc. Based on available information, Table VIII-2 shows monthly energy usage for Perc dry cleaning and alternatives (JE, 2004).

Table VIII-2. Estimated Monthly Electricity Usage[1]

Process	Electricity Usage (kWh)
Perc	1,100
DF-2000	1,100
GreenEarth	1,100
Wet Cleaning	600
CO_2	1,430

1. Source: JE, 2004.

More recently, staff conducted a phone survey of multiple dry cleaning facilities for each technology type to better assess current gas and electricity costs for typical Perc and alternative technology dry cleaning facilities. Because of overlaps in the cost ranges of both the gas and electricity costs regardless of technology type, a statistical analysis (analysis of variance) was done to determine whether the resulting averages properly represent each technology type. The analysis of variance results showed that the data do not demonstrate systematic differences in the energy requirements for the different technologies. Therefore, it is reasonable and appropriate to assume that the energy usage in the different technologies do not appear to be much different.

H. Potential Air Pollution Impacts

1. Impacts on VOC Emissions and Global Warming

Ground level ozone formation requires the mixing of ozone-forming chemicals, also known as VOCs, with nitrogen oxides and sunlight. Any reduction in VOC emissions is expected to provide a beneficial environmental impact on air quality by reducing ozone formation. Since the proposed amended ATCM will phase out Perc dry cleaning machines, there may be an increase in the use of solvents that contain VOCs. The hydrocarbon solvents, as well as the Rynex 3 solvent, used in the dry cleaning industry are classified as VOCs. An increase in the usage of these solvents may cause an adverse environmental impact. If we assume, as a result of the South Coast Rule and full implementation of the proposed amendments to the Dry Cleaning ATCM, in a worse-case scenario where all of the Perc dry cleaning machines convert to hydrocarbon solvents, there would be a total significant increase of about 1.2 tons per day of VOCs statewide. Although the State would see this significant increase in VOCs, the South Coast Rule and the proposed amendments would also lead to 3.0 tons per day reduction in Perc emissions statewide at full implementation.

Greenhouse gases, which alter the amount of heat, or infrared radiation, that can escape the Earth's surface, have been linked to a gradual warming of the Earth's surface and lower atmosphere. While CO_2 has been the traditional focus of greenhouse gas concerns, the CO_2 used in the dry cleaning process is an industrial by-product from other industrial operations and contributes a nominal amount to global warming. In the United States, the largest source of greenhouse gas emissions is from fossil fuel combustion, which accounted for approximately 84 percent of greenhouse emissions in 2005 (USDE, 2006).

2. Impacts on the State Implementation Plan for Ozone

The Federal Clean Air Act amendments of 1990 require an ozone attainment plan from every state unable to meet the national ambient air quality standard for ozone. California's State Implementation Plan (SIP) for ozone fulfills this requirement. State law provides ARB the legal authority to develop regulations affecting a variety of mobile sources, fuels, and consumer products. The regulations that have already been adopted and measures proposed for adoption constitute ARB's portion of the SIP. The SIP serves as a road map to guide California to attain and maintain the national ambient air quality standard for ozone.

On October 23, 2003, the ARB adopted the Proposed 2003 State and Federal Strategy for the California SIP, which reaffirms the ARB's commitment to achieve the health-based air quality standards through specific near-term actions and the development of additional longer-term strategies. It also sets into motion a concurrent initiative to identify longer-term solutions to achieve the full scope of emissions reductions needed to meet federal air quality standards in the South Coast and San Joaquin Valley.

On June 15, 2004, the new eight-hour ozone standards became effective, causing a transition from the one-hour ozone standard, 0.12 ppm, to the more health-protective eight-hour ozone standard, 0.08 ppm (averaged over 8 hours). Strategies to meet this new standard will be due in 2007. ARB expects that California will need to reduce emissions beyond the existing commitments.

In the updated California SIP, Perc is not considered a VOC; therefore, if a VOC-based dry cleaning technology is substituted for Perc dry cleaning under the proposed ATCM amendments, we expect an increase of approximately 0.7 tons per day of VOCs outside of the South Coast. This shortfall will need to be addressed in the next comprehensive revisions of the California SIP.

In December 2002, the South Coast AQMD adopted amendments to its Perc dry cleaning rule. Based on these amendments the South Coast AQMD staff estimated that the more likely scenario would result in an average increase in VOC emissions of 0.8 tons per day in the South Coast in 2018.

As a result of both the South Coast AQMD adopted Rule and the proposed ARB Dry Cleaning ATCM amendments the expected increase statewide of VOC's would be 1.2 tons per day.

3. Workplace Exposure

The CAL/OSHA regulates the concentration of many toxic air contaminants and VOCs in the workplace environment through the establishment of PELs. The PEL is the maximum, eight-hour, time-weighted average concentration for occupational exposure based on indoor workplace exposures which are typically higher than outside ambient exposures. CAL/OSHA has established a PEL for several of the dry cleaning compounds. Perc has a PEL of 25 ppm and Stoddard has a PEL of 100 ppm. Although the remaining solvents do not have PELs, Table VIII-3 gives a summary of any known acute and chronic health impacts. The ARB staff expects a near 100 percent reduction of Perc emissions in the workplace due to the proposed amended Dry Cleaning ATCM requirements.

Table VIII-3. Potential Health Impacts and Permissible Exposure Limit (PEL)

Solvent	Acute	Chronic	PEL
Perc	central nervous system; irritation to eyes, skin, and respiratory tract	kidney, liver, and gastrointestinal system	25 ppm
Stoddard	central nervous system; irritation to eyes, skin, nose, and throat[1]	Unknown	100 ppm
DF2000	central nervous system; irritation to eyes, skin, and respiratory tract[2]	unknown	N/A
PureDry	central nervous system; irritation to eyes, skin, nose, throat, and respiratory tract[2]	unknown	N/A
EcoSolv	central nervous system; irritation to eyes, skin, and respiratory tract[2]	unknown	N/A
Shell 140	central nervous system; irritation to skin, nose, throat, and respiratory tract[2]	unknown	N/A
GreenEarth (D_5)	mild eye irritation	increase in liver weight[3]	N/A
Rynex 3	headaches; irritation to eyes, nose, and throat[1]	unknown	N/A
CO_2	irritation to skin and eyes,[4] frostbite[5]	unknown	N/A

1. Source: U.S. EPA, 1998.
2. Information taken from Material Safety Data Sheets.
3. CARB, 2006.
4. Due to exposure to detergents used with the CO_2 process.
5. Due to exposure to liquid CO_2.

4. Other Air Pollution Impacts

There is also evidence of phosgene formation from the photooxidation of chloroethylenes in air such as Perc and TCE. Phosgene is a byproduct of the thermal decomposition of chlorinated hydrocarbons such as Perc. Phosgene is a toxic, colorless, gas or volatile liquid with a suffocating odor that is similar to decaying fruit or moldy hay. It is slightly soluble in water and freely soluble in benzene, toluene, glacial acetic acid, chloroform, and most liquid hydrocarbons. Phosgene is noncombustible but

can decompose into hydrochloric acid (HCl) and CO_2 when wetted. As a result, wet phosgene is corrosive and poses an additional hazard from pressure buildup in closed containers. The density of phosgene is more than three times that of air, which means that its concentrated emission plumes tend to settle to the ground and collect in low areas. Phosgene is listed as a TAC and a federal HAP (ARB, 2000).

The acute non-cancer affects of phosgene are of the most concern. Phosgene is extremely irritating to the lungs, and can cause severe respiratory effects, including pulmonary edema. Symptoms of acute exposure include choking, chest constriction, coughing, painful breathing, and bloody sputum. Acute phosgene poisoning may affect the heart, brain, and blood. Symptoms may be delayed up to 24 hours after exposure. Chronic inhalation exposure has been shown to result in some tolerance to acute effects noted in humans, but irreversible emphysema and pulmonary fibrosis may occur. The U.S. Occupational Safety and Health Administration (OSHA) also list a PEL of 0.1 ppm.

The implementation of the proposed amended ATCM will nearly eliminate the potential for phosgene formation in the presence of flame or heat sources thereby extending a greater level of worker and public health protection and safety.

I. Reasonably Foreseeable Feasible Mitigation Measures

As previously discussed, ARB is required to do an analysis of reasonably foreseeable feasible mitigation measures. The ARB has determined that the only significant adverse environmental impact should occur in air pollution due to the expected increase in the use of solvents containing VOCs. ARB's plan to account for such VOC increases is discussed in Section H of this chapter.

J. Reasonably Foreseeable Alternative Means of Compliance with the Amended ATCM

The ARB is required to do an analysis of reasonably foreseeable alternative means of compliance with the ATCM. Alternatives to the proposed amended ATCM are discussed in Chapter II. Based on the discussion in Chapter II, ARB staff has concluded that implementation of the proposed amendments to the ATCM will nearly eliminate the public's exposure to Perc. The ATCM is enforceable with the least burdensome approach to eliminate public health impacts from Perc dry cleaning facilities.

K. Environmental Justice

ARB is committed to evaluating community impacts of proposed regulations including environmental justice concerns. Because some communities experience higher exposure to toxic pollutants, it is a priority of ARB to ensure that full protection is afforded to all Californians. The proposed ATCM is not expected to result in significant negative impacts in any community. The proposed ATCM is designed to eliminate

emissions of Perc to residents and off-site workers living or working in communities near the affected facilities.

IX. REFERENCES

ARB, 1991. Initial Statement of Reasons for Rulemaking, Staff Report/Executive Summary, and Part B, Proposed Identification of Perchloroethylene as a Toxic Air Contaminant, California Air Resources Board, August 1991.

ARB, 1993. Staff Report: Proposed Airborne Toxic Control Measure and Proposed Environmental Training Program for Perchloroethylene Dry Cleaning Operations. California Air Resources Board, August 27, 1993.

ARB, 1993a. Technical Support Document: Proposed Airborne Toxic Control Measure and Proposed Environmental Training Program for Perchloroethylene Dry Cleaning Operations, California Air Resources Board, August 27, 1993.

ARB, 1996. Curriculum for the Environmental Training Program for Perchloroethylene Dry Cleaning Operations, California Air Resources Board, April 1996.

ARB, 1997. Toxic Air Contaminant Identification List - Summaries, California Air Resources Board, September 1997.

ARB, 2000. Initial Statement of Reasons for the Proposed Air Toxic Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities, March 10, 2000.

ARB, 2003a. Recommended Interim Risk Management Policy For Inhalation-Based Residential Cancer Risk. California Air Resources Board. October 9, 2003.

ARB, 2004b. California 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. Sacramento, California. May, 7, 2004.

ARB, 2004c. CAPCOA Enforcement Manager's Meeting, April 15, 2004.

ARB, 2004e. E-mail from Dr. Nancy W. Eilerts, Chevron Philips Chemical Company to Mei Fong, ARB, January 2004.

ARB, 2004i. Telephone conversation with Katy Wolf, January 4, 2004.

ARB, 2005c. Dry Cleaning ATCM Evaluation Workgroup Meeting, July 13, 2005.

ARB, 2005h. Hot Spots Analysis and Reporting Program, version 1.2A. California Air Resources Board. August 2005.

ARB, 2005i. October 2005 Revisions to Chapter 1-2 and Appendix B of the March 11, 2005 Staff Report, Review of the California Ambient Air Quality Standard for Ozone, California Air Resources Board. October 27, 2005.

ARB, 2006a. E-mail from Ann Heil, City of Los Angeles Sanitation District to Sonia Villalobos, ARB, January 13, 2006.

ARB, 2006b. Annual Statewide Perchloroethylene Summary, California Air Resources Board. www.arb.ca.gov/adam/toxics/statepages/percstate.html, November 6, 2006.

ARB, 2006c. E-mail from Mike Redgrave, ARB, March 13, 2006.

ARB, 2006d. California Air Resources Board. Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coating Regulation. Sacramento, California. September 29, 2006.

BAAQMD, 2001. Dry Cleaner Ventilation Guidelines. Bay Area Air Quality Management District, October 3, 2001.

Cal/EPA, 1996. California Environmental Protection Agency. Memorandum from Peter M. Rooney, Undersecretary, to Cal/EPA Executive Officers and Directors. "Economic Analysis Requirements for the Adoption of Administrative Regulations." Appendix C ("Cal/EPA Guidelines for Evaluation Alternatives to Proposed Major Regulations"). December 9, 1996.

Cal/OSHA, 2004. Title 8, Section 5155, Table AC-1: Permissible Exposure Limits for Chemical Contaminants, California Occupational Safety and Health. October 31, 2004. Printed from Cal/OSHA website link on February 14, 2006. http://www.dir.ca.gov/Title8/5155table_ac1.html.

CARB, 2006. California Air Resources Board, California Dry Cleaning Industry Technical Assessment Report, February 2006.

CDHS, 2003. California Department of Health Services (CDHS), 2003 Health Hazard Alert, Hazard Evaluation System and Information System, 1-Bromopropane, July 2003.

CFCA, 2002. Coalition for Clean Air, Hung Out to Dry: How the Use of Perchloroethylene in Dry Cleaning Endangers You and Your Family's Health, October 2002.

Chevron Phillips, 2005. Letter to Ms. Mei Fong regarding California Dry Cleaning Industry Technical Assessment Report. November 22, 2005.

Cleaners Family, 2004. Cleaners Family, Miracle Solvents? Evaluation of Hydrocarbon, GreenEarth, PureDry vs Perc; The Secrete of the Amazing Cleaning Results by Alternative Solvents, Volume 4, No. 1, February 2004.

DB, 2006. Dunn and Bradstreet, Table on Industry Quartiles and Median Variance, 2002-2004, February 27, 2006.

ExxonMobil, 2003. Product Environmental Profile, DF-2000™ Fluid, ExxonMobile Chemical, January 9, 2003.

GreenEarth, 2003. Memo from Jim Barry, Chairman of GreenEarth Cleaning to Affiliates, Friends and Associates regarding GreenEarth Cleaning Safety Update. March 19, 2003.

IFI, 2002. Research Fellowship, GreenEarth® Fellowship, Copyright International Fabricare Institute, No. F-47, September 2002.

IRTA, 2005. Evaluation of New and Emerging Technologies for Textile Cleaning, Institute for Research and Technical Assistance, August 2005.

JE, 2004. Viable Alternatives to Perchloroethylene in Dry Cleaning, Jacobs Engineering, Prepared for City of Los Angeles, December 30, 2004.

JOEH, 2005. A Proposed Methodology for Setting Occupational Exposure Limits for Hydrocarbon Solvents, Journal of Occupational and Environmental Hygiene, Richard H. McKee, et al., October 2005.

Material Safety Data Sheets for Rynex (2004), Stoddard (1997), PureDry (2002), Shell 140 (1992), DF-2000 (2000), and EcoSolv (2003).

NC, 2001. Alternatives to the Predominant Dry Cleaning Processes, North Carolina Department of Environment and Natural Resources, October 2001.

NTP, 2004. NTP Technical Report on the Toxicology and Carcinogenesis Studies of Stoddard Solvent IIC In F344/N Rats and B6C3F_1 Mice, National Toxicology Program. September 2004.

OEHHA, 1999. The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part I; The Determination of Acute Reference Exposure Levels for Airborne Toxicants, Office of Environmental Health Hazard Assessment. March 1999.

OEHHA, 2000a. The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part III; Technical Support Document for the Determination of

Noncancer Chronic Reference Exposure Levels, Office of Environmental Health Hazard Assessment. Office of Environmental Health Hazard Assessment. April 2000.

OEHHA, 2000b. The Air Toxics Hot Spots Risk Assessment Guidelines; Part IV; Exposure Assessment and Stochastic Analysis Technical Support Document. Office of Environmental Health Hazard Assessment. September 2000.

OEHHA, 2002. Part II, Technical Support Document for Describing Available Cancer Potency Factors (Revised). Office of Environmental Health Hazard Assessment. December 2002.

OEHHA, 2003. Memo from George Alexeeff to Peter Venturini regarding health effects of exposure to alternative dry cleaning solvents, December 2, 2003.

OEHHA, 2003a. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August 2003.

OEHHA, 2006. Chemicals Known To The State To Cause Cancer Or Reproductive Toxicity, February 3, 2006. Office of Environmental Health Hazard Assessment. Printed on March 14, 2006, from OEHHA website www.oehha.ca.gov/prop65/prop65_list/Newlist.html.

Rynex, 2005a. The Facts about Rynex the Proven Alternative Solvent, www.rynex.com, December 2005.

SIDS, 2003. SIDS Initial Assessment Report For SIAM 17, November 2003.

South Coast, 2002. Final Staff Report - Proposed Amendment Rule 1421 - Control of Perchloroethylene Emissions from Dry Cleaning Systems, South Coast Air Quality Management District, October 2002.

UCSD, 2005. University of California, San Diego, Flammable and Combustible Liquids Overview, January 11, 2005.

USDE, 2006, Emissions of Greenhouse Gases in the United States 2005, United States Department of Energy, Energy Information Administration, November, 2006.

U.S. EPA, 1995. ISCST3 Model User's Guide, EPA-454/B-95-003a. United States Environmental Protection Agency (U.S. EPA). Research Triangle Park, North Carolina. September 1995.

U.S. EPA, 1998. Cleaner Technologies Substitutes Assessment: Professional Fabricare Processes. Design for the Environment, June 1998.

U.S. EPA, 1999. Case Study: Liquid Carbon Dioxide (CO_2) Surfactant System for Garment Care, Design for the Environment. www.epa.gov/opptintr/dfe/pubs/garment/lcds/micell.htm. May 1999.

U.S. EPA, 2003. Siloxane D5 in Drycleaning Applications, Fact Sheet, August 2003.

Appendix A

Proposed Amended Regulation Order

Proposed Amendments to the Airborne Toxic Control Measure for Emissions of Perchloroethylene Associated With Dry Cleaning Operations And Proposed Adoption of Requirements for Manufacturers And Distributors of Perchloroethylene

PROPOSED REGULATION ORDER

PROPOSED AMENDMENTS TO THE AIRBORNE TOXIC CONTROL MEASURE FOR EMISSIONS OF PERCHLOROETHYLENE ASSOCIATED WITH DRY CLEANING OPERATIONS AND PROPOSED ADOPTION OF REQUIREMENTS FOR MANUFACTURERS AND DISTRIBUTORS OF PERCHLOROETHYLENE

Amend section 93109, title 17, California Code of Regulations, to read as follows:

[NOTE: Section 93109 is proposed for amendment. For ease of review, the amended text is shown in two parts: first as proposed new text, and second as proposed deleted text. Strikeout and underline have been omitted as authorized by title 2, California Code of Regulations, section 8.]

Section 93109. Airborne Toxic Control Measure for Emissions of Perchloroethylene from Dry Cleaning and Water-Repelling Operations.

(a) Purpose.

The purpose of this control measure is to phase-out the use of perchloroethylene (Perc) from dry cleaning and water-repelling operations. Eliminating these emissions will further protect the public health, especially for Californians who live or work near dry cleaning and water-repelling facilities.

(b) Applicability.

This section applies to any person who sells or distributes Perc to California dry cleaners or who sells, distributes, installs, owns, or operates dry cleaning equipment in California that uses any solvent that contains Perc.

(c) Severability.

Each part of this section is deemed severable, and in the event that part of this section is held to be invalid, the remainder of this section shall continue in full force and effect.

(d) Definitions. The definitions in Health and Safety Code division 26, part 1, chapter 1, commencing with section 39010, shall apply, with the following additions:

(1) *"Add-on secondary control machine"* means a closed-loop machine with a secondary control system that is designed or offered as a separate retrofit system for use on multiple machine makes and models.

(2) *"Adsorptive cartridge filter"* means a replaceable cartridge filter that contains diatomaceous earth or activated clay as the filter medium.

(3) *"Carbon adsorber"* means an air cleaning device that consists of an inlet for exhaust gases from a dry cleaning machine; activated carbon in the form of a fixed bed, cartridge, or canister, as an adsorbent; an outlet for exhaust gases; and a system to regenerate or reclaim saturated adsorbent.

(4) *"Cartridge filter"* means a replaceable cartridge filter that contains one of the following as the filter medium: paper, activated carbon, or paper and activated carbon. A cartridge filter contains no diatomaceous earth or activated clay. Cartridge filters include, but are not limited to: standard filters, split filters, "jumbo" filters, and all carbon polishing filters.

(5) *"Closed-loop machine"* means dry cleaning equipment in which washing, extraction, and drying are all performed in the same single unit (also known as dry-to-dry) and which recirculates Perc-laden vapor through a primary control system with or without a secondary control system with no exhaust to the atmosphere during the drying cycle. A closed-loop machine may allow for venting to the ambient air through a fugitive control system after the drying cycle is complete and only while the machine door is open. A closed-loop machine includes a primary control machine, an add-on secondary control machine, or an integral secondary control machine.

(6) *"Co-residential"* means sharing a common wall, floor, or ceiling with a residence or located within the same building.

(7) *"Contact information"* means name, mailing address, facility location, phone number, and if applicable, email address and fax number.

(8) *"Converted machine"* means an existing vented machine that has been modified to be a closed-loop machine by eliminating the aeration step, installing a primary control system, and providing for recirculation of the Perc-laden vapor with no exhaust to the atmosphere or workroom during the drying cycle. A converted machine may allow for venting to the ambient air through a fugitive control system after the drying cycle is complete and only while the machine door is open.

(9) *"Cool-down"* means the portion of the drying cycle that begins when the heating mechanism deactivates and the refrigerated condenser continues to reduce the temperature of the air recirculating through the drum to reduce the concentration of Perc in the drum.

(10) *"Desorption"* means regeneration of an activated carbon bed, or any other type of vapor adsorber by removal of the adsorbed solvent using hot air, steam, or other means.

(11) *"Dip tank operations"* means the immersion of materials in a solution that contains Perc, for purposes other than dry cleaning, in a tank or container that is separate from the dry cleaning equipment.

(12) *"District"* means an air pollution control or air quality management district as defined in Health and Safety Code section 39025.

(13) *"Drum"* means the rotating cylinder or wheel of the dry cleaning machine that holds the materials being cleaned.

(14) *"Dry cleaning"* means the process used to remove soil, greases, paints, and other unwanted substances from materials with Perc.

(15) *"Dry cleaning equipment"* means any machine, device, or apparatus that uses Perc to dry clean materials or to remove residual solvent from previously cleaned materials. Dry cleaning equipment may include, but is not limited to a transfer machine, a vented machine, a self-service machine, a converted machine, a closed-loop machine, a reclaimer, a drying cabinet, or a dip tank.

(16) *"Dry cleaning machine"* means any dry cleaning equipment that is used to dry clean materials. A dry cleaning machine may include, but is not limited to a transfer machine, a vented machine, a self-service machine, or a closed-loop machine.

(17) *"Dry cleaning system"* means all of the following equipment, devices, or apparatus associated with any dry cleaning process: dry cleaning equipment; filter or purification systems; waste holding, treatment, or disposal systems; solvent supply systems; dip tanks; pumps; gaskets; piping, ducting, fittings, valves, or flanges that convey Perc vapors; and control systems.

(18) *"Drying cabinet"* means a housing in which materials previously cleaned with Perc are placed to dry and which is used only to dry materials that would otherwise be damaged by the heat and tumbling action of the drying cycle.

(19) *"Drying cycle"* means the process used to actively remove the Perc remaining in the materials after washing and extraction. For closed-loop machines, the heated portion of the cycle is followed by cool-down and may be extended beyond cool-down by the activation of a control system. The drying cycle begins when heating coils are activated and ends when the machine ceases rotation of the drum for a converted or primary control machine, or at the end of the adsorption cycle for a secondary control machine.

(20) *"Environmental training program"* means an initial course or a refresher course of the environmental training program for Perc dry cleaning operations that has been authorized by the Air Resources Board according to the requirements of title 17, California Code of Regulations, section 93110.

(21) *"Existing facility"* means any facility that operated dry cleaning equipment prior to January 1, 2008.

(22) *"Facility"* means an establishment where dry cleaning equipment is operated.

(23) *"Fugitive control system"* means a device or apparatus that collects fugitive Perc vapors from the machine door, button and lint traps, still, or other intentional openings of the dry cleaning equipment and routes those vapors to a device that reduces the mass of Perc prior to exhaust of the vapor to the atmosphere.

(24) *"Gallons of perchloroethylene purchased"* means the volume of Perc, in gallons, purchased for use with the dry cleaning equipment.

(25) *"Halogenated-hydrocarbon detector"* means a portable device capable of detecting vapor concentrations of Perc of 25 ppmv or less and indicating an increasing concentration by emitting an audible signal or visual indicator that varies as the concentration changes.

(26) *"Integral secondary control machine"* means a closed-loop machine that is designed and offered with an integral secondary control system.

(27) *"Integral secondary control system"* means a carbon adsorber, or an equivalent device that is designed and offered as an integral part of a production package with a specific make and model of dry cleaning machine and primary control system.

(28) *"Liquid leak"* means a leak of liquid containing Perc of more than 1 drop every 3 minutes.

(29) *"Materials"* means wearing apparel, draperies, linens, fabrics, textiles, rugs, leather, and other goods that are dry cleaned.

(30) *"Muck cooker"* means a device for heating Perc-laden waste material to volatilize and recover Perc.

(31) *"New distributor"* means any person who begins the sale of Perc, directly or indirectly, to dry cleaners in California after January 1, 2008.

(32) *"New facility"* means a facility that did not operate any dry cleaning equipment prior to January 1, 2008. Facilities that are relocated to another district shall be considered new facilities for the purposes of this control measure.

(33) *"Perc distributor"* means any person who, directly or indirectly, sells Perc or recycled Perc to California dry cleaners.

(34) *"Perc manufacturer"* means any person who produces and sells Perc for use in California.

(35) *"Perchloroethylene (Perc)"* means the substance with the chemical formula 'C_2Cl_4', also known by the name 'tetrachloroethylene', which has been identified by the Air Resources Board and listed as a toxic air contaminant in title 17, California Code of Regulations, section 93000.

(36) *"Pounds of materials cleaned per load"* means the total dry weight, in pounds, of the materials in each load dry cleaned at the facility, as determined by weighing each load on a scale prior to dry cleaning and recording the value.

(37) *"Primary control machine"* means a closed loop machine used for dry cleaning that is equipped with a primary control system.

(38) *"Primary control system"* means a refrigerated condenser, or an equivalent closed-loop vapor recovery system that reduces the concentration of Perc in the recirculating air.

(39) *"Reasonably available"*, as it applies to a course for the environmental training program, means that the course is offered within 200 miles of the district boundaries and that all such courses have a capacity, in the aggregate, that is adequate to accommodate at least one person from each facility in the district required to certify a trained operator at that time.

(40) *"Reclaimer"* means a machine, device, or apparatus used only to remove residual Perc from materials that have been previously cleaned in a separate piece of dry cleaning equipment.

(41) *"Recycled Perc"* means Perc solvent that is recovered after initial use.

(42) *"Refrigerated condenser"* means a closed-loop vapor recovery system into which Perc vapors are introduced and recovered by cooling below the dew point of the Perc.

(43) *"Relocated facilities"* means a facility that moves from one location to another location within the boundaries of the same district.

(44) *"Remove from service"* means remove from the facility or render the dry cleaning equipment inoperable.

(45) *"Residence"* means any dwelling or housing which is owned, rented, or occupied by the same person for a period of 180 days or more, excluding short-term housing such as a motel or hotel room rented and occupied by the same person for a period of less than 180 days.

(46) *"Secondary control system"* means a device or apparatus (typically a carbon adsorber), that reduces the concentration of Perc in the recirculating air at the end of the drying cycle beyond the level achievable with a refrigerated condenser alone.

(47) *"Self-service machine"* means a dry cleaning machine that is loaded, activated, or unloaded by the customer.

(48) *"Separator"* means any device used to recover Perc from a water-Perc mixture.

(49) *"Solvent"* means a liquid substance other than water used in dry cleaning equipment.

(50) *"Trained operator"* means the owner, the operator, or an employee of the facility, who holds a record of completion for the initial course of an environmental training program and maintains her/his status by successfully completing the refresher courses as required.

(51) *"Transfer machine"* means a combination of dry cleaning equipment in which washing and extraction are performed in one unit and drying is performed in a separate unit.

(52) *"Vapor adsorber"* means a bed of activated carbon or other adsorbent into which Perc vapors are introduced and trapped for subsequent desorption.

(53) *"Vapor leak"* means an emission of Perc vapor from unintended openings in the dry cleaning system, as indicated by a rapid audible signal or visual signal from a halogenated-hydrocarbon detector or a concentration of Perc exceeding 50 ppmv as Perc as indicated by a portable analyzer.

(54) *"Vented machine"* means dry cleaning equipment in which washing, extraction, and drying are all performed in the same single unit and in which fresh air is introduced into the drum in the last step of the drying cycle and exhausted to the atmosphere, either directly or through a control device.

(55) *"Wastewater treatment unit"* means a device that treats Perc-contaminated wastewater through the addition of thermal or chemical energy, or through physical action, such as carbon or another type of adsorbent filtration system.

(56) *"Water-repelling operations"* means the treatment of materials with a Perc-containing solution for the purpose of making the material water resistant or water-repelling.

(57) *"Workday"* means any consecutive 24-hour period commencing at the same time each calendar day as defined in California Labor Code section 500(a).

(e) Prohibitions.

(1) No person shall sell, offer for sale, or initiate a new lease of any Perc dry cleaning machine for use in California on or after January 1, 2008.

(2) Transfer, vented, and self service Perc machines shall remain prohibited as they have been since November 1998.

(f) Requirements for New Facilities.

No person shall install or operate any Perc dry cleaning machine or engage in Perc water-repelling operations at a new facility on or after January 1, 2008.

(g) Relocated Facilities.

Upon approval by the district, existing facilities may relocate their Perc dry cleaning equipment for the purpose of moving from one location to another location within the boundaries of the same district.

(h) Requirements for Existing Facilities. The owner/operator of each existing facility shall meet the following applicable requirements as follows and as shown in Table 1.

(1) By January 1, 2008, drying cabinets and dip tanks shall not be used for Perc dry cleaning.

(2) By July 1, 2010, existing facilities shall remove from service all Perc converted machines.

(3) By July 1, 2010, existing facilities shall remove from service all Perc dry cleaning machines at co-residential locations.

(4) By July 1, 2010, or 15 years after the date of manufacture, whichever comes later, existing facilities shall remove from service all Perc closed-loop machines including primary control, add-on secondary control, and integral secondary control machines. If the age of the machine cannot be obtained, the machine shall be removed from service by July 1, 2010.

(5) By January 1, 2023, existing facilities shall remove from service all Perc dry cleaning machines, if not required to be removed from service earlier.

(i) Required Good Operating Practices. No person shall operate Perc dry cleaning equipment unless all of the following requirements are met:

(1) *Environmental training requirements.* Each Perc facility shall have one or more trained operators.

(A) A trained operator shall be the owner, the operator, or another employee of the facility, who successfully completes the initial course of an environmental training program to become a trained operator. Evidence of successful completion of the initial course shall be the original record of completion issued pursuant to title 17, California Code of Regulations, Section 93110.

(B) The trained operator shall be on site while the dry cleaning equipment is in operation.

(C) Each trained operator shall successfully complete the refresher course of an environmental training program at least once every three years. Evidence of successful completion of each refresher course shall be the date of the course and the instructor's signature on the original record of completion.

(D) If the Perc facility has only one trained operator and the trained operator leaves the employ of the facility, the facility shall:

1. Notify the district in writing within 15 days of the departure of the trained operator; and

2. Obtain certification for a replacement trained operator within 3 months.

3. If the district determines that the initial course of an environmental training program is not reasonably available,

the district may extend the certification period for a replacement trained operator until 1 month after the course is reasonably available.

(2) *Operation and maintenance requirements.* The trained operator shall operate and maintain all components of the Perc dry cleaning system in accordance with the requirements of this section and the conditions specified in the facility's operating permit. For operations not specifically addressed, the components shall be operated and maintained in accordance with the manufacturer's recommendations.

(A) The district shall provide an operation and maintenance checklist to the Perc facility. Each operation and maintenance function and the date performed shall be recorded on the checklist. The operation and maintenance checklist shall include, at a minimum, the following requirements:

1. Refrigerated condensers shall be operated to ensure that exhaust gases are recirculated until the air-vapor stream temperature on the outlet side of the refrigerated condenser, downstream of any bypass, is less than or equal to 45°F (7.2°C).

i. Refrigerated condensers shall have a graduated or digital thermometer with a minimum range from 0°F (-18°C) to 150°F (66°C), which measures the temperature of the outlet vapor stream, downstream of any bypass of the condenser, and is easily visible to the operator.

2. Vapor adsorbers used as a primary control system or a secondary control system shall be operated to ensure that exhaust gases are recirculated at the temperature specified by the district, based on the manufacturer's recommendations for optimum adsorption. These vapor adsorbers shall be desorbed according to the conditions specified by the district in the facility's operating permit, including a requirement that no Perc vapors shall be routed to the atmosphere during routine operation or desorption.

3. Cartridge filters and adsorptive cartridge filters shall be handled using one of the following methods:

i. Drained in the filter housing, before disposal, for no less than: 24 hours for cartridge filters and 48 hours for adsorptive cartridge filters. If the filters are then transferred to a separate device to further reduce the volume of Perc, this treatment shall be done in a system that routes any vapor to a primary control system, with no exhaust to the atmosphere or workroom; or

ii. Dried, stripped, sparged, or otherwise treated, within the sealed filter housing, to reduce the volume of Perc contained in the filter.

4. A still, and any muck cooker, shall not exceed 75 percent of its capacity, or an alternative level recommended by the manufacturer. A still, and any muck cooker, shall cool to 100°F (38°C) or less before emptying or cleaning.

5. Button and lint traps shall be cleaned and inspected for damage each workday and the lint placed in a tightly sealed container.

6. The facility owner/operator shall keep on site a spare set of gaskets for the loading door, still, lint trap, button trap, and water separator.

7. The facility owner/operator shall keep on site a spare lint filter.

8. All parts of the dry cleaning system where Perc may be exposed to the atmosphere or workroom shall be kept closed at all times except when access is required for proper operation and maintenance.

9. Wastewater treatment units shall be operated to ensure that no liquid Perc or visible emulsion is allowed to vaporize.

10. Carbon adsorbers in secondary control machines must be stripped or desorbed in accordance with manufacturer's instructions or at least weekly, whichever is more frequent.

(3) *Leak check and repair requirements.* The trained operator shall inspect the Perc dry cleaning system for vapor leaks. The district shall provide a leak inspection checklist to the Perc facility. The trained operator shall record the status of each component on the checklist.

(A) *Weekly Leak Checks.* The Perc dry cleaning system shall be inspected at least once per week for both liquid leaks and vapor leaks, using one of the following techniques:

1. A halogenated-hydrocarbon detector; or

2. A portable gas analyzer or an alternative method approved by the district.

(B) *Annual Leak Checks.* The Perc dry cleaning system shall be inspected at least once per calendar year for liquid and vapor leaks using a portable detector which gives quantitative results with less than ten (10) percent uncertainty at 50 ppmv of Perc. Upon request, a district may approve an annual leak check extension of 12 months or less.

(C) Any liquid leak or vapor leak that has been detected by the operator shall be noted on the checklist and repaired according to the requirements of this subsection. If the leak is not repaired at the time of detection, the leaking component shall be physically marked or tagged in a manner that is readily observable by a district inspector.

(D) Any liquid leak or vapor leak detected by the district, which has not been so noted on the checklist and marked on the leaking component of the dry cleaning system, shall constitute a violation of this section. For enforcement purposes, the district shall identify the presence of a vapor leak by determining the concentration of Perc with a portable analyzer according to ARB Test Method 21 (title 17, California Code of Regulations, section 94124).

(E) Any liquid leak or vapor leak shall be repaired immediately upon detection. For the purposes of this section a business day shall mean Monday through Friday, except holidays, as provided in Government Code of Regulation section 6700 and following.

1. If repair parts are not available at the facility, the parts shall be ordered within the next business day of detecting such a leak. Such repair parts shall be installed within two business days after receipt. A facility with a leak that has not been repaired by the end of the 7th business day after detection shall not operate the dry cleaning machine, until the leak is repaired, without a leak-repair extension from the district.

2. A district may grant a leak-repair extension to a facility, for a single period of 30 days or less, if the district makes the following findings:

   i. The delay in repairing the leak could not have been avoided by action on the part of the facility;

   ii. The facility used reasonable preventive measures and acted promptly to initiate the repair;

   iii. The leak would not significantly increase exposure to Perc near the facility; and

   iv. The facility is in compliance with all other requirements of this section and has a history of compliance.

(j) Recordkeeping Requirements.

(1) The following records shall be retained by all Perc facilities for at least 5 years:

   (A) For each dry cleaning machine, a log showing the date and the pounds of materials cleaned per load;

   (B) Purchase and delivery receipts for the dry cleaning solvent indicating the volume in gallons;

   (C) For add-on or integral secondary control machine operations: the start time and finish time of each regeneration; and the temperature of chilled air on the outlet side of the refrigerated condenser;

   (D) The operation and maintenance checklists required by subsection (i)(2)(A) and the completed leak inspection checklists required by subsection (i)(3); and

   (E) For liquid leaks or vapor leaks that were not repaired at the time of detection, a record of the leaking component(s) of the dry cleaning system awaiting repair and the action(s) taken to complete the repair. The record shall include copies of purchase orders or other written records showing when the repair parts were ordered and/or service was requested.

(2) The manufacturer's operating manual for all components of the dry cleaning system shall be retained for the life of the equipment.

(3) The original record of completion of the environmental training program for each trained operator shall be retained during the employment of that person. A copy of the record of completion shall be retained for an additional period of two years beyond the separation of that person from employment at the facility.

(4) All records, or copies thereof, shall be maintained in English and shall be accessible at the facility at all times.

(k) Reporting Requirements.

(1) The owner or operator of each Perc facility shall prepare an annual report which covers the period of January 1 through December 31 of each year. The facility owner or operator shall furnish this annual report to the district by the date specified by the district. The annual report shall include the following information:

(A) A copy of the record of completion of the environmental training program for each trained operator;

(B) The total of the pounds of materials cleaned;

(C) The gallons of solvent purchased in the reporting period;

(D) The make, model, serial number, and date of manufacture of the dry cleaning machine;

(2) A district may exempt a source from subsection (k)(1) if the district maintains current equivalent information on the facility.

(l) Water-repelling Operations.

No person shall perform Perc water-repelling operations unless all materials are treated in a converted, primary control, add-on secondary control, or integral secondary control machine. The machines used shall comply with the prohibitions and requirements in subsections (e), (f), (g), and (h).

(m) Violations.

Any violation of this section may carry civil or administrative penalties as specified in state law and regulation, including, but not limited to, a penalty of up to $10,000 for each day in which the violation occurs under Health and Safety Code section 39674.

NOTE: Authority cited: Sections 39600, 39601, 39650, 39655, 39656, 39658, 39659, 39665 and 39666, Health and Safety Code; Sections 7412 and 7416, Title 42, United States Code.

Reference: Sections 39650, 39655, 39656, 39658, 39659, ~~and~~ 39666, and 39674, Health and Safety Code; Sections 7412 and 7414, Title 42, United States Code; and Sections 63.14, 63.99, 63.320, 63.321, 63.322, 63.323 and 63.324, Title 40, Code of Federal Regulation.

Table 1. Summary of Perc Equipment Compliance Times for Existing Facilities

FACILITY OR EQUIPMENT TYPE	DATE OF COMPLIANCE[1]
Drying Cabinet, or Dip Tank	January 1, 2008
Converted Machine	July 1, 2010
Dry Cleaning Machines at Co-residential Facility	July 1, 2010
Closed-loop Machines: Primary Control Machine; Add-on Secondary Control Machine; or Integral Secondary Control Machine	July 1, 2010 or 15 years after the date of manufacture, whichever comes later. July 1, 2010 if age of machine cannot be determined.
All Perc Dry Cleaning Machines	January 1, 2023

1. Final date(s) by which equipment shall be removed from service or use.

Adopt section 93109.1, title 17, California Code of Regulations, to read as follows:

Section 93109.1. Requirements for Perc Manufacturers.

(a) Recordkeeping Requirement.

Perc manufacturers shall keep monthly sales records (with invoices) of the gallons of Perc sold for use in dry cleaning in California. These records shall be retained for at least 5 years and shall be made available to ARB or the district upon request.

(b) Reporting Requirement.

By January 1, 2008, Perc manufacturers shall report to ARB contact information for all their distributors who sell Perc for use in dry cleaning in California. If there are changes to their list of distributors, Perc manufacturers shall report the change(s) to ARB within 30 calendar days after the change has occurred.

(c) Violations.

Any violation of this section may carry civil or administrative penalties as specified in state law and regulation, including, but not limited to, a penalty of not more than $35,000 under Health and Safety Code section 42402.4.

(d) The provision of title 17, California Code of Regulation, section 93109, paragraphs (a), (b), (c), and (d) shall apply to this section.

NOTE: Authority cited: Sections 39600, 39601 and 41998, Health and Safety Code.

Reference: Sections 41998 and 42402.4, Health and Safety Code.

Adopt section 93109.2, title 17, California Code of Regulations, to read as follows:

Section 93109.2. Requirements for Perc Distributors.

(a) Recordkeeping Requirements.

(1) The following records shall be retained for at least 5 years and shall be made available to the ARB or the district upon request.

(A) For each dry cleaning facility, Perc distributors shall keep monthly sales records (with invoices) of the gallons of Perc and recycled Perc sold for use in dry cleaning in California.

(B) Perc distributors shall keep monthly purchase records (with invoices) of the gallons of Perc purchased for use in dry cleaning in California.

(C) Perc distributors shall keep contact information for each California dry cleaner that purchased Perc and recycled Perc.

(D) Perc distributors shall keep contact information for all their distributors who sell Perc and recycled Perc in California.

(b) Reporting Requirements.

(1) By January 1, 2008, Perc distributors shall report to ARB their contact information and, if applicable, the contact information for all their distributors who sell Perc and recycled Perc in California.

(2) Perc distributors shall report to ARB any change(s) in their contact information reported under (b)(1) above within 30 calendar days.

(3) By January 31 of each year, Perc distributors shall report to ARB the annual gallons of Perc and recycled Perc sold to California dry cleaners from January 1 through December 31 of the previous year.

(c) No later than 30 days after the issuance of an invoice from ARB, Perc distributors shall pay fees, based on the fee invoice schedule shown in Table 2.

(d) Violations.

Any violation of this section may carry civil or administrative penalties as specified in state law and regulation, including, but not limited to, a penalty of not more than $35,000 under Health and Safety Code section 42402.4.

(e) The provision of title 17, California Code of Regulation, section 93109, paragraphs (a), (b), (c), and (d) shall apply to this section.

NOTE: Authority cited: Sections 39600, 39601 and 41998, Health and Safety Code.

Reference: Sections 41998 and 42402.4, Health and Safety Code.

Table 2. Perc Fee Invoice Schedule

Year	Perc Fee per Gallon Sold (in U.S. Dollars)	Invoice Cycle	Approximate Invoice Date
2004	$3.00	August 16, 2004 *through* December 31, 2004	January 2005
2005	$4.00	January 1, 2005 *through* June 30, 2005 July 1, 2005 *through* December 31, 2005	July 2005 January 2006
2006	$5.00	January 1, 2006 *through* December 31, 2006	January 2007
2007	$6.00	January 1, 2007 *through* December 31, 2007	February 2008
2008	$7.00	January 1, 2008 *through* December 31, 2008	February 2009
2009	$8.00	January 1, 2009 *through* December 31, 2009	February 2010
2010	$9.00	January 1, 2010 *through* December 31, 2010	February 2011
2011	$10.00	January 1, 2011 *through* December 31, 2011	February 2012
2012	$11.00	January 1, 2012 *through* December 31, 2012	February 2013
2013	$12.00	January 1, 2013 *through* December 31, 2013	February 2014
2014-2022	$12.00	January 1, 2014 *through* December 31, 2014, and each subsequent calendar year *through* 2022	February 2015 and each February thereafter *through* February 2023

FINAL REGULATION ORDER

AIRBORNE TOXIC CONTROL MEASURE FOR
EMISSIONS OF PERCHLOROETHYLENE FROM
DRY CLEANING OPERATIONS

APPROVED BY THE OFFICE OF ADMINISTRATIVE LAW ON MAY 4, 1994

CONTENTS

Sub-Section	Topic	Starting Page
(a)	Definitions.	II 2-1
(b)	Applicability.	II 2-6
(c)	Initial Notification.	II 2-6
(d)	Recordkeeping.	II 2-6
(e)	Annual Reporting.	II 2-7
(f)	Good Operating Practices.	II 2-7
(g)	Equipment.	II 2-11
(h)	Equipment Testing.	II 2-15
(i)	Water-Repelling and Dip Tank Operations.	II 2-18
(j)	Compliance.	II 2-18
Table 1	Equipment Requirements and Summary of Compliance Times for Existing and New Facilities	II 2-20

Deleted

FINAL REGULATION ORDER

AIRBORNE TOXIC CONTROL MEASURE FOR EMISSIONS OF PERCHLOROETHYLENE FROM DRY CLEANING OPERATIONS

Adopt new section 93109, Titles 17 and 26, California Code of Regulation, to read as follows:

17 CCR, Section 93109. Perchloroethylene Airborne Toxic Control Measure--Dry Cleaning Operations.

(a) Definitions. For the purposes of this section, the following definitions shall apply:

(1) "Adsorptive cartridge filter" means a replaceable cartridge filter that contains diatomaceous earth or activated clay as the filter medium.

(2) "Cartridge filter" means a replaceable cartridge filter that contains one of the following as the filter medium: paper, activated carbon, or paper and activated carbon. A cartridge filter contains no diatomaceous earth or activated clay. Cartridge filters include, but are not limited to: standard filters, split filters, "jumbo" filters, and all carbon polishing filters.

(3) "Closed-loop machine" means dry cleaning equipment in which washing, extraction, and drying are all performed in the same single unit (also known as dry-to-dry) and which recirculates perchloroethylene-laden vapor through a primary control system with no exhaust to the atmosphere during the drying cycle. A closed-loop machine may allow for venting to the ambient air through a fugitive control system after the drying cycle is complete and only while the machine door is open.

(4) "Co-located with a residence" means sharing a common wall, floor, or ceiling with a residence. For the purposes of this definition, "residence" means any dwelling or housing which is owned, rented, or occupied by the same person for a period of 180 days or more, excluding short-term housing such as a motel or hotel room rented and occupied by the same person for a period of less than 180 days.

(5) "Converted machine" means an existing vented machine that has been modified to be a closed-loop machine by eliminating the aeration step, installing a primary control system, and providing for recirculation of the perchloroethylene-laden vapor with no exhaust to the atmosphere or workroom during the drying cycle. A converted machine may allow for venting to the ambient air through a fugitive control system after the drying cycle is complete and only while the machine door is open.

(6) "Cool-down" means the portion of the drying cycle that begins when the heating mechanism deactivates and the refrigerated condenser continues to reduce the

Repealed

temperature of the air recirculating through the drum to reduce the concentration of perchloroethylene in the drum.

(7) "Date of compliance" means the time from the effective date of this control measure in the district until a facility must be in compliance with the specific requirements of this control measure.

(8) "Desorption" means regeneration of an activated carbon bed, or any other type of vapor adsorber by removal of the adsorbed solvent using hot air, steam, or other means.

(9) "Dip tank operations" means the immersion of materials in a solution that contains perchloroethylene, for purposes other than dry cleaning, in a tank or container that is separate from the dry cleaning equipment.

(10) "District" means the local air pollution control district or air quality management district.

(11) "Drum" means the rotating cylinder or wheel of the dry cleaning machine that holds the materials being cleaned.

(12) "Dry cleaning equipment" means any machine, device, or apparatus used to dry clean materials with perchloroethylene or to remove residual perchloroethylene from previously cleaned materials. Dry cleaning equipment may include, but is not limited to, a transfer machine, a vented machine, a converted machine, a closed-loop machine, a reclaimer, or a drying cabinet.

(13) "Dry cleaning system" means all of the following equipment, devices, or apparatus associated with the perchloroethylene dry cleaning process: dry cleaning equipment; filter or purification systems; waste holding, treatment, or disposal systems; perchloroethylene supply systems; dip tanks; pumps; gaskets; piping, ducting, fittings, valves, or flanges that convey perchloroethylene-contaminated air; and control systems.

(14) "Drying cabinet" means a housing in which materials previously cleaned with perchloroethylene are placed to dry and which is used only to dry materials that would otherwise be damaged by the heat and tumbling action of the drying cycle.

(15) "Drying cycle" means the process used to actively remove the perchloroethylene remaining in the materials after washing and extraction. For closed-loop machines, the heated portion of the cycle is followed by cool-down and may be extended beyond cool-down by the activation of a control system. The drying cycle begins when heating coils are activated and ends when the machine ceases rotation of the drum.

Rejected

(16) "Environmental training program" means an initial course or a refresher course of the environmental training program for perchloroethylene dry cleaning operations that has been authorized by the Air Resources Board according to the requirements of 17 CCR, Section 93110.

(17) "Equivalent closed-loop vapor recovery system" means a device or combination of devices that achieves, in practice, a perchloroethylene recovery performance equal to or exceeding that of refrigerated condensers.

(18) "Existing facility" means any facility that operated dry cleaning equipment prior to the effective date of this control measure in the district. Facility relocations, within the same district, shall be considered existing facilities for the purposes of this control measure.

(19) "Facility" means any entity or entities which: own or operate perchloroethylene dry cleaning equipment, are owned or operated by the same person or persons, and are located on the same parcel or contiguous parcels.

(20) "Facility mileage" means the efficiency of perchloroethylene use at a facility, expressed as the pounds of materials cleaned per gallon of perchloroethylene used, and calculated for all dry cleaning machines at the facility over a specified time period.

(21) "Fugitive control system" means a device or apparatus that collects fugitive perchloroethylene vapors from the machine door, button and lint traps, still, or other intentional openings of the dry cleaning system and routes those vapors to a device that reduces the mass of perchloroethylene prior to exhaust of the vapor to the atmosphere.

(22) "Full-time employee" means any person who is employed at the dry cleaning facility and averages at least 30 hours per week in any 90-day period.

(23) "Gallons of perchloroethylene used" means the volume of perchloroethylene, in gallons, introduced into the dry cleaning equipment, and not recovered at the facility for reuse on-site in the dry cleaning equipment, over a specified time period.

(24) "Halogenated-hydrocarbon detector" means a portable device capable of detecting vapor concentrations of perchloroethylene of 25 ppmv or less and indicating an increasing concentration by emitting an audible signal or visual indicator that varies as the concentration changes.

(25) "Liquid leak" means a leak of liquid containing perchloroethylene of more than 1 drop every 3 minutes.

(26) "Materials" means wearing apparel, draperies, linens, fabrics, textiles, rugs, leather, and other goods that are dry cleaned.

Rejected

(27) "Muck cooker" means a device for heating perchloroethylene-laden waste material to volatilize and recover perchloroethylene.

(28) "New facility" means a facility that did not operate any dry cleaning equipment prior to the effective date of this control measure in the district. Facility relocations, within the same district, shall not be considered new facilities for the purposes of this control measure.

(29) "Perceptible vapor leak" means an emission of perchloroethylene vapor from unintended openings in the dry cleaning system, as indicated by the odor of perchloroethylene or the detection of gas flow by passing the fingers over the surface of the system. This definition applies for an interim period of 18 months only, beginning on the effective date of this control measure in the district.

(30) "Perchloroethylene (Perc)" means the substance with the chemical formula 'C2Cl4', also known by the name 'tetrachloroethylene', which has been identified by the Air Resources Board and listed as a toxic air contaminant in 17 CCR, Section 93000.

(31) "Perchloroethylene dry cleaning" or "dry cleaning" means the process used to remove soil, greases, paints, and other unwanted substances from materials with perchloroethylene.

(32) "Pounds of materials cleaned per load" means the total dry weight, in pounds, of the materials in each load dry cleaned at the facility, as determined by weighing each load on a scale prior to dry cleaning and recording the value.

(33) "Primary control system" means a refrigerated condenser, or an equivalent closed-loop vapor recovery system approved by the district.

(34) "Reclaimer" means a machine, device, or apparatus used only to remove residual perchloroethylene from materials that have been previously cleaned in a separate piece of dry cleaning equipment.

(35) "Reasonably available", as it applies to an initial course for the environmental training program, means that the course is offered within 200 miles of the district boundaries and that all such courses have a capacity, in the aggregate, that is adequate to accommodate at least one person from each facility in the district required to certify a trained operator at that time.

(36) "Refrigerated condenser" means a closed-loop vapor recovery system into which perchloroethylene vapors are introduced and trapped by cooling below the dew point of the perchloroethylene.

(37) "Secondary control system" means a device or apparatus that reduces the concentration of perchloroethylene in the recirculating air at the end of the drying

Draft

cycle beyond the level achievable with a refrigerated condenser alone. An "integral" secondary control system is designed and offered as an integral part of a production package with a single make and model of dry cleaning machine and primary control system. An "add-on" secondary control system is designed or offered as a separate retrofit system for use on multiple machine makes and models.

(38) "Self-service dry cleaning machine" means a perchloroethylene dry cleaning machine that is loaded, activated, or unloaded by the customer.

(39) "Separator" means any device used to recover perchloroethylene from a water-perchloroethylene mixture.

(40) "Still" means a device used to volatilize and recover perchloroethylene from contaminated solvent removed from the cleaned materials.

(41) "Trained operator" means the owner, the operator, or an employee of the facility, who holds a record of completion for the initial course of an environmental training program and maintains her/his status by successfully completing the refresher courses as required.

(42) "Transfer machine" means a combination of perchloroethylene dry cleaning equipment in which washing and extraction are performed in one unit and drying is performed in a separate unit.

(43) "Vapor adsorber" means a bed of activated carbon or other adsorbent into which perchloroethylene vapors are introduced and trapped for subsequent desorption.

(44) "Vapor leak" means an emission of perchloroethylene vapor from unintended openings in the dry cleaning system, as indicated by a rapid audible signal or visual signal from a halogenated-hydrocarbon detector or a concentration of perchloroethylene exceeding 50 ppmv as methane as indicated by a portable analyzer. This definition applies beginning 18 months after the effective date of this control measure in the district.

(45) "Vented machine" means dry cleaning equipment in which washing, extraction, and drying are all performed in the same single unit and in which fresh air is introduced into the drum in the last step of the drying cycle and exhausted to the atmosphere, either directly or through a control device.

(46) "Waste water evaporator" means a device that vaporizes perchloroethylene-contaminated waste water through the addition of thermal or chemical energy, or through physical action.

(47) "Water-repelling operations" means the treatment of materials with a water-repellent solution that contains perchloroethylene.

Rejected

(b) Applicability. Any person who owns or operates perchloroethylene dry cleaning equipment shall comply with Section 93109.

(c) Initial Notification. The owner/operator shall provide the district with all of the following information, in writing:

(1) By the applicable date shown in column 2 of Table 1.

(A) The name(s) of the owner and operator of the facility.

(B) The facility name and location.

(C) Whether or not the facility is co-located with a residence.

(D) The number, types, and capacities of all dry cleaning equipment.

(E) Any control systems for each dry cleaning machine.

(F) For existing facilities only, the gallons of perchloroethylene purchased by the facility during the previous calendar year.

(2) A district may exempt a source from item (1) of this subsection if the district maintains current equivalent information on the facility.

(d) Recordkeeping. The owner/operator shall maintain records for the specified time period, beginning on the applicable date shown in column 3 of Table 1. These records, or copies thereof, shall be accessible at the facility at all times.

(1) All of the following records shall be retained for at least 2 years or until the next district inspection of the facility, whichever period is longer.

(A) For each dry cleaning machine, a log showing the date and the pounds of materials cleaned per load.

(B) Purchase and delivery receipts for perchloroethylene.

1. For only those facilities with solvent tanks that are not directly filled by the perchloroethylene supplier upon delivery, the date(s) and gallons of perchloroethylene added to the solvent tank of each dry cleaning machine.

(C) The completed leak inspection checklists required by subsection (f)(2) and the operation and maintenance checklists required by subsection (f)(1)(A).

(D) For liquid leaks, perceptible vapor leaks, or vapor leaks that were not repaired at the time of detection, a record of the leaking component(s) of the dry cleaning system awaiting repair and the action(s) taken to complete the repair.

Deleted

The record shall include copies of purchase orders or other written records showing when the repair parts were ordered and/or service was requested.

(2) For dry cleaning equipment installed after the effective date of this control measure in the district, the manufacturer's operating manual for all components of the dry cleaning system shall be retained for the life of the equipment.

(3) The original record of completion for each trained operator shall be retained during the employment of that person. A copy of the record of completion shall be retained for an additional period of two years beyond the separation of that person from employment at the facility.

(e) Annual Reporting. The owner/operator shall maintain an annual report. At the district's discretion, the facility owner or operator shall furnish this annual report to the district by the date specified by the district. The annual report shall include all of the following:

(1) A copy of the record of completion for each trained operator.

(2) The total of the pounds of materials cleaned per load and the gallons of perchloroethylene used for all solvent additions in the reporting period.

(3) The average facility mileage, determined from all solvent additions in the reporting period, as follows:

$$\frac{\text{The Total of the Pounds of Materials Cleaned Per Load}}{\text{The Total of the Gallons of Perchloroethylene Used}}$$

(f) Good Operating Practices. The owner/operator shall not operate dry cleaning equipment after the applicable dates shown in column 5 and column 6 of Table 1, unless all of the following requirements are met:

(1) Operation and maintenance requirements. The trained operator, or his/her designee, shall operate and maintain all components of the dry cleaning system in accordance with the requirements of this section and the conditions specified in the facility's operating permit beginning on the applicable date specified in column 5 of Table 1. For operations not specifically addressed, the components shall be operated and maintained in accordance with the manufacturer's recommendations.

(A) The district shall provide an operation and maintenance checklist to the facility. Each operation and maintenance function and the date performed shall be recorded on the checklist. The operation and maintenance checklist provided by the district shall include, at a minimum, the following requirements:

Deleted

1. Refrigerated condensers shall be operated to ensure that exhaust gases are recirculated until the air-vapor stream temperature on the outlet side of the refrigerated condenser, downstream of any bypass, is less than or equal to 45° F (7.2° C).

2. Primary control systems, other than refrigerated condensers, shall be operated to ensure that exhaust gases are recirculated until the perchloroethylene concentration in the drum is less than or equal to 8,600 ppmv at the end of the drying cycle, before the machine door is opened and any fugitive control system activates.

3 Vapor adsorbers used as a primary control system or secondary control system shall be operated to ensure that exhaust gases are recirculated at the temperature specified by the district, based on the manufacturer's recommendations for optimum adsorption. These vapor adsorbers shall be desorbed according to the conditions specified by the district in the facility's operating permit, including a requirement that no perchloroethylene vapors shall be routed to the atmosphere during routine operation or desorption.

4. During the interim period between compliance with this subsection and compliance with the requirements of subsection (g), an existing facility with a transfer machine or a vented machine shall operate any existing carbon adsorber, which functions during the drying cycle, to meet the following requirements:

   i. Desorption shall be performed periodically, at the frequency specified by the district. The frequency, at a minimum, shall be each time all dry cleaning equipment exhausted to the device has cleaned a total of three pounds of materials for each pound of activated carbon. Desorption shall be performed with the minimum steam pressure and air flow capacity specified by the district.

   ii. Once desorption is complete, the carbon bed shall be fully dried according to the manufacturer's instructions.

   iii. No vented perchloroethylene vapors shall bypass the carbon adsorber to the atmosphere.

5. Cartridge filters and adsorptive cartridge filters shall be handled using one of the following methods.

Draft

i. Drained in the filter housing, before disposal, for no less than: 24 hours for cartridge filters and 48 hours for adsorptive cartridge filters. If the filters are then transferred to a separate device to further reduce the volume of perchloroethylene, this treatment shall be done in a system that routes any vapor to a primary control system, with no exhaust to the atmosphere or workroom.

ii. Dried, stripped, sparged, or otherwise treated, within the sealed filter housing, to reduce the volume of perchloroethylene contained in the filter.

6. A still, and any muck cooker, shall not exceed 75 percent of its capacity, or an alternative level recommended by the manufacturer. A still, and any muck cooker, shall cool to 100° F (38° C) or less before emptying or cleaning.

7. Button and lint traps shall be cleaned each working day and the lint placed in a tightly sealed container.

8. All parts of the dry cleaning system where perchloroethylene may be exposed to the atmosphere or workroom shall be kept closed at all times except when access is required for proper operation and maintenance.

9. Waste water evaporators shall be operated to ensure that no liquid perchloroethylene or visible emulsion is allowed to vaporize.

(2) Leak check and repair requirements. The trained operator, or her/his designee, shall inspect the dry cleaning system for liquid leaks and perceptible vapor leaks beginning on the applicable date shown in column 5 of Table 1. The trained operator, or her/his designee, shall inspect the dry cleaning system for vapor leaks instead of perceptible vapor leaks beginning 18 months after the effective date of this control measure in the district. The district shall provide a leak inspection checklist to the facility. The trained operator, or her/his designee, shall record the status of each component on the checklist.

(A) The dry cleaning system shall be inspected at least once per week for liquid leaks and:

1. For perceptible vapor leaks, beginning on the applicable date shown in column 5 of Table 1 until 18 months after the effective date of this control measure in the district.

2. For vapor leaks, beginning 18 months after the effective date of this control measure in the district, using one of the following techniques:

Rejected

i. A halogenated-hydrocarbon detector.

ii. A portable gas analyzer or an alternative method approved by the district.

(B) Any liquid leak, perceptible vapor leak, or vapor leak that has been detected by the operator shall be noted on the checklist and repaired according to the requirements of this subsection. If the leak is not repaired at the time of detection, the leaking component shall be physically marked or tagged in a manner that is readily observable by a district inspector.

(C) Any liquid leak, perceptible vapor leak, or vapor leak detected by the district, which has not been so noted on the checklist and marked on the leaking component of the dry cleaning system, shall constitute a violation of this section. For enforcement purposes, the district shall:

1. Identify the presence of a perceptible vapor leak based on the odor of perchloroethylene or the detection of gas flow by passing the fingers over the surface of the system.

2. Identify the presence of a vapor leak by determining the concentration of perchloroethylene with a portable analyzer.

i. According to ARB Test Method 21 (17 CCR, Section 94124, March 28, 1986).

ii. Measured 1 cm. away from the dry cleaning system.

(D) Any liquid leak or vapor leak shall be repaired within 24 hours of detection.

1. If repair parts are not available at the facility, the parts shall be ordered within two working days of detecting such a leak. Such repair parts shall be installed within five working days after receipt. A facility with a leak that has not been repaired by the end of the 15th working day after detection shall not operate the dry cleaning equipment, until the leak is repaired, without a leak-repair extension from the district.

2. A district may grant a leak-repair extension to a facility, for a single period of 30 days or less, if the district makes these findings:

i. The delay in repairing the leak could not have been avoided by action on the part of the facility.

ii. The facility used reasonable preventive measures and acted promptly to initiate the repair.

Rejected

iii. The leak would not significantly increase Perc exposure near the facility.

iv. The facility is in compliance with all other requirements of this section and has a history of compliance.

(3) Environmental training requirements. The facility shall have one or more trained operators beginning on the applicable date shown in column 6 of Table 1.

(A) A trained operator shall be the owner, the operator, or another employee of the facility, who successfully completes the initial course of an environmental training program to become a trained operator. Evidence of successful completion of the initial course shall be the original record of completion issued pursuant to 17 CCR, Section 93110. The trained operator shall be a full-time employee of the facility. Except for the provisions of subsection (f)(3)(C)2., one person cannot serve as the trained operator for two or more facilities simultaneously.

(B) Each trained operator shall successfully complete the refresher course of an environmental training program at least once every three years. Evidence of successful completion of each refresher course shall be the date of the course and the instructor's signature on the original record of completion.

(C) If the facility has only one trained operator and the trained operator leaves the employ of the facility, the facility shall:

1. Notify the district in writing within 30 days of the departure of the trained operator.

2. Obtain certification for a replacement trained operator within 3 months, except that a trained operator who owns or manages multiple facilities may serve as the interim trained operator at two of those facilities simultaneously for a maximum period of 4 months, by which time each facility must have its own trained operator.

3. If the district determines that the initial course of an environmental training program is not reasonably available, the district may extend the certification period for a replacement trained operator until 1 month after the course is reasonably available.

(g) Equipment. The owner/operator shall not operate dry cleaning equipment after the applicable date shown in column 7 of Table 1, unless the following requirements are met:

Deleted

(1) Prohibited Equipment. The owner/operator shall not operate any of the following types of dry cleaning equipment after the applicable date shown in column 7 of Table 1.

(A) A transfer machine, including any reclaimer or other device in which materials that have been previously dry cleaned with perchloroethylene are placed to dry, except a drying cabinet that meets the requirements of item (4)(A) of this subsection.

(B) A vented machine.

(C) A self-service dry cleaning machine.

(2) Required Equipment. The owner/operator of each new or existing facility shall meet the applicable requirements of Table 1 as follows:

(A) For an existing facility:

1. Within 12 months of the effective date of this control measure in the district, choose either Option 1 or Option 2 of Table 1 and notify the district of her/his choice.

2. Comply with the requirements of Option 2, notwithstanding her/his choice of Option 1, if the facility does not meet the applicable requirements for Option 1 within 18 months of the effective date of this control measure in the district.

3. Install, operate, and maintain the required equipment for the option chosen, as shown in column 1 of Table 1 for existing facilities.

(B) A new facility shall install, operate, and maintain the required equipment shown in column 1 of Table 1 for new facilities. The applicable requirements shall be determined based on the date the facility commences operation of the dry cleaning equipment.

(3) Specifications for Required Equipment. Required equipment shall meet the following specifications:

(A) A primary control system shall:

1. Operate during both the heated and cool-down phases of the drying cycle to reduce the mass of perchloroethylene in the recirculating air stream.

2. Not exhaust to the atmosphere or workroom.

Deleted

3. Not require the addition of any form of water to the primary control system that results in physical contact between the water and perchloroethylene.

4. For refrigerated condensers only:

   i. Be capable of achieving an outlet vapor temperature, downstream of any bypass, of less than or equal to 45° F (7.2° C) during cool-down; and

   ii. Have a graduated thermometer with a minimum range from 0° F (-18° C) to 150° F (66° C), which measures the temperature of the outlet vapor stream, downstream of any bypass of the condenser, and is easily visible to the operator.

5. For equivalent closed-loop vapor recovery systems:

   i. Use a technology that has been demonstrated, pursuant to the requirements of subsection (h), to achieve a perchloroethylene concentration of 8,600 ppmv or less in each test.

   ii. Have a device that measures the perchloroethylene concentration, or a demonstrated surrogate parameter, in the drum at the end of each drying cycle, before the machine door is opened and any fugitive control system activates, and indicates if the concentration is above or below 8,600 ppmv. This device shall be installed such that the reading is easily visible to the operator.

(B) A converted machine shall meet all of the following requirements, as demonstrated on-site to the district, either upon conversion or prior to compliance with the requirements of subsection (g)(2)(A):

1. All process vents that exhaust to the atmosphere or workroom during washing, extraction, or drying shall be sealed.

2. The converted machine shall use an appropriately-sized primary control system to recover perchloroethylene vapor during the heated and cool-down phases of the drying cycle.

   i. A refrigerated condenser shall be considered appropriately sized, for a machine converted on or after the date that this section is filed with the Secretary of State, if all of the following conditions are met:

      a. The water-cooled condensing coils are replaced with refrigerant-cooled condensing coils.

DRAFT

b. The compressor of the refrigerated condenser shall have a capacity, in horsepower (hp) that is no less than the minimum capacity, determined as follows:

$$\text{Minimum Capacity (hp)} = \frac{\text{Capacity of the Machine (lbs)}}{12}$$

ii. A refrigerated condenser shall be considered appropriately sized, for a machine converted prior to the date that this section is filed with the Secretary of State, if the conditions a., or b. below are met:

a. The refrigerated condenser shall meet the specifications for new conversions in subsection (g)(3)(B)2.i.

b. The refrigerated condenser shall achieve, and maintain for 3 minutes, an outlet vapor temperature, measured downstream of the condenser and any bypass of the condenser, of less than or equal to 45° F (7.2° C) within 10 minutes of the initiation of cool-down.

iii. An equivalent closed-loop vapor recovery system shall be appropriately sized for the conversion of a vented machine if the system does not extend the total drying time by more than five minutes to meet the specifications of subsection (g)(3)(A)5.

3. The converted machine shall operate with no liquid leaks and no vapor leaks. Any seal, gasket, or connection determined to have a liquid leak or vapor leak shall be replaced.

(C) A secondary control system shall:

1. Be designed to function with a primary control system or be designed to function as a combined primary control system and secondary control system that meets all of the applicable requirements of this section.

2. Not exhaust to the atmosphere or workroom.

3. Not require the addition of any form of water to the secondary control system that results in physical contact between the water and perchloroethylene.

4. Use a technology that has been demonstrated, pursuant to the requirements of subsection (h), to achieve a perchloroethylene concentration in the drum of 300 ppmv or less in each test.

DRAFT

5. Have a holding capacity equal to or greater than 200 percent of the maximum quantity of perchloroethylene vapor expected in the drum prior to activation of the system.

6. For add-on secondary control systems only, the system shall be sized and capable of reducing the perchloroethylene concentration in the drum from 8,600 ppmv or greater to 300 ppmv or less in the maximum volume of recirculating air in the dry cleaning machine and all contiguous piping.

(4) Specifications for Other Equipment.

(A) A drying cabinet shall:

1. Be fully enclosed.

2. Be exhausted via one of the following methods:

i. To a control system that has been demonstrated, pursuant to the requirements of subsection (h), to achieve a perchloroethylene concentration of 100 ppmv or less in each test, measured at the outlet without dilution.

ii. To a control system that reduces the concentration of perchloroethylene in a closed system with no exhaust to the atmosphere or workroom.

(h) Equipment Testing. For a given design, a single test program shall be conducted, in accordance with the following procedures, to meet the specifications in subsections (g)(3) and (g)(4). The person or organization conducting the test program shall prepare a written test plan that describes, in detail, the dry cleaning machine and control systems being tested, the test protocol, and the test method.

(1) Test Program and Scope. A minimum of three tests shall be conducted for each test program on each control system design. All tests for a single test program shall be conducted on a single dry cleaning machine.

(A) Test results for a primary control system design, or an add-on secondary control system design, may be applied to a different make/model of dry cleaning machine if the equipment designer or facility demonstrates, to the satisfaction of the district, that:

1. The test results would be representative of the performance of the control system design on the different make/model of dry cleaning machine.

2. The control system design is properly sized for the maximum volume of recirculating air in the dry cleaning machine during the drying cycle.

Deleted

(B) Test results for an integral secondary control system design may not be applied to a different make/model of dry cleaning machine.

(2) Test Conditions. Testing shall be conducted under normal operating conditions, unless otherwise specified.

(A) For primary control systems and secondary control systems, each test shall be conducted during the cleaning of one load of materials.

1. The machine shall be filled to no less than 75 percent of its capacity with materials for each test.

2. The weight of materials shall be recorded for each test.

(B) A primary control system shall be tested on a closed-loop machine, or a converted machine, without a secondary control system.

(C) A secondary control system shall be tested on a closed-loop machine.

1. An integral secondary control system shall be tested with the primary control system operating normally.

2. An add-on secondary control system shall be tested independent of a primary control system and the initial perchloroethylene concentration in the drum shall be 8,600 ppmv or greater.

(D) For a control system on the exhaust of a drying cabinet, each test shall be conducted following the placement of materials cleaned with perchloroethylene in the drying cabinet. The materials shall be transferred to the drying cabinet and testing shall begin no later than 15 minutes after the end of the washing and extraction process.

1. The drying cabinet shall be filled to no less than 50 percent of its capacity with materials for each test.

2. The weight of materials shall be recorded for each test.

(3) Test Method. Equipment shall be tested in accordance with the following methods.

(A) For primary control systems and secondary control systems:

1. The temperature of the air in the drum shall be measured and recorded continuously during the entire drying cycle, including the operation of the secondary control system.

2. Sampling shall be conducted as follows:

Deleted

i. For primary control systems and integral secondary control systems, sampling shall begin at the end of the drying cycle and be completed within 5 minutes.

ii. For add-on secondary control systems, sampling shall be done when the concentration of perchloroethylene is 8,600 ppmv or greater and again when the concentration reaches 300 ppmv or less.

iii. Sampling shall be completed prior to the opening of the machine door and activation of any fugitive control system.

3. The perchloroethylene concentration in the drum shall be determined by one of the following methods:

i. A sampling port and valve shall be appropriately placed to draw a sample from the interior of the drum or the lint filter housing. The sampling port shall be connected to a gas chromatograph by one-quarter (1/4-) inch, outside diameter, Teflon tubing. Any sampling pump shall have Teflon diaphragms. The gas chromatograph shall measure the concentrations of perchloroethylene in accordance with ARB Method 422 (17 CCR, Section 94132, December 31, 1991) or NIOSH Method 1003 (NIOSH Manual of Analytical Methods, U.S. Department of Health and Human Services, August 15, 1987).

ii. A sampling port and valve shall be appropriately placed to draw a sample from the interior of the drum or the lint filter housing. The sampling port shall be connected by one-quarter (1/4-) inch outside diameter Teflon tubing to a Tedlar bag. Any sampling pump shall have Teflon diaphragms. The concentration of perchloroethylene in the air sampled shall be measured in accordance with ARB Method 422 (17 CCR, Section 94132, December 31, 1991) or NIOSH Method 1003 (NIOSH Manual of Analytical Methods, U.S. Department of Health and Human Services, August 15, 1987) within 24 hours of sampling. If an independent laboratory is contracted to perform the analysis of the samples, the chain of custody procedures contained in ARB Method 422 or NIOSH Method 1003 shall be followed.

(B) For a control device on the exhaust of a drying cabinet, sampling and analysis shall be conducted using ARB Method 422 (17 CCR, Section 94132, December 31, 1991) or NIOSH Method 1003 (NIOSH Manual of Analytical Methods, U.S. Department of Health and Human Services, August 15, 1987).

(C) An alternative test method deemed acceptable by the Air Pollution Control Officer or Executive Officer of the district and the Executive Officer of the Air Resources Board.

DRAFT

(4) All test plans and test results shall be made available to the district and the Executive Officer of the California Air Resources Board upon request.

(i) Water-repelling and Dip Tank Operations. No person shall perform water-repelling or dip tank operations, after the applicable date shown in column 8 of Table 1, unless all of the following requirements are met:

(1) All materials to be treated with perchloroethylene water-repelling solutions shall be treated in a closed-loop machine, a converted machine, or a dip tank.

(2) For dip tank operations:

(A) The dip tank shall be fitted with a cover that prevents the escape of perchloroethylene vapors from the tank and shall remain covered at all times, except when materials are placed in and removed from the dip tank or while the basket is moved into position for draining.

(B) After immersion, the materials shall be drained within the covered dip tank until dripping ceases.

(C) All materials removed from a dip tank shall be immediately placed into a closed-loop machine or a converted machine for drying and not removed from the machine until the materials are dry.

(j) Compliance. A facility shall comply with all provisions of this section as follows:

(1) By the applicable dates of compliance specified in column 1 through column 8 of Table 1.

(2) For compliance with subsection (f)(3) "Environmental Training Requirements", an alternative date of compliance shall apply if the district determines that the initial course of an environmental training program for perchloroethylene dry cleaning operations is not reasonably available.

(A) For existing facilities in the district, if the initial course is not reasonably available within 12 months of the effective date of this control measure in the district, the alternative date of compliance for subsection (f)(3) only shall be 6 months from the date the district determines that the initial course is reasonably available.

(B) For each new facility in the district, if the initial course is not reasonably available within the period from 3 months prior to 2 months following commencement of operation, the alternative date of compliance for subsection (f)(3) only shall be 1 month from the date the district determines that the initial course is reasonably available.

Rejected

Authority cited: Sections 39600, 39601, 39650, 39655, 39656, 39658, 39659, 39665, and 39666, Health and Safety Code; Sections 7412 and 7416, Title 42, United States Code.

Reference: Sections 39650, 39655, 39656, 39658, 39659, and 39666, Health and Safety Code; Sections 7412 and 7414, Title 42, United States Code; Sections 63.320, 63.321, 63.323, and 63.324, Title 40, Code of Federal Regulations.

Deleted

TABLE 1

Equipment Requirements and Summary of Compliance Times for Existing and New Facilities

Facility Type	EQUIPMENT REQUIREMENTS		DATE OF COMPLIANCE (after the effective date of this control measure in the district)						
		Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
	Compliance Option(s)	Required Dry Cleaning Equipment	Initial Notification	Recordkeeping	Annual Reporting	Leak Check and Repair, Operation & Maintenance Requirements	Environmental Training Requirements	Equipment Requirements	Water-Repelling and Dip Tank Requirements
EXISTING FACILITIES	Option 1 or	Converted Closed-Loop Machine with Primary Control System	60 days	60 days	Specified by district	60 days	18 months	18 months	18 months
	Option 2	Closed-loop Machine with Primary Control System	60 days	60 days	Specified by district	60 days	18 months	48 months	18 months
NEW FACILITIES Commencing Operations prior to 18 months After the Effective Date of This Control Measure in the District									
		Closed-loop Machine with a Primary Control System	On application for permit	Upon commencement of operation	Specified by district	Upon commencement of operation	3 months following commencement of operation	Upon commencement of operation	Upon commencement of operation
NEW FACILITIES Commencing Operations 18 months or Later After the Effective Date of This Control Measure in the District									
		Closed-loop Machine with a Primary Control System and a Secondary Control System	On application for permit	Upon commencement of operation	Specified by district	Upon commencement of operation	3 months following commencement of operation	Upon commencement of operation	Upon commencement of operation

Draft

Appendix B

Health Risk Assessment Methodology for Dry Cleaning Operations

Appendix B

Health Risk Assessment Methodology for Dry Cleaning Operations

A. Introduction

This appendix presents the methodology used to estimate the potential cancer and noncancer health impacts from exposure to Perc emitted during dry cleaning activities. Also included are results from the four meteorological data sets.

As discussed in Chapter IV, the assumptions used to determine the potential health impacts are based on a selection of generic modeling scenarios for routine dry cleaning operations throughout the state. The generic facilities were created from the evaluation of over 1,600 responses to a facility survey, information obtained during over 100 site visits, and input from draft industry-specific reports, industry representatives, and from Air Pollution Control or Air Quality Management Districts staff regarding dry cleaning operations. The generic release scenarios used in the HRA are presented in Section B of this appendix. This assessment uses meteorological data sets from four locations in California. Those locations are Anaheim, Fresno, Oakland (port), and San Diego (Miramar). Emissions, source release parameters, and modeling inputs are discussed in the sections which follow.

B. Emission Estimates

Emissions for the risk assessment were based on generic unit emission rates of 100 gallons per year (1,350 pounds per year) for annual emissions and 0.1 gallons per hour (1.35 pounds per hour) for hourly emissions. Since risk assessment results are based on generic emission rates, they can be easily adjusted to reflect any emission rate scenario. Tables B-3 to B-6 use the generic emission rates.

Table B-1 shows the average and high-end (90th percentile) annual Perc emission rates that were used in Chapter IV of this report for dry cleaners with converted machines, primary controls, and secondary control. According to the facility survey results and our site visits, approximately 90 percent of dry cleaners emit below the high-end annual emission rate. The purpose for showing these two emission rates is to provide a perspective for Perc emissions at dry cleaning facilities in California. Hourly emissions are also shown for the three machines. The hourly emissions are based on the 10th percentile of mileage and 90th percentile for machine capacity from our survey results.

Table B-1. Emissions Rates

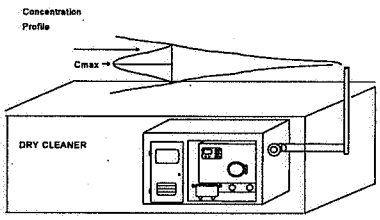
Scenario	Annual (gallons/year)		Hourly (gallons/hour)
	High-End Emissions [1]	Average Emissions	
Converted Machine	113	76	0.45
Primary Control	94	52	0.13
Secondary Control	61	34	0.06

1. High–end emissions are defined by the 90th percentile of emissions.

C. Generic Dry Cleaner Configurations

Eight generic dry cleaner scenarios were used for the air dispersion modeling. The generic release scenarios used in the HRA are presented below in Figures (a) – (f).

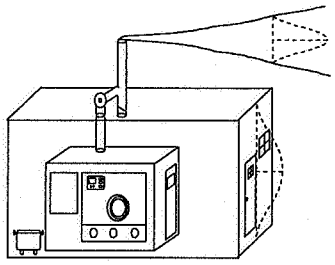
Figure (a) FULL VAPOR BARRIER ROOM (FVR)



For modeling purposes, assume: 100% capture by vapor barrier room (VBR), all emission modeled as point source.

POINT SOURCE:
Q = 1000 CFM; V = 15 m/s.
Stack Height = 5 feet + building ht. = 17 feet (5.18 m).
Diameter = 0.2 meters (8 inches).
Building Height = 12 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).

Figure (b) PARTIAL VAPOR BARRIER ROOM (PVR)

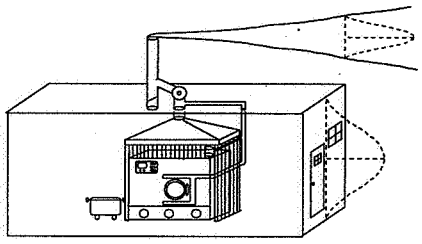


For modeling purposes, assume: 95% capture by PVR, 95% of emissions modeled as point source, 5% of emissions are treated as fugitive and modeled as volume source.

POINT SOURCE:
Q = 1000 CFM; V = 15 m/s.
Stack Height = 5 feet + building ht. = 17 feet (5.18 m).
Diameter = 0.2 meters (8 inches).
Building Height = 12 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).

VOLUME SOURCE:
σ_{yo} = Length/4.3.
σ_{zo} = Height/ 2.15.
Building Height = 12 feet.
Release Ht = 0.5 Shop Ht = 6 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).

Figure (c) LOCAL VENTILATION (L-VENT)

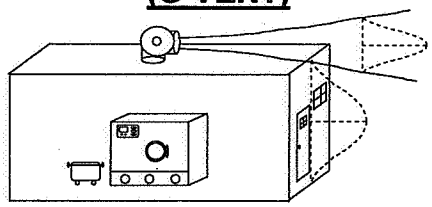


For modeling purposes, assume for typical system: 80% of emissions captured by fan and modeled as a point source, 20% of emissions are fugitive & modeled as volume source.

POINT SOURCE:
Q = 2500 CFM; V = 15 m/s.
Stack Height = 5 feet + building= 17 feet (5.18 m).
Diameter = 0.3 meters (12 inches).
Building Height = 12 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).

VOLUME SOURCE:
σ_{yo} = Length/4.3.
σ_{zo} = Height/ 2.15.
Building Height = 12 feet.
Release Ht = 0.5 Shop Ht = 6 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).

Figure (d) GENERAL VENTILATION (G-VENT)

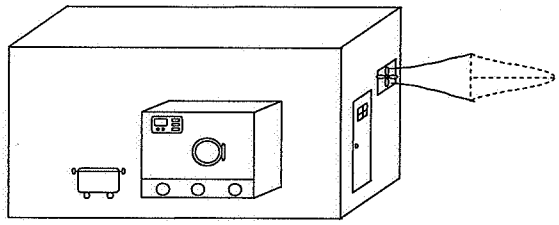


For modeling purposes, assume for typical system (< 1 change per 5 minutes): 60% capture of emissions by fan and modeled as horizontal point source, 40% of emissions are fugitive & modeled as volume source.

POINT SOURCE:
Q = 2500 CFM; V = 0.001 m/s (Exit velocity is 0.001 m/s and Q to 0.154 acfm to simulate horizontal flow, stack tip downwash off).
Stack Height = 1.5 feet + building= 13.5 feet (4.11 m).
Diameter = 0.3 meters (12 inches).
Building Height = 12 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).
Scenario (B):
Stack Height = 1.5 feet + building= 19.5 feet (5.94 m).
Diameter = 0.3 meters (12 inches).
Building Height = 18 feet.
Shop Size = Approximately 2500 ft^2.
Building Width = 15 meters (49.2 ft.).
Building Length = 15 meters (49.2 ft.).

VOLUME SOURCE:
σ_{yo} = Length/4.3.
σ_{zo} = Height/ 2.15.
Building Height = 12 feet.
Release Ht = 0.5 Shop Ht = 6 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).
Scenario (B):
Building Height = 18 feet.
Release Ht = 0.5 Shop Ht = 9 feet.
Shop Size = Approximately 2500 ft^2.
Building Width = 15 meters (49.2 ft.).
Building Length = 15 meters (49.2 ft.).

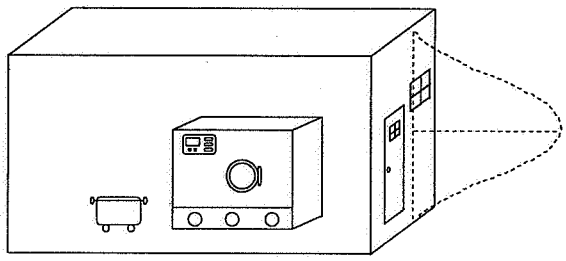
Figure (e) WINDOW FAN (WIN FAN)



For modeling purposes, assume: 100% of the emission are modeled as a horizontal point source.

POINT SOURCE:
Q = 5000 CFM, V = 0.001 m/s (Exit velocity is 0.001 m/s and Q to 0.154 acfm to simulate horizontal flow, stack tip downwash off).
Fan Height = 8 feet.
Diameter = 0.3 meters (12 inches).
Building Height = 12 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).

Figure (f) NATURAL VENTILATION (N-VENT)



For modeling purposes, assume: 100% of emissions are fugitive & modeled as volume source.

VOLUME SOURCE:
σ_{yo} = Length/4.3.
σ_{zo} = Height/ 2.15.
Scenario A:
Building Height = 12 feet.
Release Ht = 0.5 Shop Ht = 6 feet.
Shop Size = Approximately 1100 ft^2.
Building Width = 10 meters (32.8 ft.).
Building Length = 10 meters (32.8 ft.).
Scenario (B):
Building Height = 18 feet.
Release Ht = 0.5 Shop Ht = 9 feet.
Shop Size = Approximately 2500 ft^2.
Building Width = 15 meters (49.2 ft.).
Building Length = 15 meters (49.2 ft.).

For all of the dry cleaner scenarios, stack releases are modeled as a point source and fugitive releases are modeled as a volume source. The dimensions of the volume source are assumed to be the size of the dry cleaning shop (not the size of the entire building). For those configurations with a stack that simulates the presence of a rain cap or which are vented horizontally, these facilities were modeled according to OEHHA and U.S. EPA guidance. In summary, that guidance states that stack gas exit velocity, gas temperature, and stack diameter are used to estimate plume rise based on the greater of thermal buoyancy or momentum. In the presence of a rain cap or horizontal vent, then the momentum plume rise is negated. Since a window fan and a general ventilation system do not have a vertical component to the exit velocity, the momentum component of plume rise equations should not be used. In addition, since the exhaust gas from the facility is near to ambient conditions, the thermal buoyancy portion of the plume rise equations should not be used either.

To simulate these conditions with a point source release with the ISCST3 air dispersion model, the exit velocity is set to 0.001 m/s (meters per second) and stack tip downwash is turned off, as recommended in *The Air Toxics Hot Spots Risk Assessment Guidelines; Part IV; Exposure Assessment and Stochastic Analysis Technical Support Document*, September 2000, (OEHHA, 2000b) and the U.S. EPA Model Clearinghouse Memo, July 9, 1993 (U.S. EPA, 1993). Also recommended in the guidelines is to reduce the stack height by three stack diameters (this is for the maximum stack-tip downwash effect). However, this would reduce the stack tip to a level below the roof-top, which is physically impossible. Therefore, the stack height is not adjusted.

C. Air Dispersion Modeling

The model that was used during this HRA was the Hot Spots Analysis and Reporting Program (HARP) (ARB, 2005h). HARP includes an air dispersion model, ISCST3. U.S. EPA recommends the ISCST3 model for refined air dispersion modeling (U.S. EPA, 1995). HARP is a recommended tool for risk analysis in California and can be used for most source types (e.g., point, area, and volume sources) and is currently used by the ARB, districts, and other states.

The eight generic dry cleaning scenarios and modeling inputs presented Section B were used for the risk assessment. This data was used in the air dispersion modeling analysis to estimate downwind concentrations. This assessment uses meteorological data sets from four locations in California. Those locations are Anaheim (81), Fresno (85-89), Oakland (port) (98-00), and San Diego (Miramar) (67-71). The year(s) of meteorological data used at each location are listed in the parenthesis. Eight-hour emission rate scalars were used when modeling the generic scenarios. All scenarios used urban dispersion, flat terrain, and building downwash.

D. Risk Assessment Results

Tables B-3 to B-6 provide an overview of the potential cancer risk between 20 and 400 meters for residential and (off-site) worker receptors exposed to the emissions of Perc from generic dry cleaners using secondary control. The potential

health impacts are presented for generic facilities; therefore, the potential health impacts at an actual facility may vary due to that facility's individual characteristics. For any receptor located closer than 20 meters from a dry cleaner, it is possible that their potential health impacts may be either higher or lower than the results presented in this report. Factors that may contribute to this variation include meteorology (wind and weather) and the individual release characteristics at each facility. Currently, 20 meters is the minimum air dispersion modeling distance used by the ARB in their Air Toxics Program. Since 1997, the districts have used 20 meters as the minimum modeled distance in the industrywide risk assessment guidelines for sources in the Air Toxics Hot Spots Program. The impacts at other distances are presented to provide perspective for the potential health impacts at distances further away from a dry cleaner.

These tabulated results address each dry cleaner scenario presented in Section B and are broken down by meteorological data set. The results are presented assuming a unit emission rate of 1,350 pound per year (100 gallons per year). The results for residential receptors are presented using the high-end (393 L/kg-day), 80th percentile (302 L/kg-day), and average (271 L/kg-day) breathing rate point estimates under a 70-year exposure duration. The off-site worker scenario uses the worker breathing rate point estimate (149 L/kg-day) and a 40-year exposure duration. This risk assessment used the Tier 1 methodology outlined in the OEHHA Guidelines (OEHHA, 2003a). In conjunction with the OEHHA Guidelines, staff also followed the ARB's Interim Risk Management Policy (ARB, 2003a).

Each table shows the potential cancer risk to a distance of 400 meters. Potential cancer risks at distances beyond this point are no larger than one chance per million. Because the tables have spacing restraints, all scenario types are abbreviated. These abbreviations are defined in Table B-2.

Table B-2. Scenario Abbreviations for Tables B-3 to B-6

Full Name	Abbreviation
Window Fan	WinFan
Natural Ventilation	N-Vent
Natural Ventilation (B)	N-Vent B
General Ventilation (60/40)	G-Vent (60/40)
General Ventilation (B) (60/40)	G-Vent B (60/40)
Local Ventilation (80/20)	L-Vent (80/20)
Partial Vapor Barrier Room (95/5)	PVR (95/5)
Full Vapor Barrier Room	FVR

Table B-3. Potential Cancer Risk at Residential and Off-site Worker Receptors from Generic Dry Cleaners Using Secondary Control and Anaheim Meteorological Data[1, 2]

Scenario	CANCER RISK (chances per million)															
	Distance (meters)[3]															
	20	30	40	50	60	70	80	90	100	120	140	160	180	200	300	400
Resident – High-End Breathing Rate																
WinFan	205	117	73	51	39	30	24	20	17	12	10	8	6	5	2	2
N-Vent	160	98	67	46	37	29	24	20	16	12	9	7	6	5	2	2
N-Vent B[4]	112	70	51	38	30	24	20	17	14	11	8	7	6	5	2	1
G-Vent (60/40)[5]	164	100	65	47	36	29	23	19	16	12	9	7	6	5	2	2
G-Vent B[4] (60/40)[5]	108	73	51	38	29	23	19	16	14	10	8	7	6	5	2	1
L-Vent (80/20)[5,6]	61	44	33	27	22	18	15	13	11	8	7	5	4	4	2	1
PVR (95/5)[5,6]	72	54	41	32	26	21	17	14	12	9	7	6	5	4	2	1
FVR[6]	68	52	40	32	25	20	17	14	12	9	7	6	5	4	2	1
Resident – 80th Percentile Breathing Rate																
WinFan	158	90	56	39	30	23	18	15	13	9	7	6	5	4	2	1
N-Vent	123	75	51	35	28	22	18	15	12	9	7	6	5	4	2	1
N-Vent B[4]	86	54	39	29	23	18	15	13	11	8	6	5	4	4	2	1
G-Vent (60/40)[5]	126	77	50	36	28	22	18	15	12	9	7	6	5	4	2	1
G-Vent B[4] (60/40)[5]	83	56	39	29	22	18	15	12	11	8	6	5	4	4	2	1
L-Vent (80/20)[5,6]	47	34	25	21	17	14	12	10	8	6	5	4	3	3	2	1
PVR (95/5)[5,6]	55	41	32	25	20	16	13	11	9	7	5	4	4	3	2	1
FVR[6]	52	40	31	25	19	15	13	11	9	7	5	4	4	3	2	1
Resident – Average Breathing Rate																
WinFan	141	81	50	35	27	21	17	14	12	8	7	5	4	3	2	1
N-Vent	110	68	46	32	26	20	17	14	11	8	6	5	4	3	2	1
N-Vent B[4]	77	48	35	26	21	17	14	12	10	8	6	5	4	3	2	1
G-Vent (60/40)[5]	113	69	45	32	25	20	16	13	11	8	6	5	4	3	2	1
G-Vent B[4] (60/40)[5]	74	50	35	26	20	16	13	11	10	7	6	5	4	3	2	1
L-Vent (80/20)[5,6]	42	30	23	19	15	12	10	9	8	6	4	4	3	3	1	1
PVR (95/5)[5,6]	50	37	28	22	18	14	12	10	8	6	5	4	3	3	2	1
FVR[6]	47	36	28	22	17	14	12	10	8	6	5	4	3	3	2	1
Off-site Worker																
WinFan	131	75	46	32	25	19	15	13	11	8	6	5	4	3	2	1
N-Vent	102	62	43	29	24	18	15	13	10	8	6	5	4	3	2	1
N-Vent B[4]	71	45	32	24	19	15	13	11	9	7	5	4	4	3	1	1
G-Vent (60/40)[5]	104	64	41	30	23	18	15	12	10	8	6	5	4	3	2	1
G-Vent B[4] (60/40)[5]	69	46	32	24	18	15	12	10	9	6	5	4	4	3	1	1
L-Vent (80/20)[5,6]	39	28	21	17	14	11	10	8	7	5	4	3	3	2	1	1
PVR (95/5)[5,6]	46	34	26	20	17	13	11	9	8	6	4	4	3	3	1	1
FVR[6]	43	33	25	20	16	13	11	9	8	6	4	4	3	3	1	1

1. All results are rounded and represent generic dry cleaning scenarios using secondary control technology. Results are presented using a Perc unit emission rate of 1,350 pounds per year (100 gallons /yr).
2. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. This risk assessment is based on the methodology outlined in The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003 (OEHHA Guidelines) (OEHHA, 2003a) and the ARB's Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk (ARB, 2003a).
3. Distances are presented from the building edge.
4. Building is approximately 2,500 square feet. Other scenarios use a building approximately 1,100 square feet.
5. Values identified within the parenthesis identify the ratio that emissions are modeled from a point and volume source.
6. Denotes an enhanced ventilation scenario.

Table B-4. Potential Cancer Risk at Residential and Off-site Worker Receptors from Generic Dry Cleaners Using Secondary Control and Fresno Meteorological Data[1, 2]

Scenario	CANCER RISK (chances per million)															
	Distance (meters)[3]															
	20	30	40	50	60	70	80	90	100	120	140	160	180	200	300	400
Resident – High-End Breathing Rate																
WinFan	103	63	41	29	21	16	13	10	9	6	5	4	3	2	1	<1
N-Vent	90	54	36	26	19	15	12	10	8	6	5	4	3	2	1	<1
N-Vent B[4]	62	40	28	21	16	13	10	9	7	5	4	3	3	2	1	<1
G-Vent (60/40)[5]	83	53	36	26	20	15	12	10	8	6	5	4	3	2	1	<1
G-Vent B[4] (60/40)[5]	53	37	28	21	16	13	11	9	7	6	4	3	3	2	1	<1
L-Vent (80/20)[5,6]	48	34	25	19	15	12	10	8	7	5	4	3	3	2	1	<1
PVR (95/5)[5,6]	50	37	27	21	16	13	11	9	8	6	4	3	3	2	1	<1
FVR[6]	48	36	27	20	16	13	10	9	7	6	4	3	3	2	1	<1
Resident – 80th Percentile Breathing Rate																
WinFan	79	48	32	22	16	12	10	8	7	5	4	3	2	2	1	<1
N-Vent	69	41	28	20	15	12	9	8	6	5	4	3	2	2	1	<1
N-Vent B[4]	48	31	22	16	12	10	8	7	6	4	3	3	2	2	1	<1
G-Vent (60/40)[5]	64	41	28	20	15	12	9	8	6	5	4	3	2	2	1	<1
G-Vent B[4] (60/40)[5]	41	28	22	16	12	10	8	7	6	4	3	3	2	2	1	<1
L-Vent (80/20)[5,6]	37	26	19	15	12	9	8	6	5	4	3	3	2	2	1	<1
PVR (95/5)[5,6]	38	28	21	16	12	10	8	7	6	4	3	3	2	2	1	<1
FVR[6]	37	28	21	15	12	10	8	7	6	4	3	3	2	2	1	<1
Resident – Average Breathing Rate																
WinFan	71	43	28	20	14	11	9	7	6	4	3	3	2	2	1	<1
N-Vent	62	37	25	18	13	10	8	7	6	4	3	2	2	2	1	<1
N-Vent B[4]	43	28	19	14	11	9	7	6	5	4	3	2	2	2	1	<1
G-Vent (60/40)[5]	57	37	25	18	14	10	8	7	6	4	3	2	2	2	1	<1
G-Vent B[4] (60/40)[5]	37	26	19	14	11	9	8	6	5	4	3	2	2	2	1	<1
L-Vent (80/20)[5,6]	33	23	17	13	10	8	7	6	5	4	3	2	2	2	1	<1
PVR (95/5)[5,6]	34	26	19	14	11	9	8	6	5	4	3	2	2	2	1	<1
FVR[6]	33	25	19	14	11	9	7	6	5	4	3	2	2	2	1	<1
Off-site Worker																
WinFan	66	40	26	18	13	10	8	6	6	4	3	2	2	2	1	<1
N-Vent	57	34	23	17	12	10	8	6	5	4	3	2	2	2	1	<1
N-Vent B[4]	39	25	18	13	10	8	6	5	5	3	3	2	2	1	1	<1
G-Vent (60/40)[5]	53	34	23	17	13	10	8	6	5	4	3	2	2	2	1	<1
G-Vent B[4] (60/40)[5]	34	24	18	13	10	8	7	6	5	4	3	2	2	1	1	<1
L-Vent (80/20)[5,6]	31	22	16	12	10	8	6	5	5	3	3	2	2	1	1	<1
PVR (95/5)[5,6]	32	24	17	13	10	8	7	6	5	4	3	2	2	1	1	<1
FVR[6]	31	23	17	13	10	8	6	6	5	4	3	2	2	1	1	<1

1. All results are rounded and represent generic dry cleaning scenarios using secondary control technology. Results are presented using a Perc unit emission rate of 1,350 pounds per year (100 gallons /yr).
2. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. This risk assessment is based on the methodology outlined in The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003 (OEHHA Guidelines) (OEHHA, 2003a) and the ARB's Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk (ARB, 2003a).
3. Distances are presented from the building edge.
4. Building is approximately 2,500 square feet. Other scenarios use a building approximately 1,100 square feet.
5. Values identified within the parenthesis identify the ratio that emissions are modeled from a point and volume source.
6. Denotes an enhanced ventilation scenario.

Table B-5. Potential Cancer Risk at Residential and Off-site Worker Receptors from Generic Dry Cleaners Using Secondary Control and Oakland (port) Meteorological Data[1, 2]

Scenario	CANCER RISK (chances per million)															
	Distance (meters)[3]															
	20	30	40	50	60	70	80	90	100	120	140	160	180	200	300	400
Resident – High-End Breathing Rate																
WinFan	109	67	43	30	22	17	14	11	9	7	5	4	3	3	1	<1
N-Vent	92	55	37	26	20	15	12	10	8	6	5	4	3	2	1	<1
N-Vent B[4]	64	41	29	21	16	13	11	9	7	6	4	3	3	2	1	<1
G-Vent (60/40)[5]	87	56	38	27	20	16	13	10	9	6	5	4	3	2	1	<1
G-Vent B[4] (60/40)[5]	55	39	29	22	17	14	11	9	8	6	4	4	3	2	1	<1
L-Vent (80/20)[5,6]	50	37	27	21	16	13	11	9	8	6	4	4	3	2	1	<1
PVR (95/5)[5,6]	53	40	29	22	17	14	11	10	8	6	5	4	3	3	1	<1
FVR[6]	51	39	29	22	17	14	11	9	8	6	5	4	3	3	1	<1
Resident – 80th Percentile Breathing Rate																
WinFan	84	51	33	23	17	13	11	8	7	5	4	3	2	2	1	<1
N-Vent	71	42	28	20	15	12	9	8	6	5	4	3	2	2	1	<1
N-Vent B[4]	49	32	22	16	12	10	8	7	6	4	3	3	2	2	1	<1
G-Vent (60/40)[5]	67	43	29	21	15	12	10	8	7	5	4	3	2	2	1	<1
G-Vent B[4] (60/40)[5]	42	30	22	17	13	11	8	7	6	4	3	3	2	2	1	<1
L-Vent (80/20)[5,6]	38	28	21	16	12	10	8	7	6	4	3	3	2	2	1	<1
PVR (95/5)[5,6]	41	31	22	17	13	11	8	7	6	5	4	3	2	2	1	<1
FVR[6]	39	30	22	17	13	11	8	7	6	5	4	3	2	2	1	<1
Resident – Average Breathing Rate																
WinFan	75	46	30	21	15	12	10	8	6	5	3	3	2	2	1	<1
N-Vent	63	38	26	18	14	10	8	7	6	4	3	3	2	2	1	<1
N-Vent B[4]	44	28	20	14	11	9	8	6	5	4	3	2	2	2	1	<1
G-Vent (60/40)[5]	60	39	26	19	14	11	9	7	6	4	3	3	2	2	1	<1
G-Vent B[4] (60/40)[5]	38	27	20	15	12	10	8	6	5	4	3	2	2	2	1	<1
L-Vent (80/20)[5,6]	34	26	19	14	11	9	8	6	5	4	3	2	2	2	1	<1
PVR (95/5)[5,6]	37	28	20	15	12	10	8	7	6	4	3	3	2	2	1	<1
FVR[6]	35	27	20	15	12	10	8	6	6	4	3	2	2	2	1	<1
Off-site Worker																
WinFan	69	43	27	19	14	11	9	7	6	4	3	2	2	2	1	<1
N-Vent	59	35	24	17	13	10	8	6	5	4	3	2	2	2	1	<1
N-Vent B[4]	41	26	18	13	10	8	7	6	5	4	3	2	2	1	1	<1
G-Vent (60/40)[5]	55	36	24	17	13	10	8	6	6	4	3	2	2	2	1	<1
G-Vent B[4] (60/40)[5]	35	25	18	14	11	9	7	6	5	4	3	2	2	2	1	<1
L-Vent (80/20)[5,6]	32	24	17	13	10	8	7	6	5	4	3	2	2	2	1	<1
PVR (95/5)[5,6]	34	25	18	14	11	9	7	6	5	4	3	2	2	2	1	<1
FVR[6]	32	25	18	14	11	9	7	6	5	4	3	2	2	2	1	<1

1. All results are rounded and represent generic dry cleaning scenarios using secondary control technology. Results are presented using a Perc unit emission rate of 1,350 pounds per year (100 gallons /yr).
2. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. This risk assessment is based on the methodology outlined in The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003 (OEHHA Guidelines) (OEHHA, 2003a) and the ARB's Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk (ARB, 2003a).
3. Distances are presented from the building edge.
4. Building is approximately 2,500 square feet. Other scenarios use a building approximately 1,100 square feet.
5. Values identified within the parenthesis identify the ratio that emissions are modeled from a point and volume source.
6. Denotes an enhanced ventilation scenario.

Table B-6. Potential Cancer Risk at Residential and Off-site Worker Receptors from Generic Dry Cleaners Using Secondary Control and San Diego (Miramar) Meteorological Data[1, 2]

Scenario	CANCER RISK (chances per million)															
	Distance (meters)[3]*															
	20	30	40	50	60	70	80	90	100	120	140	160	180	200	300	400
Resident – High-End Breathing Rate																
WinFan	108	61	40	29	22	17	14	11	9	7	5	4	3	3	1	<1
N-Vent	85	52	36	26	20	16	13	11	9	7	5	4	3	3	1	<1
N-Vent B[4]	61	38	27	20	16	13	11	9	8	6	5	4	3	3	1	<1
G-Vent (60/40)[5]	85	51	35	26	20	16	13	11	9	7	5	4	3	3	1	<1
G-Vent B[4] (60/40)[5]	58	38	25	20	16	13	11	9	8	6	5	4	3	3	1	<1
L-Vent (80/20)[5,6]	47	32	23	17	14	11	9	7	6	5	4	3	3	2	1	<1
PVR (95/5)[5,6]	47	34	25	19	14	11	9	8	7	5	4	3	3	3	1	<1
FVR[6]	45	33	24	18	14	11	9	7	6	5	4	3	3	2	1	<1
Resident – 80th Percentile Breathing Rate																
WinFan	83	47	31	22	17	13	11	8	7	5	4	3	3	2	1	<1
N-Vent	65	40	28	20	15	12	10	8	7	5	4	3	3	2	1	<1
N-Vent B[4]	47	29	21	15	12	10	8	7	6	4	3	3	2	2	1	<1
G-Vent (60/40)[5]	65	39	27	20	15	12	10	8	7	5	4	3	3	2	1	<1
G-Vent B[4] (60/40)[5]	45	29	19	15	12	10	8	7	6	4	4	3	2	2	1	<1
L-Vent (80/20)[5,6]	36	25	18	13	11	8	7	6	5	4	3	2	2	2	1	<1
PVR (95/5)[5,6]	36	26	19	15	11	8	7	6	5	4	3	3	2	2	1	<1
FVR[6]	35	25	18	14	11	8	7	6	5	4	3	3	2	2	1	<1
Resident – Average Breathing Rate																
WinFan	74	42	28	20	15	12	10	8	6	5	4	3	2	2	1	<1
N-Vent	59	36	25	18	14	11	9	8	6	5	4	3	2	2	1	<1
N-Vent B[4]	42	26	19	14	11	9	8	6	5	4	3	3	2	2	1	<1
G-Vent (60/40)[5]	59	35	24	18	14	11	9	8	6	5	4	3	2	2	1	<1
G-Vent B[4] (60/40)[5]	40	26	17	14	11	9	8	6	5	4	3	3	2	2	1	<1
L-Vent (80/20)[5,6]	32	22	16	12	10	8	6	5	4	3	3	2	2	2	1	<1
PVR (95/5)[5,6]	32	23	17	13	10	8	6	5	4	4	3	2	2	2	1	<1
FVR[6]	31	23	17	12	10	8	6	5	4	3	3	2	2	2	1	<1
Off-site Worker																
WinFan	69	39	25	18	14	11	9	7	6	4	3	3	2	2	1	<1
N-Vent	54	33	23	17	13	10	8	7	6	4	3	3	2	2	1	<1
N-Vent B[4]	39	24	17	13	10	8	7	6	5	4	3	2	2	2	1	<1
G-Vent (60/40)[5]	54	32	22	17	13	10	8	7	6	4	3	3	2	2	1	<1
G-Vent B[4] (60/40)[5]	37	24	16	13	10	8	7	6	5	4	3	2	2	2	1	<1
L-Vent (80/20)[5,6]	30	20	15	11	9	7	6	5	4	3	2	2	2	1	1	<1
PVR (95/5)[5,6]	30	22	16	12	9	7	6	5	4	3	3	2	2	2	1	<1
FVR[6]	29	21	15	11	9	7	6	5	4	3	3	2	2	2	1	<1

1. All results are rounded and represent generic dry cleaning scenarios using secondary control technology. Results are presented using a Perc unit emission rate of 1,350 pounds per year (100 gallons /yr).
2. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. Results are for the inhalation pathway. Residents assume a 70-year exposure duration and use the high-end, 80th percentile, and average point estimate breathing rates. The worker breathing rate and a 40-year exposure duration is used for the off-site worker receptor. This risk assessment is based on the methodology outlined in The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003 (OEHHA Guidelines) (OEHHA, 2003a) and the ARB's Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk (ARB, 2003a).
3. Distances are presented from the building edge.
4. Building is approximately 2,500 square feet. Other scenarios use a building approximately 1,100 square feet.
5. Values identified within the parenthesis identify the ratio that emissions are modeled from a point and volume source.
6. Denotes an enhanced ventilation scenario.

The chronic hazard indices under the high-end (90th percentile) emissions scenario are less than 0.4 at residential receptor locations and less than 1.5 at adjacent worker locations (20 meters). The adjacent worker scenario has a higher hazard index than the residential receptor since it is assumed the adjacent worker's schedule is coincident with dry cleaning operations. The adjacent workers' hazard index decreases to less than 1.0 within 30 meters of the dry cleaner. Under the average emissions scenario, chronic hazard indices are less than less than 0.2 at residential receptor locations and less than or equal to 0.8 at adjacent worker locations. The acute hazard indices are less than 0.2 at any receptor location. Generally, hazard indices less than 1.0 are not considered to be a concern to public health. All noncancer health impacts would be virtually eliminated under the proposed amendments.

REFERENCES FOR APPENDIX B

ARB, 2003a. Recommended Interim Risk Management Policy For Inhalation-Based Residential Cancer Risk. California Air Resources Board. October 9, 2003.

ARB, 2005h. Hot Spots Analysis and Reporting Program, version 1.2A. California Air Resources Board. August 2005.

OEHHA, 1999. The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part I; The Determination of Acute Reference Exposure Levels for Airborne Toxicants, Office of Environmental Health Hazard Assessment. March 1999.

OEHHA, 2000a. The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part III; Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels, Office of Environmental Health Hazard Assessment. Office of Environmental Health Hazard Assessment. April 2000.

OEHHA, 2000b. The Air Toxics Hot Spots Risk Assessment Guidelines; Part IV; Exposure Assessment and Stochastic Analysis Technical Support Document. Office of Environmental Health Hazard Assessment. September 2000.

OEHHA, 2002. Part II, Technical Support Document for Describing Available Cancer Potency Factors (Revised). Office of Environmental Health Hazard Assessment. December 2002.

OEHHA, 2003a. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August 2003.

U.S. EPA, 1993. US-EPA Model Clearinghouse Memo from Joseph A. Tikvart of the Source Receptor Analysis Branch to Ken Eng of the Air Compliance Branch regarding Proposal for Calculating Plume Rise for Stacks with Horizontal Release or Rain Caps for Cookson Pigment, Newark, New Jersey. July 9, 1993

U.S. EPA, 1995. ISCST3 Model User's Guide, EPA-454/B-95-003a. United States Environmental Protection Agency (U.S. EPA). Research Triangle Park, North Carolina. September 1995.

Appendix C

Summary of the Differences between the Current and Proposed Amended Airborne Toxic Control Measure

Appendix C

Summary of the Differences Between the Current and Proposed Amended ATCM

	Current Dry Cleaning ATCM	Proposed Revised ATCM
Applicability	Owner/operator of Perc dry cleaning equipment	Person who sells or distributes Perc and who sells, distributes, installs, owns, or operates dry cleaning machine that uses any solvent that contains Perc.
Severability	Not addressed	Each part of this section is deemed severable, and in the event that part of this is held to be invalid, the remainder of this section shall continue in full force and effect.
Definitions		• 16 new definitions • 15 amended • 7 deleted
Prohibitions	Owner/operator shall not operate a transfer machine, vented machine, or a self-service dry cleaning machine	In addition to the existing prohibitions, no person shall sell, or initiate a new lease of any Perc dry cleaning machines. Also, prohibits existing facilities to operate any Perc dry cleaning machine with the exception of a converted, primary or secondary control machine but are required to comply with a phase out compliance schedule.
Initial Notification	Provide district in writing with name of owner and operator of facility; name and location of facility; whether facility is co-located with a residence; number, types, and capacities of dry cleaning machines; existing facilities only shall provide the annual gallons of Perc purchased.	No requirements.
New Facilities	Shall install, operate, and maintain a closed-loop machine with primary control and secondary control.	No person shall install or operate any Perc dry cleaning machine or engage in Perc water-repelling operations at a new facility on or after January 1, 2008.
Relocated Facilities	None	Upon approval by the district, existing facilities may relocate their Perc dry cleaning machine for the purpose of moving from one location to another within the boundaries of the same district.
Existing Facilities	Shall install, operate, and maintain either a converted closed-loop machine with primary control; or a closed-loop machine with a primary control system.	All existing facilities that operate converted Perc dry cleaning machines shall remove their machine by July 1, 2010. Existing facilities that operate any

Existing Facilities (con't)		dry cleaning machines using Perc shall comply with the following schedule: • Facilities must remove from service their Perc dry cleaning machine by July 1, 2010, or when the machine is 15 years of age, whichever comes later. If the age of the machine cannot be obtained, the machine must be removed from service by July 1, 2010. • All facilities that have not already done so under the above requirement, must remove from service their Perc dry cleaning machine by January 1, 2023.
Co-residential Facilities	No provisions	Existing co-residential facilities shall remove from service any currently installed Perc dry cleaning machine by July 1, 2010.
Specifications for Required Equipment	Outlined specific requirements for primary control systems, converted machines, add-on secondary control, integral secondary control machines, and drying cabinets.	No Requirements
Good Operating Practices	*Environmental Training Requirements*: The facility shall have one or more trained operators. The trained operator shall be a full time employee including the owner, operator, or another employee of the facility, who successfully completed the initial course pursuant to 17 CCR, section 93110. Each trained operator shall successfully complete a refresher course every three years. If the facility has only one trained operator and the trained operator leaves the facility shall notify the district within 30 days of departure; obtain a replacement trained operator within 3 months, except that a trained operator who owns or manages multiple facilities may serve as the interim trained operator at two of those facilities simultaneously for a max period of 4 months. If an initial course is not reasonable available, the district may extend the certification period for a replacement trained operator until 1 month after the course is reasonably available.	Same requirement, however, the length of time to notify the district when a trained operator leaves the employ of the facility has been reduced from 30 days to 15 days of the departure. The exception of allowing a trained operator who owns multiple facilities serve as the interim trained operator at two of those facilities has been deleted. The trained operator shall be an owner/employee of the facility and shall be on site while the dry cleaning machine is in operation.

Good Operating Practices (con't)	*Operation and Maintenance Requirements*: The trained operator shall operate and maintain the dry cleaning system in accordance to this section and conditions on the facility's operating permit. Operations not specifically addressed shall be operated and maintained in accordance with the manufacturer's recommendations. The district shall provide an operation and maintenance checklist. Each operation and maintenance function and the date performed shall be recorded on the checklist. Refrigerated condensers shall be operated to ensure exhaust gases are recirculated until the air-vapor stream temp. on the outlet side of the condenser, downstream of any bypass, is less than or equal to 45°F. Desorption of carbon adsorbers shall be performed at the frequency specified by the district. At a minimum it shall be each time all dry cleaning equipment exhausted to the device has cleaned a total of three pounds of materials for each pound of activated carbon. Desorption shall be performed with the minimum steam pressure and air flow capacity specified by the district. After desorption the carbon bed shall be fully dried according to the manufacturers instructions. *Leak Check and Repair Requirements*: The dry cleaning system shall be inspected weekly for liquid and vapor leaks with either a halogenated-hydrocarbon detector; PID; or an alternative method approved by the district. Any detected leak shall be noted on the checklist provided by the district and repaired within 24 hours. If repair parts are not available, then leaks shall be repaired within 15 working days. If the leak is not repaired at the time of detection, the leaking component shall be clearly marked or tagged. A 30 day extension can be granted by the district.	Same requirement, however, since transfer and vented machines are no longer permitted, any thing pertaining to these machines has been deleted. In addition to the existing requirements, facility owner/operator shall keep on site a spare set of gaskets for the loading door, still, lint trap, button trap and water separator; and a spare lint filter. Also, carbon adsorbers in integral secondary control systems must be must be stripped or desorbed in accordance with manufacturer's instructions or at least weekly, whichever is more frequent. Requirements remain the same however the timeframe to repair a leak has been reduced. Liquid leaks or vapor leaks shall be repaired immediately upon detection. If a facility with a leak does not have parts available, the parts need to be ordered within the next business day of detecting the leak and the part installed within 2 business days after receipt. A facility with a leak that has not been repaired by the end of the 7th business day after detection shall not operate the dry cleaning machine until the leak is repaired. An additional requirement would be that the dry cleaning system shall be inspected at least once a year

Good Operating Practices (con't		for liquid and vapor leaks using a portable detector which gives quantitative results with less than ten percent uncertainty at 50 ppmv of Perc.
Recordkeeping Requirements	Must retain the following records for at least 2 years of until district inspection of facility, whichever period is longer. • Log showing date and lbs. of material cleaned/load. • Purchase and delivery receipts for Perc. • For facilities with solvent tanks that are not directly filled by the Perc supplier upon deliver, the date and gallons of Perc added to solvent tank. • Completed leak inspection checklists and the operation and maintenance checklists • For liquid or vapor leaks not repaired at time of detection, a record of leaking component awaiting repair and action taken to complete repair. Record shall include copies of purchase orders or written records showing repair parts were ordered and/or service requested. • Manufacturer's operating manual • Original record of completion for each trained operator. • All records shall be accessible at the facility	All records must be retained for at least 5 years. Requirements are the same with the addition of the following: • Purchase and delivery receipts for the dry cleaning solvent; • For add-on or integral secondary control machines: - the start and end time of each regeneration, and temperature of chilled air; • All records shall be maintained in English and be accessible at the facility.
Reporting Requirements	Maintain annual report which includes: • Copy of certificate of completion for trained operator. • Total lbs. of material cleaned/load and gallons of Perc used for all solvent additions. • Average facility mileage.	Owner or operator shall prepare an annual report which covers the period of January 1 through December 31 of each year. The annual report shall cover the same requirements with the exception of the facility mileage. However, in addition the facility must include the make, model, serial number, and date of manufacture of the dry cleaning machine. The owner/operator shall furnish this annual report to the district by the date specified by the district.
Testing & Certification of Secondary Control	*Test Program and Scope*: For a given design a single test program shall be conducted. A test plan that describes, in detail, the dry cleaning machine and control system being tested, the test protocol and test method shall be	No requirements.

Testing & Certification of Secondary Control (con't)	prepared. A minimum of three tests shall be conducted for each test program on each control system design. All tests for a single test program shall be conducted on a single dry cleaning machine. Test results may not be applied to a different make/model machine.	
	Test Conditions: Testing shall be conducted under normal operating conditions. • Primary and Secondary - shall be filled to no less than 75 percent of its capacity. Weight of materials shall be recorded. • Primary - shall be tested on a closed-loop machine, or a converted machine, without secondary control. • Secondary - shall be tested on a closed-loop machine. • Integral secondary - shall be tested with primary control operating normally. • Add-on secondary - shall be tested independent of primary and initial Perc concentration in drum shall be 8600 ppmv or greater. • Drying Cabinet – Materials shall be transferred to the drying cabinet and testing shall begin no later than 15 minutes after the end of the washing and extraction process. The drying cabinet shall be filled 50 percent of its capacity. The weight of the material shall be recorded.	No requirements
	Test Method: Primary and secondary control • Temperature in the drum shall be measured and recorded continuously during the entire drying cycle. • Sampling: - For primary control and integral secondary control shall begin at the end of the drying cycle and completed within five minutes. - For add-on secondary control systems shall be done when the concentration of Perc is 8,600 ppmv or greater and again when	No requirements.

Testing & Certification of Secondary Control (con't)	the concentration reaches 300 ppmv or less. • Perc concentration in the drum shall be determined by the following methods: - A sampling port and valve shall be appropriately placed to draw samples from the interior of the drum or lint filter housing. Sampling port shall be connected to a gas chromatograph by ¼", outside diameter, Teflon tubing. Any sampling pump shall have Teflon diaphragms. The gas chromatograph shall measure the concentrations of Perc in accordance to Method 422 or NIOSH Method 1003. - A sampling port and valve shall be appropriately placed to draw samples from the interior of the drum or lint filter housing. Sampling port shall be connected by ¼" outside diameter Teflon tubing to a Tedlar bag. Any sampling pump shall have Teflon diaphragms. The concentration of Perc in the air samples shall be measured in accordance with ARB Method 422 or NIOSH Method 1003 within 24 hours of sampling. If an independent lab is contracted to perform analysis of the samples, the chain of custody procedures in Method 422 or NIOSH 1003 shall be followed. • An alternative test method deemed acceptable by the APCO or EO of the district and the EO of the ARB. *Certification Procedures*: Detailed description of the dry cleaning system including control device; the test protocol; and the test method.	No requirements.
Wastewater Treatment	Wastewater evaporators shall be operated to ensure that no liquid Perc or visible emulsion is allowed to vaporize.	No requirements.
Water-repelling Operations	No person shall perform water-repelling or dip tank operations unless all materials to be treated with Perc water-repelling are treated in a closed-	All materials to be treated with Perc water-repelling can only be treated in a converted, primary control, add-on secondary control, or

Water-repelling Operations (con't)	loop machine, a converted machine or a dip tank.	integral secondary control machine and shall comply with the requirements in subsections (e), (f), (g), and (h).
Violations	Not specified.	Any violation to this section may carry civil or administrative penalties as specified in state law, including, but not limited to, a penalty of not more than $10,000 per day.
New Section: Requirements for Perc Manufacturers		
Recordkeeping Requirements	No requirements.	Perc manufacturers shall keep monthly sales records (with invoices) of the gallons of Perc sold for use in dry cleaning in California. These records shall be retained for at lest 5 years and made available to ARB or the district upon request.
Reporting Requirements	No requirements.	By January 1, 2008, Perc manufacturers shall report to ARB contact information for all their distributors who sell Perc in California. Changes to their list of distributors shall be reported to ARB within 30 calendar days after the change has occurred.
Violations	No requirements.	Any violation to this section may carry civil or administrative penalties as specified in state law, including, but not limited to, a penalty of not more than $35,000.
New Section: Requirements for Perc Distributors		
Recordkeeping Requirements	No requirements.	Perc distributors shall keep the following records for 5 years and made available to ARB or the district upon request: • For each dry cleaning facility, monthly sales records (with invoices) of the gallons of Perc and recycled Perc sold for the use of dry cleaning in California. • Monthly purchase records (with invoices) of the gallons of Perc purchased for the use of dry cleaning in California. • Contact information for each California dry cleaner that purchased Perc and recycled Perc. • Contact information for all their distributors who sell Perc and recycled Perc in California. Any violation of this section may carry civil or administrative

		penalties as specified in state law and regulation, including, but not limited to, a penalty of not more than $35,000 under Health and Safety Code section 42402.4.
Reporting Requirements	No requirements.	Perc distributors shall report to ARB the following information: • By January 1, 2008 their contact information and, if applicable, contact information for all their distributors who sell Perc and recycled Perc in California. • Changes in their contact information reported under the above requirement, within 30 calendar days. • By January 31st of each year, the annual gallons of Perc and recycled Perc sold to California dry cleaners from January 1 through December 31 of the previous year.
Payment of Fees	No requirements.	No later than 30 days after the issuance of an invoice from ARB, Perc distributors shall pay fees, based on the fee schedule shown in Table 2 of the regulation, to ARB.
Violations	No requirements.	Any violation to this section may carry civil or administrative penalties as specified in state law, including, but not limited to, a penalty of not more than $35,000.

Appendix D

Summary of Gas and Electricity Cost Survey

Table D-1. Summary of Gas and Electricity Cost Survey[1]

Machine Type	Age Of Machine (yr)	Average Monthly Gas Cost ($)	Normalized Annual Gas Cost[2] ($)	Average Monthly Electricity Cost ($)	Normalized Annual Electricity Cost[2] ($)	Amount of material dry cleaned (lbs/year)
GreenEarth	4	1300	10356	650	5178	70200
GreenEarth	3.5	750	13529	325	5863	31000
GreenEarth	3	550	6326	475	5463	48620
GreenEarth	1.5	400	5735	400	5735	39000
GreenEarth	3	1000	11949	500	5974	46800
GreenEarth	2	750	10754	550	7886	39000
Perc 2nd	2	400	4863	250	3039	46000
Perc 2nd	1.5	600	3910	850	5540	85800
Perc 2nd	4	700	8699	600	7456	45000
Perc 2nd	4	600	5592	450	4194	60000
Perc 2nd	10	330	6031	260	4751	30600
Perc prim	9	400	6717	275	4618	33300
Perc prim	11	529	6431	313	3806	46000
Perc prim	15	400	7169	250	4481	31200
Perc prim	10	750	10485	300	4194	40000
Wet Cleaning	1.5	600	7821	200	2607	42900
Wet Cleaning	2	225	2765	225	2765	45500
Wet Cleaning	1	600	7169	250	2987	46800
Wet Cleaning	4	280	4015	270	3871	39000
Wet Cleaning	2	380	7821	195	4013	27170
Wet Cleaning	1	660	7098	750	8065	52000
DF2000	6	780	8724	620	6934	50000
DF2000	2 and 15	880	7010	310	2469	70200
DF2000	3.5 and 3.5	1530	3943	1020	2628	217000
DF2000	5,3	569	6357	582	6503	50050
DF2000	6	750	12905	500	8603	32500
DF2000	3	578	10774	466	8677	30000
Overall Average[3]	**5**		**7591**		**5122**	**51690**

1. Result of randomly chosen dry cleaning facilities
2. Costs were normalized to 46,600 lbs of material dry cleaned assuming direct correlation of cost to pounds of material dry cleaned.
3. Analysis of variance indicates no systematic differences between machine types in costs and therefore the overall average results were used.

Appendix E

Compliance Cost Estimate of Proposed Amended Dry Cleaning ATCM

TALBLE E-1. COMPLIANCE COST ESTIMATE OF PROPOSED AMENDED DRY CLEANING ATCM

ENVIRONMENTAL TRAINING		
Refresher Course Tuition	$100	
Mileage (200 miles, 40 cent/mile)	$80	
Labor (6 hr x $10/hr)	$60	
	$240 every 3 years	= $80/yr
RECORDKEEPING		
(Weighting and recording pounds of clothes every load)		
0.5 hr/wk x 52 wk/yr x $10/hr		= $260/yr
(Weekly poundage)		
0.5 hr/wk x 52 wk/yr x $10/hr		= $260/yr
REPORTING		
(Fill out district annual report)		
8 hr/yr x $10/hr		= $80/yr
OPERATION AND MAINTENANCE		
Weekly leak check:		
0.25 hr/wk x 52 wk/yr x $10/hr		= $130/yr
Annual enhanced leak check[1]:		
2 hr/yr x $10/hr		= $20/yr
(leak check arrangement include borrowing and using), and/or		
$10		= $10/yr
(group purchase cost)		
	Total	= $840/yr

[1] Annual enhanced leak check requirement might be met by group purchase of a Perc detector that gives quantitative results, reliance on district inspection, or borrowing of a quantitative detector. The lowest cost of a qualified detector is about $600. Cost of Perc quantitative detector and group purchase assumes purchase of least costly detector, 5 years of useful life and groups of 12 facilities per purchase.

Table E-2. Summary of Air District Permit Renewal Fees[1]

District	Perc Permit Renewal Fees	HC Permit Renewal Fees
Ventura	1250	1700
Sacramento	567	572
Santa Barbara	593	593
San Joaquin	89	89
San Diego	600	500
El Dorado	365	365
Placer	298	298
MD & AV	172	172
Bay Area	246	0
Weighted Average[2]	380	300

1. Fees are for year 2006.
2. Weighted average assuming 45% of the dry cleaning facilities is in the Bay Area and 55% is distributed evenly across the other districts. Values are rounded.

Table E-3. Summary of Hot Spot (AB2588) Fees[1]

District	District Fee	State Fee	Total
Bay Area	125	35	160
Sacramento	60	35	95
Santa Barbara	0	35	35
Placer County	90	35	125
San Joaquin	85	35	115
Ventura	50	35	85
San Diego	101	35	136
Weighted Average[2]	**90**	**35**	**125**

1. Fees are for year 2006.
2. Weighted average assuming 45% of the dry cleaning facilities is in the Bay Area and 55% is distributed evenly across the other districts. Values are rounded

Appendix F

Glossary of Definitions, Selected Terms, and Acronyms

Appendix F

Glossary of Definitions, Selected Terms, and Acronyms

Definitions

Acute Exposure: One or a series of short-term exposures generally lasting less than 24 hours.

Acute Health Effects: A health effect that occurs over a relatively short period of time (e.g., minutes or hours). The term is used to describe brief exposures and effects which appear promptly after exposure.

Adverse Health Effect: A health effect from exposure to air contaminants that may range from relatively mild temporary conditions, such as eye or throat irritation, shortness of breath, or headaches, to permanent and serious conditions, such as birth defects, cancer or damage to lungs, nerves, liver, heart, or other organs.

Agency Shop: Same as drop off shop. A facility with no dry cleaning machine on-site.

Air Dispersion Model: A mathematical model or computer simulation used to estimate the concentration of toxic air pollutants at specific locations as a result of mixing in the atmosphere.

Air District or District: The Air Pollution Control and Air Quality Management Districts, as defined in Health and Safety Code section 39025, are the political bodies responsible for managing air quality on a regional or county basis. California is currently divided into 35 air districts.

Airborne Toxic Control Measure: Section 39655 of the Health and Safety Code, defines an "Airborne Toxic Control Measure" means either of the following:

1) Recommended methods, and, where appropriate, a range of methods, that reduce, avoid, or eliminate the emissions of a toxic air contaminant. Airborne toxic control measures include, but are not limited to, emission limitations, control technologies, the use of operational and maintenance conditions, closed system engineering, design equipment, or work practice standards, and the reduction, avoidance, or elimination of emissions through process changes, substitution of materials, or other modifications.
2) Emission standards adopted by the U.S. Environmental Protection Agency pursuant to section 112 of the federal act (42 U.S.C. Sec. 7412).

Asthma: A chronic inflammatory disorder of the lungs characterized by wheezing, breathlessness, chest tightness, and cough.

Bioaccumulation: The concentration of a substance in a body or part of a body or other living tissue in a concentration higher than that of the surrounding environment.

California Air Resources Board (ARB): The State's lead air quality management agency consisting of an eleven-member board appointed by the Governor. The ARB is responsible for attainment and maintenance of the state and federal air quality standards, and is fully responsible for motor vehicle pollution control. It oversees county and regional air pollution management programs.

California Air Pollution Control Officers Association (CAPCOA): A non-profit association of the air pollution control officers from all 35 air quality districts throughout California. CAPCOA was formed in 1975 to promote clean air and to provide a forum for sharing knowledge, experience, and information among the air quality regulatory agencies around the state.

Cancer Potency Factor (CPF): The theoretical upper bound probability of extra cancer cases occurring in an exposed population assuming a lifetime exposure to the chemical when the chemical dose is expressed in exposure units of milligrams/kilogram-day (mg/kg-d).

Chronic Exposure: Long-term exposure, usually lasting one year to a lifetime.

Chronic Health Effect: An adverse non-cancer health effect that develops and persists (e.g., months or years) over time after long-term exposure to a substance.

Developmental Toxicity: Adverse effects on the developing organism that may result from exposure prior to conception (either parent), during prenatal development, or postnatally to the time of sexual maturation. Adverse developmental effects may be detected at any point in the life span of the organism. Major manifestations of developmental toxicity include: death of the developing organism; induction of structural birth defects; altered growth; and functional deficiency.

Dose: A calculated amount of a substance estimated to be received by the subject, whether human or animal, as a result of exposure. Doses are generally expressed in terms of amount of chemical per unit body weight; typical units are mg/kg-day.

Dose-response Assessment: The process of characterizing the relationship between the exposure to an agent and the incidence of an adverse health effect in exposed populations.

Drop off Shop: Same as agency shop. A facility with no dry cleaning machine on-site.

Endpoint: An observable or measurable biological or biochemical event including cancer used as an index of the effect of a chemical on a cell, tissue, organ, organism, etc.

Epidemiology: The study of the occurrence and distribution of a disease or physiological condition in human populations and of the factors that influence this distribution.

Exposure: Contact of an organism with a chemical, physical, or biological agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, digestive tract) and available for absorption.

Exposure Pathway: A route of exposure by which xenobiotics enter the human body (e.g., inhalation, ingestion, dermal absorption).

Flash Point: The lowest temperature at which a liquid can form an ignitable mixture in air near the surface of the liquid. The lower the flash point, the easier it is to ignite the material.

Hazard Identification: The process of determining whether exposure to an agent can cause an increase in the incidence of an adverse health effect including cancer

Hazard Index (HI): The sum of individual acute or chronic hazard quotients (HQs) for each substance affecting a particular toxicological endpoint.

Hazardous Air Pollutant (HAP): A substance that the U.S. Environmental Protection Agency has listed in, or pursuant to, section 112 subsection (b) of the federal Clean Air Act Amendments of 1990 (42 U.S. Code, section 7412(b)).

Health Risk Assessment: A health risk assessment (HRA) is an evaluation or report that a risk assessor (e.g., Air Resources Board, district, consultant, or facility operator) develops to describe the potential a person or population may have of developing adverse health effects from exposure to a facility's emissions. Some health effects that are evaluated could include cancer, developmental effects, or respiratory illness. The pathways that can be included in an HRA depend on the toxic air pollutants that a person (receptor) may be exposed to, and can include inhalation (breathing), the ingestion of soil, water, crops, fish, meat, milk, and eggs, and dermal exposure.

Hot Spots Analysis and Reporting Program (HARP): A single integrated software package designed to promote statewide consistency, efficiency, and cost-effective implementation of health risk assessments and the Hot Spots Program. The HARP software package consists of modules that include: emissions inventory, air dispersion modeling, risk analysis, and mapping.

HSC: Health and Safety Code of the State of California.

Industrial Source Complex Dispersion Model (ISC3): Air modeling software that incorporates three previous programs into a single program. These are the short-term model (ISCST), the long term model (ISCLT), and the complex terrain model (COMPLEX).

Meteorology: The science that deals with the phenomena of the atmosphere especially weather and weather conditions. In the area of air dispersion modeling, *meteorology* is used to refer to climatological data needed to run an air dispersion model including: wind speed, wind direction, stability class and ambient temperature.

Mixed Shop: A dry cleaning facility that employs more than one type of dry cleaning process.

Multipathway Substance: A substance or chemical that once airborne from an emission source can, under environmental conditions, be taken into a human receptor by inhalation and by other exposure routes such as after deposition on skin or after ingestion of soil contaminated by the emission.

Noncarcinogenic Effects: Noncancer health effects which may include birth defects, organ damage, morbidity, and death.

Office of Environmental Health Hazard Assessment (OEHHA): An office within the California Environmental Protection Agency that is responsible for evaluating chemicals for adverse health impacts and establishing safe exposure levels. OEHHA also assists in performing health risk assessments and developing risk assessment procedures for air quality management purposes.

Permissible Exposure Limit (PEL): The maximum amount or concentration of a chemical that a worker may be exposed to under the Occupational Safety and Health Administration (OSHA) regulations.

Potency: The relative effectiveness, or risk, of a standard amount of a substance to cause a toxic response.

Potency Slope: A value used to calculate the probability or risk of cancer associated with an estimated exposure, based on the assumption in cancer risk assessments that risk is directly proportional to dose and that there is no threshold for carcinogenesis. It is the slope of the dose-response curve estimated at low exposures.

Proposition 65: The Safe Drinking Water and Toxic Enforcement Act of 1986, also known as Proposition 65. This Act is codified in California Health and Safety Code Section 25249.5, et seq. No person in the course of doing business shall knowingly discharge or release a chemical known to the state to cause cancer or reproductive toxicity into water or into land where such chemical passes or probably will pass into any source of drinking water, without first giving clear and reasonable warning to such individual.

Reference Exposure Level (REL): An exposure level at or below which no noncancer adverse health effect is anticipated to occur in a human population exposed for a specific duration. An REL is virtually the same as the terms Reference Concentration (RfC) for inhalation or Reference Dose (RFD) used by U.S. EPA, only it may be for varying amounts of time rather than lifetime only. It has been given a different name so that the values estimated by the State Office of Environmental Health Hazard Assessment can easily be distinguished from those developed by the U.S. EPA. RELs are used to evaluate toxicity endpoints other than cancer.

Reproductive Toxicity: Harmful effects on fertility, gestation, or offspring, caused by exposure of either parent to a substance.

Risk: The (characterization of the) probability of potentially adverse effects to human health, in this instance from the exposure to environmental hazards.

Risk Assessment: The characterization (in the present context) of the probability of potentially adverse health effects to people from exposure to environmental chemical hazards.

Scientific Review Panel on Toxic Air Contaminants (SRP): A nine-member panel appointed to advise the Air Resources Board and the Department of Pesticide Regulation in their evaluation of the adverse health effects toxicity of substances being evaluated as Toxic Air Contaminants.

Threshold, Nonthreshold: A threshold dose is the minimally effective dose of any chemical that is observed to produce a response (e.g., enzyme change, liver toxicity,

death). For most toxic effects, except carcinogenesis, there appear to be threshold doses. Nonthreshold substances are those substances, including nearly all carcinogens, that are known or assumed to have some risk of response at any dose above zero.

TIF Detector: Halogen leak detector made by TIF™ Instruments, Inc.

Toxic Air Contaminant (TAC): An air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health (HSC Section 39655(a)). Substances, which have been identified by the United States Environmental Protection Agency as hazardous air pollutants are also identified by the Board as toxic air contaminants.

United States Environmental Protection Agency (U.S. EPA): The Federal agency charged with setting policy and guidelines, carrying out legal mandates, for the protection, and national interests in environmental resources.

Variability: The ability to have different numerical values of a parameter, such as height or weight.

Volatile Organic Compound (VOC): Means any compound containing at least one atom of carbon, including 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-13), 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-14), 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), 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).

Acronyms

APA	California Administrative Procedure Act
APCD	Air Pollution Control District
APCO	Air Pollution Control Officer
AQMD	Air Quality Management District
ARB	California Air Resources Board
ATCM	Airborne Toxic Control Measure
BACT	Best Available Control Technology
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
CAPB	Cocamidopropyl Betaine
CAPCOA	California Air Pollution Control Officers Association
CAS	Chemical Abstract Service
CEQA	California Environmental Quality Act
CG	Cellulose Gum
CO_2	Carbon Dioxide
CPF	Cancer Potency Factor
CAS	Chemical Abstract Service
CRF	Capital Recovery Factor
CTSI	U.S. EPA's Cleaner Technologies Substitute Assessment: Professional Fabricare Processes
D_5	Decamethylcyclopentasiloxane
DfE	Design for the Environment
DHS	California Department of Health Services
Districts	Local Air Pollution Control and Air Quality Management Districts
DOF	California Department of Finance
DPNB	Dipropylene Glycol Normal Butyl Ether
DTSC	California Department of Toxics Substances Control
°F	Degrees Fahrenheit
FVR	Full Vapor Barrier Room
HAP	Hazardous Air Pollutant
HHD	Halogenated Hydrocarbon Detector
HSC	Health and Safety Code
HARP	Hot Spots Analysis and Reporting Program
HRA	Health Risk Assessment
HSIA	Halogenated Solvent Industry Alliance
IARC	International Agency for Research on Cancer
IFI	International Fabricare Institute
IRTA	Institute for Research and Technical Assistance
ISOR	Initial Statement of Reasons
KB	Kauri Butanol
Kg	Kilogram
kWh	Kilowatt-hour
Lauramide DEA	Luric Acid Diethanolamide
LOC	Local Ventilation System

m^3	Cubic Meter
MDL	Minimum Detection Limit
$\mu g/m^3$	Microgram per Cubic Meter
MSDS	Material Safety Data Sheets
NAICS	North American Industrial Classification System
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OEHHA	Office of Environmental Health Hazard Assessment
OEL	Occupational Exposure Level
OSHA	Occupational Safety and Health Administration
P-20	Ethoxylated Sorbitan Monodecanoate
PVR	Partial Vapor Barrier Room
PEL	Permissible Exposure Limit
Perc	Perchloroethylene
pH	A Logarithmic Measure of Hydrogen Ion Concentration
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
PPERC	Pollution Prevention Education and Research Center
ppm	Parts per Million
ppmv	Parts per Million by Volume
psi	Pound per Square Inch
PVR	Partial Vapor Barrier Room
REL	Reference Exposure level
ROE	Return on Owner's Equity
SEHSC	Silicones Environmental, Health & Safety Council of North America
SIC	Standard Industrial Classification Code
SLI	Sodium Lauryl Isethionate
SLS	Sodium Laureth Sulfate
SRP	Scientific Review Panel on Toxic Air Contaminants
TAC	Toxic Air Contaminant
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act of 1976
TWA	Time-weighted Average
UCLA	University of California, Los Angeles
URF	Unit Risk Factor
U.S.	United States
U.S. EPA	United States Environmental Protection Agency
VBR	Vapor Barrier Room
VOC	Volatile Organic Compound

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER A STATUS REPORT ON THE CARL MOYER MEMORIAL AIR QUALITY STANDARDS ATTAINMENT PROGRAM (THE CARL MOYER PROGRAM)

The Air Resources Board (Board or ARB) will meet publicly at the time and place noted below to consider a status report on the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program), as required by section 44295 of the Health & Safety Code. The Carl Moyer Program is currently operating in its ninth year. The Board approved the original program guidelines in February 1999 and revised the guidelines on November 16, 2000, April 30, 2003, and November 17, 2005. At its November 2005 meeting, the Board directed staff to return before the Board in 2006 with an update on program implementation.

The Carl Moyer Program Status Report will provide a progress summary on ARB's and the local and regional air pollution control districts' implementation of the statewide program through funding Year 6. This report also provides a summary of audits conducted by ARB and the California Department of Finance (DOF) in 2006, as well as a look ahead at the future program and anticipated air quality benefits.

A summary of the report will be presented to the Board at the meeting scheduled on the date, time and location listed below.

DATE: January 25, 2007

TIME: 9:00 a.m.

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

The item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., January 25, 2007, and may continue at 9:00 a.m., January 26, 2007. Please note that this item may not be considered until January 26, 2007. Please consult the agenda for the meeting, which will be available at least 10 days before January 25, 2007, to determine the day on which this item will be considered.

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

BACKGROUND

The Carl Moyer Program was established in 1998 as a grant program to fund the incremental cost of cleaner-than-required heavy-duty engines. The program was originally enacted as a strategy to reduce oxides of nitrogen (NOx) to meet California's State Implementation Plan (SIP) commitments to attain air quality standards. In its first six years, the state has provided over $140 million in funding to clean up heavy-duty engines. The Carl Moyer Program entered a new era in its seventh year, as legislation provided a significant boost in funding through 2015 and expanded the program to include additional pollutants and source categories.

CARL MOYER PROGRAM PROGRESS

Over the first six years, the Carl Moyer Program helped replace over 6,300 heavy-duty diesel engines with either cleaner burning diesel engines or alternative fueled engines. The types of funded projects include: purchase of new natural gas trucks, transit buses and school buses; purchase of electric forklifts instead of internal combustion forklifts; and replacement of old diesel engines with newer diesel engines in on-road vehicles, marine vessels, agricultural pumps, and other off-road equipment. ARB estimates that emission reductions from projects paid for in the first six years are about 18 tons per day of NOx and one ton per day of diesel particulate matter (PM). Overall, the program is cost-effective – averaging below $3,000 per ton of NOx reduced.

PROGRAM EXPANSION

Legislative changes enacted in 2004 and 2005 provide increased and continuing funding for the Carl Moyer Program and other incentive programs – up to $141 million per year through 2015. These changes also added diesel PM and reactive organic gases (ROG) to the program, and expanded the program to include voluntary light-duty vehicle retirement, on-road heavy-duty fleet modernization, and assistance for agricultural sources. The changes were incorporated into the Carl Moyer Program beginning in fiscal year 2004-05 (Year 7). In order to enable the expanded program to meet its goals, the Legislature also enacted, and Governor Schwarzenegger signed, legislation in 2006 to boost ARB's and the districts' resources for program administration. These additional resources will enable ARB and air districts to enhance outreach to potential applicants, streamline application and reporting requirements, participate in regular program audits, and improve program efficiency and accountability.

PROGRAM AUDITS

In 2006, ARB audited the Carl Moyer Program implementation by Ventura County Air Pollution Control District (VCAPCD), Sacramento Metropolitan Air Quality Management District (SMAQMD), South Coast Air Quality Management District (SCAQMD), and Butte County Air Quality Management District (BCAQMD). These audits focused on air district program implementation in fiscal years 2002-03 and 2003-04 (Years 5

and 6). ARB's audit reports of VCAPCD, SMAQMD and SCAQMD are attached to the status report along with the district's responses. As of November 1, 2006, the BCAQMD audit report was not yet finalized. Once complete, this report will be available on ARB's website.

In 2006, DOF also conducted an evaluation of ARB's oversight of the Carl Moyer Program. DOF's report, which is attached to the status report, provides some suggestions for improvement which will be considered for inclusion in the 2007 Carl Moyer Program Guidelines revisions. The California Bureau of State Audits (BSA) also began a performance audit of the ARB and the Bay Area Air Quality Management District, San Joaquin Valley Air Pollution Control District, SMAQMD and SCAQMD programs. The BSA audit findings will be released in late Spring 2007 and will be made available on ARB's webpage.

AVAILABILITY OF DOCUMENTS AND CONTACT PERSON

A summary of the written report updating the Board on the progress of the Carl Moyer Program will be presented by ARB staff at the meeting. Copies of the written report prepared by staff may be obtained from the Board's Public Information Office, Air Resources Board, 1001 I Street, 1st Floor, Environmental Services Center, Sacramento, CA 95814, (916) 322-2990, prior to the scheduled meeting. This report will also be available electronically on ARB's website at www.arb.ca.gov/msprog/moyer/moyer.htm. Further inquiries regarding this matter should be directed to Lucina Negrete, Manager, Alternative Strategies Section, at (916) 445-6138, or by email lnegrete@arb.ca.gov.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written comments submissions not physically submitted at the meeting must be received **no later than 12:00 noon, January 24, 2007** and addressed to the following:

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

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

Facsimile submittal: (916) 322-3928

The Board requests but does not require 30 copies of any written submission. Also, the ARB requests that written and email statements be filed at least 10 days prior to the meeting so that ARB staff and Board Members have time to fully consider each comment. The ARB encourages members of the public to bring to the attention of staff in advance of the meeting any suggestions or comments.

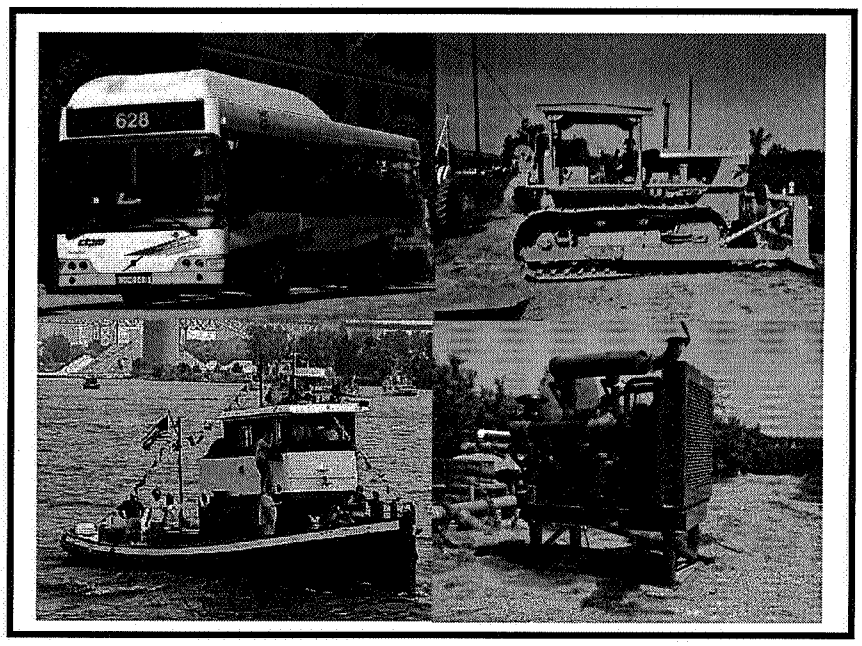
CALIFORNIA AIR RESOURCES BOARD

Michael D. Scheible

for Catherine Witherspoon
Executive Officer

Date: December 21, 2006

THE
CARL MOYER PROGRAM
2006 STATUS REPORT



The Carl Moyer
Memorial Air Quality Standards
Attainment Program

January 2007

California Environmental Protection Agency
Air Resources Board

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

I. INTRODUCTION 1

II. PROGRAM IMPLEMENTATION 3

ROLE OF THE AIR RESOURCES BOARD 3
ROLE OF THE LOCAL AIR DISTRICTS 4

III. PROGRAM EXPANSION 5

INCREASED FUNDING 5
PROGRAM EXPANSION 6
ADMINISTRATION FUNDING 7

IV. YEARS 1 THROUGH 6 PROGRAM SUMMARY 9

PROJECTS FUNDED 9
EMISSION REDUCTIONS ACHIEVED 9
HEALTH AND WELFARE BENEFITS 10
PROJECT MIX 11
PROJECT LIFE 12
COST-EFFECTIVENESS 12
TYPICAL PROJECTS 14

V. ENVIRONMENTAL JUSTICE 20

VI. 2006 AUDIT RESULTS 22

ARB AUDIT OF AIR DISTRICT PROGRAMS 22
DEPARTMENT OF FINANCE EVALUATION OF ARB PROGRAM 25
BUREAU OF STATE AUDITS 25

VII. STATE IMPLEMENTATION PLAN 26

NEW STATE IMPLEMENTATION PLANS 26
SIP EMISSION REDUCTIONS 27

VIII. LOOKING AHEAD 28

NEW REGULATIONS 28
GOODS MOVEMENT AND AIR QUALITY BOND FUNDING 29
NEW SOURCE CATEGORY EVALUATIONS 29
OTHER PROGRAM ENHANCEMENTS 30

IX. CONCLUSION 32

TABLES

TABLE III-1 STATE CARL MOYER PROGRAM FUNDING (YEARS 1 THROUGH 9).....6
TABLE IV-1 CARL MOYER PROGRAM PROJECT SUMMARY (YEARS 1 THROUGH 6).....10
TABLE IV-2 AVERAGE PROJECT LIFE 12
TABLE IV-3 ON-ROAD HEAVY-DUTY VEHICLE PROJECT SUMMARY 15
TABLE IV-4 OFF-ROAD EQUIPMENT PROJECT SUMMARY 16
TABLE IV-5 AGRICULTURAL IRRIGATION PUMP PROJECT SUMMARY 17
TABLE IV-6 MARINE VESSEL PROJECT SUMMARY (BY VESSEL TYPE) 18
TABLE IV-7 MARINE VESSEL PROJECT SUMMARY (BY ENGINE HORSEPOWER).....18
TABLE IV-8 LOCOMOTIVE PROJECT SUMMARY 19
TABLE V-1 FUNDING AND EMISSION REDUCTIONS IN ENVIRONMENTAL JUSTICE AREAS 21
TABLE VI-1 2006 DISTRICT AUDIT SUMMARY 24
TABLE VII-1 PROJECTED STATEWIDE EMISSION BENEFITS 27

FIGURES

FIGURE IV-1 FUNDING BY PROJECT TYPE.....9
FIGURE IV-2 CARL MOYER PROGRAM FUNDING MIX..... 11
FIGURE IV-3 CARL MOYER PROGRAM AVERAGE NOX COST-EFFECTIVENESS..... 13
FIGURE IV-4 ALTERNATIVE-FUELED TRANSIT BUS.....15
FIGURE IV-5 OFF-ROAD CONSTRUCTION EQUIPMENT..... 16
FIGURE IV-6 AGRICULTURAL PUMP ENGINE.....17
FIGURE IV-7 TUG BOAT.....18
FIGURE IV-8 ALTERNATIVE TECHNOLOGY LOCOMOTIVE..... 19

APPENDICES

DISTRICT PROGRAMS.....APPENDIX A
ENVIRONMENTAL JUSTICE PROJECTS.....APPENDIX B
VENTURA COUNTY APCD AUDIT RESULTS..... APPENDIX C
SACRAMENTO METROPOLITAN AQMD AUDIT RESULTS ..... APPENDIX D
SOUTH COAST AQMD AUDIT RESULTS.....APPENDIX E
CALIFORNIA DEPARTMENT OF FINANCE EVALUATION OF ARB PROGRAM.....APPENDIX F

EXECUTIVE SUMMARY

The Carl Moyer Memorial Air Quality Standards Program (Carl Moyer Program) was established in 1998 as a grant program to fund the incremental cost of cleaner-than-required heavy-duty engines. The program fills a critical niche in California's strategy to attain federal air quality standards by achieving emission reductions early or in excess of what is required by regulation. By requiring that fifty percent of funds in the most populated air districts be spent in environmental justice areas and communities that experience the greatest air pollution impacts, the program also ensures that reductions occur where they're most needed. This innovative program has proven popular among a wide variety of stakeholders, including environmental groups, technology manufacturers, and the regulated community.

In its first six years, the Carl Moyer Program provided over $140 million in funding to clean up more than 6,300 heavy-duty engines. These projects have reduced smog-forming oxides of nitrogen (NOx) emissions by over 18 tons per day (tpd) and toxic particulate matter (PM) emissions by almost one tpd, with a favorable cost-effectiveness of about $2,600 per ton of NOx reduced. Over this period, the Carl Moyer Program provided significant health and welfare benefits, helping reduce lost work days by about 17,000 and prevent about 2,800 asthma attacks and 100 premature deaths.[1] This corresponds to a societal program benefit that is better than five times the cost.

The Carl Moyer Program entered a new era in its seventh year, as legislation provided a significant boost in funding through 2015 and expanded the program to include additional pollutants and source categories. This Status Report provides a detailed analysis of Years 1 through 6 of the Carl Moyer Program, describes implementation of the expanded program in Years 7 and 8, and outlines the future direction of the Carl Moyer Program and other incentive programs in California.

How does the Carl Moyer Program work?

The Carl Moyer Program is implemented as a partnership between the California Air Resources Board (ARB) and the local air quality management districts (AQMDs) and air pollution control districts (APCDs). ARB provides program oversight and minimum program requirements and the local air districts select, fund, and monitor projects. All Carl Moyer Program projects must meet the minimum program requirements as specified in state law and ARB's Carl Moyer Program Guidelines. Carl Moyer Program projects cannot exceed a cost-effectiveness cap of $14,300 per weighted ton of NOx,

[1] These numbers reflect the estimated mean cumulative benefit of Carl Moyer Program projects from 2000 to 2005. (ARB Research Division, 2006)

reactive organic gases (ROG), and PM emission reductions. To be eligible for Carl Moyer Program funding, projects must reduce emissions beyond would be achieved through normal fleet turnover or by regulation or other legal mandate (i.e. reductions must be "surplus" to what is otherwise required by law).

What types of projects are funded?
The Carl Moyer Program funds clean air projects involving a wide variety of vehicles and equipment – from small forklifts to large locomotives. The Carl Moyer Program has provided funding for the incremental cost of a diverse range of project types, including purchase of new alternative-fuel heavy-duty vehicles (primarily transit buses and trash trucks), and engine replacements (repowers) for agricultural irrigation pumps, construction equipment, and marine vessels. Over the last six years, new technologies, regulations, and emissions standards have affected the types of projects funded. In general, the number of on-road new vehicle purchase and marine vessel repower projects have declined while the number of construction equipment and locomotive projects have increased. Emerging project categories include new locomotive purchases, light-duty vehicle scrap programs, and installation of PM retrofit devices.

How does the Carl Moyer Program help California meet its air quality goals?
The South Coast AQMD and San Joaquin Valley APCD need significant NOx and PM reductions to attain the new federal ambient air quality standards for 8-hour ozone and particulate matter less than 2.5 microns in diameter (PM2.5). Much of the rest of California also must attain the federal 8-hour ozone standard in the next decade. While regulations will achieve the vast majority of reductions needed for attainment of these standards, the Carl Moyer Program is critical for achieving early or extra emission reductions and targeting sources which aren't feasible to regulate. California relies upon regulations combined with turnover of the fleet to cleaner vehicles and equipment to provide about 90 percent of the emission reductions needed to meet federal air quality standards. Innovative programs such as the Carl Moyer Program are expected to provide the remaining ten percent of emission reductions.

How has the program expanded in recent years?
Legislative changes enacted in 2004 and 2005 provide increased and continuing funding for the Carl Moyer Program and other incentive programs – from roughly $25 million per year to up to $141 million annually through 2015. This legislation also allowed funding of projects that reduce PM and ROG, and expanded the program to include voluntary light-duty vehicle retirement and repair, on-road heavy-duty fleet modernization, and assistance for previously unregulated agricultural sources. These changes were incorporated into the Carl Moyer Program beginning in FY 2004-05 (Year 7).

This program expansion increased administrative responsibilities at both the state and local levels. In 2006, Governor Schwarzenegger and the Legislature recognized the importance of these responsibilities by enacting legislation to boost resources for program administration. These additional resources will enable ARB and the districts to enhance outreach to potential applicants, streamline application and reporting

requirements, participate in regular program audits, and improve program efficiency and accountability.

What is the status of Carl Moyer Program Year 7 through 9 funds?
Most districts are in the process of expending their remaining Year 7 funds, which are required to be fully spent by June 30, 2007. Many districts have begun funding projects with Year 8 grants and a few will be ready to receive Year 9 funds when they are available from ARB in January 2007.

What are the results of ARB's Carl Moyer Program air district audits?
In 2006, the ARB adopted more structured audit procedures and formally audited Carl Moyer Program implementation at the Ventura County APCD, Sacramento Metropolitan AQMD, South Coast AQMD, and Butte County AQMD. These audits focused on air district program implementation in FYs 2002-03 and 2003-04 (Years 5 and 6). The Ventura County APCD and Sacramento Metropolitan AQMD were found to run excellent programs that generally comply with ARB and California Health and Safety Code requirements.[1] The South Coast AQMD audit revealed that as of July 2006, the district had not expended about $10 million of its $15.6 million Year 5 and 6 program funds in a timely manner consistent with State law. The South Coast AQMD has committed to fully expend these funds by July 2007. ARB will conduct a follow-up audit of the district and report to the Board on its findings in late 2007.

In 2006, the California Department of Finance (DOF) also conducted an evaluation of ARB's oversight of the Carl Moyer Program. The DOF evaluation provides suggestions for improving the effectiveness and accountability of the program, such as establishment of more specific guidelines for project data collection and financial practices. The DOF evaluation also indicates program areas that should be more prescriptive and suggests increased ARB audits of air district programs. DOF's suggestions will be considered for inclusion in the revisions to the Carl Moyer Program Guidelines planned for the Fall, 2007. Finally, the California Bureau of State Audits (BSA) began a performance audit of the ARB and the Bay Area AQMD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD, and South Coast AQMD programs in October 2006. The BSA audit findings will be available on ARB's website when they are released in Spring 2007.

What is the future of the Carl Moyer Program?
Several factors suggest that demand for Carl Moyer Program grant funding will be strong through the program's 2015 sunset date. First, recent legislation has expanded the program to allow funding for projects that reduce ROG and PM emissions. This has added funding opportunities for gasoline engine projects, in addition to diesel engine projects. A voluntary car scrap programs is one promising example of a new Carl Moyer Program source category. A second factor relates to new ARB regulations under development to require clean-up of privately-owned diesel trucks and off-road

[1] As of December 1, 2006, the Butte County AQMD audit report was not yet finalized. Once complete, this report will be available on ARB's website at http://www.arb.ca.gov/msprog/moyer/moyer.htm.

equipment. These regulations are likely to provide more time for small businesses to comply. Carl Moyer Program funds provide an opportunity for small business owners to reduce the cost of the regulation through early regulatory compliance. Finally, there remain many sources of NOx and PM emissions – such as federally pre-empted locomotive engines – that are not subject to upcoming ARB in-use vehicle and equipment regulations. Given that the cost of cleaning up California's fleet of existing diesel engines is at least ten times the available Carl Moyer Program funds, demand for funding from this program will remain high.

In its first six years, the Carl Moyer Program has provided significant air quality benefits. The program plays a critical role in the state's strategy to attain clean, healthful air for all Californians by achieving cost-effective emission reductions from in-use engines while complementing regulations and advancing clean air technology. The program has recently expanded significantly and continues to evolve as it provides real, surplus, quantifiable, and cost-effective air quality benefits.

I.

INTRODUCTION

The Carl Moyer Program is an air quality grant program that funds the incremental cost of cleaner-than-required vehicles, engines, and equipment. The primary objective of the program is to achieve NOx, ROG, and PM emission reductions that would not otherwise occur through regulations or other legal mandates. These "surplus" reductions play an important role in meeting commitments in California's federally required State Implementation Plans (SIPs) for ozone and particulate matter. The Carl Moyer Program also targets toxic diesel PM reductions and, through its environmental justice requirements, helps ensure that emission reductions occur in communities where they're most needed. In its first six years, the Carl Moyer Program has provided air districts with over $140 million in grants, reducing NOx emissions by over 18 tpd and PM emissions by almost one tpd. The Carl Moyer Program entered a new era in its seventh year, as legislation provided a significant boost in funding through 2015 and expanded the program to include new pollutants and source categories.

Background

More than 1.2 million diesel-fueled engines operate in California – powering most trucks, buses, off-road equipment, agricultural irrigation pumps, locomotives, and marine vessels. Heavy-duty diesel engines are durable, economical to operate, and play an important role in California's economy. However, they are also significant contributors to our state's air pollution. Although they power less than five percent of all vehicles and mobile equipment in California, diesel engines produce almost 60 percent of the state's emissions of NOx, a smog-forming pollutant. California's older fleet of gasoline engines are also significant contributors of both NOx and ROG. NOx combines with ROG in the presence of sunlight to form ozone (also known as smog). Ozone can damage the respiratory tract, worsen asthma symptoms, and reduce children's lung development. In addition, many reactive organic gases emitted by gasoline engines, such as benzene and 1,3-butadiene, have been identified as toxic air contaminants by ARB.

The solid components of diesel exhaust are known as diesel PM. In 1998, ARB identified diesel PM as a toxic air contaminant based on its potential to cause cancer. One study estimates these engines are also responsible for about 70 percent of the overall cancer risk from all air toxics.[1] Particulate matter also contributes to premature death, asthma attacks, and other health problems. The Carl Moyer Program plays a critical role in achieving clean, healthful air for

[1] Multiple Air Toxics Exposure Study II, South Coast Air Quality Management District, 1999.

Californians by helping accelerate reductions of toxic and smog-forming emissions from diesel-powered vehicles and equipment.

This Carl Moyer Program Status Report includes the following[1]:

- An overview of the program's structure, funding sources, and recent program expansion.
- A summary of projects funded in Years 1 through 6, and preliminary information regarding Year 7 projects.
- A discussion of how air districts are implementing program environmental justice requirements.
- Results of ARB audits of Ventura County APCD, Sacramento Metropolitan AQMD and the South Coast AQMD implementation of the Carl Moyer Program, as well as the California Department of Finance evaluation of ARB's program.
- A projection of expected future year Carl Moyer Program air quality benefits.
- A look ahead at program challenges and potential program enhancements.

Appendix A describes the Carl Moyer Program projects funded by each air district in the program's first six years. Appendix B includes the environmental justice projects funded by California's five most populous air districts. Appendices C through E include the final ARB audit reports and air district responses for the three Carl Moyer Program audits listed above. Appendix F provides the results of the Department of Finance evaluation of ARB's program.

[1] Carl Moyer Program Status Reports published in 1999, 2001, 2002, and 2004 (available at www.arb.ca.gov/msprog/moyer/status.htm) provide more information regarding previous years of the program.

II.

PROGRAM IMPLEMENTATION

The Carl Moyer Program is implemented as a partnership between ARB and the local air districts. Program responsibilities are delineated in the California Health and Safety Code (HSC) – ARB provides overall guidance for the program while air districts administer the program locally (HSC § 44286).

Role of the Air Resources Board

ARB has oversight responsibility for the Carl Moyer Program to ensure it meets its statutory requirements. These responsibilities include:

- Carl Moyer Program Guideline Development – ARB is responsible for development of Carl Moyer Program Guidelines. The guidelines identify minimum requirements needed to ensure projects achieve real, surplus, enforceable, and cost-effective emission reductions. Program guidelines are developed in cooperation with local air districts, engine owners and operators, technology manufacturers, and other stakeholders. The guidelines are updated and taken to the Board for its approval approximately every two years. The current Carl Moyer Program Guidelines were approved by the Board in November 2005.

- Funding Allocations – ARB allocates program funding annually to air districts in accordance with the allocation formula identified in HSC § 44299.2(i).

- Program Oversight and Monitoring – ARB is responsible for reviewing district progress in obligating and expending statewide funds and, when necessary, reallocating funds among air districts within a funding cycle. In 2006, ARB also began regular field audits of air district Carl Moyer Program implementation.

- Technical Support – ARB provides districts with program policy and technical support through regular contact with district staff, training sessions, and quarterly Incentive Program Implementation meetings.

- Multi-District Projects – ARB keeps ten percent of program funding for projects which meet a state priority or are multi-district in nature in accordance with HSC § 44286(d). More information regarding multi-district projects can be found in Appendix A.

Role of the Local Air Districts

Air districts provide grants to public and private entities for the incremental cost of cleaner-than-required engines and equipment. Air districts have significant flexibility to implement the program in a way that reflects local priorities, including flexibility to evaluate and select projects. However, local district requirements must be at least as stringent as the state program guidelines. The districts' role in implementing the program include:

- Project Outreach, Solicitation, Evaluation, and Tracking – Air districts conduct outreach, solicit and evaluate project applications, select projects, contract with engine owners and operators, and track project completion in accordance with the Carl Moyer Program Guidelines.

- Match Funding – Districts participating in the Carl Moyer Program are required to provide $1 in match funding for every $2 of state Carl Moyer Program funding received, with a $12 million cap on total statewide match funds. Districts that accept only the minimum allocation may receive a waiver from the match requirement if they demonstrate they have the resources to implement the Carl Moyer Program. Match funds must be spent on projects that meet all applicable Carl Moyer Program requirements. However, match funds may also be used for low-emission infrastructure projects, such as alternative fuel refueling stations, or for the incremental cost of cleaner-than-required fuel. Up to 15 percent of the match fund requirement may be fulfilled through district "in-kind" contributions (i.e. administrative costs). Each air district's Year 1 through 6 match funding contribution is provided in Appendix Table A-2.

- Project Reporting – Districts are required by state law to fully expend their Carl Moyer Program funds within two years of receiving their annual allocation from ARB (HSC § 44287(k)). Every June 30th participating districts provide ARB with two reports – an Annual Report describing projects selected for funding with the previous year's money and a Final Report detailing completed projects funded with the allocation received two years earlier.

- Environmental Justice – Air districts with more than one million inhabitants (Bay Area AQMD, Sacramento Metropolitan AQMD, San Diego County APCD, San Joaquin Valley Unified APCD, and South Coast AQMD) must ensure that at least fifty percent of their Carl Moyer Program funds are expended in low-income communities, communities of color, or areas disproportionately affected by air pollution (HSC § 43023.5).

III.

PROGRAM EXPANSION

Legislation signed by the Governor in 2004 and 2005 expanded the Carl Moyer Program by providing increased and continuous program funding, adding PM and ROG emissions to the program, and including new project categories.

Increased Funding

The state provided air districts over $140 million in project funding over the first six years of the Carl Moyer Program. In Years 1 through 4, the California Legislature funded the Carl Moyer Program through annual budget appropriations. Voter approval of *Proposition 40: The California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002* provided funding for the program in Years 5 and 6.

Increased and continuous funding for the Carl Moyer Program was secured in 2005 when the Legislature passed and the Governor signed Senate Bill 1107 (Firebaugh) and Assembly Bill 923 (Pavley). This legislation provides up to $141 million annually for the Carl Moyer Program through 2015. The three sources of this new funding are:

- Smog Check Fee – A Smog Check fee adjustment provides about $61 million in annual funding for the Carl Moyer Program through 2015.
- Tire Fee – The fee assessed for new tire purchases increased from $1.00 to $1.75 per tire, providing about $25 million a year through 2015 for clean air programs like the Carl Moyer Program.
- Motor Vehicle Registration Fee – AB 923 gave air district governing boards the authority to increase the vehicle registration surcharge by two dollars to pay for four specific clean air incentive programs: 1) projects eligible for funding under the Carl Moyer Program; 2) purchase of new school buses; 3) light-duty vehicle programs; and 4) a program targeting previously unregulated agricultural sources. This fee adjustment could provide up to $55 million in program funds directly to local air districts. Prior to passage of AB 923, local air districts had the authority to impose a two to four dollar per vehicle registration fee to pay for clean air projects and programs (commonly referred to as "AB 2766 fees"). Appendix Table A-3 provides a summary of air district vehicle registration fees as of September 2006.

Table III-1 provides Carl Moyer Program project and program administration funding totals for program Years 1 through 9.

Table III-1:
State Carl Moyer Program Funding
Years 1-9 (in thousands)

Fiscal Year	District Projects	ARB Multi-District Projects	Administration (including outreach)		Total*
			Districts	ARB	
1998-99 (Year 1)	$ 24,500	--	--	$ 500	$ 25,000
1999-00 (Year 2)	$ 18,495	$ 125	--	$ 380	$ 23,000
2000-01 (Year 3)	$ 43,723	$ 377	--	$ 900	$ 50,000
2001-02 (Year 4)	$ 15,680	--	--	$ 320	$ 16,000
2002-03 (Year 5)	$ 19,680	--	--	$ 400	$ 20,080
2003-04 (Year 6)	$ 18,000	--	--	$ 400	$ 18,400
2004-05 (Year 7)	$ 26,280	$ 2,928	$ 610	$ 10	$ 30,428
2005-06 (Year 8)	$ 76,464	$ 8,496	$1,770	$1,770	$ 88,500
2006-07 (Year 9)	$ 73,361	$ 8,501	$4,538	$3,600	$ 90,000
TOTAL	**$316,184**	**$20,427**	**$6,918**	**$8,280**	**$361,408**

*These totals include California Energy Commission funds totaling $4 million in Year 2 and $5 million in Year 3 for infrastructure and technology development projects.

Program Expansion

The legislation that increased Carl Moyer Program funding beginning in Year 7 also expanded the program to include PM and ROG emission reductions. This change allows the program to more comprehensively address California's air pollution challenges, such as the air toxic risk associated with emissions from diesel engines. Inclusion of PM in project cost-effectiveness calculations also facilitates funding of diesel after-treatment device projects. As part of the 2005 Carl Moyer Program Guidelines, the Board approved a PM weighting factor of 20 relative to NOx and ROG in project cost-effectiveness calculations. This weighting reflects the relatively greater health impacts and cost-of-control for PM on a ton-emitted basis. The 2005 Carl Moyer Program Guidelines also raised the maximum allowable project cost-effectiveness from $13,600 per ton of NOx reduced to $14,300 per ton weighted of NOx, ROG, and PM reduced.[1]

The new legislation also directed ARB to include light-duty vehicle projects, on-road heavy-duty vehicle fleet modernization projects, and previously unregulated agricultural sources. ARB has identified two light-duty vehicle project categories eligible for Carl Moyer Program funding – voluntary accelerated vehicle retirement (VAVR or car scrap) and voluntary vehicle repair (VRV). Both programs reduce emissions by cleaning up the older, dirtier car and light truck fleet – the VAVR program provides incentives for scrapping older vehicles, while the VRV would provide grants to repair or replace emission control systems. The South Coast AQMD is conducting a pilot program which

[1] The cost-effectiveness cap was $12,000 per ton NOx reduced in Year 1 and has been raised periodically to reflect adjustments to the Consumer Price Index.

uses a remote sensing device to identify especially high-emitting vehicles that could be eligible for VAVR or VRV. The Board approved VAVR regulation revisions and updated Carl Moyer Program Guidelines for VAVR and VRV projects in December 2006.

On-road heavy-duty fleet modernization projects were required to be added to the Carl Moyer Program by legislation in 2004 (AB 1394, Levine). On-road heavy-duty fleet modernization is the replacement of an old, high-polluting, heavy-duty vehicle with a newer, cleaner vehicle. As of October 2006, the South Coast AQMD and the Sacramento Metropolitan AQMD have set aside Carl Moyer Program funds for on-road heavy-duty vehicle fleet modernization projects.

One of the programs for which air districts may use the $2 increase in the motor vehicle registration surcharge is for compliance assistance for previously unregulated agricultural sources. Referred to as the Agricultural Assistance Program (AAP), this program must comply with Carl Moyer Program requirements, with the major exception that reductions are not required to be surplus to regulations. As of September 2006, both the Santa Barbara APCD and the South Coast AQMD have funded AAP projects – the Santa Barbara APCD has spent $190,939 to clean-up nine agricultural irrigation pump engines and the South Coast AQMD has committed $119,441 to repower two agricultural irrigation pump engines with electric motors.

Finally, the guidelines also include enhanced program implementation and reporting requirements to ensure the effectiveness and integrity of the expanded program. These include project contract requirements, engine pre- and post-inspections, submittal of air district program policies and procedures to ARB, and other program enhancements.

Administration Funding

Implementation of the Carl Moyer Program – particularly an expanded program with additional implementation safeguards – requires considerable staff resources, both by ARB and local air districts. In September 2006, the Legislature and Governor recognized the need for additional staff resources by enacting and signing SB 225 (Soto, 2006). This legislation increases allowable expenditures for program administration from the two percent of program funds that was dedicated to program outreach to five percent for air districts with one million or more inhabitants and to ten percent for those with less than one million inhabitants. Administration funds provide air districts the resources to effectively implement the Carl Moyer Program, including resources for staff salaries and benefits, training, office space, printing, mailing, transportation, outreach, and other program support.

In order to allow air districts to utilize this funding as soon as possible, ARB is making this allowance effective with the Year 9 funding cycle and available to air districts starting in January 2007. The two percent in administration funding which ARB previously allocated to air districts will be used for ARB program administration and outreach, bringing ARB's allocation for program administration to four percent of state Carl Moyer Program funds. This adjustment will provide ARB the means to more

effectively implement and oversee the expanded Carl Moyer Program, including the ability to improve program efficiency, conduct additional field audits, and help rural districts solicit, evaluate, and track projects. With these administrative cost adjustments, Carl Moyer Program administration costs will be comparable to those of other government grant programs.

IV.

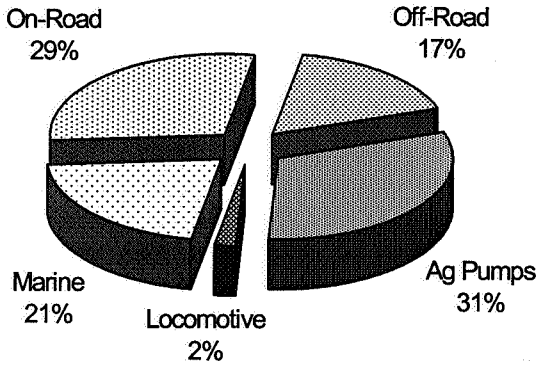
YEARS 1 THROUGH 6 PROGRAM SUMMARY

In its first six years, the Carl Moyer Program provided over $140 million in incentive grants to replace more than 1,700 diesel engines with alternative fueled engines and electric motors and to replace over 4,600 dirty diesel engines with cleaner engines. This chapter provides information regarding the types of projects funded, NOx and PM emission reductions achieved, average program cost-effectiveness, and typical projects funded.

Projects Funded

Carl Moyer Program project funds in Years 1 through 6 have been used to reduce emissions from on-road vehicles, off-road equipment, agricultural irrigation pumps, marine vessels, and locomotives. Figure IV-1 shows program funding by project type in Years 1 through 6. Over 6,300 cleaner engines have been funded, with an average grant of about $19,000 per engine. Transit buses and trash trucks represent the majority of on-road projects, while off-road projects are mostly construction, agricultural, and cargo-handling equipment repowers.

Figure IV-1:
Funding by Project Type
(Years 1-6)



Emission Reductions Achieved

Table IV-1 summarizes the types of projects funded and emission reductions achieved by the Carl Moyer Program in Years 1 through 6. This table does not include the benefits of about $19 million in Year 1 through 6 projects under contract but not yet in operation in the South Coast AQMD and the Bay Area AQMD. Table IV-1 also does not include benefits achieved by Year 7 and 8 projects that have been completed prior to their statutory deadlines. For example, as of October 2006, the South Coast AQMD has completed over $1 million in Year 7 projects and the Sacramento Metropolitan AQMD has completed over $1 million in Year 8 projects. Year 7 and 8 projects are required to be completed and reported to ARB by June 30 of 2007 and 2008, respectively.

Table IV-1: Carl Moyer Program Project Summary
Years 1-6

Source Category/ Equipment Type	Emission Reductions		Average NOx Cost-Effectiveness ($/ton)	Number of Engines		Total Funds	
	NOx (tpy)	PM (tpy)		Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road							
Transit Bus/Urban Bus	592	19	$2,900	867	329	$11,447,265	$ 2,660,422
Trash Trucks	360	8	$4,200	425	28	$11,779,025	$ 654,700
Heavy-Duty Line Haul	175	4	$4,500	118	127	$ 2,991,316	$ 2,631,044
Other	53	1	$6,100	123	41	$ 1,828,969	$ 769,764
Off-Road							
Construction Equipment	892	47	$3,500	6	316	$ 472,468	$16,262,349
Farm Equipment	48	2	$5,200	0	116	$ 0	$ 1,315,855
Cargo Handling Equip.	115	1	$2,000	130	1	$ 1,197,297	$ 10,000
Other Equipment	37	2	$3,300	0	37	$ 0	$ 674,878
Ag Pumps	3,047	136	$2,200	88	3,112	$ 1,704,150	$35,176,183
Marine Vessels	1,272	73	$1,800	0	448	$ 0	$25,838,238
Locomotives	97	2	$3,600	2	24	$ 820,000	$ 1,535,585
TOTAL	**6,688**	**295**	**$2,600***	**1,760**	**4,579**	**$32,240,490**	**$87,529,018**

Table includes information for projects completed as of October 1, 2006.
* Reflects the average NOx cost-effectiveness of completed Year 1 though 6 Carl Moyer Program projects.

Health and Welfare Benefits

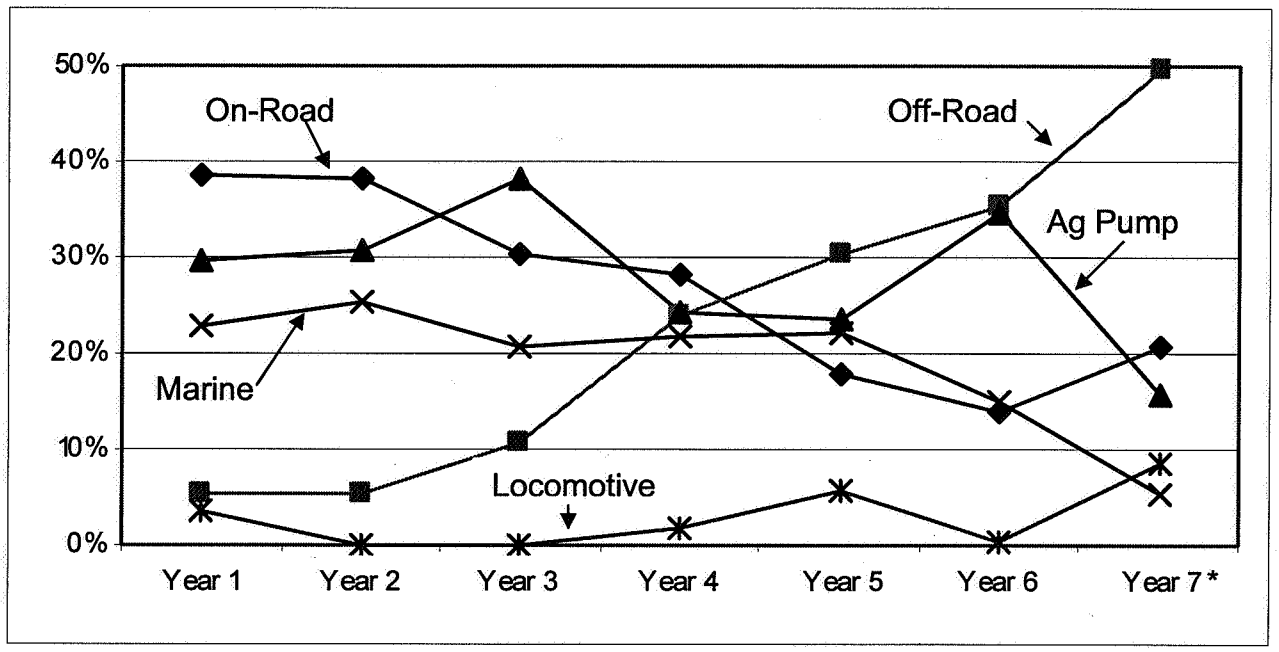
In Years 1 through 6, emission reductions achieved by Carl Moyer Program projects achieved significant health and welfare benefits, helping reduce lost work days by about 17,000 and prevent about 2,800 asthma attacks and 100 premature deaths.[1] These and other avoided health and welfare impacts have an estimated mean economic valuation of $790 million. Therefore, the societal benefit of the Carl Moyer Program is better than five times its cost. These numbers are conservative because they reflect the benefits of Carl Moyer Program projects through 2005 only. Most of these projects extend beyond 2005 and will continue to accrue additional benefits in future years.

[1] These numbers reflect the mean cumulative benefits of Carl Moyer Program projects from 2000 to 2005. (ARB Research Division, 2006) The range of estimated total cases avoided is: premature mortality (28 – 170); asthma and lower respiratory symptoms (1,100 – 4,500); work loss days (15,000 – 20,000). Ranges reflect uncertainty in health concentration-response functions.

Project Mix

The mix of projects funded by the Carl Moyer Program has shifted significantly since the program's inception. As shown in Figure IV-2, the percentage of total program funds for off-road equipment projects is increasing steadily, while relative funding for marine and on-road heavy-duty vehicle projects is declining. The decline in relative funding for these project types is due to different factors. Many of the most cost-effective marine vessel repower projects have already been funded, particularly in the South Coast AQMD. On the other hand, relative funding for on-road heavy-duty vehicle projects is declining due to new regulations that make reductions from these sources no longer surplus, and therefore not eligible for grants. Chapter VIII describes how regulations can impact opportunities for Carl Moyer Program funding.

Figure IV-2: Carl Moyer Program Funding Mix



* Year 7 data reflects preliminary project information as of October 1, 2006.

Project Life

In Years 1 through 6, Carl Moyer Program projects had an average dollar-weighted project life of over ten years. Preliminary project data indicates that in Year 7 average project life declined to about seven years. The shorter project life is occurring in part because the allowable minimum project life was shortened from five years to three years in the 2005 Carl Moyer Program Guidelines. This change provides more flexibility to fund projects in source categories subject to in-use vehicle and equipment regulations. For example, if a regulation requires a vehicle have a cleaner engine in three years, the project life for that engine cannot exceed three years since the reductions would be achieved by the regulation – and no longer be surplus – at that time. Table IV-2 provides the average dollar-weighted project life of Carl Moyer Program projects in years 1 through 7.

Table IV-2:
Average Project Life

Funding Year	Avg. Project Life
Year 1	12.6
Year 2	11.6
Year 3	9.1
Year 4	9.8
Year 5	9.3
Year 6	8.2
Year 7	7.1

The average project life reflects the average life per dollar spent rather than per engine funded.

All other factors being equal, projects with shorter lives are less cost-effective since the benefits accrue for fewer years. However, despite the decline in average project life, all projects funded meet the statutory cost-effectiveness cap, and the average program cost-effectiveness remains well below this cap.

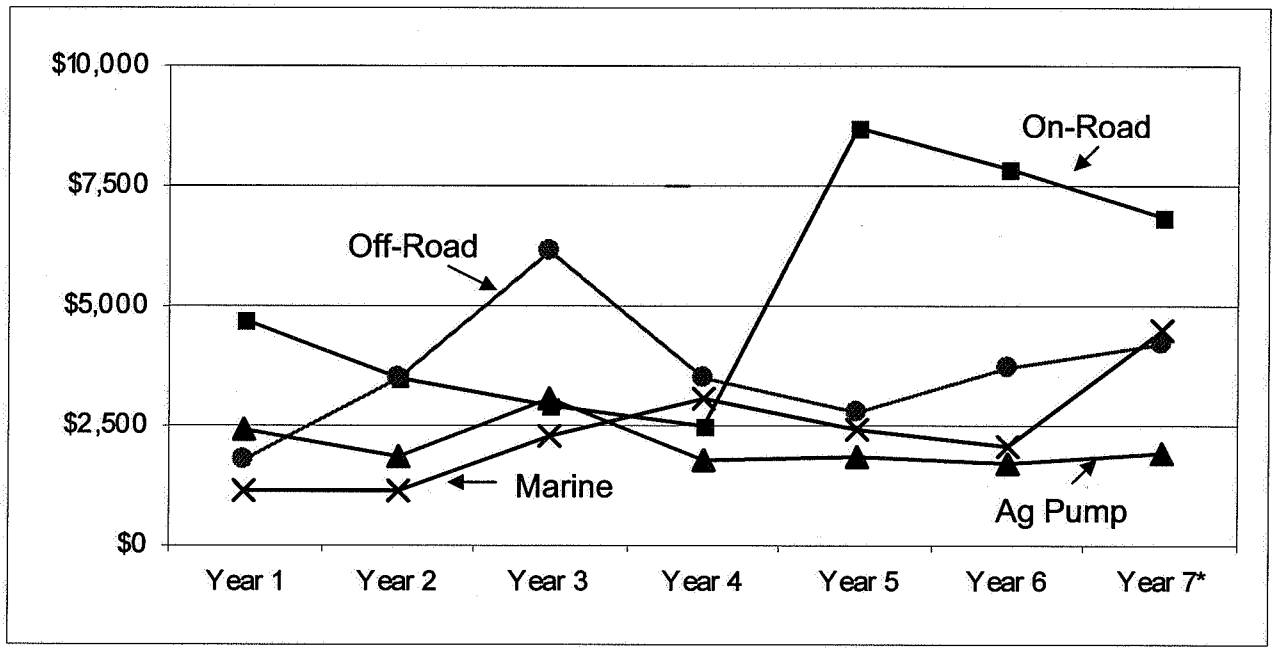
Cost-Effectiveness

Many air districts use cost-effectiveness to rank and select potential Carl Moyer Program projects. Project cost-effectiveness is based upon several factors, including emission reductions achieved, project life, and grant amount. Applicants are eligible for up to the cost differential – or incremental cost – between the low-emission project and what would typically be spent in lieu of the grant award. For example, a marine vessel operator could be eligible for the difference between the cost to rebuild his existing marine engine and the cost to install a newer, cleaner engine.

Carl Moyer Program projects have proven extremely cost-effective, averaging about $2,600 per ton of NOx reduced in Years 1 through 6. Average NOx cost-effectiveness rose to about $3,900 per ton in Year 7. This increase is likely due to several factors, including the trend towards a shorter project life or the inclusion of PM in the project cost-effectiveness calculation beginning in Year 7. Despite this increase in cost-effectiveness, the average program cost-effectiveness is still well below the $14,300 per ton statutory cap on weighted NOx, ROG, and PM emission reductions.

Figure IV-3 shows the average cost-effectiveness of on-road, off-road, agricultural irrigation pump, and marine vessel projects in Years 1 through 7. Agricultural irrigation pump and marine vessel projects tend to be the most cost-effective, in part because of their high activity and, with the exception of the largest marine engines, the lower cost of replacement engines. On-road projects – particularly the purchase of cleaner-than-required alternative-fuel vehicles – are typically less cost-effective due to the high cost of new vehicles and the relatively modest per vehicle emission reductions.

Figure IV-3: Carl Moyer Program Project Average NOx Cost Effectiveness ($/ton)



* Year 7 data reflects preliminary project information as of October 1, 2006.

Typical Projects

The Carl Moyer Program has funded a wide variety of projects in Years 1 through 6, including purchase of cleaner-than-required new vehicles or equipment, engine replacements, and engine retrofits. The types of projects funded have been dictated, in part, by project cost, the population of older engines in each source category, and the availability and efficacy of newer, cleaner technologies. In order to be eligible for funding, new engines must be certified by ARB or U.S. EPA. New purchase projects must be at least 30 percent cleaner for NOx or NOx plus non-methane hydrocarbons than the applicable new vehicle or equipment standard, while repower projects that reduce NOx emissions must achieve at least a 15 percent NOx reduction relative to the replaced engine. Retrofit devices must be ARB or (in the case of marine vessels or locomotives) U.S. EPA verified to be eligible for funding and must reduce NOx by at least 15 percent in order to take credit for NOx reductions.

Each page in this section describes typical projects in the five source categories funded in Years 1 through 6 – on-road heavy-duty vehicles, off-road equipment, agricultural irrigation pump engines, marine vessels, and locomotives. The tables on each page provide data which characterizes the types of projects funded. This data includes the number and types of engines funded and the typical vehicle or equipment annual miles traveled, fuel consumed, or hours operated.

The tables also include the average percent incremental cost, which reflects the maximum portion of the project cost eligible for Carl Moyer Program funding. This can be compared to the average percent funding, which indicates how much of the eligible cost air districts choose to provide. In some cases, an applicant may request less than the full incremental cost in order to improve the project cost-effectiveness and increase the chances of being selected for funding. Air districts may also choose to fund less than the full eligible cost in order to increase the number of applicants funded. In most cases, the cost not paid by the Carl Moyer Program is borne by the engine owner.

On-Road Heavy-Duty Vehicles

In its first six years, the Carl Moyer Program has funded over 2,000 on-road heavy-duty new vehicle purchases, engine repowers, and retrofits. Table IV-3 provides average activity and cost data for the most common project types. For on-road new vehicle purchase projects, vehicle owners typically pay over $100,000 per new vehicle, with the Carl Moyer Program providing about $20,000 for a cleaner- than-required vehicle. Many new purchase projects involve a public fleet's purchase of multiple new alternative-fuel transit buses, trash trucks, or other vehicles. Almost 80 percent of total Carl Moyer Program on-road heavy-duty new purchase projects have been funded by the South Coast AQMD.

Figure IV-4: Alternative-Fueled Transit Bus



On-road heavy-duty repower projects, on the other hand, are more typically pursued by truck owner-operators or smaller trucking firms, and involve replacement of an older line-haul truck engine with an engine which is, on average, ten years newer. On-road heavy-duty vehicles funded by the Carl Moyer Program typically travel between 18,000 and 60,000 miles annually. School buses, street sweepers, and trash trucks generally have the lowest annual mileage; however, street sweepers and trash trucks often burn more fuel due to their auxiliary engines and are therefore more cost-effective projects than school buses. Line-haul trucks travel the most but – because they travel long distances – may have low mileage within any particular air district.

Table IV-3: Carl Moyer Program On-Road Heavy-Duty Vehicle Project Summary
Years 1 through 6 by Project Type

		Number of Engines	Average Annual VMT	Average Baseline Cost	Average Low Emission Tech. Cost	Percent Incre-mental Cost	Average Grant Amount	Average Percent Funding
New Vehicle Purchase	Line Haul	117	44,500	$102,202	$137,065	25%	$24,393	18%
	Transit Bus	841	43,852	$303,386	$345,685	12%	$12,762	4%
	Urban Bus	34	33,219	$169,865	$224,235	24%	$12,484	6%
	School Bus	24	17,942	$114,645	$146,051	22%	$21,715	15%
	Trash Truck	369	30,325	$135,259	$172,954	22%	$21,592	12%
	Street Sweeper	32	26,857	$111,059	$155,482	29%	$25,708	17%
Repower	Line Haul	110	54,461	$ 9,530	$ 33,554	72%	$22,728	68%
	Trash Truck-alt. fuel	60	--	$ 7,481	$105,239	93%	$66,778	63%
	Trash Truck-diesel	17	30,000	$ 4,998	$ 24,501	80%	$16,894	69%
	Other Medium-Duty	36	59,831	$ 5,389	$ 27,211	80%	$19,037	70%
Retrofit	Line Haul	18	23,825	$ 0	$ 16,518	100%	$13,011	79%
ALL		**1658**	**41,006**	**$200,346**	**$241,115**	**17%**	**$18,709**	**8%**

Off-Road Equipment

Over 600 off-road engine replacements have been funded by the Carl Moyer Program to date. Table IV-4 provides average activity and cost information for funded off-road equipment, based on engine horsepower. Construction, agricultural, and cargo-handling equipment are the main off-road categories funded by the Carl Moyer Program, with forklifts and scrapers being the most common equipment types. Off-road engines funded through the Carl Moyer Program are often large – over 300 horsepower – and operate more than 1,500 hours per year. The average off-road repower project achieves about 10 tons of NOx reductions over the life of the project and has a NOx cost-effectiveness of about $3,400 per ton. Off-road engines must be replaced with the cleanest available engine – usually a Tier 2 or Tier 3 engine – to be eligible for funding. In Years 1 through 6, the South Coast AQMD, Sacramento Metropolitan AQMD, and Mojave Desert AQMD provided the most funding for off-road equipment projects.

Figure IV-5: Off-Road Construction Equipment

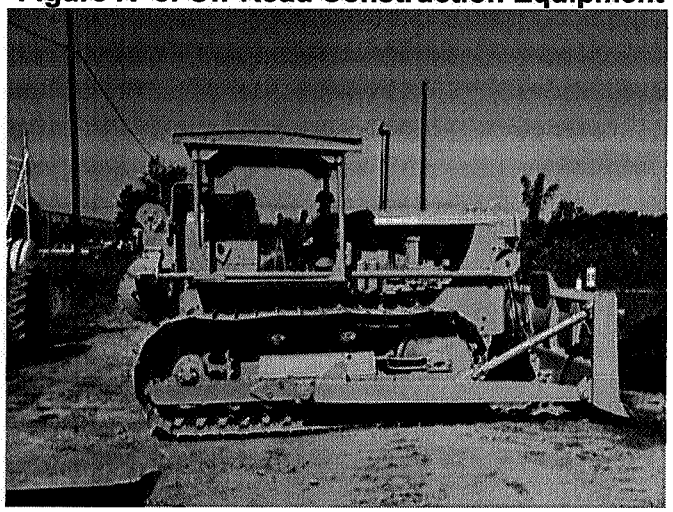
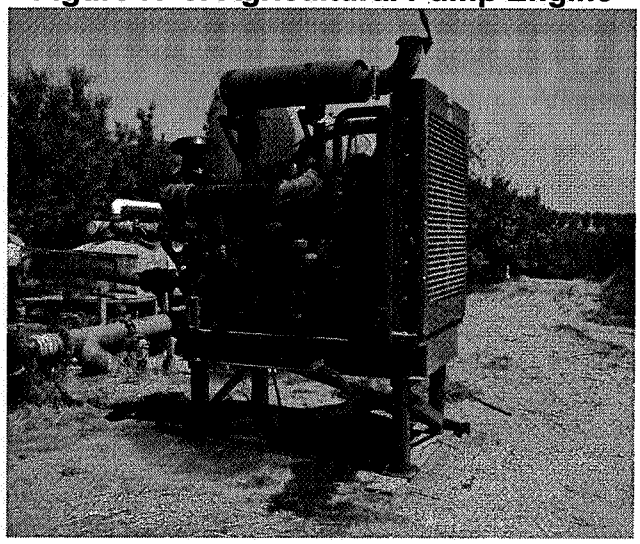


Table IV-4: Carl Moyer Program Off-Road Equipment Project Summary
Years 1 through 6 by Engine Horsepower

Engine Horse-power	Number of Engines	Average Annual Gallons Fuel per Engine	Average Annual Hours Operation per Engine	Average Rebuild Cost (Baseline)	Average Repower Cost	Percent Incremental Cost	Average Grant Amount	Average Percent Funding
0-74	75	2,020	1,690	$ 2,302	$ 15,392	85%	$12,178	79%
75-99	27		1,288	$ 2,716	$ 12,251	78%	$ 8,168	67%
100-174	87	3,006	1,192	$ 3,209	$ 16,449	80%	$12,456	76%
175-299	82	9,564	1,161	$ 5,257	$ 32,245	84%	$21,106	66%
300-449	167	19,220	1,572	$ 9,816	$ 55,444	82%	$42,669	77%
450-599	144	20,438	1,716	$20,663	$ 93,831	78%	$65,213	70%
>600	23	n/a	2,388	$25,680	$115,094	78%	$88,286	77%
ALL	605	10,837	1,721	$10,378	$ 50,804	80%	$36,601	72%

Agricultural Irrigation Pump Engines

Figure IV-6: Agricultural Pump Engine



The Carl Moyer Program provided over $36 million to clean up 3,200 agricultural irrigation pump engines in Years 1 through 6. Table IV-5 provides information regarding the number of engines funded in various horsepower ranges and typical project activity and costs. While most agricultural irrigation pump projects involve diesel engine repowers, over 60 projects were for purchase of a natural gas-powered engine or an electric motor. The average Carl Moyer Program agricultural pump engine project has received an $11,500 grant to repower a 250 horsepower engine that operates about 1,500 hours per year. These projects are among the most cost-effective in the Carl Moyer Program, penciling out at about $2,200 per ton NOx reduced. Agricultural irrigation pump engines must be replaced with the cleanest available engine to be eligible for funding. The San Joaquin Valley Unified APCD and Sacramento Metropolitan AQMD are responsible for about 55 and 28 percent of total agricultural pump engine funding statewide, respectively.

Table IV-5: Carl Moyer Program Agricultural Pump Engine Project Summary
Years 1 through 6

Horse-power Range	Number of Engines	Average Annual Hours per Engine	Average Annual Gallons Fuel per Engine	Average Engine Rebuild Cost	Average Engine Repower Cost	Percentage Incremental Cost	Average Grant Amount	Average Percent Funding
50-74	104	1,230	7,923	$1,910	$ 8,380	77%	$ 5,559	66%
75-99	145	1,397		$2,049	$10,119	80%	$ 6,207	61%
100-174	1,510	1,424	8,250	$2,601	$12,884	80%	$ 9,368	73%
175-299	1,120	1,643	9,887	$3,460	$17,854	81%	$12,977	73%
300-750	320	1,944	25,941	$4,890	$29,853	84%	$20,802	70%
ALL	**3,200**	**1,539**	**13,514**	**$3,078**	**$16,037**	**81%**	**$11,513**	**72%**

Marine Vessels

About 450 marine vessel engine repowers were funded by the Carl Moyer Program in Years 1 through 6. These projects are extremely cost-effective, costing average of about $1,800 per ton of NOx reduced. Tables IV-6 and IV-7 provide typical activity and cost information for Carl Moyer Program marine vessel projects. Fishing vessels and tugboats are the main types of vessels funded. Fishing vessel repowers typically involve smaller engines – about 300 horsepower – and cost about $50,000. Tugboat repowers usually involve engines of about 700 horsepower at a cost of about $200,000. Over 80 percent of engine repowers involve replacement of a propulsion engine, while the rest involve replacement of the vessel's auxiliary engine. The portion of repower costs borne by the Carl Moyer Program varies from 35 percent for ferries and excursion vessels to 74 percent for fishing vessels. The Bay Area AQMD and South Coast AQMD have funded by far the most Carl Moyer Program marine vessel projects in Years 1 through 6.

Figure IV-7: Tug Boat



Table IV-6: Carl Moyer Program Marine Vessel Project Summary
Years 1 through 6 by Vessel Type

Vessel Type	Number of Engines	Average Horse-power	Average Annual Gallons Fuel per Engine	Average Rebuild Cost	Average Repower Cost	Percent Incre-mental Cost	Average Grant Amount	Average Percent Funding
Commercial Fishing	148	281	12,851	$ 9,874	$ 48,143	79%	$ 35,788	74%
Charter Fishing	81	340	12,152	$ 5,041	$ 53,947	91%	$ 39,702	74%
Tug	68	650	58,582	$22,056	$213,585	90%	$ 93,539	44%
Ferry/Excursion	30	724	48,463	$58,137	$352,978	84%	$124,612	35%
Crew/Supply/Work	24	522	28,088	$16,567	$142,595	88%	$ 81,095	57%
Other	97	365	19,628	$ 9,218	$ 71,395	87%	$ 43,762	61%
ALL	**448**	**408**	**30,908**	**$14,237**	**$103,732**	**86%**	**$ 54,124**	**52%**

Table IV-7: Carl Moyer Program Marine Vessel Project Summary
Years 1-6 by Engine Horsepower

Engine Horse-power	Number of Engines	Average Annual Gallons Fuel Consumed	Average Rebuild Cost	Average Repower Cost	Percent Incremental Cost	Average Grant Amount	Average Percent Funding
0-99	45	3,228	$ 5,479	$ 24,761	78%	$ 15,065	61%
100-174	23	3,736	$ 6,231	$ 24,219	74%	$ 16,339	67%
175-299	83	9,516	$ 8,553	$ 45,195	81%	$ 31,054	67%
300-750	264	23,737	$13,216	$106,768	88%	$ 55,696	52%
>750	33	95,896	$51,183	$449,433	87%	$218,088	49%
ALL	**448**	**23,357**	**$14,237**	**$103,732**	**86%**	**$ 54,124**	**52%**

Locomotives

Over its first six years, the Carl Moyer program has funded a variety of locomotive project types, including engine repowers, installation of locomotive idle limiting devices, and purchase of alternative technology switch locomotives. In particular, demand for alternative technology switch locomotives – such as switchers powered by two or three smaller Tier 2 off-road engines– has increased in recent years as the technology matures. These locomotives typically are built on an existing locomotive chassis and, in place of the normal large locomotive engine, use one or more smaller on- or off-road engine to power the locomotive generator. As shown in Table IV-8, the Carl Moyer Program has helped fund purchase of two alternative technology switch locomotives in Years 1 through 6. ARB has provided funds to help purchase an additional ten alternative technology switchers with its Year 7 and 8 multi-district funds. These projects typically achieve very large emission reductions – over 100 tpy NOx reductions over their lifetime – with an average cost-effectiveness of under $6,000 per ton of NOx reduced. Over 95 percent of Carl Moyer Program locomotive project funding in Years 1 through 6 went to smaller "Class 3" railroads, while most Year 7 and 8 locomotive multi-district funding went to larger "Class 1" railroads. The South Coast AQMD and Bay Area AQMD have funded the most Carl Moyer Program locomotive projects in Years 1 through 6.

Figure IV-8:
Alternative Technology Switch Locomotive

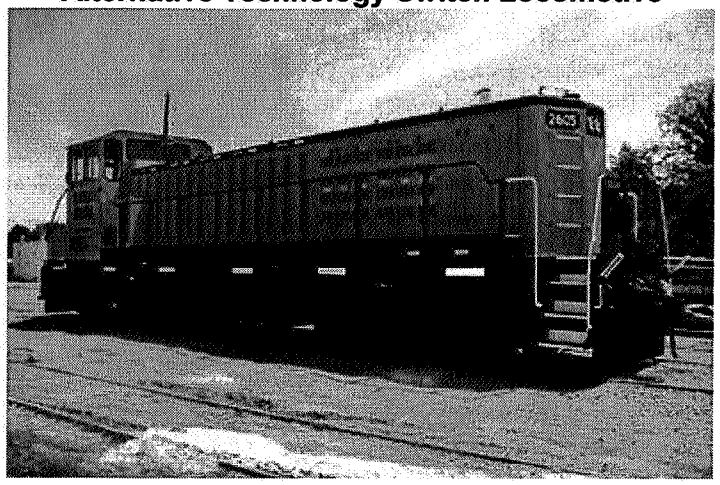


Table IV-8: Carl Moyer Program Locomotive Project Summary
Years 1 through 6 by Project Type

Project Type	Number of Loco-motives	Average Baseline Model Year	Average Annual Gallons Fuel per Loco.	Average NOx C/E ($/ton)	Average Baseline Cost	Average Reduced Technology Cost	Pct. Incre-mental Cost	Average Grant Amount	Average Percent Funding
Idle-Limiting Device	21	1972	--	$ 3,300	$ 0	$ 14,285	100%	$ 14,285	100%
Commuter Retrofit	1	1993	79,404	$ 1,100	$ 0	$ 60,600	100%	$60,600	100%
Alt. Tech. Switcher	2	1973	54,893	$ 5,700	$ 20,304	$ 607,804	97%	$587,500	97%
Passenger Repower	2	1959	108,000	$ 1,600	$200,000	$1,108,508	85%	$410,000	37%
ALL	**26**	**1972**	**81,038**	**$ 3,600**	**$ 47,850**	**$ 05,913**	**89%**	**$222,049**	**55%**

V.

ENVIRONMENTAL JUSTICE

Beginning with Year 4 (FY 2001-02), Health and Safety Code Section 43023.5 (AB 1390, Firebaugh) requires air districts with one million or more inhabitants spend at least fifty percent of their legislatively appropriated funds, including Carl Moyer Program funds, in a manner that directly reduces air contaminants (or the public health risks posed by air contaminants) in communities with the most significant air contaminant exposure, including low-income or minority communities. Districts with fewer than one million inhabitants are encouraged to do the same. The Legislature and the Governor reaffirmed their support for this requirement in 2006 by enacting AB 2843, which eliminates the 2007 sunset date in the original legislation. Implementation of the environmental justice requirement for the five California air districts subject to this mandate is described below.

- Bay Area AQMD – The Bay Area AQMD assigns each potential project an environmental justice score based upon PM exposure of sensitive populations (individuals under 18 and over 64 years of age) and household income in a project area. Goods movement projects – marine vessels, locomotives, off-road equipment permanently located at a port or rail yard, trucks that transport cargo to or from a maritime port or rail yard, and transportation refrigeration units – also receive points for environmental justice. At least the first fifty percent of available funds are allocated to projects with the highest environmental justice score, after which the remaining funds are allocated in order of the most cost-effective projects to the least cost-effective projects.

- Sacramento Metropolitan AQMD – The Sacramento Metropolitan AQMD defines an environmental justice area as any location within 1,000 feet of a census tract in which at least fifty percent of the population is non-white or in which at least ten percent of the population lives at or below the federal poverty level. The Sacramento Metropolitan AQMD also administers the Carl Moyer Program for the El Dorado County AQMD, Placer County APCD, and Yolo-Solano AQMD, which are not subject to the environmental justice requirements. Since the Sacramento Metropolitan AQMD administers the program consistently for all these air districts, the region as a whole meets the goals of the environmental justice mandate.

- San Diego County APCD – The San Diego APCD defines an environmental justice area as a census tract in which the median income is no more than 80 percent of the county median and which also exceeds the state PM standard. To allocate funds, projects are ranked in order of cost-effectiveness. If less than fifty percent of funds are associated with projects in environmental justice (i.e. low-income) areas, the lowest ranked non-environmental justice project recommended for funding is replaced with the next highest ranked environmental justice project. This process is continued until at least fifty percent of funds are allocated to environmental justice areas.

- San Joaquin Valley APCD – The San Joaquin Valley APCD defines an environmental justice area as one in which the non-white population exceeds fifty percent and in the poverty level exceeds ten percent. Based upon this definition, most of the San Joaquin Valley is considered an environmental justice area.

- South Coast AQMD – The South Coast AQMD scores each potential project for environmental justice based upon poverty level, PM exposure, and air toxics exposure. The first fifty percent of funds are allocated to projects with the highest environmental justice scores. The remaining funds are then allocated based upon project cost-effectiveness.

The Monterey Bay Unified APCD has also voluntarily set a goal of expending 50 percent of its Carl Moyer funding in environmental justice areas. The district uses excess cancer risk and poverty level to define environmental justice areas within its boundaries. In Years 4 through 6, the Monterey Bay Unified APCD expended about 35 percent of its program funds in environmental justice areas.

In the five air districts subject to the environmental justice requirement, projects in environmental justice areas have reduced NOx and diesel PM emissions, respectively, by about 1,700 and 80 tons per year. Carl Moyer Program projects in these areas achieved NOx reductions more cost-effectively than those outside of environmental justice areas. Carl Moyer Program project funding, emission reductions, and cost-effectiveness in environmental justice areas are provided in Table V-1. Appendix B provides a list of the specific Carl Moyer Program projects funded in environmental justice areas in Years 4 through 6.

Table V-1
Funding and Emissions Reductions in Environmental Justice (EJ) Areas (Years 4 through 6)

District	Total Funding	Funding for projects in EJ Areas	Percent of Funding in EJ Areas	EJ Project Diesel PM Reduced (tons/yr)	EJ Project NO_x Reduced (tons/yr)	NOx Cost-Effectiveness	
						EJ Projects	Non-EJ Projects
Bay Area	$3,382,809	$1,796,480	53%	6	87	$2,800	$2,200
Sacramento	$5,212,222	$3,262,385	63%	6	148	$4,600	$5,200
San Diego	$2,501,214	$1,450,801	58%	4	80	$1,900	$3,100
San Joaquin	$8,569,724	$7,717,874	90%	32	713	$1,800	$1,600
South Coast	$20,927,053	$14,452,745	69%	31	663	$2,900	$2,900
ALL	**$40,593,022**	**$28,680,285**	**71%**	**79**	**1,671**	**$2,600**	**$3,000**

VI.

2006 AUDIT RESULTS

Health and Safety Code § 44291 vests ARB with the responsibility for oversight and monitoring of air districts' implementation of the Carl Moyer Program. In 2006, ARB audited Carl Moyer Program implementation at four air districts: the Ventura County APCD, Sacramento Metropolitan AQMD, South Coast AQMD, and Butte County AQMD. In addition, ARB contracted with the California Department of Finance to evaluate ARB's oversight of the Carl Moyer Program and the South Coast AQMD's expenditure of program funds provided by Proposition 40 in Years 5 and 6 (FY's 2002-03 and 2003-04). The California Bureau of State Audits (BSA) also began a Carl Moyer Program performance audit in October 2006. This section summarizes the results of the Ventura County APCD, Sacramento Metropolitan AQMD, and South Coast AQMD audits. ARB's complete audit reports and the DOF evaluation of ARB are provided in Appendices C through F. As of November 1, 2006, the Butte County AQMD audit report was not yet complete. Once completed, this report, the results of BSA's audit report, and the DOF evaluation of the South Coast AQMD program will be available on ARB's website at www.arb.ca.gov/msprog/moyer/moyer.htm.

ARB Audit of Air District Programs

ARB's air district program audits in 2006 targeted Year 5 and 6 projects that utilized Proposition 40 funds. These audits focused on determining if program implementation was consistent with the requirements of the Health and Safety Code and the applicable 2003 Carl Moyer Program Guidelines. ARB staff also reviewed the status of selected projects from Years 7 and 8 to evaluate compliance with the 2005 Carl Moyer Program Guidelines. Results of the first three air district audits are summarized below:

- Ventura County APCD – The Ventura County APCD runs an efficient and effective Carl Moyer Program that generally meets the requirements of the Health and Safety Code and the applicable Carl Moyer Program Guidelines. ARB's most significant audit finding pertains to the funding of two ineligible engines. In response to the finding, the district has reprogrammed the funds to pay for eligible engines.

- Sacramento Metropolitan AQMD – The Sacramento Metropolitan AQMD does an excellent job implementing the Carl Moyer Program. ARB's audit findings pertain solely to administrative issues, which the district has agreed to address.

- South Coast AQMD – All Carl Moyer Program projects reviewed by ARB were eligible for Carl Moyer Program funding. However, ARB's fiscal audit found that approximately $10 million of the $15.6 million received by the South Coast AQMD in Years 5 and 6 has not been spent in a timely manner consistent with state law (HSC § 44287). As a result of the audit, the district has committed to expend these funds by July 2007. The DOF conducted a simultaneous audit of the South Coast AQMD's expenditure of Proposition 40 funds and concurs with ARB's assessment.

ARB will conduct a follow-up audit of the South Coast AQMD program in August of 2007 and report back to the Board with the audit results. During 2007, the ARB is also planning on conducting Carl Moyer Program audits of at least three additional air districts. Once complete, the 2007 audit reports and air district responses will be posted on the ARB's Carl Moyer Program website and included in the next Carl Moyer Program Status Report to the Board.

Table VI-1 provides Year 5 and 6 summary of information for the first three air district audits and preliminary information for the Butte County AQMD audit. In Years 5 and 6, all four air districts received more applications for project funding than was available. The Ventura County APCD, South Coast AQMD, and Butte County AQMD all conduct requests for project proposals (RFP) during specific periods of the year and evaluate and select projects based upon cost-effectiveness, public health risks, and other local priorities. The Sacramento Metropolitan AQMD does not rank project applications, but rather funds all cost-effective projects as applications are received until each year's program funds are depleted.

Table VI-1:
2006 Carl Moyer Program District Audit Summary
Years 5 and 6

	Ventura	Sacramento	South Coast	Butte County[1]
Project Solicitation Process: Request for Proposals or First Come, First Serve	Request for Proposals	First Come, First Serve	Request for Proposals	Request for Proposals
Board Approval Required?	Yes	No	Yes[2]	Yes
Moyer Funding	$1.4 million	$ 3.6 million	$ 15.6 million	$200,000
Applications Received	$1.8 million	$ 3.6 million[3]	$118.5 million	$369,958
Funds Expended[4]	$1.3 million	$ 3.6 million	$ 5.5 million	$200,000
Variety of Projects Funded[5]	4	7	8	3
Environmental Justice Selection Criteria?	No	Yes	Yes	No
Average Program NOx Cost-Effectiveness ($/ton)	$2,200	$5,100	$2,900	$1,500
Carl Moyer Program Employees (PYs)	1.0	2.3	1.5	0.3
Average Time to Select Projects (months)[6]	2.7	4.2	4.7	1.5
Average Time to Enter into Contract (months)[6]	2.9	4.4	15.0	3.5
Average Time to Project Completion (months)[6,7]	10.2	6.4	30.0[8]	7.3

ARB district field audits occurred on the following dates: Ventura County APCD – May 8-12, 2006; Sacramento Metropolitan AQMD – June 26-30, 2006; South Coast AQMD – July 6-18, 2006;
Butte County AQMD – September 11-14, 2006.

1 – Numbers based on preliminary audit information for the Butte County AQMD.

2 – The South Coast AQMD project selection process also includes evaluation by a technology committee.

3 – Sacramento Metropolitan AQMD has a continuous First-Come, First-Serve project application period. Applications received after Year 5 and 6 funds are committed to specific projects are considered Year 7 applications.

4 – Totals refer to funds expended at time of district audit. Funds for which the first project invoice has been received are considered fully expended.

5 – Includes all project types funded in Years 1 through 6. Project types include new purchase, repower, and retrofit of on-road heavy-duty vehicles, off-road equipment, locomotives, marine vessels, and agricultural irrigation pump engines. Truck stop electrification also included.

6 – Averages are based on project files audited by ARB and reflect the average time from receipt of the project application.

7 – Project completion date reflects the date the first project invoice date is received by the district.

8 – Some projects were not yet complete at the time of ARB's audit; these were evaluated based on time from project application until the ARB audit date. The average time to project completion therefore represents a minimum.

Department of Finance Evaluation of ARB Program

In order to ensure ARB's oversight of the Carl Moyer Program is as effective and efficient as possible, ARB requested a DOF program evaluation in 2006. The DOF completed its evaluation in August 2006. The DOF evaluation provides suggestions for improving the effectiveness and accountability of the program, such as establishment of more specific guidelines for project data collection. The evaluation also recommends financial practices and program areas that should be more prescriptive, such as the timing and protocol for an air district to return unspent funds. The DOF evaluation also suggests increasing ARB audits of air district programs. DOF's suggestions will be considered for inclusion in the 2007 revisions to the Carl Moyer Program Guidelines. The DOF evaluation final report is attached in Appendix F.

Bureau of State Audits

In March 2006, the California Senate Joint Legislative Audit Committee, at the request of State Senator Dean Florez, requested that the California BSA conduct a performance audit focusing on how air districts distribute Carl Moyer Program funding. The committee requested that the BSA investigate and compare practices at California's four largest air districts – the South Coast AQMD, San Joaquin Valley Unified APCD, Bay Area AQMD, and Sacramento Metropolitan AQMD. Specifically, the committee requested that the audit evaluate:

- the efficiency and equity of the application process;
- the effectiveness of project selection and funding distribution in achieving maximum emission reduction and public health protection; and
- the availability and quality of public information and public outreach about the program to ensure participation.

In late October 2006, the BSA began their Carl Moyer Program audit focused on program efficiency and effectiveness. The BSA plans to review, at a minimum, ARB's oversight of the Carl Moyer Program, as well as program implementation at the four air districts listed above. The BSA expects to complete its audits by late Spring 2007. Once complete, the BSA audit report will be posted on ARB's Carl Moyer Program website and included in the next Carl Moyer Program Status Report to the Board. ARB will consider BSA's audit findings and recommendations as part of the 2007 Carl Moyer Program Guideline revisions.

VII.

STATE IMPLEMENTATION PLAN

California's 2003 South Coast SIP and the San Joaquin Valley 2004 Ozone SIP include commitments to provide significant NOx reduction in each region by 2010. The State's strategy to achieve these reductions includes new regulations focused on reducing emissions from in-use vehicles and engines. The Carl Moyer Program fills a critical niche in California's strategy to attain federal ambient air quality standards by getting early and extra emission reductions from in-use engines, and by targeting sources which aren't feasible to regulate or which lie outside of California's regulatory jurisdiction. California relies upon regulations combined with turnover of the fleet to cleaner vehicles and equipment to provide about 90 percent of the emission reductions needed to meet its SIP commitments. Innovative programs such as the Carl Moyer Program are expected to provide the remaining ten percent of emission reductions.

New State Implementation Plans

SIPs demonstrating compliance with the new, more health-protective federal 8-hour ozone standard are due to U.S. EPA by June 15, 2007. Attainment of the 8-hour standard will require additional emission reductions beyond those needed to meet the one-hour standard in most air districts. Fifteen areas encompassing over 90 percent of the state's population are designated federal 8-hour ozone non-attainment areas. These areas and their federal 8-hour ozone attainment deadlines are:

- 2007 – Imperial County and the San Francisco Bay Area
- 2009 - 2014 – Amador, Butte, Calaveras, Mariposa, San Diego, and Toulumne Counties, Eastern Kern County, Western Nevada County, and the Sutter Buttes
- 2010 – Antelope Valley, Ventura County, and Western Mojave Desert
- 2013 – Coachella Valley, the Sacramento Region, and the San Joaquin Valley
- 2021 – The South Coast Air Basin

The South Coast Air Basin and San Joaquin Valley are also designated non-attainment of the federal standard for particulate matter less than 2.5 microns in diameter (PM2.5). Since NOx is an important precursor to particulate matter formation, both NOx and PM reductions are critical in demonstrating attainment of the PM2.5 standard by these regions' 2015 attainment deadline. Preliminary air quality modeling indicates the San Joaquin Valley will need at least 300 tpd additional NOx reductions to meet the federal 8-hour ozone standard by 2013 and the South Coast will need at least 150 tpd of additional NOx reductions to attain the federal PM2.5 standard by 2015.

Table VII-1 provides ranges for potential statewide emission reductions from the Carl Moyer Program for key years between 2006 and 2021. The emission reduction benefits of the Carl Moyer Program are highest between 2012 and 2016, when program funding will have reached its peak for at least five years.

Table VII-1:
Projected Statewide Emission Benefits
of Carl Moyer Program Projects (tpd)

Emissions		2006	2009	2012	2015	2018	2021
NOx Reductions	high	7	16	30	30	12	0
	low		10	10	10	3	0
ROG Reductions	high	0	2	4	4	2	0
	low		1	1	1	0	0
PM Reductions	high	0.4	1.0	1.9	1.9	0.8	0.0
	low		0.5	0.5	0.5	0.2	0.0

Based upon $141 million in project funding annually from 2007-2015, with 25 percent light-duty vehicle projects, 15 percent heavy-duty vehicle fleet modernization projects, and the remaining 60 percent assumed to be similar to typical Year 1 through 6 projects. "High" assumes an average project life of five years and cost-effectiveness between $3,000 and $12,000 per ton. "Low" assumes a three-year project life and a cost-effectiveness of $14,300 per ton.

SIP Emission Reductions

As Table VII-1 illustrates, emission reductions achieved through the Carl Moyer Program can vary considerably, depending upon the cost-effectiveness and project life of projects funded. Because air districts receive over 90 percent of Carl Moyer Program project funding, each district is empowered to tailor its program to achieve the maximum possible emission reductions in its required attainment year. For example, an air district with a 2013 ozone attainment date can maximize emission reductions in the attainment year by selecting the most cost-effective projects which have a project life through 2013.

Since each air district has its own attainment deadlines and attainment strategies (including the mix of NOx, ROG, and PM reductions needed), there is no uniform mechanism to maximize Carl Moyer Program SIP benefits. However, the trend towards a shorter project life suggests opportunities may be lost for achieving SIP emission reductions, especially in districts with worse air quality and later attainment dates. For example, a project starting in 2010 in an area with a 2013 attainment deadline would not achieve any SIP benefit with a three year project life. The cleaner engine may still be in operation in 2013, but its operation is impossible to verify or enforce. If the engine were subject to a regulation prior to the attainment date, the benefits of the cleaner engine could be "anyway reductions" – reductions which would have occurred anyway due to the regulation. As Carl Moyer Program project life shortens – sometimes to enable funding of soon-to-be regulated source categories – it will become increasingly important to distinguish between SIP-creditable emission reductions and provision of compliance assistance.

VIII.

LOOKING AHEAD

The Carl Moyer Program has expanded significantly from a NOx-only program at its inception to one which targets multiple pollutants and includes several new source categories. In the years ahead, the Carl Moyer Program must continue to evolve while adhering to its core mandate to achieve real, surplus, quantifiable, and cost-effective emission reductions. This chapter provides a brief overview of how new regulations, the one billion dollar goods movement air quality bond, and other issues could impact the Carl Moyer Program in the years ahead.

New Regulations

Regulations targeting in-use heavy-duty vehicles and equipment play a central role in ARB's strategy to meet federal air quality standards and reduce community health risks. Since 2000, ARB has adopted regulations to reduce emissions from in-use public transit buses, solid waste collection vehicles, public and utility on-road heavy-duty vehicle fleets, cargo-handling equipment, agricultural irrigation pump engines, and other source categories. New regulations to reduce emissions from in-use public on- and off-road fleets and in-use harbor craft are slated for Board consideration in 2007. Regulations targeting in-use engines, in particular, can impact the universe of surplus and cost-effective emission reductions eligible for Carl Moyer Program funding. For example, purchase and installation of a retrofit device isn't "surplus" and eligible for Carl Moyer Program funding if the retrofit is required by regulation within the next three years.

As traditional Carl Moyer Program source categories are increasingly subject to in-use requirements, the availability of projects in regulated source categories could decline. However, several factors suggest that demand for Carl Moyer Program grant funding will be strong through the program's 2015 sunset date. First, recent legislation has expanded the program to allow funding for projects that reduce ROG and PM emissions. This has added funding opportunities for gasoline engine projects, as well as diesel engine projects. Voluntary car scrap programs are an example of a new Carl Moyer Program source category that funds emission reductions from gasoline engines. A second factor relates to new ARB regulations under development to require clean-up of privately-owned diesel trucks and off-road equipment. These regulations are likely to provide more time for compliance for small businesses. Carl Moyer Program funds provide an opportunity for small business owners to reduce the cost of the regulation through early regulatory compliance. Third, there remain many sources of NOx and PM emissions that are not subject to upcoming ARB regulations aimed at reducing emissions from existing engines. An example is locomotive engines, where federal preemption applies. Given that the cost of cleaning up California's fleet of in-use diesel engines is at least ten times the available Carl Moyer Program funds, demand for funding from this program will remain high.

ARB will also pursue opportunities for additional source categories to be eligible for Carl Moyer Program funding where real, surplus, quantifiable, and cost-effective emission

reductions can be achieved. New source categories to be evaluated in 2007 for potential inclusion in the Carl Moyer Program are described below.

Goods Movement and Air Quality Bond Funding

In November 2006, California voters approved Proposition 1B: The Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006. One billion dollars of this general obligation bond is to be used to reduce emissions from goods movement activities. The bond language specifies only that funds be made available to ARB "for emission reductions, not otherwise required by law or regulation, from activities related to the movement of freight along California's trade corridors."[1] Enabling legislation is required before funds authorized by the bond can be made available to ARB and may provide additional direction regarding fund expenditure deadlines, project categories, and funding recipients.

In its first six years, the Carl Moyer Program has provided an average of about $4 million per year to fund goods movement projects, including marine vessels, locomotives, cargo-handling equipment, and line-haul trucks. Since $4 million represents less than five percent of Carl Moyer Program annual funding in future years, the bond funding should not have a significant impact on demand for Carl Moyer Program projects.

New Source Category Evaluations

Opportunities for funding of new types of Carl Moyer Program projects are likely to increase in the years ahead. ARB is working with air districts and other stakeholders to evaluate additional off-road source categories to include in the 2007 Carl Moyer Program Guideline update. ARB will hold workshops on the 2007 Carl Moyer Program Guideline update in 2007, with a kickoff workshop planned for early 2007. The guideline update is scheduled to be considered by the Board in November 2007.

Off-Road Industrial Equipment Electrification. Senate Bill 467 (Lowenthal), signed into law in 2005, requires ARB to revise the Carl Moyer Program Guidelines to modify the cost-effectiveness calculations for projects in which in-use industrial non-road equipment such as forklifts are replaced with electric-powered equipment. ARB is evaluating how such a program could be tailored. Project criteria for this source category will be included in the 2007 Carl Moyer Program Guideline update.

Off-Road Equipment Fleet Modernization Program. ARB is evaluating opportunities to achieve surplus and cost-effective emission reductions through projects which replace an older, dirtier piece of equipment with a newer, cleaner model. As with the on-road heavy-duty fleet modernization category, such a program will initially target certain equipment types to ensure projects achieve real, surplus, quantifiable, and cost-effective emission reductions. If this project category shows promise, criteria for project funding will be included in the 2007 Carl Moyer Program Guideline update.

---

[1] Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006. Stats. 2006, Chapter 25 (SB 1266).

Non-Engine Agriculture Projects. ARB will continue to monitor non-engine agricultural projects, such as dairies or fugitive dust sources, for potential inclusion in the Carl Moyer Program. Project criteria for this source category will be developed where technology is available to ensure emission reductions are real, surplus, quantifiable, and enforceable.

Other Program Enhancements

ARB is working with air districts and other stakeholders to improve the effectiveness and efficiency of the Carl Moyer Program. Strategies being pursued include:

- Clean Air Reporting Log (CARL) – With the significant increase in annual program funding comes an increased need for program efficiency and accountability. ARB is developing a web-based Carl Moyer Program reporting and tracking system which will allow air districts to calculate project cost-effectiveness, automate project reporting, and query program parameters, such as emission reductions achieved and average cost-effectiveness. The project tracking system is currently being evaluated by ARB and air district staff and is projected to be ready in early 2007 for use in evaluating and reporting Year 9 projects. ARB plans to provide air districts with training on how to use the system in Sacramento, the San Joaquin Valley, and South Coast between February and April, 2007.

- Locomotive Memorandum of Understanding (MOU) Penalties – The June 2005 Locomotive MOU between ARB and the Burlington Northern and Santa Fe (BNSF) and Union Pacific (UP) railroads specifies that penalties assessed due to MOU non-compliance "be deposited into the Carl Moyer Program account and ... distributed to the air district where the violation occurred."[1] The MOU requires, among other things, installation of locomotive idle-limiting devices on virtually all BNSF and UP intrastate locomotives. As of October 1, 2006, $4,800 in total fines were assessed in the Bay Area AQMD, Mojave Desert AQMD, Placer County APCD, South Coast AQMD, and San Joaquin Valley APCD. ARB will distribute these funds – and any additional penalty funds assessed through September 2007 – to the air districts in which the penalties occurred as part of the Carl Moyer Program Year 10 (FY 2007-08) program allocation.

- Enhanced Outreach – Outreach to all groups of potential Carl Moyer Program applicants is critical to the continued success of the program. ARB is evaluating methods to improve program outreach, particularly in environmental justice communities, to small businesses, and for zero-emission projects.

- Rural Air District Liaison – Rural air districts face unique challenges in implementing the Carl Moyer Program. For example, some rural air districts have one staff person responsible for all district functions, making it difficult to allocate resources for Carl

[1] ARB/Railroad Statewide Agreement – Particulate Emissions Reduction Program at California Rail Yards, June 2005, Section 10(a)(iii).

Moyer Program outreach, project evaluation, oversight, and reporting. In Year 7, ARB contracted with the California Air Pollution Control Officers Association (CAPCOA) for a rural air district liaison to help solicit Carl Moyer Program projects for rural air districts. Several air districts have contributed their Year 7 Carl Moyer Program grants – up to $970,000 – for projects to be solicited by CAPCOA. On December 20, 2006, CAPCOA issued a solicitation for projects to be funded on a first-come, first-served basis. While the solicitation targets projects in rural air districts, projects throughout California are eligible for funding. These funds must be expended by June 30, 2007. If successful, this approach to funding rural district projects could be pursued in future funding cycles.

- Voucher Program – ARB is exploring the feasibility of a rebate or voucher program to streamline and expedite Carl Moyer Program fund disbursement. ARB may conduct a pilot voucher program using 2007 Carl Moyer Program multi-district funds for retrofit devices which reduce both NOx and PM emissions from on-road heavy-duty vehicles as part of a pilot voucher program. The program would be part of SmartWay Upgrade Kits, co-funded by Cascade Sierra Solutions and the U.S. EPA SmartWay Transportation Partnership to reduce vehicle emissions and fuel consumption.

IX.

CONCLUSION

The Carl Moyer Program is a critical component of California's strategy to attain federal air quality standards and address community health risks. By providing grants to clean up in-use vehicles and equipment, the program accelerates achievement of emission reductions and the purchase of low-emission technologies. In its first six years, the Carl Moyer Program has achieved the following:

- Emission Reductions – Projects funded by the Carl Moyer Program have reduced NOx and PM emissions by over 18 tpd and almost one tpd, respectively.

- Cost-Effectiveness – The average cost-effectiveness of Carl Moyer Program projects was about $2,600 per ton of NOx emissions reduced.

- Funding – The Carl Moyer Program has provided over $140 million in grants in Years 1 through 6 to accelerate the clean-up of in-use vehicles and equipment. Legislation signed by the Governor in 2004 provides new funding for continued implementation of the Carl Moyer Program – up to $141 million annually through 2015.

- Environmental Justice – The five large California air districts collectively expended over seventy percent of program funds in these areas in Years 4 through 6. About 4.5 tpd of NOx and 0.2 tpd of PM emission reductions have been achieved by Carl Moyer Program projects in environmental justice communities over this period.

Legislative changes to the Carl Moyer Program beginning in Year 7 include the formal addition of PM and ROG to the program and new project source categories, such as heavy-duty vehicle fleet modernization and voluntary accelerated vehicle retirement. The Carl Moyer Program will continue to be a critical component of California's strategy to attain federal standards for ozone and particulate matter. ARB staff is evaluating additional source categories for potential program expansion, and is considering mechanisms to improve program implementation. As the Carl Moyer Program evolves, it will be critical to improve the efficiency of the program while continuing to achieve real, surplus, quantifiable, and cost-effective emission reductions.

Appendix A

District Programs

This Appendix provides information regarding air district implementation of the Carl Moyer Program, including state funding received, local match funding provided, types of projects funded, outreach efforts, project solicitation mechanisms, number of applicants funded, and average program cost-effectiveness. Table A-1 includes the state grant awards provided to air districts, while Table A-2 details the local match funds provided and funding sources for each air district. Table A-3 indicates the California Department of Motor Vehicles Air Quality Fees which many air districts use to help fund their air quality incentive programs. Table A-4 provides a variety of information regarding each district's program implementation, such as the types and average cost-effectiveness of projects funded. These tables are followed by a summary page for each air district which describes how each district implements the Carl Moyer Program, and highlights the project categories funded and emission benefits of the program in each area.

Appendix A
Table of Contents

Carl Moyer Program Data Summary Tables

Table A-1: Air District Carl Moyer Program Grant Awards A-1
Table A-2: Air District Carl Moyer Program Match Funding..... A-2
Table A-3: California Department of Motor Vehicle Air Quality Fees..... A-3
Table A-4: Carl Moyer Program Summary Information A-4

Local Air District Carl Moyer Program Summaries

Large Air Districts (with one million or more residents)

Bay Area AQMD..... A-7
Sacramento Metropolitan AQMD A-8
San Diego County APCD A-9
San Joaquin Valley Unified APCD A-10
South Coast AQMD..... A-11

Medium and Small Air Districts (with less than one million residents)

Amador County APCD A-12
Antelope Valley AQMD..... A-13
Butte County AQMD..... A-14
Calaveras County APCD..... A-15
Colusa County APCD..... A-16
Feather River AQMD..... A-17
Glenn County APCD A-18
Imperial County APCD A-19
Kern County APCD A-20
Lake County AQMD A-21
Lassen County AQMD..... A-22
Mariposa County APCD A-23
Mendocino County AQMD..... A-24
Modoc County APCD A-25
Mojave Desert AQMD A-26
Monterey Bay Unified APCD A-27
North Coast Unified AQMD A-28
Northern Sierra AQMD..... A-29
Northern Sonoma County APCD..... A-30
San Luis Obispo County APCD..... A-31
Santa Barbara County APCD..... A-32
Shasta County AQMD..... A-33
Siskiyou County APCD..... A-34
Tehama County APCD..... A-35
Tuolumne County APCD..... A-36
Ventura County APCD A-37
Multi-District Projects..... A-38

Table A-1: Air District Carl Moyer Program Grant Awards ($)

District	Year 1 1998-99	Year 2 1999-00	Year 3 2000-01	Year 4 2001-02	Year 5 2002-03	Year 6 2003-04	Year 7[1] 2004-05	Year 8[1] 2005-06	Total
Amador	-	-	-	-	100,000[2]	100,000[3]	200,000[4]	-	400,000
Antelope	302,571	225,000	450,000	210,149	269,652	282,930	277,087	523,328	2,540,717
Bay Area	2,500,000	1,880,000	4,306,133	1,570,344	1,894,911	1,652,595	2,478,161	10,318,307	26,600,451
Butte	-	77,842	176,750	75,000	100,000	100,000	200,000	200,000	929,592
Calaveras	-	-	-	-	100,000	100,000	200,000[4]	200,000	600,000
Colusa	-	-	-	75,000	100,000	100,000	200,000	200,000	675,000
Feather River	-	69,101	176,750	75,000	100,000	100,000	200,000	200,000	920,851
Glenn	100,000	53,743	150,000	75,000[5]	100,000	100,000	200,000	200,000	978,743
Great Basin	-	-	-	-	-	-	200,000[4]	-	200,000
Imperial	134,800	69,993	176,750	75,000	100,000	100,000	241,022	384,803	1,282,368
Kern	-	225,000[6]	325,000[6]	-	100,000	100,000	200,000[4]	200,000	1,150,000
Lake	-	-	-	-	100,000	100,000[7]	200,000[4]	-	400,000
Lassen	-	-	-	-	100,000	100,000	200,000	200,000	600,000
Mariposa	-	-	-	-	100,000[8]	100,000[3]	-	-	200,000
Mendocino	-	62,018	150,000	75,000	100,000	100,000	200,000	200,000	887,018
Modoc	-	-	-	-	100,000[9]	100,000	-	200,000	400,000
Mojave	845,791	635,678	1,535,530	-	100,000	100,000	200,000	722,955	4,139,954
Monterey	265,800	145,183	450,000	217,553	293,779	266,638[3]	427,243	1,209,456	3,275,652
N. Coast	100,000	73,255	176,750	75,000	100,000	100,000	200,000	200,000[10]	1,025,005
N. Sierra	127,700	52,692	176,750	75,000	100,000	100,000	227,940	-	860,082
N. Sonoma	113,900	-	150,000	75,000	100,000	100,000	211,590	251,571	1,002,061
Sacramento	1,927,791	1,677,042	3,909,604	1,438,944	1,981,316	1,631,110[3]	2,098,147	6,559,105	21,223,059
San Diego	1,085,661	809,498	1,850,344	714,147	867,328	919,738	1,190,957	4,364,589	11,802,262
San Joaquin	4,399,801	3,187,452	7,644,979	2,757,263	3,187,325	2,793,355	2,821,709	11,829,362	38,621,246
San Luis Obispo	157,800	83,196	176,750	75,000	100,000	100,000	252,299	419,306	1,364,351
S. Barbara	302,571	225,000	450,000	210,149	208,902	227,365[3]	325,104	725,849	2,674,940
Shasta	-	72,977	176,750	75,000[5]	-	-	231,499	200,000	756,226
Siskiyou	-	-	-	-	100,000[9]	100,000[3]	-	-	200,000
South Coast	11,275,591	8,349,769	19,745,849	7,055,564	8,148,088	7,448,659	11,906,373	34,566,109	108,496,002
Tehama	-	-	150,000	75,000[5]	100,000	100,000	200,000[4]	-	625,000
Tuolumne	-	-	-	-	100,000	100,000	200,000	-	400,000
Ventura	860,221	645,561	1,543,561	605,888	728,699	677,610	662,869	2,253,398	7,977,807
Multi-District	-	-	-	-	-	-	2,928,000	8,631,863[10]	11,559,863
Totals ($)	**24,499,997**	**18,620,000**	**44,100,000**	**15,680,001**	**19,680,000**	**18,000,000**	**29,280,000**	**84,960,001**	**254,820,000**

1 – Totals are for project funding only and do not include funds for Year 7 and 8 program administration.
2 – $66,010 of the Amador County APCD Year 5 grant award was returned to the State of California General Fund.
3 – The Amador County APCD, Mariposa County APCD, and Siskiyou County APCD each received $100,000 Year 6 grant awards, which they returned to ARB for redistribution to the Monterey Bay Unified APCD ($138,683), Sacramento Metropolitan AQMD ($138,683) and Santa Barbara County APCD ($22,634). Year 6 award totals for the recipient three air districts are therefore $405,321, $1,769,793, and $249,999, respectively.
4 – Several rural air districts are returning their Year 7 awards to ARB to help fund rural multi-district projects. The air districts and grant amount returned are: Amador County APCD ($200,000), Calaveras County APCD ($200,000), Great Basin APCD ($139,712), Kern County APCD ($80,093), Lake County AQMD ($200,000), and Tehama County APCD ($137,045).
5 – The Glenn County APCD and Shasta County APCD returned $55,000 and $19,593, respectively, of their $75,000 awards. These funds were redistributed to the Tehama County APCD. The Year 4 Tehama County APCD total grant award is therefore $149,593.
6 – Rural air districts returned a total of $501,750 in Year 2 and 3 grants to ARB to fund multi-district projects. The largest grant returned was from the Kern County APCD, which returned $125,000 of its Year 2 grant and its entire $325,000 Year 3 award.
7 – $7,659 of the Lake County APCD Year 6 grant award was returned to the State of California General Fund.
8 – $94,489 of the Mariposa County APCD Year 5 grant award is being returned to the State of California General Fund.
9 – The Siskiyou County APCD received a $100,000 Year 5 grant award, which it transferred to the Modoc County APCD. The Year 5 total grant award for the Modoc County APCD is therefore $200,000.
10 – The North Coast Unified AQMD returned $139,008 in Year 8 funds, which were applied to Year 8 Multi-District projects. This amount shall be deducted from the Year 9 Multi-District funding total and allocated to air districts in the Year 9 funding cycle.

Table A-2: Air District Carl Moyer Program Match Funding

District Name	Source	Year 1 ($)	Year 2 ($)	Year 3 ($)	Year 4 ($)	Year 5 ($)	Year 6 ($)	Year 7 ($)	Year 8 ($)	Total
Antelope Valley	DMV Fund	151,286	112,500	122,449	105,074	134,826	141,465	126,178	82,129	975,907
Bay Area	DMV Fund	1,250,000	940,000	1,171,737	785,172	947,456	826,298	1,128,488	1,613,302	8,662,453
Butte	DMV Fund, BUG	-	38,921	48,095	37,500	-	-	-	-	124,516
Colusa	BUG	-	-	-	37,500	-	-	-	-	37,500
Feather River	DMV Fund	-	34,550	48,095	37,500	-	-	-	-	120,145
Glenn	DMV Fund, Settlement Actions, and General Fund	50,000	26,871	40,816	37,500	-	-	-	-	155,187
Imperial	DMV Fund	67,400	34,996	48,095	37,500	-	-	109,755	60,390	358,136
Kern (Eastern)	DMV Fund, Excess Emission Fees	-	50,000	-	-	-	-	-	-	50,000
Mendocino	DMV Fund	-	31,009	40,817	37,500	-	-	-	-	109,325
Mojave Desert	DMV Fund, CMAQ	422,896	317,839	417,831	-	-	-	-	113,458	1,272,024
Monterey Bay	DMV Fund	132,900	72,591	122,449	108,776	146,890	133,319	194,555	189,207	1,100,687
N. Sierra	DMV Fund	63,850	26,346	48,096	37,500	-	-	103,798	-	279,589
N. Sonoma	DMV Fund	56,950	-	40,817	37,500	-	-	96,352	39,448	271,066
North Coast	DMV Fund	50,000	36,627	48,095	37,500	-	-	-	4,630	176,852
Sacramento	DMV Fund, Measure A	963,896	838,521	1,063,838	719,472	990,658	884,897	955,440	1,029,364	7,446,086
San Diego	DMV Fund	542,831	404,749	503,495	357,073	433,664	459,869	542,330	684,964	3,928,975
San Joaquin	DMV Fund, CMAQ	2,199,901	1,593,726	2,080,266	1,378,631	1,593,663	1,396,678	1,284,931	1,856,460	13,384,256
San Luis	DMV Fund, Private Funding	78,900	41,598	48,095	37,500	-	-	114,890	65,804	386,787
Santa Barbara	DMV Fund, Mitigation Fee	151,286	112,500	122,449	105,074	104,451	125,000	148,044	113,912	982,716
Shasta	DMV Fund	-	38,488	48,095	37,500	-	-	105,418	-	229,501
South Coast	MSRC, Clean Fuels Fund	5,637,796	4,174,884	5,373,020	3,527,782	4,074,044	3,724,330	5,421,846	5,424,688	37,358,391
Tehama	DMV Fund, BUG	-	-	40,816	75,000	-	-	-	-	115,816
Ventura	DMV Fund, District Fees, Reliant Mitigation Fees, and BUG	430,111	322,780	420,017	302,944	364,350	338,805	301,853	352,479	2,833,339
Totals		**12,250,003**	**9,249,496**	**11,897,483**	**7,877,498**	**8,790,002**	**8,030,661**	**10,633,878**	**11,630,235**	**80,359,256**

DMV Fund = Department of Motor Vehicle vehicle registration fees. CMAQ = Federal Congestion, Mitigation, and Air Quality Fund; BUG = Back-UP Diesel Generator Funds.

Table A-3:
California Department of Motor Vehicles Air Quality Fees

District Name	First $4	Second $2 (AB 923)	Extra $1[1]
Amador County APCD	$2	--	--
Antelope Valley AQMD	$4	$2	--
Bay Area AQMD	$4	$2	--
Butte County AQMD	$4	--	--
Colusa County APCD	$4	$2	--
El Dorado County APCD	$4	$2	--
Feather River AQMD	$4	$2	--
Glenn County APCD	$2	--	--
Imperial County APCD	$4	$2	--
Kern County APCD	$4	--	--
Mendocino County APCD	$4	$2	--
Mojave Desert AQMD	$4	--	--
Monterey Bay Unified APCD	$4	$2	--
North Coast Unified AQMD	$4	--	--
Northern Sierra AQMD	$4	--	--
Northern Sonoma County APCD	$4	$2	--
Placer County APCD	$4	$2	--
Sacramento Metropolitan AQMD	$4	$2	--
San Diego County APCD	$2	--	--
San Joaquin Valley Unified APCD	$4	$2	$1
San Luis Obispo County APCD	$4	$2	--
Santa Barbara County APCD	$4	$2	--
Shasta County APCD	$3	--	--
South Coast AQMD	$4	$2	$1
Tehama County APCD	$4	--	--
Ventura County APCD	$4	$2	---
Yolo-Solano AQMD	$4	$2	--

Data from California Department of Motor Vehicles, September 13, 2006.
1 - The South Coast and San Joaquin Valley air districts are authorized to impose an additional $1 per vehicle fee to reduce emissions from motor vehicles.
(HSC § 9250.11 and HSC § 9250.16)

Table A-4: Carl Moyer Program Summary Information
Years 1 through 6

Air District	Total Project Funding (Years 1 - 8)	Project Application Process[1]	Source Categories Funded[2]	EJ Evaluation (yes/no)	Average Project Life[3] (years)	Number of Applicants Funded[4]	Average Funding Amount per Applicant[4]	Average NOx C/E[5]
South Coast	$108,496,002	RFP	R,O,M,L	Yes	11	76	$ 562,700	$ 2,700
San Joaquin	$38,621,246	FCFS	A,R,O	Yes	7	694	$ 34,300	$ 2,100
Bay Area	$26,600,451	RFP	M,O,L,R,A	Yes	17	38	$ 324,600	$ 1,700
Sacramento	$21,361,742	FCFS	A,O,R,L	Yes	6	282	$ 45,000	$ 4,300
Multi-District	$12,061,613	RFP	R,M	Yes	14	3	$ 161,000	$ 1,800
San Diego	$11,802,262	RFP	M,R,O,A,L	Yes	12	37	$ 168,600	$ 3,100
Ventura	$7,977,807	RFP	M,R,A,O	No	14	65	$ 81,200	$ 2,900
Mojave	$4,139,954	FCFS	O,A,R	No	6	18	$ 184,500	$ 4,100
Monterey	$3,414,335	FCFS	M,A,R,O	Yes	10	37	$ 48,600	$ 3,900
S. Barbara	$2,697,574	RFP	R,A,M,O,T	No	8	38	$ 43,300	$ 3,700
Antelope	$2,540,717	FSFS	A,R,O	No	8	15	$ 116,000	$ 1,500
San Luis Obispo	$1,364,351	RFP	M,R,A,O	No	10	14	$ 49,400	$ 3,300
Imperial	$1,282,368	FCFS	A,O	No	10	45	$ 14,600	$ 1,500
North Coast	$1,025,005	FCFS	R,O,M	No	8	25	$ 25,000	$ 3,200
N. Sonoma	$1,002,061	RFP	R,M	No	12	4	$ 131,700	$ 3,100
Butte	$929,592	RFP	A,O,R	No	7	47	$ 11,200	$ 2,200
Glenn	$923,743	RFP	A,R	No	6	62	$ 8,600	$ 1,300
Feather River	$920,851	RFP	A,O,R	No	6	28	$ 18,500	$ 1,800
Mendocino	$887,018	RFP	R,A,M,O	No	10	21	$ 23,000	$ 3,500
N. Sierra	$860,082	FCFS	R,O	No	7	18	$ 34,000	$ 5,200
Shasta	$736,633	RFP	R,A,O	No	7	26	$ 8,100	$ 1,400
Colusa	$675,000	FCFS	A	No	7	22	$ 12,300	$ 1,100
Kern	$619,907	FCFS	A,R	No	6	8	$ 37,500	$ 1,200
Lassen	$600,000	FCFS	A	No	7	12	$ 16,800	$ 1,900
Modoc	$500,000	FCFS	O,R,A	No	10	4	$ 75,000	$ 5,500
Tehama	$499,593	FCFS	A,O,R	No	7	32	$ 15,700	$ 1,900
Calaveras	$400,000	FCFS	O,R	No	5	2	$ 99,200	$ 7,100
Tuolumne	$400,000	FCFS	R	No	5	n/a	n/a	$23,400[6]
Lake	$192,341	RFP	R,O	No	5	5	$ 38,700	$ 5,800
Mariposa	$100,000	FCFS	R	No	5	1	$ 5,511	$ 13,000
Amador	$33,990	FCFS	O	No	5	1	$ 34,000	$ 5,900
ALL	$253,666,238	--	A,R,M,O,L	--	10	1629	$ 73,500	$ 2,600

1 – RFP = request for proposals; FCFS = first-come, first-served.
2 – A = agricultural irrigation pumps; L = locomotives; M = marine vessels; O = off-road equipment; R = on-road heavy- and medium-duty vehicles. Categories are listed in descending order of total Year 1 through 6 funding amount.
3 – Project life is weighted by funding, such that Average Project Life reflects an average per dollar rather than per engine.
4 – Results indicate the number of discrete applicants funded in the program's first six years. Results are rounded to the nearest hundred dollars.
5 – Average Cost-Effectiveness is rounded to the nearest hundred dollars.
6 – The Tuolumne County APCD purchased 11 on-road heavy-duty vehicle diesel particulate filters, which achieve no NOx reductions and therefore adversely impact the program's average NOx cost-effectiveness.

Local Air District
Carl Moyer Program
Summaries

Bay Area AQMD

The Bay Area AQMD has participated in the Carl Moyer Program since the program's inception. Over the first six years, ARB has provided the district with $13,803,983 of Carl Moyer Program funds, which the district has matched with $5,920,663 in local funds. In Years 7 and 8, the district received an additional $12,796,468 in Carl Moyer Program funding, which it matched with $2,741,790 in local funds. The Bay Area AQMD has completed all its projects from the program's first five years. However, as of October 2006 the district had not expended about $1.4 million in Year 6 funds. These funds had been committed to a project to clean-up trucks serving the Port of Oakland. This project ultimately was not completed due to implementation challenges. The Bay Area AQMD has redirected these Year 6 funds to another project and expects the funds to be fully expended by the end of 2006. ARB is scheduled to audit the Bay Area AQMD's implementation of the Carl Moyer Program in early 2007 to ensure all program funds are expended in accordance with state law and the program guidelines.

Applicants for Carl Moyer Program funds are solicited by the Bay Area AQMD through an RFP process. Projects are ranked and selected for funding based upon project cost-effectiveness, with at least fifty percent of projects located in environmental justice areas. In recent years, requests for project funding have exceeded funding availability.

Carl Moyer Program projects funded in the Bay Area AQMD have reduced NOx and diesel PM emissions by over 700 tons per year and almost 50 tons per year, respectively, with an average cost-effectiveness of about $1,700 per ton of NOx reduced. Table A-5 summarizes the types of projects funded by the Carl Moyer Program in the Bay Area AQMD in Years 1 through 6.

Table A-5: Bay Area AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	3	201	-	-	40.0	0.26	$657,802
Off-Road									
Scraper	-	-	2	7	7	-	45.3	2.19	$877,560
Other	-	-	4	4	-	-	5.4	0.91	$214,756
Ag Pump	-	-	-	1	4	-	2.4	0.13	$55,008
Marine									
Ferry/ Excursion	4	8	11	2	2	-	252.3	9.37	$3,624,073
Tug	12	1	28	3	5	1	233.5	26.09	$4,754,808
Other	8	4	13	-	5	-	89.3	7.22	$1,331,548
Locomotive	2	-	-	-	-	-	33.6	-	$820,000
Totals	26	13	61	218	23	1	702	46	$12,335,555

Table includes projects funded as of October 1, 2006. Table does not include $1,438,428 in Year 6 funds which have not yet been expended. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Sacramento Metropolitan AQMD

The Sacramento Metropolitan AQMD has participated in the Carl Moyer Program since the program's inception and administers the Carl Moyer Program for all the air districts in the Sacramento Federal Ozone Non-Attainment Area which includes the Yolo-Solano AQMD, the El Dorado County AQMD, and the Placer County AQMD. In Years 1 through 6, ARB provided the Sacramento region with $12,704,490 in Carl Moyer Program funds. The Sacramento Metropolitan AQMD has leveraged these state dollars with $5,461,282 in local funds. The district received an additional $8,657,252 in Years 7 and 8, which it matched with $1,984,804 in local funds.

The Sacramento Metropolitan AQMD administers their Carl Moyer Program on a first-come, first-served basis. Over eight years of implementing the program, the district has developed strong relationships with local engine and vehicle dealers who provide outreach to engine owners. The district uses the internet to provide additional outreach and includes information on the Carl Moyer Program in its Clean Technology Forum newsletter (with a circulation of over 3,400). During the summer of 2006, ARB audited the Sacramento Metropolitan AQMD's implementation of the Carl Moyer Program in Years 5 through 8. ARB's audit report, available in Appendix D, provides more information regarding the district's implementation of the Carl Moyer Program.

The Sacramento Metropolitan AQMD used its Year 1 through 6 Carl Moyer Program funds to clean up over 1,000 engines. These projects include purchase of new, alternative-fueled school buses, on-road retrofit devices, agricultural pump and construction equipment engine repowers, and locomotive idle-limiting devices. These projects reduce NOx emissions by over 600 tons per day and diesel PM emissions by about 24 tons per day with an average cost-effectiveness of about $4,300 per ton of NOx reduced. Table A-6 summarizes the types of Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the Sacramento region.

Table A-6: Sacramento Metropolitan AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
School Bus	2	2	1	-	-	-	1.7	0.19	$155,911
Urban Bus	-	-	-	-	14	-	4.6	0.13	$587,791
Other	-	-	-	3	3	2	1.1	0.03	$59,745
Off Road									
Ag Tractor	-	4	10	5	4	-	14.8	0.89	$394,897
Scraper	-	1	7	3	2	8	34.5	2.09	$1,305,449
Other	-	8	39	25	8	3	47.3	2.64	$1,207,083
Ag Pump	206	160	318	51	90	62	512.6	17.74	$8,678,779
Locomotive	-	-	-	21	-	-	1.0	0.05	$299,985
Totals	208	175	375	108	121	75	618	24	$12,689,640

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

San Diego County APCD

The San Diego County APCD has participated in the Carl Moyer Program since the program's inception. In its first six years of participation in the program, the district received $6,246,716 in funding from ARB, which it matched with $2,701,681 in district funds. In Years 7 and 8, the San Diego APCD received $5,555,546 in program funding, which it matched with $1,227,294 in local funds.

The San Diego County APCD solicits applications for Carl Moyer Program funding through an annual RFP, which is mailed to about 350 companies, government entities, and individuals. A notice of availability of program funding is also placed in a general circulation newspaper oriented towards the business community and a similar notice written in Spanish is placed in the region's largest Spanish language newspaper. Program information and application procedures are also available on the district's website. Applications are selected based upon project cost-effectiveness, with a minimum of fifty percent of funding dedicated to projects in environmental justice areas. The San Diego APCD Board approves projects before they are funded.

In Years 1 through 6, the San Diego APCD provided funding to clean up 260 engines, including the purchase of 125 buses and trash trucks, and replacement of on-road, off-road, agricultural irrigation pump, and marine engines. These projects achieve over 240 tons per year of NOx reductions and 10 tons per year of diesel PM reductions, with an average cost-effectiveness of about $3,100 per ton of NOx reduced. Table A-7 summarizes Carl Moyer Program engines funded, emission reductions achieved, and funds expended in San Diego County.

Table A-7: San Diego County APCD Carl Moyer program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Transit Bus	15	50	18	2	-	-	36.8	1.23	$867,049
Other	8	9	23	-	-	-	17.0	1.53	$1,089,471
Off-Road	-	-	10	10	9	2	52.5	2.11	$1,158,748
Ag Pump	-	-	-	3	6	4	20.8	1.04	$342,108
Marine									
Charter Fishing	20	-	16	6	3	-	80.4	1.09	$1,661,796
Other	-	2	2	2	2	10	34.8	2.10	$1,057,327
Locomotive	-	-	-	-	-	1	3.8	0.82	$60,600
Totals	43	61	69	23	20	17	246	10	$6,237,099

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

San Joaquin Valley Unified APCD

The San Joaquin Valley Unified APCD has participated in the Carl Moyer Program since the program's inception. The district administers the Carl Moyer Program within its jurisdiction, which includes the following counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the western portion of Kern. In Years 1 through 6, the San Joaquin Valley APCD received $23,970,175 in funding from ARB, which it matched with $11,527,796 in local funds. The district received $14,651,071 in Carl Moyer Program funding in Years 7 and 8, for which it provided $3,134,779 in match funding.

The San Joaquin Valley Unified APCD integrates their Carl Moyer Program implementation into a larger grant and incentive program called the Heavy-Duty Engine Program. This program provides incentives for the differential cost associated with the purchase of reduced emission technology as compared with the cost of conventional technology on a first-come, first-served basis. The program is typically oversubscribed, with more applications for funding than available funds.

Carl Moyer Program funds from Years 1 through 6 have helped fund over 1,700 cleaner engines, the majority of which are replacement engines for agricultural irrigation pumps. The San Joaquin Valley Unified APCD has also funded the purchase of 13 new alternative fueled on-road heavy-duty vehicles and the retrofit of 62 transit buses. Carl Moyer Program projects in the San Joaquin Valley achieve over 1,800 tons per year of NOx reductions and 80 tons per year of diesel PM reductions, with an average cost-effectiveness of about $2,100 per ton of NOx reduced. Table A-8 summarizes the Carl Moyer Program engines funded, emission reductions achieved, and funds expended in the San Joaquin Valley.

Table A-8: San Joaquin Valley APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Line-haul Truck	2	-	1	-	-	27	20.1	0.13	$790,917
Transit Bus	-	-	-	-	62	-	4.0	-	$930,000
Other	12	-	-	-	2	-	5.2	0.04	$276,852
Off Road									
Ag Tractor	3	17	-	1	3	1	12.1	0.64	$212,592
Other	3	1	2	2	-	2	7.3	0.25	$122,048
Ag Pump	360	246	650	203	181	136	1,806.9	80.29	$21,456,932
Totals	380	264	653	206	248	166	1,856	81	$23,789,341

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

South Coast AQMD

The South Coast AQMD is California's largest local air district, responsible for air quality in portions of Los Angeles, Riverside, San Bernardino counties and all of Orange County. As the district with the largest population, the South Coast AQMD has been awarded over $62 million in Carl Moyer Program funds over the program's first six years. The district leveraged these state dollars with over $26 million in local match funding. In Years 7 and 8, the district received an additional $46,385,305 in program funds from ARB, which it matched with $10,846,534 in local funding.

The South Coast AQMD has historically solicited project applications through an RFP process that allows for evaluation of applications for cost-effectiveness and environmental justice impacts. After the projects are ranked, the Technical Committee must approve the selections before they are presented to the district Board for final approval. In 2006, the South Coast AQMD released three RFPs. The first encompassed the traditional review process described above. The other two RFPs were first-come, first-serve solicitations for on-road heavy-duty vehicle fleet modernization and for construction equipment. In early 2007, the district plans on releasing another RFP following its traditional process. Requests for program funding in the district typically far exceed available funds.

During the summer of 2006, ARB audited the district's implementation of the Carl Moyer Program for Years 5 through 8. The audit found that approximately $10 million of the $15.6 million of Year 5 and 6 funds received by the district have not been expended in a timely manner consistent with State law. ARB will conduct a follow-up audit in 2007 to verify that these funds are expended. ARB's audit report, available in Appendix E, provides more information on the district's implementation of the Carl Moyer Program.

Table A-9 summarizes projects funded by the South Coast AQMD as of October 1, 2006. These projects have helped clean up over 1,600 engines with an average cost-effectiveness of about $2,700 per ton of NOx reduced.

Table A-9: South Coast AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Refuse Hauler	44	30	223	89	3	-	319.7	5.84	$10,689,164
Transit Bus	111	128	301	136	105	-	492.1	17.16	$10,197,619
Other	24	2	47	10	34	-	67.7	0.72	$2,111,054
Off Road									
Forklift	67	-	36	1	-	14	109.9	0.33	$1,039,603
Scraper	-	-	-	37	53	19	465.0	22.71	$7,238,410
Other	10	-	-	8	8	21	100.4	5.58	$2,060,184
Marine	6	23		46	36		374.9	14.45	$8,251,149
Locomotive	-	-	-	-	2	-	39.3	1.60	$1,175,000
Totals	262	183	607	327	241	54	1969	68	$42,762,183

Table does not include benefits of $19,261,339 in projects not complete as of October 1, 2006. Once complete, these projects are projected to reduce NO and PM by an additional 800 and 30 tons per year, respectively.

Amador County APCD

The Amador County APCD participated in the Carl Moyer Program in Year 5 and 6, receiving $100,000 in funding each year. The Amador County APCD spent $33,990 of the $100,000 it received in Year 5 and is returning the remaining $66,010. These funds shall revert to the State of California General Fund. The district also returned the $100,000 in Year 6 funds to ARB for redistribution to the Monterey Bay Unified APCD, the Sacramento Metropolitan AQMD, and the Santa Barbara County APCD. The district elected not to participate in the program in Years 7 and 8 because of difficulty finding eligible projects and a shortage of resources needed to administer the program.

The Amador County APCD accepted applications on a first-come, first-served basis. The district's outreach efforts included newspaper and radio advertisements, television interviews, and phone calls to prospective participants. A one-time district Board resolution provides the district's Air Pollution Control Officer the authority to select Carl Moyer Program projects.

As of October 1, 2006, the Amador County APCD has provided approximately 33 percent of its Year 5 funds to repower a large off-road loader. This project provides about one ton per year of NO_x reductions and about one-tenth of a ton per year of diesel PM reductions, with a cost-effectiveness of about $5,900 per ton of NO_x reduced. Table A-10 summarizes information for this project.

Table A-10: Amador County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
Off-Road Equipment	-	-	-	-	1	-	1.3	0.12	$33,990
Total	-	-	-	-	1	-	1.3	0.12	$33,990

Table includes projects funded as of October 1, 2006. Reflects projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Antelope Valley AQMD

The Antelope Valley AQMD has participated in the Carl Moyer Program since the program's inception. In Years 1 through 6, the district received a total of $1,740,302, which it matched with $767,600 in district funding. For the seventh and eighth years of the program, the district received an additional $800,415, which it matched with $208,307 in district funding. As of October 1, 2006, the Antelope Valley AQMD has committed all of its Year 1 through 7 funds and about a third of Year 8 funds to specific projects.

The Antelope Valley AQMD awards Carl Moyer Program funding to eligible projects on a first-come, first-served basis each year when program funds are received from ARB. In the event that available funding exceeds project funding requests, an RFP is released to solicit additional applications. If the applications received in this period exceed available funds, the projects are evaluated by the district's Mobile Source Reduction Committee. The projects recommended for funding by the committee are forwarded to the Governing Board for approval. Any remaining, eligible applications which had not been awarded funding by the Governing Board are forwarded to the next Carl Moyer Program funding round. District outreach efforts include participation in the Antelope Valley Clean Cities Coalition, presentations to the Los Angeles County Farm Bureau, articles in the district's newsletter, and meetings with fleet managers from city, county, and state agencies. In recent years, demand for Carl Moyer Program funding has exceeded available funds.

The Antelope Valley AQMD Carl Moyer Program has funded 50 engines that operate in the district, including alternative-fueled on-road heavy-duty vehicles, and repowers of off-road equipment and agricultural irrigation pumps. Carl Moyer Program projects in the district provide approximately 178 tons per year of NOx and 10 tons per year of diesel PM reductions. Overall, the average cost-effectiveness for the district's program is about $1,500 per ton of NOx reduced. Table A-11 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the Antelope Valley.

Table A-11: Antelope Valley AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Refuse Hauler	7	5	-	1	-	-	7.8	-	$472,502
Other	-	1	3	-	-	-	3.5	0.02	$161,560
Off-Road	-	-	3	-	-	-	3.9	0.54	$114,472
Ag Pump	1	1	6	5	6	11	162.8	9.81	$991,768
Totals	8	7	12	6	6	11	178	10	$1,740,302

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Butte County AQMD

The Butte County AQMD has participated in the Carl Moyer Program since the program's second year. Between Years 2 and 6, the district received a total of $529,592 in Carl Moyer Program funds. The district provided $124,516 in district match funds in Years 2, 3, and 4 and received a waiver from the match funding requirement in program Years 5 and 6. The district received an additional $400,000 in Years 7 and 8 and received a match funding waiver. As of October 2006, the district has committed all its Year 7 and almost all Year 8 Carl Moyer Program funds to specific projects.

The Butte County AQMD solicits applications for Carl Moyer Program funding through an annual RFP process. The district notifies potential applicants of funding availability through the district's quarterly newsletter "The Stratus Status", posting information and application materials on the district's website, newspaper advertising, and a direct mailing to a list of district permit recipients and past Carl Moyer Program participants. The district generally receives applications for funding in excess of available funds.

The Butte County AQMD has used its Carl Moyer Program funds from Years 2 through 6 to fund about 60 cleaner engines, achieving 43 tons per year of NOx reductions and 2.5 tons per year of diesel PM reductions. These projects have an average cost-effectiveness of about $2,200 per ton NOx reduced. The majority of program funds have been used for agricultural irrigation pump engine replacement. Table A-12 summarizes the types of engines, emission reductions achieved, and total funding for the Carl Moyer Program in Butte County.

Table A-12: Butte County AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	1	-	-	-	0.2	0.01	$5,244
Off-Road									
Ag Tractor	-	-	1	-	-	-	0.1	0.01	$3,308
Sprayer	-	-	1	-	-	-	0.2	0.00	$6,470
Other	-	-	1	-	-	-	1.4	0.05	$18,225
Ag Pump	-	6	16	10	10	12	41.1	2.44	$495,046
Totals	-	6	20	10	10	12	43	2.5	$528,293

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Calaveras County APCD

The Calaveras County APCD has participated in the Carl Moyer Program in Years 5 and 6, receiving $100,000 in Carl Moyer Program funds each year from ARB. The district also received $200,000 in program funding in Year 8. Having received the minimum program allocation since Year 5, the district has been exempted from providing match funding each year.

In Year 5, the Calaveras County APCD funded two school bus engine repowers for a total of $100,000. The school bus projects exceeded the maximum cost-effectiveness cap and also did not achieve the minimum 15 percent NOx emission reductions required for repower projects. As a result, the district is being placed on probation for a minimum period of one year. In order to be fully reinstated into the program, the district must demonstrate to ARB that they can fully implement project eligibility criteria. ARB is working with the district to develop strategies that will satisfy this requirement.

The Calaveras County APCD accepts applications for project funding on a first-come, first-served basis. The district's outreach efforts include newspaper advertisements, industry meetings, and phone calls to prospective project applicants. A one-time board resolution allows the district's Air Pollution Control Officer to select projects and contract with engine owners and operators. Board approval is not necessary for each individual project.

The Calaveras County APCD has provided Carl Moyer Program incentive funds to retrofit one scraper and to repower one scraper and two school buses. These projects provide over six tons per year of NO_x reductions and 0.2 tons per year of diesel PM reductions, with an average cost-effectiveness of $7,100 per ton of NO_x reduced. Table A-13 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Calaveras County.

Table A-13: Calaveras County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	-	-	2	-	0.3	-	$100,000
Off-Road	-	-	-	-	1	1	6.0	0.23	$105,000
Totals	-	-	-	-	3	1	6.3	0.23	$205,000

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Colusa County APCD

The Colusa County APCD has participated in the Carl Moyer Program since the program's fourth year. In Carl Moyer Program Years 4 through 6, the district received $275,000 in funding from ARB, which it has matched with $37,500 in local funds. For Years 7 and 8 of the program, the district received an additional $400,000 in Carl Moyer Program funding. Having accepted the minimum program allocation in Years 7 and 8, the district was not required to provide match funding.

The Colusa County APCD administers their Carl Moyer Program on a first-come, first-served basis. The district places newspaper ads announcing availability of new funds. The district also shares office space with the Agricultural Commissioner's office, making it convenient to provide outreach materials to potential project applicants in the agricultural community. The Colusa County APCD has received requests for funding in excess of available funds every year it has participated in the Carl Moyer Program.

Colusa County APCD Carl Moyer Program funds have helped replace 33 older agricultural pump diesel engines with 32 new diesel engines and one electric motor. These projects achieve about 40 tons per year NOx reductions and 2 tons per year of diesel PM reductions, with an average cost-effectiveness of about $1,100 per ton of NOx reduced. Table A-14 summarizes the Carl Moyer Program engines funded, emission reductions achieved, and funds expended in Colusa County.

Table A-14: Colusa County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
Ag Pump	-	-	-	11	11	11	40.1	1.88	$269,836
Total	-	-	-	11	11	11	40	2	$269,836

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Feather River AQMD

The Feather River AQMD has participated in the Carl Moyer Program since the program's second year. Between Years 2 and 6, the district received $520,851 in Carl Moyer Program funds and provided $120,145 in local match funding. The Feather River AQMD received an additional $200,000 in Carl Moyer Program funding from ARB in both Years 7 and 8. The district was exempted from providing match funding both these years since it received the minimum program allocation.

The Feather River AQMD solicits project applications through an RFP. Eligible projects are selected for funding based upon the affected population, pollutant health impacts, emission reductions, and cost-effectiveness. When Carl Moyer Program funding becomes available to the district, the district holds a workshop to educate potential applicants about the program and assist them in filling out the required application paperwork. The workshop is advertised in the local newspaper and posted on the district web site. The Feather River AQMD has received requests for funding in excess of available funds during every year it has participated in the Carl Moyer Program.

In Years 2 through 6, the Feather River AQMD used the bulk of its Carl Moyer Program funding to clean up 52 diesel agricultural irrigation pump engines and other agricultural off-road equipment. Projects funded by the Feather River AQMD reduce NOx emissions by about 53 tons per year and diesel PM emissions by about 1.4 tons per year with an average cost-effectiveness of about $1,800 per ton of NOx. Table A-15 lists the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the Feather River AQMD.

Table A-15: Feather River AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	1	-	-	-	0.5	-	$11,063
Off-Road									
Ag Tractor	-	1	-	-	-	-	1.7	-	$7,855
Other Ag Equipment	-	2	4	-	-	-	3.1	-	$36,637
Other	-	-	4	-	-	-	0.8	-	$14,576
Ag Pump	-	6	18	9	10	9	46.9	0.63	$447,763
Totals	-	9	27	9	10	9	53	1	$517,894

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Glenn County APCD

The Glenn County APCD has participated in the Carl Moyer Program since the program's inception. In Years 1 through 6, the district received a total of $523,743 in Carl Moyer Program funding. The district matched this with $155,187 in local funds in Years 1 through 4, and received a waiver from the matching fund requirement in Years 5 and 6. The district returned $55,000 of their Year 4 funds to ARB. These funds were redistributed to the Tehama County APCD. For Years 7 and 8, the Glenn County APCD received an additional $400,000 and was exempted from providing program match funding. As of October 2006, the district has committed all its Year 7 and 8 Carl Moyer Program funds to specific projects.

The Glenn County APCD solicits applications for Carl Moyer Program funding through an annual RFP process. The district mails its RFP notice and application to interested parties identified by a sign-up sheet in the district office. The district shares office space with the Agricultural Commissioner's office, which makes it convenient to provide outreach materials to potential project applicants in the agricultural community. The district also provides applications to local engine dealers and occasionally places newspaper ads announcing availability of funds. The Glenn County APCD has received requests for funding in excess of available funds every year it has participated in the Carl Moyer Program.

The Glenn County APCD has directed nearly all its Year 1 through 6 Carl Moyer Program funds to repower agricultural irrigation engine pumps. The district provided funding to repower 81 engines, reducing NOx emissions and diesel PM emissions by about 74 and 3 tons per year, respectively. The average cost-effectiveness of these projects was about $1,300 per ton of NOx reduced. Table A-16 summarizes the Carl Moyer Program engines funded, emission reductions achieved, and funds expended in Glenn County.

Table A-16: Glenn County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road					1		0.11	0.01	$5,246
Ag Pump	14	9	23	6	15	13	73.7	3.20	$531,457
Totals	14	9	23	6	16	13	74	3	$536,703

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Imperial County APCD

The Imperial County APCD has participated in Carl Moyer Program since the program's inception. Over the first six years of the program, the district received a total of $656,543, which it matched with $187,991 in local funding. In Years 7 and 8, the district received an additional $625,824 in funding from ARB, which it matched with $170,145 in local funds. To date, the district has committed all of its Year 7 allocation to specific projects.

The Imperial County APCD accepts applications on a first-come, first-served basis and evaluates and ranks projects based on cost-effectiveness. The district distributes applications through the Agricultural Commissioner's Office, the Farm Bureau, and through a direct mailing and distribution effort. The types of industries notified include agricultural irrigation pump operators, hay processors, farmers, firms with agricultural and earthmoving equipment, off-road equipment operators, and trucking companies. The Imperial County APCD generally receives requests for Carl Moyer Program funding in excess of available funds. For example, the district received 25 applications requesting a total funding of $400,000 for its Year 7 allocation of about $241,000.

The Imperial County APCD uses Carl Moyer Program incentive funds to pay primarily for agricultural irrigation pump engine repowers. In the first six years of the program, the district has funded 53 agricultural irrigation pump engine repowers and parts of three off-road engine repowers (for a total of 1.4 off-road engines funded). Imperial County APCD Carl Moyer Program projects achieve about 55 tons per year of NOx reductions and two tons per year of PM reductions. Overall, the average cost-effectiveness for the district's program is about $1,500 per ton of NOx reduced. Table A-17 summarizes the Carl Moyer Program engines funded, emission reductions achieved, and funds expended in Imperial County.

Table A-17: Imperial County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
Off-Road	-	-	1	-	-	-	1.1	0.07	$18,723
Ag Pump	13	7	13	5	8	7	54.1	2.12	$637,820
Totals	13	7	14	5	8	7	55	2	$656,543

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Kern County APCD

The Kern County APCD participated in the Carl Moyer Program in Years 2, 3, 5 and 6. In Years 2, 5 and 6, the Kern County APCD received $300,000 in Carl Moyer Program funds, and provided $50,000 in local match funding. In Years 2 and 3, the district was allocated $225,000 and $325,000, respectively, from ARB. The district returned $125,000 of their Year 2 funds and all of their Year 3 funds to ARB to fund multi-district projects. The Kern County APCD received $100,000 in Carl Moyer program funds from ARB in both Year 5 and Year 6 and has requested only about $120,000 of the $200,000 that it was allocated for Year 7. The district has been allocated an additional $200,000 in program funding for Year 8.

The Kern County APCD administers their Carl Moyer Program on a first-come, first-served basis. The district provides outreach materials to potential project applicants in the agricultural community and advertises in local newspapers when program funds are available. The Kern County APCD has received requests for funding in excess of available funds every year it has participated in the Carl Moyer Program.

The Kern County APCD primarily funds agricultural irrigation pump engine repower projects with its Carl Moyer Program funds. In Years 2 through 6, the district funded the replacement of 14 older diesel agricultural pump engines with 11 new diesel engines and 3 electric motors, and three truck retrofit projects. These projects reduce NOx emissions by about 49 tons per year and diesel PM emissions by about 3 tons per year with an average cost-effectiveness of about $1,200 per ton of NOx reduced. Table A-18 summarizes the Carl Moyer Program engines funded, emission reductions achieved, and funds expended in Kern County.

Table A-18: Kern County APCD Carl Moyer Program Project Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	-	-	-	3	0.3	0.34	$38,473
Ag Pump	-	8	-	-	5	1	49.2	2.26	$261,527
Totals	-	8	-	-	5	4	49	3	$300,000

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Lake County APCD

The Lake County APCD participated in the Carl Moyer Program during the program's fifth and sixth years. In these two years, the district received $200,000 in total program funding from ARB. Because it received the minimum program allocation, the district was not required to provide match funding. As of October 2006, the Lake County APCD has expended all but $7,659 of its Year 5 and 6 funds. These unspent monies have been returned to the State of California General Fund. Due to difficulties in soliciting projects, the district has declined Year 7 and 8 funds.

In Years 5 and 6, the Lake County APCD solicited applications for program funding through an RFP process open to public agencies. Since few applications were received, project ranking was unnecessary and the district funded all public agency project applications that met program requirements.

The Lake County APCD has provided Carl Moyer Program incentive funds to repower six on-road medium-duty vehicles and two pieces of construction equipment that operate in the district. These projects reduce NOx emissions by about 7 tons per year, with a cost-effectiveness of about $5,800 per ton of NOx reduced. Table A-19 summarizes the Carl Moyer Program engines funded, emission reductions achieved, and funds expended in Lake County.

Table A-19: Lake County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	-	-	2	4	4.8	-	$128,446
Off-Road	-	-	-	-	2	-	2.3	-	$64,990
Totals	-	-	-	-	4	4	7	-	$193,436

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Lassen County APCD

The Lassen County APCD has participated in the Carl Moyer Program since the program's fifth year. In Years 5 and 6, the district received $200,000 in total program funding from ARB. The district received an additional $400,000 in total funding for Years 7 and 8. Because it received the minimum program allocation each year, the district has been exempt from providing match funding.

The Lassen County APCD accepts applications for funding on a first-come, first-served basis unless the number of applications exceeds the available funding, in which case, the projects achieving the most NOx emission reductions are funded. The district outreach efforts include publishing a public notice of availability of Carl Moyer Program funds in the Lassen County Times, the Modoc Record, the Redding Searchlight News, and the Burney Pines Press. The district also publicizes availability of program funding on local radio stations.

The Lassen County APCD expended their Carl Moyer Program funds on agricultural irrigation pump engine repower projects in Years 5 and 6. These projects achieve about 18 tons per year of NOx reductions with a cost-effectiveness of $1,900 per ton of NOx reduced. Table A-20 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Lassen County.

Table A-20: Lassen County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
Ag Pump	-	-	-	-	9	12	17.6	-	$201,136
Totals	-	-	-	-	9	12	18	-	$201,136

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Mariposa County APCD

The Mariposa County APCD participated in the Carl Moyer Program in Years 5 and 6, receiving $100,000 of funding each year from ARB. As of October 1, 2006, the district has expended $5,511 of its Year 5 program funding. The Mariposa County APCD is returning the remaining $94,489 from Year 5 funds, which will revert to the State of California General Fund. The district also returned all of its Year 6 funds to ARB for redistribution to the Monterey Bay Unified APCD, the Sacramento Metropolitan AQMD, and the Santa Barbara County APCD. The district has elected not to participate in the Carl Moyer Program in Years 7 and 8.

The Mariposa County APCD accepted applications for Carl Moyer Program funding on a first-come, first-served basis. While the district contacted prospective applicants directly to find projects, very few eligible project applications were received. A one-time board resolution allowed the district's Air Pollution Control Officer to select projects and enter into contracts with engine owners.

In Year 5, the Mariposa County APCD provided $5,511 for an on-road heavy-duty vehicle repower project. This project achieves about 0.07 tons per year of NOx reductions and 0.01 tons per year of diesel PM reductions, with a cost-effectiveness of about $13,000 per ton of NOx reduced. Table A-21 provides summary information for this project.

Table A-21: Mariposa County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	-	-	1	-	0.07	0.01	$5,511
Totals	-	-	-	-	1	-	0.07	0.01	$5,511

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Mendocino County AQMD

The Mendocino County AQMD has been participating in the Carl Moyer Program since the program's second year. The district received $487,018 in Carl Moyer Program funding in Years 2 through 6, which it matched with $109,326 in local funding in Years 2 through 4. In Year 5, the Mendocino County AQMD was granted a waiver of the match requirement and has retained the waiver since. Mendocino received $400,000 from ARB for the Carl Moyer Program in Years 7 and 8.

The Mendocino County AQMD solicits applications for Carl Moyer Program funding through an RFP process. The district's RFP for Year 8 projects closed in November 2006 and district staff expects to take proposed Year 8 projects to its Board for approval in May 2007. The district has typically had more project applications than they could fund. Outreach for the district includes a mailing list of interested parties, mailings sent to district permit holders, press releases to local newspapers, and notification in the local Farm Bureau news letter.

The Mendocino County AQMD has provided Carl Moyer Program incentive funds to help retrofit three heavy-duty trucks, purchase one new alternative-fueled street sweeper, and repower 26 on-road, off-road, agricultural irrigation pump, and marine engines. These projects achieve about 20 tons per year of NOx reductions with an average cost-effectiveness of $3,500 per ton of NOx reduced. Table A-22 summarizes the Carl Moyer Program projects funded, emission reductions achieved and funds expended in Mendocino County.

Table A-22: Mendocino County AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Line-Haul Truck	-	-	2	1	-	3	4.8	-	$92,868
Other	-	4	-	-	7	2	7.8	-	$220,293
Off-Road	-	1	-	-	-	-	0.7	-	$10,000
Ag Pump	-	1	3	3	-	-	4.2	-	$80,124
Marine	-	2	-	1	-	-	2.1	-	$79,083
Totals	-	8	5	5	7	5	20	-	$482,368

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Modoc County APCD

The Modoc County APCD received $100,000 in Carl Moyer Program funds from ARB in the program's fifth and six years. In addition, Modoc received an extra $100,000 in funds redistributed from the Siskiyou County APCD. The district elected not to participate in the Carl Moyer Program in Year 7 and received $200,000 in program funding in Year 8.

The Modoc County APCD accepts applications on a first-come, first-served basis. The district's outreach efforts include newspaper advertisements and phone calls to prospective participants. A one-time board resolution allows the district's Air Pollution Control Officer to select projects and enter into contract with program participants. Board approval is not necessary for each individual project.

The Modoc County APCD has provided Carl Moyer Program incentive funds to replace 12 on-road, off-road, and agricultural irrigation pump engines with newer, cleaner engines. These projects reduce NOx emissions by about eight tons per year and diesel PM emissions by about 0.4 tons per year, with an average cost-effectiveness of about $5,500 per ton of NOx reduced. Table A-23 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Modoc County.

Table A-23: Modoc County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	-	-	5	-	0.9	0.09	$100,000
Off-Road	-	-	-	-	-	6	6.0	0.27	$170,225
Ag Pump	-	-	-	-	-	1	0.8	0.04	$29,775
Totals	-	-	-	-	5	7	8	0.40	$300,000

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Mojave Desert AQMD

The Mojave Desert AQMD has participated in Carl Moyer Program since the program's inception, with the exception of the program's fourth year. The district received $3,216,999 in state funding through Year 6, which it matched with $1,158,566 in district funds. In Year 7 and 8, the Mojave Desert AQMD received an additional $922,955 in Carl Moyer Program funding, which it matched with $113,458 in district funds. The district has committed all of its Year 7 and Year 8 funds to specific projects.

The Mojave Desert AQMD awards Carl Moyer Program funding to eligible projects on a first-come, first-served basis each year when program funds are received from ARB. In the event that available funding exceeds project funding requests, an RFP is released to solicit additional funding applications. If the applications received in this period exceed available funds, the projects are evaluated by the district's Mobile Source Reduction Committee. The committee's recommendations are forwarded to the Governing Board for approval. The Mojave Desert AQMD then forwards to the next Carl Moyer Program round any remaining, eligible applications which were not awarded funding by the Governing Board. In addition to issuing the RFP, the district conducts outreach to publicize the program by working with the San Bernardino County Farm Bureau, publishing articles in the district's newsletter, and meeting with fleet managers from city, county, and state agencies. The Mojave Desert AQMD also plans to establish a Clean Cities Coalition to assist in promoting the district's Carl Moyer Program. In recent years, demand for Carl Moyer Program funding has exceeded available funds.

The Mojave Desert AQMD has provided Carl Moyer Program incentive funds to clean up 62 on-road, off-road, and agricultural irrigation pump engines, including purchase of new alternative fueled on-road vehicles, on-road engine repowers, and off-road equipment and agricultural irrigation pumps engine repowers. These projects will achieve about 187 tons per year of NOx reductions and 13 tons per year of diesel PM reductions, with a cost-effectiveness of about $4,100 per ton of NOx reduced. Table A-24 provides a summary of Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the Mojave Desert AQMD.

Table A-24: Mojave Desert AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	12	5	1	-	-	-	10.0	0.65	$433,004
Off-Road									
Off-Hwy Truck	1	5	4	-	1	1	62.1	5.03	$1,131,977
Other	1	5	14	-	-	-	59.9	3.78	$1,202,357
Ag Pump	9	1	2	-	-	-	54.8	3.52	$449,661
Totals	23	16	21	-	1	1	187	13	$3,216,999

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Monterey Bay Unified APCD

The Monterey Bay Unified APCD has participated in the Carl Moyer Program since the program's inception. The district received $1,777,636 in program funding in Years 1 through 6, which it matched with $716,925 in local funding. In Years 7 and 8, the Monterey Bay Unified APCD received $1,636,699 in program funding and provided $383,762 in local match funding.

Carl Moyer Program applications are solicited by the district on a continuous first-come, first-served basis. The district has a long wait list of project applications, primarily to repower agricultural irrigation pump engines, off-road equipment and commercial marine vessels. The maximum allowable cost-effectiveness of projects funded by the Monterey Bay Unified APCD is $8,000 per weighted ton (compared to the maximum allowable Carl Moyer Program cost-effectiveness of $14,300 per weighted ton). Grants are awarded in order of application, with consideration of per-county funding limits and environmental justice issues.

The Monterey Bay Unified APCD used its Year 1 through 6 Carl Moyer Program funds to clean up 90 on-road, off-road, agricultural irrigation pump, and marine vessel engines. These projects achieve about 62 tons per year of NOx reductions and three tons per year of diesel PM reductions, with an average cost-effectiveness of about $3,900 per ton of NOx reduced. Table A-25 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the Monterey Bay Unified APCD.

Table A-25: Monterey Bay Unified APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	8	-	-	-	-	-	3.0	-	$265,800
Off-Road	-	-	2	1	10	3	10.7	0.50	$256,676
Ag Pump	-	-	3	15	13	9	28.9	1.72	$527,757
Marine									
Commercial Fishing	-	5	10	-	-	1	7.2	0.42	$353,253
Other	-	-	5	-	1	4	12.4	0.70	$393,298
Totals	8	5	20	16	24	17	62	3.3	$1,796,784

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

North Coast Unified AQMD

The North Coast Unified AQMD has participated in the Carl Moyer Program since the program's inception. In Years 1 through 6, the district received a total of $625,005, which it matched with $172,222 in district funds in Years 1 through 4. The district has received the minimum program allocation and therefore has been exempted from providing match funding since Year 4. In Years 7 and 8, the district received $400,000 in Carl Moyer Program funding from ARB.

The district accepts applications on a first-come, first-served basis. The district may place an emphasis on funding certain project categories in any given year to maintain a diversity of projects. To notify applicants of funding availability, the district works with local engine dealers, advertises in local newspapers and maintains a mailing list of potential applicants. The North Coast Unified AQMD has typically been slightly oversubscribed, and expects that the requests for funding will continue to increase as their outreach becomes more comprehensive.

The North Coast Unified APCD has provided Carl Moyer Program incentive funds to help clean up 30 on-road, off-road, and marine engines. These projects reduce NOx emissions by about 31 tons per day, with an average cost-effectiveness of about $3,200 per ton of NOx reduced. Table A-26 provides a summary of Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the North Coast Unified APCD.

Table A-26: North Coast Unified AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	3	2	6	2	5	4	14.8	-	$451,765
Off-Road	1	-	2	1	-	1	6.8	-	$102,706
Marine	1	1	-	1	-	-	9.2	-	$70,534
Totals	5	3	8	4	5	5	31	-	$625,005

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Northern Sierra AQMD

The Northern Sierra AQMD has participated in the Carl Moyer Program in the program's first seven years. The district received $632,142 in funding in Years 1 through 6, and provided $175,791 in local matching funds in Years 1 through 4. The district received the minimum program allocation in Years 5 and 6 and was therefore not required to provide match funding. In Year 7, the district received $227,940 in program funding, which it matched with $103,798 in local funds. About $15,000 in Year 6 project funding remains and will be combined with funds for projects in Year 7. The Northern Sierra AQMD did not participate in the Carl Moyer Program in Year 8.

The Northern Sierra AQMD accepts project applications on a first-come, first-served basis. The district's outreach efforts include news releases, mailings, and radio advertisements. A one-time board resolution delegates the authority to select projects and enter into contracts with program participants to the district's Air Pollution Control Officer.

The Northern Sierra AQMD has provided Carl Moyer Program funding to repower 29 on-road and off-road engines, and purchase two alternative-fueled transit buses. These projects achieve about 22 tons per day of NOx reductions and 0.7 tons per day of diesel PM reductions, with a cost-effectiveness of about $5,200 per ton of NOx reduced. Table A-27 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in the Northern Sierra AQMD.

Table A-27: Northern Sierra AQMD Carl Moyer Program Project Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	7	5	6	2	2	1	18.8	.27	$509,175
Off-Road									
Rubber-Tired Loader	2	-	-	2	-	2	2.1	0.25	$89,682
Other	-	-	-	2	1	-	1.0	0.20	$80,676
Totals	9	5	6	6	3	2	22	0.7	$679,533

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Northern Sonoma County APCD

The Northern Sonoma County APCD has participated in the Carl Moyer Program since the program's inception, with the exception of the program's second year. In Years 1 through 6, the district received $538,900 in Carl Moyer Program funding, which it matched with $135,266 in local funds. In Years 5 and 6, the district was granted a waiver from the match funding requirement. The district received $463,161 in Carl Moyer Program funding in Years 7 and 8, for which it provided $135,800 in match funding.

The Northern Sonoma County APCD solicits applications for Carl Moyer Program funding through an RFP process targeting agricultural engines, on-road vehicles, off-road equipment, and marine vessels. In the eighth year of the program, the district issued an RFP in May of 2006, took recommended projects to the district Board for approval in July of 2006 and signed contracts with grantees in August of 2006.

The district has funded 42 cleaner-engines, including 6 marine engine repowers and purchase of 36 new alternative-fueled on-road vehicles. These projects achieve about 19 tons per year of NOx reductions, with an average cost-effectiveness of about $3,100 per ton of NOx reduced. Table A-28 summarizes the types of Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Northern Sonoma County.

Table A-28: Northern Sonoma County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
School Bus	-	-	7	2	-	-	2.2	-	$99,994
Transit Bus	-	-	8	-	-	-	2.5	-	$50,000
Urban Bus	7	-	-	-	5	7	6.5	-	$266,660
Marine	2	-	2	-	-	2	7.5	-	$110,000
Totals	9	-	17	2	5	9	19	-	$526,654

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

San Luis Obispo County APCD

The San Luis Obispo County APCD has participated in the Carl Moyer Program since the program's inception. In Years 1 through 6, the district received a total of $692,746 in program funding from ARB, which it matched with $206,093 in district funds. In Years 7 and 8, the district received $671,605 and matched it with $180,694 in local funds.

In the first year of the program, the San Luis Obispo APCD allocated all of its Carl Moyer Program funds to replace the Hearst Castle Historic Monument fleet of diesel buses with alternative fueled buses. In the following years, the district issued an annual RFP to solicit projects. Instead of a deadline, the district provides applicants with a limited time frame (typically up to two months) to submit applications for their projects. During that period, the district funds qualifying projects in the order they are received. Over the years implementing the Carl Moyer Program, the district has built a mailing list of about 200 previous and potential applicants and repower specialists. The San Luis Obispo APCD uses this mailing list, website postings, and workshop presentations to conduct outreach to potential program applicants.

In the first six years of the Carl Moyer Program, the San Luis Obispo APCD has provided Carl Moyer Program incentive funds to help clean up 40 engines that operate in the district. Besides the alternative-fueled buses funded in the first year, the district has also funded repowers of marine vessels, agricultural irrigation pumps, on-road vehicles, and off-road equipment. These projects achieve about 29 tons per year of NOx reductions and two tons per year of PM reductions, with an average cost-effectiveness of about $3,300 per ton of NOx reduced. Table A-29 provides a summary of Carl Moyer Program projects funded, emission reductions achieved, and funds expended in San Luis Obispo County.

Table A-29: San Luis Obispo County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	15	-	-	2	-	1	4.6	0.22	$239,697
Off-Road	-	-	-	1	-	1	0.6	0.02	$20,157
Ag Pump	-	2	-	4	1	4	12.8	0.52	$132,173
Marine	-	4	3	-	2	-	11.1	0.78	$298,922
Totals	15	6	3	7	3	6	29	2	$690,949

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Santa Barbara County APCD

The Santa Barbara County APCD has participated in the Carl Moyer Program since the program's inception. For Years 1 through 6, the district received $1,646,621 from ARB, which it matched with $720,760 in district funds. In Years 7 and 8, the district received $1,050,953 in program funding and provided $261,956 in local matching funds.

Each year, the Santa Barbara County APCD issues an RFP or uses other outreach efforts to solicit applications. Projects are generally funded on a first-come, first-served basis. However, additional criteria may be considered in selecting projects, including project mix, viability, and timeliness, the applicant's performance history, and to a limited extent, project cost-effectiveness. Additional outreach efforts include notifications sent to mailing lists, announcements in local newspapers and contractor association newsletters, press releases, RFP notice postings, and provision of flyers and information at various events. The Air Pollution Control Officer has the authority to approve individual project grants that are $150,000 or less. Projects grants for more than $150,000 must receive district Board approval. Requests for project funding in the district have typically exceeded available Carl Moyer Program funds.

In Years 1 through 6, the Santa Barbara County APCD provided Carl Moyer Program incentive funds to help repower over 60 engines, including engines on on-road heavy-duty vehicles, off-road equipment, agricultural irrigation pumps, and marine vessels. Additionally, reallocated Year 6 funds provided to the district during the Year 7 funding cycle were used to scrap 27 light-duty vehicles. Projects funded by the Santa Barbara County APCD achieve about 69 tons per year of NOx reductions and 6 tons per year of diesel PM emission reductions, with an average cost-effectiveness of about $3,700 per ton of NOx reduced. Table A-30 summarizes Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Santa Barbara County.

Table A-30: Santa Barbara County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Line-Haul Truck	-	-	2	5	1	-	4.0	0.32	$180,793
Refuse Hauler	-	-	3	-	4	-	9.7	0.70	$109,462
Transit Bus	3	1	-	-	-	-	1.5	-	$190,567
Car Scrap	-	-	-	-	-	27	0.6	-	$22,634
Off-Road	-	-	-	-	2	3	6.9	0.41	$237,047
Ag Pump		-	10	7	5	5	31.1	4.06	$472,159
Marine	5	8	5	-	-	1	14.8	0.13	$433,959
Totals	8	9	20	12	12	36	69	6	$1,646,621

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Shasta County AQMD

The Shasta County AQMD has participated in the Carl Moyer Program in the program's second, third, fourth, seventh, and eighth years. For Years 2 through 4, the district received a total of $324,727 in funding from ARB, which it matched with $124,083 in district funds. In Year 4, the district returned $19,593 in unspent funds to ARB; these funds were redistributed to the Tehama County APCD. For Years 7 and 8, the district received an additional $431,499. The district supplied $105,418 in local funds for the match requirement in Year 7 and received a waiver from the match requirement in Year 8. The Shasta County AQMD has committed all of its Year 7 funds to specific projects.

The Shasta County AQMD solicits applications for Carl Moyer Program funds through an RFP process. The district notifies potential applicants of funding availability by posting information and application material on the district's website and through outreach to potential applicants and local engine dealers. The district returned unused funds in Year 4 due to a staffing shortage and a lack of eligible projects. The district received applications for funding in excess of available funds in Year 7.

The Shasta County AQMD has used its Carl Moyer Program funds from Years 2 through 4 to fund 30 cleaner engines, including repowers for on-road, off-road, and agricultural irrigation pump engines. These projects reduce NOx emissions by about 42 tons per year and diesel PM emissions by about one ton per year, with an average cost-effectiveness of about $1,400 per ton NOx reduced. Table A-31 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Shasta County.

Table A-31: Shasta County AQMD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road		2	9	2			23.2	0.82	$132,704
Off-Road	-	4	6	1	-	-	9.5	0.21	$110,209
Ag Pump	-	2	2	2	-	-	9.4	0.30	$65,690
Totals	-	8	17	5	-	-	42	1	$308,603

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Siskiyou County APCD

The Siskiyou County APCD participated in the Carl Moyer Program in Years 5 and 6, receiving $100,000 in funding each year from ARB. Due to a lack of qualified projects, the district transferred the Year 5 funds to Modoc County APCD so that the funds could be expended in a neighboring district where emission reductions would also benefit Siskiyou County. The Year 6 funds were returned to ARB for redistribution to the Monterey Bay Unified APCD, Sacramento Metropolitan AQMD, and Santa Barbara APCD. The district has expressed interest in continuing to participate in the Carl Moyer Program when eligible projects become available.

Tehama County APCD

The Tehama County APCD participated in the Carl Moyer Program during Years 3 through 7, receiving $499,593 in program funding through Year 6 and an additional $200,000 in Year 7. The district provided $115,816 in match funds for Years 3 and 4, and received a waiver from the match requirement in program Years 5, 6, and 7. The district has expended $62,955 of these funds but, due to lack of staffing, plans to return the remaining $137,045 in unexpended Year 7 funds and $14,961 in interest accumulated over the past five years. The district has elected not to participate in the Carl Moyer Program in Year 8.

The Tehama County APCD solicited applications for Carl Moyer Program funding through on a first-come, first-served basis. Applications are made available at the district's office and on the district's web site. The district also notifies local engine dealers of available funds. Prior to Year 7, the district received requests for funding far in excess of available funds.

The Tehama County APCD used its Carl Moyer Program funds from Years 3 through 6 to fund 52 cleaner engines, reducing NOx emissions by 46 tons per year and diesel PM emissions by about two tons per year, with an average cost-effectiveness of about $1,900 per ton of NOx reduced. The majority of program funds have been used for agricultural pump engine replacement. On-road and off-road repower projects have also received funding. Table A-32 summarizes the Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Tehama County.

Table A-32: Tehama County APCD Carl Moyer Program

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	-	-	-	0.1	-	-	0.04	-	$2,270
Off-Road	-	-	1	-	-	-	0.54	0.03	$8,570
Ag Pump	-	-	16	15	11	9	45.8	2.45	$491,013
Totals	-	-	17	15	11	9	46	2	$501,853

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Tuolumne County APCD

The Tuolumne County APCD participated in the Carl Moyer Program in Years 5 and 6, receiving $200,000 in total funding from ARB. In Year 7, the Tuolumne County APCD received $200,000 in Carl Moyer Program funding. The district received the minimum program allocation in each year and has therefore not been required to provide local match funding. The district did not participate in the program in Year 8.

The Tuolumne County APCD's outreach efforts include newspaper advertisements, mailings, and phone calls to prospective participants. The district accepts applications for funding on a first-come, first-served basis. A one-time board resolution allows the district's Air Pollution Control Officer to select projects and enter into contracts with program participants. Board approval is not necessary for each individual project.

The Tuolumne County APCD has provided Carl Moyer Program incentive funds for 12 on-road heavy-duty vehicle projects – one engine repower and 11 vehicle retrofits. These projects will achieve about two tons per year of NOx reductions and 0.01 tons per year of diesel PM reductions with an average cost-effectiveness of about $23,400 per ton of NOx reduced. Table A-33 summarizes the Carl Moyer Program projects, emission reductions, and funds expended in Tuolumne County.

Table A-33: Tuolumne County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On Road	-	-	-	-	5	7	2.0	0.01	$205,818
Totals	-	-	-	-	5	7	2.0	0.01	$205,818

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Ventura County APCD

The Ventura County APCD has participated in the Carl Moyer Program since the program's inception. In Year 1 through 6, the district received $5,061,540 in funding from ARB, which it matched with $2,179,007 in local funding. The district has expended all of its Year 1 through 6 funding and has received an additional $2,916,267 in program funding for Years 7 and 8, which it has matched with $654,332 in local funds.

The Ventura County APCD solicits applications for program funding by issuing an RFP, with a preference for alternative-fueled projects. The district's outreach includes notification of the solicitation through mailing and e-mail lists, posting of notices on the district's website, publishing articles in the district's newsletter, sending out press releases, and contacting engine manufacturer representatives. The district typically accepts project applications for on-road, off-road, agricultural irrigation pump, and marine vessel engine repowers, and purchase of alternative-fueled on-road heavy-duty vehicles. In May 2006, ARB audited the Ventura County APCD's implementation of the Carl Moyer Program in Years 5 through 8. ARB's audit report, available in Appendix D, provides more information regarding the district's implementation of the Carl Moyer Program.

In Years 1 through 6, the Ventura County APCD provided Carl Moyer Program incentive funds for numerous project types, including purchase of new alternative-fueled street sweepers, and repower of on-road, off-road, and marine vessel engines. These projects achieve about 187 tons per year of NOx reductions and 13 tons per year of diesel PM reductions with an average cost-effectiveness of about $2,900 per ton of NOx reduced. Table A-34 summarizes Carl Moyer Program projects funded, emission reductions achieved, and funds expended in Ventura County.

Table A-34: Ventura County APCD Carl Moyer Program Summary

Source Category/ Equipment Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road									
Line-haul Truck	8	8	15	1	4	9	29.5	0.91	$1,602,924
Street Sweeper	-	2	-	-	-	-	0.4	0.01	$18,440
Off-Road	-	-	-	-	2	-	7.0	0.17	$122,887
Ag Pump	4	-	4	5	8	4	30.8	1.61	$262,801
Marine									
Commercial Fishing	17	12	24	9	7	10	93.1	8.89	$2,443,599
Other	3	-	-	4	3	7	25.7	1.59	$610,889
Totals	32	22	43	19	24	30	187	13	$5,061,540

Table includes projects funded as of October 1, 2006. Total funds expended may vary from funds received due to earned interest, cancelled projects, funds being rolled into the next funding cycle, or other factors.

Multi-District Projects

Health and Safety Code Section 44286 gives ARB the authority to reserve up to ten percent of each year's program funding for multi-district projects. These projects must operate a portion of the time outside their primary district or have significant air quality impacts in other air districts due to air pollutant transport. ARB utilized about $500,000 in program funding for multi-district projects in Year 3. ARB began reserving ten percent of program funds for multi-district projects in Year 7 in order to direct these funds towards projects which meet a state priority.

ARB conducted a statewide solicitation for multidistrict projects for Year 7 and Year 8 funds in March 2005 and March 2006, respectively. To be eligible for funding, projects were required to reduce emissions from goods movement (including marine vessels and locomotives, cargo-handling equipment, and port trucks), construction equipment, or PM retrofit devices that also reduce NOx. ARB received applications for over five times the amount of available funds. Projects were scored based upon project cost-effectiveness, environmental justice, application completeness, and other criteria. The highest ranking projects were selected and notified of their awards in June of 2005 and 2006, respectively. For multi-district projects, the primary air district – typically the air district in which the project operates the most – receives project funding from ARB, contracts with the engine owner, and manages the project locally.

Multi-district projects in Years 3, 7, and 8 provided nearly $12 million in grants to reduce emissions from 86 engines, including funds to repower 19 scrapers, and purchase 19 locomotive idle limiting devices and nine alternative technology switch locomotives. Year 7 and 8 projects are required to be completed by June 30th of 2007 and 2008, respectively. Once these projects are complete, multi-district projects will achieve 394 tons per day of NOx reductions and 14 tons per day of diesel PM reductions, with an average cost-effectiveness of about $1,800 per ton of NOx reduced. Table A-35 summarizes information for multi-district projects selected for funding by ARB.

Table A-35: Carl Moyer Program Multi-District Project Summary

Source Category/ Equipment Type	Year 3	Year 7	Year 8	NOx Reductions (tpy)	PM Reductions (tpy)	Funds Total
On-Road	2			4.0	-	$117,976
Off-Road Construction		19	26	148.4	5.03	$3,301,854
Marine	6	4		90.8	3.72	$1,332,503
Locomotive		1	28	150.6	5.16	$7,126,532
Totals	8	24	54	394	14	$11,878,865

Year 7 and 8 funds provided to air districts to enter into contract with project participants, but have not yet been expended.

Appendix B

Environmental Justice Projects

Beginning with Year 4 (FY 2001-02), California Health and Safety Code Section 43023.5 (AB 1390, Firebaugh) requires air districts with one million or more inhabitants spend at least 50 percent of their funds, including Carl Moyer Program funds, in a manner that directly benefits low-income communities and communities of color that are disproportionately impacted by air pollution. This Appendix includes information for the Carl Moyer Program environmental justice projects funded in Years 4 through 6 by the five air districts subject to this requirement – the Bay Area AQMD, the Sacramento Metropolitan AQMD, the San Diego County APCD, the San Joaquin Valley Unified APCD, and the South Coast AQMD.

Appendix B
Tables

Table B-1: Bay Area AQMD Projects in Environmental Justice Areas B-1
Table B-2: Sacramento Metropolitan AQMD Projects in Environmental Justice Areas..... B-3
Table B-3: San Diego County APCD Projects in Environmental Justice Areas B-11
Table B-4: San Joaquin Valley Unified APCD Projects in Environmental Justice Areas. B-13
Table B-5: South Coast AQMD Projects in Environmental Justice Areas B-33

Table B-1: Bay Area AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	TOTAL Carl Moyer Program Funds Expended
2001-02	On-Road	Urban Bus	199	San Francisco MUNI	5	35.28	$ 4,644	0.000	$ 534,401
2001-02	On-Road	Other Medium-Duty	2	Bode Gravel Company	5	1.52	$10,372	0.021	$ 72,079
2001-02	Off-Road	Other Off-Road	1	LB Railco, Inc.	10	0.87	$ 6,089	0.059	$ 45,000
2001-02	Off-Road	Other Off-Road	1	LB Railco, Inc.	10	0.58	$ 9,113	0.046	$ 45,000
2001-02	Marine	Tug	0.32	Amnav Maritime Services	16	4.30	$ 1,631	0.497	$ 88,692
2002-03	Marine	Tug	1.68	Amnav Maritime Services	16	22.55	$ 1,631	2.612	$ 461,308
2002-03	Marine	Tug	1.76	Amnav Maritime Services	16	19.42	$ 1,984	2.249	$ 486,148
2003-04	Marine	Tug	0.24	Amnav Maritime Services	16	2.65	$ 1,984	0.307	$ 63,852
ALL	--	--	**207**	--	**12[2]**	**87.17**	**$ 2,800**	**5.791**	**$1,796,480**

Environmental justice area determinations are based upon local air district criteria. See Chapter 5 for more information regarding each district's environmental justice criteria. Table includes projects funded as of October 1, 2006.

1 – Partial engines reflect engines funded in multiple years or from multiple funding sources.

2 - Reflects the dollar-weighted average project life of projects in environmental justice areas.

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	On-Road	Other Medium Duty	1	Paratransit, Inc.	5	0.26	$11,474	0.000	$13,400
2001-02	On-Road	Other Medium Duty	1	Paratransit, Inc.	5	0.26	$11,474	0.000	$13,400
2001-02	On-Road	Other Medium Duty	1	Ti Gas	5	0.11	$13,407	0.000	$6,315
2001-02	Off-Road	Agricultural Tractor	1	J. Rodriguez Farm	5	0.65	$5,298	0.031	$15,837
2001-02	Off-Road	Agricultural Tractor	1	R. C. Gill & Son	5	1.44	$3,130	0.079	$20,634
2001-02	Off-Road	Agricultural Tractor	1	River Garden Farms	5	0.38	$7,399	0.003	$12,800
2001-02	Off-Road	Crawler Tractor	1	Miller Equipment	5	1.62	$5,473	0.083	$40,681
2001-02	Off-Road	Excavator	1	Aqua Clear Farms	5	0.65	$5,766	0.037	$17,074
2001-02	Off-Road	Grader	1	Cull Equipment Inc.	5	0.37	$7,846	0.026	$13,360
2001-02	Off-Road	Other Ag. Equip.	1	Geo Farms	5	0.26	$5,123	0.005	$6,055
2001-02	Off-Road	Other Ag. Equip.	1	River Garden Farms	5	0.05	$8,617	-0.002	$2,036
2001-02	Off-Road	Other Construction	1	Cull Equipment Inc.	5	0.51	$7,585	0.036	$17,791
2001-02	Off-Road	Other Construction	1	Cull Equipment Inc.	5	1.10	$3,659	0.056	$18,390
2001-02	Off-Road	Scraper	1	Cull Equipment Inc.	5	1.07	$3,996	0.054	$19,549
2001-02	Off-Road	Tractor/ Loader	1	Miller Equipment	5	2.07	$3,245	0.106	$30,746
2001-02	Off-Road	Tractor/ Loader	1	Miller Equipment	5	1.21	$5,498	0.067	$30,350
2001-02	Off-Road	Tractor/ Loader	1	Miller Equipment	5	1.21	$5,498	0.067	$30,350
2001-02	Off-Road	Tractor/ Loader	1	Miller Equipment	5	1.21	$5,498	0.067	$30,350
2001-02	Ag Pump	Stationary	1	Amistad Ranch	5	0.89	$2,711	0.028	$11,094
2001-02	Ag Pump	Stationary	1	Amistad Ranch	5	0.89	$2,711	0.028	$11,094
2001-02	Ag Pump	Stationary	1	Brown Ranch	5	0.26	$6,775	0.002	$8,044
2001-02	Ag Pump	Stationary	1	Circle G. Ranch	5	1.14	$3,084	0.051	$16,096
2001-02	Ag Pump	Stationary	1	E.A.B. Inc.	5	0.69	$3,468	0.021	$10,981
2001-02	Ag Pump	Stationary	1	Fong Farms Inc.	5	0.26	$7,762	0.006	$9,411
2001-02	Ag Pump	Stationary	1	Howard Lopez	5	0.95	$1,954	0.036	$8,485
2001-02	Ag Pump	Stationary	1	J.E.B. Farms	5	0.19	$9,070	0.002	$7,697
2001-02	Ag Pump	Stationary	1	J. Rodriguez Farm	5	0.76	$3,921	0.043	$13,715
2001-02	Ag Pump	Stationary	1	Jeff Shimada	5	1.09	$2,590	0.034	$12,976

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	Jeff Shimada	5	1.24	$2,283	0.039	$12,998
2001-02	Ag Pump	Stationary	1	Joe Muller & Sons	5	0.65	$3,844	0.023	$11,425
2001-02	Ag Pump	Stationary	1	Joe Perry Farms	5	1.01	$2,810	0.047	$13,035
2001-02	Ag Pump	Stationary	1	Joe Sanchez Farms	5	0.18	$7,739	0.001	$6,315
2001-02	Ag Pump	Stationary	1	K. Barsoom Ranch	5	0.39	$5,740	0.022	$10,156
2001-02	Ag Pump	Stationary	1	K. Barsoom Ranch	5	0.38	$4,827	0.008	$8,312
2001-02	Ag Pump	Stationary	1	K. Barsoom Ranch	5	0.48	$3,890	0.009	$8,521
2001-02	Ag Pump	Stationary	1	Klein Farms	5	0.48	$5,689	0.011	$12,630
2001-02	Ag Pump	Stationary	1	Marvin Neves & Son	5	0.75	$3,642	0.033	$12,455
2001-02	Ag Pump	Stationary	1	Nakahara Farms Inc	5	0.73	$3,158	0.023	$10,609
2001-02	Ag Pump	Stationary	1	Nakahara Farms Inc	5	1.05	$2,708	0.059	$13,035
2001-02	Ag Pump	Stationary	1	Ranch Eq. Leasing	5	0.29	$7,790	0.002	$10,329
2001-02	Ag Pump	Stationary	1	Ranch Eq. Leasing	5	0.29	$7,790	0.002	$10,329
2001-02	Ag Pump	Stationary	1	Silverdale Farms	5	0.57	$4,612	0.022	$12,131
2001-02	Ag Pump	Stationary	1	Silverdale Farms	5	0.42	$6,177	0.008	$11,980
2001-02	Ag Pump	Stationary	1	Silverdale Farms	5	0.37	$7,127	0.007	$12,181
2001-02	Ag Pump	Stationary	1	Silverdale Farms	5	0.60	$4,138	0.023	$11,351
2001-02	Ag Pump	Stationary	1	Spangler Brothers	5	0.27	$6,369	0.002	$7,796
2001-02	Ag Pump	Stationary	1	Spangler Brothers	5	0.59	$3,492	0.021	$9,393
2001-02	Ag Pump	Stationary	1	Ward & Ward	5	0.16	$6,971	0.001	$5,176
2001-02	Ag Pump	Stationary	1	White Oak Ranch	5	0.29	$4,641	0.002	$6,154
2001-02	Locomotive	Locomotive	21	UP Railroad	5	20.7	$3,344	0.048	$299,985
2002-03	On-Road	Other Heavy Duty	1	Sacramento County	5	0.04	$13,599	0.002	$2,415
2002-03	On-Road	Other Heavy Duty	1	Sacramento County	5	0.06	$13,597	0.002	$4,015
2002-03	On-Road	Other Medium Duty	1	City of Davis	10	0.06	$9,556	0.005	$5,100
2002-03	On-Road	Urban Bus	1	Dry Creek Joint Elem. School District	12	0.39	$10,748	0.010	$42,000
2002-03	On-Road	Urban Bus	1	Dry Creek Joint Elem. School District	12	0.32	$13,239	0.010	$42,000
2002-03	On-Road	Urban Bus	1	El Dorado Union High	12	0.32	$13,239	0.010	$42,000

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
				School District					
2002-03	On-Road	Urban Bus	1	El Dorado Union High School District	12	0.32	$13,239	0.010	$42,000
2002-03	On-Road	Urban Bus	1	Galt Joint Union Elem. School District	12	0.32	$13,203	0.010	$41,903
2002-03	On-Road	Urban Bus	1	Galt Joint Union Elem. School District	12	0.32	$13,208	0.010	$41,888
2002-03	On-Road	Urban Bus	1	Mother Lode School	12	0.39	$10,748	0.010	$42,000
2002-03	On-Road	Urban Bus	1	Mother Lode School	12	0.32	$13,239	0.010	$42,000
2002-03	On-Road	Urban Bus	1	Natomas Unified School District	12	0.32	$13,239	0.010	$42,000
2002-03	On-Road	Urban Bus	1	Natomas Unified School District	12	0.32	$13,239	0.010	$42,000
2002-03	Off-Road	Agricultural Tractor	1	Chavier Farming	5	1.52	$3,402	0.078	$23,750
2002-03	Off-Road	Agricultural Tractor	1	J.E.B. Farms	5	1.55	$3,207	0.086	$21,111
2002-03	Off-Road	Agricultural Tractor	1	Joe Sanchez Farms	5	0.38	$5,693	0.021	$9,861
2002-03	Off-Road	Crawler Tractor	1	Miller Equipment	5	1.62	$5,021	0.083	$37,319
2002-03	Off-Road	Other Construction	1	MHS Corporation Compaction Rentals	5	1.09	$3,991	0.060	$18,600
2002-03	Off-Road	Other Construction	1	MHS Corporation Compaction Rentals	5	0.96	$4,964	0.053	$21,892
2002-03	Ag Pump	Stationary	1	Abele Farms	5	1.74	$2,567	0.078	$20,400
2002-03	Ag Pump	Stationary	1	Abele Farms	5	2.18	$2,047	0.098	$20,400
2002-03	Ag Pump	Stationary	1	ALR Farms	5	0.53	$5,407	0.029	$13,060
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.37	$4,484	-0.013	$7,550

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.71	$4,267	0.038	$13,951
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.71	$4,267	0.038	$13,951
2002-03	Ag Pump	Stationary	1	AWR Partnership	5	0.71	$4,267	0.038	$13,951
2002-03	Ag Pump	Stationary	1	Barrios Farms Inc.	5	0.30	$7,206	0.007	$9,956
2002-03	Ag Pump	Stationary	1	Circle G. Ranch	5	0.30	$4,095	0.013	$5,712
2002-03	Ag Pump	Stationary	1	Cooley Enterprises	5	0.48	$6,822	0.025	$14,996
2002-03	Ag Pump	Stationary	1	Cooley Enterprises	5	0.53	$4,170	0.030	$10,161
2002-03	Ag Pump	Stationary	1	Deseret Farms	5	1.76	$2,000	0.078	$16,103
2002-03	Ag Pump	Stationary	1	Ferreira Estate Co.	5	0.54	$4,477	0.017	$11,047
2002-03	Ag Pump	Stationary	1	Fong Farms Inc.	5	0.32	$6,845	0.010	$10,150
2002-03	Ag Pump	Stationary	1	Fong Farms Inc.	5	0.33	$6,793	0.012	$10,165
2002-03	Ag Pump	Stationary	1	Fong Farms Inc.	5	0.41	$5,458	0.013	$10,165
2002-03	Ag Pump	Stationary	1	Frank Alonso Farms	5	0.41	$8,676	0.019	$16,210
2002-03	Ag Pump	Stationary	1	Frank Martin	5	0.28	$6,216	0.002	$7,989
2002-03	Ag Pump	Stationary	1	Fruetel Farms	5	0.83	$2,898	0.031	$10,953
2002-03	Ag Pump	Stationary	1	Gene Robben Ranch	5	0.38	$5,614	0.014	$9,792
2002-03	Ag Pump	Stationary	1	Gene Robben Ranch	5	1.10	$2,846	0.051	$14,349
2002-03	Ag Pump	Stationary	1	H.D. Plocher Part.	5	0.42	$4,710	0.018	$8,975
2002-03	Ag Pump	Stationary	1	Hans Hilleby Farms	5	1.44	$2,121	0.080	$13,951
2002-03	Ag Pump	Stationary	1	Hungry Hollow Vin.	5	0.66	$3,105	0.040	$9,324
2002-03	Ag Pump	Stationary	1	Hunn Merwin, Merwin	5	0.38	$5,701	0.021	$10,034
2002-03	Ag Pump	Stationary	1	Hunn Merwin, Merwin	5	0.88	$3,252	0.045	$13,035
2002-03	Ag Pump	Stationary	1	Joe Muller & Sons	5	1.16	$2,822	0.051	$14,996
2002-03	Ag Pump	Stationary	1	Joe Turkovich Farms	5	0.35	$4,858	0.003	$7,730
2002-03	Ag Pump	Stationary	1	John Pylman & Son	5	0.84	$3,046	0.037	$11,655
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.63	$4,757	0.028	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.54	$5,561	0.023	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.70	$4,269	0.026	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.97	$3,092	0.043	$13,774

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.86	$3,494	0.030	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.86	$3,494	0.030	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.75	$4,016	0.030	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.75	$4,016	0.030	$13,774
2002-03	Ag Pump	Stationary	1	Knaggs Farming	5	0.86	$3,494	0.030	$13,774
2002-03	Ag Pump	Stationary	1	Mariani Nut Co Inc.	5	0.55	$9,486	0.031	$23,530
2002-03	Ag Pump	Stationary	1	Marvin Neves & Son	5	0.76	$3,661	0.033	$12,695
2002-03	Ag Pump	Stationary	1	Ron Tadlock Farms	5	0.36	$3,788	0.015	$6,200
2002-03	Ag Pump	Stationary	1	Ron Tadlock Farms	5	1.76	$1,830	0.087	$14,720
2002-03	Ag Pump	Stationary	1	Sills Farms	5	0.50	$3,503	0.000	$7,998
2002-03	Ag Pump	Stationary	1	Sills Farms	5	0.28	$6,166	-0.012	$7,998
2002-03	Ag Pump	Stationary	1	Ward & Ward	5	0.30	$5,993	0.002	$8,106
2002-03	Ag Pump	Stationary	1	Warren Farms	5	0.68	$3,647	0.024	$11,330
2003-04	On-Road	Other Heavy Duty	1	Ca. Waste Recovery	5	0.19	$8,844	0.012	$7,550
2003-04	On-Road	Other Heavy Duty	1	Ca. Waste Recovery	5	0.13	$13,022	0.008	$7,550
2003-04	Off-Road	Excavator	1	Triad Farms	5	1.08	$5,294	0.055	$31,132
2003-04	Off-Road	Other Ag. Equip.	1	James M Stewart Inc.	5	0.08	$10,719	0.003	$4,057
2003-04	Off-Road	Other Ag. Equip.	1	Joe Muller & Sons	5	0.33	$12,062	0.018	$20,299
2003-04	Off-Road	Scraper	1	Martin Bros. Const.	5	2.63	$9,953	0.134	$120,000
2003-04	Off-Road	Scraper	1	Teichert Construction	5	2.28	$9,716	0.113	$101,275
2003-04	Off-Road	Scraper	1	Teichert Construction	5	2.28	$11,513	0.113	$120,000
2003-04	Ag Pump	Stationary	1	AWR Partnership	5	0.61	$3,431	0.029	$9,519
2003-04	Ag Pump	Stationary	1	AWR Partnership	5	0.71	$2,912	0.034	$9,519
2003-04	Ag Pump	Stationary	1	AWR Partnership	5	0.69	$3,022	0.032	$9,519
2003-04	Ag Pump	Stationary	1	AWR Partnership	5	0.69	$3,022	0.032	$9,519
2003-04	Ag Pump	Stationary	1	AWR Partnership	5	0.69	$3,022	0.032	$9,519
2003-04	Ag Pump	Stationary	1	AWR Partnership	5	0.69	$3,022	0.032	$9,519
2003-04	Ag Pump	Stationary	1	Burt Haughey	5	0.91	$2,018	0.034	$8,380
2003-04	Ag Pump	Stationary	0.13	Charles Hermle	5	0.23	$8,811	0.010	$1,217

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	E.A.B. Inc.	5	0.60	$4,156	0.028	$11,338
2003-04	Ag Pump	Stationary	1	G & M Farms	5	1.19	$2,942	0.064	$15,978
2003-04	Ag Pump	Stationary	1	Hunn Merwin, Merwin	5	0.37	$5,481	0.023	$9,346
2003-04	Ag Pump	Stationary	1	Hunn Merwin, Merwin	5	0.41	$5,984	0.022	$11,265
2003-04	Ag Pump	Stationary	1	Hunn Merwin, Merwin	5	0.55	$4,471	0.026	$11,265
2003-04	Ag Pump	Stationary	1	Inarow Tree Co.	5	0.71	$1,705	0.022	$5,574
2003-04	Ag Pump	Stationary	1	J.H. Meek & Sons	5	0.73	$4,660	0.041	$15,586
2003-04	Ag Pump	Stationary	1	J.H. Meek & Sons	5	1.06	$4,240	0.060	$20,505
2003-04	Ag Pump	Stationary	1	J.H. Meek & Sons	5	1.06	$4,240	0.060	$20,505
2003-04	Ag Pump	Stationary	1	J.H. Meek & Sons	5	2.27	$1,976	0.102	$20,505
2003-04	Ag Pump	Stationary	1	Pylman Ranches	5	0.91	$3,370	0.045	$14,105
2003-04	Ag Pump	Stationary	1	J.H. Meek & Sons	5	2.06	$1,655	0.092	$15,586
2003-04	Ag Pump	Stationary	0.22	Joe Turkovich Farms	5	0.42	$3,978	0.023	$1,722
2003-04	Ag Pump	Stationary	1	Pylman Ranches	5	0.95	$3,118	0.046	$13,505
2003-04	Ag Pump	Stationary	1	Kidwell Farms	5	0.16	$10,176	0.009	$7,402
2003-04	Ag Pump	Stationary	1	Kidwell Farms	5	0.57	$3,060	0.027	$8,448
2003-04	Ag Pump	Stationary	0.92	Klein Farms	10	0.63	$3,339	0.027	$18,898
2003-04	Ag Pump	Stationary	1	Larry Pires Farms	5	0.46	$4,605	0.020	$9,751
2003-04	Ag Pump	Stationary	1	Larry Pires Farms	5	0.46	$4,605	0.020	$9,751
2003-04	Ag Pump	Stationary	1	Larry Pires Farms	5	0.70	$4,339	0.043	$13,960
2003-04	Ag Pump	Stationary	0.03	Mariani Nut Co Inc.	5	0.55	$9,605	0.031	$610
2003-04	Ag Pump	Stationary	1	Nakahara Farms Inc	5	0.66	$3,607	0.025	$10,953
2003-04	Ag Pump	Stationary	1	Nor Cal Nut Co.	5	0.88	$4,515	0.041	$18,203
2003-04	Ag Pump	Stationary	1	Nor Cal Nut Co.	5	1.06	$4,552	0.041	$22,082
2003-04	Ag Pump	Stationary	1	Nor Cal Nut Co.	5	1.15	$4,183	0.065	$22,080
2003-04	Ag Pump	Stationary	1	R.H. Phillips	5	0.46	$10,312	0.026	$21,617
2003-04	Ag Pump	Stationary	1	R.H. Phillips	5	0.73	$6,624	0.041	$22,156
2003-04	Ag Pump	Stationary	1	Raminder Bains	5	2.37	$3,351	0.127	$36,389
2003-04	Ag Pump	Stationary	1	Raminder Bains	5	1.89	$4,212	0.084	$36,389

Table B-2: Sacramento Metropolitan AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	Raminder Bains	5	1.64	$4,834	0.084	$36,389
2003-04	Ag Pump	Stationary	0.68	Ron Tadlock Farms	5	0.41	$6,242	0.023	$7,940
2003-04	Ag Pump	Stationary	1	Ron Tadlock Farms	5	0.54	$6,482	0.029	$16,054
2003-04	Ag Pump	Stationary	1	Schreiner Farms	5	0.57	$4,957	0.021	$12,982
2003-04	Ag Pump	Stationary	1	Sierra Sod & Supply	5	0.45	$3,590	0.019	$7,333
2003-04	Ag Pump	Stationary	1	Sierra Sod & Supply	5	0.59	$2,506	0.008	$8,576
2003-04	Ag Pump	Stationary	2	Stan Ochoa Farms	5	0.48	$6,655	0.026	$14,920
2003-04	Ag Pump	Stationary	1	Stan Ochoa Farms	5	0.50	$6,424	0.028	$14,806
2003-04	Ag Pump	Stationary	4	T.A. Hatanaka Farms	5	1.64	$7,256	0.092	$53,932
2003-04	Ag Pump	Stationary	1	William A. Driver	5	0.26	$8,825	0.021	$10,415
2003-04	Ag Pump	Stationary	1	Winkler Family Farms	5	0.93	$3,193	0.045	$13,575
ALL	--	--	**198**		**6[2]**	**147.66**	**$4,600**	**5.53**	**$3,262,385**

Environmental justice area determinations are based upon local air district criteria. See Chapter 5 for more information regarding each district's environmental justice criteria. Table includes projects funded as of October 1, 2006.

1 – Partial engines reflect engines funded in multiple years or from multiple funding sources.

2 - Reflects the dollar-weighted average project life of projects in environmental justice areas.

Table B-3: San Diego APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines[1]	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	On-Road	Transit Bus	2.07	MTDB	12	13.50	$1,673	0.190	$20,739
2001-02	Off-Road	Off-Hwy Truck	1	Vinci Pacific Yard	7	3.50	$2,642	0.321	$53,548
2001-02	Off-Road	Off-Hwy Truck	1	Vinci Pacific Yard	7	0.49	$16,196	0.157	$45,996
2001-02	Marine	Barge	1	RE Staite Engineering	20	0.33	$7,430	0.023	$30,000
2001-02	Marine	Barge	1	RE Staite Engineering	20	2.28	$1,840	0.023	$52,000
2001-02	Marine	Charter Fishing	3	Coastal Sport Fishing, Inc.	20	3.48	$2,944	0.072	$79,000
2001-02	Marine	Charter Fishing	3	Coastal Sport Fishing, Inc.	20	2.99	$2,339	0.060	$54,000
2002-03	Off-Road	Off-Hwy Truck	1	Superior Ready Mix Concrete	7	5.60	$3,118	0.254	$104,548
2002-03	Off-Road	Other Off-Road	2	Dixieline Lumber	7	0.91	$3,455	0.090	$39,200
2002-03	Off-Road	Rubber-Tired Dozer	0.92	Vinci Pacific Group	7	1.45	$6,542	0.065	$56,801
2002-03	Off-Road	Rubber-Tired Loader	2	Signs & Pinnick, Inc.	7	9.44	$2,841	0.108	$83,600
2002-03	Off-Road	Rubber-Tired Loader	1	Superior Ready Mix Concrete	7	1.60	$3,940	0.100	$37,750
2002-03	Off-Road	Rubber-Tired Loader	1	Superior Ready Mix Concrete	7	3.96	$2,928	0.055	$72,203
2002-03	Off-Road	Rubber-Tired Loader	1	Superior Ready Mix Concrete	7	3.76	$3,083	0.052	$72,203
2002-03	Marine	Charter Fishing	1	Helgren's Sportsfishing	16	1.02	$3,139	0.052	$40,100
2002-03	Marine	Tug	2	Pacific Tugboat Services	16	5.18	$2,169	0.150	$70,598
2003-04	Locomotive	Line-Haul	1	NCTD	10	3.82	$1,084	0.819	$60,600
2003-04	Marine	Commercial Fishing	2	San Diego Sportfishing	16	2.05	$2,566	0.133	$66,000
2003-04	Marine	Commercial Fishing	2	San Diego Sportfishing	16	3.36	$1,562	0.286	$66,000
2003-04	Marine	Tug	1.67	R E Staite Engineering	16	11.52	$2,856	0.830	$345,915
ALL	--	--	**31**	--	**16[2]**	**80.23**	**$1,900**	**3.839**	**$1,450,801**

Environmental justice area determinations are based upon local air district criteria. See Chapter 5 for more information regarding each district's environmental justice criteria. Table includes projects funded as of October 1, 2006.

1 – Partial engines reflect engines funded in multiple years or from multiple funding sources.

2 - Reflects the dollar-weighted average project life of projects in environmental justice areas.

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Off-Road	Combine	1	Kazarian Viniard Dev.	7	0.19	$8,505	0.015	$10,000
2001-02	Off-Road	Tractor/ Loader	1	Steve Jameson	7	0.37	$4,228	0.002	$9,677
2001-02	Ag Pump	Stationary	1	A & J Netto Farms	7	0.95	$1,751	0.023	$9,674
2001-02	Ag Pump	Stationary	1	A&A Dasso Farms	7	0.92	$1,868	0.014	$10,000
2001-02	Ag Pump	Stationary	1	Adobe Station Ranch	7	5.48	$631	0.275	$20,000
2001-02	Ag Pump	Stationary	1	Alcala Farms	7	1.55	$1,674	0.057	$15,000
2001-02	Ag Pump	Stationary	1	Alcala Farms	7	1.55	$1,674	0.057	$15,000
2001-02	Ag Pump	Stationary	1	Alcala Farms	7	1.59	$1,634	0.058	$15,000
2001-02	Ag Pump	Stationary	1	Alcala Farms	7	2.06	$1,259	0.075	$15,000
2001-02	Ag Pump	Stationary	1	Allen Teixeira	7	0.41	$2,094	0.023	$5,000
2001-02	Ag Pump	Stationary	1	Amaretto Orchards	7	4.32	$742	0.200	$20,000
2001-02	Ag Pump	Stationary	1	Andy Maik	7	0.37	$5,762	0.020	$13,448
2001-02	Ag Pump	Stationary	1	Antero Mendonca	7	0.69	$2,511	0.017	$10,000
2001-02	Ag Pump	Stationary	1	Baggiani and Isola	7	2.07	$1,254	0.076	$15,000
2001-02	Ag Pump	Stationary	1	Bergman Ranches	7	0.22	$7,809	0.000	$10,000
2001-02	Ag Pump	Stationary	1	Bobby Tate	7	0.64	$2,689	-0.022	$10,000
2001-02	Ag Pump	Stationary	1	Bobby Tate	7	0.20	$8,682	-0.049	$10,000
2001-02	Ag Pump	Stationary	1	Bobby Tate	7	0.20	$8,682	-0.049	$10,000
2001-02	Ag Pump	Stationary	1	Brian A. Heller	7	1.00	$1,428	--	$5,000
2001-02	Ag Pump	Stationary	1	Britz Farming	7	1.49	$1,157	0.045	$10,000
2001-02	Ag Pump	Stationary	1	Britz Farming	7	1.49	$1,157	0.045	$10,000
2001-02	Ag Pump	Stationary	1	Caliente Farms LLC	7	4.56	$757	0.229	$20,000
2001-02	Ag Pump	Stationary	1	Campos Brothers	7	1.72	$2,008	0.093	$20,000
2001-02	Ag Pump	Stationary	1	Campos Brothers	7	1.99	$1,736	0.107	$20,000
2001-02	Ag Pump	Stationary	1	Campos Brothers	7	1.99	$1,736	0.107	$20,000
2001-02	Ag Pump	Stationary	1	C. A. Drummond Trust	7	1.32	$1,961	0.103	$15,000
2001-02	Ag Pump	Stationary	1	C A. Drummond Trust	7	2.78	$1,244	0.135	$20,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	C. A. Drummond Trust	7	3.21	$1,078	0.155	$20,000
2001-02	Ag Pump	Stationary	1	C. A. Drummond Trust	7	3.20	$1,081	0.155	$20,000
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.32	$2,679	0.008	$5,000
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.67	$2,458	0.051	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.20	$8,103	0.034	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.20	$8,103	0.034	$9,534
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.21	$7,619	0.035	$9,116
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.14	$9,389	0.000	$7,776
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.66	$3,881	0.140	$14,814
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.94	$3,670	0.042	$20,000
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.94	$3,658	0.042	$20,000
2001-02	Ag Pump	Stationary	1	D.M. Camp & Sons	7	0.94	$3,658	0.042	$20,000
2001-02	Ag Pump	Stationary	1	Daniel Farms	7	2.58	$1,006	0.139	$15,000
2001-02	Ag Pump	Stationary	1	Del Shebelut Farm	7	0.55	$3,093	0.000	$9,900
2001-02	Ag Pump	Stationary	1	Del Shebelut Farm	7	0.55	$3,093	0.000	$9,900
2001-02	Ag Pump	Stationary	1	Del Shebelut Farm	7	0.76	$3,256	0.000	$14,400
2001-02	Ag Pump	Stationary	1	Ed Kosareff Farms	7	3.66	$943	0.160	$20,000
2001-02	Ag Pump	Stationary	1	Elrod Farming	7	1.00	$1,212	--	$6,032
2001-02	Ag Pump	Stationary	1	Escobedo farms	7	1.26	$865	0.060	$10,000
2001-02	Ag Pump	Stationary	1	Salwasser Farms	7	0.93	$929	0.007	$5,000
2001-02	Ag Pump	Stationary	1	Golden Valley Farms	7	0.68	$3,760	0.036	$14,900

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	Gray's Custom Hay	7	1.98	$2,709	0.026	$31,000
2001-02	Ag Pump	Stationary	1	Harvey Stepanian	7	2.07	$1,255	0.094	$15,000
2001-02	Ag Pump	Stationary	1	Harvey Stepanian	7	2.07	$1,255	0.094	$15,000
2001-02	Ag Pump	Stationary	1	Heritage Ranch LLC	7	0.77	$2,148	0.040	$9,597
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	0.98	$1,764	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	1.01	$1,704	0.035	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	1.01	$1,704	0.035	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	1.01	$1,704	0.035	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	1.01	$1,704	0.035	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	0.59	$2,951	0.013	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	0.59	$2,951	0.013	$10,000
2001-02	Ag Pump	Stationary	1	Higard Farms LLC	7	0.60	$2,870	0.014	$10,000
2001-02	Ag Pump	Stationary	1	Hornor Farms	7	0.73	$1,860	0.030	$7,904
2001-02	Ag Pump	Stationary	1	Hornor Farms	7	0.73	$1,910	0.030	$8,117
2001-02	Ag Pump	Stationary	1	Hornor Farms	7	0.73	$1,910	0.030	$8,117
2001-02	Ag Pump	Stationary	1	Hornor Farms	7	1.29	$1,087	0.123	$8,129
2001-02	Ag Pump	Stationary	1	Hornor Farms	7	1.29	$1,115	0.123	$8,341
2001-02	Ag Pump	Stationary	2	J & T Enterprises	7	1.00	$1,478	0.100	$10,000
2001-02	Ag Pump	Stationary	1	J. Clausen Farms, Inc.	7	0.45	$3,875	0.010	$10,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.84	$938	0.081	$10,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.12	$1,544	0.049	$10,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.56	$676	0.143	$10,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.41	$1,753	0.079	$14,271
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	6.97	$342	0.366	$13,809
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.04	$1,270	0.095	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.66	$1,560	0.089	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	4.33	$599	0.190	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	3.81	$680	0.167	$15,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.50	$1,035	0.110	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.69	$1,531	0.085	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.52	$1,703	0.077	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.58	$1,637	0.080	$15,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.46	$2,367	0.064	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	4.19	$824	0.223	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	3.61	$956	0.182	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.15	$1,608	0.108	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.51	$1,376	0.126	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	4.54	$761	0.199	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	3.20	$1,082	0.140	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.18	$1,588	0.095	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	1.87	$1,848	0.082	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.92	$1,185	0.128	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	2.35	$1,469	0.103	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	4.74	$730	0.207	$20,000
2001-02	Ag Pump	Stationary	1	J.G. Boswell Company	7	3.41	$1,013	0.149	$20,000
2001-02	Ag Pump	Stationary	1	J.J. Costa Farms	7	0.86	$1,998	0.036	$10,000
2001-02	Ag Pump	Stationary	1	J.J. Costa Farms	7	0.28	$6,111	-0.069	$10,000
2001-02	Ag Pump	Stationary	1	J.J. Costa Farms	7	2.17	$1,197	0.079	$15,000
2001-02	Ag Pump	Stationary	1	J.J. Costa Farms	7	2.04	$984	0.075	$11,634
2001-02	Ag Pump	Stationary	1	Joe Diedrich Ranch	7	1.42	$2,430	0.077	$20,000
2001-02	Ag Pump	Stationary	1	John Paskaly	7	0.39	$4,381	0.009	$10,000
2001-02	Ag Pump	Stationary	1	John Paskaly	7	0.97	$1,782	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Johnston Farms	7	1.05	$5,122	0.070	$31,000
2001-02	Ag Pump	Stationary	1	Johnston Farms	7	1.22	$4,374	0.079	$30,794
2001-02	Ag Pump	Stationary	1	Johnston Farms	7	1.22	$4,403	0.079	$31,000
2001-02	Ag Pump	Stationary	1	Johnston Farms	7	1.22	$4,403	0.079	$31,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	Johnston Farms	7	1.22	$4,403	0.079	$31,000
2001-02	Ag Pump	Stationary	1	Johnston Farms	7	1.22	$4,403	0.079	$31,000
2001-02	Ag Pump	Stationary	1	Jones Farms	7	0.99	$2,615	0.077	$15,000
2001-02	Ag Pump	Stationary	1	J. Rosa Farms	7	2.43	$1,320	0.010	$20,000
2001-02	Ag Pump	Stationary	1	Lehr Bros. Inc.	7	1.19	$4,498	0.000	$31,000
2001-02	Ag Pump	Stationary	1	M.S. Monteiro & Sons	7	0.26	$9,733	-0.063	$14,513
2001-02	Ag Pump	Stationary	1	Martin Farms	7	1.19	$2,174	0.062	$15,000
2001-02	Ag Pump	Stationary	1	Martin Farms	7	1.80	$1,436	0.077	$15,000
2001-02	Ag Pump	Stationary	1	Martin Farms	7	1.53	$1,694	0.081	$15,000
2001-02	Ag Pump	Stationary	1	McConnell Farms	7	0.70	$3,077	0.030	$12,514
2001-02	Ag Pump	Stationary	1	McConnell Farms	7	0.70	$3,077	0.030	$12,514
2001-02	Ag Pump	Stationary	1	McConnell Farms	7	0.39	$5,563	0.000	$12,595
2001-02	Ag Pump	Stationary	1	McKittrick Ranch	7	0.66	$1,380	0.027	$5,279
2001-02	Ag Pump	Stationary	1	McKittrick Ranch	7	0.66	$1,380	0.027	$5,279
2001-02	Ag Pump	Stationary	1	McKittrick Ranch	7	0.66	$1,380	0.027	$5,279
2001-02	Ag Pump	Stationary	1	McKittrick Ranch	7	0.21	$4,397	0.000	$5,279
2001-02	Ag Pump	Stationary	1	Mckittrick Ranch	7	0.31	$2,949	0.000	$5,279
2001-02	Ag Pump	Stationary	1	MCSC Farming Co.	7	2.35	$1,025	0.132	$13,909
2001-02	Ag Pump	Stationary	1	Miles Thomas Farms	7	1.55	$3,458	0.000	$31,000
2001-02	Ag Pump	Stationary	1	Monache Meadow Farming	7	1.00	$2,571	--	$15,000
2001-02	Ag Pump	Stationary	1	Monache Meadow Farming	7	1.00	$2,571	--	$15,000
2001-02	Ag Pump	Stationary	1	Monache Meadow Farming	7	1.00	$2,571	--	$15,000
2001-02	Ag Pump	Stationary	1	Monache Meadow Farming	7	1.00	$990	--	$15,000
2001-02	Ag Pump	Stationary	1	Paulo Holsteins	7	1.00	$3,213	--	$15,668
2001-02	Ag Pump	Stationary	1	Paulo Holsteins	7	1.00	$3,130	--	$16,610

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	Pedretti Ranches	7	0.78	$2,562	0.041	$11,613
2001-02	Ag Pump	Stationary	1	Pitigliano Farms	7	5.00	$350	0.200	$11,447
2001-02	Ag Pump	Stationary	1	Pitigliano Farms	7	5.48	$630	0.240	$20,000
2001-02	Ag Pump	Stationary	1	Pitigliano Farms	7	4.78	$724	0.240	$20,000
2001-02	Ag Pump	Stationary	1	R and R Farms	7	0.10	$8,692	0.000	$5,000
2001-02	Ag Pump	Stationary	1	R and R Farms	7	0.21	$8,149	0.000	$10,000
2001-02	Ag Pump	Stationary	1	R.L. Vista Inc.	7	1.00	$3,756		$3,519
2001-02	Ag Pump	Stationary	1	Ralph Hodson	7	1.42	$1,829	0.074	$15,000
2001-02	Ag Pump	Stationary	1	Robbie Collins Farming	7	0.79	$1,851	0.028	$8,416
2001-02	Ag Pump	Stationary	1	Rodrigues Farms Inc	7	1.05	$1,650	0.083	$10,000
2001-02	Ag Pump	Stationary	1	Santa Barbara Orchards	7	1.63	$1,594	0.074	$15,000
2001-02	Ag Pump	Stationary	1	Santa Barbara Orchards	7	2.72	$890	0.124	$14,000
2001-02	Ag Pump	Stationary	1	Scott Arnett	7	0.08	$10,355	0.005	$8,186
2001-02	Ag Pump	Stationary	1	Triangle T Ranch, Inc.	7	3.89	$667	0.204	$15,000
2001-02	Ag Pump	Stationary	1	Triangle T Ranch, Inc.	7	3.89	$667	0.204	$15,000
2001-02	Ag Pump	Stationary	1	Van Elderen Brothers Farms	7	1.52	$1,337	0.104	$11,772
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.71	$2,441	0.030	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.78	$2,209	0.034	$10,000
2001-02	Ag Pump	Stationary	1	Westside Harvesting	7	0.62	$2,796	0.026	$10,000
2001-02	Ag Pump	Stationary	1	Zonneveld Dairy Inc.	7	0.18	$9,730	0.000	$10,000
2002-03	On-Road	Other Med.Duty	1	C. L. Bryant	7	1.00	$5,000	--	$19,912
2002-03	On-Road	Other Med.Duty	1	Nick's Trucking, Inc.	7	0.51	$10,113	0.040	$7,224
2002-03	On-Road	Transit bus	62	City of Fresno - FAX	5	4.00	$10,000	--	$930,000
2002-03	Off-Road	Ag Tractor	1	Llamanuzzi & Pantaleo	7	0.41	$3,892	0.043	$10,000
2002-03	Off-Road	Ag Tractor	1	Llamanuzzi & Pantaleo	7	0.39	$4,097	0.040	$10,000
2002-03	Off-Road	Ag Tractor	1	Llamanuzzi & Pantaleo	7	0.31	$5,190	0.032	$10,000
2002-03	Ag Pump	Stationary	1	7-K Ranch	7	1.55	$1,554	0.073	$15,000
2002-03	Ag Pump	Stationary	1	7-K Ranch	7	1.48	$1,622	0.079	$15,000
2002-03	Ag Pump	Stationary	1	7-K Ranch	7	1.48	$1,622	0.079	$15,000
2002-03	Ag Pump	Stationary	1	7-K Ranch	7	1.98	$1,219	0.088	$15,000
2002-03	Ag Pump	Stationary	1	7-K Ranch	7	2.38	$1,347	0.106	$20,000
2002-03	Ag Pump	Stationary	1	7-K Ranch	7	2.72	$1,178	0.121	$20,000
2002-03	Ag Pump	Stationary	1	Angelo Stagnaro	7	1.08	$2,235	0.061	$15,000
2002-03	Ag Pump	Stationary	1	Angelo Stagnaro	7	0.71	$3,407	0.038	$15,000
2002-03	Ag Pump	Stationary	1	Apar Tiwana	7	1.36	$1,771	0.064	$15,000
2002-03	Ag Pump	Stationary	1	B. Yamamoto Farms	7	0.19	$4,216	0.008	$5,000
2002-03	Ag Pump	Stationary	1	Brichetto Bros.	7	0.30	$5,365	0.027	$10,000
2002-03	Ag Pump	Stationary	1	Brichetto Bros.	7	0.35	$4,625	0.032	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	Brichetto Bros.	7	0.34	$4,711	0.012	$10,000
2002-03	Ag Pump	Stationary	1	Brichetto Bros.	7	2.28	$1,056	0.101	$15,000
2002-03	Ag Pump	Stationary	1	Buttonwillow Land & Cattle Co.	7	3.54	$681	0.157	$15,000
2002-03	Ag Pump	Stationary	1	Case Vander Eyk Dairy	7	5.50	$583	0.245	$20,000
2002-03	Ag Pump	Stationary	1	D.R. Houk, Inc.	7	0.39	$2,076	0.022	$5,000
2002-03	Ag Pump	Stationary	1	D.R. Houk, Inc.	7	1.95	$894	0.110	$10,868
2002-03	Ag Pump	Stationary	1	Danny Leal	7	0.86	$1,865	0.053	$10,000
2002-03	Ag Pump	Stationary	1	Danny Leal	7	2.62	$919	0.135	$15,000
2002-03	Ag Pump	Stationary	1	DLM Partners	7	1.76	$1,371	0.099	$15,000
2002-03	Ag Pump	Stationary	1	DLM Partners	7	2.54	$948	0.143	$15,000
2002-03	Ag Pump	Stationary	1	DLM Partners	7	6.34	$380	0.285	$15,000
2002-03	Ag Pump	Stationary	1	Du Plessis Farms	7	0.55	$1,152	0.031	$3,931
2002-03	Ag Pump	Stationary	1	Du Plessis Farms	7	1.40	$1,722	0.079	$15,000
2002-03	Ag Pump	Stationary	1	Eight Ball Land Co.	7	1.34	$1,798	0.076	$15,000
2002-03	Ag Pump	Stationary	1	Excelsior Farming	7	0.60	$2,683	0.055	$10,000
2002-03	Ag Pump	Stationary	1	Excelsior Farming	7	0.72	$2,220	0.026	$10,000
2002-03	Ag Pump	Stationary	1	Excelsior Farming	7	0.79	$2,030	0.029	$10,000
2002-03	Ag Pump	Stationary	1	Fawcett Farms Inc.	7	0.49	$3,264	0.030	$10,000
2002-03	Ag Pump	Stationary	1	Fawcett Farms Inc.	7	0.47	$3,415	0.017	$10,000
2002-03	Ag Pump	Stationary	1	Fruit Patch, Inc.	7	0.47	$1,714	0.024	$5,000
2002-03	Ag Pump	Stationary	1	G & H Farms	7	1.36	$1,771	0.064	$15,000
2002-03	Ag Pump	Stationary	1	Gardiner Farms	7	0.93	$1,721	0.035	$10,000
2002-03	Ag Pump	Stationary	1	Gardiner Farms	7	0.93	$1,721	0.035	$10,000
2002-03	Ag Pump	Stationary	1	GCM Farms	7	5.27	$610	0.234	$20,000
2002-03	Ag Pump	Stationary	1	GCM Farms	7	6.29	$511	0.279	$20,000
2002-03	Ag Pump	Stationary	1	Gonzalez Farms Inc.	7	2.42	$728	0.128	$10,988
2002-03	Ag Pump	Stationary	1	Goubert Ranches	7	0.39	$4,091	0.014	$9,903
2002-03	Ag Pump	Stationary	1	Goubert Ranches	7	0.47	$3,410	0.017	$9,904

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	Goularte Farms, Inc.	7	0.46	$1,730	0.026	$5,000
2002-03	Ag Pump	Stationary	1	Goularte Farms, Inc.	7	0.60	$2,683	0.055	$10,000
2002-03	Ag Pump	Stationary	1	Goularte Farms, Inc.	7	0.99	$1,624	0.036	$10,000
2002-03	Ag Pump	Stationary	1	Granite Construction Company	7	0.04	$69,499	0.002	$17,342
2002-03	Ag Pump	Stationary	1	Granite Construction Company	7	0.04	$43,437	0.002	$11,134
2002-03	Ag Pump	Stationary	1	Granite Construction Company	7	0.06	$70,390	0.001	$27,561
2002-03	Ag Pump	Stationary	1	H & R Gunlund	7	0.45	$3,577	0.022	$10,000
2002-03	Ag Pump	Stationary	1	Higard Farms LLC	7	0.56	$2,877	0.020	$10,000
2002-03	Ag Pump	Stationary	1	Higard Farms LLC	7	0.60	$4,023	0.034	$15,000
2002-03	Ag Pump	Stationary	1	Higard Farms LLC	7	0.71	$3,391	0.040	$15,000
2002-03	Ag Pump	Stationary	1	Honey Bucket Farms	7	3.08	$781	0.175	$15,000
2002-03	Ag Pump	Stationary	1	Honey Bucket Farms	7	2.72	$885	0.128	$15,000
2002-03	Ag Pump	Stationary	1	Honey Bucket Farms	7	1.66	$1,446	0.094	$15,000
2002-03	Ag Pump	Stationary	1	Honey Bucket Farms	7	3.58	$896	0.183	$20,000
2002-03	Ag Pump	Stationary	1	Honey Bucket Farms	7	4.17	$771	0.185	$20,000
2002-03	Ag Pump	Stationary	1	Honey Bucket Farms	7	5.57	$577	0.247	$20,000
2002-03	Ag Pump	Stationary	1	J.D. Mello Dairy	7	1.17	$1,371	0.072	$5,620
2002-03	Ag Pump	Stationary	1	JDS Farms	7	1.23	$1,302	0.065	$10,000
2002-03	Ag Pump	Stationary	1	JDS Farms	7	1.23	$1,302	0.065	$10,000
2002-03	Ag Pump	Stationary	1	JDS Farms	7	1.65	$1,030	0.087	$10,620
2002-03	Ag Pump	Stationary	1	Jerry Goubert Farms	7	0.21	$3,832	0.009	$5,000
2002-03	Ag Pump	Stationary	1	Jerry Goubert Farms	7	0.31	$4,411	0.013	$8,516
2002-03	Ag Pump	Stationary	1	John Blowers Farm	7	0.40	$5,877	--	$15,000
2002-03	Ag Pump	Stationary	1	John Kalpakoff	7	0.31	$5,234	0.011	$10,000
2002-03	Ag Pump	Stationary	1	JSA Company	7	1.76	$1,352	0.095	$14,800
2002-03	Ag Pump	Stationary	1	Kazarian Vineyard Dev.	7	0.69	$2,333	0.063	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	Kazarian Vineyard	7	2.04	$1,181	0.168	$15,000
2002-03	Ag Pump	Stationary	1	Ken Blays	7	0.30	$5,376	0.018	$10,000
2002-03	Ag Pump	Stationary	1	Ken Blays	7	0.30	$5,376	0.018	$10,000
2002-03	Ag Pump	Stationary	1	Ken Blays	7	0.21	$7,480	0.012	$10,000
2002-03	Ag Pump	Stationary	1	Ken Grace	7	2.00	$978	--	$14,258
2002-03	Ag Pump	Stationary	1	Ken Handel Farms	7	0.68	$2,364	0.027	$10,000
2002-03	Ag Pump	Stationary	1	Kencarol, Inc	7	0.43	$2,908	0.022	$7,796
2002-03	Ag Pump	Stationary	1	Kern Ridge Growers	7	1.00	$2,235	--	$10,000
2002-03	Ag Pump	Stationary	1	Kern Ridge Growers	7	1.00	$2,157	--	$10,000
2002-03	Ag Pump	Stationary	1	Kern Ridge Growers	7	1.00	$2,152	--	$15,000
2002-03	Ag Pump	Stationary	1	Kirschenmann Bros.	7	1.29	$623	0.051	$5,000
2002-03	Ag Pump	Stationary	1	Kirschenmann Bros.	7	1.29	$623	0.051	$5,000
2002-03	Ag Pump	Stationary	1	Lee Del Don	7	0.63	$2,555	0.057	$10,000
2002-03	Ag Pump	Stationary	1	Lee Del Don	7	1.26	$1,272	0.054	$10,000
2002-03	Ag Pump	Stationary	1	Lee Del Don	7	0.73	$2,204	0.027	$10,000
2002-03	Ag Pump	Stationary	1	Lee Del Don	7	0.86	$2,784	0.049	$15,000
2002-03	Ag Pump	Stationary	1	Lee Del Don	7	1.02	$2,351	0.058	$15,000
2002-03	Ag Pump	Stationary	1	Les Sandrini Farms	7	1.00	$1,978	--	$15,000
2002-03	Ag Pump	Stationary	1	Lompa Farms	7	0.53	$3,050	0.032	$10,000
2002-03	Ag Pump	Stationary	1	Lompa Farms	7	0.53	$3,050	0.032	$10,000
2002-03	Ag Pump	Stationary	1	Lucky Pistachio Groves	7	2.18	$1,104	0.118	$15,000
2002-03	Ag Pump	Stationary	1	Lusk Farms	7	1.49	$1,075	0.083	$10,000
2002-03	Ag Pump	Stationary	1	Lusk Farms	7	0.92	$2,598	0.050	$14,900
2002-03	Ag Pump	Stationary	1	Maddox Farms	7	1.38	$1,741	0.076	$15,000
2002-03	Ag Pump	Stationary	1	Maddox Farms	7	1.60	$2,011	0.088	$20,000
2002-03	Ag Pump	Stationary	1	Manuel Silva	7	0.62	$3,914	0.033	$15,000
2002-03	Ag Pump	Stationary	1	Martin Farms	7	1.31	$1,228	0.051	$10,000
2002-03	Ag Pump	Stationary	1	McConnell Farms	7	1.24	$1,556	0.059	$12,053

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	McConnell Farms	7	0.62	$3,099	0.035	$12,053
2002-03	Ag Pump	Stationary	1	Mitchel Noel	7	0.59	$1,366	0.025	$5,000
2002-03	Ag Pump	Stationary	1	Pandol and Sons	7	1.70	$1,886	0.094	$20,000
2002-03	Ag Pump	Stationary	1	Phil & Dorothy Escobar	7	1.24	$1,298	0.113	$10,000
2002-03	Ag Pump	Stationary	1	R.A.D. Farming	7	2.34	$686	0.072	$10,000
2002-03	Ag Pump	Stationary	1	R.L. Vista Inc.	7	2.00	$2,000	--	$9,823
2002-03	Ag Pump	Stationary	1	Ralph Stephens Farm	7	0.31	$2,166	0.018	$4,229
2002-03	Ag Pump	Stationary	1	Ralph Stephens Farm	7	0.48	$1,860	0.044	$5,548
2002-03	Ag Pump	Stationary	1	RKRK Trust - Victor S. Sahatdjian	7	1.94	$269	0.105	$3,251
2002-03	Ag Pump	Stationary	1	Robert Diebert	7	0.30	$5,600	--	$5,032
2002-03	Ag Pump	Stationary	1	Robert Diebert	7	0.30	$5,600	--	$5,585
2002-03	Ag Pump	Stationary	1	Ron Martella Farms	7	0.31	$7,746	0.014	$15,000
2002-03	Ag Pump	Stationary	1	Rusty Schott	7	2.40	$907	0.113	$13,544
2002-03	Ag Pump	Stationary	1	San Nicolas Farms	7	0.43	$3,691	0.019	$10,000
2002-03	Ag Pump	Stationary	1	San Nicolas Farms	7	0.51	$4,646	0.029	$14,907
2002-03	Ag Pump	Stationary	1	Speciality Crop Co./Snow Ranch	7	2.14	$1,127	0.096	$15,000
2002-03	Ag Pump	Stationary	1	Stenderup Ag Partners	7	0.97	$1,662	0.059	$10,000
2002-03	Ag Pump	Stationary	1	Stenderup Ag Partners	7	1.31	$1,228	0.071	$10,000
2002-03	Ag Pump	Stationary	1	Stenderup Ag Partners	7	0.91	$1,769	0.040	$10,000
2002-03	Ag Pump	Stationary	1	Sun Pacific Farming	7	5.39	$596	0.297	$20,000
2002-03	Ag Pump	Stationary	1	Sylvester VanderTuig	7	0.61	$3,956	0.034	$15,000
2002-03	Ag Pump	Stationary	1	Tanimura & Antle, Inc.	7	0.69	$2,343	0.037	$10,000
2002-03	Ag Pump	Stationary	1	Tanimura & Antle, Inc.	7	0.69	$2,343	0.037	$10,000
2002-03	Ag Pump	Stationary	1	Terry Ranch	7	0.46	$3,211	0.011	$9,210
2002-03	Ag Pump	Stationary	1	The Nunes Company	7	1.40	$1,148	0.052	$10,000
2002-03	Ag Pump	Stationary	1	The Nunes Company	7	2.07	$1,162	0.098	$15,000
2002-03	Ag Pump	Stationary	1	The Nunes Company	7	2.07	$1,162	0.098	$15,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	The Nunes Company	7	2.07	$1,162	0.098	$15,000
2002-03	Ag Pump	Stationary	1	The Nunes Company	7	2.07	$1,162	0.098	$15,000
2002-03	Ag Pump	Stationary	1	The Nunes Company	7	2.07	$1,162	0.098	$15,000
2002-03	Ag Pump	Stationary	1	The Oaks Ranch	7	1.15	$2,092	0.065	$15,000
2002-03	Ag Pump	Stationary	1	Tim Gomes	7	0.39	$5,620	0.022	$13,702
2002-03	Ag Pump	Stationary	1	Triangle T Ranch Inc.	7	5.00	$641	--	$20,582
2002-03	Ag Pump	Stationary	1	Triangle T Ranch Inc.	7	5.00	$841	--	$20,582
2002-03	Ag Pump	Stationary	1	Tule River Dairy	7	5.26	$386	0.236	$12,638
2002-03	Ag Pump	Stationary	1	Veldhuis North	7	3.65	$660	0.189	$15,000
2002-03	Ag Pump	Stationary	1	W. C. Handel & Sons	7	0.59	$2,715	0.023	$10,000
2002-03	Ag Pump	Stationary	1	W. C. Handel & Sons	7	0.59	$2,715	0.023	$10,000
2002-03	Ag Pump	Stationary	1	W. C. Handel & Sons	7	0.59	$2,715	0.023	$10,000
2002-03	Ag Pump	Stationary	1	W. C. Handel & Sons	7	0.59	$2,715	0.023	$10,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	0.64	$1,263	0.027	$5,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	0.95	$1,697	0.058	$10,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	0.99	$1,618	0.061	$10,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	0.88	$1,834	0.054	$10,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	0.88	$1,834	0.054	$10,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	1.02	$1,576	0.062	$10,000
2002-03	Ag Pump	Stationary	1	Way Farms Inc.	7	1.73	$1,391	0.094	$15,000
2002-03	Ag Pump	Stationary	1	Westra Dairy	7	0.92	$2,615	0.052	$15,000
2002-03	Ag Pump	Stationary	1	Westra Dairy	7	0.92	$2,615	0.052	$15,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	1.40	$1,142	0.086	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	1.40	$1,142	0.086	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	1.40	$1,142	0.086	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	1.40	$1,142	0.086	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	1.40	$1,142	0.086	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	0.72	$2,236	0.066	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	0.72	$2,236	0.066	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	0.72	$2,236	0.066	$10,000
2002-03	Ag Pump	Stationary	1	Woolf Enterprises	7	0.72	$2,236	0.066	$10,000
2003-04	On-Road	Heavy-Duty	1	C.L. Bryant	7	1.00	$5,000	--	$29,367
2003-04	On-Road	Heavy-Duty	1	C.L. Bryant	7	1.00	$5,000	--	$29,367
2003-04	On-Road	Heavy-Duty	1	C.L. Bryant	7	1.00	$5,000	--	$29,367
2003-04	On-Road	Heavy-Duty	1	Poindexter Nut Co.	7	0.45	$5,763	0.042	$16,135
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Silva Trucking	7	1.07	$4,499	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Southwest Transp.	20	0.15	$13,600	0.003	$25,732
2003-04	On-Road	Heavy-Duty	1	Vernon Transp. Co.	7	1.12	$4,285	--	$30,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	On-Road	Heavy-Duty	1	Vernon Transp. Co.	7	1.12	$4,285	--	$30,000
2003-04	On-Road	Heavy-Duty	1	Vernon Transp. Co.	7	1.12	$4,285	--	$30,000
2003-04	Off-Road	Ag. Tractor	1	George Porter Farms	7	0.21	$7,498	0.027	$10,000
2003-04	Off-Road	Combine	1	High & Mighty Farms	7	0.11	$13,599	0.009	$8,935
2003-04	Off-Road	Other Ag. Eq..	1	Jorge Pineda	7	0.48	$3,342	0.026	$10,000
2003-04	Ag Pump	Stationary	1	4B Farms	7	0.41	$5,811	0.023	$15,000
2003-04	Ag Pump	Stationary	1	A & W Ranches	7	0.51	$3,117	0.023	$12,500
2003-04	Ag Pump	Stationary	1	A & W Ranches	7	0.51	$3,117	0.023	$12,500
2003-04	Ag Pump	Stationary	1	A & W Ranches	7	0.87	$2,780	0.049	$12,500
2003-04	Ag Pump	Stationary	1	A & W Ranches	7	0.94	$2,571	0.053	$12,500
2003-04	Ag Pump	Stationary	1	Ag Resources II	7	0.73	$3,297	0.041	$15,000
2003-04	Ag Pump	Stationary	1	Basrao Famrs	7	0.34	$2,359	0.019	$5,000
2003-04	Ag Pump	Stationary	1	Bernard te Velde Dairy	7	0.86	$3,748	0.047	$20,000
2003-04	Ag Pump	Stationary	1	Blackwell Land Co.	7	0.99	$1,627	0.037	$10,000
2003-04	Ag Pump	Stationary	1	Blossom Farms	7	1.83	$1,319	0.103	$15,000
2003-04	Ag Pump	Stationary	1	Brown's Dairy	7	0.69	$2,313	0.068	$12,500
2003-04	Ag Pump	Stationary	1	Brown's Dairy	7	1.22	$1,978	0.069	$12,500
2003-04	Ag Pump	Stationary	1	C.S. Batth	7	4.10	$783	0.151	$20,000
2003-04	Ag Pump	Stationary	1	Cardoza Brothers	7	4.00	$803	0.204	$20,000
2003-04	Ag Pump	Stationary	1	Crisp Warehouse	7	3.24	$990	0.165	$20,000
2003-04	Ag Pump	Stationary	1	DeBenedetto Ag	7	2.00	$1,800	0.090	$5,311
2003-04	Ag Pump	Stationary	1	DeVires Dairy	7	1.93	$831	0.101	$10,000
2003-04	Ag Pump	Stationary	1	Diamond H Diary	7	1.09	$1,320	0.052	$8,947
2003-04	Ag Pump	Stationary	1	Diamond H Diary	7	1.38	$1,160	0.051	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.035	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons	7	0.54	$2,981	0.049	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	D. Andersons & Sons	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.54	$2,981	0.049	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	0.85	$1,899	0.036	$10,000
2003-04	Ag Pump	Stationary	1	Dick Anderson & Sons Farming	7	1.09	$1,475	0.040	$10,000
2003-04	Ag Pump	Stationary	1	Estate of W. E. Daniel	7	1.24	$1,290	0.059	$10,000
2003-04	Ag Pump	Stationary	1	Estee Strombotne	7	0.79	$2,030	0.045	$12,500
2003-04	Ag Pump	Stationary	1	Estee Strombotne	7	0.92	$2,615	0.052	$12,500
2003-04	Ag Pump	Stationary	1	F & J Delano	7	5.52	$664	0.204	$22,836
2003-04	Ag Pump	Stationary	1	F & J Delano	7	6.31	$581	0.233	$22,836
2003-04	Ag Pump	Stationary	1	Fanucchi Enterprises	7	0.74	$2,158	0.042	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	Fiorini Ranches	7	1.02	$1,892	0.069	$11,931
2003-04	Ag Pump	Stationary	1	Four J Farms	7	2.07	$388	0.087	$5,000
2003-04	Ag Pump	Stationary	1	Four J Farms	7	2.07	$388	0.087	$5,000
2003-04	Ag Pump	Stationary	1	Gardiner Farms	7	0.55	$2,939	0.020	$10,000
2003-04	Ag Pump	Stationary	1	Gary Brooks	7	1.65	$971	0.061	$10,000
2003-04	Ag Pump	Stationary	1	George Holland Farms	7	0.91	$1,759	0.043	$10,000
2003-04	Ag Pump	Stationary	1	Gianinni Farms	7	1.22	$1,978	0.069	$15,000
2003-04	Ag Pump	Stationary	1	Higard Farms, LLC	7	2.00	$1,800	0.090	$10,000
2003-04	Ag Pump	Stationary	1	Higard Farms, LLC	7	2.00	$1,800	0.090	$10,000
2003-04	Ag Pump	Stationary	1	Jackson Farms	7	2.00	$1,800	0.100	$24,273
2003-04	Ag Pump	Stationary	1	Jackson Farms	7	2.00	$1,800	0.100	$24,273
2003-04	Ag Pump	Stationary	1	Jackson Farms	7	2.00	$1,800	0.100	$24,273
2003-04	Ag Pump	Stationary	1	Jalonen Ranches	7	1.22	$1,978	0.069	$15,000
2003-04	Ag Pump	Stationary	1	Jalonen Ranches	7	1.22	$1,978	0.069	$15,000
2003-04	Ag Pump	Stationary	1	Jasbir Singh Sidhu	7	2.75	$1,168	0.140	$20,000
2003-04	Ag Pump	Stationary	1	Jasbir Singh Sidhu	7	2.75	$1,168	0.140	$20,000
2003-04	Ag Pump	Stationary	1	Jerry Slough Farming	7	0.85	$1,893	0.048	$11,222
2003-04	Ag Pump	Stationary	1	Jerry Slough Farming	7	0.91	$2,194	0.051	$11,222
2003-04	Ag Pump	Stationary	1	Joe Fernandes & Sons Farms	7	4.37	$551	0.237	$15,000
2003-04	Ag Pump	Stationary	1	Joey Fragoso	7	1.83	$1,319	0.103	$15,000
2003-04	Ag Pump	Stationary	1	John Grassi Farms	7	0.20	$4,096	0.011	$5,000
2003-04	Ag Pump	Stationary	1	K & T Ranch	7	3.23	$1,036	0.063	$20,866
2003-04	Ag Pump	Stationary	1	K & T Ranch	7	3.23	$1,036	0.063	$20,866
2003-04	Ag Pump	Stationary	1	K & T Ranch	7	3.23	$1,036	0.063	$20,866
2003-04	Ag Pump	Stationary	1	Kazarian Vineyard Dev.	7	0.79	$2,030	0.045	$10,000
2003-04	Ag Pump	Stationary	1	Kazarian Vineyard Dev.	7	0.79	$2,030	0.045	$10,000
2003-04	Ag Pump	Stationary	1	Kazarian Vineyard Dev.	7	0.91	$1,773	0.051	$10,000
2003-04	Ag Pump	Stationary	1	Kazarian Vineyard Dev.	7	0.91	$1,773	0.051	$10,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	Kazarian Vineyard Dev.	7	0.91	$1,773	0.051	$10,000
2003-04	Ag Pump	Stationary	1	Kirschenmann Bros.	7	1.30	$1,851	0.073	$15,000
2003-04	Ag Pump	Stationary	1	L & P Farms	7	1.94	$1,242	0.105	$17,500
2003-04	Ag Pump	Stationary	1	L & P Farms	7	1.94	$1,242	0.105	$17,500
2003-04	Ag Pump	Stationary	1	L & P Farms	7	2.97	$1,082	0.151	$17,500
2003-04	Ag Pump	Stationary	1	L & P Farms	7	3.65	$879	0.186	$17,500
2003-04	Ag Pump	Stationary	1	L..K. Ranches	7	0.45	$3,571	0.025	$11,705
2003-04	Ag Pump	Stationary	1	L..K. Ranches	7	0.95	$2,274	0.051	$11,705
2003-04	Ag Pump	Stationary	1	Lee Del Don Farming	7	2.90	$830	0.130	$15,000
2003-04	Ag Pump	Stationary	1	Live Oak Farms	7	1.80	$1,302	0.098	$14,623
2003-04	Ag Pump	Stationary	1	Louis Brichetto	7	4.08	$589	0.184	$15,000
2003-04	Ag Pump	Stationary	1	Manuel Aquino & Son	7	3.31	$297	0.182	$6,132
2003-04	Ag Pump	Stationary	1	Mary Nicholas Ranch	7	1.14	$1,406	0.042	$10,000
2003-04	Ag Pump	Stationary	1	McFarlane & McFarlane	7	1.18	$2,038	0.056	$15,000
2003-04	Ag Pump	Stationary	1	Panella Orchards	7	0.83	$2,914	0.037	$15,000
2003-04	Ag Pump	Stationary	1	Panella Orchards	7	0.83	$2,914	0.037	$15,000
2003-04	Ag Pump	Stationary	1	Panella Orchards	7	0.66	$3,634	0.036	$15,000
2003-04	Ag Pump	Stationary	1	Panella Orchards	7	1.13	$2,137	0.056	$15,000
2003-04	Ag Pump	Stationary	1	Panella Orchards	7	1.00	$2,414	0.045	$15,000
2003-04	Ag Pump	Stationary	1	Paul A. Toste Family Trust	7	1.04	$1,543	0.038	$10,000
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$7,356
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$11,998
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$2,301
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$2,840
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$6,356
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$18,442
2003-04	Ag Pump	Stationary	1	R & S Farms	7	2.00	$1,800	0.090	$18,442
2003-04	Ag Pump	Stationary	1	Riverbend Dairy	7	2.00	$1,636	0.100	$14,920

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	Riverbend Dairy	7	2.00	$3,176	0.100	$14,920
2003-04	Ag Pump	Stationary	1	Rosa Farms	7	2.00	$1,800	0.090	$15,000
2003-04	Ag Pump	Stationary	1	San Andreas Farms	7	12.70	$315	0.477	$24,896
2003-04	Ag Pump	Stationary	1	San Andreas Farms	7	14.51	$275	0.545	$24,896
2003-04	Ag Pump	Stationary	1	Solo Mio Farms	7	2.25	$1,068	0.101	$15,000
2003-04	Ag Pump	Stationary	1	Terra Bella Farm Co.	7	1.30	$1,596	0.073	$12,928
2003-04	Ag Pump	Stationary	1	Terra Bella Farm Co.	7	1.46	$1,646	0.083	$15,000
2003-04	Ag Pump	Stationary	1	Terra Bella Farm Co.	7	1.63	$1,481	0.092	$15,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.47	$3,435	0.043	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.47	$3,435	0.051	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.42	$3,798	0.015	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.51	$3,123	0.019	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.56	$2,877	0.020	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.56	$2,877	0.020	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.56	$2,877	0.020	$10,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	1.11	$2,163	0.060	$15,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	0.64	$3,748	0.036	$15,000
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	2.86	$1,736	0.050	$30,942
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	2.86	$1,736	0.050	$30,942
2003-04	Ag Pump	Stationary	1	Terra Lnda Farms	7	2.46	$2,021	0.048	$30,942
2003-04	Ag Pump	Stationary	1	The Soares Revocable Family Trust	7	2.00	$1,800	0.090	$15,000
2003-04	Ag Pump	Stationary	1	Thomson Land Co.	7	0.73	$2,188	0.032	$10,000
2003-04	Ag Pump	Stationary	1	Tony & Nancy Thomas	7	0.45	$3,558	0.041	$13,750
2003-04	Ag Pump	Stationary	1	Tony & Nancy Thomas	7	1.87	$1,290	0.106	$13,750
2003-04	Ag Pump	Stationary	1	Tony & Nancy Thomas	7	1.58	$1,522	0.082	$13,750
2003-04	Ag Pump	Stationary	1	Tony & Nancy Thomas	7	1.58	$1,522	0.082	$13,750
2003-04	Ag Pump	Stationary	1	Tri-T Farms	7	0.22	$3,664	0.012	$5,000
2003-04	Ag Pump	Stationary	1	Tri-T Farms	7	0.59	$4,060	0.033	$15,000

Table B-4: San Joaquin Valley Unified APCD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2003-04	Ag Pump	Stationary	1	Tri-T Farms	7	0.49	$4,872	0.028	$15,000
2003-04	Ag Pump	Stationary	1	TSB Ag Services LLC	7	2.42	$994	0.131	$15,000
2003-04	Ag Pump	Stationary	1	Van Elderen Br. Farms	7	3.30	$729	0.187	$15,000
2003-04	Ag Pump	Stationary	1	Vantol Farms	7	0.34	$4,675	0.015	$10,000
2003-04	Ag Pump	Stationary	1	Warmedam Farms, Inc.	7	2.00	$1,800	0.090	$10,000
2003-04	Ag Pump	Stationary	1	Whitney Oak's Dairy	7	3.14	$1,021	0.140	$20,000
ALL	--	--	**553**	--	**7**[1]	**713.34**	**$1,800**	**31.612**	**$7,717,874**

Environmental justice area determinations are based upon local air district criteria. See Chapter 5 for more information regarding each district's environmental justice criteria. Table includes projects funded as of October 1, 2006.

1 - Reflects the dollar-weighted average project life of projects in environmental justice areas.

Table B-5: South Coast AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpv)	Carl Moyer Program Funds Expended
2001-02	On-Road	Refuse Hauler	11	Long Beach Energy	7	6.91	$9,061	0.157	$362,233
2001-02	On-Road	Refuse Hauler	3	City of Ontario	10	2.58	$5,563	0.059	$111,000
2001-02	On-Road	Refuse Hauler	2	City of Ontario	10	1.72	$6,315	0.039	$84,000
2001-02	On-Road	Refuse Hauler	4	City of Ontario	10	3.45	$7,066	0.078	$188,000
2001-02	On-Road	Refuse Hauler	1	City of Whittier	12	1.11	$6,392	0.000	$63,036
2001-02	On-Road	Refuse Hauler	12	USA Waste of Ca,LA	12	10.77	$3,043	0.245	$290,400
2001-02	On-Road	Refuse Hauler	10	USA Waste of Ca,LA	12	8.97	$3,043	0.204	$242,000
2001-02	On-Road	Refuse Hauler	6	Waste Mgmt.	12	8.97	$3,043	0.204	$145,200
2001-02	On-Road	Transit Bus	5	Compton Public Works	10	3.37	$2,015	0.089	$52,485
2001-02	On-Road	Transit Bus	130	LACMTA	12	110.74	$1,060	3.250	$1,040,000
2001-02	Off-Road	Rubber-Tired Dozer	1	Coburn Equipment	7	1.70	$5,343	0.174	$52,557
2001-02	Off-Road	Rubber-Tired Dozer	1	Coburn Equipment	7	2.23	$4,994	0.228	$64,405
2001-02	Off-Road	Rubber-Tired Dozer	1	Coburn Equipment	7	2.16	$5,161	0.221	$64,405
2001-02	Off-Road	Rubber-Tired Dozer	1	Coburn Equipment	7	2.38	$4,684	0.238	$64,405
2001-02	Off-Road	Rubber-Tired Dozer	1	Shepherd Machinery	7	3.49	$5,994	0.349	$121,040
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	3.02	$2,204	0.307	$38,566
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	3.02	$2,211	0.306	$38,566
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	3.74	$2,405	0.380	$52,052
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.87	$3,598	0.247	$50,638
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.92	$2,995	0.297	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.87	$3,598	0.199	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.87	$3,598	0.199	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.61	$3,958	0.225	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.61	$3,958	0.181	$59,800

Table B-5: South Coast AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.35	$4,398	0.163	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.35	$4,398	0.163	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.35	$4,398	0.202	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.35	$4,398	0.163	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.35	$4,398	0.202	$59,800
2001-02	Off-Road	Scraper	1	Altfillisch Contractors	7	2.35	$4,398	0.163	$59,800
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.32	$3,621	0.215	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.28	$3,691	0.211	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.28	$3,691	0.211	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.26	$3,720	0.210	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.26	$3,766	0.210	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.26	$3,808	0.210	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.00	$4,208	0.185	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.00	$4,214	0.185	$48,689
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	3.21	$3,621	0.297	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	3.15	$3,691	0.292	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	3.15	$3,691	0.292	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	3.12	$3,720	0.289	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	3.12	$3,766	0.289	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	3.12	$3,808	0.289	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.76	$4,208	0.256	$67,237
2001-02	Off-Road	Scraper	1	Coburn Equipment	7	2.76	$4,214	0.256	$67,237
2001-02	Off-Road	Scraper	1	Herigstad Eq. Rental	7	2.04	$4,822	0.182	$57,048
2001-02	Off-Road	Scraper	1	Herigstad Eq. Rental	7	4.75	$2,129	0.318	$58,548
2001-02	Off-Road	Scraper	1	Sukut Construction	7	3.70	$2,700	0.244	$57,963
2001-02	Off-Road	Scraper	1	Sukut Construction	7	3.70	$2,700	0.244	$57,963
2001-02	Off-Road	Scraper	1	Sukut Construction	7	3.70	$2,700	0.244	$57,962
2001-02	Off-Road	Scraper	1	Sukut Construction	7	3.70	$2,700	0.244	$57,962
2001-02	Off-Road	Yard Truck	1	Mattel, DC West	10	0.63	$3,993	0.000	$19,499
2001-02	Marine	Barge	2	OceanAir	20	2.42	$1,970	0.128	$59,300

Table B-5: South Coast AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpv)	Carl Moyer Program Funds Expended
2001-02	Marine	Barge	2	OceanAir	20	3.22	$1,727	0.212	$85,300
2001-02	Marine	Charter Fishing	2	Seaboard Marine	20	0.83	$3,569	0.040	$38,923
2001-02	Marine	Charter Fishing	2	Seaboard Marine	20	2.41	$3,270	0.143	$98,400
2001-02	Marine	Charter Fishing	2	Seaboard Marine	20	3.65	$2,706	0.187	$121,753
2001-02	Marine	Charter Fishing	2	Seaboard Marine	20	2.36	$4,078	0.161	$119,924
2001-02	Marine	Comm. Fishing	1	John Hensley	20	0.50	$3,570	0.012	$22,196
2001-02	Marine	Comm. Fishing	1	OceanAir	10	1.39	$11,000	0.060	$59,300
2001-02	Marine	Comm. Fishing	2	OceanAir	10	6.48	$3,500	0.358	$85,300
2001-02	Marine	Comm. Fishing	2	OceanAir	20	2.48	$4,074	0.006	$126,129
2001-02	Marine	Comm. Fishing	2	OceanAir	10	1.39	$15,809	0.300	$169,300
2001-02	Marine	Comm. Fishing	2	OceanAir	20	1.62	$4,114	0.086	$83,065
2001-02	Marine	Comm. Fishing	1	Seaboard Marine	20	1.23	$3,831	0.063	$58,800
2001-02	Marine	Comm. Fishing	1	Seaboard Marine	20	1.32	$3,629	0.101	$59,800
2001-02	Marine	Tow	1	Seaboard Marine	20	1.50	$3,193	0.094	$59,800
2002-03	On-Road	Street Sweeper	1	City of Chino	10	0.00	$13,600	0.000	$190
2002-03	On-Road	Street Sweeper	1	City of Chino	10	0.00	$13,600	0.000	$379
2002-03	On-Road	Street Sweeper	3	City of Inglewood	10	0.08	$10,707	0.003	$950
2002-03	On-Road	Street Sweeper	3	City of Inglewood	10	0.08	$10,707	0.003	$13,000
2002-03	On-Road	Street Sweeper	2	City of Placentia	10	0.11	$13,600	0.007	$13,125
2002-03	On-Road	Street Sweeper	2	City of Placentia	10	0.23	$13,600	0.007	$26,251
2002-03	On-Road	Street Sweeper	10	CleanStreet	10	1.40	$9,536	0.152	$112,500
2002-03	On-Road	Street Sweeper	10	CleanStreet	10	2.80	$9,536	0.152	$225,000
2002-03	On-Road	Transit bus	5	City of Montebello, DOT	12	1.25	$3,703	0.016	$46,045
2002-03	On-Road	Transit bus	100	LA County MTA	12	19.11	$4,205	0.000	$800,000
2002-03	Off-Road	Rubber-Tired Dozer	2	LA County Dept. of Sanitation	7	5.11	$7,851	0.450	$191,086
2002-03	Off-Road	Rubber-Tired Loader	4	LA County Dept. of Sanitation	7	7.53	$7,523	0.396	$281,382
2002-03	Off-Road	Scraper	1	Altfillisch Contractors	7	3.72	$3,904	0.147	$90,516
2002-03	Off-Road	Scraper	1	Altfillisch Contractors	7	3.24	$4,480	0.147	$90,516

Table B-5: South Coast AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpy)	Carl Moyer Program Funds Expended
2002-03	Off-Road	Scraper	2	Altfillisch Contractors	7	4.28	$3,441	0.135	$91,746
2002-03	Off-Road	Scraper	1	Altfillisch Contractors	7	3.08	$3,176	0.138	$60,952
2002-03	Off-Road	Scraper	1	Altfillisch Contractors	7	3.08	$3,176	0.138	$60,952
2002-03	Off-Road	Scraper	13	Altfillisch Contractors	7	35.48	$3,585	1.480	$792,376
2002-03	Off-Road	Scraper	7	Rentrac	7	33.00	$2,647	1.304	$544,306
2002-03	Off-Road	Scraper	7	Rentrac	7	33.00	$2,647	1.304	$544,306
2002-03	Marine	Crew & Supply	2	Sause Brothers	16	4.88	$2,793	0.209	$171,300
2002-03	Marine	Crew & Supply	2	Seaboard Marine	16	5.98	$1,774	0.476	$133,300
2002-03	Marine	Crew & Supply	3	Seaboard Marine	16	8.92	$2,609	0.456	$292,300
2002-03	Marine	Crew & Supply	3	Seaboard Marine	16	6.87	$3,386	0.351	$292,300
2002-03	Marine	Ferry/Excursion	2	Seaboard Marine	16	2.19	$3,883	0.123	$106,800
2002-03	Marine	Other	2	Seaboard Marine	16	0.17	$16,337	0.013	$34,297
2002-03	Marine	Other	2	Seaboard Marine	16	1.96	$2,695	0.142	$66,300
2002-03	Marine	Other	1	Seaboard Marine	16	0.37	$5,495	0.027	$25,433
2002-03	Marine	Other	2	Seaboard Marine	16	2.29	$4,325	0.182	$124,300
2002-03	Marine	Other	2	Seaboard Marine	16	3.35	$2,951	0.188	$124,300
2002-03	Marine	Other	2	Seaboard Marine	16	2.48	$3,989	0.167	$124,300
2002-03	Marine	Other	2	Seaboard Marine	16	3.15	$3,318	0.251	$131,300
2002-03	Marine	Other	2	Seaboard Marine	16	10.60	$1,742	0.517	$232,010
2002-03	Marine	Tow	1	Seaboard Marine	16	0.89	$3,895	0.072	$43,300
2002-03	Marine	Tug	2	Seaboard Marine	16	4.81	$1,578	0.236	$95,300
2002-03	Marine	Tug	2	Seaboard Marine	16	3.53	$2,803	0.237	$124,300
2003-04	Off-Road	Off-Hwy Truck	2	TAMCO Steel	7	16.52	$1,488	0.626	$153,176
2003-04	Off-Road	Off-Hwy Truck	1	TAMCO Steel	7	6.67	$1,844	0.245	$76,588
2003-04	Off-Road	Off-Hwy Truck	1	Varner Construction	7	3.68	$3,000	0.135	$68,850
2003-04	Off-Road	Off-Hwy Truck	1	Varner Construction	7	4.60	$2,401	0.151	$68,850
2003-04	Off-Road	Scraper	4	Varner Construction	7	28.17	$1,524	0.925	$267,460
2003-04	Off-Road	Scraper	1	Varner Construction	7	4.00	$2,682	0.147	$66,865
2003-04	Off-Road	Scraper	7	Varner Construction	7	26.06	$2,882	1.030	$468,055
2003-04	Off-Road	Scraper	1	Varner Construction	7	7.79	$1,727	0.295	$83,843

Table B-5: South Coast AQMD Carl Moyer Program Projects in Environmental Justice Areas

Fiscal Year	Project Category	Project Subcategory	Number of Engines	Applicant Name	Project Life (years)	Project NOx Reductions (tpy)	Project NOx Cost-Effectiveness	Project PM Reductions (tpv)	Carl Moyer Program Funds Expended
2003-04	Off-Road	Scraper	4	Varner Construction	7	17.92	$2,574	0.589	$335,373
2003-04	Off-Road	Skid Steer Loader	1	Fontana Steel	7	1.93	$2,349	0.089	$28,295
2003-04	Off-Road	Skid Steer Loader	1	Fontana Steel	7	1.53	$2,960	0.051	$28,295
2003-04	Off-Road	Skid Steer Loader	1	Fontana Steel	7	2.10	$4,250	0.089	$55,710
2003-04	Off-Road	Skid Steer Loader	4	TAMCO Steel	7	3.68	$3,400	0.195	$78,000
2003-04	Off-Road	Skid Steer Loader	4	TAMCO Steel	7	5.94	$3,675	0.345	$136,096
2003-04	Off-Road	Skid Steer Loader	2	TAMCO Steel	7	3.68	$2,966	0.123	$68,048
2003-04	Off-Road	Skid Steer Loader	1	TAMCO Steel	7	1.71	$3,572	0.079	$38,100
ALL	--	--	**496**	--	**10**[1]	**663.31**	**$2,900**	**30.996**	**$14,452,745**

Environmental justice area determinations are based upon local air district criteria. See Chapter 5 for more information regarding each district's environmental justice criteria. Table includes projects funded as of October 1, 2006.

1 – Reflects the dollar-weighted average project life of projects in environmental justice areas.

Appendix C

Ventura County APCD
Carl Moyer Program Audit Results

Appendix C
Table of Contents

ARB Letter to Ventura County APCD Announcing Audit Results C-1
ARB Audit Report C-3
Ventura County APCD Response C-19
District's Response to ARB Audit Finding C-25

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

July 13, 2006

Mr. Michael Villegas
Air Pollution Control Officer
Ventura County Air Pollution Control District
669 County Square Drive
Ventura, California 93003

Dear Mr. Villegas:

The Ventura County Air Pollution Control District ("District") was audited during the Air Resources Board's (ARB) staff review of the Carl Moyer Air Quality Standards Attainment Program (Carl Moyer Program) in 2006. ARB conducted this audit as a part of its program oversight responsibility as specified in Health and Safety Code section 44291(d). The audit was conducted in two phases. The desk review began on April 3, 2006, and the on-site phase began on May 8, 2006. The ARB staff appreciated the professionalism and cooperation of the District staff during the audit.

The audit report is enclosed. The audit found that the District's Carl Moyer Program efficiently and effectively obtains surplus emission reductions through the purchase of new alternative fuel on-road trucks, and cleaner engines for marine vessels and construction equipment. The District operates a very good Program, and most of the five findings relate only to administrative issues. The District has until August 21, 2006 to submit a written plan of action to address the required actions in the enclosed audit report. If the District does not do so, their Carl Moyer Program will be deemed "at-risk," subjecting the district to additional oversight from ARB to address any outstanding findings. This audit report and the District's response are public and will be included in the Carl Moyer Program's annual report to ARB in January 2007. ARB encourages the District to make the same information available to the public at the local level.

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

If you have any questions regarding the monitoring process or the results of this audit, please contact me at (916) 445-4383 or have your staff contact Mr. Robert H. Cross, Chief, Mobile Source Control Division, at (626) 575-6807.

Sincerely,

/s/

Catherine Witherspoon
Executive Officer

Enclosure

cc: Ms. Barbara Lee
Air Pollution Control Officer
Northern Sonoma Air Pollution Control District
150 Matheson Street
Healdsburg, California 95448

Ms. Diana C. Anthony, CPA
Auditor/Evaluation Manager
Department of Finance
915 L Street
Sacramento, California 95814

Ms. Jennifer Arbis
Auditor/Evaluation Supervisor
Department of Finance
915 L Street
Sacramento, California 95814

Mr. Jerry Mason
Ventura County Air Pollution Control District
669 County Square Drive
Ventura, California 93003

Mr. Robert H. Cross, Chief
Mobile Source Control Division

Carl Moyer Air Quality Standards Attainment Program
Audit Report

Ventura County Air Pollution Control District
Fiscal Years 2002/2003 and 2003/2004

Prepared by:
Mobile Source Control Division
Air Resources Board

July 2006

TABLE OF CONTENTS

Executive Summary.....1

I. Background.....3

II. Audit Procedure.....4

III. VCAPCD's Implementation of the Carl Moyer Program.....5

IV. Commendable Efforts.....6

V. Recommendations for Future Program Improvements.....7

VI. Findings, Concerns and Required Actions.....9

Attachment 1: List of Projects Reviewed

Executive Summary

The Carl Moyer Air Quality Standards Attainment Program ("Carl Moyer Program" or "Program") is a voluntary grant program that funds the extra capital cost of cleaner than required vehicles and equipment in order to reduce air pollution. The Carl Moyer Program is implemented through a partnership between the Air Resources Board (ARB or "Board") and the 35 local air districts. ARB distributes state funds to local districts, develops statewide Guidelines, and has oversight responsibility. The air districts select and pay for clean air projects in their local area that meet the requirements of the Health and Safety Code and the statewide Guidelines. Districts also provide local match funds and resources to administer the Program.

As part of ARB's oversight authority, ARB staff audited the Ventura County Air Pollution Control District's (VCAPCD or "District") implementation of the Carl Moyer Program to ensure compliance with state law and ARB's applicable Program Guidelines. The audit focused on the 2002/2003 and 2003/2004 fiscal year funds. ARB staff also reviewed the District's implementation of fiscal year 2004/2005 and 2005/2006 funds to determine whether the District is complying with the requirements of the expanded program and new ARB Guidelines that were approved in November 2005.

The VCAPCD is responsible for air quality in Ventura County, a coastal region with a population of 800,000. Ventura County's air quality does not meet federal or California health-based standards for ozone (smog), nor does it meet California standards for particulate matter. Emission reductions from the Carl Moyer Program are reflected in VCAPCD's federally-required State Implementation Plan – their road map for describing how the region will achieve healthful air.

The VCAPCD has operated a Carl Moyer Program since the Program's inception in 1998. Over the past eight years, ARB has provided the District with over $7.9 million in Carl Moyer Program funds. The District has contributed staff resources and more than the required match funding – leveraging the state dollars with $2.9 million in local funds. To date, all of the VCAPCD's funds have been obligated (promised to projects by contract), and 79 percent of those funds have been spent on projects that are in operation. The majority of the VCAPCD's Carl Moyer Program funds have been used to pay for new alternative fuel on-road trucks and cleaner engines for marine vessels and construction equipment. The state Carl Moyer Program Years 1 through 6 funds have funded 190 cleaner engines, reducing smog-forming nitrogen oxides (NOx) emissions by 202 tons and diesel soot by almost 16 tons annually[1], over the life of the projects. The average cost-effectiveness of the District's projects is about $3,700 per ton of NOx which is better than the state average cost-effectiveness for the program.

The audit found that the District's Carl Moyer Program efficiently and effectively obtains surplus emission. The Program meets most of the requirements of the Health and Safety Code and the applicable Carl Moyer Program Guidelines. The District is

[1] 10/17/06: The word "annually" was inadvertently left out of the original audit report and is being inserted herein.

frequently at the forefront of improvements to the Carl Moyer Program and was one of the districts that pioneered many of the administrative improvements in the 2005 Guidelines.

As a result of the audit, ARB staff is making five findings that require action from the District. The most significant finding pertains to the District's funding of two ineligible projects. In response to this finding, the District has already repaid $98,493 and reprogrammed $221,493 to eligible projects, thereby maintaining all of the anticipated emission reductions from the program. The remainder of the findings relate to administrative issues.

I. Background

The Carl Moyer Air Quality Standards Attainment Program (Carl Moyer Program) is a grant program that funds the extra capital cost of cleaner than required vehicles and equipment to provide California with air quality benefits. The ARB and the local air districts work cooperatively to implement the Carl Moyer Program. The local districts have the responsibility of implementing the local Carl Moyer Program by soliciting applicants, selecting, funding and monitoring projects, while the ARB has the responsibility of overseeing the statewide program to ensure funds are expended as required by the Health and Safety Code and the Carl Moyer Program Guidelines (www.arb.ca.gov/msprog/moyer/guidelines/current.htm). Health and Safety Code section 44287(k) requires timely expenditure of funds on projects that generate real, quantifiable, and surplus emission reductions. To ensure funds are expended as required, ARB has the authority to audit each district's implementation of its local Carl Moyer Program. These audits also provide ARB with a mechanism for identifying potential improvements for the future statewide program.

The ARB's audit of the Ventura County Air Pollution Control District's (VCAPCD) Carl Moyer Program satisfies the requirements of Health and Safety Code section 44291 with regard to ARB's audit responsibilities. While the VCAPCD has administered the Carl Moyer Program since the Program's inception in 1998, this audit focuses on projects that the District paid for with Proposition 40 funds during Year 5 (fiscal year 2002/2003) and Year 6 (fiscal year 2003/2004). Proposition 40 is California's Clean Water, Clean Air, Safe Neighborhood Parks and Coastal Protection Act (Public Resources Code section 5096.650). For these two program years the district was required to follow the approved 2003 Carl Moyer Program Guidelines. Hence, ARB staff reviewed the District's program for Years 5 and 6 to determine if the District followed the Health and Safety Code, as well as the 2003 Carl Moyer Program Guidelines.

This audit also reviewed the status of the District's implementation of Year 7 (fiscal year 2004/2005) and Year 8 (fiscal year 2005/2006) funds. Years 7 and 8 mark the expansion of the Carl Moyer Program, when SB 1107 and AB 923 went into effect and the Program experienced a significant influx of funding. Although Years 7 and 8 funds are not required to be fully expended until June 30, 2007 and June 30, 2008, respectively, ARB staff reviewed implementation of funds for these two years to determine the impacts of the expanded program and newly approved 2005 Carl Moyer Program Guidelines.

Staff from both the ARB and VCAPCD participated in this audit. The ARB audit team included ARB management - Jack Kitowski, Lucina Negrete and Edie Chang - and ARB's Carl Moyer Program staff- Susan Levenson-Palmer (district liaison to VCAPCD), Bruce Tuter, Johanna Levine, Joseph Calavita and Heather Arias. The ARB audit team wishes to thank the participating VCAPCD management and staff - Michael Villegas, Vicki Workman, Nancy Mendoza, Jerry Mason (VCAPCD's Carl Moyer Program staff), Chris Frank, and Keith Duval.

II. Audit Procedure

ARB's audit of VCAPCD's Carl Moyer Program was conducted in two phases: 1) a desk review and 2) an on-site review. The desk review began on April 3, 2006 and the on-site review began on May 8, 2006.

The desk review included a review of the District's solicitations and selection process of projects for Program Years 5 and 6. During the desk review ARB staff also analyzed the District's implementation of the expanded Carl Moyer Program by reviewing the District's solicitations for Years 7 and 8 projects. The following documents for Year 8 were also reviewed to determine if the District is following the new administrative procedures in the approved 2005 Carl Moyer Program Guidelines:

- Draft Policies and Procedures Manual that describes District practices for Carl Moyer Program implementation (final submittal required to ARB by November 15, 2006 as described in section IV.G. of the Guidelines)
- Engine Inspection Forms
- Boiler Plate Contract Language for Year 8 projects

The desk review also included selecting a sample of Carl Moyer Program projects for the file review that would take place as part of the on-site review. The sample was taken from projects that were paid for with state funds and District local match funds under the Carl Moyer Program and included:

- Ten Year 5 projects representing projects in the on-road, off-road, marine vessel and agricultural pump source categories, and one infrastructure project (funded with match funds)
- Six Year 6 projects representing projects in the off-road, marine, and agricultural pump categories and one infrastructure project (funded with match funds)

While at the District's office, ARB staff randomly selected four additional projects, one to verify that the District's files were all maintained consistently; one to determine how the District handles interest funds generated from Carl Moyer Program funds; and two Year 8 projects to assess the District's implementation of the new approved 2005 Carl Moyer Program Guidelines.

The ARB audit team completed a review of the program and fiscal files for these 20 projects. Field visits were only conducted for the 16 originally selected projects. To provide District staff with sufficient time to set up the field visits, ARB staff notified District staff of the 16 originally selected projects on April 26, 2006. Attachment 1 contains a descriptive list of the sampled projects reviewed.

During the on-site review, the ARB audit team also reviewed fiscal files to document the District's practices for tracking and expenditure of in-kind match and earned interest for

program Years 5 and 6 and the District's tracking systems for in-kind match, earned interest and outreach funds for program Year 8.

The results of this audit are presented below. Section III provides a description of the VCAPCD's implementation of the Carl Moyer Program. Section IV includes a description of the District's commendable efforts. Section V outlines recommended program improvements for the District's continued success. Finally, Section VI provides the findings, conditions and required actions based on the ARB audit team's review of the District's files and project site visits. "Findings" are brief descriptions of practices that are inconsistent with state requirements under the Carl Moyer Program Guidelines and/or the District's written policies and procedures, including its contract with the engine owners. "Conditions" are more detailed descriptions of the practices the ARB audit team observed during the audit period. "Required Actions" are the minimum actions the District must take to remedy the findings. The District may respond to any recommendation provided in this report. The District must respond to the findings detailed in Section VI. The District's written response to this audit report must be submitted to ARB within 30 days of notification of the findings.

III. VCAPCD's Implementation of the Carl Moyer Program

The VCAPCD has implemented the Carl Moyer Program since the Program's inception in 1998. Over the eight years of implementing this Program, the District has developed working relationships with engine manufacturer representatives and assembled a comprehensive mailing list. The mailing list includes everyone who has requested a copy of a solicitation for the program. The District's outreach efforts include notifying the engine manufacturer representatives and entities on the mailing list about the Request for Proposal (RFP). The District also provides presentations to companies and service organizations about the Program. For example, to outreach to zero-emission projects District staff have contacted the local electric company and made presentations to organizations that include farmers.

The District's RFP specifies a date the District begins to accept applications. Once the District receives the applications, District staff validate the eligibility of each project by calculating each engine's cost-effectiveness and conducting a pre-inspection. The District gives priority to alternative fuel projects by setting aside a percentage of its total allocation to be awarded to alternative fuel projects. As long as the alternative fuel project meets the cost-effectiveness limit, the District funds the project. If the alternative fuel set aside funds are not fully utilized, those funds are made available to other non-alternative fuel projects on the District's project list. These projects are ranked and selected based on cost-effectiveness. District staff presents the selected projects to the VCAPCD Board for approval. VCAPCD accepts applications until all funds are obligated by the Board.

Once contracts are signed, engine owners can begin work on their projects. When the project is complete, the engine owner submits an invoice to the District. District program staff conduct a post-project inspection and review the invoice to ensure the

project is completed and invoiced as required. District program staff approve the invoice for payment and submit a request for payment to District fiscal staff. District fiscal staff review the request for payment, process the request for payment and submit the request electronically to the county auditor-controller for payment.

The District collects engine usage data from the engine owners on an annual basis through the end of the contract term. The District has pursued action against engine owners for noncompliance with contract terms, when necessary.

For Years 1 through 6 the VCAPCD funded 190 engines, utilizing over $5 million of Carl Moyer Program funding. The ARB estimates that projected funded in Years 1 through 6 by the VCAPCD with Carl Moyer Program funds will reduce NOx emissions by 202 tons and PM by 15.6 tons over the life of the projects. VCAPCD leveraged the Years' 1 through 6 Carl Moyer Program funds with over $2.2 million of District match. Through Year 8 VCAPCD has been allocated a total of $7.9 million in Carl Moyer Program funds leveraged with over $2.9 million of District match. Every year the District received applications requesting funds that far exceeded the District's allocation of Carl Moyer Program funds. For example, in Year 7 (fiscal year 2004/2005) 30 applications totaling $2.1 million were submitted. The District's Carl Moyer Program allocation that year was slightly over $660,000.

IV. Commendable Efforts

The commendable efforts included in this section are noteworthy accomplishments of the District. Commendable efforts are exceptional practices that should serve as a statewide model for the Carl Moyer Program. ARB staff concluded that several areas of the VCAPCD program are noteworthy as commendable.

A. Leading Program Refinements

In a number of instances VCAPCD is at the forefront of implementing refinements to the Carl Moyer Program that are exceptional and go beyond the requirements in the Carl Moyer Program Guidelines. For example, VCAPCD implemented pre- and post-inspections of projects prior to the addition of the requirement in the 2005 Carl Moyer Program Guidelines. In addition, VCAPCD required destruction of the baseline engine in many source categories prior to the requirement in the 2005 Carl Moyer Program Guidelines. The District implemented this requirement to ensure reductions obtained were real, and old engines were no longer operated in California.

B. Timely Obligation and Expenditure of Allocation

VCAPCD's most commendable effort is in the obligation and expenditure of funds. Districts are required to obligate funds to projects by June 30 of the first year and expend funds by June 30 of the second year. Based on the ARB audit team's review of VCAPCD's RFP, selection and payment process for Years 5 and 6 Carl Moyer Program funds, the District is able to issue an RFP and select and pay for projects in a timely

manner. On average, VCAPCD takes one month from the date the District receives its award from ARB to issue an RFP. From the date the District begins to accept applications, VCAPCD takes an average of three months to obligate all of the funds with fully executed contracts. On average the District takes an additional nine months to expend its funds with invoices authorizing project payments. It typically took less than one month from the District's receipt of the engine owner's invoice to the date the auditor-controller issued payment to the owner. These time frames are exceptionally quick. VCAPCD is making similar progress with their Years 7 and 8 Carl Moyer Program funds.

It is important to note that VCAPCD maintains this exceptional progress even though the VCAPCD Board approves every project. The District's successful accomplishment is achieved, in part, because the District invites those engine owners whose projects are selected to attend the Board meeting. Engine owners attending the Board meeting sign their contract at the meeting and VCAPCD obtains fully executed contracts the day of the meeting. Thus, engine owners may begin work on their projects immediately after the Board meeting.

C. Responsiveness to Audit

During the period of this audit, VCAPCD staff made considerable efforts to address issues identified by ARB staff. This responsiveness is indicative of the VCAPCD's commitment to the Carl Moyer Program. Because of this responsiveness, a number of the items listed under the recommendations and findings sections include information on changes the District has already or is in the process of implementing.

D. Timely Reporting

Districts are required to submit annual reports to ARB to show obligation of funds to projects by June 30 of the first year and final reports that show expenditure by June 30 of the second year. VCAPCD's efforts in submitting the required annual and final reports are exceptional. The District always submits complete annual reports to ARB by the June 30 annual deadline and frequently submits its final reports to ARB ahead of the required deadline.

V. Recommendations for Future Program Improvement

VCAPCD should consider improving the current implementation of the Carl Moyer Program as noted below. A number of these improvements are required starting with Year 8 funds as noted in the corresponding 2005 Guidelines section which are cited in parenthesis. These recommendations do not require a response from the District, although the District may comment on the recommendations in the District's written response.

A. Documentation in Project Files

During the audit ARB observed that the District maintains a combination of hard copy project files and project documents in electronic files. Beginning with Year 8 districts are required to maintain documentation in each of the Carl Moyer Program projects' hard copy files of the projects' eligibility verification and compliance with program requirements (sections V.D.2 and V.E.). As a result of the audit, VCAPCD reorganized its documentation (copies of calculation worksheets, EPA/IMO certifications, Executive Orders, Tier II exemptions) to complete their hard copy project files, and to document eligibility verification and compliance with program requirements. Note that the 2005 Guidelines allow districts to use a solely electronic file system after satisfactorily demonstrating to ARB staff that all documentation is maintained and can be easily accessed on demand (section V.E.).

B. Documentation of Inspections

The District has a history of completing on-site inspections prior to obligation (pre-inspection) and expenditure (post-inspection). For Year 8 and beyond the District must document the completion of pre- and post-inspections using a District designed form(s) that includes the minimum elements in the Guidelines (sections IX.A and B.) and maintain that documentation in the project file. For Year 8 the District developed and utilized an inspection form that included many, but not all, of the required elements. The District is currently making modifications to include all the required elements into its inspection form.

C. Quality Assurance/Quality Control

The District subsidizes the Carl Moyer Program with staff resources beyond the allowable in-kind match. However, the District only has resources available to have one Program Manager oversee its local Carl Moyer Program. With the expansion of the Carl Moyer Program, there will be an increase in projects that will also require an increase in quality assurance/control of program related documents. Therefore, ARB staff recommend the District develop an approach to ensure quality control/quality assurance.

D. Itemized Invoices

The District currently includes invoices in its hard copy project and fiscal files. However, it is unclear which items on the invoices are being paid for with Carl Moyer Program funds and which are the responsibility of the applicant. The 2005 Carl Moyer Guidelines (section X.) require itemized invoices that clearly delineate eligible expenses the District approves to be paid. The ARB staff recommend the District include the itemized invoice in the project file along with a clear delineation of the costs that were reimbursed with Carl Moyer Program funds. In addition, the practice for accomplishing this delineation should be included in the District's policies and procedures manual (see Recommendation F below).

E. Zero-Emission, Small Business and Environmental Justice Projects

In the 2005 Guidelines, ARB strongly encourages districts' solicitations of Year 8 and future funds to expand and document outreach and obligation to zero-emission, small business and environmental justice projects (section V.A.). VCAPCD has made efforts to recruit zero-emission projects through the local electric company and public service organizations with farmer participation. The District has also made a commitment to prioritize zero-emission projects in future program solicitations. Furthermore, during the audit period the District provided a listing of funded projects that qualify as small business projects. This listing shows that over 40 percent of Year 5 and over 70 percent of Year 6 Carl Moyer Program funds were awarded to small businesses. The ARB staff applaud these efforts and encourages the District to institutionalize these efforts in the District's policies and procedures manual as well as to document these efforts in its program files for each fiscal year.

F. Policies and Procedures Manual

The approved 2005 Carl Moyer Program Guidelines require districts to submit their local policies and procedures manual for implementation of their local programs to ARB by November 15, 2006 (section IV.G.). The Guidelines also outline minimum information that districts must include in these policies and procedures. During the audit, the District supplied ARB with a proposed policies and procedures manual for review. The District's effort to submit this to ARB during the audit period, in advance of the required deadline and before the district received a sample policies and procedures manual from ARB, is noted as commendable. ARB staff provided the District with initial comments that the proposed manual needs additional information pertaining to the District's operational procedures in conducting its local program. The District plans to modify its manual to include operating procedures as required by the deadline.

VI. Findings, Conditions and Required Actions

This section specifies findings, conditions and required actions as a result of ARB's review of VCAPCD's Carl Moyer Program. "Findings" are brief descriptions of practices that are inconsistent with state requirements under the Carl Moyer Program Guidelines and/or the District's written policies and procedures, including its contract with the engine owners. "Conditions" are more detailed descriptions of the practices the ARB audit team observed during the audit period. The conditions include, where appropriate, a description of the remedying actions the District has already committed to or taken. "Required Actions" are the minimum actions the District must take to remedy the findings. The District must provide ARB with a written response to required actions by submitting a plan to remedy the respective findings listed below or will be "at-risk" as defined in section XI.B. of the Guidelines. The District's written response must be submitted to ARB within 30 days of notification of the findings.

Finding 1: The District funded two ineligible projects.

Condition: During the file review of match- and earned interest-funded projects the audit team found two projects (project numbers VCCMP-02001 and VCAPCD-08-05-01) that were not eligible because the technology used did not meet the requirement of a 15 percent NOx emission reduction in the 2003 Carl Moyer Program Guidelines. This finding requires the re-payment of $98,493 and reprogramming of $221,493 in Carl Moyer Program State funds.

VCAPCD has already repaid and reprogrammed funds with a project that the District paid for with local funds. The ARB staff have reviewed this replacement project and verified its eligibility. At the June 2006 VCAPCD Board meeting, District staff presented a proposal to their Board to reprogram these funds to the new eligible project and repay the Carl Moyer Program from District local funds.

Since the original projects were not to be operational until 2006 and the replacement project will become operational in 2006 there are no lost emission reductions.

Required Actions: Based on this finding, District staff must review all its program project files to determine if any other Carl Moyer Program funds were used to pay for the technology used in the identified ineligible projects. If so, the District must notify the ARB of the projects and the amount of funds that must be reprogrammed.

District staff must also provide the ARB with revised final reports for all affected years. The final reports must contain the pertinent information for the new, qualified Carl Moyer Program projects and delete the ineligible projects.

Finding 2: There was no documentation of notification of incomplete applications.

Condition: In files with incomplete applications, there was no documentation of the District informing the applicant that their application was incomplete. The notification of an incomplete application must be dated within five days of receipt of the application [Health and Safety Code section 44288(a)].

Required Actions: The District must include documentation in the hard copy project file of actions taken to notify an engine owner that their application is incomplete.

Finding 3: The District's project selection process was not fully documented.

Condition: Health and Safety Code section 44288(a) requires projects to be evaluated with respect to the Guidelines and the districts' own selection criteria. The written information supplied by the District did not provide a clear explanation of how projects are selected for funding. For each fiscal year, the District submitted lists of projects ranked by cost effectiveness. One list was titled, "Projects Recommended for Funding." Another list was titled, "Projects Not Recommended for Funding." There was a third list of "Projects Recommended for Funding" from a later date that did not include some of the projects from the earlier list of projects recommended for funding and did include some of the projects from the earlier list of projects not recommended to be funded. There was no written explanation of how or why projects moved from one list to the other. During the audit period District staff provided a satisfactory explanation of how projects are selected from these lists.

Required Actions: Include an explanation of the selection process in the policies and procedures manual (see Recommendation 6 above). Maintain a file on project selection for each Year's funding and outline how the procedures were followed in selecting projects for that year.

Finding 4: Minimum contract requirements for projects funded with Year 8 funds were not included in the District's new contract.

Condition: The contract template language (between the District and engine owners) used to obligate Year 8 funds, does not include a number of the minimum requirements outlined in the 2005 Carl Moyer Program Guidelines. The specific requirements that were not included in the boilerplate contract are outlined below with the Guideline citations in parenthesis.

- Specifically stating that no work may begin until the contract is fully executed (section VIII.B.1.)
- Informing the owner that noncompliance with reporting requirements shall require on-site monitoring (section VIII.B.2.)
- Requiring itemized invoices and clarifying that payments shall be made directly to the engine owner only if the invoice has been paid and the payment is a reimbursement (section VIII.C.2.)
- A disclosure of funds statement for the owner to complete and sign. In the disclosure statement the engine owner must disclose any and all applications to fund the same project and if other funds are received the grant amount will be adjusted accordingly. (section VIII.C.3.)

- Terms to cancel contracts for noncompliance with or not meeting the obligations of the contract (section VIII.C.4.)
- A general statement of compliance with all Carl Moyer Program Guidelines and/or outline those requirements, i.e. the project shall not be required by any local, state and/or federal rule, regulation or MOU currently in effect (section VIII.D.)
- A requirement that the owner shall maintain the engine according to the manufacturer's specifications for the life of the project (section VIII.E.).

During the audit period the District agreed to make these changes to the contract language.

Required Actions: Revise the District's current boilerplate contract used to obligate the Year 8 Carl Moyer Program and match funds to include all of the minimum requirements in the 2005 Guidelines. Submit a revised copy of the boilerplate contract to the ARB. Amend the Year 8 contracts that have already been executed to include all of the minimum requirements. The District's written response should include a timeline for completing these required actions. Upon completion, the District shall provide the ARB with written notification of completion.

Finding 5: The District did not follow all of its contract requirements for Years 5 and 6 projects.

Condition: The District's boilerplate contract language for Years 5 and 6 included requirements that went over and above the approved 2003 Carl Moyer Program Guideline requirements. However, the District did not always follow these requirements. These requirements are as follows:

- The District contract requires quarterly reports during the project completion stage of the contract. The District has discussed the elimination of the quarterly reports requirement with contracted engine owners and is currently preparing an amendment to each grant agreement deleting the quarterly reporting requirement.
- The District contract requires documentation of meeting insurance requirements. Since including these insurance requirements, the District realized they were beyond what is necessary to recoup funds in the event of the loss of the engine(s) and beyond the capacity of small businesses. The insurance documents from large businesses and statements of self insurance from public agencies have been placed in the project files. For Year 8 the District reduced the insurance requirements to require insurance for just the engines and the documentation is being provided.

- The District contract requires documentation of the disposition of the old engine. Several files did not include this documentation.

Required Actions: The District should consult with their legal counsel on whether or not the contracts must be amended to reduce the insurance requirements to accommodate small businesses. The District shall submit a copy of that legal opinion to the ARB along with the District's plan to implement their counsel's recommendation. The District should maintain documentation of the disposition of the old engine(s) in the District's hard copy file for each project.

ATTACHMENT 1

Ventura County Air Pollution Control District
2006 Carl Moyer Program Audit
List of Projects Reviewed

Contract Number	Project Name	Source Category	File Review	Site Visit
Year 5				
VCBUG-03-03	Southland Sod	On-Road	X	X
VCCMP-03-08	Southland Sod	On-Road	X	X
VCCNGIP-01-01*	Ventura Unified	Infrastructure	X	X
VCCMP-04-06	Cal-Fran Engineering	Off-Road	X	X
VCCMP-04-07	Cal-Fran Engineering	Off-Road	X	X
VCBUG-03-01	Vanguard	Marine	X	X
VCCMP-04-02	Barbara H	Marine	X	X
VCCMP-04-05	Sinbad	Marine	X	X
VCCMP-03-10	J.D. McGrath	Ag Pump	X	X
VCCMP-04-10	Rocking T Ranch	Ag Pump	X	X
Year 6				
VCCMP-06-04-08	Engineering Camarillo	Off-Road	X	X
VCCMP-06-04-04	Triton	Marine	X	X
VCCMP-06-04-06	Spector	Marine	X	X
VCCMP-06-04-07	Outer Banks	Marine	X	X
VCCMP-06-04-03	J. H. Gill Ranch Inc.	Ag Pump	X	X
VCCMP-02-01**	Harrison Industries	Infrastructure	X	X
VCCMP-06-04-02	Nauman Ranch	Ag Pump	X	
Years 5 & 6 Earned Interest				
VCCMP-08-05-01**	Harrison Industries	On-Road	X	
Year 8				
VCCMP-08-06-06	Reveille	Marine	X	
VCCMP-08-06-01	Harrison Industries	On-Road	X	

*School Bus Program-funded
**Ineligible Projects

Ventura County
Air Pollution
Control District

669 County Square Drive
Ventura, California 93003

tel 805/645-1400
fax 805/645-1444
www.vcapcd.org

Michael Villegas
Air Pollution Control Officer

August 16, 2006

Ms. Catherine Witherspoon
Executive Officer
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812-2815

Response to the Air Resources Board (ARB) Audit of the Ventura County Air Pollution Control District's Implementation of the Carl Moyer Air Quality Standards Attainment Program (Carl Moyer Program).

Dear Ms. Witherspoon:

During the period from May 8, 2006, through May 12, 2006, ARB conducted an audit of the District's Carl Moyer Program. I appreciate your comments concerning the professionalism of my staff and the overall quality of our Carl Moyer Program implementation.

Since that audit, my staff has either implemented the actions necessary to correct findings or developed a plan of action for implementing the corrective actions required. The written plan of actions taken or proposed, Attachment 1, provides a response to each of the five audit findings. Attachments 2 through 10 provide details of the actions taken or proposed.

If you have any questions regarding our response to the audit findings, please contact me at 805/645-1440 or have your staff contact Jerry Mason at 805/645/1479.

Sincerely,

Michael Villegas
Air Pollution Control Officer

Attachment 1 - Response to Audit Findings
Attachment 2 - Original project funding, obligations, and expenditures for Phase 3
Attachment 3 - Revised project funding, obligations, and expenditures for Phase 3
Attachment 4 - Revised final report for Phase 3
Attachment 5 - Original project funding, obligations, and expenditures for Phase 4
Attachment 6 - Revised project funding, obligations, and expenditures for Phase 4
Attachment 7 - Revised final report for Phase 4
Attachment 8 - Revised boilerplate grant agreement
Attachment 9 - Disclosure statement for existing grants
Attachment 10- Disclosure statement for new applications

printed on recycled paper

CARB Audit of VCAPCD Carl Moyer Program
Response to Audit Findings
August 16, 2006

Finding 1: **The District funded two ineligible projects.**

Response: The finding should have stated, "The District funded one ineligible project and a second project, which included funding for five ineligible vehicles." The second project also included a fueling infrastructure component that was eligible for funding. As stated in the condition, the District has already repaid and reprogrammed the funds to a project that the District paid for with local, non-Carl Moyer funds.

As directed in the required actions, the District reviewed all program project files. As a result of the review, staff determined two projects, one in Phase 3 and one in Phase 4, included funding for a total of ten (10) vehicles, which were ineligible for funding. Three (3) of those vehicles have been completed. The District will pay, $119,198, for those vehicles with local, non-Carl Moyer funds and add those funds to Phase 8 of the Program. Work on seven (7) of the vehicles has not yet begun. The project proponent has signed an amendment cancelling funding, $280,000, for those vehicles. The funds, $105,568 from Phase 3 and $293,630 from Phase 4, will be moved to Phase 8 and used to fund projects, which meet the guidelines for Phase 8.

Attachment 2 shows the original project funding, obligations, and expenditures for Phase 3 of the Carl Moyer Program. Attachment 3, the revised project funding, obligations, and expenditures for Phase 3 of the Carl Moyer Program, shows that $287,494 ($105,568 from VCCMP01-01 and $181,926 from VCCMP02-01) in Air Resources Board (ARB) project funding and $25,628.44 (from VCCMP02-01) in match funds has been reprogrammed to Phase 8. Attachment 3 also shows that the remaining project funding, both ARB and match, has been obligated and expended. Attachment 4 is a revised final report for Phase 3.

Attachment 5 shows the original project funding, obligations, and expenditures for Phase 4 of the Carl Moyer Program. Attachment 6, the revised project funding, obligations, and expenditures for Phase 4 of the Carl Moyer Program, shows that $201,127 (from VCCMP02-13) in ARB project funding and $92,503 (from VCCMP02-13) in match funds has been reprogrammed to Phase 8. Attachment 6 also shows that the remaining project funding, both ARB and match, has been obligated and expended. Attachment 7 is a revised final report for Phase 4.

The finding states, "District staff must provide the ARB with revised final reports for all affected years." As stated above, the revised reports for Phases 3 and 4 are attached; however, the final report for Phase 8 cannot be provided until the funds are obligated and expended. The final report for Phase 8 will be provided on or before the scheduled due date of June 30, 2008.

Finding 2: There was no documentation of notification of incomplete applications.

Response: District staff has rarely determined that a Carl Moyer grant application was incomplete requiring written notification to the project proponent/applicant. In an effort to expedite the application and approval process and gain the benefit of the emission reductions resulting from project implementation, District staff has met with the project proponent and assisted with completion of the application. There are a very few incomplete letters in the electronic project files. Those letters have been printed and placed in the proper file. In the future, if staff determines an application is incomplete and the errors and/or omissions cannot be corrected in a short meeting with the project proponent, an incomplete letter will be prepared, printed, and placed in the appropriate file.

Finding 3: The District's project selection process was not fully documented.

Response: District staff is preparing a policies and procedures manual, which will include a detailed explanation of the selection process. The policies and procedures manual will be completed prior to November 15, 2006. Each year, staff will prepare a "Project Selection" file, which details the selection process and how that process complies with the policies and procedures.

Finding 4: Minimum contract requirements for projects funded with Year 8 funds were not included in the District's new contract.

Response: Amendments to the existing grants and a disclosure statement have been mailed to the project proponents for signature. ARB will be notified when the amendments have been signed and incorporated into the grant agreements. The boilerplate grant agreement, Attachment 8, includes all the minimum requirements in the 2005 guidelines except the disclosure statement. Additions are noted in double underline format. The disclosure statement for existing grants, Attachment 9, will be used for grants approved by our Board on March 14, 2006. The disclosure statement for new applications, Attachment 10, will be a part of the project application. Since the project application is included as a part of each grant agreement approved for funding, the disclosure statement will become a part of the grant. The revised application and grant agreement will be used for any new projects funded with Phase 8 funds.

Finding 5: The District did not follow all of its contract requirements for Years 5 and 6 projects.

Response: The grants for years 5 and 6 have been amended to change reporting requirements to annual and to change insurance requirements to the amount needed to cover the cost of the engine(s). The required insurance documentation is being gathered.

The District's legal counsel has contacted the appropriate ARB legal counsel to discuss the statement in the findings that a legal opinion is required. The District is fully prepared to amend the grant agreements in order to reduce the insurance requirements for small business grantees. However, the District and its attorney, the Ventura County Counsel's Office, are still awaiting a response from the CARB legal office justifying the audit's recommended action of submitting a Ventura County Counsel legal opinion on the insurance issue to CARB. After the District and its counsel has received and reviewed this response from CARB's legal office, the District will be in a position to complete its amendments to the grant agreements.

The only documentation of disposition of replaced engines was for marine engines exported out of the United States. Documentation of the engine exports is being gathered and placed in the project files. Beginning with grants awarded in 2006 and after, all engines must be destroyed by burning an irregular hole in the block. As allowed in the guidelines, documentation of the engine destruction is maintained in the electronic file for the project.

Attachments 2 through 10 of the Ventura County APCD August 16, 2006 letter to ARB are available on ARB's website at:

www.arb.ca.gov/msprog/moyer/audits/2006/ventura.htm

Ventura County
Air Pollution
Control District

669 County Square Drive
Ventura, California 93003

tel 805/645-1400
fax 805/645-1444
www.vcapcd.org

Michael Villegas
Air Pollution Control Officer

August 31, 2006

Ms. Catherine Witherspoon
Executive Officer
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812-2815

Subject: Air Resources Board (ARB) 2006 Audit of the Ventura County Air Pollution Control District's (District) Implementation of the Carl Moyer Air Quality Standards Attainment Program (Carl Moyer Program).

Dear Ms. Witherspoon:

During the period from May 8, 2006, through May 12, 2006, ARB conducted an audit of the District's Carl Moyer Program. ARB's letter of July 13, 2006, provided the audit results or findings to the District and stated that the District had until August 21, 2006, to respond to those findings. The District's letter of August 16, 2006, responded to most of those findings. The District's response to Finding 5, "The District did not follow all of its contract requirements for Years 5 and 6 projects," was incomplete because the District's legal counsel was awaiting a response from ARB legal staff regarding certain legal issues related to the audit findings and recommendations. Now that the response from ARB legal staff has been received and read, this letter completes the District's response to ARB Audit Finding 5.

Finding 5 included a requirement/recommendation that the District's response include a legal opinion from the District's legal counsel concerning amendment to the existing Carl Moyer Program grants to revise insurance requirements. The District's August 16, 2006 response to Finding 5 included the following statement:

> The District's legal counsel has contacted the appropriate ARB legal counsel to discuss the statement in the findings that a legal opinion is required. The District is fully prepared to amend the grant agreements in order to reduce the insurance requirements for small business grantees. However, the District and its attorney, the Ventura County Counsel's Office, are still awaiting a response from the CARB legal office justifying the audit's recommended action of submitting a Ventura County Counsel legal opinion on the insurance issue to CARB. After the District and its counsel has received and reviewed this response from CARB's legal office, the District will be in a position to complete its amendments to the grant agreements

Based upon the ARB legal staff's response to the District's legal counsel, the District is not required to provide a formal legal opinion that insurance requirements included in the revised and future Carl Moyer grant contracts are adequate. The purpose of this letter is to inform you that the County Counsel's Office has read and reviewed current Carl Moyer grant contract

printed on recycled paper

language and has determined that sufficient insurance provisions/requirements are incorporated and are fully enforceable and that existing contracts can be amended to incorporate the current Carl Moyer grant contract/insurance language.

If you have any questions regarding our response to the audit findings, please contact me at 805/645-1440 or have your staff contact Jerry Mason at 805/645/1479.

Sincerely,

Michael Villegas
Air Pollution Control Officer

CC: Lucina Negrete, Manager; Alternative Strategies Section; California Air Resources Board
Carl Moyer Phase 8 File

Appendix D

Sacramento Metropolitan AQMD
Carl Moyer Program Audit Results

Appendix D
Table of Contents

ARB Letter to Sacramento Metropolitan AQMD Announcing Audit Results..... D-1
ARB Audit Report..... D-3
Sacramento Metropolitan AQMD Response D-19

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

August 23, 2006

Mr. Larry Green
Air Pollution Control Officer
Sacramento Metropolitan Air Quality Management District
777 12th Street, 3rd Floor
Sacramento, California 95814

Dear Mr. Green:

As you know, the Air Resources Board recently conducted a review of your Carl Moyer Program as a part of our program oversight responsibility per state law [Health and Safety Code section 44291(d)]. We appreciate the professionalism and cooperation of your staff during the audit.

Our report is enclosed. Generally speaking, we found that the District operates an excellent program. The District efficiently and effectively obtains surplus emission reductions through the purchase of cleaner diesel engines for construction equipment and agricultural irrigation pumps. Our four critical findings are limited to administrative issues which the District has agreed to rectify. Per ARB's audit guidelines, the District has 30 days (until September 23, 2006) to submit a written plan of action to address the required actions in the audit report. Also per the guidelines, if the District does not act its Carl Moyer Program will be deemed "at-risk" and additional oversight from ARB may be required. Our audit report and your written responses are public and will be included in the annual Carl Moyer Program update to our governing board in January 2007. We encourage the District to make this information locally available as well.

If you have any questions about the audit, please contact me at (916) 445-4383 or contact Mr. Robert Cross, Chief, Mobile Source Control Division, at (626) 575-6807.

Sincerely,

/s/

Catherine Witherspoon
Executive Officer

Enclosure

Printed on Recycled Paper

cc: Ms. Barbara Lee
Air Pollution Control Officer
Northern Sonoma Air Pollution Control District
150 Matheson Street
Healdsburg, California 95448

Ms. Diana C. Anthony, CPA
Auditor/Evaluation Manager
Department of Finance
915 L Street
Sacramento, California 95814

Ms. Jennifer Arbis
Auditor/Evaluation Supervisor
Department of Finance
915 L Street
Sacramento, California 95814

Mr. Larry Sherwood
Sacramento Metropolitan Air Quality Management District
777 12th Street, 3rd Floor
Sacramento, California 95814

Mr. Robert H. Cross, Chief
Mobile Source Control Division

Carl Moyer Air Quality Standards Attainment Program
Audit Report

Sacramento Metropolitan Air Quality Management District
Fiscal Years 2002/2003 and 2003/2004

Prepared by:
Mobile Source Control Division
Air Resources Board

August 2006

TABLE OF CONTENTS

Executive Summary 1

I. Background 3

II. Audit Procedure 4

III. SMAQMD's Implementation of the Carl Moyer Program 5

IV. Commendable Efforts 7

V. Recommendations for Future Program Improvements 9

VI. Findings, Concerns and Required Actions 10

Attachment 1: List of Projects Reviewed

Executive Summary

The Carl Moyer Air Quality Standards Attainment Program ("Carl Moyer Program" or "Program") is a voluntary grant program that funds the extra capital cost of cleaner than required vehicles and equipment in order to reduce air pollution. The Carl Moyer Program is implemented through a partnership between the Air Resources Board (ARB or the Board) and the 35 local air districts. The ARB distributes state funds to local districts, develops statewide guidelines, and has oversight responsibility. The air districts select and pay for clean air projects in their local area that meet the requirements of the Health and Safety Code and the statewide guidelines. Districts also provide local match funds and resources to administer the Program.

The Sacramento Metropolitan Air Quality Management District's (SMAQMD or "District") is responsible for air quality in Sacramento County. The SMAQMD administers the Carl Moyer Program for all the districts in the Sacramento Federal Ozone Non-attainment Area which includes the Yolo-Solano Air Quality Management District, the El Dorado County Air Quality Management District, and the Placer County Air Pollution Control District. Sacramento region's air quality does not meet federal or California health-based standards for ozone (smog). Emission reductions from the Carl Moyer Program are reflected in the region's federally required State Implementation Plan – their road map for describing how the region will achieve healthful air.

Over the past eight years, ARB has provided the Sacramento region with over $21.5 million in Carl Moyer Program funds. The SMAQMD has leveraged the state dollars with $7.4 million in local funds. The majority of the region's Carl Moyer Program funds have been used to pay for new cleaner replacement engines for agricultural pumps and construction equipment. To date, all of the Carl Moyer Program funds from Years 1 through 7 have been obligated (promised to projects by contract). The Carl Moyer Program funds from Years 1 through 6 have been expended on projects and have funded 1,059 cleaner engines, reducing smog-forming nitrogen oxides (NOx) emissions by 3,169 tons and diesel particulate matter (PM) by 130 tons over the life of the projects with an average cost-effectiveness of about $6,700 per ton of NOx.

As part of ARB's oversight authority, ARB staff audited the SMAQMD's implementation of the Carl Moyer Program to ensure compliance with state law and ARB's applicable program guidelines. The audit focused on the 2002/2003 and 2003/2004 fiscal year funds (Years 5 and 6, respectively). ARB staff also reviewed the District's implementation of fiscal year 2004/2005 and 2005/2006 (Years 7 and 8, respectively) funds to determine whether the District is complying with the requirements of the expanded program and the 2005 Carl Moyer Program Guidelines approved by the Board in November 2005.

The audit found that the District implements an efficient and effective Carl Moyer Program that for the most part meets the requirements of the Health and Safety Code and the applicable Carl Moyer Program Guidelines. As a result of the

audit, ARB is making four findings that require action from the District. These findings are limited to administrative issues which the District has agreed to rectify. All projects reviewed during the audit met eligibility requirements and achieved real emission reductions in a timely manner.

The District is frequently at the forefront of improvements to the Carl Moyer Program and pioneered many of the administrative enhancements in the 2005 Guidelines, such as pre- and post- inspections and scrapping of the old engine. The District's success can be directly linked to their long term commitment to the Program. The District subsidizes the administration of the Program and leverages staff and outreach from locally funded incentive programs to ensure a high level of customer service and quality assurance. In addition, the District has served as a resource for other local districts by providing advice and mentoring.

I. Background

The Carl Moyer Program is a grant program that funds the incremental cost of cleaner-than-required engines, equipment, and other sources of pollution providing early or extra emission reductions. The Carl Moyer Program can also accelerate the development and commercialization of advanced emission control technology, accelerate the turnover rate of old equipment to newer and cleaner equipment, and help reduce costs to the regulated community. The Carl Moyer Program is implemented by a partnership of ARB and local air districts. The local districts have the responsibility of implementing the local Carl Moyer Program by soliciting applicants and selecting, funding and monitoring projects, while the ARB has the responsibility of overseeing the statewide program to ensure funds are expended as required by the Health and Safety Code and the Carl Moyer Program Guidelines (www.arb.ca.gov/msprog/moyer/guidelines/current.htm). ARB has the authority to audit each district's implementation of its local Carl Moyer Program to ensure funds are expended as required. In addition, the audits provide ARB with a mechanism for identifying potential improvements to the statewide program.

The ARB's audit of the SMAQMD's Carl Moyer Program satisfies the requirements of Health and Safety Code section 44291 with regard to ARB's audit responsibilities. While the SMAQMD has administered the Carl Moyer Program since the Program's inception, this audit focuses on Year 5 and Year 6 projects that the District paid for with Proposition 40 funds, California's Clean Water, Clean Air, Safe Neighborhood Parks and Coastal Protection Act (Public Resources Code section 5096.650). ARB reviewed the District's program for Years 5 and 6 to determine if the District followed the Health and Safety Code as well as the 2003 Carl Moyer Program Guidelines, the required Guidelines for these two program years.

This audit also reviewed the status of the District's implementation of Year 7 and Year 8 funds. These years mark the expansion of the Carl Moyer Program, when SB 1107 and AB 923 went into effect and the Program experienced a significant influx of funding. Although Years 7 and 8 funds are not required to be fully expended until June 30, 2007 and June 30, 2008, respectively, ARB staff reviewed the implementation of these funds to evaluate the impacts of the expanded program and the 2005 Carl Moyer Program Guidelines.

Staff from both the ARB and SMAQMD participated in this audit. The ARB audit team included ARB management - Jack Kitowski, Edie Chang, Lucina Negrete, and John Kato - and ARB's Carl Moyer Program staff - Johanna Levine (district liaison to SMAQMD), Bruce Tuter, Elise Keddie, Dave Salardino, Stacey Dorais, and Nicole Kemena. The ARB audit team wishes to thank the participating SMAQMD management and staff - Larry Greene, Larry Sherwood, Mike Neuenburg, Colleen O'Hara, Gary Bailey, Mike Sinkevich, Sandy Rosemont, Margaret Jordan, Joanne Chan, Roger Borkenhagen, and Patrick Robinson.

II. Audit Procedure

ARB's audit of SMAQMD's Carl Moyer Program was conducted in two phases: 1) a desk review and 2) an on-site review. The desk review began on May 15, 2006 and the on-site review began on June 26, 2006.

The desk review included a review of the District's application, policies and procedures, contract language, outreach, and selection process of projects for Years 5 and 6. During the desk review ARB staff also analyzed the District's implementation of the expanded Carl Moyer Program by reviewing the same documents for Years 7 and 8. The following documents were reviewed to determine if the District is following the new administrative procedures with their Year 8 funds as required in the 2005 Carl Moyer Program Guidelines:

- Annual Reporting Survey
- Engine Inspection Forms
- Boiler Plate Contract Language for Year 8 projects
- District Application

The desk review also included selecting a sample of Carl Moyer Program projects for the file review that would take place as part of the on-site review. The sample was taken from projects that were paid for with state funds and District local match funds under the Carl Moyer Program and included:

- Seven Year 5 projects representing projects in the on-road, off-road, and agricultural pump source categories, and one infrastructure project (funded with match funds)
- Eight Year 6 projects representing projects in the on-road, off-road, and agricultural pump categories and one additional on-road project (funded with match funds). One project was partially funded with funds from Year 5 and Year 6 and another was partially funded with funds from Year 6 and Year 7.

While at the District's office, ARB staff randomly selected four additional projects: one to verify that the District's files were maintained consistently, one to evaluate the district's implementation of Year 7 funds, and two Year 8 projects to assess the District's implementation of the additional requirements in the 2005 Carl Moyer Program Guidelines.

The ARB audit team completed a review of the program and fiscal files for these 19 projects. Field visits were only conducted for the 15 originally selected projects. To provide District staff with sufficient time to set up the field visits, ARB staff notified District staff of the 15 originally selected projects on June 20, 2006. Attachment 1 contains a list of the sampled projects reviewed.

During the on-site review, the ARB audit team also reviewed fiscal files to document the District's practices for processing payments and for tracking and expenditure of in-kind match and earned interest.

The results of this audit are presented below. Section III provides a description of the SMAQMD's implementation of the Carl Moyer Program. Section IV includes a description of the District's commendable efforts. Section V outlines recommended program improvements for the District's continued success. Section VI provides the findings, conditions and required actions based on the ARB audit team's review of the District's files and project site visits. "Findings" are brief descriptions of practices that are inconsistent with state requirements under the Carl Moyer Program Guidelines and/or the District's written policies and procedures, including its contract with the engine owners. "Conditions" are more detailed descriptions of the practices the ARB audit team observed during the audit period. "Required Actions" are the minimum actions the District must take to remedy the findings. The District must respond to the findings detailed in Section VI within 30 days of notification, but may respond to any recommendation provided in this report.

III. SMAQMD's Implementation of the Carl Moyer Program

The SMAQMD manages the Carl Moyer Program for the Yolo-Solano Air Quality Management District, the El Dorado County Air Quality Management District, and the Placer County Air Pollution Control District, providing all match funds and administration. Over the eight years of implementing the Program, the District has developed strong, professional relationships with local engine and vehicle dealers who provide outreach to the engine owners. The District uses the Internet to provide additional outreach, making their application and policies and procedures available for download from the District's web page at all times. The District also includes information on the Carl Moyer Program in its Clean Technology Forum (circulation over 3,400) which includes everyone who has applied for funding in the past and anyone who requests to be added to the distribution list. The District also organizes presentations on new technologies, ARB rules, and incentive funding through their Clean Technologies Forum workshops and other meetings.

The District administers their program on a first-come-first served basis with no quotas or set aside allocations for particular source categories. Applications are accepted on a rolling basis; if the District has run out money for the current fiscal year they will hold applications until they receive the next grant award from ARB. The District operates its Carl Moyer Program in conjunction with their locally funded Sacramento Emergency Clean Air and Transportation (SECAT) program, sharing staff and outreach efforts. This provides additional resources to the Moyer Program. The District's Carl Moyer Program funds are spent mainly on agricultural equipment, agricultural pumps, and off-road projects and the SECAT funds are spent primarily on on-road heavy-duty diesel vehicles.

To keep their incentive programs streamlined, the District uses one application and contract for both the Carl Moyer Program and SECAT. Once the District receives an application, staff checks the application for completeness, determines project eligibility, calculates each project's cost-effectiveness, and conducts a pre-inspection. The District provides funding based on operation within the five county Sacramento Federal Ozone Nonattainment Area and funds the full incremental cost of the project if it meets the cost-effectiveness limit. The Air Pollution Control Officer has authority to sign contracts for participants whose total Moyer funding is less than $250,000; for participants whose total funding (over all years) is $250,000 or greater, District staff must present the contracts to SMAQMD Board of Directors for approval.

AB1390 (Firebaugh) requires that 50 percent of Carl Moyer Program funds in districts with a population of more than one million are spent in environmental justice areas. The SMAQMD uses U.S. Census Bureau census tracts to geographically define AB 1390 qualifying areas. The District assumes Moyer all funds allocated to the District are subject to the requirements of AB 1390 and identifies qualifying census tracts in all air districts for which they administer funds. Qualifying areas are those that meet the District's definition of a low-income community or a community of color, or an area within 1,000 feet of a qualifying area. The SMAQMD assumes that all qualifying areas suffer a disproportionate impact by either regional or localized pollution because ozone is a regional pollution problem and high ozone levels may occur many miles downwind from the pollution source. In Years 4 through 6, approximately 60 percent of the SMAQMD's Carl Moyer Program allocation was spent in AB1390 qualifying areas. The SMAQMD's guidance for implementing the requirements of AB1390 and qualifying areas may be found at http://www.airquality.org/mobile/moyer/AB1390overview.shtml.

When projects are completed, the engine owner submits a request for payment and an itemized invoice to the District. District program staff review the invoice to ensure the project is complete and invoiced as required and the inspection staff conducts a post-project inspection. District Carl Moyer Program staff approve the invoice for payment and submit a request for payment to the fiscal staff. District fiscal staff review the request for payment, process the request for payment and submit the request electronically to the county auditor-controller for payment. In addition, the fiscal staff submits to the county auditor-controller an accounts payable transmittal, an original invoice (or certified copy), and a copy of the contract.

The District requires annual usage reports from participants and fulfills this requirement by sending out mileage and hour meter usage surveys to engine. These surveys are sent out a minimum of once per year. Engine owners who fail to return the survey are flagged by the District for an on-site audit of the project. The District's contract has specific payback terms based on cumulative usage over the life of the project and the District has pursued action against engine owners for noncompliance.

In the 2005 Guidelines, ARB strongly encourages districts' solicitations of Year 8 and future funds to expand and document outreach and obligation to zero-emission, small business and environmental justice projects (section V.A.). SMAQMD is working with

Pacific Gas and Electric to replace diesel agricultural pumps engine with electric motors. To date, the District has 47 diesel agricultural pump replacements under contract. In addition, the District has the ability to fund electric forklifts. The District treats all companies regardless of size the same and does not actively solicit applications from small business. District staff do work directly with applicants assisting with the application process making it easier for small businesses to participate. In addition, many of the dealers that the District works closely with also provide assistance to owner-operators and small fleets. ARB encourages the District to institutionalize these efforts in the District's policies and procedures manual as well as to document these efforts in its program files for each fiscal year.

In July 2004, ARB conducted a monitoring of the SMAQMD's Year 5 Carl Moyer Program. The results of this monitoring showed that the District used its funding productively, provided adequate outreach, and processed applications in a timely manner. As a result of this monitoring, ARB requested that the District make several improvements to their program: 1) documentation of the District's 15 percent in-kind match, 2) maintain Proposition 40 funds in a separate account from all other Moyer money, 3) not to make final payment on projects prior to installation, and 4) documentation that the applicant was notified of incomplete application within 5 days of receipt as required by the Health and Safety Code section 44288(a). Program improvements recommended to the District included committing their policies and procedures to paper and improving documentation of project eligibility, inspections, and qualifying of environmental justice projects in the hard copy project files. The results of this audit confirmed that the District has made headway in almost all of the required and recommended improvements except for notification of incomplete application within 5 days of receipt and documentation in the project files.

For Years 1 through 6, the SMAQMD funded 1,059 engines, utilizing over $12.7 million of Carl Moyer Program funding. The ARB estimates these projects will reduce NOx emissions by 3,169 tons and PM by 130 tons over the life of the projects. SMAQMD leveraged the Years' 1 through 6 Carl Moyer Program funds with over $5.4 million of District match. Through Year 8, the SMAQMD has been allocated a total of $21.5 million in Carl Moyer Program funds leveraged with over $7.4 million of District match.

IV. Commendable Efforts

The commendable efforts included in this section are noteworthy accomplishments by the District. Commendable efforts are exceptional practices that should serve as a statewide model for the Carl Moyer Program.

A. Quality Assurance/ Quality Control

SMAQMD is dedicated to quality assurance and quality control. The District's process for expending funds ensure that projects, from application to final payment, are examined by several staff and checked for eligibility, completeness, correctness. The

District has developed a comprehensive database which allows the district to track project status, calculate cost-effectiveness, and streamline the project management process. The District employs project engineers whose responsibilities are to review applications and approve projects for funding and inspection staff who are responsible for conducting pre- and post-inspections. This division in project duties provides an additional level of protection from fraud. The fiscal staff verify that funding amounts, invoices and contracts match prior to transmitting request for payment to the county auditor-controller. In addition, in response to the ARB monitoring in 2004, the District has set up separate accounts for each funding cycle to account for each years funding separately. To accomplish this level of quality control, the District has dedicated significant resources to the Program.

B. Leading Program Refinements

In a number of instances SMAQMD is at the forefront of implementing refinements to the Carl Moyer Program that are exceptional and go beyond the requirements in the Carl Moyer Program Guidelines. The SMAQMD implemented pre- and post-inspections of projects prior to the addition of the requirement in the 2005 Carl Moyer Program Guidelines. In addition, SMAQMD required destruction of the baseline engine or participation in an approved remanufacture program prior to the scrap requirement in the 2005 Carl Moyer Program Guidelines. These efforts were documented by including inspection forms in the project files and by taking photos. The District implemented this requirement to ensure reductions obtained were real, and old engines were no longer operated in California. The District has also required annual reporting by applicants and has included a payback provision in their contracts since Year 1.

C. Timely Obligation and Expenditure of Allocation

SMAQMD has made a concerted effort to obligate and expend their funds within the required timeline and is almost always successful. Districts are required to obligate funds to projects by June 30 of the first year and expend funds by June 30 of the second year. Based on ARB's review of SMAQMD's process for expending Years 5 and 6 Carl Moyer Program funds, the District is able to acquire applications, select, and pay for projects in a timely manner. On average, SMAQMD takes approximately 4.5 months to enter into contract with an applicant after the application is submitted. On average the District takes an additional 2 months to expend its funds with invoices authorizing project payments. It typically took 40 days from the District's receipt of the engine owner's request for payment to the date the District staff approved payment. SMAQMD is making similar progress with their Years 7 and 8 Carl Moyer Program funds.

D. Timely Reporting

Districts are required to submit annual reports to ARB to show obligation of funds to projects by June 30 of the first year and final reports that show expenditure by June 30 of the second year. The SMAQMD makes a strong effort to submit complete annual

reports to ARB by the June 30 annual deadline and frequently submits its final reports to ARB ahead of the required deadline.

V. Recommendations for Future Program Improvement

SMAQMD should consider improving the current implementation of the Carl Moyer Program as noted below. A number of these improvements are required starting with Year 8 funds as noted in the corresponding 2005 Guidelines section which are cited in parenthesis. These recommendations do not require a response from the District, although the District may comment on the recommendations in the District's written response.

A. Documentation in Project Files

1. Project Eligibility

During the audit ARB staff observed that the hard copy project files did not consistently include project eligibility information such as cost-effectiveness calculations, documentation of inspection, and environmental justice analysis. The District was able to provide the information upon request. Beginning with Year 8, districts are required to maintain documentation in each of the Carl Moyer Program project's hard copy files of the project's eligibility verification and compliance with program requirements (sections V.D.2 and V.E.). As a result of the audit, the SMAQMD is implementing a functional check sheet to verify that each file contains all necessary documentation. The District has developed operating procedures for storage of digital files and should include the file address for all digital files in the hard copy project file. The District may include their protocols for naming and storage of electronic files in their policies and procedures manual in lieu of identifying file addresses in each hard copy project file.

2. Itemized Invoices

The District receives itemized invoices with the request for payment from participants. It is unclear which items on the invoice the District pays for with Carl Moyer Program funds and which are the responsibility of the applicant. ARB recommends that the District include a clear delineation of the costs reimbursed with Moyer funds and include in their policies and procedures manual their process for making this delineation.

3. Annual Reports

The District sends out annual usage surveys to participants and enters the equipment activity into their database. The District retains the hard copy reports in a separate file organized by year and sorted alphabetically. ARB recommends that the District include this process in their policies and procedures manual. In accordance with the 2005 Carl Moyer Program Guidelines, the District should keep the hard copy reports for three years beyond the term of each project's contract.

4. Case-by-case approval

During the audit, ARB staff reviewed one project file that required a case-by-case approval from ARB. The project file included no documentation of prior approval from ARB and did not include the documentation to substantiate the request for case-by-case evaluation. The District was able to provide documentation to validate the case-by-case approval and ARB was able to confirm approval through an email string. In the future, the District should maintain the written approval of case-by-case projects from ARB and the supporting documentation in the project file for all projects that require a case-by-case approval.

B. Tracking of Interest

The District was able to document the interest earned on Moyer funds for Years 5 and 6 as $43,867.38. The District must determine interest earned on all Moyer funds starting with Year 1 up through Year 8 and provide a plan to ARB on how these funds will be spent in accordance with section VI.E.3 of the 2005 Guidelines. The ARB recognizes that the District's process for determining interest earned on Moyer funds is very staff intensive and time consuming. The ARB recommends that the District set up a separate account with the County of Sacramento so that future Moyer funds can be accounted for separately from other District funds.

C. Invoicing Prior to Contract Execution

During the audit, ARB noted two project files where the itemized invoice was dated prior to full contract execution. Beginning with Year 8, districts are required to include language in their contracts requiring that no work may begin on a project until the contract is fully executed (section VII.B.1); this was not prohibited in Years 5 and 6. ARB recommends that for future projects the District integrate sufficient checks to ensure that work has not begun prior to contract execution.

VI. Findings, Conditions and Required Actions

This section specifies findings, conditions and required actions as a result of ARB's review of SMAQMD's Carl Moyer Program. "Findings" are brief descriptions of practices that are inconsistent with state requirements under the Carl Moyer Program Guidelines and/or the District's written policies and procedures, including its contract with the engine owners. "Conditions" are more detailed descriptions of the practices the ARB audit team observed during the audit period. "Required Actions" are the minimum actions the District must take to remedy the findings. The District must provide ARB with a written response to required actions by submitting a plan to remedy the respective findings listed below or will be "at-risk" as defined in section XI.B. of the Guidelines. The District's written response must be submitted to ARB within 30 days of notification of the findings.

Finding 1: No documentation of notification of incomplete application.

Condition: In files with incomplete applications, there was no documentation of the District informing the applicant that their application was incomplete. The notification of an incomplete application must be dated within five days of receipt of the application [Health and Safety Code section 44288(a)].

Required Actions: The District must include documentation in the hard copy project file of actions taken to notify an engine owner that their application is incomplete. The 2005 Carl Moyer Program Guidelines state that this notification must be in writing (section V.D.1) and must clearly state what is required to make the application complete. The District has agreed to send boiler plate letters to the applicants who submit incomplete applications and will provide the template in their policies and procedures manual.

Finding 2: Minimum contract requirements for projects funded with Year 8 funds were not included in the District's new contract.

Condition: The contract template language (between the District and engine owners) used to obligate Year 8 funds, does not include a number of the minimum requirements outlined in the 2005 Carl Moyer Program Guidelines. The specific requirements that were not included in the boilerplate contract are outlined below with the Guideline citations in parenthesis.

- Specifically stating that no work may begin until the contract is fully executed (section VIII.B.1.)
- Payment terms requiring itemized invoices for all source categories and project types and clarifying that payments shall be made directly to the engine owner only if the invoice has been paid and the payment is a reimbursement (section VIII.C.2.)
- A disclosure of funds statement for the owner to complete and sign (section VIII.C.3.)
- Statement in contract requiring a working hour meter for the term of the contract (section VIII.E)
- Statement requiring the participant submit annual reports to the District (section VIII.K)

During the audit period the District agreed to make the first four changes to the contract language. The District's policy of requesting the annual report information from the participant at a minimum of once per year is functionally equivalent to the contract reporting requirements missing in the last bullet. The District has agreed to document this policy in their policies and procedures manual.

Required Actions: Revise the District's current boilerplate contract used to obligate the Year 8 Carl Moyer Program and match funds to include all of the minimum requirements in the 2005 Guidelines. Submit a revised copy of the boilerplate contract to the ARB. Amend the Year 8 contracts that have already been executed to include all of the minimum requirements. The District's written response should include a timeline for completing these required actions. Upon completion, the District shall provide the ARB with written notification of completion.

Finding 3: Minimum application requirements were missing from Year 8 applications.

Condition: The District's Year 8 applications were missing some items required in the in the minimum application requirements of each source category in the 2005 Carl Moyer Program Guidelines. These items include, but are not limited to, percent operation in California, percent operation in District, ARB Executive order number or engine family, project life, name of person filling out application, and several items specific to particular source categories.

Required Action: The District uses the same streamlined application for almost all of the incentive projects as a pre-screening tool to determine project viability and does significant follow up with the applicant and engine dealers to retrieve additional information specific to each project. The District has proposed to use a supplemental application form for unique projects. For those projects with equipment that are subject to an ARB in-use regulation, the District should incorporate a check sheet to verify project eligibility as part of the supplemental application. ARB is requiring the District incorporate the following items on their application:

- Percent operation in California
- Name of person who filled out application
- For electric agricultural pump projects: Applicant participating in the Ag ICE program and/or currently under Moyer contract

In addition, ARB is requiring that the District have available in their hard copy project files all information requested in the specific minimum application requirements for each source category.

Finding 4: The District did not follow all of its contract requirements for Years 5 and 6 projects.

Condition: The District's boilerplate contract language for Years 5 and 6 included requirements that went beyond the 2003 Carl Moyer Program Guideline requirements. However, the District did not always follow these requirements.

1. Annual Reporting

The District sends out annual usage summary reports for participants to fill out and return to the district in lieu of applicants submitting the annual reports. The District did not request all the information participants are required to submit in the annual reporting requirement of the contract.

2. Disposition of old engine

For repower projects the District contract required documentation of the disposition of the old engine, either by transferring to a factory authorized remanufacture program, destroying the old engine and allowing for inspections, or some other District approved method. Several files did not include this documentation.

Required Actions: In future contracts the District is requiring the participant to maintain records adequate to document this information and the District may request all or some of this information at any time during the term of the contract. The District shall maintain documentation of the disposition of the old engine(s) in the District's hard copy file for future projects.

ATTACHMENT 1

Sacramento Metropolitan Air Quality Management District
2006 Carl Moyer Program Audit
List of Projects Reviewed

Contract Number	Project Name	Source Category	File Review	Site Visit
Year 5				
VET-02-0182	County of Sacramento	Infrastructure	X	X
VET-03-0247-A	Rescue Union School District	On-road	X	X
VET-03-0259	Phil Reome, Inc.	Off-road	X	X
VET-03-0266	Fong Farms	Ag pump	X	X
VET-03-0311	Bullseye Farms	Ag pump	X	X
VET-03-0320	Dan Meier Farms	Ag pump	X	X
VET-04-0005	J.H. Meeks & Sons	Ag pump	X	
VET-04-0015	Knaggs Farming Company LP	Ag pump	X	X
Year 6				
VET-03-0114	Elk Grove Unified School District	On-road	X	X
VET-04-0046	J.H. Meeks & Sons	Ag pump	X	X
VET-04-0058	AWR Partnership	Ag pump	X	X
VET-05-0012	Raminder Mains	Ag pump	X	X
VET-05-0022	Joe Muller & Sons	Off-road	X	X
VET-05-0037	F.C. Allen LTD*	Off-road	X	X
VET-05-0065	Tigerlines LLC**	On-road	X	X
VET-05-0083	Teichert Construction	Off-road	X	X
Year 7				
VET-06-0051	Button & Turkovich	Ag pump	X	
Year 8				
VET-06-0058	Klein Farms	Ag pump	X	
VET-06-0106	Daniel B. Hrdy	Ag pump	X	

* funded with year 5 and year 6

** funded with year 6 and year 7

SACRAMENTO METROPOLITAN
AIR QUALITY
MANAGEMENT DISTRICT

Larry Greene
AIR POLLUTION CONTROL OFFICER

September 22, 2006

Catherine Witherspoon
Executive Officer
1001 I Street
Sacramento, California 95812

Dear Ms. Witherspoon:

The audit conducted by the Air Resources Board (ARB) of our Carl Moyer Program identified several areas for enhancing program integrity. We appreciate the insights provided by your audit team because the Moyer Program is something our District has always been very proud of, in part because it was first implemented here. I have a very progressive staff managing this program and they are constantly seeking ways to improve it. The information provided by your audit team will help us make a good program even better.

We appreciate the professionalism and courtesy displayed by your staff during the audit of our program. Our Moyer staff has always had a good relationship with the ARB team which has allowed timely communication on many issues to our mutual benefit.

We were pleased to see that the findings in the audit report were restricted to administrative areas that could be easily corrected to bring the District into full compliance with Carl Moyer Guideline revisions for Year 8. Many of the corrections were initiated immediately upon disclosure of the preliminary audit results. The majority of the remaining changes should be implemented no later than October 16, 2006. There are a few changes that need to be amended into existing contracts which could take up to six months but we believe this is an acceptable timeframe for this effort.

Attachment 1 is a response to each of the findings in the audit report, and a commitment to resolving those issues. Although it was not required, my staff appreciated the recommendations provided in the report and prepared comments in response to them as well.

As a result of the long term and substantial funding increase available for future Moyer projects, benefits of this program will be accrue for many years to come. We look forward to working with you and your staff in an effort to continuously improve the Carl Moyer Program to achieve our air quality goals.

Sincerely,

Larry Greene
Air Pollution Control Officer

Attachment 1
Detailed Response to Each of the ARB Audit Findings of the Sacramento Metropolitan Air Quality Management District Carl Moyer Program

The following provides a detailed response to each of the recommendations and findings outlined in the audit report provided by the Air Resources Board (ARB) of the Sacramento Metropolitan Air Quality Management District (AQMD) Carl Moyer Program.

Regarding the timeline comments on page 8, paragraph C , in the audit report, our timeline goals for future projects, are shown in the following table:

Task	Number of Days
Approval of application upon receipt	5 business days
Pre-inspection appointment	5 business days
Pre-inspection.	10 business days (depending on inspector demand no more than 20 business days)
Contract Execution:	10 business days (upon receipt of contract signed by applicant Usually obtained in person after successful pre-inspection)
Project funding approval:	immediately after contract execution (applicant is contacted that original contract is being mailed via certified mail and commitment can be made to purchase approved technology.)
Project completion:	30 – 60 days. After 90 days if projects is not completed a follow-up call is made to determine status, then every 30 days thereafter
Project post inspection:	10 business days (depending on inspector demand no more than 20 business days)
Project Funding:	4-6 weeks upon receipt of final dealer invoices from applicant

The timeline associated with establishing a contract with an applicant when funding is available does not exceed 20 business days once the contract has been signed by the applicant and a successful pre-inspection has been performed. Our goal is to complete the contract within10 business days upon receipt of the original contracts signed by applicant. However, the average is 13 business days.

The dates in the files reviewed by ARB depicting lengthy responses or approval of funds were associated with gaps in the availability of grants between funding cycles. When operating a program on a "first come, first served" basis, it is difficult to forecast the volume of applications or demand for funding.

Often the SMAQMD has committed their annual funds quickly, only to have to wait several months to petition for additional funds from the next funding cycle.

Response to Recommendations

A. Documentation in Project Files

1. Project Eligibility – The District is implementing a requirement for staff to use a functional check sheet to verify that each file contains all necessary documentation. A copy of this check sheet will be included in the Policy and

Procedures Manual. In addition, the District will include the protocol for file naming and storage of electron c documents in our Policy and Procedures Manual that will be provided to the ARB when the Year 8 Status Report is provided and Year 9 funding is requested around November, 2006.

2. Itemized Invoices – We review items on the invoices from participants which are paid out from Moyer funds. Parts and labor that are needed to make the project a success vary substantially from project to project. However, we will try to develop a methodology and include it in the Policy and Procedures Manual that will describe how the invoice should be reviewed to ensure that payments from the Carl Moyer Program are associated with emission reductions on the project.
3. Annual Reports – The District will include in our Policy and Procedures Manual the procedures for organizing and retaining annual reports for three years after the project ends.
4. Case-By-Case Approval – The District will maintain written approval of case-by-case projects from ARB and any supporting documentation in the project files.

B. Tracking of Interest

The District will determine interest earned on all Moyer funds from Year 1 through year 8 and provide a plan to ARB by November 30, 2006, describing how these funds will be spent in accordance with section VI.E.3 of the 2005 Moyer Guidelines. In addition, the District will set up a separate account with the County of Sacramento to track Moyer funding separate from other District funding.

C. Invoicing Prior to Contract Execution

Beginning with Year 8, the District will include language in our contracts requiring that no work may begin on a project until the contract is fully executed in accordance with section VII.B.1 of the 2005 Moyer Guidelines.

Response to Findings, Conditions and Required Actions

Finding 1: No documentation of incomplete application.

The SMAQMD is adopting a policy to send out letters to applicants asking for missing information. To expedite the process we often contact applicants directly via telephone and fill in the information missing from their application for them.

In response to this concern, when a phone call is placed to obtain information, a note will be included in the project file with the date, contact identification, and the description of the missing information obtained. Additionally, the information will be recorded in the comments section of the database for each applicant that submits an incomplete application.

When a letter is sent requesting missing application information, the letter will indicate that the SMAQMD requires the information in order to determine eligibility for grant funding. A copy of the original letter sent to applicants will be placed in the file.

As a side note, when an application does not have the original initials or signatures, we obtain them in person when we perform the pre-inspection portion of the project evaluation.

Finding 2: Minimum contract requirements for projects funded with Year 8 funds were not included in the District's new contract

The SMAQMD has revised the current boilerplate contract and incorporated all of the missing elements associated with requirements in the new Moyer guidelines and it is under SMAQMD legal review. The revised contract will be provided to the ARB as soon as it is approved by District Counsel, which should be no later than October 16, 2006

The District will send out contract amendments for 8th year Moyer projects that have already been signed using the previous contract. The District anticipates that this process may take up to six months due to the current staff workload and due to the follow up work that may be required to have participants sign off on projects that have already been funded. The District will inform the ARB when this process is complete or if we encounter any difficulties in obtaining the signed contract amendments.

Finding 3: Minimum application requirements were missing from Year 8 applications.

The District will use a supplemental application form for unique projects. For projects that are subject to an ARB in-use regulation, the District will utilize a check sheet to verify project eligibility as part of the supplemental application. Missing information will be added into the application format including the ARB recommended items by October 16, 2006.

- *Percent operation requirement in California*
- Name of person who filled out the application
- For electric agricultural pump projects; whether applicant is participating in the Ag ICE program and/or whether they are currently under a Moyer contract.

The District will have, in the hardcopy project files, all information requested in the specific minimum application requirements for each source category.

Finding 4: The District did not follow all of the contract requirements for Years 5 and 6 projects.

In all future contracts, starting November 1, 2006, the SMAQMD will begin requiring the participant to maintain adequate records to document all required project information and the District will continue to do, at a minimum, annual surveys to collect some or all of this information. In addition, the District will keep the signed surveys for three years beyond the project life. We will modify the annual survey to include all of the information required in the new Moyer guidelines. The SMAQMD database will continue to be updated with this information to enable quick and easy access to an applicant's project information upon demand.

In addition, all future project files will maintain documentation on the disposition of the old engine(s). The District already has the steps in place to maintain consistency in this area.

Appendix E

South Coast AQMD
Carl Moyer Program Audit Results

Appendix E
Table of Contents

ARB Letter to South Coast AQMD Announcing Audit Results E-1
ARB Audit Report..... E-5
South Coast AQMD Response E-23

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

October 2, 2006

Dr. Barry Wallerstein
Air Pollution Control Officer
South Coast AQMD
21865 East Copley Drive
Diamond Bar, California 91765-4182

Dear Dr. Wallerstein:

As you know, the Air Resources Board recently conducted a review of the South Coast Air Quality Management District's Carl Moyer Program. This was part of our program oversight responsibility per state law [Health and Safety Code section 44291(d)]. We appreciate the professionalism and cooperation of your staff during the audit.

Our report is enclosed and our major findings can be summarized as follows. In many areas, including outreach and project diversity, the District operates an exemplary program. However, we have three critical findings that require action. The most serious concern is that the District has not, in the past, expended funds in a timely manner. Approximately $10 million of prior year awards have yet to be expended. This tardiness has delayed the expected emissions reductions for a significant portion of the program. Our second critical finding relates to the cost-effectiveness calculations for two projects. The third finding has to do with missing contract language requirements. We understand that the District has taken steps to remedy all of these issues and we appreciate those efforts.

As a formality I need to remind you that ARB's audit guidelines give the District 30 days from the date of this letter to submit a written plan of action to address the findings in the audit report. Also per the guidelines, if the District does not act, its Carl Moyer Program will be deemed "at-risk" and additional oversight from ARB may be required.

Our audit report and your written responses are public, and will be included in the annual Carl Moyer Program update to our governing Board in January 2007. We encourage the District to make this information public locally as well.

If you have any questions about the audit, please contact me at (916) 445-4383 or contact Mr. Robert H. Cross, Chief, at (626) 575-6807.

Sincerely,

Catherine Witherspoon
Executive Officer

Enclosure

cc: Ms. Diana C. Anthony, CPA
Auditor/Evaluation Manager
Department of Finance
915 L Street
Sacramento, California 95814

Ms. Jennifer Arbis
Auditor/Evaluation Supervisor
Department of Finance
915 L Street
Sacramento, California 95814

Mr. Chung Liu
Deputy Executive Officer
South Coast AQMD
21865 E. Copley Dr ive
Diamond Bar, California 91765-4182

Mr. Fred Minassian, Manager
South Coast AQMD
21865 E. Copley Drive
Diamond Bar, California 91765-4182

Mr. Mel Zeldin, Director
California Air Pollution Control Officers Association
980 9th Street, 16th Floor
Sacramento, California 95814

Continued next page

cc: Mr. Larry Allen, APCO
California Air Pollution Control Officers Association
3433 Roberto Court
San Luis Obispo, California 93401-7126

Mr. Doug Quetin, APCO
California Air Pollution Control Officers Association
24580 Silver Cloud Court
Monterey, California 93940-6536

Ms. Barbara Lee
Air Pollution Control Officer
Northern Sonoma Air Pollution Control District
150 Matheson Street
Healdsburg, California 95448

Carl Moyer Air Quality Standards Attainment Program
Audit Report

South Coast Air Quality Management District
Fiscal Years 2002/2003 and 2003/2004

Prepared by:
Mobile Source Control Division
Air Resources Board

October 2006

TABLE OF CONTENTS

Executive Summary 1

I. Background 3

II. Audit Procedure 4

III. SCAQMD's Implementation of the Carl Moyer Program 5

IV. Commendable Efforts 7

V. Recommendations for Future Program Improvements 9

VI. Findings, Conditions and Required Actions 10

Attachment: List of Projects Reviewed

Executive Summary

The Carl Moyer Air Quality Standards Attainment Program is a voluntary grant program that funds the extra capital cost of cleaner than required vehicles and equipment in order to reduce air pollution. The Carl Moyer Program is implemented through a partnership between the Air Resources Board and California's 35 local air districts. The ARB distributes state funds to local districts, develops statewide guidelines, and conducts periodic oversight. Air districts select and fund clean air projects in their areas that meet the requirements of the Health and Safety Code and the statewide guidelines. Districts also provide local match funds and resources to administer the Program.

The South Coast Air Quality Management District is responsible for air quality in portions of Los Angeles, Riverside, San Bernardino counties and all of Orange County. The region's does not meet federal or California health-based standards for ozone (smog) or particulate matter (soot) and its air quality is among the worst in the nation. The Carl Moyer Program is critical to achieving near term emission reductions for the region and is reflected in the South Coast's federally-required State Implementation Plan – the District's road map for describing how the region will achieve healthful air.

As the most populous District in California, SCAQMD has been awarded more than $108 million in Carl Moyer Program funds over the first eight years. That is approximately 43 percent of the statewide total. The District has leveraged the state dollars with over $37 million in local funds.

To meet its oversight responsibilities, ARB staff audited SCAQMD's implementation of the Carl Moyer Program to ensure compliance with state law and applicable guidelines. The audit focused on funds provided by Proposition 40, California's Clean Water, Clean Air, Safe Neighborhood Parks and Coastal Protection Act, which cover the 2002/03 and 2003/04 fiscal year funds (Years 5 and 6, respectively). The ARB staff also reviewed Years 7 and 8 to determine if the District is complying with recent law changes and the Carl Moyer Program Guidelines approved by the Board in November 2005.

Our audit found that Proposition 40 funds have not been expended in a timely manner. State law requires all funds to be expended (invoices paid and projects in operation) within a two year timeframe. Approximately half of the Proposition 40 funds were required to be expended by June 30, 2005 and all funds were required to be expended by June 30, 2006. At the time of the audit (July 2006), approximately $10 million of the $15.6 million Proposition 40 funds received by the District had not been expended. As a result approximately two-thirds of the anticipated emission reductions, over 300 tons per year of NOx and approximately 15 tons per year of PM, have not yet been achieved.

District staff indicated that the delay in spending Carl Moyer Program funds is due to several factors: lack of resources for adequate project follow-up, contracts falling through because grantees decide not to take funds, and delays in contract execution. SCAQMD has recently expanded its staff resources dedicated to the Carl Moyer Program and is implementing several new procedures to expedite expenditures. The District also guaranteed the ARB that these funds will be expended by July 2007 and anticipated reductions will be achieved by that time.

Under a strict interpretation of funding guidelines, unspent funds would be returned to the ARB for redistribution or remanded to the State's General Fund. However, the ARB recognizes the importance of achieving emission reductions in California's most severely impacted region. Also, we recognize that the Carl Moyer Program funds are vital to achieving that objective. For its own part, the District recognizes the importance of expediting projects to obtain reductions at the earliest, most practicable date. Therefore all funds promised to projects by contracts will remain in the District.

The District is hereby required to report quarterly on its progress for expenditures. ARB will also conduct a follow-up audit of the District to verify that funds are expended and to confirm that the Districts new measures indeed expedite expenditures. If the funds have not been fully expended by July 1, 2007 then the SCAQMD will be deemed an "at-risk" district, and the ARB will look to recapture funds.

The ARB is making two additional findings as a result of its audit. These findings relate to miscalculations of cost-effectiveness for two projects resulting in the required reprogramming of $10,000 and missing contract language requirements. The District has already taken steps to mitigate or correct these issues.

The ARB's audit also found that the District program encompasses a number of commendable efforts that noticeably go above and beyond the basic Moyer requirements. Most noteworthy is that the District has designed their program to fund the widest diversity of projects in California - achieving significant participation by public and private fleets, construction companies, railyards, port operators, marine operators, and farmers. A necessary corollary to this is that the District has one of the most extensive outreach programs in the State. Finally, the SCAQMD has spent considerable effort in developing a robust Environmental Justice program, and the District ensures that the minimum Environmental Justice requirements are clearly exceeded each year. In these areas, the District's program may serve as a model for the Moyer program in other districts.

The California Department of Finance (DOF) conducted a simultaneous audit of the SCAQMD's administrative process for expenditures of Proposition 40 funds (years 5 and 6) of the Carl Moyer Program and Lower Emission School Bus Program. The ARB staff worked closely with the DOF during its audit to assist with DOF inquiries regarding the statewide Carl Moyer Program. The DOF established and followed independent protocol and procedures for their audit and is currently drafting an audit report that will also be available to the general public upon completion.

I. Background

The Carl Moyer Program funds the incremental cost of purchasing cleaner-than-required engines and equipment. The multiple benefits of the Program include: accelerating the commercialization of advanced emission controls, accelerating turnover of old equipment, and helping to reduce costs to the regulated community. The Carl Moyer Program is implemented by a partnership of the ARB and local air districts. Local districts solicit applicants and select, fund and monitor projects. The ARB oversees the statewide program to ensure funds are expended as required by law and the Carl Moyer Program Guidelines (www.arb.ca.gov/msprog/moyer/moyer.htm). The ARB audits each district periodically to ensure funds are expended as required. The audits also provide the ARB with a mechanism for identifying potential improvements to the statewide program.

The SCAQMD is the largest local air quality district responsible for air quality in portions of Los Angeles, Riverside, San Bernardino counties and all of Orange County. Due to large number of sources such as ports, airports, trucks, passenger vehicles, and railyards, the South Coast region's air quality does not meet federal or California health-based standards for ozone (smog) or particulate matter (soot) and is among the worst air quality in the nation. Emission reductions from the Carl Moyer Program are critical to achieving near term air quality improvements in the region. These reductions are also reflected in the region's federally-required State Implementation Plan – the District's road map for describing how the region will achieve healthful air.

As the District with the largest population, SCAQMD has been awarded more than $108 million in Carl Moyer Program funds for years 1 through 8, approximately 43 percent of the total statewide funds. The District has leveraged the state dollars with over $37 million in local funds.

The ARB's audit of the SCAQMD's Carl Moyer Program satisfies the requirements of Health and Safety Code section 44291 with regard to the ARB's audit responsibilities. This audit focuses on Year 5 and 6 projects that drew on Proposition 40 funds, California's Clean Water, Clean Air, Safe Neighborhood Parks and Coastal Protection Act. The ARB reviewed the District's program for Years 5 and 6 to determine if the District followed the Health and Safety Code as well as the 2003 Carl Moyer Program Guidelines, the required Guidelines for these two program years. This audit also reviewed implementation of Year 7 and 8 funds, when SB 1107 and AB 923 went into effect and the Program experienced a significant influx of funding. Although year 7 and 8 funds are not required to be fully expended until June 30, 2007 and June 30, 2008, respectively, the ARB staff reviewed these funds to evaluate the impacts of the expanded program and the 2005 Carl Moyer Program Guidelines.

Staff from both the ARB and SCAQMD participated in this audit. The ARB audit team included ARB management – Robert Cross, Jack Kitowski, Edie Chang, Lucina Negrete and John Kato - and the Carl Moyer Program staff – Heather Arias (district liaison to SCAQMD), Bruce Tuter, Dave Salardino, Joe Calavita, Susan Levenson-Palmer, Bob

Nguyen, Araliza Manuel, Margaret Sanchez and Jesse Lopez. The ARB audit team wishes to thank the participating SCAQMD management and staff – Barry Wallerstein, Chung Liu, Kurt Wiese, Barbara Baird, Rick Pearce, Fred Minassian, Dean Saito, Elisa Virgo, Dean Hughbanks, Mike Harris, Connie Day, Drue Ramirez, Lani Montojo, Cheryl Wade, Haydee Pearce and Penny Shaw Cedillion.

II. Audit Procedure

The ARB's audit of SCAQMD's Carl Moyer Program was conducted in two phases: a desk review and an on-site review. The desk review began on May 30, 2006 and the on-site review began on July 6, 2006. The desk review included the District's request for proposal (RFP), application, draft policies and procedures, contract language, outreach, and selection process of projects for Years 5 and 6. During the desk review the ARB staff also analyzed the implementation of the expanded Carl Moyer Program by reviewing the same documents for Years 7 and 8. The following documents were reviewed to determine if the District is following the new administrative procedures with their Year 8 funds as required in the 2005 Carl Moyer Program Guidelines:

- Draft Policies and Procedures Manual which describes District practices for Carl Moyer Program Implementation (final version is required to be submitted to the ARB by November 15, 2006 as described in section IV.G. of the Guidelines)
- Year 8 Request for Proposal, including the District application
- Engine Inspection Forms
- Boiler Plate Contract Language for Year 8 projects

The desk review included selecting a sample of projects for the file review that would receive a thorough on-site review. The sample was taken from projects that were paid for with state funds and District local match funds under the Carl Moyer Program and included:

- Ten Year 5 projects, representing the on-road, off-road, marine, and locomotive source categories, and infrastructure (funded with match funds)
- Twelve Year 6 projects, representing the on-road, off-road, marine, locomotive, idle reduction, and forklift categories and infrastructure (funded with match funds)

While at the District's office, the ARB staff randomly selected two additional projects to evaluate the district's implementation of year 7 funds and to assess the District's implementation of the additional requirements in the 2005 Guidelines.

The ARB audit team completed a review of the program and fiscal files for 24 projects. Field visits were conducted for 12 of the projects because only 12 of the 24 projects selected were completed and in operation at the time of the audit. To provide District staff with sufficient time to set up the field visits, the ARB staff notified District staff of the 12 projects with field visits on June 28, 2006. Attachment 1 contains a list of the sampled projects reviewed.

During the on-site review, the ARB audit team reviewed fiscal files to document the District's practices for tracking and documenting state and local match funds expended, interest earned and beginning with Year 7, state funds used for outreach and program administration.

The California Department of Finance (DOF) conducted a simultaneous audit of the SCAQMD's administrative process for expending Proposition 40 funds (years 5 and 6). ARB staff worked closely with the DOF during its audit to assist with DOF inquiries regarding the statewide Carl Moyer Program. The DOF established and followed independent protocol and procedures for their audit and is currently drafting an audit report that will also be available to the general public upon completion.

The results of the ARB audit are presented below. Section III describes the SCAQMD's Carl Moyer Program. Section IV identifies commendable efforts in the District. Section V outlines recommended improvements for the District's continued success. Section VI provides the findings, conditions and required actions based on ARB audit team's review of District's files and project site visits. "Findings" are practices that are inconsistent with state guidelines and/or the District's written policies and procedures. "Conditions" are more detailed descriptions of the practices the ARB audit team observed during the audit period. "Required Actions" are the minimum actions the District must take to remedy the findings. The District must respond to the findings detailed in Section VI within 30 days of notification, but may also respond to any recommendation provided in this report.

III. SCAQMD's Implementation of the Carl Moyer Program

For each funding year, the SCAQMD develops a request for proposal (RFP) with specific dollar amounts allocated to selected equipment categories. The RFP goes to the District's Technical Committee for consideration and, once approved, is forwarded to the District Governing Board for approval. Approved RFPs are posted at http://www.aqmd.gov/tao/implementation/carl_moyer_program_2001.html. Hardcopy format can be obtained at SCAQMD's Diamond Bar facility and applicants can request a copy to be mailed to them by contacting SCAQMD staff. Following the release of the RFP, SCAQMD begins extensive outreach efforts per its Procurements Policy and Procedures. A public notice advertising the RFP and inviting applications is published in the Los Angeles Times, the Orange County Register, the San Bernardino Sun, and the Riverside County Press Enterprise newspapers. Outreach efforts also include workshops, advertising in multiple publications, letters to mailing and e-mail lists, web postings, a 24-hr message line, presentations to groups, and program brochures. The District's RFP outlines eligibility requirements, how to calculate cost-effectiveness, boiler plate contract language, applications and a list of required documentation including a form for the applicant to indicate if it qualifies as a small business or as a Disabled Veteran. Although funds are not specifically set aside to pay for small business projects, SCAQMD will meet with small businesses and work directly with them in completing an application.

The District's RFP states its policy that only alternative fuel projects are eligible for on-road engine repowers and purchase of new on-road vehicles. New on-road diesel purchases or repowers are not funded by SCAQMD. Beginning in Year 7, retrofit of in-use diesel vehicles with the highest available verified level particulate matter traps or diesel oxidation catalysts verified by ARB are allowed. In the off-road categories, both alternative fuel and diesel to diesel projects are eligible. In addition, SCAQMD has implemented a low emission engine/vehicle, zero emission vehicles (ZEV) and other alternative fuels, preference policy.

SCAQMD staff evaluate projects under the Carl Moyer Program Guidelines and any additional requirements specifies in the RFP. In addition, applications are ranked for Environmental Justice (EJ) per AB 1390. A list of eligible projects categorized by equipment type is sorted based on EJ ranking, followed by cost-effectiveness. Selected projects are considered by the Technical Committee and then forwarded to the District Governing Board for approval. Once approved, a contract is executed and work can begin. When projects are completed, the engine owner submits an invoice to the District. District staff ensure the project is complete and invoiced as required. Beginning with Year 7 projects, staff also conduct a post-project inspection. Approved invoices are submitted to the District's Finance Department for check generation and disbursement.

Throughout the term of the contract, the District requires grantees to report quarterly and annually. Quarterly status reports are required until the project has been accomplished and include information on any problems encountered and how they were resolved, changes in schedule, and recommendations for project completion. Once the project is in operation annual reports are required from participants. These reports include information on usage, location of operation, and operation and maintenance issue encountered and how they were resolved.

As an example timeline for this process, the RFP for year 8 funds was released on February 3, 2006. Applications were due to the district approximately three months (May 5, 2006) after the release of the RFP. SCAQMD Technical Committee's consideration of the selected projects is currently scheduled for September 22, 2006. If approved, the project selection list will then be forwarded to the District Governing Board for consideration on October 6, 2006, approximately five months after applications were due. Fully executed contracts should be in place early 2007. Projects must be in operation and paid for no later than June 30, 2008.

Based on the Year 5 and 6, project files reviewed by the ARB staff during the 2006 Program audit of SCAQMD, the average time from application submittal to project completion (invoice paid and project in operation) is 30 months for those projects that have been completed. However as noted in Section VI, two-thirds of the projects have not yet been completed. Part of this delay may be a result of delays in contract execution (contracts signed by SCAQMD and applicant). For SCAQMD, achieving fully executed contracts for Years 5 and 6 took anywhere from two to 25 months.

Once Years 1 through 7 funds are spent, it is anticipated that the District's program will pay for 3,061 cleaner engines. The ARB anticipates these projects will reduce NOx emissions by over 2,800 tons and PM by over 100 tons annually. SCAQMD leveraged Years 1 through 7 funds with over $32 million of District match. Through Year 8, the SCAQMD has been allocated a total of $108.5 million in Carl Moyer Program funds leveraged with over $37.3 million of District match.

IV. Commendable Efforts

The commendable efforts included in this section are noteworthy accomplishments by the District. Commendable efforts are exceptional practices that should serve as a statewide model for the Carl Moyer Program.

A. Diversification of Projects

SCAQMD is dedicated to funding a diversified range of projects. It is notable that the District's project selection is broader than any other district in the state, spanning over all possible source categories (on-road, marine, off-road, forklift, locomotives, agricultural engines, ground support equipment, truck stop electrification and auxiliary power units). This requires SCAQMD to take on a higher burden as staff must be knowledgeable in many more source category areas.

B. Outreach

Outreach efforts for the SCAQMD Carl Moyer Program have proven to be successful as directly reflected in the number of applications received, which for funding Years 5 through 7 exceeded funding available by six times. SCAQMD outreach includes both extensive publications as well as personal outreach. SCAQMD advertises the RFP in multiple publications and local newspapers, conducts workshops, and provides presentations to small businesses and industry organizations. Letters and brochures are also sent to mailing lists, electronic notifications are sent to personal lists and lists compiled from SCAQMD sponsored meetings/conferences, information is posted on SCAQMD's website as well as industry websites and is available through a 24-hr message line.

C. Environmental Justice

Each Year SCAQMD has exceeded the requirements of AB 1390 which requires at least 50 percent of Carl Moyer Program funds be spent in areas that are significantly impacted by air pollution and are low income or communities of color, or both. SCAQMD has defined eligible projects to include those in areas with the highest 15 percent of particulate matter (PM) concentrations, projects in areas with a cancer risk of 1,000 in a million and above, and projects in areas where at least 10 percent of the population falls below the federal poverty level. EJ scores are comprised of 40 percent for poverty level, 30 percent for PM and 30 percent for toxic exposure. It is SCAQMD's policy to first fund projects based on highest AB1390 EJ ranking, until 50 percent of the

funding is earmarked to qualifying projects. After that, funds are continually earmarked to additional projects using the cost-effectiveness ranking. Historically 10-25 percent of these additional projects have also qualified as AB1390 projects, exceeding the District's 50 percent funding requirement on EJ projects. A project's EJ score is filed electronically at SCAQMD and SCAQMD's guidance for implementing the requirements of AB1390 and qualifying areas may be found at http://www.aqmd.gov/tao/implementation/disproportionate_impact_areas.htm.

D. Responsiveness to Audit

During the period of this audit, SCAQMD staff made considerable efforts to address issues identified by the ARB staff. Because of this responsiveness, a number of the items listed under the recommendations and findings sections include information on modifications and improvements the District has already or is in the process of implementing.

E. Policies and Procedures Manual

The 2005 Carl Moyer Program Guidelines require districts to submit their local policies and procedures manual for implementation of their local programs to the ARB by November 15, 2006. The Guidelines also outline minimum information that districts must include in these policies and procedures. During the audit, the District supplied the ARB with a proposed policies and procedures manual for review. The District's effort to submit this to the ARB during the audit period, in advance of the required deadline and before the District received a sample policies and procedures manual from the ARB, is noted as commendable.

V. Recommendations for Future Program Improvement

SCAQMD should consider improving the current implementation of the Carl Moyer Program as noted below. A number of these improvements are required starting with Year 8 funds as noted in the corresponding 2005 Guidelines section which are cited in parenthesis. These recommendations do not require a response from the District, although the District may comment on the recommendations in the District's written response.

A. Documentation

During the audit the ARB staff observed that the hard copy project files did not consistently include cost-effectiveness calculations, documentation of inspection, eligibility determinations and environmental justice analysis. Beginning with Year 8, districts are required to maintain documentation in each of the Carl Moyer Program project's hard copy files of the project's eligibility verification and compliance with program requirements (sections V.D.2. and V.E.).

As a large agency, SCAQMD has departmentalized various tasks. As a result documentation for projects is not always located in the project file. However in every instance, the ARB staff was taken to and able to access necessary documentation. The ARB recommends that SCAQMD incorporate these departmentalized tasks into its *Carl Moyer Program Policies and Procedures Manual* due to ARB by November 15, 2006. SCAQMD is already in the process of accomplishing this task and is on track to present their Policies and Procedures to their Technology Committee for review on September 22, 2006 and forwarded to the SCAQMD Governing Board for consideration at their October 6, 2006 board hearing.

The ARB also found areas in which the District assist small businesses and has established a preference policy for low emission engine/vehicle, zero emission vehicles and other alternative fuels. The ARB encourages the District's solicitations of future funds to expand and document outreach and obligation to zero- emission and small business (section V.A.). The ARB also encourages the District to institutionalize these efforts in the District's policies and procedures manual.

B. Itemized Invoices

The District currently includes invoices in its hard copy project and fiscal files from participant. However, in some cases an itemized invoice is not provided with the participant invoice. There are also cases in which an itemized invoice was provided yet it is unclear which items on the invoices are being paid for with Carl Moyer Program funds. The 2005 Carl Moyer Guidelines (section X.) require all project files to have itemized invoices that clearly delineate eligible expenses the District approves to be paid. The ARB staff recommends the District include the itemized invoice in the project file along with a clear delineation of the costs that were reimbursed with Carl Moyer Program funds. In addition, the practice for this delineation should be included in the District's policies and procedures manual (see Recommendation A. above).

C. Quality Assurance/Quality Control

During the audit, file discrepancies and miscalculations were observed. With the recent expansion of the Carl Moyer Program funding and requirements an increase in quality control/quality assurance of program related documents is also necessary. Therefore, the ARB staff recommends the District develop an approach to ensure quality control/quality assurance and include it in the District's policies and procedures manual.

VI. Findings, Conditions and Required Actions

This section specifies findings, conditions and required actions as a result of the ARB's review of SCAQMD's Carl Moyer Program. "Findings" are brief descriptions of practices that are inconsistent with state requirements under the Carl Moyer Program Guidelines and/or the District's written policies and procedures, including its contract with the engine owners. "Conditions" are more detailed descriptions of the practices the ARB audit team observed during the audit period. "Required Actions" are the minimum actions the District must take to remedy the findings. The District must provide the ARB with a written response to required actions by submitting a plan to remedy the respective findings listed below or will be "at-risk" as defined in section XI.B. of the 2005 Guidelines. The District's written response must be submitted to the ARB within 30 days of notification of the findings.

Finding 1: Expenditures Not Meeting Deadline.

Condition: SCAQMD fiscal records indicate that at least $10,043,180 of the $15,596,747 Proposition 40 funds have not been expended by the District within the two year timeframe required under State law (see sections 44299.2 (c) and 44287 (k) of the Health and Safety Code). As a result, two-thirds of the anticipated emission reductions, over 300 tons per year of NOx and approximately 15 tons per year of PM, have not yet been achieved. A two year timeframe is required so funds are expended, projects are completed and near term emission reductions are achieved.

H&SC section 44287 (k) states "any funds reserved for a district pursuant to this section are available to the district for a period of not more than two years from the time of reservation. Funds not expended by June 30 of the second calendar year following the date of the reservation shall revert back to the state board as of June 30, and shall be deposited in the Covered Vehicle Account established pursuant to section 44299".

Since the inception of the Program, Health and Safety Code sections 44287 (k) and 44299.2 (c), the Carl Moyer Program guidelines, and grant applications pertaining to each program year have all specified that funds must be expended within two years of June 30 for the year in which funds were reserved. Year 5 and 6 funds were reserved in June 2003 and June

2004, respectively. Therefore, June 30, 2005 and June 30, 2006 were the deadlines for expending all Year 6 funds.

SCAQMD staff have identified a number of factors that have led to delays in expending funds. These include a shortage of staff, delays in contract execution, projects being withdrawn from the program, and lack of back-up projects available for immediate use. SCAQMD has recently implemented several steps to help expedite expenditures, including increasing staff, shortening deadlines for grantees to fully execute contracts, and shortening deadlines for grantees to complete projects. Moreover, SCAQMD now has the authority to select backup projects from a Governing Board approved list.

During Years 5 and 6 of the Carl Moyer Program, SCAQMD staffing was limited to three full time employees. Beginning in Year 7 staffing was increased to seven full time employees and continues to increase.

After SCAQMD's Governing Board approved projects for Years 5 and 6, achieving a fully executed contract between the grantee and SCAQMD took anywhere from two to 25 months. Beginning in Year 7, SCAQMD required full execution of all contracts by June 30, 2006, five months after Governing Board Approval.

Required Actions:

The ARB recognizes the importance of ensuring that anticipated emission reductions are achieved in California's most severely polluted region and that the Carl Moyer Program funds remain in the District to achieve the much needed reductions. The District also recognizes the importance of expediting projects to obtain reductions at the earliest, most practicable date. Since all Year 5 and 6 funds advanced to SCAQMD have been awarded to approved projects and are currently bound by fully executed contracts, the ARB has decided that it will not recapture these funds. However, the district is required to provide quarterly reports and provide updated annual reports and cost-effective calculations for all years of funding. Further, the District will not receive any additional disbursements of funds until full expenditures can be documented. The ARB will audit the District again in 2007.

Quarterly Reports:

The District must provide quarterly expenditure reports to the ARB for any funds that are past expenditure deadlines. The reports must discuss the following:

1. Current status of expenditures
2. Current status of project selection, contract execution and expenditures of turn back funds

3. Current status of project selection, contract execution and expenditures of interest

The report must also have the following attachments:

1. Copies of Carl Moyer Program project invoices SCAQMD has paid
2. Updated cost-effective calculations reflecting changes in existing projects or new projects selected as a result of turn back funds

The quarterly reports are due as follows:

1. 60 days from date of the audit report cover letter
2. Six months from date of the audit report cover letter
3. Nine months from date of the audit report cover letter
4. One year from date of the audit report cover letter

Annual Reports and Revised Cost-effective Calculations:
As a result of the expenditure finding, the ARB believes the reports on file regarding the SCAQMD Carl Moyer program are not accurate. The District has agreed to provide updated annual reports and updated cost-effective calculations for Years 1 through 7 in September 2006.

Holding of Additional Funds:
SCAQMD requested and received an initial disbursement of $1,328,443 of Year 7 funds in 2005. SCAQMD has also requested a check for the remaining Year 7 funds ($10,853,540) and an initial disbursement of their reserved $35,366,250 Year 8 funds. However, as a result of the late expenditures, the ARB is holding these funds until SCAQMD can document full expenditures for Years 1 through 6.

Once the ARB has received expenditure documentation for these funds SCAQMD will be allowed to submit another request for the remaining Year 7 and 8 funds. In addition, as long as the SCAQMD is not deemed an "at-risk" district they will be allowed to reserve Year 9 funds later this year.

Follow-up Audit in 2007:
The District has ensured the ARB that all funds through Year 7 will be fully expended by July 1, 2007. Over the next year the ARB will work closely with SCAQMD to track expenditure progress. In addition, the ARB will return to the District in August of 2007 to conduct a follow-up audit to verify full expenditure of these funds. If the funds (including turn back funds as a result of a project change) have not been fully expended by July 1, 2007 then the SCAQMD will be deemed an "at-risk" district as defined in section XI.B.1. of the 2005 Guidelines and the ARB will look to recapture funds.

Finding 2: Miscalculations for Projects.

Condition: During the audit several miscalculations of cost-effectiveness were found. Two of the miscalculations (contract numbers 5237 and 6126) resulted in the execution of contracts for amounts that did not meet the cost-effectiveness threshold. This finding requires repayment of $6,317 from contract 5237 and an amendment to contract 6126 to decrease the contract amount by $3,703. This finding also requires the reprogramming of these funds, totaling $10,020 in Carl Moyer Program State funds.

In response to this finding, SCAQMD is in the process of requesting reimbursement of the overpaid amount of contract 5237 and is modifying contract 6126 to reduce the award amount. In addition, SCAQMD has reprogrammed these funds to a project approved by the SCAQMD Governing Board on July 14, 2006.

Required Action: The District must provide documentation proving reimbursements for the overpayment of contract 5237. The District must also provide ARB with a copy of the fully executed amendment for contract 6126. District staff must provide ARB with revised annual reports and cost-effective calculations for all affected years. The reports must contain the pertinent information for the new, qualified Carl Moyer Program project and update the calculations for contracts 5237 and 6126.

Finding 3: Minimum contract requirements for projects funded with Year 8 funds were not included in the District's new contract.

Condition: The contract template language (between the District and engine owners) used to obligate Year 7 and 8 funds do not include one of the minimum requirements outlined in the 2005 Carl Moyer Program Guidelines. The specific requirement not included in the boilerplate contract includes a disclosure of funds statement for the owner to complete and sign. This requirement is specified in section VIII.C.3. of the 2005 Guidelines.

During the audit period the District prepared a disclosure of funds statement that was reviewed by the ARB and sent to all Year 7 awardees for signature. The District has also submitted a revised copy of the contract boilerplate language for Year 8 contracts to the ARB, which includes the disclosure of funds statement.

Required Actions: The District must ensure receipt of signed copies of the disclosure of funds statement for all Year 7 applicants and include appropriate copies in the project file with the original contract. Once this is complete the District

shall provide the ARB with written notification of completion. The District must also ensure use of the revised Year 8 boilerplate contract language that includes the disclosure of funds statement for all Year 8 contracts.

ATTACHMENT

South Coast Air Quality Management District
2006 Carl Moyer Program Audit
List of Projects Reviewed

Contract Number	Project Name	Source Category	File Review	Site Visit
Year 5				
4187	Altfillisch Contractors	Off-road	X	X
5038	City of Redlands	On-road	X	X
51341	Clean Air Partner Transportation Systems. Inc.	Locomotive	X	
3099	LA County Sanitation District	Infrastructure	X	X
4139	Nationwide Environmental Services	On-road	X	
4140	Pacific Harbor Line, Inc.	Locomotive	X	
4176	Railpower Technologies	Locomotive	X	X
4160	Railserve	Locomotive	X	X
5020	Two Harbors	Marine	X	X
4156	Yusen Terminals Inc.	Off-road	X	
Year 6				
5170	Ameron International	Off-road	X	
6011	City of Whittier	On-road	X	
52381	Clean Air Partner Transportation Systems, Inc.	Locomotive	X	
6030	Clean Energy, Foothill Transit	Infrastructure	X	X
5167	Fontana Steel	Off-road	X	X
5237	Frontier Aluminum Corporation	Forklift	X	
6041	IdleAire	Idle Reduction	X	
6223	Kimberly Salas	Marine	X	
5167	Peed Equipment	Off-road	X	X
5209	Shaw Diversified Services Inc.	Forklift	X	X
5168	TAMCO Steel	Off-road	X	X
52451	Varner Construction Inc.	Off-road	X	X
Year 7				
6126	City of Newport	On-road	X	
6151	Norwalk – La Mirada Unified School District	On-road	X	

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

October 27, 2006

Office of the Executive Officer
Barry R. Wallerstein, D.Env.
909.396.2100, fax 909.396.3340

VIA FEDERAL EXPRESS AND ELECTRONIC MAIL

Catherine Witherspoon
Executive Officer
California Air Resources Board
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812

RECEIVED
NOV - 2 2006
AIR RESOURCES BOARD
EXECUTIVE OFFICE

Re: 2006 Carl Moyer Program Audit

Dear Ms. Witherspoon:

This letter presents the South Coast Air Quality Management District ("SCAQMD") staff's response to the Air Resources Board's ("CARB") Final Carl Moyer Air Quality Standards Attainment Program Audit Report, dated October 2006, and also constitutes the required written plan of action to address the audit report's three formal findings. While we disagree with several of the audit conclusions/recommendations, I want to make note of the highly professional manner in which the CARB staff conducted the audit. Our comments are provided below for each finding.

Finding 1

CARB states in Finding 1 that "SCAQMD fiscal records indicate that at least "$10,043,180 of the $15,596,747 Proposition 40 funds have not been expended by the District within the two year timeframe required under State law . . .." The audit finding acknowledges that these funds are currently committed in fully executed contracts, although final payments to the contractors have not yet been made. CARB also states that the SCAQMD must provide quarterly expenditure reports to CARB for all funds that are past expenditure deadlines, and that the SCAQMD will not receive any additional disbursements of Year 7 or 8 funds until full expenditure of past funds can be documented.

SCAQMD's Response:

SCAQMD understands that CARB has made the determination regarding late expenditure of $10,043,180 based upon an interpretation that the term "expenditure" requires that funds appropriated to the air districts be both committed under contract and

invoices paid within two years. **This interpretation, however, is inconsistent with both the intent of the Carl Moyer Program authorizing legislation and CARB's 2003 Carl Moyer Program Air Quality Standards Attainment Program Guidelines, which were in effect during Program Years 5 and 6.**

In analyzing the intent of the legislature in making an appropriation under Section 44287(k), it is necessary to look to the California Department of Finance (DOF), which has established uniform accounting guidance which is used by all state agencies in interpreting legal obligations with respect to fiscal appropriations by the state legislature. According to DOF's Glossary of Terms revised in December 2004 (www.dof.ca.gov/fisa/bag/dofgloss.htm), the term "appropriation" is an "authorization for a specific agency to make expenditures and incur liabilities from a specific fund for a specific purpose and is usually limited in amount and period of time which the expenditure is to be incurred." In this case, the legislature requires that funds be "expended" within two years. DOF, however, has also defined this term, stating that an expenditure represents the amount of an appropriation used for goods and services ordered, whether paid for or not. In other words, under DOF guidelines, an agency can meet the statutory deadline to expend appropriated funds by encumbering the monies, which is defined by DOF to mean "a commitment of part or all of an appropriation," as expressed in documents such as purchase orders, and contracts.

It is our belief that when the state legislature appropriated Carl Moyer Program funds, it intended to adhere to these DOF guidelines. Indeed, if the legislature intended for different accounting terms to apply than those used by state agencies across the board, specific language would have appeared in either the statutory text or the legislative history. Therefore, SCAQMD fully complied with statutory requirements by committing all funds for years 5 and 6 within the two year deadline.

Similarly, CARB's 2003 Carl Moyer Guidelines require only that the funds reserved to a district be "obligated," which the SCAQMD has done, and which we interpreted to mean encumbered so as to be consistent with DOF guidelines. On pages 5-6 of the 2003 Guidelines, CARB states: "Districts must report project status including specific projects, state fund expenditures, additional funds obligated via contract or contracts in progress, and remaining funds that have not been obligated. Any funds not obligated by contract at the end of fiscal year are subject to reallocation as determined by the interpretation of Proposition 40 by the California Department of Finance."

In one instance CARB staff actually requested that SCAQMD de-obligate Moyer funds from an executed contract ($443,534) and substitute funding for that project with State Mitigation funds from the electricity crisis. Obviously, this caused the de-obligated Moyer funds to be reallocated to a new project at a later time.

For Years 1-6 SCAQMD has relied on an annual solicitation process to select projects for program implementation instead of the first-come-first-served approach. This annual selection process achieves maximum emissions reductions as the most cost-effective projects are selected for awards. Through the same process a number of

additional program goals established by our Governing Board can also be addressed. These goals are:

- Environmental Justice (50%)
- Goods Movement (40%)
- Advanced Technologies
- Fleet Rules
- School Buses

Since the program's conception, the SCAQMD has fully funded over 1,700 individual projects with the anticipated reductions of over 2,000 tons per year of NOx and 32 tons per year of PM. In addition, during the first six years of the program the SCAQMD has also successfully implemented the State Emissions Mitigation Fund Program, fully funding the purchase of an additional 939 pieces of equipment in excess of $27 million. These program funds reduce NOx emissions another 1,375 tons per year. We believe SCAQMD's selection of the most cost effective projects and projects located in disproportionately impacted areas achieves larger emission reductions for a longer period of time than required by CARB.

Because of the success of SCAQMD's implementation of both the Carl Moyer Program and the State Emissions Mitigation Fund Program, we do not believe that the delay in expending turn back funds from Years 5 and 6 has "delayed the expected emissions reduction for a significant portion of the program." Obviously obtaining an anticipated 300 tons per year of NOx reductions and approximately 15 tons per year of PM as early as possible is important in the SCAQMD. But we do not believe that CARB's findings fully take into account SCAQMD efforts over the past decade to implement these voluntary emission reduction programs, including efforts to reallocate turn back funds as soon as possible. Moreover, CARB's findings fail to take into account that the SCAQMD has been able to achieve an average cost-effectiveness of $4,000 per ton in projects funded by Carl Moyer, which is substantially lower than the program cap of $14,300. This means that the SCAQMD has achieved anticipated emission reductions that are far greater than allowed by the legislation, and the equipment/vehicles funded under the Carl Moyer Program are anticipated to operate between ten to twenty years.

SCAQMD acknowledges that in the most recent version of the Carl Moyer Program Guidelines CARB specifically requires that funds be obligated within one year and expended within two years from the reservation. It is our understanding that CARB defines "expended" as used in the new guidelines, and requires that the award monies be actually paid to the project within two years. Although, for reasons noted above, we do not believe this is required by the statute, SCAQMD has revised its program process to meet the new time requirements established by CARB.

SCAQMD is also very concerned that CARB's proposal to withhold disbursements of Program Years 7 and 8 funds may have the unintentional effect of jeopardizing the viability of the program in Fiscal Years 2006/07, 2007/08 and beyond. The SCAQMD has already entered into Year 7 binding contracts for approximately 23

projects in excess of $11.9 million. These projects are anticipated to achieve future reductions of approximately 385 tons per year of NOx and 14.7 tons per year of PM. Invoices for these projects are already arriving to the District, and all invoices are due by June 2007. SCAQMD is also in process of entering into Year 8 contracts in excess of $30.5 million and invoices for these projects will start arriving within a few months. AQMD does not believe, from an accounting or legal standpoint, it is appropriate to use non-Year 7 or Year 8 funds to pay these invoices. Thus, without availability of funds previously awarded by CARB to the district, prompt payment of these invoices cannot be assured and contracts will have to be cancelled. We are concerned that this could negatively impact the reputation and continuing success of the Carl Moyer Program. If this were to occur, substantial future emission reduction opportunities would be lost. We don't believe that CARB intends such consequences, but SCAQMD needs immediate written confirmation that the Year 7 funding is forthcoming soon.

In addition, SCAQMD does not believe that the decision to hold back disbursement of Year 7 and 8 funds is a remedy authorized in either the Health & Safety Code or the CARB program guidelines. Pursuant to the guidelines, CARB is to provide a district with a written review of the audit, including, if applicable, any deficiencies in the district's program that require correction. The district has 30-days to correct the deficiencies and respond in writing to the report. CARB must also provide the district with the opportunity for training and technical assistance to develop and implement a corrective management plan. Only if the CARB determines that the district has not taken adequate corrective action within the allotted 30 days will the district be deemed "at-risk." In this case, SCAQMD has re-obligated the turn back funds (see attachments 1 and 2), and committed to CARB that all such funds will be fully expended by July 2007. CARB has acknowledged that this corrective action is sufficient.

SCAQMD's Plan of Action:

First, in order to adhere with CARB's new program guidelines requirements, SCAQMD has developed specific project timelines, which were recently incorporated in the SCAQMD's Governing Board approved Carl Moyer Program Guidelines, to ensure that all contracts are fully executed within one year and that all invoices are received and paid within two years. These timelines will be strictly adhered to the degree humanly possible. As an example, the Year 8 awards for 46 projects totaling about $30.5 million have already been granted and the contractors will have at least 18 months rather than a year to complete their projects by the due date of June 30, 2008.

Second, SCAQMD has taken steps to reduce any potential delay in reallocating so-called "turn back funds," such as where a contractor decides not to move forward with all or part of a previously executed contract. This delay is mostly associated with the need to obtain Governing Board approval to award the turn back funds to a new contractor. In July 7, 2006, our Governing Board authorized its Chairman to expend turn back funds by executing contracts from a back-up list of unfunded projects that meet Carl Moyer criteria and were previously approved by the Board. A copy of the Governing Board letter approving this action is attached (attachment 1).

Finally, to ensure sufficient projects will be funded by June 30, 2007, which is the final date to expend Program Year 7 funds, SCAQMD staff is recommending that the Governing Board authorize a Program Announcement in an amount not to exceed $12 million from the Clean Fuels Fund and the Carl Moyer Program turn back funds to fund cleaner construction equipment on a first come, first serve basis. All equipment funded under this Program Announcement must be installed by May 31, 2007 and invoiced no later than June 30, 2007. We believe this will ensure sufficient projects will be available so that all Program 7 funds will be expended within the deadline set in the new CARB guidelines. SCAQMD staff will be taking this item to the Governing Board for approval in November 3, 2006 (attachment 2).

Quarterly Reports: In accordance with Finding 1, SCAQMD will provide CARB reports for any funds that are past expenditure deadlines. The reports will discuss:

- Current status of expenditures;
- Current status of program selection, contract execution and expenditures of turn back funds; and
- Current status of project selection, contract execution and expenditures of interest.

The reports will be provided to CARB on a quarterly basis, beginning 60 days from the date of the audit report cover letter. The report will include copies of Carl Moyer Program project invoices paid by SCAQMD and updated cost-effectiveness calculations reflecting changes in existing projects or new projects selected as a result of turn back funds.

Annual Reports and Revised Cost-effective Calculations: As previously agreed to, the SCAQMD staff has already provided CARB an updated annual report and updated cost-effective calculation for Program Years 1 through 7 to reflect any change made to existing projects or the award of new projects as a result of turn back funds.

Finding 2

CARB determined during the audit that miscalculations of cost-effectiveness in two projects (numbers 5237 and 6126) resulted in contracts for amounts that did not meet the cost-effectiveness thresholds. CARB determined that for contract 5237, repayment of $6,317 was required. For contract 6126, a contract amendment was required to reduce funding by $3,703.

SCAQMD's Response and Plan of Action:

Contract 6126: SCAQMD has recalculated the cost-effectiveness for this project and amended the contract. A copy of the amendment was previously provided to CARB. Since the $3,703 in question was never paid to the contractor, this issue is resolved.

Contract 5237: We agree that there was an error in the original calculation performed by SCAQMD staff and reviewed by CARB staff. SCAQMD recalculated the cost effectiveness of this project, and has provided that information to CARB. This project was fully funded before completion of the audit. SCAQMD has sent a letter to the contractor seeking reimbursement of $6,317 (attachment 3). The contractor has not responded to the request as of the date of this letter. SCAQMD will either retrieve the $6,317 in question or pay the local Moyer Program back that amount from our budget.

Finding 3

CARB identified that for Program Years 7 and 8, project files showed that the project awardees had not signed "Disclosure of Funds" statements required by the Carl Moyer Guidelines.

Response and Plan of Action:

As CARB is aware, this is a new requirement just implemented for Program Year 7 awards. SCAQMD had prepared a disclosure statement, but it was inadvertently left out of individual award packets. As of the date of this letter, appropriate disclosure of fund language has been incorporated into our contract boilerplate for Carl Moyer Program awards, and contract modification forms have been sent out to all of the Program Year 7 awardees for signature to include the required language. Both the boilerplate contract language and a copy of the modification forms were sent to CARB staff on July 27, 2006.

SCAQMD sent via FedEx to CARB signed copies of all disclosure forms for all Year 7 applicants on October 19, 2006. Thus, Finding 3 has been fully addressed and resolved.

* * * * *

Please feel free to call me at 909-396-2100 if you have any questions regarding our response

Sincerely,

Barry R. Wallerstein

Barry Wallerstein, D.Env.
Executive Officer

Attachments

c:\share\mike\letters\cmp_audit_response.doc

Attachment 1

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

BOARD MEETING DATE: July 7, 2006 AGENDA NO. 38

PROPOSAL: Execute Contracts for Carl Moyer Memorial Air Quality Standards Attainment Program with Returned Funds from Incomplete Projects

SYNOPSIS: The AQMD has administered its Carl Moyer Program since FY 1998-99, awarding more than $85 million in projects for purchase of low-emitting heavy-duty vehicles, engines, and equipment. Some of the awarded contracts have been returned by the recipients due to various reasons such as economic conditions and other business priorities. This action is to execute new contracts under the Carl Moyer Program with companies that were unable to receive funds in the last round of awards in February 2006, with turn-back funds in an amount not to exceed $9.1 million.

COMMITTEE: Technology, June 23, 2006, Recommended for Approval

RECOMMENDED ACTIONS:

A. Authorize the Chairman to execute the following contracts with turn-back dollars from the Carl Moyer Program Fund:

1. A contract with Rentrac for the repower of five diesel dual engine scrapers in an amount not to exceed $1,064,270 from the Carl Moyer Program Fund Prop. 40 Account.
2. A contract with Cash Grading for the repower of one dozer and 5 diesel dual engine scrapers in an amount not to exceed $74,614 from the Carl Moyer Program Prop. 40 Account and $862,545 from the Carl Moyer Program Fund.
3. A contract with Bruno Farms for the repower of one diesel agricultural tractor in an amount not to exceed $55,821 from the Carl Moyer Program Fund SB1107 Account.
4. A contract with JKM Equipment for the repower of seven diesel dual engine scrapers in an amount not to exceed $1,277,124 from the Carl Moyer Program Fund SB1107 Account and $212,854 from the Carl Moyer Program Fund.
5. A contract with Yeager Skanska for the repower of one dual engine scraper in an amount not to exceed $194,000 from the Carl Moyer Program Fund.

6. A contract with Parsec, Inc. for the purchase of ten new LNG yard tractors in an amount not to exceed $489,780 from the Carl Moyer Program Fund.
7. A contract with KEC Engineering for the repower of four diesel cranes in an amount not to exceed $137,592 from the Carl Moyer Program Fund.
8. A contract with Moss Equipment for the repower of 10 diesel dual engine scrapers in an amount not to exceed $1,326,625 from the Carl Moyer Program Fund.
9. A contract with TNT Grading to repower seven diesel scrapers in an amount not to exceed $608,438 from the Carl Moyer Program Fund.
10. A contract with American Contracting to repower two diesel dual engine scrapers in an amount not to exceed $374,990 from the Carl Moyer Program Fund.
11. A contract with Dalton Trucking to repower two diesel pipe loader in an amount not to exceed $52,590 from the Carl Moyer Program Fund.

B. Authorize the Chairman to modify the following contracts with turn-back dollars from the Carl Moyer Program Fund:

1. A contract with Pick Your Part to add the repower of three diesel scrap metal loaders in an amount not to exceed $20,065 from the Carl Moyer Program Fund Prop. 40 Account, $20,065 from the Carl Moyer Program Fund SB1107 Account, and $24,967 from the Carl Moyer Program Fund to the existing contract that is for the repower of 16 diesel scrap metal loaders for $496,988 from the Carl Moyer Program Fund Account AB923 originally approved on February 3, 2006.
2. A contract with Sukut Equipment to add the repower of five diesel dozers, and six diesel single engine scrapers in an amount not to exceed $41,893 from the Carl Moyer Program Fund Prop. 40 Account, and $740,522 from the Carl Moyer Program Fund to the existing contract that is for the repower of one dual engine and 16 single engine diesel scrapers for $1,488,925 from the Carl Moyer Program Fund AB923 Account originally approved on February 3, 2006.
3. A contract with Jagur Tractor to add the repower of eight diesel dual engine scrapers in an amount not to exceed $1,438,560 from the Carl Moyer Program Fund to the existing contract that is for the repower of nine diesel scrapers for $794,903 from the Carl Moyer Program Fund AB923 Account originally approved on February 3, 2006.

ADOPTED
by the
South Coast Air Quality
Management District Board
Date: 7-14-2006
Clerk of the Board

Barry R. Wallerstein, D.Env.
Executive Officer

CSL:HH:FM:CD

Background

The Carl Moyer Memorial Air Quality Standards Attainment Program (CMP) provides funding on an incentive basis for the incremental cost of purchasing cleaner than required engines and equipment. Eligible projects include cleaner on- and off-road, marine, locomotive, and agricultural engines, as well as forklifts, airport ground support equipment, and auxiliary power units. To date, the AQMD has awarded more than $85 million in projects for purchase of low-emitting heavy-duty vehicles, engines, and equipment under its Carl Moyer Program. Some of the awarded contracts have been returned by the recipients due to various reasons such as economic conditions and other business priorities. Table 1 shows the total amount of returned funds currently available under the Carl Moyer Program, and Table 2 shows the detailed breakdown of the turn-back funds.

Table 1: Carl Moyer Program Available Dollars

Funding Source	Available Amount
SB 1107	$1,353,077
Carl Moyer Turn-Back (Proposition 40 funds)	$1,200,602
Carl Moyer Turn-Back (Non Proposition 40 funds)	$6,461,127
Total	$9,014,806

Table 2: Returned Program Dollars

AWARD RECIPIENT	AMOUNT DECLINED	ACCOUNT
FY 1999-00		
American Marine	$60,862	CMP
Seaboard Marine	$16,900	CMP
FY 2000-01		
City of Pasadena	$14,000	CMP
London Bus & Taxi	$194,040	CMP
Lowe's	$269,403	CMP
Palm Springs Disposal	$192,221	CMP
Sysco	$90,636	CMP
Ware Disposal	$176,865	CMP
FY 2001-02		
Blue Barrel Disposal	$134,490	CMP
Altfillisch	$44,131	CMP
G&B Rubbish	$124,708	CMP
Nationwide Environmental	$227,325	CMP
Sysco	$315,900	CMP
Sukut Construction	$150	CMP
USA Waste, LA Metro	$72,600	CMP
USA Waste, Sun Valley	$121,000	CMP
Waste Mgmt. Orange County-Dewey's	$132,325	CMP
Waste Mgmt. San Gabriel/Pomona Valley	$319,728	CMP
Waste Mgmt. San Gabriel/Pomona Valley	$459,800	CMP
WXRT – Express Reefer Transport	$2,000,000	CMP
FY 2002-03		
Athens Services	$65,181	Prop 40
City of Cathedral City	$7,908	Prop 40
City of Los Angeles	$6,200	Prop 40
County Sanitation Districts of L.A.	$99,650	Prop 40
Enterprise Rent-a-Car	$45,317	CMP
Herigstad Equipment Rental	$360,888	CMP
Interstate Sweeping Services	$67,500	Prop 40
Jagur Tractor	$171,310	CMP
Mellon Grading	$140,450	CMP
Roadbuilders	$78,673	CMP
Tidewater Marine	$404,232	CMP
Two Harbor Enterprises	$20,339	Prop 40
FY 2003-04		
Catalina Passenger Services	$396,955	Prop 40
London Bus & Taxi	$285,000	Prop 40
Omnitrans	$64,000	Prop 40
Shaw Diversified Services, Inc.	$63,805	Prop 40
Clean Street	$97,632	Prop 40
Southern California Regional Rail	$282,000	CMP
City of Whittier	$26,432	Prop 40
FY 2004-05		
Unused Funds	$388	SB1107
City of Los Angeles	$960,749	SB1107
Altfillisch	$391,940	SB1107
City of Banning	$11,173	CMP
TOTAL DECLINED AWARDS	$9,014,806	

Proposal

At its July 8, 2005 meeting, the Board approved the release of RFP #P2006-01 to solicit proposals for Year Seven of the Carl Moyer Program. By the closing date of September 30, 2005, a total of 72 proposals were submitted requesting approximately $52 million in funding. On December 2, 2005, and February 3, 2006, the Board approved awards for a total of $19,625,677. This action is to execute new contracts under the Carl Moyer Program with companies that were unable to receive funds in the last round of awards under RFP #P2006-01, with turn-back funds in an amount not to exceed $9,017,315. This amount is comprised of $1,353,010 from the Carl Moyer Program Fund Account SB1107, $1,200,842 from the Carl Moyer Program Fund Account Proposition 40, and $6,463,463 from the Carl Moyer Program Fund. Table 3 provides a detailed list of all the projects proposed for funding.

Total NOx and PM reductions from the recommended projects are approximately 463 tons/year and 16 tons/year, respectively. All the recommended award recipients have agreed to complete the recommended projects by June 30, 2007.

In case of availability of additional turn-back funds, staff recommends the Board to approve the selection of projects and execution of contracts from unfunded projects under RFP #P2006-01, which is provided as a back-up list in Attachment 1.

Funding Distribution

Table 4 summarizes staff's recommendation for awards in disproportionately impacted areas under the requirements of AB1390. The total amount of projects funded in disproportionately impacted areas is $6,914,027. The total amount of projects funded solely based on cost-effectiveness is $2,100,288. In summary, 76.7% of the projects are in disproportionately impacted areas. The requirements of AB 1390 are implemented according to the following criteria.

1) All projects must qualify for the Carl Moyer program by meeting the cost effectiveness limits established in the RFP.

2) All projects were evaluated according to the following criteria to qualify for funding under DI requirements:

   a) Poverty Level: All projects in areas where at least 10% of the population falls below the Federal poverty level based on the year 2000 census data, are eligible to be included in this category, and

   b) PM Exposure: All projects in areas with the highest 15% of PM concentration will be eligible to be ranked in this category. The highest 15% of PM concen-

tration level is 46 micrograms per cubic meter and above, on an annual average, or

c) Air Toxics Exposure: All projects in areas with a cancer risk of 1,000 in a million and above (based on MATES II estimates) will be eligible to be ranked in this category.

Table 3: Recommended Awards by Fund Accounts

Carl Moyer Program Proposition 40 Account	Awards
Rentrac	$1,064,270
Cash Grading	$74,614
Pick Your Part	$20,065
Sukut	$41,893
Total Prop. 40 Account	$1,200,842
Carl Moyer Program Funds	Awards
Cash Grading	$862,545
JKM Equipment	$212,854
Yeager Sanska	$194,000
Parsec	$489,780
KEC Engineering	$137,592
Moss Equipment	$1,326,625
TNT Grading	$608,438
American Contracting	$374,990
Dalton Trucking	$52,590
Pick Your Part	$24,967
Sukut	$740,522
Jagur	$1,438,560
Total Carl Moyer Program Funds	[illegible]
Carl Moyer Program SB1107 Account	Awards
Bruno Farms	$55,821
JKM Equipment	$1,277,124
Pick Your Part	$20,065
Total SB1107 Account	[illegible]
Grand Total	[illegible]

Table 4: Award Recommendations and Proposed Funding Distribution

[illegible]	[illegible]
Cash Grading	$ 937,159
Pick Your Part	$ 65,097
Sukut	$ 782,415
JKM	$1,489,978
Yeager Sanska	$ 194,000
Parsec	$ 489,780
KEC Engineering	$ 137,592
Moss Equipment	$1,326,625
Jagur	$1,438,560
Bruno Farms	$ 52,821
[illegible]	[illegible]
[illegible]	[illegible]
Dalton	$ 52,590
American Contracting	$ 374,990
Rentrac	$1,064,270
TNT	$ 608,438
[illegible]	[illegible]

Outreach

In accordance with AQMD's Procurement Policy and Procedure, a public notice advertising the RFP/RFQ and inviting bids was published in the following publications:

1. *Antelope Valley Press*
2. *Black Voice News*
3. *Chinese Daily News*
4. *Desert Sun*
5. *Eastern Group Publications*
6. *El Chicano*
7. *El Informador*
8. *Inland Empire Hispanic News*
9. *Inland Valley Daily Bulletin*
10. *Korea Central Daily*
11. *La Opinion*
12. *La Prensa Hispana*
13. *La Voz Publications*
14. *Los Angeles Daily News*
15. *Los Angeles Sentinel*
16. *Los Angeles Times*
17. *Orange County Register*
18. *Philippine News*
19. *Precinct Reporter*
20 *Press Enterprise*
21. *Rafu Shimpo*
22. *San Bernardino Sun*
23. *State of California Contracts Register*
24. *The Daily Breeze*
25. *The Excelsior*
26. *The Signal*
27. *Wave Community Newspapers*

Additionally, potential bidders may have been notified utilizing the Los Angeles County MTA Directory of Certified Firms, the Inland Area Opportunity Pages Ethnic/Women Business & Professional Directory; and AQMD's own electronic listing of certified minority vendors. Notice of the RFP/RFQ was mailed to the Black and Latino Legislative Caucuses and various minority chambers of commerce and business associations, and placed on the Internet at AQMD's Web site (http://www.aqmd.gov).

Information was also available on AQMD's bidder's 24-hour telephone message line (909) 396-2724.

Benefits to AQMD

AQMD's Clean Fuels Program has been active in funding the development and demonstration of low emission, alternative fuel technologies within its Technology Advancement Office. The AQMD has also supported a number of activities directed to commercialization of low-emission alternative fuel technologies. The successful implementation of the Carl Moyer Program is a direct result of these technology advancement activities. The vehicles and equipment funded under this recommendation will operate many years and will provide long-term emissions reductions.

Resource Impacts

Funding for the recommended projects shall not exceed $9,017,315 in turn-back funds under the Carl Moyer Program comprised of $1,353,010 from the Carl Moyer Program Fund Account SB1107, $1,200,842 from the Carl Moyer Program Fund Proposition 40 Account, and $6,463,463 from the Carl Moyer Program Fund, which includes projected interest.

Attachment

Backup list of Qualified Projects from RFP #P2006-01

Attachment 1
Backup List of Qualified Projects from RFP #P2006-01

Company	Equipment	Requested Funding
Moss Equipment	Diesel repower of 7 single engine scrapers	$ 551,011
American Contracting	Diesel repower of 8 dual engine scrapers	$1,499,960
Larry Jacinto Construction	Diesel repower of 4 dozers, 3 single engine scrapers, and 1 loader	$ 440,476
Road Builders	Diesel repower of 4 dozers	$ 399,147
TNT	Diesel repower of 3 dual engine scrapers, 2 water pulls, 1 tractor	$ 625,827
Total		$3,516,421

Attachment 2

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

BOARD MEETING DATE: November 3, 2006 AGENDA NO. 8

PROPOSAL: Issue Program Announcement to Solicit Projects for Cleaner Construction Equipment Under the Carl Moyer Program, Correct Name of Existing Contract, and Allow Acceptance of 2006 and Newer Model Year Vehicle Applications Under the Fleet Modernization Program

SYNOPSIS: CARB's Carl Moyer Program guidelines have strict requirements for expenditure of funds for each year before allocation of new funds for each subsequent year. This action is to issue a Program Announcement in an amount not to exceed $12 million from the Clean Fuels Fund and the Carl Moyer Program returned funds to fund cleaner construction equipment on a first come first served basis with the requirement that all equipment be installed by May 31, 2007, and be in service no later than January 30, 2007. This action is also to correct the name of an awarded contract, and also to allow the purchase of 2006 and newer model year diesel vehicles rather than 2006 model years only under the Fleet Modernization Program.

COMMITTEE: Technology, October 27, 2006

RECOMMENDED ACTIONS:

1. Approve issuance of Program Announcement PA# 2007-07 in an amount not to exceed $12 million, to solicit off-road projects under the Carl Moyer Program on a first come first served basis.
2. Approve correction of an error by changing the name of an awarded contract from its owner's name of Kimberly Salas to its company name of Harbor Breeze Corporation under the Carl Moyer Program.
3. Approve revising the Fleet Modernization Program Announcement #PA2007-01, to accept applications for the purchase of model years 2006 and newer heavy-duty diesel vehicles rather than 2006 model year vehicles only, as newer models become available.

Barry R. Wallerstein, D.Env.
Executive Officer

CSL:FM:CD

DRAFT

Background

The Carl Moyer Memorial Air Quality Standards Attainment Program (CMP) provides funds on an incentive basis for the incremental cost of purchasing cleaner than required engines and equipment. CARB's Carl Moyer Program guidelines have strict requirements for expenditure of funds for each year before allocation of new funds for each subsequent year. Therefore, all outstanding funds must be expended no later than June 30, 2007 for the AQMD to receive future funding. Due to the nature of the Carl Moyer Program, it is not unusual to have a quantity of returned funding during a program year. The new requirement makes it difficult to conduct the program annually and meet the fund expenditure deadlines. Therefore, creating a pool of completed backup projects funded with the Clean Fuels Fund, and the expedited reallocation of any Carl Moyer returned funds to complete new projects, will enable the AQMD to expend the program funding in a timely manner.

Proposal

Carl Moyer Program Announcement

This action is to issue a program announcement for heavy-duty off-road construction or similar equipment in an amount not to exceed $12 million comprised of Carl Moyer Program returned funds and up to $4 million from the Clean Fuels Fund. The projects will be funded on a first come first served basis. All the projects must have a maximum cost-effectiveness level of $5,000/ton for combined emission reductions of NOx + ROG +(20 x PM), and they must be installed by May 1, 2007 and be invoiced no later than June 30, 2007. Under CARB's Carl Moyer Program guidelines funding for each year must be expended within two years from the date of their allocation. Due to the variety of projects with a short implementation time coupled with the fact that a number of project fundings are returned each year, it is imperative to implement a backup system in order to have a pool of available projects for substituting the returned projects in an expedited manner. Projects funded with the Clean Fuels Fund will therefore be available to be substituted with any returned funds from incomplete projects from years 1 through 7. The $4 million from the Clean Fuels Fund will then revert as returned funds from Moyer projects become available. This will ensure the timely expenditure of all the Carl Moyer Program funds and will enable the AQMD to receive its fair share of funds from CARB each year. At no time will more than $4 million from the Clean Fuels Fund be used to create a pool of backup projects.

Correction of a Carl Moyer Program Contract

This action is to approve correction of an error by changing the name of an earlier awarded contract from its owner's name of Kimberly Salas to its company name of Harbor Breeze Corporation under the Carl Moyer Program.

Fleet Modernization Program Announcement #PA2007-01

This action is to approve revising the Fleet Modernization Program Announcement #PA2007-01, to accept applications for the purchase of model years 2006 and newer

DRAFT

heavy-duty diesel vehicles rather than 2006 model year vehicles only, as newer models become available.

Outreach
In accordance with AQMD's Procurement Policy and Procedure, a public notice advertising the Program Announcement and inviting bids will be published in the Los Angeles Times, the Orange County Register, the San Bernardino Sun, and Riverside County Press Enterprise newspapers to leverage the most cost-effective method of outreach to the entire South Coast Basin.

Additionally, potential bidders may be notified utilizing AQMD's own electronic listing of certified minority vendors. Notice of the Program Announcement will be mailed to the Black and Latino Legislative Caucuses and various minority chambers of commerce and business associations, and placed on the Internet at AQMD's Web site (http://www.aqmd.gov/ where it can be viewed by making menu selections "Inside AQMD"/"Employment and Business Opportunities"/"Business Opportunities" or by going directly to http://www.aqmd.gov/rfp/index.html). Information is also available on AQMD's bidder's 24-hour telephone message line (909) 396-2724.

Benefits to AQMD
The successful implementation of the projects under this program announcement will help the AQMD retain its fair share of state emission reduction funding under the CMP, and significantly reduce NOx and PM10 emissions in a cost effective and expeditious manner.

Resource Impacts
The total program amount of up to $12 million will be comprised of returned funds from the Carl Moyer Program Fund and up to $4 million from the Clean Fuels Fund. The $4 million from the Clean Fuels Fund will serve as a pool of backup projects and will gradually be returned to the Clean Fuels Program Fund, as additional CMP returned funds become available.

The Clean Fuels Program under Health and Safety Code Sections 40448.5 and 40512 and Vehicle Code Section 9250.11, establishes mechanisms to collect revenues from mobile sources to support projects to increase the utilization of clean fuels, including the development of the necessary advanced enabling technologies. Funds collected from motor vehicles are restricted, by statute, to be used for projects and program activities related to mobile sources that support the objectives of the Clean Fuels Program.

Attachment
Program Announcement #PA2007-07 – Carl Moyer Heavy-Duty Off-Road Construction Equipment Program

DRAFT

Attachment 3

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

October 11, 2006

Mr. Mick Rapport
Frontier Aluminum Corporation
2480 Railroad Street
Corona, CA 92880-5418

Subject: AQMD Contract # 05237

Dear Mr. Rapport:

It has come to our attention as a result of ARB's audit, in July 2006, of the AQMD's Carl Moyer Program that your company was awarded funding in excess of what is allowable. At the time of the analysis incorrect guidance was provided. As a result of new information, it has been determined that your FY 2003-04 Carl Moyer Program award needs to be adjusted.

Frontier Aluminum's award should have been $7,448. The actual award of $13,765 resulted in an overpayment of $6,317 which must be returned to the Carl Moyer Program funds.

Regretfully, we must ask Frontier Aluminum to return the overpayment of $6,317. If you wish to discuss this matter please contact me at 909 396-2641. Thank you for your attention to this matter.

Respectfully,

Fred Minassian
Technology Implementation Manager
fminassian@aqmd.gov

FM:CD:lm

Appendix F

Department of Finance Evaluation of ARB Carl Moyer Program

Appendix F
Table of Contents

ARB Letter to DOF Confirming Receipt of Draft Report F-1
DOF Report Sumbittal Letter to ARB F-3
DOF Evaluation Report F-5

Linda S. Adams
Secretary for Environmental Protection

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

December 13, 2006

Ms. Diana L. Ducay
Office of State Audits and Evaluations
Department of Finance
300 Capitol Mall, Suite 801
Sacramento, California 95814-3706

Dear Ms. Ducay:

This letter is to confirm that the Air Resources Board (ARB) has received the Department of Finances' (DOF) draft report, *Review of the Carl Moyer Air Quality Attainment Program, Administrative, Fund and Project Tracking Procedures*.

We appreciate DOF's time and effort in completing such a thorough review and providing not only observations but recommendations to improve the Carl Moyer Program. While some of the outlined recommendations have already been incorporated into ARB's process, the others will be taken into consideration during our 2007 guideline revisions.

Sincerely,

/s/

Jack Kitowski, Chief
On Road Controls Branch

cc: See next page

Printed on Recycled Paper

Mr. Larry Allen, President
California Air Pollution Control Officers Association
San Luis Obispo County APCD
3433 Roberto Court
San Luis Obispo, California 93401

Ms. Diana C. Antony, Manager
Department of Finance
Office of State Audits and Evaluation
300 Capitol Mall, Suite 801
Sacramento, California 95814

Mr. Robert H. Cross, Chief
Mobile Source Control Division

DEPARTMENT OF FINANCE
ARNOLD SCHWARZENEGGER, GOVERNOR
915 L STREET ■ SACRAMENTO CA ■ 95814-3706 ■ WWW.DOF.CA.GOV

December 21, 2006

Mr. Jack Kitowski, Chief
Air Resources Board
On Road Control Branch
Mobile Source Control Division
1001 I Street
Sacramento, CA 95812

Dear Mr. Kitowski:

Final Report: Review of the Air Resources Board Carl Moyer Memorial Air Quality Attainment Program

Enclosed is the final report on our review of administrative, fund, and project tracking procedures of the Air Resources Board (Board) Carl Moyer Memorial Air Quality Attainment Program. The Department of Finance, Office of State Audits and Evaluations, performed this review in accordance with an interagency agreement with the Board.

We appreciate the assistance and cooperation of the Board's staff in this review. If you have any questions, please contact Diana Antony, Manager, or Osman Sanneh, Supervisor, at (916) 322-2985.

Sincerely,

Original signed by:

Diana L. Ducay, Chief
Office of State Audits and Evaluations

Enclosure

cc: Ms. Lucina Negrete, Manager, Mobile Source Control Division, Air Resources Board

A Special Review

Report on the Air Resources Board

Review of the Carl Moyer Air Quality Attainment Program Administrative, Fund, and Project Tracking Procedures

Prepared By:
Office of State Audits and Evaluations
Department of Finance

063900082

May 2006

TABLE OF CONTENTS

Preface iii

Background, Scope, and Methodology 1

Observations and Recommendations 3

Exhibit I 13

Exhibit II 20

Response 25

PREFACE

In accordance with our interagency agreement with the Air Resources Board (Board), the Department of Finance, Office of State Audits and Evaluations, performed a review of the Carl Moyer Program. Specifically the Board requested a review of the administrative procedures included in the revised 2005 Carl Moyer Program Guidelines (Guidelines) dated January 6, 2006. The objectives included:

- Review the Guidelines administrative procedures to verify compliance with California Health and Safety Code Sections 44275 to 44299.2.
- Review the Guidelines administrative procedures to determine whether it includes sufficient controls for districts to implement an effective and fiscally sound program.
- Evaluate the fund and project tracking procedures to determine their effectiveness for program auditing purposes.

Our review was limited to procedures documented in the Guidelines and did not include a review of other Carl Moyer Program controls and processes that may or may not be in place. In addition, we did not review the implementation or operation of the Guideline procedures.

This report is intended solely for the information and use of the Board, and is not intended to be and should not be used by anyone other than the specified parties. However, this report is a matter of public record and its distribution is not limited.

STAFF:

Diana Antony, CPA
Manager

Osman Sanneh, CPA
Supervisor

Robert Scott
Chikako Takagi-Galamba

BACKGROUND, SCOPE AND METHODOLOGY

Background

Chapter 923, Statutes of 1999, created the Carl Moyer Program (Program) to expedite the implementation of low-emission technologies through incentive based voluntary participation. In addition, the Program also assists in fulfilling the California State Implementation Plan, a federal requirement describing how and when the state will meet federal air quality standards. The primary objective of the Program is to provide financial incentives to offset incremental costs of noxious emission reduction. To achieve this objective, the Program reimburses approved grantee purchases of low-emission technology engines to install in vehicles, vessels, and locomotives.

The Program is implemented through a partnership of the Board and 35 California air pollution control districts and air management districts (districts). The Health and Safety Code Section 44286 charges the Board with overseeing and managing Program funds, prescribing guidelines and criteria for specified emission projects, and developing methodologies to evaluate project cost-effectiveness. In turn, the districts solicit, select, fund, monitor, and report project results to the Board in accordance with the Program guidelines developed by the Board.

Prior to fiscal year 2004-05, the program received annual appropriations from various sources. Specifically, between fiscal years 1998-99 and 2004-05, the state appropriated $114 from the General Fund and $40 million from Proposition 40, the California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act.

However, beginning fiscal year 2004-05, new legislation expanded the program scope and provided increased and continuous funding of up to $140 million *per year* through 2015. With the expanded program scope and significant increase in funding, the Board revised its guidelines to reflect the new program scope and funding. In March 2006, the Board contracted with the Department of Finance (Finance) to ascertain whether the provisions in the revised 2005 Carl Moyer Guidelines (Guidelines) were sufficient to ensure an effective administration of the program.

Scope

The objectives of our review included:

- Review the Guidelines administrative procedures to verify compliance with California Health and Safety Code Sections 44275 to 44299.2.
- Review the Guidelines administrative procedures to determine whether it includes sufficient controls for districts to implement an effective and fiscally sound program.
- Evaluate the fund and project tracking procedures to determine their effectiveness for program auditing purposes.

The scope did not include prior years' program administration, oversight, and Health and Safety Code compliance. Further, Finance was not engaged to assess the adequacy of controls over information systems or data electronically collected by the Board. Therefore, Finance did not perform prior year reviews and did not assess information system or electronic data controls.

Methodology

To address the objectives Finance reviewed the Health and Safety Code Sections 44275 to 44299.2, the 2005 Guidelines, and the current and proposed fund and project data collection procedures. In addition, Finance conducted interviews with the Board management and staff responsible for the administration of the program. The observations and recommendations section of this report present the results of the Finance review performed from March 2, 2006 through May 31, 2006.

Compliance with Health and Safety Code Requirements

The 2005 Carl Moyer Program Guidelines (Guidelines) were reviewed and compared against Health and Safety Code (HSC) Sections 44275 through 44299.2. The more significant observations are noted below and relate to the recapturing of unexpended funds and the district grant awarding process. Exhibit I provides additional observations and recommendations that, although are not significant, may still warrant further review.

Observation 1 **Recapturing Unexpended Grant Funds**

The Board may not be able to adequately enforce the unexpended fund recapture provisions due to HSC section contradictions and due to a lack of clearly defined terms and conditions in the Guidelines. The Board claims that its efforts to recapture unexpended funds have been partially impaired by a possible contradiction in the code. Specifically, while HSC Section 44299.2(c) requires program funds allocated to districts be expended by June 30 of the second calendar year following the reservation date or be recovered for reallocation to other projects, Section 44291(d) states, "The state board shall not recapture funds already awarded to approved projects." The Board's staff indicate that some districts and grantees have used Section 44291(d) to prevent the recapture of unspent grant funds, claiming the funds have been awarded via an approved contract. Furthermore, Guidelines Section II.E, *Obligation*, defines obligation as one of the following actions:

- District's governing board "approves" a project for funding through a resolution, minute order, letter or other written instrument.
- Air Pollution Control Officer or designated district staff, if given the authority by the governing board, approves a contract.
- Contract between the district and the owner is fully executed.

According to the Board, in some cases the contracts do not have clearly defined contract terms and therefore, actual expenditures may not occur in a timely manner. Specifically, the staff cite four scenarios under which some districts and grantees have questioned the Board's ability to recapture unexpended funds after the two year expenditure limit.

Scenario No. 1: The district's board has approved a project, but a contract was not signed by the end of the two year period.

Scenario No. 2: The district and grantee have executed a contract, but no expenditures are incurred by the end of the two year period.

Scenario No. 3: The district and grantee have executed a contract, and a portion of the obligated funds remain unexpended at the end of the two year period.

Scenario No. 4: The district and grantee recipient have executed a contract. However, the grantee claims that it did not have the resources to complete its part of the grant agreement.

These conditions arise, in part, because of the contradictions in the HSC sections and because terms such as "obligate," "expend," and "award" are not clearly defined in the Guidelines.

Further, although HSC Section 44288(d) requires the recapture provision to be incorporated into grantee contracts (district subcontracts with entities), the Guidelines' minimum contract elements do not require the districts to include the circumstances, method, and timing to recapture unexpended funds from grantees that fail to spend program funds as required.

A lack of clearly defined terms and conditions impairs the Board's ability to recoup and reallocate unexpended funds in a timely manner. In fact, during the first six years of program operations the Board allocated approximately $140 million in program funds to districts.[1] Of that amount, approximately $14 million, or 10 percent, remains unexpended two years after the date the Board originally reserved the funds for the districts.[2] Without further statute and guideline clarification, unexpended funds may continue to increase, which may ultimately inhibit the Program from effectively achieving its primary goal of reducing noxious emissions and improving air quality.

Recommendations: Expeditiously consult with the Board's legal counsel to clarify relevant HSC sections and other contradictory terms noted above. Specifically:

- Establish specific conditions and timelines for recapturing and reallocating unexpended funds.
- Ensure that districts include unexpended funds recapture provisions in their contracts with grantees.

Based on the advice of counsel, seek statutory language changes, if necessary, and revise the Guidelines to include clear criteria and procedures governing the recapture of unexpended program funds.

[1] The Carl Moyer Program Annual Status Report dated February 2004, page 6.
[2] The Board's response to Finance questions on May 30, 2006.

Observation 2 **District Grant Application and Award Processes**

The Guidelines Section V, *District Solicitation and Project Acceptance*, requires each district to maintain and follow written policies and procedures for soliciting and accepting projects. However, the Guidelines do not provide adequate direction on the district grant awarding process. Consequently, grant application and award processes may be inconsistent among districts.

- The Guidelines encourage, rather than require, the districts to use a standard application form to capture applicant information. Further, other than the grantees minimum disclosure statement, the Guidelines do not specify the minimum documentation required for grant applications to be considered complete. Consequently, application requirements may be inconsistent and inequitable among districts.

- The Guidelines lack application submission deadlines. Consequently, some districts have fixed application due dates while others accept applications on an on-going basis. As a result, application submission, processing, and awards criteria may vary among districts. Further, the lack of uniformity in the application and award processes could create negative perceptions regarding the consistency and fairness of the grant award process.

- Although the Guidelines include minimum project cost effectiveness criteria, the Guidelines do not require districts to apply consistent project selection methodologies which rate and rank specific standards. Consequently, project selections may be inconsistent and inequitable within and across districts. HSC Section 44288(a) requires that projects be evaluated with respect to the appropriate project selection criteria. The section further requires the Board to clarify project evaluation protocols and provide the information necessary to properly evaluate a project application.

- The Guidelines lack a timeline or other application processing and approval standards. Instead, the Guidelines encourage districts to make every effort to process applications and award grants rapidly and require districts to provide average and median award timeframes in their Year 8 (fiscal year 2005-06) annual reports.

Recommendation: Review the Guidelines to ensure that the grant awarding criteria facilitates consistency among districts.

Evaluation of Carl Moyer Program Administrative Procedures

The Board is responsible for developing guidelines and criteria to oversee and monitor district grant administration and the districts implement program projects in accordance with the Guidelines. During the review, Finance identified areas where sufficient guidance is in place for districts to implement programs as intended. However, Finance also identified

areas where additional guidance should be provided to districts. The observations are summarized below.

Observation 3 **Cost Principles and Standards**

Although the Guidelines Section II.B, *Outreach Funds*, and Section II.C, *Match*, provides general criteria regarding allowable outreach and match funds, it does not include adequate criteria regarding administrative cost principles and standards. The Board sets aside up to two percent of district annual program allocations for outreach activities. In addition, the Board requires districts to provide a match of $1 for every $2 of Program funding awarded, with certain caps and waivers allowed. The Board first allocated outreach costs of $0.6 million to districts in fiscal year 2004-05 and in fiscal year 2005-06 the outreach allocation increased by $1.1 million to approximately $1.7 million. Similarly, the match requirement increased from $10.6 million in fiscal year 2004-05, to approximately $11.7 million in fiscal year 2005-06.[3] With the increase in administrative costs allowed, it becomes imperative for the Board to clearly define allowable cost principles and standards. The following sections outline areas where the Guidelines could be improved.

Outreach Costs and Matching Requirements: The Guidelines do not provide adequate cost standards for the identification and recording of outreach activity costs or in-kind contributions. For example, Section II B, *Outreach Funds*, provides that staff time spent on outreach activities or program administration are allowable and requires districts to maintain timesheets to support staff time. However, the Guidelines do not provide instructions on how to identify, accumulate, and record staff time charged to outreach or in-kind match. Consequently, reported staff time may not accurately reflect the benefits received from district administrative services or outreach activities. The Board's staff indicate that standard district procedures require staff that work less than full-time on the program to maintain timesheets reflecting the number of actual program hours worked or duty statements substantiating the percentage of staff time spent on program activities. However, the Guidelines do not reflect these standards.

Travel Costs: The Guidelines allow staff travel costs to be included in program outreach costs and match contributions. However, the Guidelines do not include applicable travel criteria and/or maximum per diem rates.

Indirect Costs: The Guidelines allow districts to claim indirect costs. However, it does not specify the methodology and documentation required to support the allocation of indirect costs, which can include general administrative services, office space, and telephone services. Without a reasonable allocation methodology, there is a risk that district indirect costs charged to the program award, or attributable to match contribution, may not be consistent with the benefits received.

[3] Year 8 Carl Moyer Funding Allocation dated January 23, 2006 and the Board's response to Finance questions on May 30, 2006

Allowable and Unallowable Costs: Even though the outreach and matching fund sections in the Guidelines provide examples of allowable costs, the Guidelines do not specify the consequences incurred if districts charge unallowable costs to the project. As a result, the Guidelines do not provide a basis for disallowing or recovering inappropriate costs from the districts and their project grantees.

In establishing and clarifying cost principles and standards, the Board may consider the Office of Management and Budget Circular A-87 (OMB A-87), *Cost Principles for State, Local, and Indian Tribal Governments* as a reference. OMB A-87 outlines general cost principles for state and local governments receiving federal funds. Although the program does not include federal funds, OMB A-87 could assist the Board to further improve the Guidelines.

Recommendation: Revise the Guidelines to include general cost principles and standards. For example, travel cost criteria could include that at a minimum allowable costs be consistent with the district's written travel policies for like circumstances, and in the absence of an acceptable written policy the rates and amounts established under the State's travel policy shall apply. In addition, indirect cost criteria may include a requirement that districts provide a cost allocation plan to demonstrate how indirect costs are allocated to ensure an equitable distribution.

Observation 4 **Accounting System and Record Keeping Requirements**

The Guidelines require districts to record project information by funding source and by funding year in the Board's fund and project tracking system, which currently consists of an Excel spreadsheet. The Guidelines further require districts to account for project funds and outreach funds separately.

However, the Guidelines do not specify what records should be maintained and what reports should be prepared, and lack procedures for maintaining district accounting records (cash receipts, disbursement registers, or equivalent accounting records) by funding source (i.e., program grants, interest, and matching funds) and the related expenditures. In addition, the Guidelines do not require the districts to reconcile the fund and project tracking system data to their accounting records.

The lack of specific guidance on record-keeping increases the risk of commingling of funds, and errors in district accounting and reporting of program funds, expenditures, match contributions, and interest earnings. In addition, there is a potential risk of an inadequate audit trail in the recording, tracking, monitoring, and verifying the accuracy and compliance of program grant moneys, in-kind match contributions, interest earnings, and expenditures.

Furthermore, the Guidelines require districts to maintain documentation for match and outreach costs without specifying the retention period for support documents. The lack of a retention requirement limits the availability of documents for audit and on-site monitoring, which may inhibit the ability to verify that the district meets the match requirement, and that outreach costs are expended for allowable outreach activities.

Recommendations: Revise the Board's Guidelines requiring districts to:

- Maintain accounting records (e.g. general ledger) that separate Program project funds from other funds administered by the district. The accounting records should further separate project, outreach, and matching funds, earned interest, other project resources, and the related expenditures.
- Reconcile program fund and project data entered in the Board's project tracking system to the district's accounting system and records.
- Record in-kind matching contribution and outreach costs in categories paralleling the Guidelines allowable cost categories such as personnel, consulting services, and other operating costs (e.g. mailing, printing, and travel costs.)
- Revise the Guidelines to require districts and their sub-grantees to retain project files and related financial records for a specified time period.

Observation 5 **Interest Earned**

The Guidelines Section IV.E.3, *Earned Interest,* requires districts to report funds deposited in interest bearing accounts to the Board. The Guidelines further requires districts to spend interest earned on projects that meet the program guidelines, and to report projects funded by interest earned in the Board's program database and final report. However, the Guidelines could further be improved by providing specific procedures for accounting and reporting interest earned on program funds.

Recommendations: Establish criteria and guidance on:

- The minimum accounting records districts should maintain to account for interest earned and how it is spent.
- The method of reporting interest earnings on program funds and related expenditures in reports to the Board. Note that the current annual report structure does not provide a section for projects funded by interest earned and therefore does not accommodate interest reporting. Therefore, the Board should update the database to include the capacity to record and track interest earned as a funding source.
- The applicability of earned interest to satisfy the matching fund contribution.

Observation 6 **Audit Planning**

The Guidelines Section XI, *ARBs Oversight*, describe the Boards general monitoring and auditing process, however the Guidelines could be improved by describing the Boards overall audit plan objectives. For this area, the Board asked us to review its *Carl Moyer Program Auditing Policies and Procedures Background* (procedures) to identify areas that may need improvement and/or could be included in the Guidelines. The procedures document general policies and check lists for desk reviews and on-site audits of districts. This document requires the Board's staff to discuss the goals, objectives, and schedule of on-site audits at the entrance conference. However, the document does not include essential features of an audit plan such as, audit objectives, risk assessments, risk-based audit selections, and complete audit procedures to achieve the objectives. Further, the document does not include a plan to review district fiscal and administrative controls in order to determine the extent to which the Board may rely on them for effective program administration. In addition, the document does not include reviews of district audits of grantees, if any, performed in accordance with the Guidelines Section IX.D, *Audits*. Without an appropriate audit plan, the Board's audits may not effectively address significant aspects of the environment in which the districts administer the program and monitor grantee performance.

In addition, the Board's monitoring and auditing of the districts program operations could benefit from a risk based systematic approach to selecting districts for audit. The Board completed monitoring activities at the Sacramento district in July 2004, and an audit of the San Joaquin district in May 2003. The Board has also selected two large districts and two small districts to audit during calendar year 2006. According to the Board, the selection was influenced largely by the availability of staff and is consistent with the Board's plans to audit four districts per year. However, auditing only four districts per year the Board will complete one audit cycle of all 35 districts in 9.25 years. Thirty-five districts throughout the state administer 7,000 projects annually through program funding of approximately $140 million annually. In addition, the program funding structure is complex, including many technical and cost sharing requirements.

The lack of an appropriate approach to the Board's audits and monitoring activities increases the risk that program funds may not be expended effectively or in compliance with program requirements. HSC Section 44291(d) requires the Board to monitor district programs to ensure consistency with the Guidelines and to recapture obligated funds from districts that fail to demonstrate that their implementation is consistent with program requirements.

Recommendation: Amend the Guidelines or include a reference to an additional guide which incorporates an annual audit plan. At a minimum, the plan should include:

- Clearly defined work plan and procedures for audits, desk reviews, on-site monitoring.
- Evaluations of:
  - District fiscal, administrative, accounting and project tracking control environments relative to program funds and the results of project operations.
  - The degree to which the Board may rely on such activities to reduce the Board's workload.
  - Outreach, matching funds, application processing, award effectiveness, and equity issues.
  - Reporting, follow-up, and remedial policies for completed audits (including desk-audits and on-sight monitoring reviews).
- A risk-based approach to ensure appropriate selection of districts and grantees, and adequate coverage of the obligated, expended and unexpended program funds. Potential risk factors for selecting district audits may include the following:
  - Adequacy of district program policy and procedures documents.
  - The Board's assessment of the district program administration.
  - Timeliness, accuracy, and adequacy of support in districts annual and final reports.
  - Districts compliance with the requirement to publicly post reports.
  - Timeliness of districts disbursements to grantees and update of project data.
  - Timeliness of districts project data elements updates.
  - Adequacy and timelines of district pre- and post-inspections of grantee projects.
  - Instances of fraud in districts annual or final reports.
  - Availability of annual independent audits of districts and reported internal control, compliance, or fraud issues.
  - Alternative funds or financial incentives (tax credits or deductions, grants, etc) for program type projects available to the district.
  - Third party grant applications.
  - Timeliness of district grant application processing.
  - Validity of invoices and compliance with the contract provisions.

In addition, the Board may compare actual district data to predetermined benchmarks, including the following, to identify some of the above risk factors in the districts:

- Expected percentage of funds expended for annual and final reporting periods.
- Expected number of projects the districts audited and reported on annually.
- Expected number of district enforcement actions.

- Expected amount of funds recaptured by the district.
- Ratio of applications to awards.
- Mean dollar amount of award for each source category.

Based on the identified risk factors, the Board may establish district audit priorities and the appropriate annual, biennial, etc., audit cycles.

The Effectiveness of Fund and Project Tracking Procedures for Program Auditing Purposes

The Board currently captures program fund and project data in an Excel spreadsheet. An internet based data collecting tool (CARL) designed to replace the spreadsheet is currently under construction. In addition, the Guidelines require the districts to collect certain project data. Our analysis, observations, and recommendations regarding data elements collected by the Board and the districts did not include an assessment of the reliability, integrity, and security of the electronic transmission or the information systems used. Therefore, this report does not include electronic transmission or the information systems observations.

Exhibit II provides a comparative summary of the data elements required in the Guidelines, the Excel spreadsheet, and those proposed for CARL. In addition to summarizing the Board's actual and proposed data collection requirements, Exhibit II provides our recommended data collection elements. The Board's proposed data elements to be collected under CARL are largely consistent with the program requirements. However, we noted additional data elements which, if included, may provide the Board with district information to adequately monitor and control district administration of emission reduction projects. The observations below summarize the most significant omissions.

Observation 7 **Project Data Collection and Annual Financial Reports**

The Guidelines do not include instructions for collecting and validating project data and for filing reliable and consistent annual financial reports. In addition, the Guidelines do not require the appropriate district officer to certify to the truth and accuracy of the annual reports and whether there are known instances of fraud in the program.

The Board currently collects district project and financial information through Excel spreadsheets and Word document templates. When the proposed CARL is implemented, the Board plans to eliminate the district financial reporting requirement because the districts will be required to post project and financial data directly into CARL. The Board will then extract the required annual reports from CARL. Consequently, because the districts post the data into CARL rather than formally submit certified reports, districts may not perceive themselves to be accountable or responsible for the project data, reports, or the program financial management. Therefore, the reliability, accuracy, consistency, and comparability of project and financial information may be compromised.

Further, if the program and financial data and reports are perceived to be unreliable, the Board's oversight and monitoring role over the program may be impaired.

Recommendation: Revise the Guidelines to require the district Chief Administrative Officer, the Chief Financial Officer, and the Chief Carl Moyer Program Grant Administrator to certify annually that the project and financial data keyed into CARL is complete, accurate and the district's responsibility. In addition, require that the certification disclose all known instances of program fraud or state that there are no known instances of fraud.

Observation 8 **Historical and Projected Equipment Emission Data**

The Board does not require districts to obtain historical equipment usage data for replacement projects or projected equipment usage data for new equipment projects. Historical and projected equipment usage data provides a basis for evaluating the applicant's expected emission reductions from new or replacement equipment reported in the grant application. Without this information, the district will not be able to assess the applicant's emission reduction estimates as a basis for approving or declining a grant application. Therefore, the districts may not be approving the most efficient emission reduction projects.

Recommendation: Revise the Guidelines grant application data requirements to require the districts to obtain the applicant's historical and planned equipment usage data to support their emission reduction estimates. This information will provide the districts the data needed to validate projected emission reductions and ensure the districts are making efficient emission reduction award decisions.

Although the Board has generally addressed significant administrative procedures and HSC requirements within the Guidelines, opportunities for improvement exist. We believe that implementing the recommendations listed above will improve the Guidelines compliance with the applicable HSC sections and provide additional controls and criteria for districts to follow.

However, this review was limited to a review of procedures documented in the 2005 Guidelines and a vital component to any review is to evaluate whether the criteria and procedures are "in process" and working as intended. Therefore, we recommend that the Board continue its efforts to improve its administrative oversight by ensuring the Guidelines are updated with appropriate revisions and that the Guidelines are ultimately implemented by the districts via increased audits and on-site monitoring.

Carl Moyer Program 2005 Guidelines
Compliance with Applicable Health Safety Code Sections

EXHIBIT I

This exhibit lists additional observations and recommendations of our 2005 Guidelines review not included in the report. The review was limited to program administration included in Part I, Chapter 2. The more significant observations are discussed in the Observations and Recommendations section of the report. Observations are organized by the guideline part, chapter, and section. Unless otherwise stated, all Guidelines section references are to Part 1, Chapter 2.

Section II - Funding Sources and Types of Carl Moyer Projects			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44291(d): *The state board shall monitor district programs to ensure that participating districts conduct their programs consistent with the criteria and guidelines established by the board and the commission pursuant to this chapter.*	The Guidelines substantially address this requirement through monitoring and auditing provisions at: • Section II.G, At-risk district. • Section IX, *Districts' Monitoring Requirements* • Section XI, *ARB Oversight*	The Guidelines could benefit from a consolidation of the monitoring sections, or at a minimum, a referencing of similar aspects in the three sections.	Revise the Guidelines to consolidate the various monitoring requirements or, at a minimum, cross-reference the relevant sections.

Section III. Program Award Process			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44286(d): *The state board may reserve up to 10 percent of the program funds available each year to directly fund any project that is multidistrict in nature.* Section 44287(a): *The Guidelines shall enable and encourage districts to co-fund projects.*	The Guidelines Section III, *CMP Award Process*, addresses this requirement stating that HSC grants the Board the authority to set aside 10 percent of the program funds for multi-district projects, defining Multi-district projects, and specifying the Board focus and areas of statewide importance.	The Guidelines could be strengthened by specifying: • How or when districts shall apply for the multi-district projects. • Eligibility criteria. • The process and criteria for awarding contracts to multi-districts projects.	Revise the Guidelines to include reference to the multi-district solicitation packet available at the ARB web site. The packet provides information on: • The application documentation requirement and due date. • Eligibility criteria. • Project selection methodology.
Section 44286(b): *The responsibilities of a district include: local administration of project funds, monitoring funded projects, and reporting results to the board.*	The Guidelines Section III substantially addresses this requirement. The Board requires districts to submit status, annual, and final reports as follows: **1. Status Report** • Due by November 15. • Shall be made publicly available. • District's policies and procedures manual shall be submitted with the status report. • The status report shall indicate the district's progress in meeting its projected milestones. **2. Annual Report** • Due by or before June 30 of the year following districts allocation. • Shall be made publicly available.	The Guidelines do not provide: 1. References to or examples of the prescribed Board report format for status reports, annual reports, or final reports. 2. Instructions on updating project information in the database. 3. Feasible reporting due dates. For example, if reports are due on or before June 30, a district cannot reasonably include financial data for the fiscal period ending *June 30*. Therefore, if the Board is requesting fiscal year-end data (i.e. *as of* June 30), the report due dates should be extended to July 30 or another reasonable date.	Revise the Guidelines to address the observations noted. For example: 1. Provide description and formats of status, annual, final reports, instructions on how to fill out the reports, and instructions on how to obtain blank report forms. Make them available at the web site and include a link to the site. 2. Establish/provide instructions on how to update project information in the database. 3. Clarify and establish report "*as of*" and "*due*" dates.

Section III. Program Award Process			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
	• At minimum, a brief narrative on the implementation of the program shall be submitted. • Districts shall update all of the project information in the database. 3. **Final Report** • Due by June 30 of the second year following the award or after program funds and local match commitment have been expended. • Shall be made publicly available. • At minimum, a brief narrative on the implementation of the program shall be submitted. • Districts shall update all of the project information in the database.		

Section IV. Program Solicitation			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44287(d): The state board shall develop guidelines for a district to follow in applying for the reservation of funds. The Guidelines shall be established and published by the state board as soon as practicable, but no later than January 1, 2006.	The Guidelines Section IV, *Program Solicitation*, outline solicitation process, required application documents, application review process, and final grant awards process.	The Guidelines do not adequately address the following issues: 1. Reference or link to the web address, where the districts can obtain the current solicitation packet. 2. Deadline to respond to the Board solicitation package. 3. Authorized district signatory for the district application, the Grant Award and Authorization Form. The section merely observes, "Usually APCO signs the Grant Award Authorization form." Such language does not constitute a directive. 4. No reference identifying the Boards authorized staff that signs the Grant Award and Authorization form.	Revise the Guidelines to address the observations noted.

500

Section V. District Solicitation and Project Acceptance			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44288(a): *The date and time of receipt of each application determined to be complete shall be recorded and the complete application shall be evaluated with respect to the appropriate project selection criteria.*	The Guidelines Section V.D, *Project Applications*, and Section VI, *Project Selection* substantially satisfy this requirement by requiring the districts to review all applications for completeness and eligibility. Additionally, Section VI requires districts to select projects based on the district's policies and procedures manual. The sections further require the districts to maintain a record of the eligibility verification and the projects rating, ranking, and other selection criteria with the application in the applicant's file.	For completeness and clarity appropriate reference(s) to the minimum requirements for each project category (Part II and chapters 1 through 12) should be provided in the eligibility and project selection sections of the Guidelines.	Revise the Guidelines to include references to the minimum requirements outlined in Part II and chapters 1 through 12.
Section 44288(a): *Notwithstanding any other provision of this chapter, the administering district may determine that an application is not in good faith, not credible, or not in compliance with this chapter and its objectives.*	The Guidelines Section V.D.2, *Eligibility of Project,* states that the district is responsible for determining if the application is good faith, credible, or compliant with the program objectives. The section further requires the districts to determine whether the applicant's project meets the programs emission reduction and cost effectiveness criteria.	The Guidelines do not provide *good faith*, *credibility*, or *compliance* application standards. The lack of such guidelines could lead to inconsistent and inequitable application approval/denial decisions among districts.	Revise the Guidelines to provide good faith, credibility, or compliance application standards.
Section 44290: *The state board and district shall vigorously recruit grant applications and publish examples of successful projects.*	The Guidelines Section V.C, describes the two typical solicitation methods used by districts: • Over the counter (OTC) • Notice of funds available (NOFA) Further the section allows districts to solicit applicants for two years of funds in one solicitation in order to stay current with the obligation requirements.	The Guidelines merely describe the two typical solicitation methods used by districts. However, both are passive in nature, and it is not clear if OTC and NOFA are the only solicitation methods allowed.	Revise the Guidelines to include vigorous recruitment procedures as required by HSC Section 44290.

501

Section VI. Project Selection			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44288(a): *A district shall make every effort to process an application and grant an award rapidly and to coordinate project approval with any purchase or installation timing constraint on an applicant.*	The Guidelines Section VI, *Project Selection*, requires districts to make every effort to process an application and grant an award rapidly. It requires the district to provide the average and median time frames to award grants as part of the "Year 8" annual reports. Further, it requires grant award notification to be in writing and a copy maintained in the district in the applicant files.	The Guidelines do not provide adequate procedures to facilitate expedited district processing of project application or grant awards.	Revise the Guidelines to specify time frames for processing project applications and awarding grants.

Section VIII. Minimum Contract Requirements			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44291(a): *The state board shall assist districts with developing procedures to monitor whether the emission reductions projected in successful grant applications are actually achieved. Monitoring procedures may include project audits, and may also include requirements, as part of the contract between the state board or districts and the grant recipients, that each grant recipient provide information about the project on an annual basis.*	The Guidelines Section IX addresses the districts responsibility to conduct project pre- and post-inspections, and annual reporting. Section VIII further requires on-site inspections, auditing, and reporting during the installation phase through the implementation phase, which may last up to six years. For example the section requires biennial reporting on zero-emission technology projects for up to six years. Further, the Guidelines requires districts to include on-site inspections, auditing, and reporting as part of the contract between the district and grantee.	The Guidelines sections subject to this review (Part 1, Chapter 2) does not address procedures to specifically monitor the achievement of emission reductions projected in the grantee applications are actually achieved. Neither do these sections reference other portions of the Guidelines that do.	Revise the Guidelines to include • Procedures or references to procedures that specifically monitor project emission reductions achieved, against those projected in the grantee applications. • Specific objectives for performing project pre- and post-inspections.

Section IX. Districts' Monitoring Requirements			
HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Section 44291a), Third sentence: *Information required from grant recipients should be minimized and the format for reporting the information should be made simple and convenient.*	The Guidelines do not address this requirement.	The Guidelines do not instruct districts to minimize the information required from grantees and to make reporting formats simple and convenient.	Revise the Guidelines to require that districts minimize the information required from grantees and make the format for reporting the information simple and convenient.

Section X. Expenditure Requirements			
HSC Requirements	**Guidelines Summary**	**Observation**	**Recommendations**
Section 44297(b): *The Guidelines may define eligible costs to include monitoring and verifying compliance with this article.*	The Guidelines Section X, *Expenditure Requirements,* states that districts must require grant recipient to provide project information on an annual basis. In addition, the Guidelines provide districts with detailed monitoring requirements.	The Guidelines do not specify that costs incurred by the districts to monitor and verify compliance with the relevant HSC sections are allowable.	Revise the Guidelines to specify that costs incurred by the districts to monitor and verify compliance with the relevant HSC sections are allowable.

HSC Requirements	**Guidelines Summary**	**Observations**	**Recommendations**
Glossary			
General – Glossary of Administrative terminology.	*Section I, Administrative Terminology* defines only two terms used in the Guidelines, "Carl Moyer Program Funds" and "contract."	For clarity in the interpretation of key sections of the Guidelines, it is necessary to define key program terminology.	Expand glossary.

EXHIBIT II

Air Resources Board
Carl Moyer Program

Data Elements Collected for Project Tracking

Description	Data Elements Currently Collected			Recommended Data Collection Elements
	Guidelines (a)	On-Road Excel (b)	CARL (c)	
Project Administrative Information				
Project Number		x	x	x
District		x		x
MultiDistrict			x	x
Year of Funding (multiple records)		x	x	x
Source of Funding (multiple records)		x	x	x
Funding Program (multiple records)			x	x
Funding Amount (multiple records)		x	x	x
Date Application Received			x	x
Application Approved/Denied				x
Date Application Approved/Denied			x	x
Obligation Date			x	x
Pre-Inspection				
Date Inspection Completed			x	x
Inspector's Name and Title				x
Meter Reading (miles/Hours)				x
Engine Working as Described in the Application	x			x
Verified Base Engine Information (Family, Make, Model, Year, etc	x			x
Verified Engine Identification Number	x			x
Verified Owner Has Title				x
Verified Engine Location	x			x
Verified Engine in Approved Equipment/Vehicle	x			x
Verified Equipment/Vehicle Identification Number	x			x
Inspector Comments	x			x
Post-Inspection				
Date Inspection Completed			x	x
Inspector's Name and Title				x
Verified New/Rebuilt Engine/Retrofit Installed	x			x
Verified New/Rebuilt Engine/Retrofit in Running Condition	x			x
Meter Reading (miles/Hours)				x
Verified Engine/Retrofit Location	x			x
Verified Owner has Title				x

Air Resources Board
Carl Moyer Program

Data Elements Collected for Project Tracking

Description	Data Elements Currently Collected			Recommended Data Collection Elements
	Guidelines (a)	On-Road Excel (b)	CARL (c)	
Awarded Project Information (possible for multiple records)				
Project Name			x	x
Equipment Type (Source Cat)			x	x
Grant Amount Approved				x
Technology (New, Repower, Retrofit)	x	x	x	x
Project Location-Street Address, City, County, State, Zip Code.	x	x	x	x
Vehicle Type	x	x	x	x
Vehicle Identification Number	x	x	x	x
Vehicle Make	x		x	x
Vehicle Model	x		x	x
Model Year	x		x	x
GVWR	x		x	x
License Plate Number	x		x	x
Baseline Vehicle Fuel			x	x
New Vehicle Vendor	x			x
Vendor and Address (multiple records)				x
Vendor ID Number (Statewide)			x	x
Contract Amendment No. (multiple records)				x
Contract Amendment Date (multiple records)				x
Activity Information				
Percent Operated in California	x		x	x
Percent Operated in Air District	x	x	x	x
Project Life	x		x	x
Annual Miles/Hours or Gallons of Fuel Used	x			x
Electronic Monitoring Unit (EMU)				
Will a new EMU be Installed?	x		x	x
EMU Make	x		x	x
EMU Model	x		x	x
EMU Model Year	x			x
EMU ID Number	x		x	x
EMU Cost	x		x	x
EMU Installation Cost (Labor)				x

Air Resources Board
Carl Moyer Program

Data Elements Collected for Project Tracking

Description	Data Elements Currently Collected			Recommended Data Collection Elements
	Guidelines (a)	On-Road Excel (b)	CARL (c)	
New Purchase Projects				
Engine Family (if applicable)				x
Engine Make	x		x	x
Engine Model	x		x	x
Engine Year	x		x	x
Engine Serial Number	x		x	x
New Engine Purchase Costs				x
New Engine Installation Cost (Labor)				x
New Engine Meter Reading (if applicable)				x
ARB Certification Executive Order Number	x		x	x
Fuel Type	x			x
Baseline Fuel Type for Main Engine	x			x
Baseline Fuel Type for Auxiliary Engines	x			x
Auxiliary Engine Make	x			x
Auxiliary Engine Model	x			x
Auxiliary Engine Year	x			x
Auxiliary Engine Serial Number	x			x
Auxiliary Engine Horsepower	x			x
Auxiliary Engine Fuel	x			x
Auxiliary Engine Family	x			x
New Auxiliary Engine Meter Read (if applicable)				x
Baseline Auxiliary Engine Costs	x			x
Baseline Auxiliary Installation Costs (Labor)				x
New Vehicle Costs	x		x	x
Incremental Cost			x	x
Amount District to Pay (preliminary)			x	x
New Vehicle Meter Reading (if applicable)				x
Expected Usage (miles/hours) per Year				x
Vehicle Identification Number				x
Repower Projects				
Baseline Main and Auxiliary				
Engine Family	x			x
Engine Make	x			x
Engine Model	x			x
Engine Year	x			x
Engine Serial Number	x			x
Horsepower	x			x
Fuel Type	x			x
Meter Reading (Miles/Hours)				x
Engine Age (Years)				x

Air Resources Board
Carl Moyer Program

Data Elements Collected for Project Tracking

Description	Data Elements Currently Collected			Recommended Data Collection Elements
	Guidelines (a)	On-Road Excel (b)	CARL (c)	
Reduced Emission Main and Auxiliary				
Engine Family	x			x
Engine Make	x			x
Engine Model	x			x
Engine Year	x			x
Engine Serial Number	x			x
Horsepower	x			x
Fuel Type	x			x
Meter Reading (Miles/Hours)				x
ARB Executive Order Number	x			x
Engine Remanufacture Costs	x			x
Newer Engine Costs	x			x
Newer Engine Installation Cost	x			x
Retrofit Projects				
Vehicle Make (if applicable)				x
Vehicle Model (if applicable)				x
Vehicle Year (if applicable)				x
Vehicle Identification Number (if applicable)		x		x
Engine Make	x			x
Engine Model	x			x
Engine Year	x			x
Engine Tier (if applicable)	x			x
Engine Family	x			x
Engine Serial Number	x			x
Engine Horsepower	x			x
Fuel Type	x	x		x
Retrofit Devise Make	x			x
Retrofit Devise Model				x
Retrofit Devise Serial Number	x			x
ARB Verified Retrofit Devise	x			x
Retrofit Devise ARB Executive Order	x			x
Retrofit Devise Cost	x	x		x
Retrofit Devise Installation Cost	x			x
Retrofit Devise Project Life Maintenance Costs	x			x
Engine Meter Reading (miles/hours) at Installation				x
Baseline Annual Miles/Hours per Year	x			x
Baseline Costs		x		x
Reduced Emission Costs		x		x

Air Resources Board
Carl Moyer Program

Data Elements Collected for Project Tracking

Description	Data Elements Currently Collected			Recommended Data Collection Elements
	Guidelines (a)	On-Road Excel (b)	CARL (c)	
Invoice Information				
Invoice Number (multiple records)				x
Invoice Amount (multiple records)			x	x
Date Invoice Received (multiple records)			x	x
Date Invoice Paid (multiple records)			x	x
Amount Paid (multiple records)			x	x
Source of Disbursement (multiple records)				x
Air District Check No. (multiple records)				x
Air District Program Administration				
Air District Name				x
Air District Chief Executive Officer				x
Phone Number				x
Email Address				x
Air District Chief Financial Officer				x
Phone Number				x
Email Address				x
Air District Chief CMP Officer				x
Phone Number				x
Email Address				x
Air District CMP Claim Processor/Approver				x
Phone Number				x
Email Address				x
Air District CMP Contact Person				x
Phone Number				x
Email Address				x
Air District Shipping Address				x
City/State/Zip				x
Air District Mailing Address				x
City/State/Zip				x
Air District Physical Address				x
City/State/Zip				x
Air District Program Financial Reporting				
Funding Year (multiple records)				x
Air District Match Source (multiple records)				x
Air District Match Amount (multiple records)				x
CMP Funding Request (multiple records)				x
CMP Allocation (multiple records)				x
CMP Obligated (multiple records)				x
CMP Expended (multiple records)				x
Interest Earned on CMP Funds (multiple records)				x
2% Admin Expenditure Categories (multiple records)				x
Amount (multiple records)				x
Comments and Notes				x