

SUMMARY OF BOARD ITEM

ITEM # 01-3-I : PUBLIC HEARING TO CONSIDER THE STATUS OF IMPLEMENTATION OF THE CARL MOYER AIR QUALITY STANDARDS ATTAINMENT PROGRAM

STAFF RECOMMENDATION: The staff recommends that the Air Resources Board (ARB or Board) approve the status report on the implementation of the Carl Moyer Air Quality Standards Attainment Program (The Carl Moyer Program) for submittal to the Governor and the Legislature as required by section 44297(a) of the Health and Safety Code.

DISCUSSION: The Carl Moyer Program is in its third year of implementation. Initial program guidelines were approved in February 1999 and revised guidelines were approved in November 2000. The Carl Moyer Program has provided \$98 million (\$25 million for the 1998/1999 fiscal year (FY), \$23 million for the 1999/2000 FY, and \$50 million for the 2000/2001 FY) in incentives to substantially reduce emissions of oxides of nitrogen (NO_x), a smog-forming pollutant, from mobile source diesel engines. The Carl Moyer Program also aims to reduce the fine particulate component of diesel exhaust, which contributes to particulate matter (PM) air pollution and is a toxic air contaminant. The program provides grants for the incremental cost of cleaner on-road heavy-duty vehicles, off-road equipment, marine vessels, locomotives, agricultural pumps, and other equipment. A portion of the program also provides grants to support refueling infrastructure and engine technology development. The NO_x emission reductions achieved through this program are necessary to meet California's clean air commitments under the State Implementation Plan.

Section 44275 of Part 5 of Division 26 of the Health and Safety Code, Chapter 923, establishes the ARB and the California Energy Commission as the administrators of the Carl Moyer Program. This section also mandates that the Board submit an annual report on the status of the Carl Moyer Program.

The Carl Moyer Program has been implemented quickly and is helping provide near-term solutions to California's air pollution problems. This expedited implementation has resulted in the availability of hundreds of tons of NO_x reductions. These reductions are proving to be a critical element in alleviating California's energy crisis. In response to Executive Order D-24-01 and D-28-01, ARB has established an emissions reduction credit bank to provide emissions offsets for the establishment of additional power capacity. Emission reductions from the first two years of the Carl Moyer Program are being used to "fund" the bank. The immediate availability of these reductions will enable additional generating capacity to come on-line quickly to meet summer power demand.

Over 80 percent of the engines funded include agricultural irrigation pumps, refuse haulers, urban transit, and school buses. These vehicles and equipment operate in inner-city and agricultural communities, where the majority of the emission reductions from this program will be realized. All major air districts in the state are well into the process of awarding third year grants.

Estimated emission reductions from the first two years are about 7 tons per day of NO_x and 400 pounds per day of PM. Emission benefits occur immediately, and will continue well into the next decade because some lower-emission engines may be in service 20 years or more. Overall, the program is extremely cost-effective – averaging below \$5,000 per ton of NO_x. At

this level, ongoing funding could result in NOx emission benefits of 15 to 20 tons per day by 2005, depending on the expected life and cost-effectiveness of the projects funded, and the quantity of offsets used for power generation.

This report is an update on the status of the statewide program for the first two years as required by the Health and Safety Code, including status of expenditures, types of projects, number of engines, and emission benefits. The report also addresses the role of the Carl Moyer Program in reducing public exposure to toxic diesel exhaust and the program's role in alleviating California's energy crisis. The significant emission benefits possible through incentive programs and the overwhelming request for funding support the need for continued funding.

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CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER A STATUS REPORT ON THE CARL MOYER MEMORIAL AIR QUALITY STANDARDS ATTAINMENT PROGRAM;
INCENTIVES FOR LOWER EMISSION HEAVY-DUTY ENGINES (THE CARL MOYER PROGRAM)

The Air Resources Board (Board or ARB) will conduct a public meeting at the time and place noted below to consider a status report on the Carl Moyer Program, as required by Section 44295 of the Health & Safety Code. The Carl Moyer Program is in its third year of implementation. Initial program guidelines were approved in February 1999 and revised guidelines were approved on November 16, 2000. A total of \$43.5 million has been encumbered to participating districts through the first two years of the program, and an additional \$50 million (\$45 million to ARB for engine projects and \$5 million to the California Energy Commission (CEC) for infrastructure and advanced technology projects) was authorized by the Governor and the Legislature for the third year of the program (FY 2000-01.) The status report will include background on the Carl Moyer Program and the participating districts' progress toward expending the funds appropriated in the 1998/1999, 1999/2000, and 2000/2001 fiscal years. The report also includes discussion of CEC's activities in implementing the infrastructure demonstration and advanced technology portions of the Carl Moyer Program. A summary of the report will be presented to the Board at the meeting.

D A T E : April 26, 2001

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Central Valley Auditorium
1001 I Street, Second Floor
Sacramento, CA 95814

The item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., April 26, 2001, and will continue at 8:30 a.m., April 27, 2001. This item may not be considered until April 27, 2001. Please consult the agenda for the meeting, which will be available at least 10 days before April 26, 2001, to determine the day on which this item will be considered.

This facility is accessible to persons with disabilities. If accommodation is needed, please contact Erin Weaver at (916) 322-6922 or TDD (916) 324-9531 or (800) 700-8326 for TDD calls from outside the Sacramento area 14 days before April 26, 2001.

BACKGROUND

Diesel engines emit significant quantities of pollutants such as oxides of nitrogen (NO_x) that form smog and ambient particulate matter, as well as compounds that have been shown to cause cancer. Despite being less than five percent of California's total engine population, heavy-duty diesel engines contribute to more than 40 percent of California's NO_x emissions. Additionally, the approximately 1.2 million heavy-duty diesel engines currently operating statewide do so for a very long time, which impacts the turnover rate of these engines-

The ARB's 1994 South Coast State implementation Plan for Ozone (1994 SIP) contains many emission reduction measures, including a number of measures to reduce emissions from heavy-duty diesel engines. These measures include mandatory emission standards and voluntary incentive measures. Stringent new engine emission standards will result in 80 to 90 percent of the expected NO_x reductions called for in the 1994 SIP by 2010. The additional emission reductions needed to reach 100 percent will have to be achieved through incentive programs.

In 1998, the ARB identified particulate matter exhaust (PM) from diesel-fueled engines as a toxic air contaminant. One study concluded that diesel PM is responsible for over 70 percent of the cancer risk from identified toxic air contaminants in the South Coast air basin. Consequently, in September of 2000, the Diesel Risk Reduction Plan (Plan) was approved by the Air Resources Board, which focuses on PM emission reductions for new and existing diesel-fueled engines and vehicles. In light of this Plan, the Carl Moyer Program revised guidelines include a provision to reduce PM emissions.

The Carl Moyer Program has been implemented quickly and is contributing near-term emission reductions to help address California's air pollution. This expedited implementation has resulted in the availability of hundreds of tons of NO_x reductions- These reductions are proving to be a critical element in alleviating California's energy crisis. In response to the Governor's Executive Orders D-24-01 and D-28-01, ARB has established an emissions reduction credit bank to provide limited term emissions offsets to facilitate siting of additional peaking power capacity. Emission reductions from the first two years of the Carl Moyer Program are being used to "fund" the bank. The immediate availability of these reductions will enable additional generating capacity to come on-line quickly to meet summer power demand.

DISTRICT PROGRESS

Implementation of the Carl Moyer Program has been successful with 22 districts participating statewide. Districts have been gratified by strong local response to requests for project applications, and demand for project funds continues to exceed available funding. The types of projects being funded 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 marine vessels, agricultural pumps, and other off-road equipment. All the major air districts in the state are well into the process of awarding third year grants.

Estimated emission reductions from the first two years are about 7 tons per day of NO_x and 400 pounds per day of PM. Emission benefits will be realized into the next decade because many lower-emission engines will remain in service for 10 years or more. Overall, the program is extremely cost-effective – averaging below \$5,000 per ton of NO_x. At this level, ongoing funding could result in NO_x emission benefits of 15 to 20 tons per day by 2005, depending on the expected life and cost-effectiveness of the projects funded, and the amount of offsets used for power generation.

In order to continue “funding” the ERC bank with sufficient emission reductions for power plants to provide additional electric generation through 2003, another incentive program – The NO_x and PM Emission Reduction Program – has been proposed as part of the Governor’s FY2001/02 budget. This program will provide additional short term emission offsets and longer term emission reductions that will benefit public health.

STATUS OF CEC INFRASTRUCTURE DEMONSTRATION AND TECHNOLOGY DEVELOPMENT PROJECTS

The CEC program criteria and guidelines for implementing the Carl Moyer Fueling Infrastructure Program were approved at a CEC Business Meeting in November 1999. Under the CEC program, funds are subvented to air districts which solicit applications and expend funds in accordance with the criteria. The CEC has conducted two solicitations for infrastructure projects, and awarded a total of \$4.5 million for projects in local air districts.

The CEC released the first solicitation of \$2 million for the Advanced Technology Development program in November 1999. In addition, the CEC contracted with the South Coast AQMD for \$500,000 to join a program to develop and commercialize natural gas heavy-duty-engines meeting 0.5 g/bhp-hr NO_x emissions. Proposals to the 2000-01 solicitation for \$2.22 million are currently under review.

Like the ARB’s portion of the Carl Moyer Program, the CEC’s infrastructure demonstration and advanced technology development programs have been oversubscribed in both funding years. A full discussion of CEC’s Carl Moyer programs is included in the report.

AVAILABILITY OF DOCUMENTS AND CONTACT PERSON

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, P.O. Box 2815, 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 Cindy Sullivan, Manager, Alternative Strategies Section, at (916) 445-6015, P.O. Box 2815, Sacramento, California, 95812.

SUBMITTAL OF COMMENTS

The public may present comments relating to this matter orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written submissions received **no later than 12:00 noon, April 25, 2001**, and addressed to the following:

Clerk of the Board
Air Resources Board
1001 I Street, 23rd Floor
Sacramento, CA 95814

To be considered by the ARB, e-mail submissions must be addressed to mover01@listserve.arb.ca.gov and received at the ARB **no later than 12:00 noon, April 25, 2001**.

To be considered by the ARB, facsimile submissions must be sent to (916) 322-3928 and received at the ARB **no later than 12:00 noon, April 25, 2001**.

The Board requests but does not require 30 copies of any written submission. Also, the ARB requests that written and e-mail statements be filed at least 10 days prior to the meeting so that AR5 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 of comments.

CALIFORNIA AIR RESOURCES BOARD


 Michael P. Kenny
Executive Officer

Date: April 13, 2001

California Environmental Protection Agency

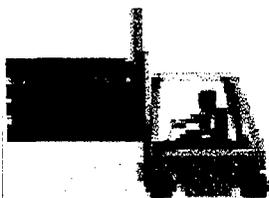


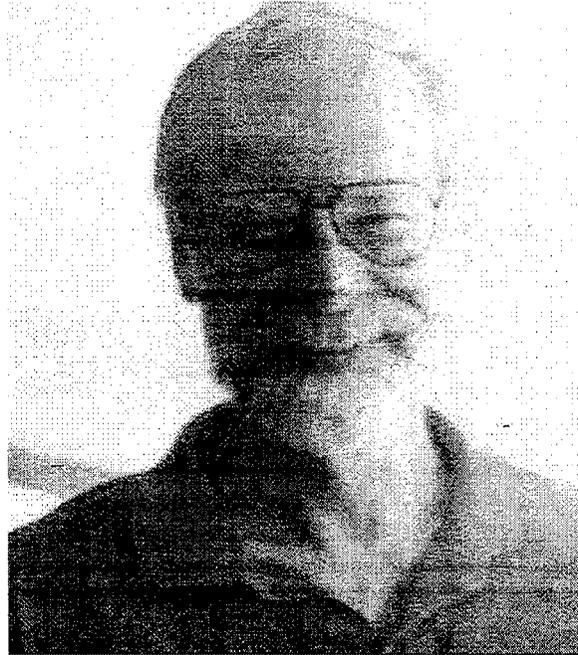
Air Resources Board

THE CARL MOYER PROGRAM STATUS REPORT

The Carl Moyer Memorial Air Quality Standards
Attainment Program; Incentives for Lower Emission
Heavy Duty Engines

April 13, 2001





In memory of Dr. Carl Moyer
(1937 – 7997)

This program is named in honor of the late Dr. Carl Moyer, whose extraordinary dedication, hard work, vision and leadership made this program possible. He created and masterminded this program, in a noble effort to unite business and government in the name of public interest to improve California's air quality.

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EXECUTIVE SUMMARY

There are more than 1.2 million diesel engines in-use within California. In trucks, buses, trains, boats, agriculture and construction equipment – diesel engines move goods and people, build our cities and towns, and help grow our crops. They also pollute the air. Diesel engines emit significant quantities of pollutants that form smog, as well as compounds that are carcinogenic- A prominent study concluded that diesel particulate matter (PM) is responsible for over 70 percent of the cancer risk from identified toxic air contaminants in the South Coast air basin. Most control strategies depend on fleet turnover to achieve emission reductions over the course of time. Diesel engines are very durable and can continue operating for 20 years or more, making fleet turnover an uncertain emission control strategy. Near-term emission reductions from heavy-duty diesel engines are critical to achieving air quality goals.

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a vital part of the solution to reducing emissions from heavy-duty diesel engines, resulting in very near-term emission reductions that are extremely cost-effective. The purpose of the Carl Moyer Program is to reduce emissions and help California meet its air quality obligations under the State Implementation Plan (SIP), a federally-enforced clean air plan. The program provides grants for the extra capital cost of vehicles and equipment that are cleaner than required. In essence, the program buys critical near-term emission benefits that **California** needs to meet impending federal air quality deadlines. The program also provides grants to pay for infrastructure to fuel engines funded under the Carl Moyer Program, as well as to pay for advanced technology projects that will move technology further to reduce emissions beyond what is required by any state, federal, or local regulations.

The Carl Moyer Program has been implemented quickly and has proven to be one of the key heavy-duty programs of the Air Resources Board (ARB). ARB's goal is to provide safe, clean air to all Californians, in particular those populating areas that are often disproportionately impacted by air pollution, Much of this pollution is caused by heavy-duty diesel engines. The Carl Moyer Program is a near-term solution to this challenge. In the first two years of the program, over 80 percent of the engines funded by the Carl Moyer Program include refuse haulers, urban transit buses, school buses, and agricultural irrigation pumps. These engines are operated throughout inner-city communities and in agricultural areas.

Through the first two years of the program, local air districts and the ARB have participated in a variety of conventional outreach methods to attract participants. These have included solicitations, brochures and workshops. In this third year, additional action is being taken to attract increased participation by those businesses that

operate in areas that are disproportionately impacted by air pollution. The new activities include advertisements in various languages in numerous local newspapers, publications, community newsletters, as well as targeted one-on-one outreach to small businesses in impacted communities.

Air quality districts have been gratified by the strong local response to their calls for project applications. Demand continues to exceed available funding. The Health and Safety code, Section 44275 et. seq., authorized the Air Resources Board (ARB) and the California Energy Commission (CEC) to implement the Carl Moyer Program, and established the Carl Moyer Program Advisory Board (Advisory Board). The advisory board was responsible for assessing program implementation and determining the need for continued funding. In the first quarter of 2000, both the ARB and the Advisory Board provided the Governor and the Legislature with separate reports explaining the program's success and the need for this program to continue beyond the first two years. The Governor and the Legislature agreed with conclusions made in those reports and responded by making a third one-time budget appropriation in the 2000/2001 fiscal year to fund this program for a third year.- To date, the Governor and the Legislature have appropriated a total of \$98 million over the last three fiscal years (1998/1999, 1999/2000, and 2000/2001) to fund this important program. Of that \$98 million, ARB administers \$89 million to pay for engine projects- CEC administers \$9 million for infrastructure and advanced technology.

In the first three years ARB has allocated program funds to 22 local air pollution control and air quality management districts. Over 80 percent of first and second year engine project funds (about \$38 million) have been committed to specific projects. Of these - funds 50 percent paid for alternative fuel projects (610 engines), 26 percent paid for agricultural irrigation pump projects (947 engines), 16 percent paid for marine vessel projects (95 engines), 4 percent paid for forklift projects (105 motors), and 4 percent paid for both on- and off-road diesel-to-diesel repower projects (108 engines).

CEC has awarded 75 percent of its funds, \$4.5 million to pay for infrastructure projects - and \$2 million to pay for several advanced technology development projects- Infrastructure funding is a critical component to the success of the Carl Moyer Program. Local air districts and project proponents have leveraged CEC funds to establish natural gas fueling facilities capable of fueling hundreds of vehicles. Through the advanced technology development portion the Carl Moyer Program, CEC is funding the development of aftertreatment devices for diesel engines and development of very low emission natural gas engines. This program places a strong emphasis on commercialization so that these low emission technologies will be available to the marketplace much earlier than required by regulations.

Estimated emission reductions from the first two years are about 7 tons per day of NO_x and about 400 pounds per day of PM. When third year projects are implemented, it is anticipated that annual NO_x reductions will total approximately 14 tons per day, and PM emission reductions will total about 800 pounds per day. The majority of the emission benefits will occur in the first five years (the minimum project life), although some of the lower-emission engines may be in service 20 years or more. On-road projects paid for under the program have been alternative fuel new engines or conversions that include refuse haulers, school buses and urban transit buses. Diesel-to-diesel replacements were predominantly in the marine vessel, off-road equipment, and stationary agricultural irrigation pump categories. Off-road engines were previously unregulated, and these older engines are two to three times more polluting than new, certified engines. The majority of the engines paid for under the Carl Moyer Program include agricultural irrigation pumps, refuse haulers, urban transit and school buses.

Quick implementation of the Carl Moyer Program has provided Californians with benefits beyond those expected for air quality. These reductions are proving to be a critical element in alleviating California's energy crisis. The Governor issued Executive Order D-24-01 directing ARB to establish an emissions reduction credit (ERC) bank from all available sources. In response to that Executive Order, ARB has established an ERC bank to provide emission offsets for new peaking facilities as needed. Emission reductions (about 5.8 tons/day of NO_x and 354 pounds/day of PM) that will be achieved in 2001 from the engines funded in the first two years of the Carl Moyer Program will be borrowed to "fund" the bank. The immediate availability of these reductions will enable additional generating capacity to come on-line quickly to meet summer 2001 power demand without resulting in adverse air quality impacts.

In order to continue "funding" the ERC bank with sufficient emission reductions for power plants to provide additional energy relief through 2003, another incentive program – The NO_x and PM Emission Reduction Program – will be implemented by ARB and the local air districts. This new program is designed to help address the energy crisis and provide additional ERCs for new power plant projects. The ERCs being made available for power plants are limited to three years, from 2001 to 2003. At the end of the three years power producers will have to provide their own offsets to continue operation. Since many of the projects paid for under the new program would have a project life beyond three years, ARB anticipates that the NO_x and PM Emission Reduction Program will replenish the emission reductions borrowed from the Carl Moyer Program after 2003. Additionally, the new program will provide further air quality benefits that would not be realized under the Carl Moyer Program. The ARB anticipates that emission reductions from the new program will provide California with air quality benefits for the remaining life of the projects beyond 2003, which are expected to be 10 years or more.

Overall, the program has been very cost-effective – averaging below \$5,000 per ton of NO_x reduced. At this level, ongoing funding could result in NO_x emission benefits of 15 to 20 tons per day by 2005, depending on the expected life and cost-effectiveness of the projects funded. The Carl Moyer Program will enable California to increase power generation quickly and effectively. The program will continue to provide air quality benefits for the remainder of the life of each project. In addition to alleviating a near-term power crisis and continuing to help California meet its SIP obligations, reducing public exposure to smog and toxic PM emissions make the need for continued financial support of this program even more pressing.

The following report is an update on the status of the statewide program for the first two years as required by Health and Safety Code Section 44295. The report contains information on both the ARB and CEC portions of the Carl Moyer Program. Detailed information is provided regarding local air district programs which include the status of expending state funds under the program, the types of projects and number of engines paid for, and the emission benefits for each local program. In addition, the report addresses how the Carl Moyer Program has reduced public exposure to toxic diesel exhaust and the role this program is playing in alleviating California's energy crisis.

I.

BACKGROUND

Diesel-fueled engines used in trucks buses, many types of off-road equipment, emergency engines, locomotives, and ships are a major source of air pollution. Diesel-fueled engines emit a complex mixture of thousands of gases, vapors, and particles. These include smog-forming oxides of nitrogen (**NOx**), fine particles less than 10 microns in size (**PM₁₀**), and over forty substances currently listed by ARB as toxic air contaminants. This Chapter describes current statewide **NOx** and **PM₁₀** emissions and explains the need for incentive programs to assist California in reducing emissions from heavy-duty diesel engines.

A. What Are Total NOx And PM Emissions Statewide?

Despite being less than the five percent of the vehicle population, heavy-duty mobile source engines account for about 40 percent of **NOx** emissions, a smog-forming pollutant. Light- and medium-duty vehicles account for about 40 percent, and stationary sources for roughly 20 percent of statewide **NOx** emissions. In addition, the fine particulate matter exhaust from heavy-duty diesel engines has been identified as a toxic air contaminant which can cause cancer. Total statewide emissions of **NOx** and **PM₁₀** are about 3600 tons per day and 2300 tons per day, respectively (2000 inventory). Statewide **NOx** and **PM₁₀** emissions from selected categories of heavy-duty engines are shown in Table I-1.

Source Category	2000		2005		2010	
	NOx	PM₁₀	NOx	PM₁₀	NOx	PM₁₀
On-road Heavy-Duty Vehicle ^a	607	19	527	15	439	13
Off-Road Equipment ^b	558	39	517	36	411	29
Locomotive	146	3	106	3	77	3
Marine	70	6	105	9	109	9
Total	1381	67	1255	63	1036	54

a) Emissions from large heavy-duty diesel trucks and buses. Emissions based on EMFAC2000 v2.02.

b) Emissions from all off-road diesel equipment as represented in the currently adopted OFFROAD emissions model.

B. What Is The State Implementation Plan (SIP)?

In 1994, ARB worked with industry, environmentalists, government agencies, and experts in the air quality field to put together a long-term plan for bringing clean air to all Californians. That long-term plan is known as our 1994 State Implementation Plan, or SIP for ozone. Many of the emission reduction measures in the SIP are heavy-duty engine measures, including standards for new engines, and incentives to introduce even cleaner engines. The South Coast Air Quality Management District (SCAQMD) revised its part of the SIP in 1997 and again in 1999.

The SIP calls for California to set more stringent emission standards for both on-road and off-road heavy-duty engines. For categories where California is preempted by federal law from setting emission standards, the SIP calls for new national or international emission standards. California is preempted from setting emission standards for new farm and construction equipment less than 175 horsepower (hp), for marine vessels, for new locomotives and new engines used in locomotives, and for aircraft.

Significant progress has been made in setting the emissions standards specified in the SIP. In 1995 and 1996, the ARB, the US. EPA, and manufacturers of diesel engines signed agreements to reduce emissions from on- and off-road heavy-duty diesel engines. In 1997, based on the agreement with on-road heavy-duty diesel engine manufacturers, U.S. EPA established a more stringent national standard for heavy-duty truck emissions beginning with the 2004 model year. The ARB approved a similar California standard in 1998. As part of a settlement among engine manufacturers, U.S. EPA and ARB, the majority of the engine manufacturers have agreed to meet 2004 standards in 2002. Earlier this year, US. EPA established even tighter emission standards for heavy-duty trucks starting in 2007. Later this year, ARB will consider approving these standards for California. Though not originally envisioned when the SIP was developed, the 2007 engine standards will provide significant additional NO_x reductions by 2010 in the South Coast's attainment year for the 1-hour national ozone standard. In February 2000, ARB also adopted regulations to reduce emissions from urban transit buses.

For off-road equipment, U.S. EPA recently adopted more stringent standards for off-road diesel equipment and for locomotives. In 2000, the International Maritime Organization (IMO) adopted a protocol, which if ratified by the member nations, will reduce emissions from new ships. This protocol is retroactive to January 1, 2000. Other actions include U.S. EPA regulations to limit emissions from domestic vessels; ARB Memorandum of Understanding (MOU) with two railroads to further reduce in-use

emissions from locomotive engines in the South Coast non-attainment area; and a pending MOU to reduce emissions from airport ground support equipment and local ports in the South Coast.

Although the majority of the measures in the SIP are directed to more stringent emission standards, the SIP also calls for emission reductions from market-based measures. SIP measure M4, for example, calls for incentives for the early (pre-2004) introduction of lower-emission heavy-duty trucks and buses. Other measures focus on incentives as part of the strategy to meet the longer-term emission reduction commitments in the SIP. The vast majority of reductions from the later years (80 to 90 percent) will be achieved through emission standards for new engines and MOUs, and not through incentives. In order for California to meet its overall SIP commitments, however, emission reductions must occur in the early years. Table I-2 shows total SIP commitments for reducing NOx emissions for selected categories of heavy-duty engines in the South Coast Air Basin using the emission inventory at the time the SIP was developed,

Source Category	2005 NOx (tpd)	2010 NOx (tpd)
On-road heavy-duty vehicles ^a	35	62
Off-road equipment	15	64
Marine vessels	11	15
Locomotives	11	17
Longer-term commitments	0	9

a. Based on EMFAC 7G model, which was used to develop the 1999 South Coast SIP.

C. Is There A Need For Incentive Programs To Meet California's Commitments?

Incentive programs are needed to alleviate the near-term pollution challenge. Generally, the industries that generate emissions are responsible for reducing those emissions without the assistance of public funding. As listed in Table I-2, the industries participating in the heavy duty incentive programs will bear almost all of the responsibility for reducing their emissions through new engine standards, and through agreements such as the locomotive MOU.

Although stringent emission standards will result in significant emission reductions, in time, many of the regulated categories are still dominated by large diesel engines that last a long time and are usually rebuilt two or three times over their service lifetime. To meet the impending federal attainment deadlines, California must retrofit or repower to reduce emissions from existing engines, and introduce new technology (like alternative fuels) in markets where opportunities exist.

Retrofits, repowers, and alternative fuel technology can be very cost-effective for a particular project. However, in the near term they may not be technically feasible and cost-effective for a broad enough segment of the market to justify a regulation. As such, incentives are needed to take advantage of cost-effective reductions by paying a vehicle or equipment operator for going beyond what is required.

The staff of ARB estimates that heavy-duty incentive programs would help in achieving about five percent of the total emission reductions needed in the early years. Hence, funding was appropriated into the State's Budget to pay for heavy-duty engine incentive programs, such as the Carl Moyer Program. A total of \$98 million has been appropriated for the first three years of the Carl Moyer Program to fund incentives for the incremental cost of heavy-duty diesel engines that are cleaner than required.

D. Could Incentive Programs Help California's Energy Crisis?

California is currently facing an energy crisis with insufficient power generation to meet the needs of homes and businesses. In the last year, California has faced multiple Stage 2 and 3 energy episodes, and electricity demand is growing at three percent per year. A near-term strategy to meet this electricity demand over the next two to three years is to increase the use of peaking plants, either by constructing temporary new units, or by allowing greater operation of existing units. In general, these existing peaking plants have relatively high emissions and state and federal requirements limit their hours of operation.

Implementing a near-term strategy that allows expansion in electricity generation without increasing statewide emissions will require emission offsets which can be generated through mobile source incentive programs similar to the Carl Moyer Program. Without the offsets provided by mobile source incentive programs, it would be nearly impossible to increase electricity generation without significant increases in air pollution. Incentive programs would continue to provide applicants with grants to pay for replacing older diesel engines in trucks, farm and construction equipment, and marine vessels with cleaner models. However, emission reductions for replacing these types of engines early would be used as emission offsets to fund the ERC bank in the first 2 to 3 years. ERCs would be sold to power plants to offset emissions through

2003. Beyond that time, emission reductions would provide additional public health and air quality benefits from reducing the toxic diesel particulate emissions from the same engines. In additions, funds generated from the sold ERCs would go to local air districts impacted by the increase in power plant emissions to continue funding projects that would provide air quality benefits in California.

II.

THE GENERAL PROGRAM

The purpose of the Carl Moyer Program is to reduce NO_x emissions by providing grants for the incremental cost of cleaner heavy-duty vehicles and equipment. The program is also designed to reduce the fine particulate component of diesel exhaust, which contributes to particulate matter (PM) air pollution and is a toxic air contaminant. The grants are issued by air pollution control and air quality management districts that choose to administer a local program. Private companies or public agencies that operate heavy-duty engines in California may apply for grants from the local air district. This chapter presents a brief discussion on the requirements of the overall Carl Moyer Program.

A. What Is ARB's Role In The Carl Moyer Program?

There are three general project areas under the Carl Moyer Program – the engine projects, the infrastructure demonstration projects, and advanced technology projects. The ARB is responsible for the development and oversight of the largest portion of the Carl Moyer Program that covers engine projects. The ARB works with the public, local air districts, port authorities, industry, and environmental groups to develop program guidelines. The guidelines describe the types of projects that could be funded, the criteria to evaluate those projects, and how to calculate the emission benefits and cost-effectiveness.

The ARB also provides on-going assistance to local air districts on program administration and technology status. In addition, ARB reviews and monitors the progress of local districts implementing the program.

B. What Is CEC's Role In The Carl Moyer Program?

The California Energy Commission (CEC) is responsible for developing two key portions of the program: advanced technology and infrastructure. The CEC develops guidelines and oversees implementation of the infrastructure demonstration and advanced technology projects. Districts apply directly to CEC to implement infrastructure programs. The CEC issues a formal solicitation for the advanced technology projects and administers grants for selected projects.

C. Who implements The Carl Moyer Program?

Local air districts that choose to participate implement the program locally according to ARB and CEC guidelines. Implementation includes program outreach, soliciting project applications, awarding grants, and monitoring projects to ensure the emission reductions are actually achieved. The program is currently entering into its third year. During the first year of the program (fiscal year 1998/1999), 16 local air districts implemented local programs. In the second year (fiscal year 1999/2000) 20 districts are implementing local programs. Projects funded in the first and second year have been selected and meet the criteria outlined in the guidelines approved in February 1999. In the third year (fiscal year 2000/2001) 22 districts have applied to implement local air programs. Projects funded with third year funds will meet criteria outlined in the modified guidelines that were approved by this board on November 16, 2000.

D. Who Can Apply For Grants, And How Do They Apply?

Private companies or public agencies that operate heavy-duty engines in California may apply to local air pollution control or air quality management districts for engine or infrastructure grants. The guidelines have been developed to provide each district with flexibility to design a local program to meet specific local air pollution challenges. Each district may set more stringent criteria than those listed in the guidelines, such as limiting funds for certain engine applications. Commonly, districts issue one or more formal solicitations for engine/vehicle and infrastructure projects. Companies and agencies that manufacture engines, advanced control technology, or retrofits for engines apply to CEC for advanced technology grants.

E. How Much Funding Is Available?

The Carl Moyer Program is currently entering into its third year. The Governor and the Legislature have appropriated annual funds to this program over three fiscal years (1998/1999, 1999/2000, and 2000/2001) which total \$98 million dollars.

In the first year ARB received \$25 million to fund engine projects that meet Board approved program guidelines. The ARB encumbered the first year funds through subventions to 16 local air pollution/air quality management districts that applied to administer local programs in the state. The local air districts expended these funds by paying for incremental costs of heavy-duty engine projects that are cleaner than required by any federal, state, or local governments.

In the second year (July 1999), \$23 million was appropriated to the 1999/2000 fiscal year budget to fund an expanded Carl Moyer Program, which included infrastructure and advanced technology development. Of these funds, \$19 million (funds obtained from a diesel settlement with engine manufacturers) was designated for ARB and local air districts to pay for engine projects. The remaining \$4 million was designated for CEC to fund a new portion of the overall program which included infrastructure and advanced technology development projects.

In the first quarter of 2000 (the third year), ARB and the Advisory Board submitted separate reports to the Governor and the Legislature pertaining to the status and success of the Carl Moyer Program. The Governor and the Legislature responded by appropriating an additional \$50 million for the third year -- \$45 million to fund engine projects and \$5 million to fund infrastructure and advanced technology development projects.

F. Which Heavy-Duty Engine Categories Are Eligible For Funding?

The engine portion of the Carl Moyer Program pays for the incremental cost of cleaner heavy-duty vehicles and equipment from the following categories.

- On-road motor vehicles over 14,000 pounds gross vehicle weight rating
- Off-road equipment over 50 horsepower
- Marine vessels
- Auxiliary Power Units (APUs)
- Locomotives
- Stationary agricultural pump engines
- Forklifts
- Airport ground support equipment

The program is not intended to pay for engine research and development, certification testing, training, or operational controls.

G. Are The Replacement Engines Likely To Be Alternative Fuel Engines?

The types of replacement engines vary by project category. For some categories, the only technology currently available that can achieve significant, cost-effective emission reductions is alternative-fuel technology. For other categories, baseline (pre-project) emission levels are very high, and substantial emission reductions can be achieved with new diesel engines. For example, new on-road heavy-duty vehicle projects are likely to be alternative fuel. In contrast, marine vessel engine replacement (e.g., replacing a tugboat engine) is likely to be with a diesel engine. In the first two years of the program

about 1,865 engines (both on- and off-road) were funded statewide. Of those engines 610 were alternative fueled engines, 105 were electric motors, and the remaining 1,150 were diesel-to-diesel repowers. Chapter III contains a detailed explanation of these projects funded through each local air district-

H. Is There An Option To Fund Heavy-Duty Engine Projects That Are Not Included In The Guidelines?

Yes. In the first three years, however, the demand for project funding under the approved categories exceeded the amount of program funding available. Over the years, the number of projects that qualify for funding under the existing categories may decrease. Hence, the program has been designed to provide districts with flexibility to work with project proponents to submit heavy-duty engine projects, that are not included in the guidelines, for ARB's consideration on a case-by-case basis. The ARB would evaluate those projects based on technological feasibility, the potential for real, quantifiable emission reductions, cost-effectiveness, and the likelihood of other applicants going forward with that type of project. The ARB's Executive Officer has the authority to determine whether the project is eligible for funding.

I. Can The Carl Moyer Program Be Used to Pay for Infrastructure and Incremental Fuel Costs?

Motor vehicle registration fee (Assembly Bill 2766 and Assembly Bill 434) funds, that districts generally use as matching funds to implement local programs may be used to pay for infrastructure. Funds for infrastructure must support a qualifying engine project in order for those funds to qualify as matching-funds. In addition, the CEC administers the Carl Moyer infrastructure demonstration program. Air districts apply directly to CEC to receive those funds. If a district receives funds from the CEC to pay for infrastructure, those funds would-not qualify as district matching funds to implement the Carl Moyer Program.

Under the Carl Moyer Program the local air districts are allowed to pay for the incremental fuel costs of alternative fuels or alternative diesel, provided those funds come from the local air district's budget. Incremental fuel costs are considered as the increase in cost of alternative fuels or alternative diesel over diesel. District funds would pay for those increases in costs that occur as a result of a conversion or new purchase of an engine that qualifies for Carl Moyer Funds. Any funds that a district uses to pay for incremental fuel costs also count as matching funds.

J. What Is The Matching Fund Requirement?

Districts and port authorities are required to provide matching funds in order to receive state funding to implement a local program. Of those match funds, districts and port authorities may use up to 15 percent as in-kind contributions (i.e., administrative costs). The matching fund requirement is important because it provides a literal “buy-in” from those responsible for the selection, monitoring, and enforcement of the project. This requirement helps ensure that the most worthwhile projects are selected.

In the first two years state funds for the program totaled \$48 million -- \$25 million for the first year and \$23 million for the second year. During these two years districts provided \$1 in match funding for every \$2 of Carl Moyer Program funding for engine incentives. Program funds in the first two years, including districts, matching funds for infrastructure, totaled about \$71 million.

State funds for the third year program were increased to \$50 million. At the increased funding level, districts would not be able to provide increased matching funds. Hence, the matching fund requirement for the third year was capped at \$12 million statewide. This is equivalent to a match of about \$1 for every \$3.68 received from state funds. Third year program funds bring the overall total to about \$135 million in state and local funds.

K. What Is The Cost-Effectiveness Criterion?

Under the Carl Moyer Program, each project must meet a specific cost-effectiveness level – an allowable cost-per ton of pollutant reduced. The cost-effectiveness level is based solely on Moyer program funds and those motor vehicle registration fees that are used to pay for the engine. In the first two years of the program, the cost-effectiveness limit was \$12,000 per ton of NO_x reduced. In the third year, this limit has been increased to \$13,000 per ton in order to account for cost of living adjustments. In general, districts have funded projects that were well below the required cost-effectiveness limit. In the first two years of the program, cost-effectiveness averaged about \$5,000 per ton of NO_x reduced.

L. How Has The Carl Moyer Program Changed?

In October 1999, the Carl Moyer Program was codified into the Health and Safety Code. Section 44297 of the Health and Safety Code established a thirteen member

Carl Moyer Program Advisory Board (Advisory Board) with the responsibility for making recommendations on the need to continue the program, the amount and source of continued funding, and program modifications, if necessary. The Advisory Board recommendations included that the program continue at an increased funding level through 2010 and that the district match fund requirement be capped consistent with the requirements at the \$25 million funding level. The Governor and the Legislature responded by amending Health and Safety Code, section 44287 (f), to allow ARB to modify districts' matching fund requirement. The Advisory Board also recommended that a 25% PM reduction target be set for the statewide program, with a 25% local program requirement on air districts designated as non-attainment for the federal PM standard.

The Board approved modifications to the February 1999 guidelines on November 16, 2000 (These are available at www.arb.ca.gov/msprog/moyer/approved.htm). The new guidelines include recommendations that the Advisory Board made to the Governor and the Legislature and technical modifications based on ARB's and local air districts' experiences with the first two years of the program. The new guidelines affect projects funded with third year funds and beyond.

The new guidelines contain a 25 percent PM emission reduction requirement for local programs in districts that are designated as serious non-attainment for the federal PM standard and a 25 percent emission reduction target for the statewide program. The new guidelines also contain a new cost-effectiveness limit of \$13,000 per ton of NOx reduced. The cost-effectiveness limit was adjusted to account for cost of living increases over three years. The districts' matching fund requirement was also revised, setting a \$12 million cap over the statewide matching funds if state budget appropriated program funds exceed \$25 million in a particular fiscal year. Baseline emission factors were modified to account for adjustments made in the inventory based on new approved on-road and off-road models. The guidelines were also modified to allow funding for new project categories and to expand existing categories.

III.

DISTRICT HEAVY-DUTY ENGINE PROGRAMS

In February 1999, the Carl Moyer Program Guidelines were approved by the ARB. In total, the program has received \$98 million to fund the program through three years. Of those funds, \$89 million was allocated to pay for engine projects. Over the first three years of the program, 22 air quality management/air pollution control districts applied to implement local programs. First and second year funds were distributed to districts to implement local programs in June 1999, and April 2000, respectively. Third year funds, are currently being distributed to local air districts. This section of the report provides ARB's solicitation efforts in administering the statewide program, along with a brief description of the program requirements met by each of the districts that have local programs. This section also provides the status of each district's program, the types of engines that were funded, and the estimated emission reductions for each program.

A. What Were ARB's Methods For Soliciting District Participation In The Carl Moyer Program?

In February 1999, the initial Carl Moyer Program Guidelines were approved to implement a statewide heavy-duty incentive program designed to reduce NOx emissions from heavy-duty diesel engines. During the development and implementation of this program ARB conducted meetings with the Incentive Planning Implementation Team (IPI Team). The IPI Team is a working group for incentive implementation that includes representatives of local air districts, CEC, U.S. EPA and ARB. The IPI Team meetings are designed to provide ARB and districts with an opportunity to exchange ideas that would encourage district participation and facilitate local program implementation. These meetings also provide districts the opportunity to discuss potential projects, receive assistance and direction with outreach, and share technical challenges pertaining to projects in each district. The ARB solicited district participation in the Carl Moyer Program through formal written invitations. Three format solicitations were sent – each representing the year of funding (Year I - \$25 million, Year 2 - \$19 million, and Year III – \$45 million. Solicitations were made in May 1999, December 1999, and November 2000, respectively. These notices were also posted on ARB's website.

The staff of ARB evaluated each district application to ensure that adequate match funding was committed and that already funded matching projects met the guidelines for each program year. Upon application approval, ARB staff provided each district with a letter of award, and a Grant Award and Authorization Form for the district to sign and return to ARB authorizing the district's participation in the Carl Moyer Program.

Each district was authorized to receive an initial disbursement of 10 percent or \$100,000 (the largest of the two amounts). When a district provided ARB staff with documentation showing the need for additional funds, along with a disbursement request, ARB staff would provide the district with additional funds.. Table III-1 below provide ARB's schedule for solicitations, grant awards, and program evaluations.

District Name	1998/1999 Year I	1999/2000 Year II	2000/2001 Year III
Guidelines Approved	2/99	Same as Year I	11/00
Solicitation for Program App.	5/99	11/99	11/00
Application Evaluations	6/99	12/99	1/01
Funds Awarded	7/99	1/00 – 4/00	2/01
District Status Report to ARB	9/30/99	9/30/00	9/30/01
ARB Evaluation of Status Reports	10/99	10/00	10/01
District Annual Report to ARB	6/30/00	6/30/01	6/30/02
ARB Evaluation of Annual Reports	6/30/00 – 3/1/01	6/30/01 – 3/1/02	6/30/02 – 3/1/03
District Final Report Due	7/31/2001	7/31/2002	7/31/2003

In conducting public outreach, ARB staff also considered several methods for informing Californians about the Carl Moyer Program. The ARB designed a statewide brochure describing the program and made it available to the public at conferences and public requests. Staff of ARB also attended conferences, such as the Tulare Farm Show, throughout California promoting the program. At the request of local air districts, ARB staff attended several local air district workshops to educate the public on how the Carl Moyer Program would benefit their local community. The ARB also made an effort, when conducting any public workshop, to conduct workshops in various locations throughout California. Staff of the ARB conducted workshops in Glenn County, Fresno, Bay Area, South Coast, and Sacramento. Conducting workshops and meetings in various locations throughout California provided Californians with the opportunity to participate and comment on this program.

B. Which Districts Are Participating In The Statewide Heavy-Duty Engine Program?

Twenty-three districts applied and received funding from the ARB to implement the Carl Moyer Program in the first three years. Table III-2 lists the districts that applied and received funding over the three years of the program. In the third year, Placer County Air Pollution Control District (PCAPCD) applied to ARB for funding, but decided to allow

Sacramento Metropolitan Air Quality Management District (SMAQMD) to administer PCAPCD's program. Hence, PCAPCD's funds were incorporated into SMAQMD's funds under the third year program.

District Name	1998/1999 Year I	1999/2000 Year II	2000/2001 Year III
Antelope Valley APCD	✓	✓	✓
Bay Area AQMD	✓	✓	✓
Butte County AQMD		✓	✓
Feather River AQMD		✓	✓
Glenn County APCD	✓	✓	✓
Imperial County APCD	✓	✓	✓
Kern County APCD		✓	
Mendocino County AQMD		✓	✓
Mojave Desert AQMD	✓	✓	✓
Monterey Bay Unified APCD	✓	✓	✓
North Coast Unified AQMD	✓	✓	✓
Northern Sierra AQMD	✓	✓	✓
Northern Sonoma County APCD	✓		✓
Placer County APCD			Applied Only
Sacramento Metropolitan AQMD			
San Diego County APCD			
San Joaquin-Valley APCD	v	v	v
San Luis Obispo APCD	✓	✓	✓
Santa Barbara County APCD	✓	✓	✓
Shasta County APCD		✓	✓
South Coast AQMD	✓	✓	✓
Tehama County APCD			✓
Ventura County APCD	✓	✓	✓

C. What Program Requirements Were Met By The Local District Programs?

In order to administer the Carl Moyer Program locally, the districts had to meet the following three general program requirements.

- The district had to provide match funding for any Carl Moyer Program funding received from the ARB.

- . Any projects that a district funded and committed as its match requirement under the Carl Moyer Program had to meet the project criteria for the respective source category listed in the approved Carl Moyer Program Guidelines.
- Lastly, any project that a district funded before December 31, 2000 and was used as its match fund requirement under the Carl Moyer Program had to meet a maximum cost-effectiveness criterion of \$12,000/ton of NOx emissions reduced. Projects funded after December 31, 2000 and counted as matching funds must 'meet the maximum cost-effectiveness of \$13,000/ton of NOx reduced.

D. How Much Funding Was Provided To Each District Participating In The Statewide Program?

For three years of the program a total of about \$87.2 million (245 million – 1st year, \$18.6 million – 2nd year, and \$44.1 million – 3rd year) was distributed to the participating districts to fund engine projects. The remaining \$1.8 million (two percent) was appropriated to ARB to administer the statewide program over three years. The funds for each district were allocated based on population and the districts' SIP incentive based commitments- Table III-3 lists the districts that are currently participating in the Carl Moyer Program and the funds allocated to each district by program year.

Table III-3 Funding			
District Name	Final Funding Allocation Year I	Final Funding Allocation Year II	Tentative Funding Allocation Year III
South Coast AQMD	\$11,275,591	\$8,349,769	\$19,745,849
San Joaquin Valley APCD	\$ 4,399,801	\$3,187,452	\$ 7,644,979
Bay Area AQMD	\$ 2,500,000	\$1,880,000	\$ 4,306,133
Sacramento Metropolitan AQMD	\$ 1,927,791	\$1,677,042	\$ 3,909,604
San Diego County APCD	\$ 1,085,661	\$ 809,498	\$ 1,850,344
Ventura County APCD	\$ 860,220	\$ 645,561	\$ 1,543,561
Mojave Desert AQMD	\$ 845,791	\$ 635,678	\$ 1,535,530
Antelope Valley APCD	\$ 302,571	\$ 225,000	\$ 450,000
Santa Barbara County APCD	\$ 302,571	\$ 225,000	\$ 450,000
Kern County APCD	-	\$ 225,000	Funds Declined
Monterey Bay Unified APCD	\$ 265,800	\$ 145,183	\$ 450,000
San Luis Obispo APCD	\$ 157,800	\$ 83,196	\$176,750
Imperial County APCD	\$ 134,800	\$ 69,993	\$176,750

Table III-3 (continued) Funding			
District Name	Final Funding Allocation Year I	Final Funding Allocation Year II	Tentative Funding Allocation Year III
Northern Sierra AQMD	\$ 127,700	\$ 52,692	\$176,750
Northern Sonoma County APCD	\$ 113,900	-	\$150,000
North Coast Unified AQMD	\$ 100,000	\$ 73,255	\$176,750
Glenn County APCD	\$ 100,000	\$ 53,743	\$150,000
Butte County AQMD	-	\$ 77,842	\$176,750
Shasta County APCD	-	\$ 72,977	\$176,750
Feather River AQMD	-	\$ 69,101	\$176,750
Placer County APCD	-	-	SMAQMD will Administer
Mendocino County AQMD	-	\$ 62,018	\$150,000
Tehama County APCD	-	-	\$150,000
Inter-district Projects			\$376,750
Total	\$24,500,000	\$18,620,000	\$44,100,000

Kern County-Air Pollution Control District (KCAPCD) notified ARB that the district would only expend \$100,000 from their \$225,000 second-year allocation and declined funding for the third year. Unused funds (\$376,000) have been placed into a separate account to pay for statewide inter-district projects. The Health and Safety Code provides ARB with the authority to set aside up to 10% of statewide program funds to pay for inter-district projects. Placing the unused funds into an account for inter-district projects also addresses the Carl Moyer Program Advisory Board recommendation to the Governor and the Legislature that the continuing program encourage statewide inter-district projects.

E. How Much Funding Did Each District Provide As Matching Funds To Participate In The Carl Moyer Program?

In the first three years of the Carl Moyer Program, matching funds statewide totaled about \$33.6 million. In the first two years of the program, each district was required to provide \$1 in matching funds for every \$2 dollars provided by the State. In the third year, program funds exceeded \$25 million, hence state wide matching funds were capped at \$12 million. Each district had to provide \$1 in matching funds for every \$3.68 received from the ARB in the third year of the program. Table III-4 lists each

district's required matching funds and the source of those funds for the first three years of the program.

Table III-4 Required Matching Funds^a				
District Name	Source	Year I	Year II	Year III
SCAQMD	MSRC, Clean Fuels Fund	\$ 5,637,796	\$4,174,884	\$5,373,020
SJVAPCD	DMV Fund, CMAQ	\$ 2,199,901	\$1,593,726	\$ 2,080,266
BAAQMD	DMV Fund	\$ 1,250,000	\$ 940,000	\$ 1,171,737
SMAQMD	DMV Fund, Measure A	\$ 963,896	\$ 838,521	\$ 1,063,838
SDCAPCD	DMV Fund	\$ 542,831	\$ 404,749	\$ 513,495
VCAPCD	DMV Fund, District Fees	\$ 430,111	\$ 322,780	\$ 420,017
MDAQMD	DMV Fund, CMAQ	\$ 422,896	\$ 317,839	\$ 417,831
AVAPCD	DMV Fund	\$ 151,286	\$ 112,500	\$122,449
SBCAPCD	DMV Fund, Mitigation Fee	\$ 151,286	\$ 112,500	\$ 122,449
KCAPCD	DMV Fund, Excess Emission Fees	-	\$ 112,500	
MBUAPCD	DMV Fund	\$ 132,900	\$ 72,591	\$ 122,449
SLOAPCD	DMV Fund, Private Funding	\$ 78,900	\$ 41,598	\$48,095
ICAPCD	DMV Fund	67,400	\$ 34,996	\$48,095
NSAQMD	DMV Fund	63,850	\$ 26,346	\$48,095
NSCAPCD	DMV Fund	\$ 56,950	-	\$40,817
NCUAQMD	DMV Fund	\$ 50,000	\$ 36,627	\$48,095
GCAPCD	DMV Fund, Settlement Actions, and General Fund	\$ 50,000	\$ 26,871	\$40,817
BCAQMD	DMV Fund		\$ 38,921	\$48,095
Shasta County AQMD	DMV Fund		\$36,488	\$48,095
FRAQMD	DMV Fund		\$ 34,550	\$48,095
MCAQMD	DMV Fund		\$ 31,009	\$40,817
TCAPCD	DMV Fund			\$40,817
Inter-district Projects	EACH DISTRICT PARTICIPATING IN THE PROJECT		-	\$102,517
Total		\$12,250,003	\$9,309,996	\$12,000,001

a. The district funding commitment may include up to 15 percent of its match funds as in-kind administration to implement the Carl Moyer Program locally.

District matching funds may be used to pay for heavy-duty engine projects, alternative fuel infrastructure, and in-kind administration (only 15 percent of matching funds). Many districts receive funds from a surcharge on motor vehicle registration fees (a.k.a. Assembly Bill 2766 and Assembly Bill 434 funds) to fund engine projects. Most districts used funds from their motor vehicle fees (past and future) as a source for committing match funds under the Carl Moyer Program. Prior to the first year of the program, some districts **already** had active programs to fund grants for lower-emission on-road and off-road motor vehicle projects with the motor vehicle fee money. Where this was the case, the Carl Moyer Program funding significantly augmented their current programs.

There are some notable differences between district motor vehicle fee programs and the first year Carl Moyer Program: motor vehicle fee funding can be used for refueling infrastructure --the Carl Moyer Program could not. Motor vehicle fee funds cannot be used for most off-road engines, marine, locomotive, or agricultural pump projects, while the Carl Moyer Program funds can. Hence, by combining motor vehicle fee funding and Carl Moyer Program funding, districts were able to have significant flexibility with funds provided by the state to pay for a variety of worthwhile projects.

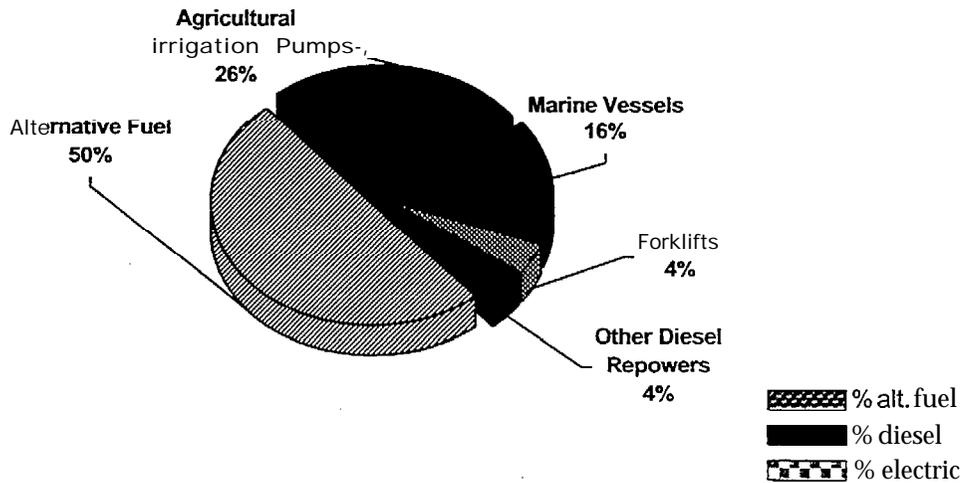
F. What Types Of Projects Were Funded Statewide?

To date, districts received applications and paid for engines for almost every source category under the Carl Moyer Program. Engines were funded for heavy-duty line haul trucks, urban transit buses, school buses, waste haulers, delivery trucks, off-road equipment, agricultural pumps, marine vessels, locomotives, and forklifts. The types of projects ranged from diesel-to-diesel repowers, new diesel engines, new alternative fueled engines and electric motors. Of the funds spent to date, 50 percent paid for alternative fuel projects, 26 percent for agricultural irrigation pump projects, 16 percent for marine vessel projects, 4 percent for forklifts, and 4 percent other on-/off-road diesel repowers. Table III-5 lists the types of projects funded, the number of engines funded by fuel type, and the amount of funds spent. Figure III-1 shows the percentage of funds spent by project type.

Table III-5 Types and Number of Engines Funded Statewide Year I & II				
Source Category/ Equipment Type	Number of Engines		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:				
Heavy-Duty Line Haul		29	-	\$ 712,950
Refuse Haulers	200	38	\$ 9,374,303	\$ 268,111
Urban Transit Buses	329		\$ 6,626,959	-
School Buses	12		\$ 315,640	-
Other	41	8	\$ 1,732,567	\$ 141,524
Off-Road Equipment:				
Farm Equipment		25	-	\$ 240,915
Construction		1	-	\$ 4,352
Other	12	7	\$ 174,745	\$ 108,070
Locomotives:	-	2	\$ 820,000	
Marine Vessels:		95	-	\$ 6,067,346
Agricultural Irrigation Pumps:	14	947	\$ 179,551	\$ 9,852,940
Forklifts (electric):	105		\$ 1,482,000	
Total	-	715	\$20,705,765	\$17,396,208

Figure III-I

Percent Funding By Project Type



G. How Much Funds Were Spent On Projects Operating Throughout Inner-City Communities?

The ARB's goal is to provide safe clean air to all Californians, in particular those populating areas that are often disproportionately impacted by air pollution. Much of this pollution is caused by heavy-duty diesel engines. Under the Carl Moyer Program, a total of about \$25 million from first- and second-year statewide funds paid for projects that include refuse haulers, urban transit buses, school buses, and agricultural irrigation pumps. These engines represent 80 percent of the engine population funded with state funds under the Carl Moyer Program and typically operate throughout inner-city and agricultural communities. Engines such as agricultural irrigation pumps often operate 24 hours per day during the growing season, already aggravating the high ozone during that time of year. Replacing these engines assisted in reducing exposure to agricultural workers and rural community residents.

Through the first two years of the program, local air districts and the ARB have participated in a variety of conventional outreach methods to attract participants. These have included solicitations, brochures, and workshops throughout several locations in California. In this third year, additional efforts are being taken to attract increased participation by those businesses that operate in areas of California that often are disproportionately impacted by air pollution. The ARB will continue its efforts to encourage districts to select projects that would benefit specific areas that are disproportionately impacted by air pollution.

H. What Is The Status Of Each Local Program?

Currently, all of the districts have conducted a public solicitation for projects for first and second year funds either through a formal request for proposals (RFP) or some other means of solicitation. Most districts have already obligated over 80 percent of those funds to projects, with well over 70 percent actual contracts. Staff estimates that projects funded will reduce NO_x and PM emissions by-about 2165 and 69 lifetime tons, respectively. These emission reductions will cost California about \$4,900 per ton. This compares favorably to a typical cost for other air pollution control programs -- \$10,000 per ton.

Many districts have started formal solicitation for projects under the third year program. Since revisions to the guidelines were approved in November 2000, and many of the districts had to incorporate those revisions into their local programs, ARB anticipates third year funds to be obligated to projects beginning in April 2001. Appendix A contains a brief description of each districts' program. Appendix B contains detailed information for each project funded using state funds.

IV.

DISTRICT INFRASTRUCTURE PROGRAM

Sections 44284 of the Health and Safety Code directs the CEC to administer fueling infrastructure demonstration projects under the Carl Moyer Program. The CEC received \$2 million in the 1999-2000 FY budget and \$2.5 million in the 2000-01 FY budget for this portion of the program. This chapter explains the status of the fueling infrastructure demonstration projects to date.

A. What Is The Infrastructure Demonstration Portion Of The Carl Moyer Program?

The Infrastructure Demonstration portion of the Carl Moyer Program was designed to provide districts with the means for funding infrastructure for engine projects that would qualify for Carl Moyer funds. These guidelines can be obtained on CEC's website at www.energy.ca.gov. The CEC must solicit applications for a broad mix of fueling and electrification infrastructure projects. Funded facilities must dispense a minimum of 14,280 million Btus per year, or 4,000 kWh of electricity per charger annually. Vehicles used to meet these thresholds must meet the Carl Moyer Program criteria for vehicles and equipment.

B. What Is The Status Of The Infrastructure Demonstration Projects Paid For With Second Year Carl Moyer Program Funds?

The California Energy Commission (CEC) developed program criteria and guidelines (criteria) for implementing the Carl Moyer Fuel Infrastructure Program. The criteria were released for public review in August 1999 and public workshops were held in San-Diego and Sacramento during September 1999. The criteria were approved at a CEC Business meeting in November 1999. Under the CEC program, funds are distributed to air districts (Districts) which solicit applications and expend funds in accordance with the criteria. This approach allows districts to coordinate funding for infrastructure that correlates to heavy-duty engine projects also funded under the Carl Moyer Program. CEC allocated \$2 million for the Infrastructure Demonstration in 1999-2000.

A Program Opportunity Notice (PON) was released to all California air districts in November 1999, but was canceled in March 2000, because of a lack of qualifying proposals representing critical, non-attainment air quality areas in California. A second PON was reissued in March 2000, and awards for fueling infrastructure

totaling \$2,000,000 were made to eight qualifying Districts. Those qualifying Districts and the amount of funds requested and received are listed in Table IV-1, below.

Applicant	Funding Requested	Funding Received
SCAQMD	\$2,522,000	\$900,000
SJVAPCD	\$700,000	\$350,000
BAAQMD	\$200,000	\$200,000
SMAQMD	\$200,000	\$150,000
SDCAPCD	\$100,000	\$100,000
VCAPCD	\$200,000	\$100,000
AVAPCD	\$100,000	\$100,000
MDAQMD	\$100,000	\$100,000
Total	\$4,122,000	\$2,000,000

Districts are currently in the process of finalizing agreements with applicants who have qualified for funds. When these fuel sites are completed they will furnish compressed natural gas (CNG), and liquefied natural gas (LNG) to over 160 new Moyer-qualified trucks and dispense over 304,000 million Btus of fuel annually. It is estimated the projects proposed for funding will reduce NO_x emissions annually by over 169 tons. Table IV-2 lists the applicants in each district, number of vehicles per site, total Btu's dispensed, and estimated NO_x reductions.

Air District	Site	Trucks	Fuel	NO _x ^a	Btu ^b	CEC	Match
SCAQMD						\$ 900,000	\$1,500,000
	Pickens/Waste Mgt LA	20	CNG	93	90,072		
	Pickens/Waste Mgt San Gabriel	20	CNG	93	30,024		
	Pickens/USA Biomass	20	CNG	131	44,671		
	Pickens/Calmet	27	CNG	229	35,466		
	Pickens/Sunline Trans.	10	LNG	47	30,024		
	Burte Riverside		LNG				
SJVAPCD	Reviewing PONs						
BAAQMD	County Waste Srv.	24	CNG	23	16,329	\$ 200,000	\$4,900,000

**Table IV-2 (continued)
Infrastructure Projects
1999-2000**

Air District	Site	Trucks	Fuel	NOx^a	Btu^b	CEC	Match
SMAQMD	City of Sacramento	50 ^c	L/CNG	12		\$ 200,000	\$ 400,000
SDCAPCD	Pending						
VCAPCD	GI Rubbish	14	LNG	52	18,639	\$ 100,000	\$ 16,864
AVAPCD	Waste Management	14	LNG	91	16,058	\$ 100,000	\$ 425,111
MDAQMD	Burtec Waste Industry	15	LNG	90	23,170	\$ 100,000	\$ 255,000
Total		164		826	304,453	\$1,400,000	\$7,096,975

- a. NOx reduction over life of project
b. Projected Btus to be consumed annually
c. 20 School Buses

C. What Is the Status Of The Infrastructure Demonstration Projects Paid for with Third Year Carl Moyer Program Funds?

Under the third year of the Carl Moyer Program CEC received \$2.5 million to pay for infrastructure demonstration projects. CEC issued a PON in October 2000, with proposals due December 1, 2000. CEC received a total of about \$5,289,000, in funding requests for infrastructure. CEC awards for seven local air districts were approved in March 2001. The awarded districts and funding amounts are listed below in Table IV-3.

**Table IV-3
Infrastructure Program Awards
2000/2001**

District	Tentative Amounts
SCAQMD	\$1,188,710
SJVAPCD	\$ 450,000
BAAQMD	\$ 250,000
SMAQMD	\$ 216,130
VCAPCD	\$ 135,080
Shasta County AQMD	\$ 135,080
MDAQMD	\$ 125,000
TOTAL	\$2,500,000

D. How Much Matching Funds Were Provided By Districts?

\$1,400,000 was committed to support infrastructure implementation in 1999/2000, which was matched with over \$7,000,000 from project participants. This means that every dollar of state funding was matched by five dollars from program participants.

E. Is There A Need For Additional Infrastructure Funding?

Based on CEC's experience with the infrastructure program in the second and third year of the Carl Moyer Program there is a need to continue funding infrastructure projects. CEC received over \$9 million in funding requests from districts for both years that infrastructure was funded. This amount exceeds infrastructure funds available to CEC under the Carl Moyer Program by about 2 times. Without continued funding, a number of infrastructure projects may never be started and additional clean low emission heavy-duty vehicles may never be purchased without sufficient infrastructure to support the number of engines funded.

Once infrastructure is established, there is opportunity to increase the number of alternative fuel vehicles – by the host fleet and by other nearby fleets. Eventually, a network of stations can be established. This increases flexibility of the fleet for vehicle deployment and provides the opportunity to utilize alternative fuel trucks throughout a region and the state.

V.

ADVANCED TECHNOLOGY PROGRAM

Sections 44285 of the Health and Safety Code directs the CEC to administer an advanced technology development program under the Carl Moyer Program. The CEC allocated \$2 million from the 1999-2000 FY budget and \$2.2 million from the 2000-01 FY budget for this portion of the program. This chapter explains the status of the advanced technology development program to date.

A. What Is The Advanced Technology Development Portion Of The Carl Moyer Program?

The Advanced Technology Development program is a program designed to support the development of advanced emission-reducing technologies for heavy-duty engines, including add-on and retrofit technologies. The Health & Safety Code also requires that each project show a strong commercialization plan to bring the technology from development to full commercialization.

B. What Is CEC's Schedule For Soliciting Projects Under The Advanced Technology Development Portion Of The Carl Moyer Program?

The CEC received a total of \$4 million (\$2 million for 1999/2000 and \$2.2 million for 2000/2001) to fund advanced technology projects under the Carl Moyer Program. The advanced technology portion of the Carl Moyer Program started during the second year. CEC released its PONs in November 1999 and November 2000 to solicit project applications. The PONs were designed to solicit projects for new and retrofit or add-on applications of both diesel and alternative fuel technologies. Table VI-I lists the schedule that CEC followed for the two years of funding.

Table V-I Advanced Technology Demonstration Program Schedule		
Milestone	1999/2000	2000/2001
PON Release	November 1999	November 21, 2000
Workshop	January 17, 2000	January 17, 2001
Application Deadline	February 15, 2000	February 13, 2001

Table V-1 (continued)		
Advanced Technology Demonstration Program Schedule		
Milestone	1999/2000	2000/2001
Notice of Proposed Award	April 5, 2000	April 4, 2001
Commission Business Meeting	May 31, 2000	May 30, 2001
Award Start Date	June 1, 2000	May 31, 2001

C. What Is The Status Of The Awards For Advanced Technology Projects?

During 1999/2000 15 qualifying proposals were received and five met the minimum technical score. These projects included the following:

- Ceryx, Inc. Quad CAT Converter for NO_x Reduction
- Delphi Energy and Chasis Systems Development of HD Non-Thermal Plasma Aftertreatment
- Engelhard Cot-p Development of an EGR with DPX catalysts
- GOAL Line Environmental Technologies, LLC Demonstration of SCONOX for NO_x Emissions Control of Off-Road Diesel Engine Applications
- Noxtech, Inc. Plasma Assisted Catalysts for NO_x and Particulate Removal

Based on the highest technical score, grants were subsequently awarded to Ceryx, Delphi, and Engelhard.

The Energy Commission also awarded \$500,000 to the South Coast Air Quality Management District for a joint solicitation with DOE's National Renewable Energy laboratory for low-emission heavy-duty natural gas engine development. Staff of the - Energy Commission, SCAQMD, and NREL participated in the selection committee. This joint solicitation resulted in two projects selected for award:

- Detroit Diesel Corporation 0.5 g/bhp-hr NO_x Advanced Fuel Control Natural Gas Engine Development
- Cummins/Westport 0.5 g/bhp-hr NO_x High Pressure Direct Injection Natural Gas Engine Development

An agreement has been executed with the SCAQMD for the low NO_x natural gas engine program. CEC is currently reviewing applications for the 2000/2001 program and anticipates awards to be made in May 2001.

D. What Emission Reductions Can Be Expected From These Projects If Fully Commercialized?

Each proposer was required to provide market projections reflecting a fully-commercialized product. Based on these projections, the estimated NO_x reductions total over 55 thousand cumulative tons by 2005. Since this estimate is based on the projection of product commercialization, it may not represent actual reductions. The actual NO_x reductions will be determined by the success of projects in developing the NO_x reduction technologies and the effectiveness of the technologies in commercial implementation. Unknown variables include the availability of future Carl Moyer incentive funding to support projects using the technologies, the success of the Carl Moyer program and technology suppliers in marketing the NO_x reduction technologies to individual customers, and customer use patterns with the vehicles or equipment that incorporate these technologies.

One of the 0.5 g/bhp-hr NO_x natural gas engine projects will certify a heavy-duty engine specifically for the transit market. NO_x reductions in 2002 on an annual basis for a typical transit bus will be over one-third of a ton. The other engine, being developed under this program is for over-the-road truck applications. These vehicles typically have high annual mileage, making the emission reduction potential even greater.

E. Is-There A Need For Additional Funding For Advanced Technology Development Projects?

As future emission regulations become increasingly stringent, there will be a continuing need to foster the development of low-emission heavy-duty engine technology. There is a provision in the engine portion of the Carl Moyer Program to fund add-on equipment or retrofits. This type of technology can provide significant cost-effective reductions. However, there is a lack of available technology. The Advanced Technology Development component of the Carl Moyer Program provides a level of financial assistance to technology developers to reduce the risk in developing these types of innovative technologies.

VI.

ESTIMATED BENEFITS OF THE CARL MOYER PROGRAM

initially, the Carl Moyer Program was designed to substantially reduce NO_x, a smog-forming pollutant. Although PM reductions are also expected, they have not been required in order to qualify for funding under the Carl Moyer Program. However, ARB anticipates that some technologies will significantly contribute to reductions in particulate air pollution. This chapter explains ARB's estimate of air quality and public health benefits from the Carl Moyer Program.

A. What Are The NO_x Benefits Of The Program Statewide?

Each participating district is required to provide ARB with a report on its program by June of each program year. That report must include estimated NO_x reductions and cost-effectiveness using the emission factors provided in the Carl Moyer Program Guidelines. Staff of ARB has evaluated reports provided by districts for the first year and estimated NO_x and PM emission reductions for the first year of the program. Staff also evaluated September 30, 2001 reports on the status of districts' second year programs, and estimated NO_x and PM emission reductions for the-second year.

Since a variety of projects were funded, the project life for each project varied from five to 20 years. In the first year total NO_x reductions are about 1466 tons per year (or about 4 tons per day). Based on the amount of funds obligated by 10 districts in the second year, ARB estimates second year projects will reduce NO_x emissions by about 699 tons per year (or about 2 tons per day). If projects continue to be funded at the same cost-effectiveness-level as those that have been funded to date, ARB estimates that the program will reduce NO_x emissions by about 7 tons per day in the first two years. Once third year program funds are obligated, ARB anticipates the program will reduce NO_x emissions by about 14 tons per day. About 5.8 tons per day of NO_x will be borrowed to "fund" the ERC bank with emission offsets. The offsets in the ERC bank will be available for power plants to purchase as offsets for increased operation when providing energy relief through the summer of 2001 through 2003 (The ERC bank is discussed further in section D of this chapter).

Because projects last 10 or more years, ARB expects emission reductions to benefit air quality beyond 2003 into the next decade. Table VI-I lists the amount of funds each of the districts obligated in the first two years, resulting annual NO_x emission reductions and cost-effectiveness for each year.

**Table VI-I
Program NOx Reductions and Cost-Effectiveness
Year I and Year II**

District	State Funds Obligated To Date ^a	Estimated Annual NOx Reductions (tons/year)	Estimated Average Cost- Effectiveness (\$/ton)
SCAQMD	\$ 17,874,029	607 ^b	\$3,445
SJVAPCD	\$ 7,506,634	901	\$2,967
BAAQMD	\$ 2,925,098	177	\$1,864
SMAQMD	\$ 3,462,889	248	\$4,941
SDCAPCD	\$ 1,895,109	70	\$5,993
VCAPCD	\$ 1,505,782	65	\$4,138
MDAQMD	\$ 845,791 ^d	16	\$6,780
AVAPCD	\$ 302,571 ^d	4	\$10,732
SBCAPCD	\$ 510,753	16	\$4,458
MBUAPCD	\$ 410,983	7	\$9,184
SLOAPCD	\$ 157,800 ^d	2	\$11,161
ICAPCD	\$ 134,800 ^d	13	\$1,461
NSAQMD	\$ 180,392	9	\$5,667
NSCAPCD	\$ 113,900 ^e	6	\$3,376
NCUAQMD	\$ 100,000 ^d	6	\$4,844
GCAPCD	\$ 99,662 ^d	11	\$3,007
BCAPCD	\$ 75,780 ^f	7	\$1,025
Total	\$ 38,101,973	2165	\$5,000^c

- Notes:
- a. Some of the remaining project funds were not enough to fund one project, so the district combined those funds with second year funds to pay for a complete project.
 - b. NOx reductions have been estimated based on committed funds only. This district has committed about 90 percent of first and second year funds.
 - c. Average statewide program cost-effectiveness.
 - d. Only first year funds, second year funds will be obligated by June 30, 2001.
 - e. This district only received first year funds.
 - f. This district only received second year funds:

Local air districts funded a wide variety of projects. Transit buses, refuse trucks, agricultural irrigation pumps, and marine applications received particular emphasis in district programs. Based on the wide variety of projects, cost-effectiveness for each project category varied considerably. On a program basis in the first two years, however, the average cost-effectiveness for the statewide program is about \$5,000 per ton reduced. These amounts are well below the \$12,000 per ton

threshold. In addition, those values do not consider the particulate reductions discussed below. Table VI-2 lists the amount of NOx emission reductions, and cost-effectiveness by project category.

Table VI-2 Statewide Benefits by Project Category Year I & II		
Source Category/ Equipment Type	NOx (tons/year)	Cost-Effectiveness (\$/ton)
On-Road:		
Heavy-Duty Line Haul	41	\$ 2,570
Refuse Haulers	303	\$ 5,127
Urban Transit Buses	130	\$ 6,546
School Buses	3	\$10,818
Other	5	\$ 6,162
Off-Road:		
Farm Equipment	18	\$ 4,260
Construction	0.09	\$ 7,194
Other	36	\$ 8,722
Locomotives:	22	\$ 2,322
Marine Vessels:	386	\$ 4,291
Agricultural Irrigation Pumps:	1092	\$ 2,348
Forklifts (electric):	129	\$ 3,016

B. What About Diesel Particulate Reductions?

The Carl Moyer Program was designed to assist California in meeting the NOx emission reductions in measure M4 in the 1994 SIP. Although the focus of the program is not on PM, many of the funded technologies, such as electric motors, engine repowers and alternative fueled engines, will also reduce PM. Based on findings regarding the health implications of diesel PM, however, it has become more critical to include PM reductions into the Carl Moyer Program. In the third year of the program the Board approved the revised Carl Moyer Program guidelines which set a statewide program goal to achieve a 25 percent emission reduction for PM. Local air districts like SCAQMD and SJVAPCD that are serious non-attainment for the federal PM standard, are required to meet a 25 percent PM emission reduction for the local program.

Since some of the technologies funded under the Carl Moyer Program reduce PM emissions, the Carl Moyer Program also reduces diesel particulate. In SCAQMD alone, over 700 alternative fueled engines were funded that would result in substantial PM

emission reductions. Based on the data provided by the districts on their local programs in the first two years, ARB estimates PM reductions from the Carl Moyer Program to be about 69 tons per year. Once third year program funds are obligated, ARB anticipates the program will reduce PM emissions by about 147 tons a year, or over 800 pounds per day. About 354 pounds per day of PM will be borrowed to “fund” the ERC bank with emission offsets. The offsets in the ERC bank will be available for peaker plants to purchase as offsets **during** the summer of 2001 through 2003 (The ERC bank is discussed further in section D of this chapter). Table VI-3 lists the PM emission reductions for the first and second year, by district.

District	PM (tons/year)
SCAQMD	11
SJVAPCD	26
BAAQMD	13
SMAQMD	11
SDCAPCD	3
VCAPCD	
MDAQMD	0.4
AVAPCD	0.1
SBCAPCD	0.6
MBUAPCD	0.3
SLOAPCD	0.06
ICAPCD	0.6
NSAQMD	0.4
NSCAPCD	0.2
NCUAQMD	0.3
GCAPCD	0.5
BCAPCD	0.2
Total	68.66

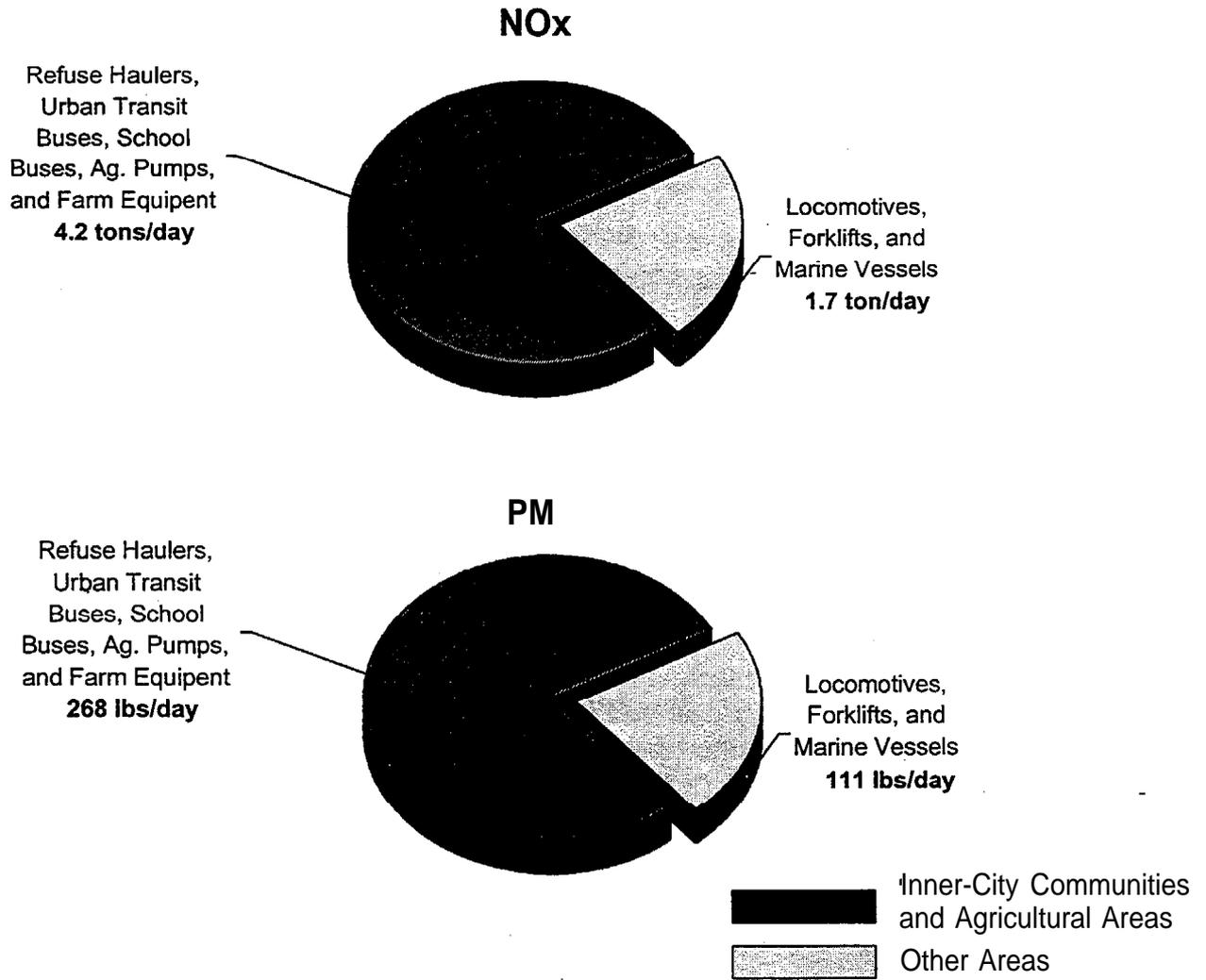
C. What Benefits Will This Program Provide For Inner-City Communities?

Staff estimates that emission reductions from projects such as refuse haulers, urban transit and school buses, and agricultural irrigation pump engines would benefit both inner-city and agricultural communities. Staff estimates that these communities would benefit from NO_x and PM emission reductions of about 4 tons per day and 268 pounds per day, respectively. Targeted outreach, conducted by ARB, is ongoing to enhance participation and ensure emission reductions from this program are realized in

impoverished areas that are often disproportionately impacted by air pollution. Figures VI-1 and VI-2 illustrate the amount of reductions potentially realized in these areas.

Figure VI-1

Potential NOx & PM Emission Reductions for Projects That Operate Throughout Inner-City & Agricultural Communities



D. How Would Emission Reductions From The Carl Moyer Program Affect State and Local Programs?

1. California's Energy Crisis

The Carl Moyer Program will assist in the solution to California's energy crisis. One of the immediate solutions to providing sufficient power generation to meet the needs of homes and businesses through the summer peak seasons of 2001-2003 includes an increase in the use of peaking power plants, either by constructing new peaking units or allowing greater operation at existing peaking units. To balance our energy needs with environmental concerns, the Governor issued Executive Order D-24-01 directing ARB to create an ERC bank. As stated in that Executive Order, "An emissions reduction credit bank is to be established using emissions reductions from all available sources."

In order for new peaking power plants to operate during the summer 2001 and help alleviate the state's energy crisis immediately, emission reductions for the ERC bank are needed before summer 2001. The Governor has proposed funds for another incentive program – The NO_x and PM Emission Reduction Program -to pay for projects that reduce NO_x and PM emissions beyond what is required by any federal, state, or local requirements. Emission reductions from the new program would fund the bank with emission offsets through 2003. Based on ARB's experience with other mobile source incentive programs, the new program would provide emission reductions quickly. However, many of the potential projects would not be realized before summer of 2001 and therefore the surplus emission reductions would not be available for the 2001 summer energy demand.

In order to have immediate credits available to "fund" the ERC bank for the summer 2001 energy demand, ARB has borrowed emission reductions from the Carl Moyer Program with the intent of replenishing those reductions once the energy demand is met. The ARB will borrow first and second year emission reductions (currently about 5.8 tons per day of NO_x and 354 pounds per day of PM) to fund the ERC bank through 2003. Beyond 2003, the borrowed, emission reductions would again be utilized to achieve clean air goals consistent with California's needs to meet its SIP, local air quality/transportation plans, or conformity obligations. The ARB anticipates that projects funded under the new program will generate "Carl Moyer-Like" emission reductions that would also benefit air quality beyond 2003. Furthermore, funds generated from the credits sold to the power plants will be available to local air districts to pay for additional projects to reduce emissions and benefit air quality.

2. California's Air Quality Plans

Some local air quality plans within California rely on incentive programs, including the Carl Moyer Program, for achieving emission reductions. When these incentive elements are included as part of a local region's State Implementation Plan (SIP), the State makes a federally enforceable SIP commitment to provide the emission reductions either through the incentive program or another mechanism that yields the same or more emission reductions. Further, if the planned emission reductions come from on-road mobile sources, they become part of the region's conformity emissions budget. In the latter case, the emission reductions are needed not only to satisfy the SIP commitment, but also to ensure the region on-road emissions continue to conform with adopted regional transportation plans. Failure to show conformity can place delivery of federal transportation resources at risk.

The magnitude of the Carl Moyer Program's emission reductions in a region's plan may, for accounting purposes, differ from the reductions provided in this report. When U.S. EPA approves a SIP, the inputs to the plan (emission inventories and emission models) are fixed for purposes of assessing satisfaction of SIP commitments and for determining transportation conformity. In contrast, the reductions contained in this report are based on the latest ARB estimates of emissions.

VII.

SUMMARY AND RECOMMENDATIONS

A. Summary

The Carl Moyer Program has been implemented quickly and efficiently and is providing near-term emission reductions that help reduce the adverse health consequences of California's air pollution. This expedited implementation has resulted in hundreds of tons of **NO_x** reductions, as well as PM reductions. The immediate availability of these reductions will play a critical role in alleviating California's energy crisis by enabling additional generating capacity to come on-line quickly to meet summer power demand. Beyond 2003, emission reductions generated through the Carl Moyer Program will continue to provide air quality benefits into the next decade.

The Carl Moyer Program has paid for the replacement of heavy-duty diesel engines that power urban transit buses, school buses, refuse trucks, and agricultural irrigation pumps. In fact over 70 percent of the projects funded fall into these categories. These vehicles and equipment operate in school, inner-city, or agricultural communities and the majority of the air quality benefits from this program will be realized in inner-city communities and agricultural communities.

B. Will There Be Additional Funding Available After the Third Year?

Currently, funds to pay for the Carl Moyer Program are not included in the Governor's proposed budget for fiscal year 2001/2002. The Governor has proposed, however, to include \$100 million to pay for a diesel reduction program that would operate similarly to the Carl Moyer Program. That program would produce **NO_x** reductions to be used for emission offsets toward expanding electricity generation over the next two years. After those two years, those emission reductions would be applied toward the much needed air quality benefits in California. Based on a preliminary analysis of both programs, **NO_x** emissions benefits would be up to 20 tons/day by 2005. For 2006 and beyond, emission benefits are expected to decrease if continued funding does not become available.

C. Is There A Need For Continued Funding?

Air districts statewide must continue to reduce emissions to meet federal air quality deadlines, meet and maintain healthful air quality levels, and reduce public exposure to

toxic air contaminants. Incentive programs, such as the Carl Moyer Program, assist districts in achieving the necessary NO_x and PM emission reductions to meet these objectives and requirements. Without an incentive program, emission reductions would have to be obtained from industrial and other sources, reductions which are typically not as cost-effective.

The Carl Moyer Program reduces the economic and societal cost of NO_x and PM pollution for all the people of California in an efficient, environmentally sound and equitable way. The \$98 million in program funding for the first three years of this program cost California about \$1 per person per year for the 33 million people of California. Continued funding at the current annual level of \$50 million would cost California less than 1 penny a day per person. The health, economic, and societal benefits would far exceed these costs.

Additional funding would also provide program continuity. This would help create a sustainable market for low-emission engines and chassis, enabling fleets to continue to have access to these technologies earlier than required. -

Finally, the Carl Moyer Program has provided short-term emission credits that will help California sight new electrical generation facilities this summer. Continued funding will allow repayment of these borrowed credits, assuring on-going progress towards clean air.

D. Recommendations

Staff recommends that the Board

- Approve this report on the Carl Moyer Program for transmittal to the Governor and the Legislature; and
- Continue supporting the Carl Moyer Program and efforts to identify additional funding for the program.

**APPENDIX A
DISTRICT PROGRAMS**

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This Appendix provides a description of each district's program and provides, by project category, the number of engines funded, the amount of funds granted, overall program NO_x reductions and cost-effectiveness for statewide funds granted under the Carl Moyer Program. The subsections also describe each district's process for selecting projects and schedules for accepting applications. Detailed information for each project funded with state funds is provided in Appendix B.

1. South Coast Air Quality Management District (SCAQMD)

Over the first three years, the SCAQMD's program totaled about \$54.5 million (about \$39.4 million from statewide funds, and about \$15.1 million district matching funds). Currently, the SCAQMD has obligated funds about 91 percent of first and second year programs. Those amounts are listed in Tables III-3 and III-4 above.

The SCAQMD issued a RFP in April 1999 to solicit projects under the first-year Carl Moyer Program. That RFP was designed to accept project applications on a first-come first-serve basis. In the second year, SCAQMD issued an RFP on September 10, 1999 that was designed to allow the district to select projects competitively – based on cost-effectiveness. The program announcement was sent to over 15,000 businesses, government agencies, and industry. Criteria for selecting projects were based on the Carl Moyer Program Guidelines, with priority given to alternative fuel projects. The amount of funding requested in the first and second year of the program totaled about \$72 million, exceeding the amount of funds that SCAQMD has available to fund projects in the first three years of the program. To date, all funds have been awarded to projects in the first and second years of the program and the SCAQMD released its RFP on January 19, 2001 to select projects under the third year program. Applications are due to the district in April 2001.

SCAQMD's program has been very successful. The district has funded over 500 engines in the first two years. Some of the project participants that received funds in the South Coast during the first two years include Waste Management, Burrtec Waste Industries, Sunline, Omnitrans, Los Angeles County Metropolitan Transit Authority, Lucky Stores, Marine Terminals, Homebase, Lowe's HIW, Avery-Dennison, and Harbor Distributors. Table A-I lists the types of projects paid for with funds received from the ARB, the number of engines funded, and an estimate of funds obligated by project category.

In the first two years, SCAQMD's program has proven to be very cost effective. The staff of ARB estimates that the SCAQMD's program, using funds allocated by the state, will result in a total of approximately 7,357 tons of NO_x reduced, with an average cost effectiveness of about \$5,000 per ton of NO_x reduced. The ARB anticipates that approximately 123 tons of PM will also be reduced.

**Table A-1
Types and Number of Engines Paid For In the SCAQMD
Carl Moyer Funds Allocated by ARB**

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Refuse Haulers	86		66		\$7,407,369	
Urban Transit Buses	117		117		\$5,262,725	
Other			38		\$1,706,000	
Off-Road Equipment:						
Other	12				\$174,745	
Marine Vessel Engines:		6				\$1,841,190
Forklifts (electric):	105				\$1,482,000	
Total	320	6	221		\$16,032,839	\$1,841,190

2. San Joaquin Valley Air Pollution Control District (SJVAPCD)

Over the first three years, the SJVAPCD's program totaled about \$21 million (about \$15.2 million from statewide funds, and about \$5.8 million in district matching funds). The amount of funding requested in the first three years of the program totaled about \$40 million, exceeding the amount of funds that SJVAPCD has for their program. Currently, the SJVAPD has obligated funds for the first and second year funds. Those amounts are listed in Tables III-3 and HI-4 above.

The SJVAPCD issued a call for applications on June 22, 1999 to solicit projects under the first year Carl Moyer Program. The district's RFP was designed to solicit project applications on a first-come first-serve basis until both first and second year funds were obligated. Criteria for selecting projects were based on the Carl Moyer Program Guidelines approved February 1999. For third year funds, SJVAPCD released its formal call for projects on January 4, 2001 to select projects and received over \$25 million in funding requests. The district will evaluate and select projects based on the revised guidelines approved November 16, 2000.

SJVAPCD's program has proven to be a huge success, based on the projects that the district has funded in the first two years. Some of the types of projects that the district paid for include: agricultural pump engines, school buses, alternatively fueled transit buses, refuse haulers, street sweepers, tractors, line-haul trucks, and delivery trucks. Table A-2 lists the types of projects paid for using Carl Moyer Program funds allocated

by the state, the number of engines funded, and an estimate of funds obligated by project category. The ARB estimates that approximately 6,408 tons of NO_x, and 182 tons of PM will be reduced over the entire project life of projects funded in the first two years of the program. Based on the amount of funds that the district received from ARB, the district's program cost-effectiveness averages about \$3,000/ton of NO_x reduced.

Table A-2
Types and Number of Engines Paid For In the SJVAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	A Fuel	Alt Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:						
Heavy-Duty Line Haul		29				\$ 712,950
Refuse Haulers		6		19		\$ 165,542
Other	3	1			\$ 26,567	\$ 21,300
Off-load Equipment:						
Farm Equipment		7		18		\$ 240,915
Agricultural Irrigation Pumps:	12	306	2	239	\$179,551	\$6,159,809
Total	15	349	2	276	\$206,118	\$7,300,516

3. Bay Area Air Quality Management District (BAAQMD)

Over the first three years, the BAAQMD's program totaled about \$12.1 million (about \$8.7 million from statewide funds, and about \$3.4 million district matching funds). The BAAQMD issued a call for projects on August 16, 1999 to solicit projects in the first and second year. The district's program was a competitive process focusing on cost-effectiveness. Only projects that could achieve a cost-effectiveness of less than \$3,000 per ton of NO_x reduced were accepted into the evaluation process. The district program focused on paying for locomotives, marine vessels, off-road agricultural equipment and irrigation pumps. To date, first year funds have been awarded to projects and about \$400,000 from second year funds have been obligated. BAAQMD anticipates second year funds to be obligated by May 2001. BAAQMD applied to ARB for third year funds in January 2001, with a call for projects sent out on January 24, 2001.

The ARB estimates that state funds obligated by the BAAQMD to date will produce

approximately 3,759 tons of NO_x, and 282 tons of PM reductions over the entire project life of these projects. The district's program cost-effectiveness for those funds averages about \$1,900/ton of NO_x reduced. Some of the types of projects that the district funded include marine vessels and one locomotive (the Napa Valley Wine Train). Table A-3 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
Locomotive Engines:			2		\$820,000	
Marine Vessels Engines:		32				\$2,105,098
Total		32	2		\$820,000	\$2,105,098

4. Sacramento Metropolitan Air Quality Management District (SMAQMD)

Over the first three years, the SMAQMD's program totaled about \$10.1 million (about \$7.3 million from statewide funds, and about \$2.8 million district matching funds). The district already had an on-going heavy-duty incentive program in place and the Carl Moyer Program was incorporated into that program. In June 1999 the SMAQMD started notifying the public of the Carl Moyer Program and by December 1999, had pre-qualified 56 applicants under the Carl Moyer Program. The district's program is designed to select the most cost-effective projects to yield the greatest NO_x reductions to meet Sacramento's much needed conformity and air quality plans.

To date, the SMAQMD has obligated and awarded both first and second year funds to pay for agricultural pump engine repower projects. The district paid for over 300 engines with funds received by the ARB. SMAQMD applied for funds from the third year in January 2001 and received a program award in February 2001.

The ARB estimates that state funds granted to the district will provide approximately 1,263 tons of NO_x, and 57 tons of PM reductions over the entire project life of these projects. Overall, the district's program cost-effectiveness averages about \$4,900/ton of NO_x reduced. Table A-4 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-4
Types and Number of Engines Paid For In the SMAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
School Buses	4				\$ 120,000	
Off-Road Equipment:						
Farm Equipment						
Agricultural Irrigation Pumps:		200		165		\$3,342,889
Total	4	200		165	\$ 120,000	\$3,342,889

5. **San Diego County Air Pollution Control District (SDCAPCD)**

Over the first three years, the SDCAPCD's program totaled about \$5.2 million (about \$3.7 million from statewide funds, and about \$1.5 million district matching funds). SDCAPCD issued a RFP on May 4, 1999 for first year funding. The amount of funds requested in the first year was \$5 million dollars, almost what the district has to pay for projects over three years. Based on the overwhelming response in the first year, SDAPCD. extended its RFP to fund the backlog of projects in the first year with second year funds. The district's program is designed to select the most cost-effective projects.

To date, the SDCAPCD has obligated all of the first and second year funds. The district funded a total of approximately 94 engines. The types of projects funded by the SDAPCD include alternative fueled urban transit and school buses, waste haulers, and marine vessel repowers. SDCAPCD has applied for third year funds to continue implementing its program.

The ARB estimates approximately 1154 tons of NO_x, and 61 tons of PM will be reduced over the entire project life of these projects. Overall, the district's program cost-effectiveness averages about \$6,000/ton of NO_x reduced. Table A-5 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

**Table A-5
Types and Number of Engines Paid For In the SDCAPCD
Carl Moyer Funds Allocated by ARB**

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Refuse Haulers			9		\$213,179	
Urban Transit Buses	50		16		\$677,920	
School Buses	3		5		\$195,640	
Marine Vessels:		8		3		\$808,370
Total	53	8	30	3	\$1,086,739	\$808,370

6. Ventura County Air Pollution Control District (VCAPCD)

The VCAPCD received about \$4.1 million (\$3 million in state funds, and \$1.1 million in district matching funds) to implement the Carl Moyer Program over the first three years of the Carl Moyer Program. In the first year and second years, VCAPCD started accepting project applications for funding on July 19, 1999 and May 18, 2000, respectively. The VCAPCD received project applications for agricultural pump engines, marine vessel engines, and on-road engine repowers. The VCAPCD estimated that the funding requests totaled over \$3 million, which exceeds the amount of Carl Moyer Program funds that the state allocated to the VCAPCD to implement its program over three years.

To date, the VCAPCD has obligated all of its first and second year funds and has received disbursement for the district's third year program. VCAPCD has released an RFP for third year funds with a proposal due date of May 7, 2001. The types of projects that the district has funded include alternative fueled refuse haulers, street sweepers, agricultural irrigation pumps, and marine vessels.

The staff of ARB estimates that VCAPCD's program will result in a total of approximately 729 tons of NO_x reductions and 14 tons of PM reductions. Overall, the districts program cost-effectiveness averages about \$4,100/ton of NO_x reduced. Table A-6 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

**Table A-6
Types and Number of Engines Paid For In the VCAPCD
Carl Moyer Funds Allocated by ARB**

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Refuse Haulers	8		9		\$605,393	
Off-Road:						
Other		5				\$ 74,070
Marine Vessels:		15		12		\$786,319
Agricultural Irrigation Pumps		4				\$ 40,000
Total	8	24	9	12	\$605,393	\$900,389

7. Mojave Desert Air Quality Management District (MDAQMD)

The MDAQMD received a total of about \$4.2 million in funding (\$3 million in state funds, and \$1.2 million in district matching funds) to implement the Carl Moyer Program in the first three years. In the first and second years of the program MDAPQMD issued its "Call for Projects" on September 30, 1999, and July 28, 2000, respectively. The district mailed solicitations to the following industries: fuel distributors/utilities, railroad industry, transit agencies, school districts, alternative fuel vehicle/engine providers/associations, city/county state government fleets, public/private fleets, commercial delivery/distributions/associations, consultants, construction, Chambers of Commerce, waste haulers, manufacturing facilities, and military facilities. MDAQMD's process for selecting projects is based on the total dollar amount of funding requests received in the first five business days. If funding requests did not exceed the amount of funds available in the district, projects were selected based on a first-come-first serve basis. If the total funding requests exceeded the money available, projects were reviewed and selected on a competitive basis.

To date, the MDAQMD has obligated all of its first year funds to fund 19 natural gas refuse haulers. Under the second year of the program, MDAPCD anticipates funds will be obligated to projects by June 30, 2001. MDAQMD has not started its third year program.

The ARB staff estimates that the first year of MDAQMD's program will result in a total of approximately 161 tons of NOx reductions and 4 tons of PM reductions. Overall, the

districts program cost-effectiveness averages about \$6,800/ton of NO_x reduced. Table A-7 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-7 Types and Number of Engines Paid For In the MDAQMD Carl Moyer Funds Allocated by ARB						
Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		T o t a l Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Refuse Haulers	19		Not Obligated		\$845,791	
Total	19				\$845,791	

8. Antelope Valley Air Pollution Control District (AVAPCD)

The AVAPCD received a total of about \$1.4 million in funding (\$1 million in state funds and \$400,000 in matching funds) to implement the Carl Moyer Program through the first three years. On September 3, 1999, and July 28, 2000 the AVAPCD issued a "Call for Projects" for the first and second years, respectively. The AVAPCD mailed out approximately 69 solicitations to the following industries: farm, airport/aerospace, railroad, transit agencies, school districts, engine providers/associations, city/county government fleets, commercial delivery distributors, waste haulers, construction, Chambers of Commerce, and consultants. AVAPCD's process for selecting projects was based on the total dollar amount of funding requests received in the first five business days. If funding requests did not exceed the amount of funds available in the district, projects were selected based on a first-come-first serve basis. If the total funding requests exceeded the money available, projects were reviewed and selected on a competitive basis.

To date, the AVAPCD has obligated all of its first year funds to fund 7 natural gas refuse haulers. Under the second year of the program, the district anticipates funds will be obligated to projects by June 30, 2001. AVAPCD has not started its third year program.

Staff of ARB estimates that the first year of AVAPCD's program will result in a total of approximately 41 tons of NO_x reductions and 1 ton of PM reductions- Overall, the

average cost-effectiveness for the district's program is about \$10,700/ton of NOx reduced. Table A-8 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-8 Types and Number of Engines Paid For In the AVAPCD Carl Moyer Funds Allocated by ARB						
Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Refuse Haulers	7		Not Obligated		\$302, 571	
Total	7				\$302, 571	

9. Santa Barbara County Air Pollution Control District (SBCAPCD)

The SBCAPCD received a total of about \$1.4 million in funding (\$1 million in state funds and \$400,000 in matching funds) to implement the Carl Moyer Program over the first three years. In March 1999, SBCAPCD issued a "Request for Proposals" for the first year. In the second year, funds were limited, so the district approach was one of direct contact. In both years, the district used state funds to complement its current Diesel Marine Vessel ("Trawler") Repower Program, with some of the funds reserved for school buses, waste haulers and off-road equipment.

To date, the SBCAPCD has obligated all of its first and second year funds to pay for marine vessel repowers, and on-road projects such as the Clean Air Express Commuter Bus CNG Repower Project. In February 2001, the district applied to ARB to receive its initial grant disbursement under the third year program and anticipates beginning the third year program in summer 2001.

The ARB staff estimates that the SBCAPCD's program will result in a total of approximately 153 tons of NOx reductions and 6 tons of PM reductions for projects paid for in the first two years. Overall, the average cost-effectiveness for the district's program is about \$4,500/ton of NOx reduced. Table A-9 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

**Table A-9
Types and Number of Engines Paid For In the SBCAPCD
Carl Moyer Funds Allocated by ARB**

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Urban Transit Buses	3				\$ 1 6 9 , 7 4 9	
Other				1		\$ 20, 818
Marine Vessels:		5		6		\$320, 186
Total	3	5		7	\$169,749	\$341,004

10. Kern County Air Pollution Control District (KCAPCD)

KCAPCD did not participate in the first year of the program. In the second year of the program KCAPCD was allocated \$225,000 and requested \$100,000 in program funds to pay for one project that the district selected. The district expects that project to be under contract by June 30, 2001. KCAPCD notified ARB that the district would only use \$100,000 of second year funds and not participate in the third year program, for which the district had been allocated \$450,000. This action by the districts means that this district's remaining funds from the second and third year are available for reallocation-

In March 2000 the Carl Moyer Program Advisory Board recommended that the ARB consider a method for encouraging inter-district projects under the program. Furthermore, the Health and Safety Code also allows ARB to set aside up to 10 percent of statewide funds to pay for inter-district projects. Hence, ARB recommends that the - district's unused funds be used to pay for inter-district projects.

11. Monterey Bay Unified Air Pollution Control District (MBUAPCD)

Over the first three years of the program MBUAPCD has a total of about \$1.3 million in funding (\$1 million in State funds and \$300,000 in matching funds) to implement the Carl Moyer Program in its district. In the first and second years of the program, the district issued an RFP in July 1999 and September 2000, respectively. In both years, the district separated its funds into three amounts- This allowed each of the three counties under MBUAPCD's jurisdiction to benefit from projects paid for under the program. These counties include Monterey, Santa Cruz, and San Benito. Funding

amounts were determined using the population in each of these counties. Projects were selected on a first-come-first-serve basis.

To date, MBUAPCD has obligated all of its first and second year funds to eight urban transit buses and five marine vessels. The staff of ARB estimates that the MBUAPCD's program will result in a total of approximately 64 tons of lifetime NO_x reductions and 3 tons of lifetime PM reductions for projects paid for in the first and second years.

Overall, the average cost-effectiveness for the district's program is about \$9,200/ton of NO_x reduced. Table A-I 0 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by-project category.

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Urban Transit Buses	8				\$265,800	
Marine Vessels:						
				5		\$145,183
Total	8			5	\$265,800	\$145,183

12. San Luis Obispo County Air Pollution Control District (SLOCAPCD)

Over three years, the SLOCAPCD has about \$570,000 in funding (\$400,000 in state funding and \$170,000 in matching funds) to implement the Carl Moyer Program in its district. In the first year of the program, the district did not issue an RFP because it had already committed its funds to the Hearst Castle for a CNG Bus project. In the second year, however, SLOCAPCD issued an RFP and accepted applications on a first-come-first serve basis.

To date, the district has obligated all of its first year state funds to pay for 10 Hearst Castle CNG buses. The district expects to obligate second year funds by June 30, 2001. The staff of ARB estimates that SLOCAPCD's program will result in a total of approximately 17 tons of NO_x reductions and 0.6 tons of PM reductions for first year projects. Overall, the average cost-effectiveness for the district's program is about \$11,200/ton of NO_x reduced. Table A-I 1 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-1 1
Types and Number of Engines Paid For In the SLOCAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Urban Transit Buses	10		Not Obligated		\$157,800	
Total	10				\$157,800	

13. Imperial County Air Pollution Control District (ICAPCD)

Over the first three years, the ICAPCD has a total of about \$550,000 in funding (\$400,000 in state funds and \$150,000 in matching funds) to implement the Carl Moyer Program in its district. In the first and second years of the program the district solicited applications through a public notice that was issued in August 1999 and July 2000, respectively. The district distributed applications through the Agricultural Commissioner's Office, the Farm Bureau, and through a direct mailing and distribution effort. The types of industries notified included firms with agricultural and earthmoving equipment, on-road equipment operators, farmers, trucking companies, hay processors, and agricultural irrigation pump operators. ICAPCD accepted applications on a first-come-first serve basis and conducted evaluations based on cost-effectiveness.

To date, the district has obligated all of its first year funds to pay for agricultural irrigation pumps. The district expects to obligate second year funds by June 30, 2001. The staff of ARB estimates that ICAPCD's program will result in a total of approximately 1.26 tons of NOx reductions and 6 tons of PM reductions for first year projects. Overall; the average cost-effectiveness for the district's program is about \$1,500/ton of NOx reduced. Table A-12 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A - 12
Types and Number of Engines Paid For In the ICAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
Agricultural Irrigation Pumps		13	Not Obligated			\$134,800
Total		13				\$134,800

14. Northern Sierra Air Quality Manacaement District (NSAQMD)

Over the first three years, the NSAQMD has a total of about \$390,000 in funding (\$250,000 in state funds and \$140,000 in matching funds) to implement the Carl Moyer Program in its district. In the first and second years of the program the district solicited applications through news releases, mail-outs, and radio advertisements. The district accepted applications on a first-come-first serve basis. Only applicants within Western Nevada County were considered and projects were evaluated on cost-effectiveness. If any projects had the same cost-effectiveness for NO_x, the district evaluated those projects by considering cost-effectiveness for PM reductions.

To date, the district has obligated all of its first and second year funds to pay for on- and off-road engines. The staff of ARB estimates that NSAQMD's program will result in a total of approximately 76 tons of NO_x reductions and 3 tons of PM reductions for first and second year projects. Overall, the average cost-effectiveness for the district's program is about \$5,700/ton of NO_x reduced. Table A-13 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-13
Types and Number of Engines Paid For In the NSAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Diesel	Fuel Diesel
O n - R o a d :						
-Refuse Haulers		7		2		\$102,569
Urban Transit Buses			1		\$9,065	
Other		1		1		\$ 34,758
Off-Road Equipment: .						
Other		2				\$ 34,000
Total		10	1	3	\$9,065	\$171,327

15. **Northern Sonoma County Air Pollution Control District (NSCAPCD)**

For the first and third year of the program, the NSCAPCD has a total of about \$360,000 in funding (\$260,000 in state funds and \$100,000 in matching funds) to implement the Carl Moyer Program in its district. The district did not participate in the second year of the program.

In the first year of the program the district sent out an RFP on September 24, 1999. The district accepted applications on a first-come-first serve basis. The industries that received RFPs included the agricultural industries, farms, transportation associations, school districts, and government agencies. The district's program is based on a competitive processes where the most cost-effective projects are selected.

To date, the district has obligated all of its first year funds to pay for on- and off-road engines. The staff of ARB estimates that NSCAPCD's program will result in a total of approximately 6-l tons of NO_x reductions and 2 tons of PM reductions for first year projects. Overall, the average cost-effectiveness for the district's program is about \$3,400/ton of NO_x reduced. Table A-14 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-14
Types and Number of Engines Paid For In the NSCAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Urban Transit Buses	7		No Funds		\$83,900	
Marine Vessel Engines:		2	No Funds			\$30,000
Total	7	2			\$83,900	\$30,000

16. Glenn County Air Pollution Control District (GCAPCD)

Over the first three years, the GCAPCD has a total of about \$420,000 in funding (\$300,000 in state funds and \$120,000 in matching funds) to implement the Carl Moyer Program in its district. In the first and second years of the program the district solicited applications through an RFP in November 1999 and September 2000, respectively. The district accepted applications on a first-come-first serve basis, and used **cost-effectiveness** to select projects competitively. Projects operating within the county received 90 percent of incremental costs, while those operating outside the county received 85 percent of incremental costs.

To date, the district has obligated all of its first year state funds received by the state to pay for agricultural irrigation pump engines. The district expects to obligate second year funds by June 30, 2001. The staff of ARB estimates that GCAPCD's program will result in a total of approximately 57 tons of NO_x reductions and 3 tons of PM reductions for projects paid for in the first year. Overall, the average cost-effectiveness for the district's program is about \$3,000/ton of NO_x reduced. Table A-15 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

**Table A-15
Types and Number of Engines Paid For In the G.CAPCD
Carl Moyer Funds Allocated by ARB**

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
Agricultural Irrigation Pumps		14	Not Obligated			\$99,662
Total		14				\$99,662

17. North Coast Unified Air Quality Management District (NCUAQMD)

Over the first three years, the NCUAQMD has a total of about \$480,000 in funding (\$350,000 in state funds and \$130,000 in matching funds) to implement the Carl Moyer Program in its district. In the first and second years of the program the district issued and Opportunity Notice on July 2, 1999 and May 17, 2000, respectively. The district accepted applications on a first-come-first serve basis.

To date, the district has obligated all of its first year funds for on-road, off-road, and marine vessel engines. The district expects to obligate second year funds by June 30, 2001. The staff of ARB estimates that NCUAQMD's program will result in a total of approximately 55 tons of NOx reductions and 3 tons of PM reductions for first year projects. Overall, the average cost-effectiveness for the district's program is about \$4,800/ton of NOx reduced. Table A-16 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-1 6
Types and Number of Engines Paid For In the NCUAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
On-Road:						
Other		4	Not Obligated			\$ 64,648
Off-Road Equipment:						
Construction		1	Not Obligated			\$ 4,352
Marine Vessels:						
		1	Not Obligated			\$ 31,000
Total		6				\$100,000

18. **Butte County Air Quality Management District (BCAQMD)**

Over the second and third years of the program, the BCAQMD has a total of about \$360,000 in funding (\$250,000 in state funds and \$90,000 in matching funds) to implement the Carl Moyer Program in its district. The district did not participate in the first year of the program. In the second year of the program the BCAQMD issued an RFP on May 1, 2000. The district accepted applications on a first-come-first serve basis.

To date, the district has obligated all of its second year funds for agricultural irrigation pump engines. The staff of ARB estimates that BCAQMD's program will result in a total of approximately 133 tons of NO_x reductions and 5 tons of PM reductions for second year projects. Overall, the average cost-effectiveness for the districts program is about \$1,000/ton of NO_x reduced. Table A-17 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-1 7
Types and Number of Engines Paid For In the BCAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel Diesel	Diesel
Agricultural Irrigation Pumps	No Funds			6		\$75,780
Total				6		\$75,780

19. **Shasta County Air Quality Management District (Shasta County AQMD)**

Over the second and third years of the program, the Shasta County AQMD has a total of about \$330,000 in funding (\$250,000 in state funds and \$80,000 in matching funds) to implement the Carl Moyer Program in its district- The district did not participate in the first year of the program. In the second year of the program the Shasta County AQMD's solicited project applicants through local news papers, mail-outs, and through engine and equipment dealers. The district will fund a maximum of \$10,000 per project. SCAPD expects to obligate second year funds to projects by June 30, 2001.

20. **Feather River Air Quality Management District (FRAQMD)**

Over the second and third years of the program, the FRAQMD has a total of about \$320,000 in funding (\$240,000 in state funds and \$80,000 in matching funds) to implement the Carl Moyer Program in its district. The district did not participate in the first year of the program. FRAQMD is currently accepting applications on a first-come-first serve basis and anticipates second year funds will be obligated by June 30, 2001.

21. **Mendocino County Air Quality Management District (MCAQMD)**

Over the second and third years of the program, the MCAQMD has a total of about \$280,000 in funding (\$210,000 in state funds and \$60,000 in matching funds) to implement the Carl Moyer Program in its district. The district did not participate in the first year of the program. In the second year of the program the MDCAQMD solicited projects applicants through direct contact and meetings with public fleet managers,

school districts, the local Farm Bureau, and marine vessel owners. The district is currently accepting applications on a first-come-first serve. MCAQMD anticipates second year funds will be obligated, by June 30, 2001.

22. Tehama County Air Pollution Control Districts

Tehama County Air Pollution Control Districts has currently applied for state funds to participate in the third year Carl Moyer Program. The district will have about \$190,000 in funding (this includes both state funding and local matching funds) to pay for projects in the third year.

**APPENDIX B
DISTRICT PROJECTS**

Carl Moyer Program Fiscal Year 19980999 Funded Projects

Client	Route of Funding	Project Number	Category Type	Project Type	Equipment Type	Baseline Emission Engine Type	Reduced Emission Engine Fuel	Baseline Emission Engine Cost	Reduced Emission Engine Cost	Grant Approved per Operation	Number of Engines	Request Granted	Annual Operation	Operation Hours	Annual Fuel Consumption	Percent Reduction (GWR)	Baseline Emission Horsepower	Reduced Emission Horsepower	Project Life (Years)	Baseline Emission Nox	Reduced Emission Nox	NOx Units	Baseline g/d Conversion Factor	Reduced g/d Conversion Factor	Lead Fuel	Energy Consumption on Factor	Engine Nox Reduction Operation (lb/year)	Engine Nox Reduction Fuel Consumption (lb/year)	Project Nox Reduction Operation (lb/year)	Project Nox Reduction Fuel Consumption (lb/year)	Project Nox Reduction (lb/year)	Project Lifetime Nox Reduction			
SCAQMD	Mayor	SCF-6	Forklift	New	Class 1	Propane Electric	Electric	\$12,000	\$12,000	10	1480,000	2,364	2,364	2,364	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	1.2	0.0	46.4	0.0	46.4	232.0				
SCAQMD	Mayor	SCF-4	Forklift	New	Class 1, code 5	Propane Electric	Electric	\$12,875	\$12,875	32	1410,400	2,500	2,500	2,500	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	1.5	0.0	16.4	0.0	16.4	232.0				
SCAQMD	Mayor	SCF-5	Forklift	New	Class 1, code 5	Propane Electric	Electric	\$12,000	\$12,000	10	1106,000	1,500	1,500	1,500	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	2.8	0.0	10.4	0.0	10.4	15.2				
SCAQMD	Mayor	SCF-3	Forklift	New	Class 1, code 6	Propane Electric	Electric	\$15,000	\$15,000	1	155,800	4,500	4,500	4,500	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	2.8	0.0	2.6	0.0	2.6	13.0				
SCAQMD	Mayor	SCF-1	Forklift	New	Class 1, code 6	Propane Electric	Electric	\$18,000	\$18,000	2	137,200	3,800	3,800	3,800	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	3.2	0.0	6.8	0.0	6.8	32.2				
SCAQMD	Mayor	SCF-2	Forklift	New	Class 1, code 6	Propane Electric	Electric	\$18,000	\$18,000	2	118,600	3,920	3,920	3,920	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	2.3	0.0	2.3	0.0	2.3	11.5				
SCAQMD	Mayor	SCF-7	Forklift	New		Propane Electric	Electric	\$18,000	\$18,000	20	132,000	3,864	3,864	3,864	100%	NA	NA	5	8.8	0.0	g/bhp-hr	NA	NA	NA	18.5	3.7	0.0	14.0	0.0	14.0	70.0				
SCAQMD	Mayor	SCM-1	Marine Vessel	Recover	Crab Boat	Propane	Electric	\$26,000	\$26,000	2	176,800	1,100	1,100	1,100	100%	NA	NA	20	168.0	298.0	ba/100gal	NA	NA	NA	NA	NA	0.0	16.8	0.0	33.1	0.0	33.1	661.9		
SCAQMD	Mayor	SCM-3	Marine Vessel	Recover	Tug	Diesel	Diesel	\$180,000	\$180,000	2	1802,568	2,800	2,800	2,800	100%	NA	NA	20	163.8	145.0	ba/100gal	NA	NA	NA	NA	NA	0.0	22.4	0.0	44.8	0.0	44.8	896.1		
SCAQMD	Mayor	SCM-2	Marine Vessel	Recover	Tug	Diesel	Diesel	\$180,000	\$180,000	2	1802,568	2,800	2,800	2,800	100%	NA	NA	20	163.8	145.0	ba/100gal	NA	NA	NA	NA	NA	0.0	21.9	0.0	43.8	0.0	43.8	876.9		
SCAQMD	Mayor	SCO-1	Off Road	New	Yard Spalling Fractor	Diesel	LPG	\$152,340	\$152,340	1	155,726	1,800	1,800	1,800	100%	NA	NA	12	100.0	100%	NA	195	195	12	10.0	2.5	0.0	0.0	0.0	0.0	1.5	0.0	1.5	18.3	
SCAQMD	Mayor	SCO-2	Off Road	New	Yard Spalling Fractor	Diesel	LPG	\$155,726	\$155,726	2	155,726	1,800	1,800	1,800	100%	NA	NA	12	100.0	100%	NA	195	195	12	10.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCAQMD	Mayor	SCO-3	Off Road	Recover	Yard Spalling Fractor	Diesel	LPG	\$152,340	\$152,340	5	1500,000	6,240	6,240	6,240	100%	NA	NA	12	100.0	100%	NA	195	195	12	10.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
SCAQMD	Mayor	SCN-16	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-17	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-18	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-19	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-20	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-21	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-22	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-23	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-24	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-25	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-26	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-27	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-28	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-29	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-30	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-31	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-32	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-33	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-34	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-35	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-36	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-37	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-38	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-39	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-40	On Road	Recover	Refuse Collection	Diesel	GNV	\$18,000	\$18,000	1	191,682	3,068	3,068	3,068	100%	33000	300	12	80.0	2.5	g/bhp-hr	NA	NA	NA	66.8	18.5	2.4	0.8	2.4	0.8	2.4	29.0			
SCAQMD	Mayor	SCN-41</																																	

Carl Moyer Program Fiscal Year 1998/1999 Funded Projects

Account	Source of Funding	Project Number	Category	Project Type	Equipment Type	Baseline Emission Engine Fuel Type	Reduced Emission Engine Fuel Type	Baseline Emission Engine Fuel Cost	Reduced Emission Engine Fuel Cost	Drift Approved per Conversion	Number of Engines	Request Granted	Annual Operation	Operation Units	Annual Fuel Consumption	Percent in Category	GW/HP	Baseline Emission Engine Horsepower	Reduced Emission Engine Horsepower	Project Life (Years)	Baseline Emission Factor	Reduced Emission Factor	NOx Units	Baseline g/m Conversion Factor	Reduced g/m Conversion Factor	Lead Fuel	Energy Conversion on Factor	Engine NOx Reduction (lb/yr/ft)	Project NOx Reduction (lb/yr/ft)	Project NOx Reduction (lb/yr/ft)	Project NOx Reduction (lb/yr/ft)		
JAPCO	WSP	C-011	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	13,217	114,338	111,029	1	111,029	4,000	Hours	18,522	100%	NA	210	210	5	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	7.6	3.8	2.8	3.8	18.0	
JAPCO	WSP	C-011	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	11,217	114,338	113,029	1	113,029	4,000	Hours	18,522	100%	NA	210	210	5	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	7.6	3.8	2.8	3.8	18.0	
JAPCO	WSP	C-011	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	12,217	114,338	111,029	1	111,029	4,000	Hours	18,522	100%	NA	210	210	5	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	7.6	3.8	2.8	3.8	18.0	
JAPCO	WSP	C-012	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	12,045	112,595	110,000	1	110,000	3,000	Hours	36,000	100%	NA	186	186	5	12.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	7.6	2.8	2.8	2.8	18.0	
JAPCO	WSP	C-012	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	13,400	118,318	117,918	2	117,918	3,000	Hours	36,000	100%	NA	211	211	5	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	7.6	2.1	2.1	2.1	18.0	
JAPCO	WSP	C-013	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	17,500	117,327	114,000	1	114,000	2,000	Hours	10,000	100%	NA	190	190	12	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	11.3	0.8	1.3	0.8	0.8	9.5
JAPCO	WSP	C-013	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	17,500	117,327	114,000	1	114,000	2,000	Hours	10,000	100%	NA	190	190	12	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	11.3	0.8	1.3	0.8	0.8	9.5
JAPCO	WSP	C-014	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	22,045	111,500	109,455	1	109,455	1,650	Hours	8,075	100%	NA	133	133	8	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	1.1	1.1	1.1	1.1	1.1	9.8
JAPCO	WSP	C-014	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	22,270	111,875	112,212	1	112,212	1,650	Hours	8,075	100%	NA	133	133	8	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	1.1	1.1	1.1	1.1	1.1	9.8
JAPCO	WSP	C-050	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	14,600	121,000	120,000	1	120,000	3,000	Hours	40,000	100%	NA	450	450	5	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	3.2	4.8	3.2	4.8	14.4
JAPCO	WSP	C-051	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	17,045	110,725	108,600	1	108,600	5,500	Hours	13,553	100%	NA	133	133	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	3.7	1.8	3.7	1.8	3.7	11.8
JAPCO	WSP	C-051	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	18,635	108,811	106,400	1	106,400	5,100	Hours	24,375	100%	NA	79	79	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	3.7	1.8	3.7	1.8	3.7	11.8
JAPCO	WSP	C-055	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	19,184	121,713	121,000	1	121,000	3,500	Hours	40,000	100%	NA	212	212	5	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.0	2.0	2.0	2.0	2.0	14.4
JAPCO	WSP	C-057	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	18,400	113,565	115,265	1	115,265	3,000	Hours	18,000	100%	NA	185	185	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.1	2.1	2.1	2.1	2.1	10.8
JAPCO	WSP	C-058	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	14,500	113,565	115,165	1	115,165	2,000	Hours	18,000	100%	NA	185	185	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.5	1.8	2.5	1.8	2.5	14.8
JAPCO	WSP	C-059	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	14,500	113,565	115,165	1	115,165	2,000	Hours	18,000	100%	NA	185	185	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.5	1.8	2.5	1.8	2.5	14.8
JAPCO	WSP	C-059	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	14,500	113,565	115,165	1	115,165	2,000	Hours	18,000	100%	NA	185	185	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.5	1.8	2.5	1.8	2.5	14.8
JAPCO	WSP	C-059	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	14,500	113,565	115,165	1	115,165	2,000	Hours	18,000	100%	NA	185	185	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.5	1.8	2.5	1.8	2.5	14.8
JAPCO	WSP	C-059	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	14,500	113,565	115,165	1	115,165	2,000	Hours	18,000	100%	NA	185	185	5	13.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	2.5	1.8	2.5	1.8	2.5	14.8
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump	Repower	irrigation Pump	Gasol	Gasol	16,500	127,000	126,000	1	126,000	2,000	Hours	54,000	100%	NA	434	434	6	11.0	8.8	g/bhp-hr	NA	NA	0.75	17.6	4.8	4.3	4.8	4.3	4.3	21.4
JAPCO	WSP	C-063	Ag Pump</																														

Carl Moyer Program Fiscal Year 1998/1999 Funded Projects

Entity	Source of Funding	Project Number	Category	Project Type	Equipment Type	Baseline Emission Type	Reduced Emission Type	Baseline Emission (t/yr)	Reduced Emission (t/yr)	Grant	Number of Engines	Request Amount (\$)	Annual Operation Hours	Operation Units	Annual Fuel Consumption	Percent Offsets	OT/HR	Baseline Emission (t/yr)	Reduced Emission (t/yr)	Project Life (Years)	Baseline Emission (t/yr)	Reduced Emission (t/yr)	Baseline Emission Factor	Reduced Emission Factor	Load Factor	Energy Consumed on Fuel	Engine NOx Reduction (lb/yr)	Engine NOx Reduction (lb/yr)	Engine NOx Reduction (lb/yr)	Project NOx Reduction (lb/yr)	Project NOx Reduction (lb/yr)	Project NOx Reduction (lb/yr)
SIAPCD	Mayor	N-058	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,439	132,602	19,143	1	19,143	1,000	Hours	4600	100%	NA	133	133	12	130	69	NA	NA	0.75	17.8	0.7	0.7	0.3	0.3	0.3	
SIAPCD	Mayor	N-059	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,450	111,500	17,450	1	17,450	600	Hours	2700	100%	NA	133	133	12	130	69	NA	NA	0.75	17.8	0.4	0.3	0.4	0.3	0.3	0.3
SIAPCD	Mayor	N-061	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	12,100	114,780	110,000	1	110,000	550	Hours	13553	100%	NA	135	135	12	130	69	NA	NA	0.75	17.8	0.4	1.8	0.4	1.8	0.4	1.8
SIAPCD	Mayor	N-063	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	15,927	150,165	148,338	1	148,338	624	Hours	2664	100%	NA	104	104	12	130	69	NA	NA	0.75	17.8	0.3	0.3	0.3	0.3	0.3	0.3
SIAPCD	Mayor	N-064	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	15,927	126,600	120,000	1	120,000	500	Hours	18190	100%	NA	104	104	10	110	69	NA	NA	0.75	17.8	0.7	0.7	0.7	0.7	0.7	0.7
SIAPCD	Mayor	N-066	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	14,450	126,600	120,000	1	120,000	500	Hours	15750	100%	NA	104	104	10	110	69	NA	NA	0.75	17.8	1.2	1.2	1.2	1.2	1.2	1.2
SIAPCD	Mayor	N-068	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	17,472	169,440	125,000	2	125,000	1,500	Hours	40000	100%	NA	1715	1715	10	110	69	NA	NA	0.75	17.8	3.8	3.2	3.3	3.3	3.3	3.3
SIAPCD	Mayor	N-068	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	15,815	133,514	120,000	1	120,000	500	Hours	23000	100%	NA	120	120	10	110	69	NA	NA	0.75	17.8	2.1	2.0	2.1	2.0	2.1	2.0
SIAPCD	Mayor	N-070	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	12,850	122,523	119,943	1	119,943	950	Hours	4815	100%	NA	168	168	12	130	69	NA	NA	0.75	17.8	0.8	0.8	0.8	0.8	0.8	0.8
SIAPCD	Mayor	N-072	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	112,607	110,107	1	110,107	1,000	Hours	11200	100%	NA	168	168	9	130	69	NA	NA	0.75	17.8	1.4	1.3	1.4	1.3	1.4	1.3
SIAPCD	Mayor	N-072	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	14,550	118,400	111,850	1	111,850	1,600	Hours	8600	100%	NA	218	218	9	110	69	NA	NA	0.75	17.8	1.2	0.8	1.2	0.8	0.8	0.8
SIAPCD	Mayor	N-073	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	12,175	18,226	14,000	1	14,000	2,000	Hours	7000	100%	NA	61	61	7	130	69	NA	NA	0.75	17.8	0.8	0.8	0.8	0.8	0.8	0.8
SIAPCD	Mayor	N-075	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	12,700	119,215	116,315	1	116,315	2,500	Hours	20000	100%	NA	110	110	10	130	69	NA	NA	0.75	17.8	1.4	2.4	1.4	2.4	1.4	2.4
SIAPCD	Mayor	N-076	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,700	114,295	110,000	1	110,000	2,000	Hours	8000	100%	NA	145	145	12	130	69	NA	NA	0.75	17.8	2.2	2.2	2.2	2.2	2.2	2.2
SIAPCD	Mayor	N-077	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	18,000	120,000	112,000	1	112,000	1,700	Hours	13500	100%	NA	225	225	11	110	69	NA	NA	0.75	17.8	1.3	1.1	1.3	1.1	1.3	1.1
SIAPCD	Mayor	N-078	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	110,800	107,300	1	107,300	1,500	Hours	8000	100%	NA	155	155	8	130	69	NA	NA	0.75	17.8	1.2	0.9	1.2	0.9	0.9	0.9
SIAPCD	Mayor	N-078	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,850	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	2	111,950	1,200	Hours	7800	100%	NA	168	168	12	110	69	NA	NA	0.75	17.8	1.0	0.9	2.0	1.8	1.8	1.8
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75	17.8	0.8	0.6	0.8	0.6	0.6	0.6
SIAPCD	Mayor	N-079	Ag Pump	Repower	Impingement Pump	Diesel	Diesel	13,500	115,950	111,950	1	111,950	1,200	Hours	7800	100%	NA	191	191	12	110	69	NA	NA	0.75							

Carl Moyer Program Fiscal Year 1998/1999 Funded Projects

Device	Source of Funding	Project Number	Category	Type	Equipment Type	Baseline Emission Engine Fuel Type	Reduced Emission Engine Fuel Type	Baseline Emission Engine Cost	Reduced Emission Engine Cost	Grant Approved per Conversion	Number of Engines	Request Period	Annual Operation	Operation Units	Annual Fuel Consumption	Percent Saved	CO2/M	Baseline Emission Horsepower	Reduced Emission Horsepower	Project Life (Years)	Baseline Emission Hrs	Reduced Emission Hrs	Baseline gnd Conversion Factor	Reduced gnd Conversion Factor	Lead Factor	Energy Consumed (kWh/yr)	Engine Hrs Reduction (hr/yr)	Engine Hrs Reduction (hr/yr)	Project Hrs Reduction (hr/yr)			
SAMQAD	Mayor	CA200001	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,843	\$11,715	\$8,872	1	18,414	800	Hours	100%	NA	125	135	5	130	69	NA	NA	0.75	18.5	0.3	0.0	0.3	0.0	0.3	1.7	
SAMQAD	Mayor	CA200002	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,843	\$11,715	\$8,872	1	18,414	800	Hours	100%	NA	125	135	5	130	69	NA	NA	0.75	18.5	0.3	0.0	0.3	0.0	0.3	1.6	
SAMQAD	Mayor	CA200003	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,533	\$11,340	\$8,807	1	18,807	900	Hours	100%	NA	140	135	5	130	69	NA	NA	0.75	18.5	0.3	0.0	0.3	0.0	0.3	1.3	
SAMQAD	Mayor	CA200004	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,871	\$10,715	\$8,659	1	18,659	850	Hours	100%	NA	145	135	5	130	69	NA	NA	0.75	18.5	0.3	0.0	0.3	0.0	0.3	1.4	
SAMQAD	Mayor	CA200005	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,104	\$12,129	\$10,029	1	11,029	1,200	Hours	100%	NA	178	185	5	110	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.1	
SAMQAD	Mayor	CA200006	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,250	\$18,742	\$13,492	1	13,492	1,200	Hours	100%	NA	200	246	5	110	69	NA	NA	0.75	18.5	2.1	0.0	2.1	0.0	2.1	10.7	
SAMQAD	Mayor	CA200007	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,300	\$19,099	\$16,788	1	16,788	1,600	Hours	100%	NA	190	130	5	130	69	NA	NA	0.75	18.5	1.0	0.0	1.0	0.0	1.0	5.2	
SAMQAD	Mayor	CA200008	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,347	\$19,152	\$16,834	1	16,834	1,600	Hours	100%	NA	155	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	3.8	
SAMQAD	Mayor	CA200009	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,374	\$18,895	\$16,523	1	16,523	1,700	Hours	100%	NA	130	180	5	110	69	NA	NA	0.75	18.5	1.5	0.0	1.5	0.0	1.5	7.2	
SAMQAD	Mayor	CA200010	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,700	\$19,089	\$17,389	1	17,389	1,200	Hours	100%	NA	155	130	5	130	69	NA	NA	0.75	18.5	1.1	0.0	1.1	0.0	1.1	5.3	
SAMQAD	Mayor	CA200011	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,978	\$19,752	\$17,704	1	17,704	1,100	Hours	100%	NA	130	160	5	130	69	NA	NA	0.75	18.5	0.5	0.0	0.5	0.0	0.5	2.7	
SAMQAD	Mayor	CA200012	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,842	\$19,360	\$17,518	1	17,518	1,500	Hours	100%	NA	105	127	5	130	69	NA	NA	0.75	18.5	0.6	0.0	0.6	0.0	0.6	3.0	
SAMQAD	Mayor	CA200013	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,190	\$14,150	\$11,960	1	11,960	1,200	Hours	100%	NA	175	185	5	120	69	NA	NA	0.75	18.5	0.7	0.0	0.7	0.0	0.7	3.3	
SAMQAD	Mayor	CA200014	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,700	\$19,089	\$17,376	1	17,376	1,050	Hours	100%	NA	111	130	5	130	69	NA	NA	0.75	18.5	0.5	0.0	0.5	0.0	0.5	2.4	
SAMQAD	Mayor	CA200015	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,044	\$10,715	\$8,671	1	8,671	600	Hours	100%	NA	105	135	5	130	69	NA	NA	0.75	18.5	0.2	0.0	0.2	0.0	0.2	1.1	
SAMQAD	Mayor	CA200016	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,214	\$10,715	\$8,501	1	8,501	600	Hours	100%	NA	135	135	5	130	69	NA	NA	0.75	18.5	0.4	0.0	0.4	0.0	0.4	2.0	
SAMQAD	Mayor	CA200017	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,881	\$10,715	\$8,434	1	8,434	700	Hours	100%	NA	335	335	5	110	69	NA	NA	0.75	18.5	1.6	0.0	1.6	0.0	1.6	8.0	
SAMQAD	Mayor	CA200018	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,671	\$10,715	\$8,044	1	8,044	550	Hours	100%	NA	145	135	5	110	69	NA	NA	0.75	18.5	0.3	0.0	0.3	0.0	0.3	1.5	
SAMQAD	Mayor	CA200019	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$2,019	\$14,626	\$12,607	1	12,607	1,500	Hours	100%	NA	249	246	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	4.5	
SAMQAD	Mayor	CA200020	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,111	\$10,968	\$9,857	1	9,857	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.8	
SAMQAD	Mayor	CA200021	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,311	\$10,968	\$9,657	1	9,657	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.9	
SAMQAD	Mayor	CA200022	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,332	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	152	168	5	130	69	NA	NA	0.75	18.5	0.4	0.0	0.4	0.0	0.4	2.0	
SAMQAD	Mayor	CA200023	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,329	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	170	177	5	130	69	NA	NA	0.75	18.5	0.2	0.0	0.2	0.0	0.2	0.9	
SAMQAD	Mayor	CA200024	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,111	\$10,968	\$9,857	1	9,857	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.8	
SAMQAD	Mayor	CA200025	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,311	\$10,968	\$9,657	1	9,657	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.9	
SAMQAD	Mayor	CA200026	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,332	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	152	168	5	130	69	NA	NA	0.75	18.5	0.4	0.0	0.4	0.0	0.4	2.0	
SAMQAD	Mayor	CA200027	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,329	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	170	177	5	130	69	NA	NA	0.75	18.5	0.2	0.0	0.2	0.0	0.2	0.9	
SAMQAD	Mayor	CA200028	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,111	\$10,968	\$9,857	1	9,857	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.8	
SAMQAD	Mayor	CA200029	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,311	\$10,968	\$9,657	1	9,657	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.9	
SAMQAD	Mayor	CA200030	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,332	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	152	168	5	130	69	NA	NA	0.75	18.5	0.4	0.0	0.4	0.0	0.4	2.0	
SAMQAD	Mayor	CA200031	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,329	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	170	177	5	130	69	NA	NA	0.75	18.5	0.2	0.0	0.2	0.0	0.2	0.9	
SAMQAD	Mayor	CA200032	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,111	\$10,968	\$9,857	1	9,857	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.8	
SAMQAD	Mayor	CA200033	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,311	\$10,968	\$9,657	1	9,657	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.9	
SAMQAD	Mayor	CA200034	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,332	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	152	168	5	130	69	NA	NA	0.75	18.5	0.4	0.0	0.4	0.0	0.4	2.0	
SAMQAD	Mayor	CA200035	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,329	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	170	177	5	130	69	NA	NA	0.75	18.5	0.2	0.0	0.2	0.0	0.2	0.9	
SAMQAD	Mayor	CA200036	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,111	\$10,968	\$9,857	1	9,857	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.8	
SAMQAD	Mayor	CA200037	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,311	\$10,968	\$9,657	1	9,657	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.9	
SAMQAD	Mayor	CA200038	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,332	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	152	168	5	130	69	NA	NA	0.75	18.5	0.4	0.0	0.4	0.0	0.4	2.0	
SAMQAD	Mayor	CA200039	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,329	\$11,761	\$10,429	1	10,429	800	Hours	100%	NA	170	177	5	130	69	NA	NA	0.75	18.5	0.2	0.0	0.2	0.0	0.2	0.9	
SAMQAD	Mayor	CA200040	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,111	\$10,968	\$9,857	1	9,857	2,000	Hours	100%	NA	112	160	5	130	69	NA	NA	0.75	18.5	0.8	0.0	0.8	0.0	0.8	2.8	
SAMQAD	Mayor	CA200041	Ag Pump	Repower	Impaction Pump	Deisel	Deisel	\$1,311	\$10,968	\$9,657	1	9,657	2,000	Hours	100%	NA	112	160	5	130	6											

Carl Moyer Program Fiscal Year 1998/1999 Funded Projects

Model	Source of Funding	Project Number	Category	Project Type	Equipment Type	Baseline Emission Engine Fuel	Reduced Emission Engine Fuel	Baseline Emission Engine Fuel	Reduced Emission Engine Fuel	Grant Approved per Conversion	Number of Engines	Request Granted	Annual Operation	Operation Hours	Annual Fuel Consumption	Percent In-Calendar	GWWR	Baseline Emission Engine Horsepower	Reduced Emission Engine Horsepower	Project Life (Years)	Baseline Emission NOx	Reduced Emission NOx	NOx Units	Baseline g/ft Conversion Factor	Reduced g/ft Conversion Factor	Load Factor	Energy Consumed on Factor	Engine NOx Reduction (Percent)	Engine NOx Consumption (lb/Year)	Project NOx Reduction (lb/Year)	Project NOx Consumption (lb/Year)	Project NOx Reduction (lb/Year)	Project Lifetime NOx Reduction		
SMUAHQ	Mayor	GM200051	Ag Pump	Replacer	Irrigation Pump	12,495	115,674	113,183	113,183	1	113,183	800	800	211	5	113	0.8	206	211	5	113	0.8	g/bhp-hr	NA	NA	0.75	18.5	0.0	0.0	0.0	0.0	0.0	0.0		
SMUAHQ	Mayor	GM200051	Ag Pump	Replacer	Irrigation Pump	52,291	510,215	510,215	510,215	1	510,215	500	500	133	5	133	0.9	206	133	5	133	0.9	g/bhp-hr	NA	NA	0.75	18.5	0.0	0.0	0.0	0.0	0.0	0.0		
SMUAHQ	Mayor	GM200051	Ag Pump	Replacer	Irrigation Pump	52,495	515,870	515,870	515,870	1	515,870	500	500	211	5	211	0.9	206	211	5	211	0.9	g/bhp-hr	NA	NA	0.75	18.5	0.0	0.0	0.0	0.0	0.0	0.0		
SMUAHQ	Mayor	GM200051	Ag Pump	Replacer	Irrigation Pump	52,495	515,874	515,874	515,874	1	515,874	500	500	211	5	211	0.9	206	211	5	211	0.9	g/bhp-hr	NA	NA	0.75	18.5	0.0	0.0	0.0	0.0	0.0	0.0		
SMUAHQ	Mayor	GM200051	Ag Pump	Replacer	Irrigation Pump	51,909	511,340	511,340	511,340	1	511,340	500	500	211	5	211	0.9	206	211	5	211	0.9	g/bhp-hr	NA	NA	0.75	18.5	0.0	0.0	0.0	0.0	0.0	0.0		
SDAPCO	Mayor	7	Marine Vessel	Replacer	Fishing Vessel	15,500	177,209	177,209	177,209	1	177,209	1	1	669	20	669	100%	GA	300	320	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	7	Marine Vessel	Replacer	Fishing Vessel	17,600	197,789	197,789	197,789	1	197,789	1	1	669	20	669	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	7	Marine Vessel	Replacer	Fishing Vessel	17,600	197,789	197,789	197,789	1	197,789	1	1	669	20	669	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	8	Marine Vessel	Replacer	Fishing Vessel	16,400	182,240	182,240	182,240	1	182,240	1	1	640	20	640	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	11	Marine Vessel	Replacer	Fishing Vessel	14,800	162,240	162,240	162,240	1	162,240	1	1	640	20	640	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	13	Marine Vessel	Replacer	Fishing Vessel	14,800	162,240	162,240	162,240	1	162,240	1	1	640	20	640	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	14	Marine Vessel	Replacer	Fishing Vessel	14,800	162,240	162,240	162,240	1	162,240	1	1	640	20	640	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	15	Marine Vessel	Replacer	Fishing Vessel	14,800	162,240	162,240	162,240	1	162,240	1	1	640	20	640	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	11	On Road	New	School Bus	124,111	130,851	130,851	130,851	23,000	130,851	23,000	23,000	125	20	125	100%	GA	350	350	20	570.0	236.3	bar/1000gal	NA	NA	NA	NA	0.0	7.2	0.0	7.2	0.0	153.5	
SDAPCO	Mayor	12	On Road	New	Urban Bus	127,204	127,613	127,613	127,613	50	127,613	45,000	45,000	125	12	125	100%	GA	275	275	12	4.0	2.5	g/bhp-hr	4.3	4.3	NA	18.5	0.0	0.0	0.0	0.0	16.0	151.8	
SDAPCO	Mayor	12	On Road	New	Urban Bus	11,500	112,500	112,500	112,500	1	112,500	10,000	10,000	125	5	125	100%	GA	275	275	5	13.0	6.9	g/bhp-hr	NA	NA	0.75	17.6	0.9	0.0	0.0	0.0	0.0	0.0	4.4
SDAPCO	Mayor	12	On Road	New	Urban Bus	11,500	112,500	112,500	112,500	1	112,500	10,000	10,000	125	5	125	100%	GA	275	275	5	13.0	6.9	g/bhp-hr	NA	NA	0.75	17.6	0.9	0.0	0.0	0.0	0.0	0.0	4.4
SDAPCO	Mayor	12	On Road	New	Urban Bus	11,500	112,500	112,500	112,500	1	112,500	10,000	10,000	125	5	125	100%	GA	275	275	5	13.0	6.9	g/bhp-hr	NA	NA	0.75	17.6	0.9	0.0	0.0	0.0	0.0	0.0	4.4
SDAPCO	Mayor	3	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	3	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	4	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	4	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	5	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	5	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	6	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	7	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	9	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	9	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	10	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	10	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	11	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	11	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	13	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	13	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	13	Marine Vessel	Replacer	Fishing Vessel	110,500	149,300	149,300	149,300	1	149,300	1	1	800	12	800	100%	GA	125	580	12	371.0	214.8	bar/1000gal	NA	NA	NA	NA	0.0	2.8	0.0	2.8	0.0	33.1	
SDAPCO	Mayor	7	Off-Road	Replacer	Marine Auxiliary	14,100	120,120	119,620	119,620	1	119,620	1	1	50	12	50	100%	NA	50	55	12	13.0	6.9	g/bhp-hr	NA	NA	NA	NA	18.5	0.0	0.0	0.0	0.0	3.1	
SDAPCO	Mayor	7																																	

Carl Moyer Program Fiscal Year 1998/1999 Funded Projects

Market	Source of Funding	Project Number	Category	Project Type	Equipment Type	Baseline Engine Fuel Type	Reduced Engine Fuel Type	Baseline Engine Fuel	Reduced Engine Fuel	Grant Approved per Conversion	Number of Engines	Request Granted	Annual Operation	Operation Units	Annual Fuel Consumption	Percent Fuel Saved	CO2/HR	Baseline Engine Horsepower	Reduced Engine Horsepower	Project Life (Years)	Baseline Emission Hrs	Reduced Emission Hrs	NOx Units	Baseline g/mi Conversion Factor	Reduced g/mi Conversion Factor	Lead Factor %	Energy Consumption Factor	Engine Hrs Reduction (per year)	Engine Hrs Reduction Fuel Conversion (per year)	Project Hrs Reduction (per year)	Project Hrs Reduction Fuel Consumption (per year)	Project Hrs Reduction (per year)	Project Lifetime Hrs Reduction
DCARCO	Wayne March	18.AJ 57714	On Road	Repower	Road Repair	Diesel	Diesel	17,600	\$19,962	\$16,162	1	\$16,162	20,000	4367	100%	50000	315	315	10	10.0	8.0	g33p-hr	2.7	2.7	NA	18.5	0.2	0.3	0.2	0.3	0.3	2.9	
DCARCO	Wayne March	18.AJ 57715	On Road	Repower	Road Repair	Diesel	Diesel	13,800	\$19,962	\$16,162	1	\$16,162	18,000	4366	100%	50000	315	315	10	10.0	8.0	g33p-hr	2.7	2.7	NA	18.5	0.2	0.3	0.2	0.3	0.3	2.8	
DCARCO	Wayne March	18.AJ 57716	On Road	Repower	Road Repair	Diesel	Diesel	13,800	\$19,962	\$16,162	1	\$16,162	22,000	4377	100%	50000	315	315	10	10.0	8.0	g33p-hr	2.7	2.7	NA	18.5	0.3	0.3	0.3	0.3	0.3	2.8	
DCARCO	Wayne	1	Marine Vessel	Repower	Fishing Vessel	Diesel	Diesel	\$16,000	\$27,000	\$31,000	1	\$31,000	18,800	4400	80%	NA	400	440	10	14.0	8.7	g33p-hr	NA	NA	NA	19.5	0.0	4.3	0.0	4.3	4.3	42.8	
DCARCO	Wayne	1	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$8,000	\$26,135	\$14,608	1	\$14,608	4,488	4815	100%	NA	330	330	3	11.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	3.7	0.0	3.7	3.7	18.3	
DCARCO	Wayne	2	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$2,547	\$11,812	\$11,452	1	\$11,452	750	6215	100%	NA	170	170	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.7	0.0	0.7	0.7	3.7	
DCARCO	Wayne	3	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$1,875	\$9,850	\$8,512	1	\$8,512	500	3000	100%	NA	135	135	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.4	0.0	0.4	0.4	1.8	
DCARCO	Wayne	4	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$2,968	\$11,276	\$8,237	1	\$8,237	1,000	2000	100%	NA	160	160	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.6	0.0	0.6	0.6	3.0	
DCARCO	Wayne	5	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$3,237	\$9,720	\$5,202	1	\$5,202	900	3800	100%	NA	115	115	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.4	0.0	0.4	0.4	2.1	
DCARCO	Wayne	6	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$3,012	\$13,190	\$8,262	1	\$8,262	2,000	16000	100%	NA	153	152	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	1.7	0.0	1.7	1.7	6.3	
DCARCO	Wayne	7	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$7,450	\$9,950	\$5,961	1	\$5,961	1,200	6000	100%	NA	133	133	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.7	0.0	0.7	0.7	3.8	
DCARCO	Wayne	8	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$3,607	\$9,200	\$4,993	1	\$4,993	600	1800	100%	NA	115	115	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.2	0.0	0.2	0.2	1.1	
DCARCO	Wayne	8	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$7,190	\$8,720	\$5,667	1	\$5,667	800	3200	100%	NA	115	115	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.4	0.0	0.4	0.4	1.9	
DCARCO	Wayne	10	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$2,305	\$9,212	\$5,335	1	\$5,335	650	3400	100%	NA	115	115	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.4	0.0	0.4	0.4	2.0	
DCARCO	Wayne	11	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$7,500	\$9,920	\$8,059	1	\$8,059	1,000	4000	100%	NA	115	115	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.5	0.0	0.5	0.5	2.4	
DCARCO	Wayne	12	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$4,545	\$9,920	\$4,552	1	\$4,552	70	1512	100%	NA	90	90	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.2	0.0	0.2	0.2	10.9	
DCARCO	Wayne	13	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$2,674	\$12,572	\$8,082	1	\$8,082	1,400	8400	100%	NA	160	160	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	1.0	0.0	1.0	1.0	5.2	
DCARCO	Wayne	14	Ag Pump	Repower	Irrigation Pump	Diesel	Diesel	\$2,864	\$9,800	\$5,647	1	\$5,647	1,344	5510	100%	NA	121	121	5	13.0	6.9	g33p-hr	NA	NA	0.75	17.6	0.0	0.7	0.0	0.7	0.7	3.3	

NOTE: These numbers represent the preliminary data of projects and do not reflect any discounts or adjustments taken to calculate credits for the ERC Bank.

