APPENDIX E

Cost Effectiveness Analysis for Proposed Rule 9510 (Indirect Source Review) and Rule 3180 (Administrative Fees for Air Impact Assessment Applications)

November 17, 2005

I. INTRODUCTION

California Health and Safety Code (CH&SC) Section 40920.6(a) requires the San Joaquin Valley Unified Air Pollution Control District (District) to conduct a cost effectiveness analysis of the proposed control options prior to the adoption of the proposed rules. The purpose of conducting a cost effectiveness analysis is the evaluation of the possible economic effect of the pollution control measures (rules). The analysis also serves a guideline in developing the control requirements for the rule.

II. SUMMARY AND CONCLUSION

The CH&SC section cited above requires a cost effectiveness analysis for the most likely compliance scenario, and an incremental cost effectiveness analysis on an alternative compliance scenario. Absolute cost effectiveness of a control option for traditional rules are typically determined by taking the added annual cost (in $/year) of the control technology or technique, divided by the emission reduction achieved (in tons/year). The costs can include capital equipment costs, engineering design costs, installation costs, and any cost savings, such as from decreased energy usage and decreased maintenance costs.

Rule 9510 would require developers to reduce the following project's operational and area source emissions: 33.3% of NOx emissions and 50% of the PM10 emissions, over a ten-year period. Rule 9510 would also require the developers to reduce emissions from equipment used during the construction phase by 20% for NOx and 45% for PM10 emissions compared to the statewide average. The construction emissions may be reduced on-site by using newer fleets than the statewide construction average, using add-on controls, and/or by using clean fuels. The rules are structured to allow flexibility in complying with the rule requirements due to various requirements and limitations imposed by local agencies in the projects' jurisdiction. Methods of compliance include the following: achieving the necessary reductions entirely through on-site emission reduction measures; reducing, in varying degrees, partially on-site and partially off-site through the off-site emission reduction fee; reducing entirely off-site through the payment of an off-site emission reduction fee. The fee for emissions not reduced in the design of the project or with equipment controls would fund off-site emission reduction projects. The fee for these off-site projects would be calculated by multiplying the required emission reductions by a cost effectiveness factor. This rule differs from traditional rules, in that a cost effectiveness value is predetermined and the control costs are based on that cost effectiveness value.

Cost effectiveness is a primary criterion for the District to fund emission reduction projects. Cost effectiveness of a off-site emission reduction project is based on the amount of pollution (per pound or ton of a pollutant) the project eliminates for each

dollar spent. There are different methodologies to determine cost effectiveness for different programs, but in general, cost effectiveness is determined by dividing the cost of the project by the amount of emissions reduced. Several factors are used to determine the emission reductions for a particular mitigation project, including: the age of the vehicle or engine being replaced, project life (how long in terms of time the emission reductions can be expected to be surplus), and activity level, which is usually represented in annual hours of operation or mileage. Project life allows the District to determine how many emission reductions can occur per year. This is important in determining timelines for emission reductions and will assist the District in attaining the ozone and PM10 standards.

To determine the cost effectiveness for the ISR Program, District staff identified NOx emission reduction projects that have previously been funded and the costs associated with each project. Table E–1*, Estimated NOx Emission Reductions from Current and Historical Grant Programs by the District* summarizes the grant programs.

Table E-1
Estimated NOx Emission Reductions from Current and Historical Grant Programs

	Emissions Tons	Emissions Pounds	Grant Funded Dollar Amounts	Cost Effectiveness* $/Pound	Cost Effectiveness* $/Ton
All External Projects					
1992 -1993	400	800,000	$3,665,200	$4.58	$9,163.00
1993 -1994	525	1,050,000	$4,773,814	$4.55	$9,092.98
1994 - 1995	590	1,180,000	$3,594,486	$3.05	$6,092.35
1995 - 1996	650	1,300,000	$3,688,311	$2.84	$5,674.32
1996 - 1998	885	1,770,000	$6,309,952	$3.56	$7,129.89
1998 - 2004	30,419	60,838,805	$60,798,609	$1.00	$1,998.68
Total	***33,469***	***66,938,805***	***$82,830,372***	***$3.26***	***$6,525.20***
REMOVE Program					
1992 - 1993 Phase I	400	800,000	$3,665,200	$4.58	$9,163.00
1993 - 1994 Phase II	525	1,050,000	$4,773,814	$4.55	$9,092.98
1994 - 1995 Phase III	590	1,180,000	$3,594,486	$3.05	$6,092.35
1995 - 1996 Phase IV	325	650,000	$2,688,311	$4.14	$8,271.73
1996 - 1998 Phase V	360	720,000	$5,309,952	$7.37	$14,749.87
1998 - 1999 Phase VI	104	208,247	$2,556,403	$12.28	$24,551.64
1999 - 2000 Phase VII	304	607,640	$2,422,741	$3.99	$7,974.26
2002 - 2003 Phase VIII	156	311,059	$1,210,648	$3.89	$7,784.04
Total	*2,608*	*5,526,946*	*$26,221,555*	*$5.48*	*$10,959.98*
Vehicle Buy-Back					
1995 - 1996	325	650,000	$1,000,000	$1.54	$3,076.92
1997 - 1998	525	1,050,000	$1,000,000	$0.95	$1,904.76
Total	*850*	*1,700,000*	*$2,000,000*	*$1.25*	*$2,490.84*
Heavy-Duty Program					
1997 - Jan 2004	29,811	59,622,859	$53,381,817	$2.28	$4,564.13
Lt. & Med.-Duty Vehicle Program					
2001 - Jan 2003	22	43,000	$750,000	$17.44	$34,883.72
1999 Lawnmower Replacement Program					
2001 - 2002	23	46,000	$477,000	$10.37	$20,739.13

Please note that beginning in 1995-96 vehicle buy-back was no longer included in the REMOVE Program. A separate program for heavy-duty vehicle projects was established beginning in 1997.

III. GRANT PROGRAMS

This section identifies the existing grant programs and different types of projects that are funded under those programs that are possible candidates for any off-site emission reduction fees collected under Rule 9510. In addition, this section identifies additional projects that may be funded through the ISR program. The District will also consider projects and programs for funding in addition to the ones discussed in this section, when other projects and programs are identified.

REMOVE/REMOVE II

The Reduce Motor Vehicle Emissions (REMOVE) Program was the first District grant program implemented in 1992 to fund projects that reduced emissions associated with motor vehicle trips. Due to the lengthy REMOVE evaluation committee process, the District's Governing Board approved the revised REMOVE II Program on March 13, 2005. The REMOVE II Program awards grant funding on a first-come, first-serve basis and consists of a broad range of mobile source incentive projects. The following separate components within the REMOVE II Program have established parameters and funding caps to achieve prudent cost effectiveness levels: E-Mobility (Telecommunications) Incentive Component; Public Transportation and Commuter Vanpool Passenger Subsidy Component Bicycle Infrastructure Component; Light and Medium Duty Incentive Component. The components establish guidelines to maximize the emission reduction potential for individual projects. The criterion for evaluating potential projects is ARB's methodology for calculating cost effectiveness and emission reductions. Additionally, the District has established requirements for applicants to validate the emission reductions generated by REMOVE II incentive program components.

The E-Mobility Component of the REMOVE II Program provides funding for the development or expansion of electronic telecommunications services in municipal government and public education. The electronic technology will serve as direct replacement of vehicle trips to public sites for conferencing, document transactions, general information, work functions, school instruction, and related applications. E-Mobility projects include: distance-learning technology, telecommute center equipment, teleconference systems, E-government technology, E-court technology and related electronic applications.

The Public Transportation and Commuter Vanpool Passenger Subsidy Component of the REMOVE II Program, provides funding to attract new participants to public transportation and commuter vanpools. The passenger subsidies will serve to attract new participants to public transportation and commuter vanpools as an alternative to single occupant vehicle (SOV) commutes. Passenger subsidy projects include: incentives for transit bus agencies, shuttles, commuter vanpools, rail, and park-and-ride lot construction.

The Bicycle Infrastructure Component of the REMOVE II Program will fund the development of a comprehensive bicycle transportation network. The component will

support the expansion and linkage of bicycle transportation facilities that promotes the practice of commuter bicycling as a safe and viable transportation alternative. Bicycle infrastructure projects may include the development of Class I Bicycle Paths (construction) and Class II Bicycle Lanes (striping).

The Light and Medium Duty Incentive Component of the REMOVE II Program will fund a portion of the purchase cost of low-emission light-duty and medium-duty motor vehicles for public agencies. The purpose for the component is to encourage and increase the introduction of reduced emission alternative fuel vehicles. Low-emission vehicles may include Zero Emission Vehicles, Super Ultra Low Emission Vehicles, Ultra Low Emission Vehicles, and Electric Bicycles based on ARB emission standards.

Heavy-Duty Program

The Heavy-Duty Engine Emission Reduction Incentive Program (Heavy-Duty Program) initially evolved from REMOVE in 1997 and the District continues to administer the program. The Heavy-Duty Program replaces older model high polluting engines with newer and cleaner burning engines. The Heavy-Duty Program also encourages the early introduction of on-road and off-road heavy-duty motor vehicles with engines that include reduced-emission technologies. Eligible project types funded under this program include: marine vessels, forklifts, agricultural pump engines, on-road and off road vehicles and equipment, agricultural harvesters, hay bailers, tractors, delivery trucks, sprayers, yard spotters, earthmovers, line haul trucks, back hoes, dump trucks, earth movers and drills, transit and school buses, and forklifts. This program has been expanded to assist in the development of alternative fuel infrastructure, particulate filters on eligible diesel school buses, and idle reduction technologies for heavy-duty vehicles.

Emission reductions are obtained when the project applicant purchases vehicles and engines that are cleaner than required by current emission standards or installs an emission certified retrofit kit on an existing engine. The District pays the differential cost of purchasing the lower emitting technology compared to conventional technology. Emission reduction, calculations, and horsepower categories are used to determine an incentive amount. Project monitoring is conducted to verify eligibility, to ensure proper use of public funds and to validate the emission reductions. Applicants are required to enter into contracts with the District and are required to submit annual usage reports for five years after the technology is purchased.

The Heavy Duty Program is primarily aimed at NOx reductions, but many projects also achieve particulate matter (PM10) reductions. Historically, this incentive program has been exceptionally cost effective, replacing approximately 4,484 engines[1].

[1] *SJVAPCD Heavy-Duty Engine Incentive Program Database*

PM10 Incentive Program

The District currently does not have an incentive program that primarily targets PM10 emissions reductions, however an incentive program will be needed for Rule 9510. Initially, District staff surveyed the PM10 emissions inventory to determine the largest sources of emissions and related factors, the extent of existing or planned control, and types of control options that are available. District staff identified unpaved traffic surfaces and unpaved shoulders as the most viable options for emission reduction projects. Other potential sources include the use of PM10-efficient street sweepers and fireplace retrofits/replacement. The District is proposing to develop an Unpaved Road and Traffic Surface Program that would fund or partially fund the treating or paving of unpaved roads or unpaved shoulders within the San Joaquin Valley Air Basin, in time to implement and achieve the reductions committed to for this rule. Once that program is established, the District will continue to explore and develop other PM10 incentive programs, such as PM10-efficient street sweepers, fireplace retrofits/replacement, and/or leaf blowers.

The duration of the contract will vary depending on the project. Some contracts will be completed upon installation, while others may require reporting for 5 years. For example, a road-paving project would have a contract that is completed upon installation, whereas an engine contract typically contains a 5-year reporting requirement. The staff report will be amended to include this information.

IV. RULE 9510 ESTIMATED COST EFFECTIVENESS

The District's future prospects for funding the most cost effective NOx reduction projects are currently declining. Many of engines that qualify for the Heavy-Duty Program incentive funds have been replaced or retrofitted. Diesel engines greater then 50 horsepower are being regulated by the State and the District resulting in cleaner operating engines with lower emissions. Consequently, the most cost-effective projects (e.g. diesel engines manufactured before 1996) have previously been funded resulting in projects that will cost more in the future to fund.

To determine future cost effectiveness for NOx emission reduction projects, staff reviewed previously funded projects' NOx cost effectiveness, the types of projects, and the future availability of those projects. Attachment 1 compiles the necessary information and determines the resulting cost effectiveness. The general concept for NOx projects in Attachment 1, is that the types of grant applications received will move from the heavy duty projects to lighter duty projects at a rate of 5% per year, and that the cost of heavy duty projects will increase approximately $2000 more per ton. Attachment 1, can be summarized as follows:

NOx Cost-Effectiveness

Year	Cost to Reduce One ton of NOx
2006	$4,650.00
2007	$7,100.00
2008 and beyond	$9,350.00

Presently, most of the Districts incentive funds have been used to fund NOx emission reductions. In order to determine future cost effectiveness for PM10 emission reduction projects, District staff researched PM10 emissions and reductions. Initially, the PM10 emissions inventory was surveyed to determine the largest sources of emission factors, the extent of existing or planned control, and types of control options that are available. District staff identified unpaved traffic surfaces and unpaved shoulders as the most viable options for emission reduction projects. Other potential sources include the use of PM10-efficient street sweepers and fireplace retrofits/replacement.

Once the sources were identified, each source was analyzed in terms of emission factors, thresholds, available control effectiveness, and costs of those controls. Attachment 1 also compiles the necessary information and determines the resulting cost effectiveness for PM10 projects. There are several concepts for PM10 projects that are incorporated in Attachment 1. Initially, the District is anticipating that it will receive a high number of applications to treat or pave unpaved roads, with the most cost effective projects coming in the first few years. The District is also expecting the cost to treat or pave unpaved roads to increase by 75% each year for each ton reduced. The District is anticipating receiving a higher number of applications for unpaved shoulders and street sweepers, each year. Attachment 1, can be summarized as follows for PM10:

PM10 Cost-Effectiveness

Year	Cost to Reduce One ton of PM10
2006	$2,907.00
2007	$5,594.00
2008 and beyond	$9,011.00

V. SOURCES OF COST DATA

District staff used cost effectiveness information derived from actual NOx emissions reduction projects administered by the District. This data is sent to the California Air

Resources Board (ARB) on an annual basis. The following data sources were used for the PM10 analysis:

1. Effectiveness Demonstration of Fugitive Dust Control Methods for Unpaved Roads and Unpaved Shoulders on Paved Roads
   DRI document No. 685-5200.1F1
   Desert Research Institute
   December 31, 1996

2. Methods to find Cost-effectiveness of Funding Air Quality Projects: For Evaluating Motor Vehicle Registration Fee Projects and Congestion Mitigation and Air Quality Improvement (CMAQ) Projects
   California Air Resources Board
   2003 Edition

3. Final BACM Technological and Economic Feasibility Analysis
   Sierra Research, Inc.
   Prepared for the SJVAPCD
   March 2003

4. Entrained Road Dust from Paved Road Travel: Emission Estimation Methodology, Background Document
   Section 7.9
   California Air Resources Board
   Updated July 1997

5. Unpaved Road Dust (non-farm roads, SJV only)
   Section 7.10 SJV
   California Air Resources Board
   Patrick Gaffney
   Updated May 2004

6. Spreadsheet used for San Joaquin Valley Air Pollution Control District PM10 SIP, 2003
   Spreadsheet, “Unpaved1999Mar_13_2003Final.xls”
   California Air Resources Board
   Patrick Gaffney

7. Conversations and E-mail correspondence with Mel Zeldin, consultant

Attachment 1
Anticipated Use of ISR Funds
for Determining Cost Effectiveness

For 2006					
	Projected % of Fund Use	**Cost Effectiveness ($/ton reduced)**			
		Likely Minimum	Cap[1]	Representative Cost Effectiveness[2]	Weighted Representative Factor
PM10					
Unpaved Roads/Traffic Areas	90%	$1,694	$15,000	$1,819	
Unpaved Shoulders	5%	$11,838	$15,000	$12,907	
Street Sweepers	5%	$10,000	$15,000	$12,500	
Overall PM10		**$1,694**	**$15,000**	**$9,075**	**$ 2,907**
NOx					
Heavy Duty Program	95%	$3,000	$5,000	$4,000	
REMOVE	5%	$14,000	$20,000	$17,000	
Overall NOx		**$3,000**	**$20,000**	**$10,500**	**$ 4,650**

For 2007					
	Projected % of Fund Use	**Cost Effectiveness ($/ton reduced)**			
		Likely Minimum	Cap[1]	Representative Cost Effectiveness[2]	Weighted Representative Factor
PM10					
Unpaved Roads/Traffic Areas	75%	$1,900	$15,000	$3,183	
Unpaved Shoulders	20%	$11,838	$15,000	$12,907	
Street Sweepers	5%	$10,000	$15,000	$12,500	
Overall PM10		**$1,900**	**$15,000**	**$9,530**	**$ 5,594**
NOx					
Heavy Duty Program	90%	$5,000	$7,000	$6,000	
REMOVE	10%	$14,000	$20,000	$17,000	
Overall NOx		**$5,000**	**$20,000**	**$11,500**	**$ 7,100**

Anticipated Use of ISR Funds
for Determining Cost Effectiveness

For 2008					
	Projected % of Fund Use	Cost Effectiveness ($/ton reduced)			
		Likely Minimum	Cap[1]	Representative Cost Effectiveness[2]	Weighted Representative Factor
PM10					
Unpaved Roads/Traffic Areas	55%	$1,900	$15,000	$5,571	
Unpaved Shoulders	35%	$11,838	$15,000	$13,419	
Street Sweepers	10%	$10,000	$15,000	$12,500	
Overall PM10		**$1,900**	**$15,000**	**$10,497**	**$ 9,011**
NOx					
Heavy Duty Program	85%	$7,000	$9,000	$8,000	
REMOVE	15%	$14,000	$20,000	$17,000	
Overall NOx		**$7,000**	**$20,000**	**$12,500**	**$ 9,350**

For 2009					
	Projected % of Fund Use	Cost Effectiveness ($/ton reduced)			
		Likely Minimum	Cap[1]	Representative Cost Effectiveness[2]	Weighted Representative Factor
PM10					
Unpaved Roads/Traffic Areas	55%	$1,900	$15,000	$9,749	
Unpaved Shoulders	35%	$11,838	$15,000	$13,419	
Street Sweepers	10%	$10,000	$15,000	$12,500	
Overall PM10		**$1,900**	**$15,000**	**$11,889**	**$ 11,308**
NOx					
Heavy Duty Program	80%	$9,000	$12,000	$10,500	
REMOVE	20%	$14,000	$20,000	$17,000	
Overall NOx		**$9,000**	**$20,000**	**$13,750**	**$ 11,800**

Anticipated Use of ISR Funds
for Determining Cost Effectiveness

For 2010					
	Projected % of Fund Use	Cost Effectiveness ($/ton reduced)			
		Likely Minimum	Cap[1]	Representative Cost Effectiveness[2]	Weighted Representative Factor
PM10					
Unpaved Roads/Traffic Areas	45%	$1,900	$15,000	$14,682	
Unpaved Shoulders	40%	$11,838	$15,000	$13,419	
Street Sweepers	15%	$10,000	$15,000	$12,500	
Overall PM10		**$1,900**	**$15,000**	**$13,534**	**$ 13,850**
NOx					
Heavy Duty Program	75%	$11,000	$13,000	$12,000	
REMOVE	25%	$14,000	$20,000	$17,000	
Overall NOx		**$11,000**	**$20,000**	**$14,500**	**$ 13,250**

1 The cost effectiveness cap in this column represents the cap that this program would require, not necessarily the historical cap.

2 The representative cost effectiveness is the anticipated cost effectiveness for that year. This is based on district staff forecast.

APPENDIX E
Attachment 1

Project Spending Plan for Proposed Rule 9510 (Indirect Source Review)

November 17, 2005

I. INTRODUCTION

The purpose of this document is to demonstrate that any funds collected by the District will meet their intended purpose of reducing emissions caused by new development in the air basin. It provides a plan for spending any funds generated by the rule in a cost-effective and responsible manner.

Rule 9510 is projected to generate up to $103 million between 2006 and 2008. After 2008 the District will provide a new estimate based on experience with the program and the amount of development occurring in the San Joaquin Valley. The new estimates may be higher or lower than the amounts currently in the rule. To demonstrate the capability to distribute these funds to cost-effective projects, the District has analyzed the potential emission reduction projects available that meet requirements for being surplus, quantifiable, and enforceable. Once the potential projects were identified, staff performed additional research into the cost of individual projects and the potential for owners of the equipment, vehicles, etc. to take advantage of incentive funding.

The District plans on using existing grant programs that are available for immediate funding of projects and to develop new programs for non-traditional sources not eligible for other funding sources such as DMV Surcharge Fees and California Carl Moyer Program funds.

II. Existing Programs

The following existing programs and programs where the District has operated programs in the past are described in Appendix E.

- **Heavy-Duty Engine Incentive Program**
- **REMOVE II Program**
- **Lawnmower Buyback Program**
- **Light and Medium Duty Vehicle Program**
- **Voluntary Accelerated Vehicle Retirement**

The Heavy-Duty Engine Incentive Program and REMOVE II Program are currently in operation and can be used as an outlet for funds from ISR immediately. Other programs where the District has past experience can be implemented quickly.

III. New Programs

Stationary Source Incentive Program

Program concept: Some control options that are in excess of current rule requirements and best available control technology (BACT) thresholds can be implemented with the help of incentive funding. These options typically exceed BACT cost-effectiveness limits or were not required by the rule due to economic impacts; however, relatively cost-effective control options may be available in a variety of industries.

All projects would be required to demonstrate that they are:

- Surplus to all federal, state, and local requirements
- Quantifiable – emission reductions can be determined
- Enforceable – a mechanism is available to ensure that reductions occur
- Permanent – reductions are maintained for the life of the credit

There are several potential ways in which stationary source operators would be attracted to the incentive program:

- Applicant initiated - Applicant proposing expansion or equipment replacement approaches the District with equipment or control technologies in excess of requirements.

- District initiated - District permit engineers identify control technology in excess of BACT requirements and rule requirements during project review and suggest to applicant the potential for going beyond requirements with the help of incentive funding.

- Ongoing program - The District identifies specific equipment or technologies in excess of requirements in a grant program and open application process.

Stationary Source Project Review Process Outline:

1. For projects identified during BACT analysis required under Rule 2201, permit engineers identify potential control technology that exceeds BACT requirements and is surplus of all regulations.
2. The engineer contacts Emission Reduction Incentive Program (ERIP) staff to forward cost effectiveness analysis. *Note: the cost effectiveness performed for ERIP purposes is not the BACT cost effectiveness*.
3. ERIP determines whether project meets ISR funding criteria and contacts PSD and applicant.
4. If not, the project, as initially proposed, is processed by Permit Staff.
5. If yes, 3-parts meeting (ERIP, PSD, Applicant) to review feasible options (technical aspects and funding).

6. Project, as initially proposed, is on hold, waiting for ERIP and applicant final approval/decision.
7. Applicant determines whether the project would be feasible at their facility.
8. If not, the project, as initially proposed, is processed by Permit Staff.
9. If yes, ERIP staff initiates incentive funding application process.
10. For eligible projects, the applicant would complete an application providing contact information and complete project and cost information.
11. Initial project amended to incorporate new proposed control technology.
12. The application would be approved by ERIP and Permit Service Division (PSD).
13. ERIP staff would prepare a contract for the project between the applicant and the District.
14. PSD would incorporate the new controls and emission amounts into the applicant's permit application.
15. PSD issues an Authority to Construct (ATC) allowing the applicant to install the new control.
16. Compliance staff conducts an inspection, that may include a source test for some projects, to verify the emission reductions.
17. Compliance notifies PSD and ERIP that the installation is complete.
18. ERIP approves claim for payment for the contract.
19. Finance issues payment for the project to the applicant.
20. Long term monitoring and reporting is accomplished through the normal process for permitted equipment.
21. ERIP reports emission reductions in periodic reports to the Governing Board.

Projects may also enter the system that are initiated by operators of the permitted sources. In these cases, PSD will conduct an assessment to determine technological feasibility and if the project is surplus and enforceable. PSD would then turn the project over to ERIP for application processing and contracting. Project types that have the potential for large numbers of applications may become an ongoing program component with outreach to recruit applicants.

Example Projects

The following are examples of projects that illustrate the potential to obtain emission reductions through a stationary source incentive program. All projects listed would require additional research and analysis prior to offering incentives.

Example: Replace natural gas fired boilers/burners with cleaner model.

Under District Rule 4306, boilers rated from greater than 5 up to 20 MMBTU per hour are required to achieve a NOx emission rate of 15 ppm. If the applicant currently operated a 30 ppm boiler, when it comes time to replace the boiler, he would be required to install a 15 ppm boiler. Due to advances in technology there are now 9 ppm ultra-low NOx burners available. The cost is in excess of the District's BACT threshold, so the applicant is not required to purchase the 9 ppm boiler. The increment between

the 15 ppm boiler and the 9 ppm boiler are therefore surplus reductions. The incentive amount would be set to cover the extra cost of installing the cleaner boiler. There are approximately 420 units between 5 to 20 MMBTU per hour that are subject to Rule 4306. Complete new burner unit costs are in the range of $28,000 to $57,000 depending on size, based on contact with venders. The differential cost between low emitting and high emitting burners ranges from $5,000 to $7,000

Another possible source of surplus reductions may occur from boilers rated from 2 to 5 MMBTU per hour and subject to proposed Rule 4307, which has a NOx limit of 30 ppm. Some boilers that currently operate above 30 ppm may be exempt from rule retrofit requirements now under development, so the surplus reductions for those units may be calculated from the uncontrolled emissions of 55 ppm down to 9 ppm. The incentive would need to cover 100 percent of the cost of the installation. There are no increased operating costs expected with the 9 ppm burners. There could be more than 300 of these exempt units eligible for an incentive. Unit costs for 2.5 MMBtu/hr 9 ppm burners are about $41,000 based on contact with vendors.

Example: Electrification of stationary non-emergency IC engines.

Stationary engines are required to meet a NOx emission limit specified by Rule 4702. Installing an electric motor in place of the engine would result in a surplus reduction for the increment between the emission limit and the zero emission electric motor. Depending on the current electric rate and price of fuel, there may be a cost increase from changing to electric. The incentive would need to cover the cost of replacing the engine with an electric motor and increased operating costs. There are hundreds of units installed that could take advantage of this program with sufficient incentive amounts. Costs have not been researched.

Example: Install SCR at a flat glass melting furnace.

Glass melting furnaces are required to meet NOx emission limits specified in Rule 4354 when the furnace is next rebuilt. These furnaces are rebuilt approximately every 7 years. The rule requirements can be exceeded with installation of selected catalyst reduction. The surplus reductions can be achieved by using SCR instead of oxy fuel or in addition to oxy fuel in some cases. The cost of control may exceed $10 million per unit, but the large potential emission reductions result in relatively good cost-effectiveness. SCR has high operating costs and would most likely require incentives to cover increased operating costs. There are two potential candidates for this project in the San Joaquin Valley.

Example: Install plenum chambers or additional cyclone separators in cotton gins.

Cotton gins are required to reduce PM10 emissions produced during the ginning process under Rule 4204. Additional controls may be possible for some gins if an

incentive were provided. Installing a plenum chamber before the required cyclone separators may provide reductions if there is room for the equipment in the building. After the cyclone separators there may be potential to add either cyclone separators in or a bag house in series. Feasibility will depend on the gin configuration. There are increased operating costs with adding cyclone separators and bag houses that may impact cost-effectiveness of these options.

PM10 Public Agency Road and Unpaved Surface Program

The District has identified several sources of fugitive PM10 from paved and unpaved roads that provide significant emission reduction potential for the ISR rule. The most promising projects are:

- Paving unpaved roads
- Paving unpaved road shoulders
- Long-term contracts for chemical suppressants on unpaved roads
- Long-term contracts for chemical dust suppressants on unpaved road shoulders
- Purchase of PM10 Efficient Street Sweepers

Program Concept

The District envisions this program as a coordinated effort between the District, Valley Transportation Planning Agencies, city and county road agencies, and public works departments. The funds collected for PM10 will be spent in the county of origin to the extent possible.

The District will develop an application process and evaluation procedure for funding road projects. Some of the key features are outlined below:

General Program Features

1. Each county and the cities within each county will be competing for funds generated in the county
2. The Council of Governments/Transportation Planning Agencies may coordinate the process of identifying funding priorities among the local member jurisdictions.
3. The primary consideration in funding priorities is cost-effectiveness.
4. Projects must not supplant funding from any source.
5. A mix of projects with higher cost-effectiveness may be funded as long as the average cost-effectiveness for the year is consistent with the District's annual target.
6. Once a list of eligible projects is created and ranked, funding would be allocated twice each year as fees are collected by the District.

Unpaved Roads

1. Provide a list of unpaved road segments in descending average daily trip (ADT) sequence (same data used for compliance with Rule 8061).
2. Indicate road segments that will be paved or chemical treated in compliance with Rule 8061.
3. If economic hardship is claimed for Rule 8061, provide justification.
4. As a general rule, the highest ADT road segments should be paved or treated first.
5. Other factors to consider in scoring projects:
   Roads with significant truck traffic should receive added points
   Roads in or near to urban areas should receive added points
6. Payment will be made to the agency after the project is complete.
7. Suppressant projects would be paid annually under a continuing agreement.
8. A single project could be based on total miles of road segments from a jurisdiction so that different roads could be done under one contract.

Paved Road Shoulder Paving Projects

1. Provide a list of unpaved road shoulders in descending average daily trip (ADT) sequence (same list used for compliance with Rule 8061).
2. Indicate road shoulder segments that will be paved or chemical treated in compliance with Rule 8061.
3. Other criteria should be same as unpaved road projects

PM10 Efficient Street Sweepers

1. Provide a description of the existing street sweeping program if any, including sweeping schedule and types of sweepers (PM Efficient or Standard)
2. Demonstrate compliance with Rule 8061 sweeper purchase requirements or provide economic hardship justification.
3. Provide an estimate of the curb miles that will be swept by the new sweeper(s).
4. Projects proposing natural gas vehicles may be eligible for additional funding based on NOx and PM10 exhaust emission reductions.

Agricultural Project Incentive Program

The District has identified several potential projects for agricultural equipment and emission sources not currently eligible for other funding sources. The projects must be surplus to agricultural regulations and be able to demonstrate quantifiable emission reductions.

Program Concept: Although many agricultural sources are now regulated, there are some opportunities for early implementation of controls that are scheduled far enough in the future to result in surplus reductions. In some cases, it is possible to go beyond

current regulations. For example, measures in addition to those required by the Agricultural Conservation Management Program rule.

Agricultural Projects:

- ❖ Lower emitting almond harvester purchase
- ❖ Chippers and shredder purchases as alternative to burning

Project descriptions:

New almond harvesters that emit 35 to 70 percent less PM10 than older units are currently available. Field-testing results completed for the harvesters is currently under analysis by UC Davis. Early introduction of lower emitting almond harvesters will result in significant reductions.

Chipping and shredding wood waste in the orchard instead of burning results in substantial reductions of PM10, NOx, and ROG. Although Rule 4103 phases out most burning by 2010, some will be exempt due to lack of an economic alternative to burning. The District would purchase chippers and shredders for growers that were unable to implement an alternative to burning and had not selected this as a practice for their CMP Plan.

IV. Potential Projects Lists for NOx and PM10

The following tables list potential projects along with estimates of the number of potential projects, costs, emission reductions and cost-effectiveness for each type of project. The purpose of the list is to show that sufficient projects are available at a cost-effectiveness to achieve program goals. The list is not all inclusive. There are many Heavy-Duty Engine Incentive Program and REMOVE II eligible projects that could also be funded. New projects may also become available as retrofit devices are certified and new technologies are released to the market. The conclusion that can be drawn from this information is that projects well in excess of projected funding are available for the ISR program.

Tables are also provided for 2006, 2007, and 2008 containing a demonstration that the cost-effectiveness targets can be met with the types of projects that are available. This is not intended as a funding allocation system. Participation in grant programs is voluntary and on a first come, first served basis. The District may perform targeted outreach and may set up funding pots for the most cost-effective projects if necessary to achieve emission reduction commitments.

NOx Project Availability

	Individual Project Cost	Annual Reduction (t/y)	Project Life	Lifetime Reductions	Project CE $/ton	Projects Available	Total Cost	Cumulative Cost	Category Reductions Life (tons)	Total Reductions t/d	Cumulative Reductions tons	Cumulative CE
Marine Vessels (Harbor Craft) 04 repower	$197,850	7.6	16	121.6	1627.5	1	$197,850	$197,850	121.57	0.02	121.6	$1,627.46
Ag Irrigation Pump Electrification	$21,558	3.0	10	29.9	720.8	142	$3,061,273	$3,259,124	4247.22	0.58	4368.8	$746.00
Marine Vessels (Harbor Craft) 03 repower	$69,288	3.3	16	52.8	1313.3	1	$69,288	$3,328,412	52.8	0.01	4421.6	$752.77
Ag Irrigation Pumps Portable Diesel Repowers	$27,144	2.3	7	15.9	1705.0	50	$1,357,198	$4,685,610	796.0	0.11	5217.6	$898.05
HDD Trucks Idle Reduction	$9,883	0.6	5	3.0	3316.3	320	$3,162,411	$7,848,021	953.6	0.13	6171.2	$1,271.73
Open Burning Chippers Almond	$227,182	5.7	10	57.2	3971.7	1	$227,182	$8,075,203	57.2	0.01	6228.4	$1,296.52
Off-Road Vehicles/Equipment large ag	$48,382	1.7	7	11.8	4100.2	10	$483,820	$8,559,023	118.0	0.02	6346.4	$1,348.65
Auxiliary Power Units (Transportation Refridgeration Units)	$12,518	0.4	5	1.8	6878.1	294	$3,680,348	$12,239,371	535.1	0.07	6881.4	$1,778.61
Ag non self-propelled ICE	$9,200	0.1	7	1.0	8846.2	10	$92,000	$12,331,371	10.4	0.00	6891.8	$1,789.27
On-Road HD Vehicles - Fleet Modernization	$88,756	1.0	10	10.2	8744.4	1000	$88,755,962	$101,087,334	10150.0	1.39	17041.8	$5,931.72
Glass Melting Furnaces - SCR	$22,120,500	239.0	10	2390.0	9255.4	1	$22,120,500	$123,207,834	2390.0	0.33	19431.8	$6,340.52
Off-Road Vehicles/Equipment small ag repowers	$12,677	0.2	7	1.3	9981.9	20	$253,540	$123,461,374	25.4	0.00	19457.2	$6,345.27
Ag non self-propelled ICE - repowers	$15,500	0.2	7	1.5	10402.7	12	$186,000	$123,647,374	17.9	0.00	19475.1	$6,348.99
Small Boilers, Steam Generators, and Process Heaters - replacement	$13,000	0.1	10	1.2	10743.8	1207	$15,691,000	$139,338,374	1460.5	0.20	20935.6	$6,655.58
School Bus Replacement	$110,000	0.3	10	3.1	35483.9	1000	$110,000,000	$249,338,374	3100.0	0.42	24035.6	$10,373.72
Locomotives	$1,414,286	6.0	18.6	111.7	12664.7	10	$14,142,857	$263,481,231	1116.7	0.15	25152.3	$10,475.44
Small Boilers, Steam Generators, and Process Heaters - replacement	$6,000	0.0	10	0.3	18181.8	552	$3,312,000	$266,793,231	182.2	0.02	25334.5	$10,530.85
Forklifts (Electric, ICE, SI)	$44,457	0.4	5	2.0	22798.7	50	$2,222,873	$269,016,104	97.5	0.01	25432.0	$10,577.88
Airport Ground Support Equipment - Electric replacements	$27,889	0.2	5.0	1.1	24753.5	73	$2,035,889	$271,051,993	82.2	0.01	25514.2	$10,623.57
Open Burning Chippers Figs	$185,212	0.6	10	5.7	32379.7	12	$2,222,544	$273,274,537	68.6	0.01	25582.8	$10,681.95
Gross Polluter - VAVR	$3,000	0.1	1	0.08	37500.0	100	$300,000	$273,574,537	8.0	0.00	25590.8	$10,690.33
Old Vehicle - VAVR	$3,000	0.02	3	0.06	50000.0	5000	$15,000,000	$288,574,537	300.0	0.04	25890.8	$11,145.82
									25890.8	3.55		

PM10 Project Availability

	Individual Project Cost	Annual PM10 Reduction (t/y)	Project Life	Lifetime Reductions	Project CE $/ton	Projects Available	Total Cost	Cumulative Cost	Category Reductions Life (tons)	Total Reductions t/d	Cumulative Reductions tons	Cumulative CE
Unpaved Roads - City and County												
Paving 75 ADT roads	$290,000	27.1	20	542.0	535.1	10	$2,900,000	$2,900,000	5420	0.7	5420	$535.06
Paving 25 ADT roads	$290,000	9.0	20	180.7	1605.2	90	$26,100,000	$29,000,000	16260	2.2	21680	$1,337.64
Paving 10 ADT roads	$290,000	3.6	20	72.0	4027.8	100	$29,000,000	$58,000,000	7200	1.0	28880	$2,008.31
Suppressants 10 year contract	$140,080	3.5	10	35.0	4002.3	100	$14,008,000	$72,008,000	3500	1.0	32380	$2,223.84
Paved Roads											32380	
Paving Shoulders	$100,000	0.2	20	3.8	26315.8	500	$50,000,000	$122,008,000	1900	0.5	34280	$3,559.16
Suppresants on Shoulder 10 yr	$48,370	0.2	10	1.6	30231.3	500	$24,185,000	$146,193,000	800	0.2	35080	$4,167.42
PM Efficient Street Sweepers	$152,000	0.9	8	7.3	20821.9	15	$2,280,000	$148,473,000	109.5	0.0	35189.5	$4,219.24
Stationary Source Projects												
Cotton Gin - Install barrel cyclone before master trash 1D3D cyclone	$7,500	1.6	10	16.3	460.1	12	$90,000	$148,563,000	195.6	0.0	35275.6	$4,211.49
Cotton Gin - Install barrel cyclone or 1D2D cyclone before mote system 1D3D cyclone	$60,000	2.8	10	27.6	2173.9	12	$720,000	$149,283,000	331.2	0.0	35606.8	$4,192.54
Cotton Gin - Install plenum chamber before the unloading system and the drying/cleaning systems	$70,000	2.8	10	27.6	2536.2	12	$840,000	$150,123,000	331.2	0.1	35938	$4,177.28
Charbroiler Replacement	$6,600	0.2	10	2.4	2750.0	135.0	$891,000	$151,014,000	324	0.1	36262	$4,164.52
Other Ag Projects												
Almond Harvester Purchase	$145,000	3.6	10	35.7	4061.6	260	$37,700,000	$188,714,000	9282	2.5	45220	$4,173.24
										8.5		

NOx Cost-Effectiveness Demonstration

NOx Project Mix in 2006 to achieve an average cost effectiveness of $4650/ton with $6,006,379 available

	Project Cost	Annual Reduction (t/y)	Project Life	Life Reductions	Total No. Projects Available	Number of Projects in 2006	Total cost	Total tons	Project CE $/ton
Ag Projects									
Ag Irrigation Pump Electrification	$21,558	3.0	10	29.9	142	20	$431,165	598.2	721
Ag Irrigation Pumps Portable Diesel Repowers	$27,144	2.3	7	15.9	50	10	$271,440	159.2	1,705
Off-Road Vehicles/Equipment large ag repowers	$48,382	1.7	7	11.8	10	4	$193,528	47.2	4,100
Ag non self-propelled ICE repowers hay bayler	$9,200	0.1	7	1.0	10	1	$9,200	1.0	8,846
Ag non self-propelled ICE repowers spray rig	$15,500	0.2	7	1.5	12	2	$31,000	3.0	10,403
Off-Road Vehicles/Equipment small ag repowers	$12,677	0.2	7	1.3	20	3	$38,031	3.8	9,982
Open Burning - Chipping Almonds	$227,182	5.7	4	22.9	1	1	$227,182	22.9	9,921
Open Burning - Chipping Figs	$185,212	0.6	4	2.28	12	1	$185,212	2.3	81,233
Marine Projects									
Marine Vessels (Harbor Craft) 03 repower	$69,288	3.3	16	52.8	1	1	$69,288	52.8	1,313
Marine Vessels (Harbor Craft) 04 repower	$197,850	7.6	16	121.6	1	1	$197,850	121.6	1,627
HD Truck/Bus Projects									
HDD Trucks Idle Reduction	$9,883	0.6	5	3.0	320	0	$0	0.0	#DIV/0!

NOx Cost-Effectiveness Demonstration

NOx Project Mix in 2006 to achieve an average cost effectiveness of $4650/ton with $6,006,379 available

HD Truck/Bus Projects *Cont*									
Auxiliary Power Units (Transportation Refridgeration Units) repowers	$12,518	0.4	5	1.8	294	20	$250,364	36.4	6,878
On-Road HD Vehicles Fleet Modernization	$88,756	1.0	10	10.2	1000	10	$887,560	101.5	8,744
School Bus Replacement	$110,000	0.3	10	3.1	1000	9	$990,000	27.9	35,484
Locomotives Tier 0 to Tier 2 or hybrid	$1,414,286	6.0	18.6	111.7	10	1	$1,414,286	111.7	12,665
Stationary Source Projects									
Glass Melting Furnaces	$22,120,500	239.0	10	2390.0	1	0	$0	0.0	#DIV/0!
Small Boilers, Steam Generators, and Process Heaters Replace Existing units with new	$13,000	0.1	10	1.2	1207	1	$13,000	1.2	10,744
Small Boilers, Steam Generators, and Process Heaters Replace Existing units with new	$6,000	0.0	10	0.33	552	12	$72,000	4.0	18,182
Off-Road Mobile									
Forklifts (Electric, ICE, SI)	$44,457	0.4	5	1.95	50	5	$222,287	9.8	22,799
Airport Ground Support Equipment - Electric	$27,889	0.2	5	1.13	73	3	$83,667	3.4	24,753
Other Mobile									
Gross Polluter - VAVR	$3,000	0.1	1	0.08	100	0	$0	0.0	#DIV/0!
Old Vehicle - VAVR	$3,000	0.02	3	0.06	5000	150	$450,000	9.0	50,000
				Overall cost and average CE for 2006			**$6,037,059**	**1316.7**	**4,585**

NOx Project Mix in 2007 to achieve an average cost effectiveness of $7100/ton with $14,407,974 available

	Project Cost	Annual Reduction (t/y)	Project Life	Life Reductions	Total No. Projects Available	Number of Projects in 2007	Total cost	Total tons	Project CE $/ton
Ag Projects									
Ag Irrigation Pump Electrification	21,558	3.0	10	29.9	122	20	$431,165	598.2	721
Ag Irrigation Pumps Portable Diesel Repowers	27,144	2.3	7	15.9	40	20	$542,879	318.4	1,705
Off-Road Vehicles/Equipment large ag repowers	48,382	1.7	7	11.8	6	4	$193,528	47.2	4,100
Ag non self-propelled ICE repowers hay bayler	9,200	0.1	7	1.0	9	4	$36,800	4.2	8,846
Ag non self-propelled ICE repowers spray rig	15,500	0.2	7	1.5	10	4	$62,000	6.0	10,403
Off-Road Vehicles/Equipment small ag repowers	12,677	0.2	7	1.3	17	4	$50,708	5.1	9,982
Open Burning - Chipping Almonds	227,182	5.7	3	17.2	0	0	$0	0.0	#DIV/0!
Open Burning - Chipping Figs	185,212	0.6	3	1.71	11	0	$0	0.0	#DIV/0!
Marine Projects									
Marine Vessels (Harbor Craft) 03 repower	69,288	3.3	16	52.8	0	0	$0	0.0	#DIV/0!
Marine Vessels (Harbor Craft) 04 repower	197,850	7.6	16	121.6	0	0	$0	0.0	#DIV/0!
HD Truck/Bus Projects					0				
HDD Trucks Idle Reduction	9,883	0.6	5	3.0	320	0	$0	0.0	#DIV/0!
Auxiliary Power Units	12,518	0.4	5	1.8	274	40	$500,728	72.8	6,878

NOx Project Mix in 2007 to achieve an average cost effectiveness of $7100/ton with $14,407,974 available

HD Truck/Bus Projects *Cont.*									
On-Road HD Vehicles - Fleet Modernization	88,756	1.0	10	10.2	990	45	$3,994,018	456.8	8,744
School Bus Replacement	110,000	0.3	10	3.1	991	40	$4,400,000	124.0	35,484
Locomotives	1,414,286	6.0	18.6	111.7	9	2	$2,828,571	223.3	12,665
Stationary Source Projects					0				
Glass Melting Furnaces	22,120,500	239.0	10	2390.0	1	0	$0	0.0	#DIV/0!
Small Boilers, Steam Generators, and Process Heaters Replace Existing units with new	13,000	0.1	10	1.2	1206	2	$26,000	2.4	10,744
Small Boilers, Steam Generators, and Process Heaters Replace Existing units with new	6,000	0.0	10	0.33	540	6	$36,000	2.0	18,182
Off-Road Mobile									
Forklifts (Electric, ICE, SI)	44,457	0.4	5	1.95	45	3	$133,372	5.9	22,799
Airport Ground Support Equipment - Electric	27889	0.2	5.0	1.13	70	4	$111,556	4.5	24,753
Other Mobile									
Gross Polluter - VAVR	$3,000	0.1	1	0.08	100	5	$15,000	0.4	37,500
Old Vehicle - VAVR	$3,000	0.02	3	0.06	4850	350	$1,050,000	21.0	50,000
				Overall cost and average CE for 2007			**$14,412,326**	**1892.0**	**7,617**

NOx Project Mix in 2008 to achieve an average cost effectiveness of $9350/ton with $22,373,287 available

	Project Cost	Annual Reduction (t/y)	Project Life	Life Reductions	Total No. Projects Available	Number of Projects in 2008	Total cost	Total tons	Project CE $/ton	Comments
Ag Projects										
Ag Irrigation Pump Electrification	21,558	3.0	10	29.9	102	18	$388,049	538.4	721	
Ag Irrigation Pumps Portable Diesel Repowers	27,144	2.3	7	15.9	20	10	$271,440	159.2	1,705	
Off-Road Vehicles/Equipment large ag repowers	48,382	1.7	7	11.8	2	2	$96,764	23.6	4,100	
Ag non self-propelled ICE repowers hay bayler	9,200	0.1	7	1.0	5	5	$46,000	5.2	8,846	
Ag non self-propelled ICE repowers spray rig	15,500	0.2	7	1.5	6	6	$93,000	8.9	10,403	
Off-Road Vehicles/Equipment small ag repowers	12,677	0.2	7	1.3	13	8	$101,416	10.2	9,982	
Open Burning - Chipping Almonds	227,182	5.6	2	11.1	1	1	$227,182	11.1	20,467	Rule 4103 2010 Implementation
Open Burning - Chipping Figs	185,212	0.6	2	1.14	11	0	$0	0.0	#DIV/0!	Rule 4103 2010 Implementation
Marine Projects										
Marine Vessels (Harbor Craft) 03 repower	69,288	3.3	16	52.8	0	0	$0	0.0	#DIV/0!	
Marine Vessels (Harbor Craft) 04 repower	197,850	7.6	16	121.6	0	0	$0	0.0	#DIV/0!	
HD Truck/Bus Projects					0					
HDD Trucks Idle Reduction	9,883	0.6	5	3.0	320	50	$494,127	149.0	3,316	Idle Aire req. min order of 50 units

NOx Project Mix in 2008 to achieve an average cost effectiveness of $9350/ton with $22,373,287 available

HD Truck/Bus Projects *Cont.*										
Auxiliary Power Units - Repower	12,518	0.4	5	1.8	234	40	$500,728	72.8	6,878	
On-Road HD Vehicles - Fleet Modernization	88,756	1.0	10	10.2	945	66	$5,857,894	669.9	8,744	
School Bus Replacement	110,000	0.3	10	3.1	951	50	$5,500,000	155.0	35,484	
Locomotives	1,414,286	6.0	18.6	111.7	7	4	$5,657,143	446.7	12,665	
Stationary Source Projects					0					
Glass Melting Furnaces	22,120,500	239.0	10	2390.0	1	0	$0	0.0	#DIV/0!	
Small Boilers, Steam Generators, and Process Heaters Replace Existing units with new	13,000	0.1	10	1.2	1204	60	$780,000	72.6	10,744	
Small Boilers, Steam Generators, and Process Heaters Replace Existing units with new	6,000	0.0	10	0.33	534	60	$360,000	19.8	18,182	
Off-Road Mobile					0					
Forklifts (Electric, ICE, SI)	44,457	0.4	5	1.95	42	5	$222,287	9.8	22,799	
Airport Ground Support Equipment - Electric	27889	0.2	5.0	1.13	10	5	$139,444	5.6	24,753	
Other Mobile					0					
Gross Polluter ID & Replace - VAVR	$3,000	0.1	1	0.08	95	50	$150,000	4.0	37,500	
Old Vehicle - VAVR	$3,000	0.02	3	0.06	4500	500	$1,500,000	30.0	50,000	
				Overall cost and average CE for 2008			**$22,385,473**	**2391.7**	**9,359**	

NOx Cost Effectiveness Demonstration

Year	Nox Projected Revenue	NOx CE $/ton
2006	$6,006,379	4,650
2007	$14,407,974	7,100
2008	$22,373,287	9,350
Total	$42,787,640	

PM10 Cost-Effectiveness Demonstration

Project Mix in 2006 to achieve an average cost effectiveness of $2907/ton with $5,941,908 available

	Project Cost	Annual Reduction (t/y)	Project Life	Life Reductions	Total No. Projects Available	Number of Projects in 2006	Total cost	Total tons	Project CE $/ton
Unpaved Roads									
Paving 75 ADT roads	$290,000	27.1	20	542	10	2	$580,000	1084.0	535
Paving 25 ADT roads	$290,000	9.0	20	180.7	90	2	$580,000	361.3	1,605
Paving 10 ADT roads	$290,000	3.6	20	72.0	100	4	$1,160,000	288.0	4,028
Suppressants 10 year contract	$140,080	3.5	10	35.0	100	6	$840,480	210.0	4,002
Paved Roads									
Paving Shoulders	$100,000	0.2	20	3.8	500	14	$1,400,000	53.2	26,316
Suppresants on Shoulder 10 yr	$48,370	0.2	10	1.6	500	16	$773,920	25.6	30,231
PM Efficient Sweeper Purchase	$152,000	0.9	8	7.3	25	2	$304,000	14.6	20,879
Cotton Gins									
Install barrel cyclone before master trash 1D3D cyclone	$7,500	1.6	10	16.3	12	2	$15,000	32.6	460
Install barrel cyclone or 1D2D cyclone before mote system 1D3D cyclone	$60,000	2.8	10	27.6	12	2	$120,000	55.2	2,174
Install plenum chamber before the unloading system and the drying/cleaning systems	$70,000	2.8	10	27.6	12	2	$140,000	55.2	2,536
Other Ag Equipment									
Almond Harvester Purchase	$145,000	3.6	10	35.7	260	0	$0	0.0	#DIV/0!
Average CE in 2006						**Overall cost and CE for 2006**	**$5,913,400**	**2179.7**	**2,713**

Project Mix in 2007 to achieve an average cost effectiveness of $5594/ton with $20,861,575 available

	Project Cost	Annual Reduction (t/y)	Project Life	Life Reductions	Total No. Projects Available	Number of Projects in 2007	Total cost	Total tons	Project CE $/ton
Unpaved Roads									
Paving 75 ADT roads	$290,000	27.1	20	542	8	0	$0	0.0	#DIV/0!
Paving 25 ADT roads	$290,000	9.0	20	180.7	88	5	$1,450,000	903.3	1,605
Paving 10 ADT roads	$290,000	3.6	20	72.0	96	22	$6,380,000	1584.0	4,028
Suppressants 10 year contract	$140,080	3.5	10	35.0	94	16	$2,241,280	560.0	4,002
Paved Roads					0				
Paving Shoulders	$100,000	0.2	20	3.8	486	55	$5,500,000	209.0	26,316
Suppresants on Shoulder 10 yr	$48,370	0.2	10	1.6	484	50	$2,418,500	80.0	30,231
PM Efficient Sweeper Purchase	$152,000	0.9	8	7.3	23	12	$1,824,000	87.4	20,879
Cotton Gins									
Install barrel cyclone before master trash 1D3D cyclone	$7,500	1.6	10	16.3	10	2	$15,000	32.6	460
Install barrel cyclone or 1D2D cyclone before mote system 1D3D cyclone	$60,000	2.8	10	27.6	10	2	$120,000	55.2	2,174
Install plenum chamber before the unloading system and the drying/cleaning systems	$70,000	2.8	10	27.6	10	2	$140,000	55.2	2,536
Other Ag Equipment									
Almond Harvester Purchase	$145,000	3.6	10	35.7	260	2	$290,000	71.4	4,062
Average CE in 2007						**Overall cost and CE for 2007**	**$20,378,780**	**3638.1**	**5,602**

Project Mix in 2008 to achieve an average cost effectiveness of $9011/ton with $33,883,309 available

	Project Cost	Annual Reduction (t/y)	Project Life	Life Reductions	Total No. Projects Available	Number of Projects in 2008	Total cost	Total tons	Project CE $/ton
Unpaved Roads									
Paving 75 ADT roads	$290,000	27.1	20	542	8	1	$290,000	542.0	535
Paving 25 ADT roads	$290,000	9.0	20	180.7	83	5	$1,450,000	903.3	1,605
Paving 10 ADT roads	$290,000	3.6	20	72.0	74	10	$2,900,000	720.0	4,028
Suppressants 10 year contract	$140,080	3.5	10	35.0	78	5	$700,400	175.0	4,002
Paved Roads					0				
Paving Shoulders	$100,000	0.2	20	3.8	431	175	$17,500,000	665.0	26,316
Suppresants on Shoulder 10 yr	$48,370	0.2	10	1.6	434	160	$7,739,200	256.0	30,231
PM Efficient Sweeper Purchase	$152,000	0.9	8	7.3	11	11	$1,672,000	80.1	20,879
Cotton Gins					0				
Install barrel cyclone before master trash 1D3D cyclone	$7,500	1.6	10	16.3	8	2	$15,000	32.6	460
Install barrel cyclone or 1D2D cyclone before mote system 1D3D cyclone	$60,000	2.8	10	27.6	8	2	$120,000	55.2	2,174
Install plenum chamber before the unloading system and the drying/cleaning systems	$70,000	2.8	10	27.6	8	2	$140,000	55.2	2,536
Other Ag Equipment									
Almond Harvester Purchase	$145,000	3.6	10	35.7	258	6	$870,000	214.2	4,062
Average CE in 2008						**Overall cost and CE for 2008**	**$33,396,600**	**3698.6**	**9,029**

PM10 Cost-Effectiveness Demonstration

Year	PM10 Projected Revenue	PM10 CE $/ton
2006	$5,941,908	2,907
2007	$20,306,433	5,594
2008	$33,883,309	9,011
Total	$60,131,650	

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