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NEW CONCEPTS IN ENVIRONMENTAL POLICY

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY POLICY, NATURAL RESOURCES AND REGULATORY AFFAIRS

OF THE

COMMITTEE ON GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

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NEW CONCEPTS IN ENVIRONMENTAL POLICY

TUESDAY, MAY 28, 2002

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY POLICY, NATURAL
RESOURCES AND REGULATORY AFFAIRS,
COMMITTEE ON GOVERNMENT REFORM,
Orange, CA.

The subcommittee met, pursuant to notice, at 9:30 a.m., in room 209, Argyros Forum, Chapman University, Orange, CA, Hon. Doug Ose (chairman of the subcommittee) presiding.

Members present: Representative Ose.

Staff present: Dan Skopec, staff director; Jonathan Tolman, professional staff member; Yier Shi, press secretary; and Allison Freeman, clerk.

Mr. OSE. Welcome to this morning's hearing before the Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs. We are today in Orange County for the purpose of taking testimony on the environmental issues before the country; in particular, how we can move to the next generation of environmental improvements.

As a member of the Government Reform Committee, I have had an opportunity to see how the Government spends our tax dollars, manages our programs, and delivers its services to the American people. Like any good business, Government needs to continually evaluate its performance and make necessary changes when current policies are out-of-date. Government policies to protect the environment are no exception to this rule.

In 1970, the U.S. EPA was established to address the massive pollution problems our country faced. Through laws, such as the Clean Air Act and the Clean Water Act, EPA has sought to reduce the bigger sources of pollution: industry and wastewater treatment emissions. EPA took a "command and control" approach to these problems, setting strict emission standards and proscribing the type of technology that industry could use to meet those standards. Although the compliance costs were high, these rules did succeed in reducing pollution from industrial sources. Today, as a result, we have cleaner water and cleaner air.

But, as our society has evolved and our economy has moved away from its longstanding and traditional industrial base, we have reached the time when we must reevaluate our performance in protecting the environment.

Despite efforts to clean our air, there are still 34 counties in California that fail to meet at least one of EPA's air standards. Three-fifths of smog-causing nitrogen oxides come from cars, trucks, rail-

roads, and other non-industrial sources that are not directly regulated by the Clean Air Act.

And, while industrial pollution has been virtually eliminated as a source of water pollution in California, 60 percent of the rivers and streams that EPA has assessed are not fully fishable or swimmable. Think about that, 60 percent—you can't go down there and just jump in the old water. The leading sources of degradation in California's rivers and streams are agriculture, forestry activities, urban runoff and storm sewers, and municipal point sources, which are not effectively managed under the Clean Water Act.

By 2025, the population of California is expected to reach nearly 50 million people. This State will have to accommodate an additional 15 million people over the next 25 years. Think about the amount of food, water, housing, and energy consumed by an additional 15 million people. To say that's going to put a strain on our environment is to understate the obvious.

If we are to prepare for these changes, we must begin to take a different approach to environmental regulation. The old "command and control" approach won't get us where we need to go. Today's environment is inflexible, and the compliance costs often are too high. The time has come for our government to seek innovative ways to manage our environment. High standards of environmental protection are a must. And, individuals must have the flexibility to meet those standards in new ways. Government functionaries should not be environmental bean counters but environmental managers. The goal should not be the number of permits issued or the amount of money spent, but, rather, do we clean up the environment.

While we face some daunting problems, there are also some reasons to be hopeful—areas where environmental innovation and experimentation have, in fact, worked. For example, the 1990 Clean Air Act Amendments introduced a novel concept for controlling sulfur emissions from power plants. Instead of requiring specific clean technology at every plant, that is, the equipment, sulfur emissions in total were capped for the whole country. Power plants were then forced to either reduce their own emissions, or buy credits, or purchase credits from other plants that reduced emissions further than they were required. At the time, environmental economists predicted that this would be a more efficient way to reduce pollution. The program was even more successful than originally predicted, with power plants reducing sulfur pollution even more effectively than even the economists thought. Dr. Green, you are going to have something to say about that.

EPA itself has attempted to adopt more flexible management techniques. Project XL, which began in 1995, was an effort by EPA to improve environmental performance while reducing regulatory burdens.

The State of California, with the help of EPA's Region IX office whose director is here with us today, has also achieved some success in terms of adopting innovative and flexible environmental policies. The RECLAIM program and the Bay Area Emissions Trading Program are two good examples. But, such programs are few and far between.

The purpose of today's hearing is to look for ways that we can increase the frequency of such programs. California is a perfect place to begin this search. We have the largest population in the United States, we have serious air pollution problems, we have a huge agricultural industry, we have sprawling suburbs, numerous river systems, we have the Bay Delta, which is, frankly, a very unique asset to the State, hundreds of miles of coastline, we have mountains, forests, and deserts. Frankly, California has a plethora of environmental challenges.

Last summer, President Bush was in California and stood by the General Sherman Giant Sequoia and called for a "new environmentalism" that embraces "a new spirit of respect and cooperation" in which "citizens and private groups play a crucial role." New approaches to environmental policy that complement or even replace the current command and control regulations will depend on government agencies fostering the creativity and ingenuity of private individuals, organizations, and associations.

I want to welcome our witnesses today. They include: Wayne Nastri, the Regional Administrator for EPA Region IX, Professor A. Denny Ellerman, from the Center for Energy and Environmental Policy Research at MIT, and Dr. Kenneth Green, Director of Environmental Program for the Reason Public Policy Institute.

[The prepared statement of Hon. Doug Ose follows:]

Chairman Doug Ose
Opening Statement
New Concepts in Environmental Policy
May 28, 2002

As a member of the Government Reform Committee, I have an opportunity to see how the government spends your tax dollars, manages programs, and delivers services to the American people. Like any good business, government needs to continually evaluate its performance and make necessary changes when current policies are out-of-date. Government policies to protect the environment are no exception.

In 1970, the U.S. Environmental Protection Agency (EPA) was established to address the massive pollution problems our country faced. Through laws, such as the Clean Air Act and the Clean Water Act, EPA sought to reduce the biggest sources of pollution: industry and wastewater treatment emissions. EPA took a "command and control" approach to these problems, setting strict emission standards and prescribing the type of technology that industry could use to meet those standards. Although the compliance costs were high, these rules did succeed in reducing pollution from industrial sources. Today, as a result, we have cleaner water and cleaner air.

But, as our society has evolved and our economy has moved away from its industrial base, we have reached the time when we must reevaluate our performance in protecting the environment.

Despite efforts to clean our air, there are still 34 counties in California that fail to meet at least one of EPA's air standards. Three-fifths of smog-causing nitrogen oxides come from cars, trucks, railroads, and other non-industrial sources, that are not directly regulated by the Clean Air Act.

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By 2025, the population of California is expected to reach nearly 50 million people. In other words, this State will have to accommodate an additional 15 million people over the next 25 years. Think about the amount of food, water, housing and energy consumed by an additional 15 million people. To say that it could put a strain on our environment is an understatement.

If we are to prepare for these changes, we must begin to take a different approach to environmental regulation. The old "command and control" approach won't get us where we need to go. It is inflexible and the compliance costs are too high. The time has come for our government to seek innovative ways to manage our environment. High standards of environmental protection are a must. But, individuals must have the flexibility to meet

those standards in new ways. Government bureaucrats should not be environmental bean counters but environmental managers. The goal should not be the number of permits issued or the amount of money spent but, rather, the ultimate result – a cleaner environment.

While we face some daunting problems, there are also some reasons to be hopeful --areas where environmental innovation and experimentation have worked. For example, the 1990 Clean Air Act Amendments introduced a novel concept for controlling sulfur emissions from power plants. Instead of requiring specific clean technology at every plant, sulfur emissions were capped for the whole country. Power plants were forced to either reduce their own emissions or buy credits from other plants that reduced emissions further than they were required. At the time, environmental economists predicted that this would be a more efficient way to reduce pollution. The program was even more successful than originally predicted, with power plants reducing sulfur pollution even more effectively than the economists thought.

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The purpose of today's hearing is to look for ways that we can increase the frequency of such programs. California is a perfect place to begin this search. With the largest population in the United States, serious air pollution problems, a huge agriculture industry, sprawling suburbs, numerous river systems, the Bay Delta, hundreds of miles of coastline, mountains, forests and deserts, California has a plethora of environmental challenges.

Last summer, President Bush stood by the General Sherman Giant Sequoia and called for a "new environmentalism" that embraces "a new spirit of respect and cooperation" in which "citizens and private groups play a crucial role." New approaches to environmental policy that complement or even replace the current command and control regulations will depend on government agencies fostering the creativity and ingenuity of private individuals, organizations, and associations.

I want to welcome our witnesses today. They include: Wayne Nastri, Regional Administrator, EPA Region IX, Professor A. Denny Ellerman, Center for Energy and Environmental Policy Research, Massachusetts Institute of Technology, and Dr. Kenneth P. Green, Director of Environmental Program, Reason Public Policy Institute.

Mr. OSE. Gentlemen, welcome. This committee, by practice, swears in every one of its witnesses, regardless of the hearing, so I'm going to ask each of you to rise. Thank you. Raise your right hands.

[Witnesses sworn.]

Mr. OSE. Let the record show that the witnesses answered in the affirmative.

The way we work this is that you've all submitted written testimony—I've read the testimony, my staff has read the testimony, sometimes they have to read it a second time, but we have read the testimony. If you could go through maybe 5 or 7 minutes to summarize your respective testimonies that would expedite things. Since we don't have a lot of other Members, we are not going to have a lengthy debate here; it's only myself, and then we'll just go to questions. I do have a number of questions.

So, Mr. Nastri.

STATEMENT OF WAYNE NASTRI, REGIONAL ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, REGION IX

Mr. NASTRI. Thank you, Chairman Ose. It's a pleasure to be here this morning in beautiful southern California, close to my home I might add.

Since my arrival at EPA, I've had the opportunity to discuss priorities for the Agency on several occasions. I've consistently stressed my commitment for Region IX to be flexible, innovative, and to be results driven.

As you've noted, we have prepared testimony. That testimony has been submitted, and as you request I will briefly summarize that testimony.

When Governor Whitman came on board as the Administrator, she made very clear to us that we really had three goals that we had to achieve, that is that the air is cleaner, the water is purer, and the land is better protected at the end of our term. And, the manner in which we achieve that is really a lot up to our discretion, but clearly innovation has a big role in how we approach that.

A number of programs that the President and Administrator Whitman have proposed have been based on voluntary measures, have been based on flexibility. They've been based on regional approaches, and are all approaches that, as you've noted, have been proven in the past and have been successful.

We think that, as again you've noted, there's been tremendous success over the last few years, and let me restate that, over the last two decades there's been tremendous success. But, clearly, the low-hanging fruit of success is gone, and the question is how do we get to the next level of environmental clean-up?

The "command and control" structure may not work, and so when we look in terms of flexibility we try to identify what are some of the most flexible means that we do have to achieve that.

I think one of the most flexible means, when people think about flexibility, is a voluntary program, and in a voluntary program we are experimenting with industries and trying to get them to step up to the table to look at global climate change. I think that's a good example, where although the United States is not participat-

ing in the Kyoto protocol we are trying to reach many of the goals through voluntary means.

And, so, can industries step up to the plate and meet some of those reductions? And, more importantly, in a manner that, should some future events allow us to be tied in on a more global basis, we can gain the advantages of some of the efforts we've done without losing the innovation and the timing from that perspective?

I'd like to give an example of some of the successes that we've seen in some of the voluntary programs. One example that comes to my mind has to do with the mining industry in the State of Nevada. Mercury emissions were significant, through data that was brought to us through our toxic release inventory. We were able to go to the four largest gold mines and say, "We believe there's a problem. Let's sit down together and discuss how we might be able to reduce these mercury emissions."

Now, this was all done in the context of having a MACT, Maximum Achievable Control Technology, rule that was going to be developed in 2007, and the mines said to us, we'll be willing to work with you if you can put in abeyance the MACT rule. And, we said, well let's see what we can come up with. And, we were actually able to sit down with the mines, get them to achieve a 50 percent reduction in less than a few years time, and for that we then went to Headquarters and said, "Look, we've gotten tremendous reductions, we saw that we don't need to move forward on this MACT rule, let's demonstrate the achievements."

Now, the interesting thing was, in this voluntary program the mines in the State of Nevada said, look, we're willing to do this with you, but we want to keep this on the quiet for now. We don't want to be held up as the industry poster boy and have all our colleagues extremely upset at us. So, we said, fine, so in one sense we don't really talk much about it, but in another sense we talk about a voluntary program and success that can be achieved. This is an excellent example.

So, from the voluntary aspect, we think there's a lot of opportunity. We think that we can achieve those measurable reductions and go ahead and continue to meet the next round of environmental goals.

There are other issues, too, that we can talk about here in southern California. There's the Santa Anna Watershed Project. There we are looking at bringing in a number of different municipalities, agencies, and trying to look at water quality protection from a holistic basis, from a watershed basis, instead of each municipality trying to address the various concerns as the water comes into their jurisdiction.

This is also exemplified, I think, in terms of our approach when we talk about the Watershed Pilot Program that the President and Administrator discussed, but we'll be looking at 21 pilots across the Nation and trying again to look at a holistic approach instead of the jurisdiction by municipality approach.

So, those are two examples of the voluntary programs.

The next approach that we are looking at in terms of innovation is market-based approach. You talked about the RECLAIM, the Regional Clean Air Incentives Market. You also talked about the Acid Rain Program, that program being over 90 percent effective, it is

our most cost-effective program to administer, requiring less than 21 people across the Nation. It is a model for many of the programs that we are looking at, and so when we look at market-based approaches we can look at RECLAIM.

RECLAIM, obviously, had some issues, I want to say last year or the year before, in terms of what happened when the credits became sparse. We are certainly looking at how that can be rectified and what can be traded.

In terms of other market-based approaches, we are also looking at water quality trading. This, I think, is a unique concept. I think people are comfortable with the air quality trading concept, but on the water quality side it's something I think that we are going to have to take a closer look at.

A third aspect in terms of innovation is really looking at new technologies, those technologies that exist. When you think about EPA and innovation I always think of Superfund, but in Superfund you have a number of technologies that are always brought to bear. You have the SITE program, the Superfund Innovative Technology Evaluation Program. These programs utilize new technologies that haven't generally been utilized or proven elsewhere before. And, given that technology, it's a chance to demonstrate whether or not this works.

In supporting new technologies, and I will address that a little bit more shortly, you do have to address the concept of, not only addressing the technical aspect of innovativeness, but addressing the culture aspect, and that's something, again, that I want to talk about a little bit later.

The fourth aspect is systems improvement. How can we improve our systems so that we are doing a better job in serving our stakeholders, whether that be the general public, whether that be the State government, tribal government, or local government? How can we make information that we have more readily available and, therefore, more readily usable to make timely decisions? I think given all the information, given all the happenings that have occurred since September 11th, that information is absolutely vital. We need to make sure that we can address the information needs, so by improving our systems technology, and not necessarily by simply replicating various systems, we need to really look at how can we effectively manage and access data.

That really concludes the four programs that I talked about in terms of our strategic vision. We are focusing on greenhouse gases, reducing smog, improving water quality, and diversified environmental protection tools. That, I think summarizes the comments of the testimony that was submitted.

Now, in terms of our outlook and what I see as the challenge of innovation, I'd like to give you my perspective. The key view, or the key challenge in my short tenure as the RA, is the culture within EPA. It's getting people to accept the fact that we have a challenge before us, and how can we meet that challenge aggressively and not be afraid of failure. No one wants to be on the receiving end of someone saying, why did we use this technology when it was experimental, it hadn't been proven across the Nation, and it didn't get us the results we wanted, in the timeframe that we wanted, or

in the budget that we wanted. And, that fear is something that really tends to suppress innovation.

And, so, what we've been trying to do is change the rewards, the recognition, the culture if you will, in terms of how can you get people to embrace change, to say we can become a champion and we can now move forward in this technology. And, it's interesting, because it's little things within the Agency that I think will go a long way. It's having management, it's having leadership, recognizing that everything is not going to go perfectly, and realizing that we're going to be there to support them.

One of the things that I've instituted in Region IX, although it may sound trite, it's actually a big hit within the region, and that is, whenever there is a significant project that garners a lot of attention, we make very clear, we'll bring in the team, we'll say this is the goal, this is what we are trying to do, you tell us how can we do it, and we get them to lay out the specific timetables, the goals, the milestones, the objectives. And, when we meet those goals and objectives, and we make sure that they have all the resources that they need, I pull them into my office and we have a party, whether it's cookies and ice cream, and soda, or chips and what not, the staff really appreciates that, and they appreciate the recognition that they are getting for doing it. And, when things don't go right, we say we've learned a lot from this. How could we have done this thing differently? We cannot be afraid to embrace change, to embrace innovation, that is so important to us.

Now, not only is that an issue within the Agency, it's really something that we need to look to for support from our political leadership, because I think—I could be the one saying, you know, we shouldn't have done this, or we should have done this, very easily I could be on the receiving end of the congressional hearing saying, "Mr. Nastri, why did you go with this approach when you knew that, in fact, that technology wasn't necessarily proven?" So, we certainly look to you, Chairman Ose, and to other congressional leaders, to have that faith and confidence and to instill in us to move forward, to take those chances, assuredly, minimizing every single potential risk possible, looking at all the potential up sides and down sides. And, that's something that we, obviously, take very seriously.

From my perspective, I think that is the biggest challenge that we face. I think when you look at the plethora of ideas that people come up with, there's no shortage of ideas out there for us to embrace and to move forward on. The real challenge is making sure that we, as an Agency, and our States, and our Federal Government, supports us as we take those challenges and move forward.

And, that concludes my remarks at this point. I'll be looking forward to answering any questions you may have later.

[The prepared statement of Mr. Nastri follows:]

Statement of
Wayne Nastri
Regional Administrator
U.S. Environmental Protection Agency, Region 9

Before the
Subcommittee on Energy Policy, Natural Resources, and Regulatory Affairs
of the
Committee on Government Reform
U.S. House of Representatives

May 28, 2002

Good morning, Chairman Ose and Members of the Subcommittee. My name is Wayne Nastri. I was appointed Regional Administrator for the United States Environmental Protection Agency Region 9, our Pacific Southwest office in October 2001. The office covers federal environmental issues in Arizona, California, Hawaii, Nevada, and the Pacific Islands. Thank you for the opportunity to provide testimony today on new concepts in environmental policy for the 21st century. I would especially like to thank Congressman Ose for extending this invitation and look forward to working with everyone on the Subcommittee on how we can creatively address our environmental challenges in the years ahead.

In the last thirty years, we and our regulatory partners have made significant progress in protecting human health and the environment largely through setting and enforcing standards for pollutant discharges. However,

as our environmental challenges grow more complex it seems clear that traditional approaches alone will not suffice. For example, problems such as polluted runoff from streets and farms, global climate change, and loss of habitat and biodiversity require a broader set of tools than we have relied on in the past.

Alternative Approaches for Better Environmental Results

Our Pacific Southwest office has for several years been testing alternative approaches for better environmental results with the goal of modifying our basic strategies as we find evidence of the effectiveness of new ideas to achieve environmental and public health protection faster and with lower transaction costs. Our strategy has been to focus on those environmental issues that are of great concern in the region. Our work to date falls into four broad categories: 1) voluntary programs, 2) market based approaches, 3) support of new technologies, and 4) improved systems.

Voluntary Programs

Voluntary programs offer an opportunity to build partnerships in areas which may require regulation, and in pursuit of the goal of pollution prevention. Specific examples of voluntary partnerships we have supported dealing with significant environmental issues include:

Agriculture: Agriculture is an extremely important economic sector and has major impacts on public health and natural resources in the Pacific Southwest. In California we are providing technical assistance and funding to support voluntary partnerships for research and education for environmentally-friendly growing methods for more than a dozen key dairies and crops, including walnuts, citrus, rice, strawberries, apples, almonds, grapes and prunes. Much of this work has been coordinated through the University of California's Biologically Integrated Farming System projects. These projects directly involve farmers who develop, field test and educate other farmers on innovative sustainable farming systems, and commodity groups that help publicize results among the agricultural community. Most of the participating farms, orchards, and vineyards are in California's Central Valley. Working cooperatively with our industry partners, we have achieved significant results. For example, one notable accomplishment over the last year was the cultivation of 1334 acres of rice on nine demonstration farms in Butte County. These farms were successful in using 50% less toxic herbicides and 20% less nitrogen fertilizer than the county average, yet sustained no reduction in crop yields. These ongoing collaborations between growers, scientists, and EPA have benefits for everyone with a stake in farming: growers save money by using less chemicals; workers have safer

working conditions; consumers get safer food; and the overall environment is better protected.

Mining: The Pacific Southwest has the top three mineral producing states in the nation. In Nevada we are currently working with the state and four of the state's largest gold mining companies in an effort to voluntarily reduce mercury air emissions from mining operations. Mercury is a toxic pollutant that adversely affects the nervous system and data from EPA's Toxic Release Inventory indicate that mines released over 13,000 pounds per year of mercury to the atmosphere. Normally, the regulatory option for reducing air emissions from a stationary source would be to establish Maximum Achievable Control Technology emission limits for the industry. The regulatory process to develop these limits however, typically takes a long time and can impose substantial transaction costs for the agency and mining industry. We chose an alternative approach of working with the state and the mining companies to voluntarily reduce emissions to levels equivalent to or less than those that would be required by regulations. Through this program we are doing just that and anticipate that over the next three years over 50% of the mercury air emissions from these four mines will be eliminated, as well as the need for a regulatory rulemaking process.

Comprehensive Watershed Protection: With rapid growth taking place in the Pacific Southwest, water quantity and quality issues are significant environmental issues. Our region is involved in a number of watershed protection partnership programs to address these issues at the local level. For example, our region is one of a number of partners involved in the Santa Ana River Watershed Project. This voluntary program is a successful example of shared governance - that is the strategic collaboration of local, state, and federal government and the private sector. This partnership is particularly important for the Santa Ana River Watershed since it is one of the most rapidly urbanizing areas in the country and it is home to more than 270 dairies that produce approximately one million tons of manure annually -- two factors that create a significant amount of stress on the watershed. The Santa Ana Watershed Project group has achieved significant progress in minimizing these impacts on the watershed. For example, the partnership has collectively secured funding to build a $10 million 20 acre storm water detention basin that prevents flooding from the dairies and the subsequent pollution of the river. Through this voluntary program a pilot sewering project for nine dairies has been implemented that better controls the management of manure wastes coming from the dairies.

Medical Waste Management: Hospitals generate large amounts of wastes on a daily basis -- about 13.2 million pounds per day nationally. In California, some of this waste must be incinerated. Incineration of medical wastes results in a variety of air emissions, including dioxin, which is one of the more toxic substances known. We have partnered with hospitals in the San Francisco Bay Area, other government agencies, and community and environmental groups to launch a voluntary pollution prevention project that is lessening the amount of waste generated by local medical facilities so as to lessen the amount of air pollution. The partnership has achieved some notable results. In six Bay Area hospitals, 90 to 95% of the mercury waste has been eliminated ranging from 8-15 kilograms of mercury per hospital. Another hospital in the Bay Area identified 13 tons of plastics waste that could be diverted from incineration, by switching to recyclable containers for needles. Since waste incineration contributes to air pollution, including dioxin formation, this system can reduce the incinerator's emissions of toxic air pollutants. The partnership also identified a mopping system that reduces janitorial chemicals by 90%, conserves water, and reduces worker injuries because of its light weight and easy use. Our goal over the next year is to introduce this successful program to hospitals in southern California as well.

Environmental Management Systems: For many years, our Region has held a leadership role in promoting environmental management systems (EMSs) as a tool for achieving and moving beyond compliance. Through a number of innovative partnerships with industries and municipalities we have developed a good knowledge base about the benefits of EMSs. This experience positioned us well for our participation in the National Environmental Performance Track Program one of EPA's newest and most comprehensive beyond compliance programs.

Like other voluntary programs, Performance Track Program is successful because it builds upon the concepts of results and performance, going beyond regulations and enforcement. Instead of focusing on one aspect of environmental performance, such as waste generation or energy efficiency, the Performance Track Program asks partners to commit to the principles of EMSs for continuous improvements in multiple areas of environmental impact. For example, of the 32 partners participating in Region 9, collectively they have agreed to reduce solid waste by 8000 tons per year, lower emissions of greenhouse gases by 938 tons per year, and reduce water use by 100 million gallons per year.

Market Based Approaches

Market based approaches can be a powerful tool for achieving environmental

improvements more efficiently. In the Pacific Southwest, air quality and watershed protection are urgent matters. We have undertaken market-based experiments aimed at speeding our progress in both these areas.

For air quality, in southern California our region has been involved with the **South Coast Air Quality Management District ("SCAQMD")** in a regional "cap and trade" program that sets caps on sulfur and nitrogen dioxide emissions but allows industries to comply by reducing their own emissions or buying "credits" from other sources that achieved extra reductions. Over the last year we have become aware of increasing concerns regarding the potential shortages of emission reduction credits for use as offsets. Working closely with the SCAQMD we are developing innovative ways to generate emission reduction credits. We are currently exploring innovative options for mobile sources, such as alternative fuel garbage trucks, delivery vehicles, and marine vessels as potential categories for emission reduction credits. In fact, our region recently approved five mobile and area source credit rules in southern California which allow these emission reduction credits to be used for new source permits. We also expect that these emission credits will help promote further use of these alternative technologies.

In pursuit of our watershed protection agenda, the Administrator recently proposed a **Water Quality Trading Policy** that promotes the use of pollution reduction credits for trading in watersheds. Similar to the air "cap and trade" programs, the policy does not change any of the current regulations or standards but simply provides incentives for voluntary reductions from all sources to improve and maintain the quality of the nation's waters. Our region will be participating in this policy through a pilot program with the Sacramento Regional Wastewater Treatment Plant and the U.S. Geological Survey that will seek to develop an offset/trading program that reduces mercury loading into the Sacramento River. We hope the success of this pilot program will soon be extended throughout the Region.

Support of New Technologies

In the Pacific Southwest, we actively partner in testing new technologies -- to understand their relevance and benefits, and also to avoid any unintended negative consequences. Two interesting examples are cited in waste management and military base cleanup and closure.

Waste Management: Our region is involved in supporting the Yolo County Central Landfill in operating part of their landfill as a bioreactor. A bioreactor landfill involves a technology that uses controlled quantities of liquid to

accelerate the otherwise slow decomposition of waste. This acceleration increases the biodegradation of the solid waste and can decrease the composting time from over 30 years down to 5 to 10 years. Although the addition of liquid waste to a landfill is generally a prohibited activity under federal and state law, EPA and the state provided regulatory flexibility to operate part of the landfill as a bioreactor. Just recently the county has started its bioreactor operations and over the next five years we will be collecting data to determine whether this is a practice we want to offer to other landfills nationwide.

Base Cleanup and Closure: Another example, as part of the Superfund program our region has been part of an effort in the San Francisco bay area over the last 8 years to test various innovative technologies in the cleanup of closing military bases. This effort resulted in a number of new technology demonstrations on many of the bases including Mare Island Shipyard, Hamilton Field, and the Alameda Naval Air Station. We believe it helped to expedite the transfer of these bases to the local community for reuse and redevelopment and in the process accelerated the revitalization of local economies.

Improved Systems

Continued creativity in how we use our "established" processes to carry out

our regulatory responsibilities can be a potent source of better environmental protection. For example, our permitting programs can be daunting for industries operating in a fast moving international environment, such as electronics and computers which are significant economic sectors in our region. These plants are rapidly changing equipment and processes to meet new design specifications. Normally these changes require revisions to the facility's air permits which can take much longer to process than the manufacturer can tolerate.

For example, working with **Intel's Ocotillo site in Chandler, Arizona** EPA and Maricopa county developed an air permit which sets emission limits for the entire plant rather than individual pieces of equipment and processes. This permit provides much needed operational flexibility while maintaining the same overall environmental benefits. In the development of this "test" program, Intel also developed an Internet-based information system for keeping the neighboring communities up to date on events at the plant, and designed and built an advanced wastewater treatment system — of great importance in the desert environment of Arizona.

Another example involves **Imation's Camarillo, California facility** which manufactures magnetic data storage cartridges for the computer industry. Magnetic tape manufacturing is an industry characterized by rapidly

changing technology and markets, and Imation anticipates making several modifications at the Camarillo site to expand or improve existing operations or add equipment for new products. Such modifications usually would have to be approved at the time a project is about to be undertaken by issuing a permit to construct and/or modifying the source's existing permit to operate. However, Imation was allowed to make anticipated changes without separate project-by-project permit actions by working with EPA and the State. This was accomplished by establishing alternative operating scenarios in Imation's operating permit that characterize changes and assure that, if implemented, they will meet all requirements.

Creative Approaches to Compliance Assurance

In the region's compliance assurance program, we have also tried a variety of flexible approaches to promote environmental compliance. This work has focused on compliance assistance and creative use of settlements.

Compliance Assistance

Our region has been involved in a number of multi-agency efforts to provide better environmental compliance services to various small business sectors. For example, in the mid 1990s we were part of an effort in the San Francisco Bay Area to better meet the environmental needs of small businesses. Through a series of customer need surveys, small businesses were telling us

that they wanted an easier way to understand environmental compliance requirements, one source to go to for environmental compliance information, tips on cost saving pollution prevention and resource conservation strategies, and recognition for doing the right thing. Based on these requirements, EPA, the State and local governments developed a **green business recognition program in the Bay Area**. Working with businesses, we also developed industry-specific compliance checklists which in some cases took over 50 pages of regulations from 4 or 5 regulatory agencies and condensed them into an easy to understand 10 page checklist. Results in one Bay Area county have been impressive — significant participation by auto repair facilities has produced impressive reductions in discharges of pollutants to local wastewater treatment plants.

Based on the premise that the best ongoing delivery of compliance assistance is local, we have supported several state and local programs which target assistance to small businesses. For example, the **Nevada Small Business Development Center** trains and provides on-site consultations on environmental compliance to a variety of small business industries. There is a clear need for this service since last year the center trained 420 businesses and conducted 85 on-site consultations. In addition, the waste generated by these businesses was reduced by approximately

140,000 pounds and resulted in a total cost savings of $50,000.

In cooperation with national trade associations, we recently completed a **compliance assistance program for Bay Area auto repair facilities** that ultimately translated into an estimated 720 tons of pollution reductions and savings of more than $1 million for the participants. These type of results show that you can go green while staying in the black.

Creative Use of Settlements

In addition to seeking appropriate remedies in settling cases of non-compliance, the Region has also encouraged use of "supplemental environmental projects" ("SEPS") as alternatives to strictly cash penalty payments. These SEPs represent on-the-ground improvements that companies must implement as part of a settlement and often help to advance a pollution reduction or prevention agenda that is of importance to the local community.

For example, last year we reached a settlement with **Torrance Mobil Corporation** that called for the facility to fund two groundbreaking environmental projects in addition to paying a penalty for numerous multi-media violations. One project involved Mobil spending $800,000 to start a water recycling program at its Southland facility that is projected to greatly

reduce the facility's wastewater volume as well as cut back on overall water use. A second part of the SEP had the facility purchasing emergency response equipment for the Torrance Fire Department.

This is an example that demonstrates how EPA is working cooperatively to achieve the goal of environmental compliance and improved performance.

Future Directions

Let me now turn to future directions for our Pacific Southwest office. Recently, Administrator Whitman reaffirmed EPA's commitment to finding innovative approaches to environmental protection. The Agency's strategic vision for innovation – which was developed in consultation with stakeholders inside and outside EPA – is encapsulated in a report announced by Administrator Whitman last month. Entitled **"Innovating for Better Environmental Results"**, the report lays out four core strategic goals for the Agency:

- Strengthen innovation partnerships with States and Tribes.
- Focus on priority environmental issues such as reducing greenhouse gases, reducing smog, restoring and maintaining water quality, and closing the water infrastructure gap.
- Diversify environmental protection tools and approaches, to make better use of incentives, innovative technology, environmental

management systems, and new information tools.

- Foster a more "innovation friendly" culture within EPA.

We face significant challenges in the coming years. Experimentation requires durable partnerships, and those relationships require time. Measurement and communication of results are vitally important, and sometimes perplexing in their implementation. Transfer of knowledge in a speedy and effective fashion is often equally difficult. *Absorbing* lessons learned into the conduct of our business is another area where we have much to learn.

Our region is committed to the goals of this strategy. We have already initiated dialogues with our state and tribal partners, on potential innovative partnership programs. For example, this year we started working with various state agencies in California to collectively agree on a number of innovative projects for addressing significant environmental issues. Our goal is to complete similar dialogues with our other state partners by the end of this year.

We are committed to innovation as a significant ingredient to achieving our goals of cleaner air, purer water, and better protected land. We will continue to improve the system and accelerate the pace of environmental progress in the years ahead. Thank you. I will be happy to answer any questions that you may have.

Mr. OSE. Thank you, Mr. Nastri. We do appreciate you coming down.

Mr. NASTRI. Thank you.

Mr. OSE. Our next witness is Dr. A. Denny Ellerman, who a Senior Lecturer, Sloan School of Management, at Massachusetts Institute of Technology, and the Executive Director of MIT's Center for Energy and Environmental Policy Research.

Dr. Ellerman, welcome.

STATEMENT OF A. DENNY ELLERMAN, SENIOR LECTURER, SLOAN SCHOOL OF MANAGEMENT, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Dr. ELLERMAN. Thank you, Chairman Ose, and it's a pleasure to be here. I'm very grateful for this opportunity to discuss innovative approaches to environmental regulation, which is a field to which we've directed a lot of our research at MIT.

I'm going to direct my remarks this morning to a particular innovation in regulation that's known as cap-and-trade systems, or tradeable permit systems. This is one form of market-based incentive programs, which are typically contrasted with command-and-control programs, such as you've already referred, and which have served us well up to the present.

The essence of cap-and-trade programs is, as the name suggests, to cap the emissions, or to limit them in the aggregate, and distribute permits to emit, typically called allowances, and then to allow those permits to be traded among the entities that are regulated or that are subject to the cap.

The most successful of these programs by far has been the SO2 emission trading program known as Title IV of the 1990 Clean Air Act Amendments, also known as the acid rain program. The concept, prior to this program going into effect, the concept of cap-and-trade programs, or tradeable permit programs, had been largely theoretical, and I think this program has put theory into practice and has demonstrated a lot of very attractive features.

I would mention three lessons that stand out in particular, that we have learned from this experiment, and which have been repeated in other cap-and-trade programs, as well. The first, of course, is the reason that they were promoted in the first place, which was a cheaper way to achieve environmental goals, to be more efficient in an economic sense. All studies have been done of the SO2 trading program have shown that, in fact, the cost is less than if the same regulations had been imposed by more traditional command-and-control techniques.

The second lesson is one now that appears almost commonplace, which is that markets in these permits will appear. When this legislation was initially passed in 1990, there were a lot of doubts as to whether markets would appear. I think we know now that they have, and that contributes to the success of it. We can take it largely for granted, that markets will appear if the permits are created and distributed so that they can be traded.

The third lesson is the one that is a surprise to everyone, and it's one Administrator Nastri just referred to, which is environmental effectiveness. This program reduced emissions far more quickly and further than had been expected, I believe you said,

even by the economists. It certainly was a large reduction and greater than we'd experienced in other types of programs, so I think we do observe that cap-and-trade programs can be very effective, and more effective than traditional forms of regulation.

I'm often posed the question, well, why is this so? I attribute this to three elements of these programs, which if they are achieved I think means that they will be successful, and those three are simplicity, strict accountability, and flexibility. They are very simple programs, and the SO2 program is a classic in this sense. The requirement placed upon affected sources could not be more simple: to have a permit and to give up that permit for every ton that is emitted. There are no other side conditions, no technologies required, a facility is not even required to reduce emissions. It just has to have permits for every ton emitted. Since the total number of permits is limited, then, of course, that will require an aggregate reduction to be made.

Now, with such a simple requirement, strict accountability is almost unavoidable. There's no other basis upon which to judge compliance other than whether there is a ticket corresponding to the ton. This is very different from command-and-control. The requirement may sound simple—install this piece of equipment, or adopt certain practices—except uniform rules are not always equally applicable upon all sources, and therefore various exceptions and relaxations are made in the process. So, that simplicity leads to strict accountability and makes it possible, because now there is only one criteria and, in fact, requires the strict accountability that contributes to the environmental success.

With such strict accountability, from an environmental standpoint, or from a regulator's standpoint, one can allow complete flexibility, which is what we observe. We know the emissions will be reduced and, therefore, we can be much more relaxed if it's a well-designed system, concerning whether the reductions will, in fact, be made.

Let me close briefly by saying that cap-and-trade had been largely a theoretical concept. It has now moved out of the text books and into practice. I would stress that it may not always be appropriate in all circumstances. There are cases where there is no alternative but to resort to command-and-control regulations. It depends upon the nature of the environmental problem.

What we do know now is that these programs, the cap-and-trade programs, work well, and that where applicable—and I believe that will be in a vast number of circumstances, although each one will be different—that they are better for the environment and better for the economy than the conventional way of doing things, and they are an appropriate approach of environmental regulation for the next generation problems that the country now faces in the environment.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Ellerman follows:]

STATEMENT OF A. DENNY ELLERMAN[1]

BEFORE THE SUBCOMMITTEE ON ENERGY POLICY, NATURAL RESOURCES AND REGULATORY AFFAIRS
UNITED STATES HOUSE OF REPRESENTATIVES

MAY 28, 2002

Thank you for this opportunity to appear before the Subcommittee. Chairman Ose's letter of invitation noted both the progress in cleaning up pollution from large industrial sources over the past thirty years and the more complex and intractable environmental problems now faced that defy the simple solutions of the past and call for more flexible and innovative approaches. My remarks are directed to one of these new approaches: the use of cap and trade systems for controlling air emissions. This innovation in environmental regulation has been receiving increasing attention throughout the world, but the only country with appreciable experience with this regulatory innovation is the United States and enough experience has been gained that some lessons can be drawn. My comments are based upon research conducted at MIT by a group, including myself, that have focused primarily on the SO_2 cap-and-trade program, which is the largest and most successful of these programs.[2] I will also comment on the Regional Clean Air Incentives Market (RECLAIM) program for NO_x, where the same principles have been applied but with less success.

Cap and trade systems are defined by 1) an aggregate limit or "cap" on emissions from some geographic area, 2) the breaking up of that cap into tradable allowances that are distributed to emitters in some manner, and 3) the requirement that emissions from all affected sources be covered by an equal number of allowances. This approach to environmental regulation is often contrasted with the conventional approach, usually characterized as "command-and-control," by which individual sources of emissions face

[1] Senior Lecturer, Sloan School of Management, at the Massachusetts Institute of Technology (MIT) and Executive Director of MIT's Center for Energy and Environmental Policy Research. The opinions expressed here are my own and do not necessarily reflect the views of MIT or of any other organization with which I am associated. A copy of my resume is attached.

[2] The book, *Markets for Clean Air: The U.S. Acid Rain Program*, by A. Denny Ellerman, Paul L. Joskow, Richard Schmalensee, Juan-Pablo Montero, and Elizabeth M. Bailey (Cambridge University Press, 2000) is

a specific mandate, usually in the form of installing particular equipment, engaging in specified practices, or limiting the emission rate.

The labels, cap-and-trade and command-and-control, are appropriate and revealing of the differences between these two approaches. With conventional, command-and-control regulation, emissions are typically not capped and emission reduction obligations cannot be traded. Emissions will typically increase with increasing economic activity, albeit at a lower level than if the regulation were not in force. Also, emission control obligations cannot be rearranged among sources without specific authorization from the regulator. Doing more than required may earn a pat on the back, but there is no monetary incentive or reward for doing so in a command-and-control system. And, while in theory no one is doing less than required, one rule rarely fits all and those upon whom the rule may impose unique hardship typically gain a relaxation of the requirement. Similarly, in a cap-and-trade system there is no command or control in the conventional sense. Individual sources are at liberty to reduce emissions in any particular way they can and in whatever amount suits them, provided allowances are obtained and given up in number corresponding to the level of emissions. This proviso is very important and it is, in a sense, a command; but it controls only at the aggregate level while allowing maximum flexibility in implementation. Since allowances are limited in number, every ton emitted above the average is off-set by an additional ton reduced elsewhere.

Comparisons between cap-and-trade and command-and-control systems are typically unfavorable to the latter; and before going any further, I want to put this matter in perspective. Just as a single technology mandate is inappropriate for all sources, so is one system inappropriate for all circumstances. Command-and-control approaches will be more appropriate in certain, and perhaps, many situations. The cap-and-trade approach has gained so much attention because it is the new entrant and its role in environmental regulation is increasing at the expense of command-and-control, but that does not mean that it could or should displace command-and-control approaches everywhere. The

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the most complete statement of this research. More recent research can be found at the website of the Center for Energy and Environmental Policy Research, http://web.mit.edu/ceepr/www/.

appropriate share, so to speak, depends on the circumstances of the environmental problems being addressed.

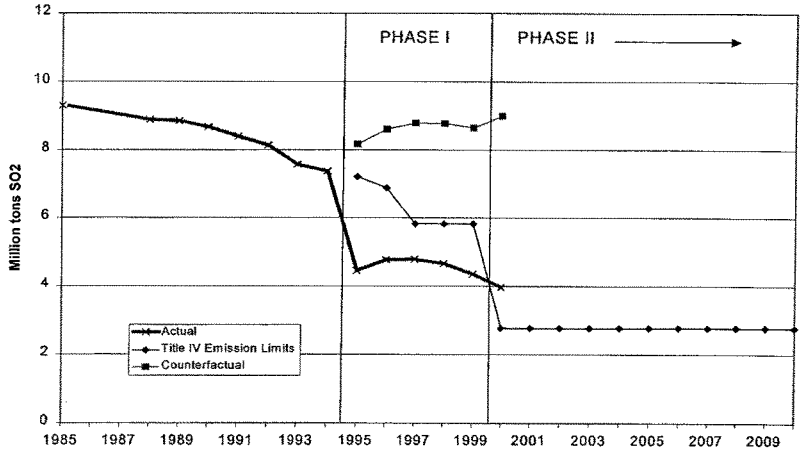
Also, as noted in your letter to me, Mr. Chairman, the command-and-control system that has been in place for the past thirty years has been effective in achieving environmental goals and has generally served the country well. Having said that, I would hasten to add that times change and that what worked well in the past may not do so in the present or the future. No one gets a free pass in life, and this adage applies to regulatory systems as well as to persons. The environmental problems now being faced are different from those the country confronted thirty years ago, as are the regulatory tools and the technology available to us now. In particular, environmental problems are much less attributable to the obvious, big sources and increasingly due to dispersed stationary and mobile sources that are more closely tied to individual behavior and more in need of the decentralized incentives that the markets created by cap-and-trade systems can provide. Also, the advances in information technology over the past decade or two have made it possible to measure and to monitor emissions and to keep track of allowances to an extent that was possible before, only at much greater cost. A good argument can be made that, in those earlier days, the nature of the problem and the technology available favored command-and-control over cap-and-trade. The circumstances are the opposite now, but the underlying criterion then, as it is now, is: Which system works better in the particular situation.

The country now has seven years of experience with the nationwide SO_2 emissions trading program, also known as the Acid Rain Program, that came into being in 1995 as a result of Title IV of the 1990 Clean Air Act Amendments. There are many lessons to be drawn from this experience, but three stand out.

The first, and perhaps the most important, is environmental effectiveness. SO_2 emissions from the largest emitting units, know as Table A units, which were first subject to Title IV in 1995, fell by a striking 45% in the first year of the program. The attached Figure 1 puts this drop in emissions in perspective, by also showing emissions from these units before and since 1995, the level of the cap, and an estimate of the counterfactual, or what emissions would have been without Title IV. After rising slightly, emissions are

now 10% lower than they were in 1995 and they are clearly headed down by another 30% to the level of the Phase II cap. Because of banking, the extent to which emissions are lower than the annual cap in Phase I will be made up by emissions higher than the annual cap in Phase II, but as long as we consider it better to have the emission reduction sooner rather than later, this is a gain. To my knowledge, no other environmental control program can claim such success in its first year. And the ability to bank, that is, to reduce emissions more in Phase I in return for less emission reduction in the early years of Phase II is clearly one of the incentives causing this acceleration of the required emission reductions.

Figure 1: The U.S. Acid Rain Program in Historical Perspective (Table A Units)

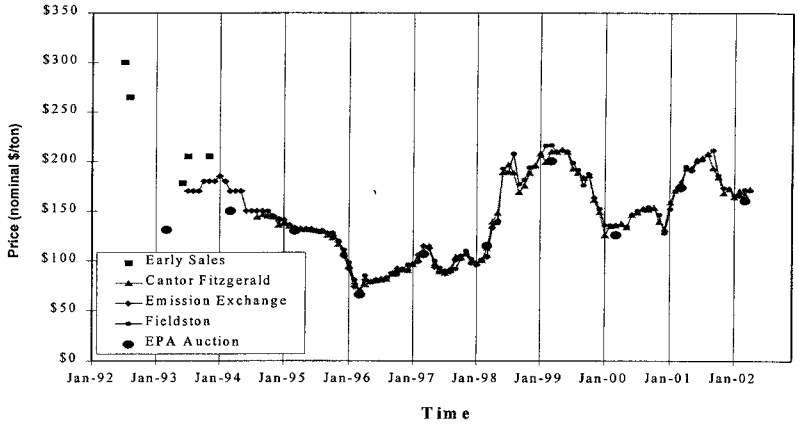


Two other features relating to the environmental success of this program deserve note. First, compliance has been 100%. There have been no exemptions, deferrals of deadlines, or other administrative measures that detract from the environmental effectiveness of most command-and-control programs. Second, 83% of the reduction in SO_2 emissions took place in the Midwestern states that were the primary source of acid rain precursor emissions. I mention this fact because of the concern expressed about this program (and others) that the reductions would occur in the wrong places when trading is

allowed. That has not happened in this program and the reason is clear. The cheapest emission reductions are generally found at the biggest, dirtiest sources; and cap and trade programs create incentives for units with the cheapest costs to reduce more.

The second lesson from the SO_2 emissions trading program is that markets will emerge, almost effortlessly, to facilitate trading when regulators allow emitting sources to trade. We have seen this phenomenon so often now, in one program after another, that it seems almost a commonplace, but it should be remembered that grave doubts were initially expressed concerning whether such a market would emerge. Figure 2 illustrates the emergence of this market. Keep in mind that, when markets exist for some service or commodity, there can only be one price. The few early SO_2 allowance transactions, in 1992 and 1993, occurred at widely divergent prices as reported by various sources. By mid-1994, price quotes from different sources had converged and since then have stayed close together at any one point in time, although that one price may change considerably from one period to another.

Figure 2: SO_2 Allowance Prices, 1993-2002 (1995 or Current Vintage)



The third lesson is that emissions trading reduces the cost of reducing emissions. When Title IV was being legislated and thereafter, a wide range of estimates for the cost of compliance existed. The higher cost estimates assumed that trading would emerge

slowly if at all, and the lower cost estimates usually assumed that trading would work. The program came in at the lower end of these cost estimates, around $750 million annually in Phase I, in large part because a market for trading SO_2 allowances emerged. Research by my colleagues and myself estimate the cost savings due to emissions trading in the acid rain program at about half of what the cost would have been without trading.[3] This research does not support claims that emissions trading can reduce costs ten-fold or more; however, cost savings of 50% are significant and not to be dismissed just because they are not as great as may have been hoped.

Lessons are to be learned not only from successful programs, but also from a less successful one: the Regional Clean Air Incentives Market for NO_x established by the South Coast Air Management Quality District and better known as RECLAIM.[4] This program seemed to be working well until the California electricity crisis that started in the summer of 2000. The increased demand placed upon natural-gas fired units in the Los Angeles Basin, which had been used previously only for peaking duty, greatly increased the demand for NO_x RECLAIM Trading Credits (RTCs) and the price of these permits sky-rocketed from several thousand dollars a ton to a high of nearly $90,000 in less than half a year. At this point, it became impossible to obtain NO_x RTCs at any price and operators were authorized to continue operating without permits on an interim basis in order to keep the lights on. A series of measures were taken subsequently that effectively took power plants temporarily out of the NO_x RECLAIM program, mandated that they install specified pollution control equipment, and required them pay a mitigation fee of $15,000 for every ton of NO_x emissions above the facility's RTC allocation.[5]

The extreme price volatility exhibited by the NO_x RECLAIM program has raised many questions concerning price volatility in cap-and-trade programs. These concerns are legitimate and I would like to place the NO_x RECLAIM experience in perspective. Nothing like the price volatility seen in the NO_x RECLAIM program has been experienced in the SO_2 program. Whereas the ratio of early 2000 prices to the peak price

[3] See in particular chapter 10 of *Markets for Clean Air, op. cit.*
[4] A separate RECLAIM program for SO_2 emissions has also been established. My comments pertain only to the NO_x program.
[5] South Coast Air Quality Management District, *Preliminary Draft Staff Report for Proposed Amendments to Regulation XX—Regional Clean Air Incentive Market (RECLAIM)*, February 2001.

later in the year in the NO_x RECLAIM program was 1:30, the ratio from the lowest to the highest observed price in the SO_2 program is 1:3. The SO_2 program has never been subjected to strains similar to those placed on the NO_x RECLAIM program by the California electricity crisis of 2000-01; however, other features of program design are important in understanding the contrasting price behavior. The key factor is market scope: the SO_2 program is nation-wide in scope and unlimited banking is allowed, whereas the RECLAIM program is restricted to the Los Angeles Basin and very limited banking and borrowing are allowed. A similar surge of demand in the acid rain SO_2 program could be supplied from a much greater geographic area and by drawing down the accumulated bank. The nature of the environmental problem in RECLAIM is such that geographic scope is necessarily local, but greater flexibility in trading between adjacent compliance periods would have dampened the volatility experienced in 2000 considerably. If allowances unused in earlier periods could have been banked, the price spike would have been less. By the same token, if sources have been able to borrow from the future, by using future vintage allowances in the current period (at a discount), the price volatility would have been less. Borrowing would have given sources the flexibility to comply in the current period and the time to install the abatement equipment that would be required to meet the future cap that has been made lower by the borrowing. In fact, the measures the SCAQMD has taken is equivalent to what sources would have done had they been able to borrow.

One of the lessons of general applicability that I draw from the experience in California for the design of cap-and-trade programs is that limited borrowing should be seriously considered in all programs and incorporated where it does not frustrate the environmental goal of the particular program. As I have noted above, emissions have exceeded the cap in this program and the intent is to offset them in the future by purchasing offsets from outside the program and mandating retrofitted abatement equipment on a number of sources. Another broad lesson from the NO_x RECLAIM program is that the design of a cap-and-trade program matters. The more robust the design, the more likely it is to work when tested by extreme events.

One of the most important, and least appreciated, prerequisites of a cap-and-trade system is the ability to measure emissions with reasonable accuracy. Quite simply, if the

emissions being controlled cannot be measured, an effective cap and trade system cannot be implemented. It bears noting that most of our environmental regulations do not require that emissions be measured. The usual requirement is to install some equipment or to adopt some technique that will reduce emissions. Compliance consists of ensuring that the equipment is installed and operated. Emissions are not measured, but good engineering estimates can be made using assumptions concerning the effect of the equipment and its operations. One of the benefits of the advances in information technology during the past decade or two has been that emissions can be measured more accurately, more cheaply, and often in real time to an extent that was never possible before. As a result, cap-and-trade systems are more feasible than before.

A second requirement of cap-and-trade systems is that the emissions falling under the cap must have an approximately equal effect in mitigating the environmental problem that justifies the cap in the first place. To take an extreme example, it would make no sense to trade NO_x emission reductions in New York for NO_x emission reductions in the Los Angeles Basin. The scope of the cap depends on the environmental problem and there is no single prescription. Sometimes, the scope can be global, as is the case with ozone-depleting substances and as would be the case with greenhouse gas emissions. In other instances, such as the RECLAIM program, the scope will be necessarily local. Having made this point, it should be quickly noted that knowledge of environmental effects is not such as to allow an exact identification of sources and effects and that regulators should err on the side of inclusiveness in the interest of creating broader trading areas that will reduce the problem of price volatility.

One of the greatest virtues of cap-and-trade systems is the utter simplicity of the compliance requirement: to give up an allowance for each ton of emissions. When the number of allowances sums to the cap, this requirement is all that is needed to ensure compliance with the cap. This simple one-to-one relationship has had two consequences that help to explain the success of these systems: strict accountability and flexibility.

With a requirement so simple, there is no alternative to strict accountability. A source either has an allowance to give up or it doesn't. In contrast, the mandates of command-and-control systems often sound simple—install this or that—but they are

rarely so in practice. Conditions vary from source to source and invariably the seemingly simple and straightforward mandate imposes undue hardship on one source or another because of conditions unique to that source. Such circumstances lead, as indeed they should, to exceptions or other forms of relaxation in order to achieve an equitable application of the simple rule. We are all aware that some petitioners may be seeking competitive advantage rather than equitable exception and that regulators are not omniscient, but the worst aspect of this process is its asymmetry. For every source facing undue hardship, there is another for which the application of the uniform rule imposes less cost or difficulty than the average; yet, under a command-and-control program, these sources can never be expected to step forward with offers to do more in order to mitigate the greater hardship faced by others. The great advantage of cap-and-trade systems is that this off-setting is automatic as those facing higher costs seek out those facing lower costs and effect trades through the market. And in a market with many buyers, no single one can claim to face a unique hardship. The result is an absence of the administrative petitions for equitable exception that undermine the strict accountability in command-and-control systems.

The second implication of the one-to-one relationship between emissions and allowances is flexibility. This single requirement gives the operator complete flexibility in deciding how to comply at a particular source, even to deciding not to reduce at all, so long as sufficient allowances are given up to match to tons emitted. Of course, the allowances cost money and the operator can be expected to undertake any abatement costing less than the market price and to avoid only that abatement that costs more. With a well-designed cap under which the emissions are approximately equal in effect and with strict accountability, the regulator can afford to be relaxed about this flexibility to an extent that would not be possible with command-and-control mandates.

I hope that I have conveyed the promise of cap-and-trade programs for addressing environmental problems, while also indicating what is required to make them work. Cap-and-trade programs are not necessarily appropriate for every environmental problem, but I believe that they are appropriate in a surprising number of cases. Their performance to date warrants giving them careful attention and adopting them whenever possible.

Mr. OSE. Thank you, Dr. Ellerman.

The final today is Dr. Kenneth Green. Dr. Green joins us from the Reason Public Policy Institute, where he serves as an Environmental Scientist.

Welcome.

STATEMENT OF KENNETH GREEN, CHIEF SCIENTIST, REASON PUBLIC POLICY INSTITUTE

Dr. GREEN. Thank you, Mr. Chairman.

Given the comments of the previous witnesses and yourself, I will, indeed, skip ahead and try to focus my testimony on the parts that shed the most light.

My own interest in environmental policy originates quite a ways back in this local area, 27 years ago. I grew up in the San Fernando Valley about an hour or so north of here, which I guess may get a new name in a few years, or it may not, but we'll still have the summertime air pollution problem. I discovered the hazards about environmental contamination the hard way when I was in junior high school and running the 600, and was coming around one of the last turns at the 450 yard line and had my lungs lock up completely and staggered across the finish line and couldn't breathe. That was when it was finally determined I had asthma, when it became somewhat less ambiguous, and I realized that air pollution was not just something that is irritating to the eye, it's actually quite devastating to people's lifestyles.

That interest took me forward to study more about the environment, study more about biology and health, but also there were other experiences in my childhood that taught me that we need to find ways to solve environmental problems and still preserve people's ability to live their lives and pursue their dreams. In my case, I bounced from having asthma and being unable to basically hardcore exercise. About a year later I was Bar mitzvahed and took my Bar mitzvah money and bought a small motorcycle with it, which, of course, would horrify many people now, and sadly enough it's probably illegal for the rest. But with that I could go places that otherwise would never have been accessible to me in terms of going out and looking at nature. And, in fact, there were plenty of old mining trails that I could take on and go over anything pristine; in fact, the trails I was riding on had been packed down in the 1850's. It was unlikely I was adding to the damage there, but I realized at the time that we need to find ways to both protect the environment and protect people's ability to actually profit by it, to become better people because of their interaction with it.

Now, I've spent the years since then looking for those approaches, primarily, in air quality, but also in water quality, and also in species preservation, and global warming, and other areas of endeavor. What I found in that research, and also at Reason, is that the approaches that rectify those two different interests, which is solving the problem, but also protecting people's ability to live their dreams, tend to focus on flexibility. They tend to focus, as you said, on results, not on the number of permits issued, not on the number of lawsuits brought, not on the number of fines levied, but on actually achieving environmental results. They tend to focus on cooperative approaches that tap people's ingenuity and

entrepreneurialism. I think part of the reason they may have found that their expertise was very seeded in the Acid Rain Trading Program is because while they had accounted for the standard economic benefits of using individualized incentives, there also was a creation of entrepreneurial opportunity. And, so, you have, you tap a well of creativity that gets you more than simply the homo economic view of, well, people will reduce their emissions in order to reduce their operating costs. You create a whole new class of people who find an interest and find a benefit in making that more efficient and more effective, and that entrepreneurialism is probably that margin between what the economists said they would get and what they actually got.

So, I want to actually spend most of my time today talking about examples of where things have worked, where we have solved environmental problems without the bitter and recriminatory legislative process, or regulatory process, or judicial battles that steer environmental resources more to advocates or attorneys than to problem solvers.

And, I agree completely with Mr. Nastri that we have had great successes in the past, including some through regulatory approaches, but those problems really were a very unsubtle sort; those were burning rivers, and heavily contaminated air sheds, and heavily damaged open waste sites, and the low hanging fruit really has been plucked. If we're going to move forward successfully, we need to emulate these programs to show how greater cooperativity and greater creativity can solve problems more effectively.

So, one example. Let's consider the air, which is still an issue here in California, as you pointed out. Under the traditional permit-based approach for cleaning the air, Massachusetts was using permits, issuing them. They had 10,000 businesses that they were regulating through 16,000 permits. But, almost 4,500 of those permits were for tiny mom-and-pop businesses that were only 5 percent of the State's total air pollution emissions. So, they looked for a more cooperative way.

Under the Environmental Results Program, they instituted permit systems that were whole facility based, that is, a facility could agree to an industry-wide standard, but then how they achieved it, what equipment they used, was left up to them.

And, signing on to that agreement got results. In the first few years, they knocked a 43 percent reduction in fugitive emissions from participating dry cleaners, and a 99 percent reduction in silver discharges by photo processors. Those are just two sectors that joined the pilot program.

A similar program was implemented in New Jersey; they capped emissions on participating firms, but let them choose how to do it. For one firm alone they dropped from 80 single permits to a single permit. They reduced 8.5 million pounds of air emissions in a year because they could update their facilities more efficiently.

There are still many opportunities for us to form or to improve some environmental rules that are still regrettably command-and-control oriented, and/or we still have serious environmental problems that are too tricky for the blunt objects approach. Several were named here.

I know there are a couple that weren't named that I'd like to put on the record, including smog check, which is still done here in California. It's a program in which, despite our knowledge that 70 percent of the cars are not significantly contributing to the problem, we test 100 percent of all vehicles as if they were equally the same. And, down water protection, service water protection, which despite knowing that a great deal of our failure has been our focus on engineering nature, to channelize water flows and to use better and more hydraulically ambitious control systems, we have not looked at the question of how we can use market-based incentives to work with nature and to lead people to make less impervious surfacing that uses nature to actually prevent non-point sources from reaching water supplies in a concentrated peak flow way that is known to cause a large part of the problems we now face.

So, on that note, I look forward to questions and talking to you more about it.

Thank you for inviting me today.

[The prepared statement of Dr. Green follows:]

Testimony of
Dr. Kenneth Green
Chief Scientist
Reason Public Policy Institute

Hearing on Environmental Innovation

Before the United States House of Representatives
Subcommittee on Energy Policy, Natural Resources, and Regulatory Affairs
May 28, 2002

Thank you Mr. Chairman. I am Dr. Kenneth Green, an environmental scientist with the Reason Public Policy Institute, a project of the Reason Foundation, a non-profit, non-partisan policy research and education organization headquartered in Los Angeles.

My interest in environmental policy originates quite a ways back, over 27 years, in fact, to the year when I was diagnosed with asthma, living a few hours north of here in the smoggy San Fernando Valley of decades past. I learned about the hazards of extreme environmental contamination the hard way: one day, when running the 600, my lungs simply locked up. I collapsed at the 600-yard line, my breath sounding like a steam whistle.

From then on, I was one of the kids you often see profiled in environmental media reports - sentenced to corrective physical education, to sit and play checkers while the other kids were out on the gym field.

Growing up with asthma taught me how important it is to have a healthful environment, and how radically environmental health hazards can impact the lives of our children.

But growing up with asthma was not my only formative experience. My father died when I was very young, and after a short stint with an abusive second husband, my mother decided to raise her two sons by herself, out in Los Angeles.

It was a brave decision that started out well at a small sandwich shop she opened with a friend, but they ran straight into the teeth of the 1970s economic recession. As local building projects were cancelled, the business failed. As rents inflated, and salaries stagnated, we were bumped from apartment to cheaper apartment.

I went to four different elementary schools in only two years. My mother's health, none too good to begin with, wasn't helped by the constant stress of trying to make it in an economy that was fighting against her.

Things stabilized a bit by the time I was 13, when my Bar Mitzvah brought me back a certain amount of my outdoor liberty.

Though it will no doubt horrify some listeners here today, that was when I took my $200.00 in Bar Mitzvah money, and bought a small off-road motorcycle – an 80cc Yamaha, to be specific.

Camping was the one recreation we could afford, and though I couldn't hike, even in the clean air of the mountains or desert, I could ride, and boy, did I.

That little bike took me places that would make mountain goats nervous. It let me indulge my budding love for nature in ways that would have been impossible to me without the motorized assist.

That love for things natural formed the core of my motivation that ultimately carried me through my doctorate in environmental science and engineering at UCLA.

My smoggy childhood taught me these lessons that I've never forgotten:

Environmental quality is a vital good.

A sound economy is a vital good.

And the freedom of mobility, and the ability to develop oneself are vital goods.

My subsequent studies taught me, fortunately, that one needn't trade one of these for the others. Indeed, studying environmental science and policy convinced me that choice and economic competition were not the enemies of the environment. Rather, choice, competition, and technological progress are the wellspring of safety, health, and environmental quality.

I've spent the years since my graduation looking for approaches to environmental problems that embody the wisdom of environmental science – approaches that are holistic, flexible, and cooperative.

Such approaches that tap into local knowledge are not only more likely to produce results, they are less likely to breed angry litigation, the ultimate waste of resources we need to invest in environmental quality.

Though muted by the events of September 11, debate over the direction of environmental policy has continued in the United States.

While many voices champion initiatives elevating the voluntary over the mandatory, the flexible over the rigid, and the decentralized over the centralized, those in opposition seem to hold an old, 1970s, "us versus them" mentality that holds voluntary, cooperative, and locally-derived approaches to solving environmental problems to be inferior to centralized, command-and-control approaches driven from Washington, D.C.

As a policy analyst without governmental portfolio, it's not my primary job to take sides in the political squabbles over who is, or who is not an environmentalist. But it is my job to defend approaches to environmental protection that can move society out of the bitter, recriminating legislative, regulatory, and judicial battles that have turned environmental policy into a battlefield, rather than the shared journey it could and should be.

In its time, the regulatory approach did considerable good – We have virtually eliminated open dumps, our air is constantly cleaner, we've reduced pollution in our surface waters, which no longer burst into flame, though we have a way to go before we can claim victory in that environmental arena.

But the low-hanging fruit that yields to such methods is pretty much plucked. The environmental problems that remain are not the simple ones of the past that might yield to blunt-object regulatory approaches.

Today's problems require all the creativity that can be brought to bear, from the people with the local knowledge of the problem, and the technologies or behaviors that might ameliorate those problems all working together, rather than fighting it out in courtrooms, where only the lawyers benefit.

I'd like to review a few of the voluntary, cooperative, and locally-derived environmental policy approaches that have gotten results without all the negative baggage that command-and-control regulations historically breed.

First consider the air. Under the traditional permit-based approach to cleaning the air, Massachusetts found itself in an uncomfortable position in the 1990s, regulating some 10,000 businesses through 16,000 permits.

Some 4,400 of those permitted facilities were small, mom-and-pop businesses that, combined, only emitted about 5 percent of the state's total air pollutant emissions.

So the state looked for a better way. Under the Massachusetts Environmental Results Program, a voluntary approach was tried.

Participating firms agreed to comply with a set of industry-wide whole-facility emission standards developed in cooperation with the Massachusetts Department of Environmental Protection.

Signing on to this voluntary, mutually agreeable standard would gain the small businesses of Massachusetts's freedom from the equipment-based permits that kept them mired in a regulatory morass.

And the program worked. In the first few years alone, the program resulted in a 43 percent reduction in fugitive emissions from participating dry cleaners, and a 99 percent reduction in silver discharges by photo processors.

A similar program was implemented in New Jersey, which set emission caps on participating firms, but let them achieve those emission targets in whatever ways they felt were most effective and efficient.

For one firm, the old source-by-source permitting processes had generated ten full binders of paperwork. The new system replaced 80 separate permits with a single permit, and could be processed in 90 days, rather than the 18 months required under the old system.

The result? One firm estimated that it reduced 8.5 million pounds of emissions per year because the new system allowed them to modernize their facility without the pain of individual equipment permitting.

Through the modernization, the firm eliminated 107 of 350 pieces of equipment.

Now let's talk about water. In California's Feather River basin in 1985, Pacific Gas and Electric discovered that 250,000 cubic yards of silt was piling up behind its dams.

Since the sedimentation was reducing reservoir capacities and damaging power generation systems, PG&E was about to follow the standard, and legally acceptable approach of dredging the reservoir.

But a concerned history teacher named John Schramel, county supervisor of Plumas County, proposed that the money earmarked for the dredging be used in upstream erosion-abatement programs instead, solving the cause of the sedimentation problem, rather than the symptoms. Gathering a coalition of anglers, business owners, government officials and environmental activists around his dining room table, Schramel formed the Feather River Alliance as a means to restore some of the local creeks and watersheds.

With funding from PG&E, the group did a trial run on the Red Clover Creek, and not only dramatically reduced watershed erosion and sedimentation, but restored what was a barren range riddled with sagebrush into a wet meadow lush with wildflowers and waist-high grasses, geese, herons, and sandhill cranes.

The Upper Clark Fork River basin in Montana has been utilized for over 100 years for mining and smelting purposes, and the water has steadily degraded.

In fact, 140 miles of the Clark Fork River, from Butte to Milltown, Montana constitute the largest Superfund site in America.

By the mid 1980's, copper and zinc concentrations in the water were high enough to be toxic to fish, and logging operations in the area were causing soil erosion and streambank degradation.

In 1985, environmental groups pleaded with Montana's department of Fish, Wildlife and Parks (DFWP) to initiate conservation efforts to increase instream flows to protect fish and wildlife habitats.

The DFWP agreed, but its plan was not exactly nuanced. The DFWP's conservation effort would have halted all development in the basin, setting aside the water as a nature conservancy.

While area businesses were willing to work to see the river cleaned up, a ban on all water use would simply have run the local businesses needing that water for irrigation right out of business.

Having already spent over $1 million dollars in court over a previous hearing on the Missouri River, area irrigators wanted to avoid the judicial solution pathway.

Fortunately, a way was found out of the impending conflict. The Northern Lights Institute, a neutral third party stepped in to coordinate a voluntary agreement allowing the basin's water users and managers to develop a basin management plan that would balance the interests of all the users while preventing any new demands to be made on the river's flow.

Now over 10 years old, the Clark Fork project has a council of 21 members that work to not only clean and protect the river, but to balance the interests of the diverse area residents who want to use the river for business and recreation.

It has become popular to pooh-pooh voluntary, cooperative approaches to environmental problem solving of late, particularly as the Bush administration has made that a focus in setting environmental policy, and some groups seem determined to keep environmental policy debates as partisan as possible, though polls show that virtually all Americans are environmentalists, regardless of where they work.

Further, success stories abound showing that such approaches have been embraced by members of both major political parties, industry groups, environmental activists, and informed citizens.

To sum up, then: the low-hanging fruit of environmental problems has been plucked in the United States, and the problems that remain are tricky. Solving those tricky problems, while retaining the choice and economic competition that are the wellsprings of our safety, health, and environmental quality will require the cooperation of all parties, flexibility on all sides, the tapping of local knowledge, and the avoidance of wasteful litigation.

As Reason researchers have pointed out, environmental problem-solving works best when regulators: work cooperatively with the regulated community; set clear performance-based criteria for success; limit regulation to situations where a net environmental benefit is possible; give the regulated community maximum flexibility in

achieving environmental improvement, and use measures that tap the incentive powers of the market, and adhere to a "polluter-pays" principle.

I thank you for the opportunity to speak to you today, and I will gladly take your questions.

Mr. OSE. Thank you, Dr. Green.

I want to thank each of our panelists, and I learned early on that when I decided to run for office the first thing I had to do every time I went out in public was introduce my wife. I commited a somewhat faux pas in not thanking Chapman University this morning for hosting us here, so I want to do that while I'm thinking of it.

Gentlemen, each of your comments suggest that there are things that we are going to have to continue on with but we also have opportunities over here being under air and water, to take advantage of new technologies and what have you.

Now, we had a hearing in Washington recently about elevation of the EPA to Cabinet-level status. One of the things that we talked about here was the data on which many decisions are made, that it's sparing at best, that there's a lack of a data collection system at EPA.

I don't remember which of your testimonies—I think it was Dr. Ellerman, who said there seems to be more of a focus on process than there is on accounting, or having a numerical count, or a quantification of the impact. I guess my first question would be, when you look at command-and-control versus cap-and-trade are you actually measuring the impact on the environment, are you measuring reductions in actual pollution, or are you measuring number of permits issued?

Dr. Ellerman.

Dr. ELLERMAN. Let me respond to that. The number of permits should approximate what we believe would be the level of emissions that would avoid pollution or would mitigate the particular environmental problem.

If you take the Acid Rain Program as an example, at the time it was passed the belief and the estimate was that a 50 percent reduction of sulfur oxide emission would be required to reduce deposition to a level where natural systems could recover from damages from acidification.

That was the rationale for the cap, and so that then becomes a proxy for that environmental problem, for solving that environmental problem. Now, it may change over time. President Bush's proposal for the Clear Skies initiative, for instance, proposes a further reduction in that SO2 cap. When we talk about the environmental problem, there can be several steps.

There's no question emissions have gone down. Deposition has gone down dramatically in the areas in the northeastern part of the country that was the main area of concern. The tests that have been taken of ecosystems, show, in fact, that the sulfur component of acidification has reduced. It takes a longer time for these systems to recover, and nitrogen oxides continue to be a problem in the acidification of these sensitive areas, but the sulfur component has definitely reduced.

So, I think it can be said that we are not simply tracking permits. That is the regulatory tool, if you wish, that in some ways replaces the command. It's just this limit, and it has to be based upon environmental science, and assessments of technology, as to what's a level of emissions that will avoid unwarranted damages.

Mr. OSE. All right.

Give me an example of a command-and-control approach.

Dr. ELLERMAN. The Acid Rain Program was before Congress for about 10 years before it was finally passed. The early 1980's legislative proposals were, in fact, command-and-control, and they would typically require that scrubbers would be mandated for a certain number of plants, and the number varied from proposal to proposal but the idea was that all the big plants will be required retrofit scrubbers in order to reduce the SO2 emissions.

Mr. OSE. If you have a stack and you've got something coming out of the top of the stack, you've got to put a scrubber on it.

Dr. ELLERMAN. Yes, that would have been the requirement.

Now, that would have the same effect of reducing emissions, and I think we should not kid ourselves, command-and-control can be effective. As you've said in your opening statement, the command-and-control system has reduced the gross sources of environmental pollution.

It's just that it's costly to start with. In some places scrubbers cost much more than they do in others, and as we have learned, that unequal incidence of cost leads to relaxations of requirements, which is——

Mr. OSE. Hardship reasons.

Dr. ELLERMAN [continuing]. Yes, for equity reasons, which implies hardship. One of the beauties of the cap-and-trade system is that it allows parties to find an automatic offset.

Mr. OSE. Now, you did some comparative analysis between a command-and-control approach versus a cap-and-trade approach.

Dr. ELLERMAN. Yes.

Mr. OSE. In terms of, not only its monetary efficiency, but also its net impact to the environment in terms of reductions in pollution.

Did the cap-and-trade approach achieve the same goals as the command-and-control approach; was it less, greater?

Dr. ELLERMAN. Yes, it did. It achieved the goal, and I would say more, it accelerated the goal, because of the banking provisions and allowing plants to reduce sooner, and to get credit for early reductions.

Actually, not only did it achieve the same reductions, and I would argue more because there were no relaxations, but it moved the reductions forward in time.

Mr. OSE. Your point being that the owner of that smokestack could buy something, buy a scrubber that, perhaps, exceeded the requirements, and then the incentive remained in that acquisition because you could then take those savings and apply them to future year testing.

Dr. ELLERMAN. That's exactly correct.

Mr. OSE. And, that's the acceleration you are talking about, you bring it up sooner.

Dr. ELLERMAN. That's right.

Mr. OSE. Now, Administrator Nastri, you have talked about a similar trading program here in southern California known as RECLAIM, and I want to make sure I understand how RECLAIM works. Can you just step us through that?

Mr. NASTRI. Having been on the board of the South Coast AQMD you would hope that I'd be able to give you a detailed explanation of RECLAIM.

Mr. OSE. Generic is fine.

Mr. NASTRI. All right, generic.

The concept was that industry knows what industry does best, and that as an environmental board or environmental agency we know what's best for the environment. How could we work with industry then to come up with a way to get the emissions that we wanted for them to get? And, RECLAIM is what came out of that.

The Regional Clean Air Incentives Market identified a means by which companies could control their fate in terms of their operations, and they would create excess credits that would be then available on the market. A cap was established for the region, that was a declining cap over time. So, those companies that took the incentive to invest in pollution control equipment, and generated the credits, were then able to sell those credits to other companies that for whatever reasons felt it wasn't cost effective for them to invest in control technology, that it was more cost effective to buy those credits. They would, in turn, buy those credits.

And, so, a market was created, NOx was a big component of that, and this is a really big issue here because of the type of fuels that we use compared to back East. The market or the program in the first few years, I think, worked very well. We were able to get those immediate reductions, and it was because companies could say, you know what, we don't have to operate all this time and we can generate credits. It created an incentive for them to be as efficient as possible to generate those credits, thereby accelerating the timeframe in reducing emissions, as Dr. Ellerman talked about, and creating more incentive to do that.

Now, with the declining cap and the credits going, the market base—and I want to say it was a year and a half or so ago when we had the energy crunch in California, and in that particular case what happened was, we had a huge demand for credits that was caused by the utilities needing to increase their output for the energy demand situation. That, in turn, drove up the price of credits to the point that people who had been paying, you know, marginal amounts for credits were now faced with, literally paying thousands, tens of thousands of dollars, for these credits. And, they were in a position that they could not do that.

The unfortunate thing is that in this market program many people would simply operate the way they would normally operate. Then at the end of the year, before their permits were renewed or their credits were settled, they would all of a sudden come on the market and realize, oh, my God, there's no way that we can afford these credits and now we are being faced with hefty penalties, or how do we get the credits. And, that was something that the board addressed in terms of their needs to be better equity between the larger companies that can afford whatever the cost was for those credits and the smaller companies.

And, so, the South Coast then embarked on a program to sort of separate the market and to try to bring some sense of balance to the marketplace on the credits program. And, that's, basically, how the program operates. It lets the facility decide how best to operate.

Mr. OSE. Let me try some examples here, and you correct me when I'm wrong.

Mr. NASTRI. OK.

Mr. OSE. Let's say whatever the cap is, it has a numerical quantification of 1,000, and over time that 1,000 number is going to go down incrementally. So, like 3 years from now it might be 900, 3 years after that it might be 800, in terms of the total amount allowed.

I'm a small business owner in the area. I have a dry cleaner or a printing business, so I've got to go out and get a permit for any volatile organic compounds that I emit. Based on my historical usage, I know I'm going to need a permit under the 1,000 scenario for X number of credits, and if I look out there in the future, 3, 5, 10 years, I know the availability of those permits is going down. So I have to change my manufacturing process over the 3, 5, or 10-year period, to reduce the amount of volatile organic compounds I emit, or I go in the marketplace and buy them from someone else who may have reduced them in their manufacturing process.

And, the relative price of those credits at any given time goes up and down with demand, and the point you are making is that when the energy producing companies had to turn on all of their peaker plants that typically had run on the basis of hours per year in past years as opposed to days or weeks per year now, they exceeded their air quality emissions standards. Then they went out in the marketplace to buy permits, to buy credits, and drove the price up accordingly, and all the small businesses got shut down.

Mr. NASTRI. That's correct.

Mr. OSE. Dr. Ellerman, are there substantial differences between the sulfur dioxide program that you are familiar with and the RECLAIM program that Mr. Nastri just described?

Dr. ELLERMAN. Yes.

In California, in late 2000 and early 2001, the critical issue is the absence of ability to trade over time. In the SO2 program, any credits not used in the current period can be banked and used in subsequent periods. The California RECLAIM program permits very limited banking and borrowing, essentially, a 6-month overlap between what are called cycles. Much of the early abatement that is often cited could not be used to help relieve the demand for the period of the critical demand.

Mr. OSE. Because they were expired.

Dr. ELLERMAN. Because they were expired, instead of being left to have an indefinite date of expiration. That created a great shortage. The number of permits available in 2000–2001, during this crisis, were very limited, and there was no flexibility over time.

Mr. OSE. Is there a finite duration to the credits in the Federal program?

Dr. ELLERMAN. In the Federal SO2 program, a permit is good from the year it is made valid, or the vintage, such as 1995, 1996, whatever, but it's good until used. So, it's indefinitely good in the future.

Mr. OSE. It doesn't depreciate or discount over time.

Dr. ELLERMAN. No.

Mr. OSE. It's a fixed number for whatever.

Dr. ELLERMAN. The ultimate cap is fixed over time, but any credits that are saved in one period that are not used can be used in any future period.

Now, just the power of interest on money will cause one to want to use them sooner, rather than later. The key point and the lesson from the RECLAIM program is that, particularly when you have a program of limited geographic scope, temporal flexibility is needed. The SO2 program is national, so had there been sulfur emissions at generating plants in southern California, even if there had not been banking, or the same sort of limits on trading over adjacent periods of time, they'd have had a much larger area to draw on, and that would have affected the prices.

But, some programs, of course, have to be local.

Mr. OSE. So, under the Federal program, a coal electricity plant in Pennsylvania, just high sulfur coal, can come into the South Coast Air Quality Management District and buy credits to use against their emissions there.

Dr. ELLERMAN. Yes, anywhere in the country.

Mr. OSE. Across air basins, it doesn't matter.

Dr. ELLERMAN. Because of the nature of the problem, and the acid rain case is one where there's much less spatial or geographic concern than there is in the Los Angeles Basin. You could not make the RECLAIM program a national trading program; it would make no sense to trade NOx emissions in New York with California.

Mr. OSE. I saw that comment in the testimony, and I have to ask if you can trade sulfur dioxide credits across the air basin why not just align the duration of the credits so that you can trade across air basins for nitrous oxide?

Dr. ELLERMAN. The origin goes back to the environmental problem, and what we are doing in cap-and-trade programs is creating a market to provide results and to solve an environmental problem. So, it starts, in each case, with what is the environmental problem.

In the acid rain case, the concern is primarily deposition in the eastern part of the country. Sulfur dioxide emissions in the west do, in fact, arrive in the east, and so there is some trading. Now, the correspondence is not exact, but it's good enough.

The NOx RECLAIM program is aimed at ozone problems in the Los Angeles Basin, which is by nature a more local problem, and, therefore, the geographic scope has to be more limited because emissions in other parts of the country don't affect ozone concentrations in the South Coast Air Basin.

Mr. OSE. Mr. Nastri and I have been working on a problem having to due with air flows out of the Bay Area into the San Joaquin and Central Valley, which is the exact exchange of air that you are referring to on a national basis.

Dr. ELLERMAN. Right.

Mr. OSE. So, I might reverse the argument on you, at least as it relates to the Central Valley or the Bay Area air quality.

Dr. ELLERMAN. Yes. I don't know whether in the RECLAIM case, it may have been possible to have a broader geographic scope. That is an issue for the scientists to deal with, in terms of the transport of the pollutants. All I'm saying is that some programs will be

smaller geographically than other programs, depending on the nature of the problem.

We can think of greenhouse gases as the ultimate. We know that the problem is global in scope and the effects of the emissions are the same because of atmospheric mixing. There may be other environmental problems that would be similar. I'm sure Administrator Nastri knows better, whether the Bay Area and the San Joaquin Valley may be, in fact, one air shed, but that is an empirical and a design issue.

Mr. OSE. I'm not asking Mr. Nastri for a comment, but as a representative of the Central Valley I would argue that it does have an adverse impact to our ability to deal with our environmental problems, to have this inflow, and it's the cross basin flow, whether they are the Central Valley, Bay Area, or some other location in the country, that I think at least makes a case for some flexibility. Mr. Nastri, I think, has a comment.

Mr. NASTRI. Mr. Chairman, I'd just like to add that I think Dr. Ellerman hit it right on the head when he talked about the geographic impact and the nature of the pollutant and its effect. And, the NOx impact is very localized.

The issue of NOx transport and impact within the Central Valley I think is real. You mentioned, can you look at this as one air shed. I think you can look at it as a contributing factor to the Central Valley airshed. When you look at the data that we do have, if you look at the northern part of the valley, you do see a contribution from the Bay Area of, I think, estimates are up to 20 percent.

Now, that is less in the southern portions of the Central Valley, but there's still a contribution, it still leads to the ozone problem.

So, when you talk about creating a market-type program, based on transport and based on impact, that might very well be a good candidate for it.

Mr. OSE. OK. So, there are ways we might want to look at the RECLAIM program, particularly, as it relates to the duration or term of the credits.

Dr. ELLERMAN. Yes.

Mr. OSE. You would argue in favor of that, so far as the members of the South Coast board have not gotten to that point, but it's a suggestion.

Dr. ELLERMAN. Yes, and I think there's one other aspect I take from the RECLAIM experience of general applicability, which is to consider borrowing as well. In fact, the cap, the NOx cap was busted in 2000. Mitigation fees are paid, the South Coast Air Quality District is taking measures to offset the exceedences, but, more was emitted in the current period and less will be emitted in the future, because of both command-and-control requirements being placed on the generators and other program offsets that do, in fact, pay the exceedences back.

Now, I take one of the lessons from RECLAIM is that, when we have a more local program, having temporal flexibility is even more important, and not just banking, but also borrowing, because that, in fact, is what happens when a program breaks down in the manner exhibited by RECLAIM where the generators were taken out of the program and set aside.

Mr. OSE. So, your point is not only, if you will, the excess reductions at any given point in time, but the ability to borrow prospectively against reductions you might achieve in the future.

Dr. ELLERMAN. Yes.

Mr. OSE. Dr. Green, I may have misspoke when I talked about my anecdotal proposal or any compounds, I'm not sure that RECLAIM covers that. Does the RECLAIM program target both nitrous oxide and VOCs?

Dr. GREEN. Well, it was going to be expanded to cover VOCs, but I believe they decided not to.

One of the things that wasn't raised in the previous discussions that I wanted to mention was that in looking at RECLAIM, one of the other problems with RECLAIM is that in the early days of the program the way credits were initially allocated often created very large surplus credit situations, where there was no bite from the market. You'd have long stretches where you did not have the actual ramping up, a transition phase, that would have let groups be at a point where they could have weathered the power crisis when it got there, because of the initial market allocation of permits. That's very important if they move to expand RECLAIM further, if they want to say use the RECLAIM model for trading particulate matter, or use the RECLAIM model for bringing in VOCs or other pollutants as pollutants become more evident; you wouldn't want to make that same mistake again. You'd want to make sure that you set up your credit allocations and your declining caps so that you have market signals from early on that move the situation along so that you don't have sticker shock, essentially, when you get to the point where the market suddenly starts to bite, and that it bites in a completely unsustainable way.

So, that was the situation, I think, that makes RECLAIM somewhat unique, and RECLAIM is a fascinating case study because in a way it sort of shows what happens when you have rules of limited flexibility. You have RECLAIM which had a lot of flexibility, but then you have the other rules about power generation, which have led to higher cost power and generations from out of State and so forth. You wind up with a promising environmental rule, RECLAIM, being sort of suspended and/or weakened because of other decisions that were made.

Mr. OSE. "Overwhelmed" is a good term.

Dr. GREEN. Overwhelmed, because there are other decisions, other command-and-control decisions, that were made regarding how power could be generated.

Mr. OSE. I don't want to leave that point by not noting that what the South Coast Air Quality Management District did, I thought, was pretty forward thinking and a step, definitely, in the right direction, at least, I mean, from a small business point of view, large business consumer.

Dr. GREEN. Oh, definitely.

Mr. OSE. It's a positive step.

Dr. GREEN. Right, and, in fact, it was part of an overall movement at the time to find ways of allowing permit trading and credits to be traded between different forms of emissions.

I was an intern at Hughes Aircraft at the time, and they were running a ride sharing program, and one of the things they were

tending to do was to find ways to trade credits from being able to demonstrate emission reductions on their own. They had a fleet which they could monitor; they set up their own smog monitors. They demonstrated pound reductions in emissions, but there was no mechanism in the regulatory structure at the time to get credit for actual pounds of emissions reduced. All you could get credit for was compliance with regulations that said, well, here's a ride sharing rule, here's an equipment rule, here's, you know, at best we have a control technology. There was no way to step forward and say, "We see an opportunity to reduce 300 tons, or however many tons, of emissions this year, we'd like to get credit for it against other things that we can't afford to do." That was part of the overall setting at the time; I think it was very forward looking.

Mr. OSE. Transferability.

Dr. GREEN. Right, you could transfer credits, that's right, you could trade more credits.

Mr. NASTRI. Mr. Chairman, I'd just like to add that I think the shortage of credits is something that's recognized as a problem, not just in RECLAIM, but certainly within the State of California. And, EPA Region IX and our Headquarters is working very closely with the South Coast Air Quality and with other air districts to identify what are some of the potential opportunities that may exist that we, in fact, can generate the type of credits that Dr. Green just talked about.

A good example, I think, in your area, would be rice burning credits. We are going to be developing a pilot program to look at credits that could be generated.

Mr. OSE. We're grateful for that.

Mr. NASTRI. And, we enjoy working with you on that.

I think there are other areas, too. South Coast just passed a series of Mobile Source rules, and are looking at other incentives to generate credits. We are looking and working very closely with them, as well, on that matter.

Mr. OSE. Let me go back now. The Acid Rain Program was sulfur dioxide. The RECLAIM program, because of the nature of the air basin, is nitrous oxides. Do we have anything that targets volatile organic compounds specifically?

Dr. GREEN. On a trading aspect?

Mr. OSE. No.

Dr. GREEN. Well, I think there are still, perhaps, a few tradable credit systems within some specific rules of the district. Primarily, VOCs are controlled through elements of the State Limitation Plan, and the local air quality management plans of the various control emissions bases, or control districts here in California.

Mr. OSE. OK. So, how much of our ozone problem is caused by VOCs?

Dr. GREEN. That depends, really, it's a very location specific question, and it really depends——

Mr. OSE. Right here.

Dr. GREEN [continuing]. This area, my understanding is we are NOx-limited, which means that there's enough VOC in the air that the chemical reactions that lead ozone are going to be much more controllable through changing the amount of nitrogen oxide than changing the amount of VOCs. In other words——

Mr. OSE. So, you are adjusting the mix accordingly.

Dr. GREEN. Right, but we have so much VOCs that you are at saturation level, you would have to eliminate all the VOCs, or see a huge chunk of the VOCs, to have any impact on ozone formation, compared to the amount of NOx you'd have to use, and a much bigger proportion of the VOCs is biogenic, which means you have difficulties dealing with foliage and issues in the natural background levels of VOCs, whereas almost all the NOx are combustion byproducts.

Mr. OSE. So, in the South Coast area you are saying that the amount of VOCs in the air, as a percentage of the whole, is so large that you might as well just go pick on another piece?

Dr. GREEN. No, it's not necessarily the percentage of the whole, it's the necessary amount for the chemical reactions to go forward to produce ozone. The key question is, what do you get the benefit of reducing more, in terms of dropping ozone levels, do you get more of a benefit by using VOCs or more of a benefit by using NOx?

Mr. OSE. So, you are actually measuring the net impact, you are modeling it anyway.

Mr. NASTRI. Yes, I agree, the modeling effect is being addressed, but in terms of the overall impact to smog formations in the basin, the relative contribution of both is such that they have to be addressed. There has been a lot of discussion in terms of, well, if you only regulated NOx you wouldn't have smog, because you wouldn't have the right type of reaction in the atmosphere, or if you only regulated VOCs that again you wouldn't have smog.

And, so, there have been components of both industry and other groups that say, "Do them, not us." But the fact of the matter is that there's so much in both that we have to do both. And the relative contribution, we are never going to get all of the VOC and we are never going to get all of the NOx but by reducing the total contribution of each we can reduce the amount of smog formed, and that's been the general strategy, go after what you can.

Dr. GREEN. It's also very tricky, you can actually over-reduce one element to make the problem worse. You can actually, if you drop your NOx level too low you can shift the chemical reaction in favor of VOCs, which will actually move it faster. So, it's an equilibrium, you really are trying to——

Mr. OSE. Step it down.

Dr. GREEN [continuing]. Step down equilibrium without actually shifting it out of balance. It's pretty tricky.

Mr. OSE. And, that leads to something that was discussed earlier when you were talking about transport issues. I think we are just beginning to learn how much we have to learn about transport, not only between airsheds, but within States, between States, and now between countries. It's becoming more apparent that you have, actually, international transfer issues. So when trading programs are designed, I guess the lesson there would be to keep them open to expansion and to be prepared for the prospect that not all States' knowledge regarding the argument of the precursors and/or pollutants, that you are going to have to be able to evolve your trading program, and so evolvability is a key element to the program design.

Right, so I just want to make sure I've got this in my head, so when I go back to Washington I'm not speaking too foolishly. The acid rain thing, that primarily was driven by high sulfur coal being burned at power generation in the East. Our problem out here is mobile sources, cars and the like, with nitrous oxide coming out of the tailpipe. What is the state of our understanding as to where all four organic compounds are coming from? Do you have a breakdown for that?

Mr. NASTRI. I don't have the exact breakdowns, but I just wanted to clarify that in terms of the nature of the problem—yes, NOx and its source from mobile sources is a significant contributing factor to the ozone problems we have. But if you look within the Central Valley and other areas, in terms of VOCs, if you look at some of the ammonia emissions, they have a big effect on our PM problem, and VOCs also contribute to the smog aspect. So, we have NOx and we have PM resulting in terms of the ammonia emission. Then we have VOC which also contributes to some of the smog issues.

So, it's not just one, there's a plethora.

Mr. OSE. So, where are the volatile organic compounds coming from?

Mr. NASTRI. VOCs come from biogenic sources. VOCs come from various compounds. I think architectural coatings and paints are a big source.

Mr. OSE. Solvents.

Mr. NASTRI. Solvents, which are moving away from those types of VOC compounds, ammonia.

Dr. GREEN. Also, unburned hydrocarbon coming out of tailpipes contributes to VOC problem, as an evaporative source off of the vehicles and off of ancient technology.

As Mr. Nastri was pointing out, though, these problems are sort of interwoven, and your VOCs are precursors for particulates, as are your NOx emissions. A lot of these pollutants actually form outside of the tailpipe, they form in sort of an atmospheric soup from the precursors. So, the exact relationship and the chemistry that you get at times is not always clear.

Mr. OSE. Well, that begs the question—and this is directed at Dr. Ellerman—just from a market science perspective, can you create a cap-and-trade program for any of these products similar to the one for sulfur dioxide?

Dr. ELLERMAN. There are two prerequisites to a cap-and-trade program that I ask people to keep in mind.

Mr. OSE. Accountability, flexibility, and simplicity.

Dr. ELLERMAN. Well, those are the reasons for success, let's go back to the prerequisites, which are in my written testimony. The first of those is measurability, ability to measure the emissions. If you can't measure the emissions you can't have a cap-and-trade program. And, in many of our early environmental regulations we did not have the ability to measure, or it was very expensive, so you just said put this piece of equipment on and then you went out to inspect it. In fact, the equipment was there and it was operating, and that was the best you could do. We can do much better now. So, measurability is the first issue. If you can't measure it, you can't have a cap-and-trade program.

The second issue, and it's the one we discussed earlier, is approximate equal environmental effect. You have to consider the environmental problem, it's going to be different for every program. You have to believe the emissions have an approximately equal effect, and I would stress approximately equal.

A colleague of mine comments about the SO2 program that the enabling myth of Title IV is that location doesn't count. We all know from an atmospheric standpoint that certain emissions count a lot more in creating the acidification in the northeast than others, but the program treats as if they are all equally culpable.

Now, you know, as a Congressman, that all legislation needs enabling myths, that's part of how things happen.

Mr. OSE. Dr. Ellerman, I'm shocked.

Dr. ELLERMAN. But, I think there's an irony in this, which is that we would not have had the reductions we've had without that enabling myth, which I think, again, is a more general political principle as well.

Mr. OSE. So, what enabling myth should we use?

Dr. ELLERMAN. Each problem has its own.

Dr. GREEN. If I can intrude, I would have to say that last statement is dangerous—it's not dangerous, it's tricky, because it assumes that progress only comes from a regulatory standpoint. In fact, if you look back at the early history of the United States, the movement, in terms of the decarbonization of fuels, the reduction of mass use in manufacturing, the, in fact, decreased environmental footprint of industrial endeavor has preceded, in very many cases, any regulatory approach whatsoever. This is including here in California where, in fact, there's a very good example, which is that the regulations here were local before they were made State, and before they became Federal. If you look at the improvement curves for air quality, what you find is that the trends were well established before the next level of Government enshrined them into law beyond the local level.

So, I think one has to tread carefully on the assumption that without what we have we wouldn't have seen improvement. One of the things that was mentioned earlier is that there are benefits of command-and-control. We also need to keep track of the fact that they also provide inferences as well, which is, you have situations like New Source Review where if a company wants to change a piece of equipment to gain an environmental benefit, it may face a regulatory hurdle in doing so because it's unwilling to go through the permitting process in order to create environmental improvement. While we tend to track environmental improvements, we don't track opportunity costs. There's no way to actually capture the opportunity costs of something that doesn't happen as a result of resources being diverted in a direction due to regulations that were overly specific.

Mr. OSE. Now, this is an interesting area too, the kind of law of unintended consequence. One of you talked about an example of a company that had cleaned its emissions and then took the residue from the cleaning and created a new business line using that chemical that they had extracted from the emission. I can't remember the name of the chemical. They, basically, take lemons and make lemonade.

Dr. GREEN. Would this be in the publications submitted, because one of the things they discussed there is how several companies under toxic waste actually have taken waste products and then turned them into beneficial products.

Mr. OSE. I don't remember the——

Dr. GREEN. There was a case in which—it's an interesting story, because the company was more or less villainized under TRI—there's a situation in which a company that generated something called pickle liquor, which is a spent sulfuric acid remnant of manufacture, and under TRI that pickle liquor is considered a discharge to the environment. Yet, it's used in water purification, it's a water purification input. So, the company took the pickle liquor and sold it, actually, below cost to the local municipal water treatment provider, as a community benefit. And yet, it was considered again as a TRI released to the environment.

Mr. OSE. Wastewater treatment.

Dr. GREEN. That's right, I should specify, it's used in wastewater treatment.

But, you do have situations of that sort, where you have an unintended consequence of something being defined as a waste, which can also be a useful product in some sort of process that has environmental benefits as well.

Mr. NASTRI. I was going to say, I am with the Environmental Protection Agency. We do pass a lot of rules and regulations. I think that if you look at the history of environmental gains made over the last 30 years or so, significant gains have been made as a direct result of command-and-control. And, I firmly believe that those gains remain on a much more accelerated schedule had they not been implemented.

I think when you look at regulations, you might experience, both as a government official and as a business person, those regulations are what keep things going. They are the ones that often times develop that innovation, because a challenge will come up and they say, "Alright, how can I do better than that, how can I do it without necessarily having to have this come down on us?"

Mr. OSE. You must be reading my script up here. Speaking of regulatory hurdles, in terms of the RECLAIM program, what do we need to, at least at the Federal level, what would we need to consider in terms of expanding RECLAIM to include more of these pollutants? First, is it possible? Dr. Ellerman, you indicate that it is, as long as you have measurability and approximately equal impact.

Mr. Nastri, how do we help expand this? Our objective is to lower the amount of pollution in the environment, how do we expand this?

Mr. NASTRI. Well, let me ask the question to make sure that I understand it. Is the goal to expand RECLAIM to a national basis then, or is it to expand RECLAIM within the Los Angeles Basin, or to take RECLAIM and transfer it somewhere else?

Mr. OSE. My objective is to find a way where we rationalize and provide certainty for businesses and the jobs that they bring to the table, and we have a measurable positive impact on the environment. That's what I'm after.

And, I mean, it's kind of like stepping down between nitrous oxide—I don't know which comes first, I mean they are both equally important.

Mr. NASTRI. I guess thinking out loud, Mr. Chairman, the goal of RECLAIM was to address, again, on a very regionalized basis, a very impacted airshed. And, so, to take that model nationally you would almost have to say on impacted airsheds this model can be applied.

Now——

Mr. OSE. And, we could tweak it, of course.

Mr. NASTRI. Oh, absolutely, but as a basic framework of establishing caps, establishing credits, establishing a trading program, letting companies have the flexibility of changing fuels, or installing control equipment, or a whole host of other options that are available to them, we let them make that option. But, you do set up the basic framework.

And, it would have to be set up in a way that would be conducive to achieving real benefits for that particular market.

You know, as we talked about here, there's an aggressive strategy to go after VOC, NOx, and PM. That strategy may not be necessary, nor effective, for instance, on the East Coast, where their contaminants are different because of the fuels that they use. But, the basic framework could apply, and I would leave it to the experts in the particular areas to assess what would be the actual benefit in terms of, do we go after VOCs, do we go after NOx. But clearly the framework, I think, tweaked, taking into account some of the long-term variability, although I did want to point out that when you talk about the temporal aspect of banking and borrowing you do tend to impact the immediate quality aspect. And, when you are in an extreme situation, you are being forced to go down, down, down. You do not want to have that variability, where all of a sudden you are having blips and you go back up.

Mr. OSE. Well, the borrowing aspect would be particularly conducive to deterioration. I don't know how the credit is—I mean, the fact of the matter is that you've accelerated the positive impact onto the environment.

Dr. GREEN. Well, that can be accounted for, though, in the definition of non-attainment. You are saying you are right there up against your non-attainment cap, you can't afford, even if you have a certain period of crisis and you have a bunch of people borrowing credits, you could blow your non-attainable level by having your emissions go up a few times in a row. That could take you from being an attainment area to being a non-attainment area, or prevent you from going out.

But, in terms of the way that could be dealt with, it doesn't have to be dealt with in the structure of a trading program. It can be dealt with in the structure of defining non-attainment areas.

Mr. OSE. But, that's my point, it's the borrowing aspect, and it goes to the banking aspect. They have two different impacts, in terms of taking an attainment area that's right at the margin into a non-attainment area.

Dr. Ellerman.

Dr. ELLERMAN. I would argue that for any specific extreme event that causes non-attainment, banking and borrowing would have

equal effect. It would be true only when one reduced more than required in this earlier period and if the nature of the problem is such that has no effect upon the air quality two periods later, then one would say that's without effect.

In the acid rain program, it's deposition or an cumulative pollutant; it's a different type of a problem, so the banking is OK.

My argument for considering banking and borrowing in RECLAIM is that we don't shut down sources when an extreme event occurs, we have non-attainment. The question is, when we have the non-attainment event, and then we adopt various measures to try to deal with it, and make up for it whether it is better to let people anticipate the possible event and let them take the actions. If that extreme event happens, I would argue typically we don't end up shutting down the sources, as was the case in southern California.

Mr. OSE. Now, in your testimony, you indicated that the banking of credits created a predictable response——

Dr. ELLERMAN. Yes.

Mr. OSE [continuing]. In terms of the attainment versus non-attainment, two, or three, or four increments of time in the future. But, at the end of the day, after you got through that temporary, I'm going to call it the notch issue——

Dr. ELLERMAN. Right.

Mr. OSE [continuing]. After you got through that temporary notch you ended up with a much better impact. Would it not be the same here?

Dr. ELLERMAN. It's different in acid rain, because it is a cumulative pollutant. In other words, what matters at the end of the day is the total deposition over some period of time, where the argument on NOx and ozone each summer is different, or each period is independent of the other.

Now, I think there is some effect, that if you do have a tight enough requirement that it leads to the type of measures—let's say putting SCRs on the utility—that you bring the average level down sufficiently. Then that, of course, brings the exceedences down as well, so it can have those effects. That's a more complicated argument.

I think one has to think that in acid rain, and in global warming type issues, between periods it's all cumulative, so if you reduce in this period it's just as good as reducing in the next period. And, in ozone, it's a much trickier proposition.

Dr. GREEN. It's what they call a "stock versus flow problem," and in global warming and acid rain you buildup a long-term stock. It's not the daily flow of pollutant up and down that matters, it's the long-term shifting of the total stock of pollutant that's circulating through the environment.

And, with long-lived pollutants that are broad disposition, it's much easier to set up a predictable trading system and have predictable effects with it. That's not to say it can't be done, and I think, in fact, in RECLAIM it can be expanded.

One of the things I was going to ask Mr. Nastri about is, my understanding is that the delegation of authority for air quality into the basin structure we have now is an element of the Clean Air Act, is a Federal regulatory approach, that might create parochial interests, which would prevent what you are talking about which

would be a statewide limitation of RECLAIM between the basins. That may be an area where what you have is a law defining the actual boundaries of an air basin with regard to an individual pollutant. That may not be applicable, or may not be most logical, from a scientific standpoint in managing that pollutant.

Mr. OSE. Well, I will tell you that parochial interests manifest themselves in my political world, on a State-to-State basis, and that's a reality. So, I would commend you for making that observation.

Dr. Green or Dr. Ellerman, are there other areas, say outside South Coast, or the L.A. Basin, where it might make sense to try and implement cap-and-trade programs for air pollution—the Bay Area, the Central Valley, what have you?

Dr. GREEN. Within California specifically?

Mr. OSE. My interest is California, today.

Dr. GREEN. My feeling would be that anywhere you have non-attainment areas with transport going on, that it's that transport and non-attainment element that would define where you draw the circle and institute a trading program inside the circle.

Mr. OSE. Can I explore something here, before we leave that thought? You know, we tend to focus on non-attainment areas, but it seems to me we ought to focus on both non-attainment and attainment areas, as a means in preventing the attainment areas from becoming non-attainment areas. Do you understand that logic? So, I'm not jealously guarding this or that area, this is an open book for me.

Dr. GREEN. And, they do, near non-attainment areas are areas that are close to getting into non-attainment, have a unique status under the Clean Air Act. They submit plans, generally, more voluntary approaches that are designed to keep them from becoming non-attainment areas. But, I think you are absolutely correct, and that's what I was getting at, which is that the decision as to whether an area, or whether emissions from an area need to be included in some sort of a cap-and-trade scheme has to transcend whether or not they reside in a non-attainment area. It has to move to whether or not they contribute to a problem, to an exposure.

But, by the same token, we also need to define non-attainment areas and look at the question of exposure, because even within a non-attainment area you may have a situation where 90 percent of your public is not exposed, actually ever exposed, to the level of pollution that would be harmful, and yet, you have certain sensors in certain areas that are putting an area in non-attainment, even though most of the population is not exposed, and that's an issue which needs exploration.

On the one hand, you'll hear people say, well, air pollution moves around. But the answer to that is, well, but if it moves around that freely all the sensors would read the same thing all the time, and clearly they don't.

So, some of these issues need further unpacking; I think that goes without argument.

Mr. OSE. So, are there other areas besides South Coast or the L.A. Basin where it makes sense to try and implement a cap-and-trade program?

Mr. NASTRI. Let me answer first, Chairman Ose. I think that there are; I think that wherever you have exceedances of standards there's a good opportunity. I think the Central Valley is a great opportunity for establishing cap-and-trade programs. You have that area which is currently severe, almost requesting a bump up to go extreme. That in and of itself, I think, lends itself to saying, alright, we know we've got an extreme problem here. How can we now address emissions in this basin?

And, there are a number of things that we know we have to go after. We know that CAFOs are a big source of PM. We know that AG is a big source of NOx from the AG pumps. We know that petroleum production is a big issue. We need to establish the framework that says, in order to get to clean air by 2010, these are the type of emission reductions that we are going to have to see. Then, let's let industry step up to the plate and say, this is how we think we can achieve it. Working together through a partnership, and this is something that we in Region IX are doing very closely with the San Joaquin Air Pollution Control District, and a number of the other stakeholders, a big part of AG—I mean, actually are very optimistic that the farm bill is going to provide us with some of the conservation funds to go after some of those AG problems, and to look into the development of best management practices that will reduce PM releases from AG operations.

So, I think it's an excellent opportunity to look at establishing this type of area.

Now, the question will be, as Dr. Green pointed out, within the political structure of the Central Basin and the Bay Area can we establish a common framework that they'll all agree to and move forward, or will we have to tip them?

Mr. OSE. Dr. Ellerman.

Dr. ELLERMAN. Yes.

Mr. OSE. You are the scientist.

Dr. ELLERMAN. Well, I was hesitant to respond to your question because of my lack of familiarity with the specifics in California.

Mr. OSE. Well, let me invite you to the Central Valley.

Dr. ELLERMAN. But, I would endorse what I understand both the other panelists to have argued and I'd like to reinforce the point that the notion of a cap is implicit all through the Clean Air Act. Attainment is the perfect example. Attainment suggests a cap, and, in fact, in the offset program and in the process of bringing new sources into non-attainment areas, there is a cap and trading process that is extremely inefficient and very costly. What are called DERCs, and ERCs, emission reduction credits, and discrete emission reduction credits are traded. It's very costly, slow, and difficult; and it creates problems for new entrants into a market.

One of the challenges, and the cutting edge of research in tradable permit systems, is not the new areas, like CO2 and mercury but actually going back into the guts of the Clean Air Act to transform some of these requirements, which are not working quite as well as they may have in the past, or, perhaps, they never did, by making the various types of offsets and trading more feasible and easier to take place.

Mr. OSE. Is that statutory or regulatory? I'm hoping you can tell me regulatory.

Dr. ELLERMAN. I think that is going to depend on each case, I don't know, that's a legal issue. I think the approach of having the local regulators and industry come together to try to suggest ways out of this is in everybody's interest. Maybe it does require some statutory fixes; I don't know.

To the extent it does, I will suggest that there is going to be a need for some enabling myths to be embraced, to permit this to take place.

Mr. OSE. That's a great phrase.

The reason I'm bringing it up, obviously, is I'm from the Central Valley, I'm very close to agriculture.

Dr. ELLERMAN. Right.

Mr. OSE. I know that EPA Region IX is working with the San Joaquin Valley about a number of things, including the diesel water pumps and the like. One question I had in reading this article in the Freseno Bee, the credit that a farmer would receive from taking the old diesel water pump off, I mean the number quoted in here for the pollution reduction credits is up to 40,000 per ton. Is that an annual payment? Is it a one-time payment? It's unclear in this document. For instance, the credits that are purchased here, they are issued annually? In other words, if I have a dry cleaning business, I go get a permit, every year, or I just get it once? How do I get credits here, if I'm a polluter, how am I getting credits? How are you factoring in the award of credits to me?

Mr. NASTRI. I am going to take a venture. But we do have an expert on RECLAIM in the audience and I'd also like to ask her, but it's my understanding that, every year, if you are going to have to go for credits you do that every year. But, Dr. Coy, no? One time? I'm talking about VOC credits.

On the VOC aspect, Dr. Coy, who is the Deputy Executive Officer of the South Coast Air Quality Management District, suggested, or stated, that you would purchase your first several years of VOC credits, and after that there would be a reconciliation.

Mr. OSE. So, if I have a process, manufacturing or otherwise, and submitting all organic compounds into the atmosphere, I'd go down to South Coast Air Quality Management District and I write a check for the estimated amount of emissions? You are saying yes, and she's shaking her head no.

Why don't the two of you talk about this.

Mr. NASTRI. OK.

Mr. OSE. And, I'll ask these guys some other questions while you resolve that. We'll get to the bottom of this.

Now, Dr. Green, speaking of watershed-based trading, we are going to come back to Mr. Nastri on these other things, but speaking in terms of the watershed-based cap-and-trade stuff, is it harder or easier to do with water than with air? I'll tell you why this is so important, California just has a water problem.

Dr. GREEN. Sure.

Mr. OSE. And, it always has.

Dr. GREEN. I think it would be easier with water than with air, in fact.

Mr. OSE. Why?

Dr. GREEN. Part of it is water is more easily monitored. Its flows are better defined. You have a two-dimensional problem with water

and a three-dimensional problem with air. And, so, I would think that from the standpoint of monitoring, tracing upstream origins or up-flow origins of pollutant problems you would have—and this is purely theoretical—you would have an easier time of it with water than with air. In fact, early on in the earlier history of market maintenance, and purely environmental protection, and environmental security, and environmental quality—I would say from the standpoint of if you are going after point source water problems, or point source water contamination problems, it would be easier to use trading with those than it is with air.

Non-point source water pollution problems, on the other hand, would probably yield to an entirely different approach, or a third approach. They would be looked at as the concept of groundwater or surface water utility, which for a non-point source the key issue is preventing surface concentrations of pollutants, which then run off in spikes and are channelized through engineering approaches and cause mainly damage to surface water. They also lead to the kind of pollutant spikes that contaminate aquifers, because it hits all at one time and overwhelms the ability of the natural bacterial and biological mediators to prevent that from happening.

Mr. OSE. OK. We are going to come back to the watershed thing.

Mr. Nastri, on the permits, my question was, how do I get the permits as a small business in the first place?

Mr. NASTRI. For VOC, you would buy these credits on the market through a broker or some other means. You would then go to South Coast and you would apply for a permit with the actual credits in hand.

Mr. OSE. OK.

Mr. NASTRI. And then, South Coast would grant the permits to construct, you'd begin your operations.

Mr. OSE. And, those credits have a term.

Mr. NASTRI. Yes.

Mr. OSE. OK.

Mr. NASTRI. Well, let me restate that. The credits for VOCs would be in perpetuity. It's the RECLAIM that has the term. RECLAIM is on an annual basis.

Mr. OSE. OK. You are buying capacity first.

Do they discount or depreciate, or do the VOC credits decline over time, or is it a fixed number?

Mr. NASTRI. The VOC credits themselves are fixed.

Mr. OSE. OK.

Mr. NASTRI. You can go out on the market and buy more credits if you have to.

Mr. OSE. OK.

So, if your manufacturing process exceeds your expectations in terms of emissions, you've got to go back out in the marketplace and buy more?

Mr. NASTRI. Correct.

And then conversely, if you are short you can sell them.

Mr. OSE. Is there a maintenance to prevent the same thing from happening that happened with NOx with regard to if you have a sudden huge demand for VOC emission, capability for price spike prevention?

Mr. NASTRI. I'm not aware if the South Coast has addressed VOCs within that framework or not.

Mr. OSE. OK.

Let me go to the Fresno and San Joaquin Valley example. A farmer takes his diesel pump off and replaces it with an electric pump. He's going to get some quantification of credit for the emissions that were coming off that diesel pump.

Mr. NASTRI. Right.

Mr. OSE. And, he's going to be able to sell those credits. In the case of a diesel pump, those would be nitrous oxide, and the term of those credits is a 1-year window?

Mr. NASTRI. It's over the life of the equipment, I believe.

Mr. OSE. OK.

Mr. NASTRI. Yes.

Mr. OSE. So, it's a one-time sale.

Mr. NASTRI. Right.

Mr. OSE. So, if the pump—let's say the guy has got an old pump out there on the canal lifting water out of the irrigation canal and out onto the fields, he can continue to run that pump or he can change it, swap out, buy an electric pump, and sell the credits.

Mr. NASTRI. Yes.

Mr. OSE. And, an electric pump, do the electric pumps cost the same as the diesel pumps?

Mr. NASTRI. The electric pumps, I believe, are actually less expensive.

Mr. OSE. To operate or to acquire?

Mr. NASTRI. I think both.

Mr. OSE. OK. You see where I'm trying to get to, I'm trying to figure out what's the incentive, how does the farmer get an incentive to take those diesel pumps out? The diesel pump he already has, it's not costing him anything other than operating costs. You take that off, you've got to get an electric pump that costs presumably less to run, as it would be more efficient lifting water and pumping it out. What's this electric pump cost?

Mr. NASTRI. That I don't know, but I can find out for you.

Mr. OSE. And, how does that cost compare with the value of the credits that he'd get by shutting down his diesel pump? That's the essential question right there. But, Mr. Nastri, your office is working on this plan?

Mr. NASTRI. Yes.

Mr. OSE. In the Central Valley?

Mr. NASTRI. Yes.

Mr. OSE. Or, the San Joaquin?

Mr. NASTRI. Yes.

Mr. OSE. Thank you.

Dr. Ellerman, you had something you wanted to say?

Dr. ELLERMAN. Yes, let's take that case. I think you can provide that incentive. Let's imagine this farmer and that Region IX actually creates a cap over these SO2 emissions, or whatever the relevant emissions are from this pump, and over all of them in the area, and at the same time gives that farmer the rights to continue using that pump, or to sell those rights. They have a value in the market. They are now given the value of the market, and if he has the opportunity, and he can calculate very easily—this pump will

have another 20 years of life, or 10 years of life, or whatever it happens to be, and it's going to emit so much. I have these permits that have been given to me from the Government, and I can go ahead and continue using them, but I can also sell them and I'll make so much. And, I can buy this electric pump and I don't need those permits, so I, in fact, will make that calculation; that's exactly the calculation.

What's new here is that now he can actually sell those credits, because that cap has been set up including that, even though that does not cost him anything, and that's what Congress called——

Mr. OSE. But, he can only sell them in that air basin.

Dr. ELLERMAN. That's right, to other sources for whom it may be more expensive to reduce emissions. And, the assumption here is that the electric pump is cheaper, in fact, and he now has the incentive that command-and-control would not provide. It might allow the farmer to emit more, but if the farmer emits less it's nice, it's thank you for doing it, but the farmer doesn't get any money.

Mr. OSE. So, the farmer is going to look at the financial impact of keeping them or switching out the pumps. The buyer of the credit is going to look at the financial impact of, what's it cost me to abate my pollution now, what would it cost me to buy the equipment to make the impact I need, what are the cost of credits compared to the cost of the new equipment?

Mr. NASTRI. And, I'd just like to add, there's another factor to consider. That is the avoidance cost of permitting. By that, within the Central Valley, a big factor, as you may recall, the Title V settlement that we had with the State of California will identify major farms that have a lot of these pumps as major sources. So, they'll now have to apply for a permit.

Part of our goal is, if we can trade out enough of these pumps they no longer trigger the Title V threshold. Therefore, they don't have to sign up for permits, which, as you know, these farmers don't want to be permitted, regulated, or anything else. So, we think we can avoid that by coming in with a program that would reduce their emissions.

Now, whether they go electric or whether they go with new reduced diesel, because the problem is, unfortunately, that with many of the Ag operations these diesel units run literally, you know, 50 to 100 years. You've got pumps, engines, that are out there that are unregulated that have been operating for the last 50 years. You guys aren't going to change it unless there's some incentive for that. And, so, I think the avoidance aspect of being permitted is a big factor as well.

Mr. OSE. I would encourage you to work on the incentive side of things, rather than the threshold of the paying side of things.

Mr. NASTRI. It all works together.

Mr. OSE. OK. Now, we've covered that pretty well, and I do appreciate the fact that Region IX is trying to make this happen. I think you are on the right track, but I would just say that you need to lean more toward the incentive side than the paying side.

Dr. Green.

Dr. GREEN. I was going to say, I think the way you cast that question, actually, is fantastic, in that you really have boiled the question down to the absolute nub, and that is, if a person has a

piece of equipment that is functional and will continue to be useful, and some costs have been recouped, it's purely a matter of operating costs. How do we tie the amount of money it will take to cross the threshold to a different technology into the overall process of determining allowances, credits and value given for a given piece of equipment over a certain length of time and life expectancy.

And, I think you really have nailed that down. I would say that again, you really have to look at your initial permit allocation with great care, when you start on a trading system, because these are the kind of questions that are really very hard to get at in the aggregate level. Only the individual farmer knows how much it costs him to fix that piece of equipment. It may be 50 years old, that means a new part for it is going to be hand made, not off the shelf, and so those questions are the key.

Mr. OSE. Is there availability of new technologies that are somewhere reasonably within the realm of making that transition? It's fine to say, well, we'd like everybody to go straight to fuel cells. I mean, it wouldn't be fine to say that, but if you could say there are alternatives available if you have a fuel cell line?

Dr. GREEN. Well, but the transition error would be so huge you could never really functionally tie it into a meaningful permit value to achieve an emission reduction. So, the technology alternatives also have to be considered at the time, and be considered from a fully holistic standpoint, which is, if the diesel pump has been there 50 years, how are they getting the diesel to it? Do they run it out every day on a tractor or do they already have a small diesel line that runs from a central repository? Can they get electricity out there?

Mr. OSE. It sounds like decisions that every business person up and down the State makes every day in their respective enterprises.

Dr. GREEN. That's right, they each have the fine level of knowledge necessary to make it work, and that's the really tricky part when someone say we want to move from diesel to electric, or move from diesel to something else; that's the problem, is that decision-making can really only be made at the level of the individual who knows best where they are in the life cycle.

Mr. OSE. My only point is, I prefer the incentive side to the paying side.

Dr. GREEN. And, I would actually say one other thing, which is, I think we actually take avoidance, the avoidance factor should really be completely off the table, because so long as there's an avoidance factor there is no market.

You cannot have an incentive-based program if on the other hand the agent is going to say, well, command-and-control works even when it doesn't, because it poses an alternative that drives you to do something different. That's not a great dynamic.

Mr. OSE. That's a different philosophical argument we are not going to have today.

I want to go back now to the watershed thing. I do appreciate your comments on the market structure, because the design of the market does matter.

Mr. Nastri, we've talked about, primarily, air so far. I want to talk about watersheds at this point.

Mr. OSE. Mr. Nastri, you talked about a pilot project on watershed-based trading for water, and water pollution. Now, is this similar in concept to the cap-and-trade program on the air that we've been talking about, or is it still under development?

Mr. NASTRI. I think it's still under development. We actually just came out with the Water Quality Trading Program, which is actually out for draft comments. So, at this point I don't have a good enough base I think to really comment on where it stands. It is very conceptual.

[The information referred to follows:]

Information on the County of Sacramento Mercury Offset Pilot Program

- EPA released a proposed Water Quality Trading Policy on May 15, and accepted public comments through June 21, 2002. This water quality initiative is intended to build upon EPA's efforts over the last seven years to encourage the use of trading programs. In 1996, EPA issued an Effluent Trading in Watersheds Policy and draft Framework for Watershed-Based Trading. EPA has previously supported several demonstration trading projects including those in Cherry Creek Reservoir, Colorado; Long Island Sound; the Fox Wolf Basin in Wisconsin; Kalamazoo River in Michigan; Lower Boise River in Idaho; and the Chesapeake Bay. These projects have provided lessons and approaches EPA believes may be useful in other efforts to restore and maintain water quality.

- In this proposed Water Quality Trading Policy, EPA provides policy guidance to states, tribes, and others for the design and implementation of trading programs. The proposed policy signals EPA support for soundly designed water quality trading programs developed by states and tribes and to identify components EPA believes are appropriate for programs to operate successfully and protect water quality.

- The proposed policy addresses: (1) trading to protect unpolluted waters; (2) trading in polluted waters before development of required Total Maximum Daily Load (TMDL) allocations; and (3) trading to meet TMDLs. While the focus is on nutrients and sediment trading, the policy also discusses the potential for trading other pollutant reductions under certain circumstances. The policy acknowledges some of the challenges encountered in trading programs, such as estimation of nonpoint source load reductions, and offers possible approaches.

- EPA supports development of water quality trading programs by states and tribes to restore or maintain water quality, and believes that trading programs can potentially achieve these water quality goals more efficiently and at lower cost while providing additional benefits such as habitat restoration. Implementation of water quality trading programs occurs within the existing Clean Water Act regulatory framework.

- EPA's Office of Water is also funding 11 new pilot projects nationally to promote water quality trading, develop infrastructure and build partnerships through the exchange of information.

County of Sacramento Mercury Offset Pilot Program

- One of the new projects to receive funding is the Sacramento mercury offset program. This offset program could potentially allow a discharger of mercury to reduce pollutant loadings from a source other than its own to receive pollutant discharge credits. The Sacramento Regional County Sanitation District (SRCSD) is required in its current effluent discharge permit to evaluate the feasibility of a mercury offset program for

possible future implementation by the District. In the Sacramento River watershed, an offset program is a promising idea because the majority of mercury loadings come from nonpoint sources such as abandoned mine sites. Point sources such as the SRCSD's water treatment plant comprise a small portion of total loading. Therefore, a well-run offset program has the potential to reduce mercury levels in fish tissue more quickly and at a lower cost than may otherwise be the case under the current regulatory system.

- U.S. EPA Region 9 requested and received $50,000 in funding for this project. Region 9, SRCSD, and the State of California agreed that these funds would be provided to the U.S. Geological Survey (USGS), who will provide its expertise in economics, GIS mapping tools, and science to help SRCSD study the feasibility of the offset program. If an offset program is developed, USGS will provide modeling tools designed to help program participants choose offset projects that are the most environmentally beneficial and cost-effective.

Mr. OSE. And, it is a pilot project?

Mr. NASTRI. Yes.

Mr. OSE. So, it's just this single watershed that we are talking about for the moment?

Mr. NASTRI. Right, and we are actually looking to expand, as I mentioned earlier, to 21 pilots across the Nation. But again, those haven't been implemented. They'll be coming up. They'll be nominated by the Governors, I think, this fall.

Mr. OSE. And again, you are working on the market design at this point?

Mr. NASTRI. Yes.

Mr. OSE. There's a fellow sitting next to you that might have some suggestions on market structure.

Mr. NASTRI. We'll be sure to consult with Dr. Ellerman.

Mr. OSE. All right.

Now, Dr. Ellerman, you've talked about the few basic conditions that need to be in place for markets to work, the prerequisites you cited, and the characteristics we've cited. Now, do you think it's possible on water and watersheds to create a cap-and-trade program similar to the one we have on the air side of things?

Dr. ELLERMAN. The experience has not been as encouraging. There hasn't been as much experience, and the experiences of some of the early experiments were not particularly encouraging, but there is the Tar-Pamlico case in North Carolina that from what I understand has been successful. I don't remember the details enough to comment on it.

In general, in watersheds, we are dealing with small markets. We have the same problem again of the small markets. Airsheds are in some ways easier, because you've got large areas that you can trade over, and for watersheds or water systems that could be less, but I think that's, again, a matter of the specific problem we are trying to deal with, defining what would be that market, and whether you can organize and create a market for it.

I think we should be encouraging, we should attempt to do so, and I think to the extent we can do so we can expect to have the same success we've seen in air systems.

Mr. OSE. Would you expect the same constraints on a watershed trading system to exist as exist on the air basin, that is, you can't trade your credits outside your watershed?

Dr. ELLERMAN. I would think that off hand, it seems to me absolutely yes, that it would be tighter. Air moves around in all sorts of different directions, I'm not aware of any argument that water in one watershed actually moves over to other watersheds. The lines are much clearer.

I note Dr. Green made a very interesting comment, that actually it's easier to measure the water than it is the air. That's really quite an interesting comment, and I think that's right. You've got fewer dimensions, it's much more contained, so it might be easier to work out these problems.

In air, where the meteorology is changing all the time, there's a chaotic element that makes it harder to deal with.

Dr. GREEN. We also have a lot of new technology available in geographic information systems, mapping systems, that give even greater detail with regard to water flows.

One thing that I think does need to be considered, and we're getting at it, which is, would this be only within watersheds? We do have situations of nesting watersheds. You may not have a situation where a downstream watershed contaminates an upstream one; you certainly have the reverse. And, so, again, in the initial conditions of establishing the market, you are going to have to pay close attention to what you define as the unit of trading or as the market unit, so that you have the ability for upstream or downstream trading between watersheds that are nested. Because few watersheds exist in isolation, anymore than air basins exist in isolation. It's not usually a case where you have just this whole area of water that discharges purely to the ocean that takes no water from the surrounding areas. So, you are going to have to look at the nesting and interweaving nature of watersheds.

But, nonetheless, it's a physical resource for which we have more technology.

Mr. NASTRI. I think, from my perspective, my concern over watersheds is that, as Dr. Ellerman mentioned, in airsheds you have fairly significant dispersal, and often times it's fairly rapid. In a watershed, in a stream, you don't have that significant dispersal immediately. You may have it over time, but when you look at the localized effects of pollution in that one particular area you may have a fish kill in one particular area that by the time it was downstream it wouldn't affect the overall quality. But because it is such a localized impact, that's where I sort of have trouble understanding how the water quality trading would work, unless you were only moving toward a reduction from existing standards and not allowing exceedances, because to allow exceedances would, I think, potentially cause an increase in harm to human health and the environment. So, that aspect of developing the program, itself, would have to be addressed.

I also agree with Dr. Green in the sense of nested watersheds. I think within California we all tend to think of CALFED, and the number of watersheds that feed into this overall watershed aspect. I think that if you do take into account the cumulative aspect of the loads within streams, and the relative value when you are creating your market, in essence, you'd almost have to create a series of impacted zones along your entire market that would thereby set the value of the credits that you would generate.

Dr. GREEN. We've also actually stepped straight into another subtle distinction, which is what Mr. Nastri is pointing out about surface water spikes and fish kills, and the cap being set with regard to current standards of peak loading for surface waters. It's different than what your goal is going to be if you are trying to protect sub-surface waters.

And, so, from the standpoint that within a watershed only a small amount of water at any given time is moving in the watershed, it's actually moving through surface water structures. You have to look beyond simply the question. That's one question that would trigger setting a cap, another question that would set a cap is going to be the capability of the local environment to filter, percolate, and protect the ground sub-surface water as well as the surface waters.

Mr. OSE. I think this is a fascinating issue, because I was born and raised in Sacramento, a large urban area, on the Sacramento River, on the American tributary to the Sacramento. You go upstream from Sacramento, you've got the Feather, the Bear, and a host of other smaller creeks and what have you. You've got Cottonwood Creek, which is a tremendous creek when the rains hit. Can you take credits purchased off Cottonwood Creek to address a problem in Sacramento, or can you take credits purchased in Feather River to address an issue, for instance, with the regional sewer plant on the Sacramento River downstream to Sacramento?

Mr. NASTRI. You'd have to look at the load, what's the potential load in that particular area, and the contribution to Sacramento.

Mr. OSE. You are almost creating a property right.

Mr. NASTRI. Yes.

Dr. GREEN. That's why the industry flow right model is vaguely related. This is a directional question, as to where you can trade a credit in the market. There's a directional component to where you can trade, where in theory you can trade the credits.

Mr. OSE. Do you measure your impact on the watershed at the point at which the watershed empties into the ocean, or do you measure it at spots along the path, or how do you quantify the impact you are looking for?

Mr. NASTRI. You actually measure it at spots along the path. That's actually what EPA is trying to do with the development of the Total Maximum Daily Load, which assesses the ability of any particular water body stream to carry any particular pollutant.

Mr. OSE. If that's the case, why wouldn't you be able to trade those credits across watersheds?

Dr. GREEN. Why wouldn't you?

Mr. OSE. Why wouldn't you?

Mr. NASTRI. Only insofar as they are nested and impacted.

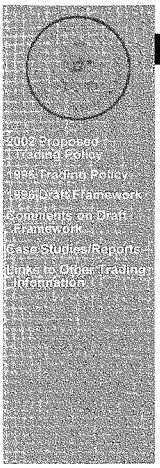
Mr. OSE. A TMDL is a TMDL, though. I mean, this is the part——

Mr. NASTRI. Well, then it gets to the localized impact, though. Why should somebody in southern California, that's paying to clear up their creek, be able to provide any offset or relief to somebody up in Sacramento? They are two totally disjointed watersheds, one having no impact on the other. But, the Cottonwood does have a direct impact on the Sacramento and, therefore, that should be allowed.

Mr. OSE. That's an interesting question. I'll be curious to see the comments on your draft notice there.

Mr. NASTRI. I'll make sure we forward them to you.

[The information referred to follows:]



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Trading

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2002 Proposed Trading Policy

Federal Register notice announcing the availability of EPA's Proposed Water Quality Trading Policy for public comment published on May 15, 2002 (HTML, PDF 39KB EXIT disclaimer)

Proposed Trading Policy, (HTML, PDF 28KB)

Fact Sheet on Proposed Trading Policy (HTML, PDF 8KB)

EPA Press Release -- EPA Proposes Enhanced Approach to Cleaning Up America's Waters

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Last updated on Thursday, May 16th, 2002
URL: http://www.epa.gov/owow/watershed/trading/tradingpolicy.html

agricultural advocates; the chemical industry; pesticide users; and members of the public interested in the use of pesticides on food. Since other entities also may be interested, the Agency has not attempted to describe all the specific entities that may be affected by this action. If you have any questions regarding the applicability of this action to a particular entity, consult the person listed under **FOR FURTHER INFORMATION CONTACT**.

B. How Can I Get Additional Information, Including Copies of this Document and Other Related Documents?

1. *Electronically.* You may obtain electronic copies of this document, and certain other related documents that might be available electronically, from the EPA Internet Home Page at http://www.epa.gov/. On the Home Page select "Laws and Regulations," "Regulations and Proposed Rules," and then look up the entry for this document under the "**Federal Register**—Environmental Documents." You can also go directly to the **Federal Register** listings at http://www.epa.gov/fedrgstr/. In addition, copies of the methidathion interim risk management decision documents released to the public may also be accessed at http://www.epa.gov/pesticides/reregistration/status.htm.

2. *In person.* The Agency has established an official record for this action under docket control number OPP–2002–0064. The official record consists of the documents specifically referenced in this action, and other information related to this action, including any information claimed as Confidential Business Information (CBI). This official record includes the documents that are physically located in the docket, as well as the documents that are referenced in those documents. The public version of the official record does not include any information claimed as CBI. The public version of the official record, which includes printed, paper versions of any electronic comments submitted during an applicable comment period is available for inspection in the Public Information and Records Integrity Branch (PIRIB), Room 119, Crystal Mall #2, 1921 Jefferson Davis Highway, Arlington, VA 22202–4501, from 8:30 a.m. to 4:00 p.m., Monday through Friday, excluding legal holidays. The PIRIB telephone number is (703) 305–5805.

II. What Action is the Agency Taking?

EPA has assessed the risks of methidathion and reached an Interim Reregistration Eligibility Decision (interim RED) for this OP. Provided that risk mitigation measures are adopted, methidathion fits into its own risk cup-its individual, aggregate risks are within acceptable levels. Methidathion is also eligible for reregistration, pending a full reassessment of the cumulative risk from all OP pesticides. Used on a variety of agricultural crops, predominantly alfalfa, citrus, and cotton, methidathion residues in food and drinking water do not pose risk concerns. Methidathion has no residential uses. EPA considered the mitigation proposal submitted by the technical registrant, as well as comments and mitigation ideas from other interested parties, and has decided on a number of label amendments (restrictions) to mitigate risks of concern posed by the uses of methidathion. With the implementation of these mitigation measures, methidathion's worker and ecological risks also will be below levels of concern for reregistration.

The methidathion interim RED was made through the OP pesticide pilot public participation process, which increases transparency and maximizes stakeholder involvement in EPA's development of risk assessments and risk management decisions. The pilot public participation process was developed as part of the EPA/USDA Tolerance Reassessment Advisory Committee, which was established in April 1998, as a subcommittee under the auspices of EPA's National Advisory Council for Environmental Policy and Technology. A goal of the pilot public participation process is to find a more effective way for the public to participate at critical junctures in the Agency's development of OP pesticide risk assessments and risk management decisions. EPA and USDA began implementing this pilot process in August 1998, to increase transparency and opportunities for stakeholder consultation.

EPA worked extensively with affected parties to reach the decisions presented in the interim RED, which concludes the pilot public participation process for methidathion. As part of the pilot public participation process, numerous opportunities for public comment were offered as the interim RED was being developed. The methidathion interim RED is issued in final, without a formal public comment period. The OP Public Regulatory Docket remains open; however, and any comments submitted in the future will be placed in the docket.

The revised risk assessments for methidathion were released to the public through a notice published in the **Federal Register** of December 8, 1999 (OPP–34213), (FRL–6399–2).

EPA's next step under the FQPA is to consider available information on the basis of cumulative risk encompassing all of the OP pesticides, sharing a common mechanism of toxicity. The tolerance reassessment decision for methidathion cannot be considered final until the cumulative risks for all of the OPs is considered. The Agency may need to pursue further risk management measures at that time.

List of Subjects

Environmental protection, chemicals, insecticides, acaricides, Pesticides and pests.

Dated: May 6, 2002.

Lois Rossi,

Director Special Review and Reregistration Division, Office of Pesticide Programs.

[FR Doc. 02–12009 Filed 5–14–02; 8:45 am]

BILLING CODE 6560–50–S

ENVIRONMENTAL PROTECTION AGENCY

[FRL–7212–3]

Water Quality Trading Policy; Proposed Policy

AGENCY: Environmental Protection Agency.

ACTION: Notice; request for comment.

SUMMARY: Today's notice invites comment on the U.S. Environmental Protection Agency's (EPA's) proposed Policy on Water Quality Trading ("proposed policy"). The purpose of the proposed policy is to signal EPA support for soundly designed water quality trading programs developed by States and Tribes. Another purpose is to propose program components that EPA believes are appropriate for trading programs to be soundly designed and to operate successfully. In addition, the proposed policy is intended to address issues left open and limitations encountered implementing projects under EPA's January 1996 Effluent Trading Policy and May 1996 draft Framework for Watershed-Based Trading (EPA 800-R–96–001).

Water quality trading is a voluntary, incentive-based approach to more efficiently protect and restore the nation's waters. The proposed policy addresses trading to maintain water quality in unimpaired waters, trading in impaired waters before development of a Total Maximum Daily Load (TMDL) and trading to meet TMDLs. While the focus is on nutrients and sediment, the policy also discusses the potential for trading other pollutants under certain circumstances.

The proposed policy is available for review at *www.epa.gov/owow/watershed/trading.htm.*

DATES: The Agency requests comments on the proposed policy posted at *www.epa.gov/owow/watershed/trading.htm.* Comments must be received or post-marked by midnight on July 1, 2002.

ADDRESSES: The proposed policy is available for review at *www.epa.gov/owow/watershed/trading.htm.* Please send an original and three copies of your written comments and enclosures to W–02–07 Comment Clerk, Water Docket (MC4101), EPA, 1200 Pennsylvania Avenue, NW., Washington, DC 20460. Comments may also be submitted electronically to *ow-docket@epamail.epa.gov.* Electronic comments must be submitted as an ASCII, WP5.1, WP6.1 or WP8 file avoiding the use of special characters and form of encryption. Electronic comments must be identified by the docket number W–02–07. Comments and data will also be accepted on disks in WP 5.1, 6.1, 8 or ASCII file format. Electronic comments on this notice may be filed online at many Federal Depository Libraries. Hand deliveries should be delivered to: EPA's Water Docket at 401 M Street, SW., Room EB57, Washington, DC 20460.

The record for this proposed policy has been established under docket number W–02–07, and includes supporting documentation as well as printed, paper versions of electronic comments. The record is available for inspection from 9 to 4 p.m., Monday through Friday, excluding legal holidays at the Water Docket, EB 57, USEPA Headquarters, 401 M St SW., Washington, DC 20460. For access to docket materials, please call 202/260–3027 to schedule an appointment.

FOR FURTHER INFORMATION CONTACT: David Batchelor, EPA, Office of Water, (202) 564–5764, *batchelor.david@epa.gov,* or Lynda Hall Wynn, EPA, Office of Water, (202) 564–0472, *wynn.lynda@epa.gov.*

Dated: May 9, 2002.

Diane C. Regas,

Acting Assistant Administrator for Water.

[FR Doc. 02–12148 Filed 5–14–02; 8:45 am]

BILLING CODE 6560–50–P

FEDERAL COMMUNICATIONS COMMISSION

Notice of Public Information Collection(s) Being Reviewed by the Federal Communications Commission

May 8, 2002.

SUMMARY: The Federal Communications Commission, as part of its continuing effort to reduce paperwork burden invites the general public and other Federal agencies to take this opportunity to comment on the following information collection(s), as required by the Paperwork Reduction Act of 1995, Public Law 104–13. An agency may not conduct or sponsor a collection of information unless it displays a currently valid control number. No person shall be subject to any penalty for failing to comply with a collection of information subject to the Paperwork Reduction Act (PRA) that does not display a valid control number. Comments are requested concerning (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimate; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

DATES: Written comments should be submitted on or before June 14, 2002. If you anticipate that you will be submitting comments, but find it difficult to do so within the period of time allowed by this notice, you should advise the contact listed below as soon as possible.

ADDRESSES: Direct all comments to Judith Boley Herman, Federal Communications Commission, Room 1–C804, 445 12th Street, SW, DC 20554 or via the Internet to *jboley@fcc.gov.*

FOR FURTHER INFORMATION CONTACT: For additional information or copies of the information collection(s), contact Judith Boley Herman at 202–418–0214 or via the Internet at *jboley@fcc.gov.*

SUPPLEMENTARY INFORMATION:

OMB Control No.: 3060–0835.

Title: Ship Inspection Certificates.

Form No.: FCC Forms 806, 824, 827, and 829.

Type of Review: Extension of a currently approved collection.

Respondents: Business or other for-profit, not-for-profit institutions, state, local or tribal government.

Number of Respondents: 3,770 respondents; 1,210 responses annually.

Estimated Time Per Response: .084 hours (average).

Frequency of Response: On occasion, annual and five year reporting requirements, recordkeeping requirement and third party disclosure requirement.

Total Annual Burden: 102 hours.

Total Annual Cost: N/A.

Needs and Uses: The Communications Act requires the inspection of small passenger ships at least once every five years. The Safety Convention (which the United States is signatory) also requires an annual inspection, however, permits an Administrator to entrust the inspections to either surveyors nominated for the purpose or to organizations recognized by it. Therefore, the United States can have other entities conduct the radio inspection of vessels for compliance with the Safety Convention. The Commission adopted rules that require this inspection to be conducted by a FCC-licensed technician. This requirement reduces administrative burden on the public and the Commission. The purpose of the information is to ensure that the inspection was successful so that passengers and crew members of certain United States ships have access to distress communications in case of an emergency.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

[FR Doc. 02–12059 Filed 5–14–02; 8:45 am]

BILLING CODE 6712–01–P

FEDERAL COMMUNICATIONS COMMISSION

Notice of Public Information Collection(s) Being Reviewed by the Federal Communications Commission, Comments Requested

May 6, 2002.

SUMMARY: The Federal Communications Commission, as part of its continuing effort to reduce paperwork burden invites the general public and other Federal agencies to take this opportunity to comment on the following information collection(s), as required by the Paperwork Reduction Act of 1995, Public Law 104–13. An agency may not conduct or sponsor a collection of information unless it displays a currently valid control number. No person shall be subject to any penalty for failing to comply with a collection of information subject to the Paperwork Reduction Act (PRA) that

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Office of Water
Proposed Water Quality Trading Policy

I. Background

The Clean Water Act (CWA)[1] was enacted in 1972 to restore and maintain the chemical, physical, and biological integrity of the nation's waters. It established a national policy that prohibits the discharge of toxic pollutants in toxic amounts and called for the discharge of pollutants to be eliminated by 1985. The CWA established interim goals for protecting fish, wildlife and recreational uses. It established financial assistance for the construction of publicly owned waste treatment facilities, requirements for area-wide waste treatment management planning and major research and demonstration efforts to develop pollution control technology. The CWA established a national policy for development and implementation of programs so the goals of the Act could be met by addressing point and nonpoint sources of pollution. Congress recognized and preserved the primary responsibilities and rights of the States to prevent, reduce and eliminate pollution.

The application of technology-based requirements through the National Pollutant Discharge Elimination System (NPDES) permit program has achieved tremendous success in controlling point source pollution and restoring the nation's waters. By 1990 over 87% of the major municipal facilities and 93% of major industrial facilities were in compliance with NPDES permit limits. EPA has estimated that in 1997, annual private point source control costs were about $14 billion and public point source costs were about $34 billion[2].

Despite these accomplishments almost 40% of currently assessed rivers, streams and lakes still do not support their designated uses[3]. Today sources of pollution such as urban storm water, agricultural runoff and atmospheric deposition threaten our nation's waters. Nutrient and sediment loading from agriculture and storm water are significant contributors to water quality problems as evidenced by Hypoxia in the Gulf of Mexico and a decreased fishery in Chesapeake Bay. Population growth and development place increasing demands on the environment making it more difficult to achieve and maintain water quality standards.

Finding solutions to these complex water quality problems requires innovative strategies that are aligned with core water programs. Water quality trading is an innovative approach that offers greater efficiency in achieving water quality goals on a watershed basis.

The National Cost to Implement Total Maximum Daily Loads (TMDLs) Draft Report estimates that flexible approaches to improving water quality could save $900 million dollars annually

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[1] Federal Water Pollution Control Act (Public Law 92-500, as amended).
[2] A Retrospective Assessment of the Costs of the Clean Water Act: 1972 – 1997 (EPA October, 2000).
[3] About 40 percent of the nation's waters have been assessed by States and Tribes pursuant to Section 305(b) of the Clean Water Act. The proportion of non-assessed water that do not meet designated uses is likely lower since assessments tend to be focused in known problem areas.

compared to the least flexible approach (August 2001). EPA believes that market-based approaches such as water quality trading provide greater flexibility and have potential to achieve water quality and environmental benefits greater than can be achieved under current practices and policies.

Market-based programs can achieve water quality goals at a substantial economic savings. Nitrogen trading among publicly owned treatment works that discharge into Long Island Sound, is expected to save over $200 million dollars in upgrading treatment facilities to meet water quality goals. Market-based approaches also create economic incentives for innovation, emerging technology, voluntary reductions and greater efficiency in improving the quality of the nation's waters.

This policy addresses issues left open by and limitations encountered implementing projects and programs under EPA's January 1996 Effluent Trading In Watersheds Policy ("Effluent Trading Policy") and May 1996 Draft Framework for Watershed-Based Trading ("Framework"). EPA believes that providing guidance through policy is appropriate to address outstanding issues and promotes the implementation of water quality trading and other market-based programs by States and Tribes. This policy provides necessary guidance for States and Tribes to implement programs designed to address water quality and economic issues within their jurisdictions.

A number of successful pilot trading projects have recently been completed and a number of States are developing water quality trading programs. These initiatives underscore the need and provide the basis for issuing the proposed policy. The lessons learned from these efforts provide workable innovative solutions to regulatory barriers that should be addressed in order to encourage trading to implement total maximum daily loads, offset growth and development and establish economic incentives for going beyond the minimum requirements of the CWA.

II. Water Quality Trading Policy Statement

EPA is issuing a revised policy encouraging States and Tribes to implement water quality trading for nutrients, sediments and other pollutants where opportunities exist to achieve water quality improvements at reduced costs.

This policy supercedes EPA's January 1996 Effluent Trading In Watersheds Policy. It strengthens and expands EPA's support for watershed-based trading set forth in EPA's May 1996 Draft Framework for Watershed-Based Trading (Draft Framework). This policy is intended to be interpreted in conjunction with the Draft Framework to the extent practicable. The policy should be given precedence over any inconsistencies with the Draft Framework. This policy sets forth what EPA believes is necessary for water quality trading to be successful and identifies

provisions of acceptable trading programs that are consistent with the CWA and federal regulations, including: requirements to obtain permits (Sections 402 and 404), antibacksliding provisions (Section 303(d)(4) and Section 402(o)), the development of water quality standards and antidegradation policy (Section 303), federal NPDES permit regulations (40 CFR Parts 122, 123 and 124) and water quality management plans (40 CFR Part 130).

This policy does not establish or affect any legal rights or obligations nor is it a final determination on the issues addressed in this policy. EPA's decision in any particular trade, project or program will be based on the applicable requirements of federal law and regulations and the specific facts and circumstances involved.

A. Purpose.

The purpose of this policy is to facilitate States and Tribes developing and implementing water quality trading programs that implement the requirements of the CWA and federal regulations in more flexible ways and reduce the cost of improving and maintaining the quality of the nation's waters. More specifically, the policy is intended to encourage the adoption of trading programs that facilitate implementation of TMDLs, reduce the costs of compliance with CWA regulations, establish incentives for voluntary reductions and promote watershed-based initiatives that result in greater water quality and environmental benefits than would otherwise be achieved under the CWA.

B. Policy.

1. Water quality trading and other market-based programs must be consistent with the CWA.

2. EPA supports trading that involves nutrients (total phosphorus and total nitrogen) or sediments. EPA recognizes that carefully and properly designed programs can achieve water quality goals and ancillary environmental benefits from trading of pollutants other than nutrients and sediments. EPA supports trading for pollutants other than nutrients and sediments where such trading achieves a net water quality or environmental benefit and does not cause adverse localized impacts. EPA also supports trading among pollutants (cross-pollutant) where appropriate and where adequate information exists to establish and correlate similar impacts on water quality. These other types of trades should be reviewed on a case-by-case basis to ensure consistency with State and Tribal water quality standards. EPA also believes that these types of trades should receive prior approval by issuance of a general or facility-specific permit; or, occur in the context of a TMDL approved by a State or Tribe and EPA to ensure adequate public access to information and provide an opportunity for public notice, comment and hearing.

3. EPA supports and encourages States and Tribes to implement water quality trading programs for many purposes, including the following:

- Reducing the cost of compliance with water quality-based requirements.
- Offsetting growth and maintaining water quality.
- Achieving early reductions and progress towards water quality standards pending development of TMDLs for impaired waters.
- Reducing the cost of implementing TMDLs through greater efficiency and flexible approaches.
- Establishing economic incentives for voluntary reductions from all sources, especially agriculture and urban storm water runoff.
- Achieving greater environmental benefits than those under existing regulatory programs. EPA supports the creation of water quality trading credits in ways that achieve ancillary environmental benefits beyond reductions in specific pollutant loads, such as the creation and restoration of wetlands, floodplains and wildlife and/or waterfowl habitat.
- Developing other market-based programs that bundle ecological services to achieve multiple environmental and economic benefits.

4. EPA supports water quality trading programs that include all the following general elements that are necessary for programs to be successful and specific provisions that EPA believes should be in any acceptable trading programs.

A. General Elements Of Successful Trading Programs:

1. Clear legal authority for trading to occur. This may be established by States or Tribes through legislation, rule making, incorporating provisions for trading into NPDES permits, establishing provisions for trading in TMDLs, or a combination thereof.

2. A fungible, clearly defined, unit of trade. Pollutant reduction credits and allowances are examples of tradable units for water quality trading. These may be expressed in rates or mass per unit time as appropriate to be consistent with the time periods that are used to determine compliance with NPDES permit limitations or other regulatory requirements.

3. Standardized protocols to quantify pollutant loads and load reductions, pollutant reduction credits, allowances or other tradable units. States and Tribes should develop procedures to account for the generation and use of credits in NPDES permits and discharge monitoring reporting forms. EPA believes this is necessary to track the generation and use of credits and allowances between sources and assess compliance.

   Methods and procedures used by the United States Department of Agriculture, Natural Resource Conservation Service (NRCS) may be used for trading to determine edge of field sediment loss for agricultural nonpoint source runoff. For nutrient trading, EPA recommends representative soil sampling to determine nutrient content and loads associated with sediment loss. EPA supports the use of NRCS technical field guidance for estimating load reductions achieved through installing controls and implementing management practices to reduce soil erosion. States and Tribes should develop site-specific delivery ratios or procedures to account for distance from edge of field to the stream segment, water body or watershed where trading occurs.

   EPA recommends estimating pollutant loads, load reductions and credits from storm water runoff, other than agriculture, based on local hydrology and pollutant loading factors that relate land use patterns, percent imperviousness and controls or management practices in a watershed to per acre pollutant loads, where other methods are not specified in a permit or regulation. This is done by determining pollutant-specific loading factors for each land use type in the watershed or area where trading occurs, calculating the average annual storm water runoff volume from pervious and impervious areas for each combination of land use type and control and management practices; and, computing the average total annual load for the watershed or trading area by the sum of all land use loading factors multiplied by the area for each land use type.

4. Mechanisms for determining compliance and ensuring enforcement. These may include a combination of record keeping, monitoring, reporting and inspections. Compliance audits should be conducted frequently enough to ensure that a high level of compliance is maintained across the program. States and Tribes should establish clear enforceable mechanisms consistent with NPDES regulations that ensure legal accountability for the generation of credits and allowances that are traded. EPA also recommends that States and Tribes consider providing periodic accounting and reconciliation periods and establishing enhanced enforcement provisions for failure to generate the quantity of credits or allowances that are traded.

5. Public participation and access to information. EPA supports public participation in the development of water quality programs to strengthen program effectiveness and credibility.

Public access to real-time information is necessary for markets to function and water quality trading to occur. EPA encourages States and Tribes to make trading programs electronically available to the public using geographic information system (GIS) applications to provide real time information on the sources that trade, track the generation and use of credits or allowances traded on a watershed basis, publish bids, quantities exchanged and market prices where available, and delineate watershed and trading boundaries. This information is necessary for the market to function efficiently, allow easy aggregation of credits or allowances, reduce transaction costs and establish public credibility.

6. Program evaluations. Periodic assessments of environmental and economic effectiveness should be conducted and program revisions made as needed. Program evaluations should include provisions for ambient monitoring to ensure localized violations of water quality standards do not occur and document water quality conditions. Studies should be performed to quantify actual nonpoint source load reductions, validate nonpoint source pollutant removal efficiencies and determine whether the anticipated water quality objectives have been achieved. The number and type of trades, the price paid for pollutant reduction credits and allowances, transaction costs, and costs incurred to administer the program should be considered to assess economic performance of the program.

   The results of program evaluations should be made available to the public. An opportunity for comment should also be provided on changes to the program as necessary to ensure the water quality standards are achieved, trading does not result in localized impairment of existing or designated uses and that the program achieves the water quality objectives it was designed to.

B. Provisions To Be Consistent With The CWA:

1. All water quality trading should occur within a watershed for which a trading program has been established or a defined area for which a TMDL has been approved. Establishing defined trading areas that coincide with watershed or TMDL boundaries results in trades that affect the same water body or stream segment, guards against localized effects and helps ensure that water quality standards are maintained throughout the trading area and contiguous waters.

2. Sources and activities that are required to obtain a federal permit pursuant to Sections 402 or 404 of the CWA will do so before they may participate in a trading program.

3. EPA supports several flexible approaches for incorporating provisions for trading into NPDES permits issued to point sources that trade. In some cases, specific trades may be

identified in NPDES permits, including nonpoint source requirements where appropriate. In other cases, the NPDES permit may authorize and contain provisions for trading to occur. EPA supports several approaches for incorporating trading into point source NPDES permits: a) general conditions that allow trading to occur, b) the use of variable permit limits that may be adjusted up or down based on the quantity of credits generated or used; and/or, c) the use of alternate permit limits or conditions that establish restrictions on the amount of a point source's pollution reduction obligation that can be achieved by the use of credits if trading occurs. EPA also encourages the use of watershed general permits under Sections 121(b) and 119(c)(1) of the CWA, where appropriate, to establish pollutant-specific limitations for a group of sources in the same or similar categories to achieve net pollutant reductions and water quality goals through trading.

4. Notice, comment and opportunity for hearing must be provided for all NPDES permits (40 CFR 124). NPDES permit and fact sheets should describe how baselines and conditions or limits for trading have been established and how trading is consistent with water quality standards. EPA will not consider individual trades to be a modification of NPDES permits that contain authorization and provisions for trading to occur provided the public was given notice and an opportunity to comment and/or attend a public hearing at the time the permit was issued.

5. Where methods and procedures are specified by federal regulations or in NPDES permits, these should continue to be used for measuring compliance for point sources that engage in trading. EPA believes this is necessary to provide clear and consistent standards for measuring compliance and to ensure that appropriate enforcement action can be taken.

6. EPA does not support trading to comply with technology-based effluent limitations except as expressly authorized by federal regulations. Existing technology-based effluent guidelines for the iron and steel industry allow intraplant trading of conventional and toxic pollutants between outfalls (40 CFR 420.03) under certain circumstances.

   EPA will consider including provisions for trading in the development of new and revised technology-based effluent guidelines and other regulations to achieve technology-based requirements, reduce implementation costs and increase environmental benefits.

7. EPA will not consider backsliding triggered where a source makes surplus reductions and later decides to discontinue generating credits as long as the actual discharge level does not exceed the discharge level previously authorized by a permit prior to generating credits.

8. The baselines for trading to occur should be derived from and be consistent with water

quality standards. Where a TMDL has been developed and approved by EPA, the applicable point source waste load allocation and nonpoint source load allocation establish the baselines for trading. For trades that occur where water quality fully supports designated uses, and in impaired waters prior to a TMDL being established, the baseline for point sources should be established by the current permit water quality based effluent limitation or a performance requirement or management practice derived from water quality standards; and, the baseline for nonpoint sources should be the level of pollutant load associated with existing land uses and management practices that comply with applicable State or Tribal regulations. Reductions below baseline levels are necessary to create a pollutant reduction credit or surplus allowance that can be used or traded.

9. Any use of pollutant reduction credits or allowances that would cause a localized impairment of existing or designated uses at the point of use, or that would exceed an in-stream target established under a TMDL is not acceptable.

10. State or Tribal antidegradation policies should include provisions addressing when trading can occur without requiring antidegradation review. EPA will consider trades and trading programs that achieve a no net increase in the discharge or loading of the same pollutant in waters that fully support designated uses as satisfying the anti-degradation requirements of the CWA.

11. EPA supports pre-TMDL trading in impaired waters that achieves a net reduction of the pollutant or pollutants causing impairment as providing a direct water quality benefit and progress towards achieving water quality standards. EPA also supports pre-TMDL trading that results in a direct environmental benefit beyond pollutant load reductions to achieve progress towards restoring designated uses where reducing pollutant loads alone is not sufficient or as cost effective. EPA considers greater than 1:1 point/point source and point/nonpoint source trading ratios necessary to provide a net water quality benefit unless it can be demonstrated that 1:1 trading ratios are consistent with achieving progress towards meeting water quality standards or a direct environmental benefit beyond pollutant load reductions results in progress towards restoring designated uses.

12. Trading programs in impaired waters for which a TMDL has been approved by a State or Tribe and EPA should be consistent with the TMDL.

    Reductions greater than required to achieve the level of reductions established by a TMDL are necessary to create a surplus allowance. Only surplus or unused allowances should be traded after a TMDL has been approved. To be consistent with water quality standards, the cap established by the TMDL should not exceed the maximum amount of a given pollutant

the water body can assimilate and attain the applicable water quality standards. Allocation of the cap among and between point sources and or nonpoint sources is necessary to establish the respective baselines for trading to occur. Any trading activity that would cause the combined point source discharge and nonpoint source loading to exceed the cap would not be acceptable.

The margin of safety incorporated in the TMDL under current regulations addresses the uncertainty associated with the calculations of pollutant loads, water quality monitoring and modeling. In addition, the margin of safety should account for the uncertainty of load shifts between point and nonpoint sources that may result from trading; or, greater than 1:1 trading ratio should be established to do so.

13. Provisions for water quality trading should be included in water quality management plans that set forth explicit provisions for implementing a water quality trading program and describe how the program will be consistent with water quality standards, the development and implementation of TMDLs; and, incorporated into NPDES permits.

14. While EPA envisions that at least initially, most credits or allowances will be purchased by point sources as a means of complying with water quality based permit requirements, it may also be acceptable for trading programs to include provisions for the purchase of credits and/or allowances by other entities for the purposes of securing long-term improvements in water quality.

EPA's Water Quality Trading Proposed Policy

The United States Environmental Protection Agency's (EPA's) Office of Water is renewing efforts to support the development and implementation of market-based approaches to improving water quality. This water quality trading initiative builds on EPA's efforts over the last seven years. In 1996, EPA issued an Effluent Trading in Watersheds Policy and Draft Framework for Watershed-Based Trading. EPA has previously funded and provided support for a number of demonstration trading projects including those in Cherry Creek Reservoir, Colorado; Long Island Sound; the Fox Wolf Basin in Wisconsin; Kalamazoo River in Michigan; Lower Boise River in Idaho; and the Chesapeake Bay. These projects have provided lessons and approaches that EPA believes will be potentially useful in other efforts to restore and maintain water quality.

In the proposed policy on water quality trading presented here for public comment, EPA draws on these lessons and experience to provide policy guidance to states, tribes, and others for the design and implementation of trading programs. The purpose of the proposed policy is to signal EPA support for soundly designed water quality trading programs developed by states and tribes and to identify components that EPA believes are appropriate for programs to operate successfully and protect water quality.

EPA supports development of water quality trading programs by states and tribes to restore or maintain water quality, and believes that trading programs can potentially achieve these water quality goals more efficiently and at lower cost while providing additional benefits such as habitat restoration. Implementation of water quality trading programs occurs within the existing regulatory framework. The proposed policy is intended to be fully consistent with this existing framework and includes many provisions intended to ensure program consistency with regulatory requirements.

The proposed policy addresses trading to maintain water quality in unimpaired waters, trading in impaired waters before development of a TMDL, and trading to meet TMDLs. While the focus is on nutrients and sediment, the policy also discusses the potential for trading other pollutant reductions under certain circumstances. The policy acknowledges some of the challenges encountered in trading programs, such as estimation of nonpoint source load reductions, and offers possible approaches. The importance of monitoring and program evaluation are also emphasized.

Office of Water Contacts

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United States Environmental Protection Agency

U.S. Press Release

05/15/2002

EPA PROPOSES ENHANCED APPROACH TO CLEANING UP AMERICA'S WATERS

Environmental News

FOR RELEASE: WEDNESDAY, MAY 15, 2002

EPA PROPOSES ENHANCED APPROACH TO CLEANING UP AMERICA'S WATERS

Robin Woods 202-564-7841/Woods.Robin@epa.gov

U.S. Environmental Protection Agency Administrator Christie Whitman today proposed a Water Quality Trading Policy to increase the pace and success of cleaning up impaired rivers, streams and lakes throughout the country. EPA officials believe this policy could save the public hundreds of millions of dollars by advancing more effective, efficient partnerships to clean up and protect watersheds. The policy encourages incentives to maintain high water quality where it exists as well as restoring impaired waters. In addition, the policy sets forth what EPA believes is necessary for state and tribal water quality trading programs to be successful and identifies provisions of acceptable trading programs that are consistent with the Clean Water Act and federal regulations.

"Many of us remember when some of our country's rivers were so heavily polluted that they were catching fire in the 1960s," said Whitman. "As a result of the Clean Water Act, signed into law in 1972, the discharge of pollutants by industry was greatly reduced. However, there is more to be done and the policy we are proposing today will help enhance the efforts that are already underway. This policy will lead to greater efficiency and better results, while being responsive, as we meet our clean water goals."

Despite the accomplishments of the Clean Water Act, many of America's waterways are still polluted by urban stormwater, sanitary sewer overflows, agricultural runoff and pollutants from the air that fall into our waters. What this policy seeks to encourage is more innovative approaches to meeting clean water standards and does not change any of the current regulations or standards

that are in place.

"We've made a lot of progress controlling pollution from industrial and municipal sources," Whitman explained. "Now we must look to innovative strategies that complement our current programs, to help us address the remaining challenges. Our Water Quality Trading Policy keeps existing controls and safeguards in place, but offers greater flexibility and incentives to states, tribes and companies to comply with the Clean Water Act. Trading provides incentives for voluntary reductions from all sources to improve and maintain the quality of the nation's waters."

The trading policy seeks to support and encourage states and tribes in developing and implementing water quality trading programs that implement the requirements of the Clean Water Act and federal regulations in more flexible ways and reduce the cost of improving and maintaining the quality of the nation's waters.

Under the proposed policy, industrial and municipal facilities would first meet technology control requirements and then could use pollution reduction credits to make further progress towards water quality goals. In order for a water quality trade to take place, a pollution reduction "credit" should first be created. EPA's water quality trading policy states that sources should reduce pollution loads *beyond* the level required by the *most stringent* technology requirements in order to create a pollution reduction "credit" that can be traded. For example, a landowner or a farmer could create credits by changing cropping practices and planting shrubs and trees next to a stream. A municipal wastewater treatment plant then could use these credits to meet water quality limits in its permit.

EPA officials believe that most trading will occur as states, tribes and sources implement programs to restore polluted waters. The policy supports trading among and between regulated and unregulated sources through watershed partnerships and programs developed by states and tribes.

EPA will publish a notice of availability in the Federal Register and post the proposed policy to protect and restore the nation's waters at: http://www.epa.gov/owow/watershed/trading.htm The policy will be open to public comment for 45 days. The final policy will be released later this summer.

R-94 ###

EPA Home Page Email A Comment

Mr. OSE. Dr. Green, do you know of any watershed trading programs, and then secondarily, do you know of any successful ones, and what are the characteristics of successful versus unsuccessful, that you've been able to discern, if any?

Dr. GREEN. I'm not aware of any watershed trading programs, specifically, where what they are looking at is trading pollutants within a watershed under a cap. I'm not aware of any cap-and-trade systems that exist for watershed protection.

There's an analogous process for protecting sub-surface water, which is more or less a cap-and-trade process on imperious surfaces, and a watershed utility embodies something like a cap-and-trade approach to impervious surfacing in that you pay a certain amount based on how much impervious surfacing you really do and the way you develop facilities, there's a price signal to control how much you do.

But, I'm not aware of any specific watershed trading programs around the country that have worked or that are implemented.

Mr. OSE. OK.

Let me go on to the information and data issue, which I talked about in my opening remarks. At the national level we are having a problem, in terms of gathering and analyzing the data that we do have. Do we have that same problem at a regional level? Mr. Nastri.

Mr. NASTRI. Yes. The data collection costs, the analytical costs, are extremely expensive, and we rely to a great extent on States and local agencies to collect that data. We are trying to find the resources to increase the data, and I agree that without that type of data it's difficult to set TMDLs and some of the other issues, but it is a problem.

Mr. OSE. One of the things that occurs to me is between Federal, State, and local—the Federal EPA, and Cal EPA, and say the local health departments—we ought to have a significant body of data somewhere, in terms of what the air quality algorithms are, or what the water TMDLs are. Are we spending resources at the Federal level that repeat the tasks that are being done at the State level, or local level? In other words, are we presently using our resources efficiently, in terms of the collection of data? Are we doing it once? Are we doing it two or three times, depending on whether you are Federal, State, or local, or do you know?

Mr. NASTRI. I don't think I know well enough to answer your question 100 percent, because there's a couple of different facets that I can answer your question. The actual data collection itself, and by that I mean the water sampling events and the analytical costs, I think that there isn't much duplicity going on. There aren't enough resources for that. So, the question becomes, the data that is generated, is that being managed efficiently?

And, on that I would probably say I think there's alot of room for improvement, because when I talk about the data management I think that what we found in the past is that you are getting data bases established at the local level, and then you are finding another data base that's been established at the State level, and then you are finding another data base that was established at the Federal level. Is that effective use of funds? I don't think so.

Is there a way that we can create a single data repository and have individual agencies access that data without necessarily repeating the data base itself? Yes, that's what we are trying to work on with all the States right now, in establishing a common language so that we can actually manipulate, utilize, and access the data efficiently, instead of simply recreating it.

And, that's something that we are working on.

Mr. OSE. Dr. Green, you talked in your written testimony about the local partnership issue, where often times the local non-profit or NGO's would be in the field working on something, and while they wouldn't have all the information, all of the empirical data, perhaps, that a governmental agency did, they had an intuitive understanding of a system and how it worked.

How do we get local folks involved that have this intuitive understanding of how an ecosystem operates? How do we get them meaningfully involved in this process? They might know intuitively that the wind blows from the east on most days, or when the wind blows you get a tide of this nature or that nature. How do we get this involvement, how do we do this?

Dr. GREEN. I think a key element is in creating awareness of the fact that there's a prospect for these processes to work, that is, there's enough flexibility within the regulatory process. I think there are things like Excel and agency efforts where the agencies make an effort to alert the local leaders to the fact that they are open to alternative solutions to that which is laid out in the specifically defined regulatory structure, that they want to tap that local knowledge and be at the table.

The local examples that I talked about in the testimony, the Feather River Alliance and so forth, they do have a component of the Government, whether it's State and local or Federal, at the table saying, "We are interested in finding a way to solve this problem other than the one you may have codified in a particular regulation. We can find ways to work with that regulatory framework to enable innovation and creativity in the use of your local knowledge of State, and place, and economy, and balance interests within districts, in a way that produces environmental improvement and still maximizes your abilities to run your community the way you want to run it."

So, I think a key element is that active outreach by the agency that says, "We are interested in this kind of innovation."

Mr. OSE. If I can make one observation on that. One of the first things I did upon becoming a Member of Congress was, I went over to the nearby high school, where they had an international baccalaureate program, and in the science section of that baccalaureate program there were like six or eight kids—I think actually one of them is now at MIT—and, I mean, these kids were up here and I'm kind of down here in the lower gene pool. They are actually the team that goes into the nearby creeks and collects the empirical data that then the local, State, and Federal agencies base their decisions on. Is that the kind of partnership you are talking about?

Dr. GREEN. Well, that's certainly one of them. The people who use the local watershed are going to have better knowledge about the condition of that watershed, and that's going to include the people who are based locally at universities. My own university,

UCLA, which isn't getting enough air time here, had an environmental program in which researchers went out and actually monitored airsheds here, in fact. At UCLA, we are responsible for a lot of the South Coast Air Quality Management District, resolving questions of inventory and emissions and so forth. But, that is clearly a part, tapping your local university knowledge base to gather the data.

One of the things that Mr. Nastri was talking about is the reason you don't have a lot of duplicative nature in water quality collection readings is that they tend to roll up. The data that they hold at the State level they hold because it was gathered at a local level for a local program. The information that the Federal Government has is because the State governments turn over their water quality data to the Federal Government.

The problem you have is that, between the States and between the localities they haven't really defined their water quality indicators in ways that are planned to make them interchangeably usable, and to draw the good ones. That's one of the reasons why you really need to drive down to that local level, because those indicators aren't necessarily going to be the same, and will, in fact, be an arbitrary and, perhaps, an unscientifically arbitrary way of saying, well, we are going to establish national indicators of quality. It's not always that easy.

Mr. NASTRI. Mr. Chairman, if I could add to that. Within California, the State has primacy for the safe water and clean water implementation. The issue of how do we get the local organizations, local stakeholders, local public, to become engaged is really something that's very important to me. It's important to me because a lot of these groups come to EPA saying, why isn't EPA doing something about the State, and why is EPA being forced to develop this or that various type of program? And so, the key is to develop stakeholder outreach programs. The key is to meet with these groups in their areas, with our State partners, and say—what are your concerns, what is the program that's being done to address that, and what, if any, improvements need to be made to that.

There are a number of programs here in southern California where locals have brought information up to the regional board. They weren't satisfied with the response that they were getting at the regional board and, therefore, they brought it up to us at EPA.

We at EPA are doing a number of different outreach efforts. In fact, for some of the programs, we actually do the analytical work for samples that are collected by some of these organizations. We also provide funding for them to continue some of their work. So, I think we are actively engaged. Can we do more? Absolutely, and we're going to be making a significant effort to do that. In fact, this afternoon I'm meeting with, I hate to say this, but about 60 representatives from cities all interested in various aspects of the TMDL development, and EPA's role as it passes off to the State the whole process. So, we are making that outreach.

Mr. OSE. I want to applaud you for doing that, because I know the cities and counties in my district, and I presume they are reflective of everybody's district, they are all terribly concerned about what the TMDL thing means to them from an on-the-ground viewpoint.

Frankly, I live across the street from the creek that this team from the high school monitors and now my 9 and 7 year-old are starting to say, "Well, I want to go with the team today." So, I mean, this is coming, and I do want to applaud your trying to press forward on this.

I'm sensitive to each of your time; I said we'd be done around noon, and it's 11:40 now. I want to go to the particular issue here, and that's the Supplemental Environmental Projects process where Region IX is using these as an alternative to the assessment of a cash penalty. Keep in mind our objective is to improve the environment, rather than generate cash. I think this is a very appealing concept. I'm curious how frequently, and I'm going to refer to them by their acronym, SEPs, how frequently are SEPs being used in Region IX, generically? I mean, three dozen, five?

Mr. NASTRI. Well, I'll give you just a ball park number; in the 7-months that I've been on the job we've probably done about 10 SEPs. A lot of times they'll relate to companies—the SEPs that we try to look at. We try, and we are actually constrained by the SEP requirements. And the actual money that's being spent goes into that area that's been impacted.

So, for instance, in Hawaii, there were a number of discharges that were made. What we were able to do there was get the company that was responsible for those discharges to buy emergency response equipment for the local responders. We were able to do the same thing here in Torrance, where emergency response was provided to local emergency responders.

There have been other SEPs that we've looked at. They are related, again, to water-type issues, where we are looking at providing water infrastructure to that local area—funds for improvement to the infrastructure.

Mr. OSE. How does Region IX assure itself that the SEP adequately addresses the problem that's on the table, so to speak?

Mr. NASTRI. Well, the SEP is almost a side bar to the problem that's on the table, because until the problem is solved we don't even get to the SEP. So, once the problem is solved then it becomes an issue of, do we want to push for penalties or do we want to push for some other creative mechanism that we think benefits everyone?

No one likes to pay penalties. We like to see the benefit sort of spread around, so we always push for SEPs. Now, in instances where we believe there was an egregious action by a party, we'll try to go for both penalties and SEPs. So, we used the SEP as the preferred method, but again, a lot will depend on the intent of the party.

Mr. OSE. Let me reverse that, let me reverse the question. Under a SEP, in a business where somebody has a problem, they enter into the SEP; what kind of assurance do they have that's a safe harbor?

Mr. NASTRI. Well again, the company would have to have settled with us, and the SEP is just a portion of that. Simply by offering themselves up to engage in a SEP doesn't provide them any relief.

Mr. OSE. So, if they've engaged in a SEP, I mean they don't get to the SEP until they get through this other thing.

Mr. NASTRI. Correct.

Mr. OSE. OK. So then, my second question is, having gotten through the other thing, and done the SEP, are they now in a safe harbor position?

Mr. NASTRI. No.

Mr. OSE. I'm trying to get into the certainty thing, are they still subject to challenge on their original thing or their SEP?

Mr. NASTRI. They would not be subject to challenge on the original item that brought the SEP about. If there were a new action that was a violation, then we would go after them for that.

Mr. OSE. Outside the constraints of the program.

Mr. NASTRI. Outside, correct.

Mr. OSE. OK.

I do think that if people violate the law, they ought to be held accountable, but if our choice is to collect a cash penalty and turn it over to the Treasury, or have them spend the same amount of money on fixing a problem, or two or three similar problems, I'm in favor of that.

You have, say, 10 SEPs in operation now. How do we go about expanding those? Is it a case-by-case basis?

Mr. NASTRI. It really is a case-by-case basis. In those instances where an honest mistake was made, we are not looking to impose penalties. I mean, I very much agree with your philosophy, and if we think that we can simply correct a problem so that it's not an ongoing issue, and if the company's willing, and we think that there's a good opportunity to do it, we would go through the SEP process. The way that we go through the SEP process, I think, is important to understand, because, you know, we want to use this as a tool. We can use SEPs for outreach to other companies to say, look, by doing this you can benefit in this particular way.

And so, we really look at it as something positive, and we really tout that the company came forward, did the right thing, is helping the community. I mean, they get a lot of, I think, positive benefit out of that, as opposed to, you know, these guys are bad actors and we are going after them.

Mr. OSE. Well, maybe they were.

Mr. NASTRI. Well, if they were, we would go after them.

Mr. OSE. Dr. Green.

Dr. GREEN. I think the key point, which is how do you institutionalize the favoring of environmental improvement over fines and/or paperwork compliance values, and perhaps some of what Wayne is getting at here is that perhaps one answer is to find ways to constrain fines only to situations of bad intent. You don't simply say, well, we favor it where we don't have a bad actor, but somebody had an accidental paperwork non-compliance, so we don't want to fine them.

On the other hand, you may not even want them to have to deal with the SEP either, but one thing to consider is that question of how do you institutionalize a system that would say, if we have a problem, how do we first look at getting an improvement, and how do we make sure that we're only using punitive approaches against bad actors? We maybe need to look at it from that standpoint, of constraining punitivity and expanding the SEP approach, because you achieve the same end.

Mr. OSE. Well, I will tell you, if there's egregious behavior I don't have a problem with——

Dr. GREEN. No, I don't either. I don't think anybody does.

Mr. OSE [continuing]. But going back to my comment about incentives versus paying, if there's somebody out there considering X, Y, or Z, and X is clearly illegal, and Y is on the border, and Z is no problem, if I could get them to go to Z through a SEP or some other incentive, that's what I'm trying to get to.

Dr. GREEN. It won't be through a SEP unless they've already gone through the Y or the illegal thing.

Mr. NASTRI. Yes, they have to get to the legal aspect before we get to the SEP. But there is a policy, Mr. Chairman, that sort of outlines the penalties, and when SEPs are appropriate. I can forward that to you and your committee for review, if you'd like.

[The information referred to follows:]

Signed 4/10/98

MEMORANDUM

SUBJECT: Issuance of Final Supplemental Environmental Projects Policy

FROM: Steven A. Herman
Assistant Administrator

TO: Regional Administrators

I am pleased to issue the final Supplemental Environmental Projects (SEP) Policy, the product of almost three years of experience implementing and fine-tuning the 1995 Interim Revised SEP Policy. It is also the product of the cooperative effort of the SEP Workgroup, comprised of representatives of the Regions, various OECA offices, OGC and DOJ. This Policy is effective May 1, 1998, and supersedes the Interim SEP Policy.

Most of the changes made to the Interim SEP Policy are clarifications to the existing language. There are no radical changes and the basic structure and operation of the SEP Policy remains the same. The major changes to the SEP Policy include:

1. Community Input. The final SEP Policy contains a new section to encourage the use of community input in developing projects in appropriate cases and there is a new penalty mitigation factor for community input. We are preparing a public pamphlet that explains the Policy in simple terms to facilitate implementation of this new section.

2. Categories of Acceptable Projects. The categories of acceptable projects have remained largely the same, with some clarifications and a few substantive changes. There is now a new "other" category under which worthwhile projects that do not fit within any of the defined categories, but are otherwise consistent with all other provisions of the SEP Policy, may qualify as SEPs with advance OECA approval. The site assessment subcategory has been revised and renamed to "environmental quality assessments." The environmental management system subcategory has been eliminated.

3. Use of SEPS to Mitigate Stipulated Penalties. The final SEP Policy prohibits the use of SEPs to mitigate claims for stipulated penalties, but does indicate that in certain defined extraordinary circumstances, I may approve a deviation from this prohibition.

4. Penalty Calculation Methodology. The penalty calculation steps have been better defined and broken into five steps rather than three. A calculation worksheet, keyed to the text of the Policy, has been added. The penalty mitigation guidelines have not been substantively changed, only clarified.

5. Legal Guidelines. The legal guidelines have been revised to improve clarity and provide better guidance. The nexus legal guideline has been revised to make it easier to apply. The fifth legal guideline concerning appropriations has been revised and subdivided into four sections.

Questions regarding the final SEP Policy should be directed to Ann Kline (202-564-0119) in the Multimedia Enforcement Division.

Attachment

cc: (w/attachment)
OECA Office Directors
Regional Counsels, Regions I-X
Director, Office of Environmental Stewardship, Region I
Director, Division of Enforcement and Compliance Assurance, Region II
Director, Compliance Assurance and Enforcement Division, Region VI
Director, Office of Enforcement, Compliance and Environmental Justice, Region VIII
Regional Enforcement Coordinators, Regions I-X
Chief, DOJ, EES

SEP Workgroup Members
David Hindin, Chair, EPTDD
Leon Acierto, V
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Joe Boyle, V
Lourdes Bufill, WED
Becky Dolph, VII
Karen Dworkin, DOJ, EES
Gwen Fitz-Henley, IV
Melanie Garvey, FFEO
Mark Haag, DOJ, PSLS
Tanya Hill, OGC
Leslie Jones, OSRE
Maureen Katz, DOJ, EES
Amelia Katzen, I
Ann Kline, MED
Gerard Kraus, MED
Sylvia Liu, DOJ, PSLS
Amy Miller , IX
Peter Moore, MED
Mike Northridge, OSRE
Reginald Pallesen, V
Rudy Perez, II
Erv Pickell, AED
JoAnn Semones, IX
Efren Ordonez, VI
Lawrence Wapensky, VIII

EPA SUPPLEMENTAL ENVIRONMENTAL PROJECTS POLICY

Effective May 1, 1998

A. INTRODUCTION

1. Background

In settlements of environmental enforcement cases, the U.S. Environmental Protection Agency (EPA) requires the alleged violators to achieve and maintain compliance with Federal environmental laws and regulations and to pay a civil penalty. To further EPA's goals to protect and enhance public health and the environment, in certain instances environmentally beneficial projects, or Supplemental Environmental Projects (SEPs), may be part of the settlement. This Policy sets forth the types of projects that are permissible as SEPs, the penalty mitigation appropriate for a particular SEP, and the terms and conditions under which they may become part of a settlement. The primary purpose of this Policy is to encourage and obtain environmental and public health protection and improvements that may not otherwise have occurred without the settlement incentives provided by this Policy.

In settling enforcement actions, EPA requires alleged violators to promptly cease the violations and, to the extent feasible, remediate any harm caused by the violations. EPA also seeks substantial monetary penalties in order to deter noncompliance. Without penalties, regulated entities would have an incentive to delay compliance until they are caught and ordered to comply. Penalties promote environmental compliance and help protect public health by deterring future violations by the same violator and deterring violations by other members of the regulated community. Penalties help ensure a national level playing field by ensuring that violators do not obtain an unfair economic advantage over their competitors who made the necessary expenditures to comply on time. Penalties also encourage regulated entities to adopt pollution prevention and recycling techniques in order to minimize their pollutant discharges and reduce their potential liabilities.

Statutes administered by EPA generally contain penalty assessment criteria that a court or administrative law judge must consider in determining an appropriate penalty at trial or a hearing. In the settlement context, EPA generally follows these criteria in exercising its discretion to establish an appropriate settlement penalty. In establishing an appropriate penalty, EPA considers such factors as the economic benefit associated with the violations, the gravity or seriousness of the violations, and prior history of violations. Evidence of a violator's commitment and ability to perform a SEP is also a relevant factor for EPA to consider in establishing an appropriate settlement penalty. All else being equal, the final settlement penalty will be lower for a violator who agrees to perform an acceptable SEP compared to the violator who does not agree to perform a SEP.

The Agency encourages the use of SEPs that are consistent with this Policy. SEPs may not be appropriate in settlement of all cases, but they are an important part of EPA's enforcement

program. While penalties play an important role in environmental protection by deterring violations and creating a level playing field, SEPs can play an additional role in securing significant environmental or public health protection and improvements. SEPs may be particularly appropriate to further the objectives in the statutes EPA administers and to achieve other policy goals, including promoting pollution prevention and environmental justice.

2. Pollution Prevention and Environmental Justice

The Pollution Prevention Act of 1990 (42 U.S.C. § 13101 et seq., November 5, 1990) identifies an environmental management hierarchy in which pollution "should be prevented or reduced whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort ..." (42 U.S.C. §13103). Selection and evaluation of proposed SEPs should be conducted generally in accordance with this hierarchy of environmental management, i.e., SEPs involving pollution prevention techniques are preferred over other types of reduction or control strategies, and this can be reflected in the degree of consideration accorded to a defendant/respondent before calculation of the final monetary penalty.

Further, there is an acknowledged concern, expressed in Executive Order 12898 on environmental justice, that certain segments of the nation's population, i.e., low-income and/or minority populations, are disproportionately burdened by pollutant exposure. Emphasizing SEPs in communities where environmental justice concerns are present helps ensure that persons who spend significant portions of their time in areas, or depend on food and water sources located near, where the violations occur would be protected. Because environmental justice is not a specific technique or process but an overarching goal, it is not listed as a particular SEP category; but EPA encourages SEPs in communities where environmental justice may be an issue.

3. Using this Policy

In evaluating a proposed project to determine if it qualifies as a SEP and then determining how much penalty mitigation is appropriate, Agency enforcement and compliance personnel should use the following five-step process:

(1) Ensure that the project meets the basic definition of a SEP. (Section B)
(2) Ensure that all legal guidelines, including nexus, are satisfied. (Section C)
(3) Ensure that the project fits within one (or more) of the designated categories of SEPs. (Section D)
(4) Determine the appropriate amount of penalty mitigation. (Section E)
(5) Ensure that the project satisfies all of the implementation and other criteria. (Sections F, G, H, I and J)

4. Applicability

This Policy revises and hereby supersedes the February 12, 1991 *Policy on the Use of Supplemental Environmental Projects in EPA Settlements* and the May 1995 *Interim Revised Supplemental Environmental Projects Policy*. This Policy applies to settlements of all civil judicial and administrative actions filed after the effective date of this Policy (May 1, 1998), and to all pending cases in which the government has not reached agreement in principle with the alleged violator on the specific terms of a SEP.

This Policy applies to all civil judicial and administrative enforcement actions taken under the authority of the environmental statutes and regulations that EPA administers. It also may be used by EPA and the Department of Justice in reviewing proposed SEPs in settlement of citizen suits. This Policy also applies to federal agencies that are liable for the payment of civil penalties. Claims for stipulated penalties for violations of consent decrees or other settlement agreements may not be mitigated by the use of SEPs.[1]

This is a settlement Policy and thus is not intended for use by EPA, defendants, respondents, courts or administrative law judges at a hearing or in a trial. Further, whether the Agency decides to accept a proposed SEP as part of a settlement, and the amount of any penalty mitigation that may be given for a particular SEP, is purely within EPA's discretion. Even though a project appears to satisfy all of the provisions of this Policy, EPA may decide, for one or more reasons, that a SEP is not appropriate (e.g., the cost of reviewing a SEP proposal is excessive, the oversight costs of the SEP may be too high, the defendant/respondent may not have the ability or reliability to complete the proposed SEP, or the deterrent value of the higher penalty amount outweighs the benefits of the proposed SEP).

This Policy establishes a framework for EPA to use in exercising its enforcement discretion in determining appropriate settlements. In some cases, application of this Policy may not be appropriate, in whole or part. In such cases, the litigation team may, with the advance approval of Headquarters, use an alternative or modified approach.

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[1] In extraordinary circumstances, the Assistant Administrator may consider mitigating potential stipulated penalty liability using SEPs where: (1) despite the circumstances giving rise to the claim for stipulated penalties, the violator has the ability and intention to comply with a new settlement agreement obligation to implement the SEP; (2) there is no negative impact on the deterrent purposes of stipulated penalties; and (3) the settlement agreement establishes a range for stipulated penalty liability for the violations at issue. For example, if a respondent/defendant has violated a settlement agreement which provides that a violation of X requirement subjects it to a stipulated penalty between $1,000 and $5,000, then the Agency may consider SEPs in determining the specific penalty amount that should be demanded.

B. DEFINITION AND KEY CHARACTERISTICS OF A SEP

Supplemental environmental projects are defined as **environmentally beneficial projects** which a defendant/respondent agrees to undertake **in settlement of an enforcement action,** but which the defendant/respondent is **not otherwise legally required to perform.** The three bolded key parts of this definition are elaborated below.

"Environmentally beneficial" means a SEP must improve, protect, or reduce risks to public health, or the environment at large. While in some cases a SEP may provide the alleged violator with certain benefits, there must be no doubt that the project primarily benefits the public health or the environment.

"In settlement of an enforcement action" means: 1) EPA has the opportunity to help shape the scope of the project before it is implemented; and 2) the project is not commenced until after the Agency has identified a violation (e.g., issued a notice of violation, administrative order, or complaint).[2]

"Not otherwise legally required to perform means" the project or activity is not required by any federal, state or local law or regulation. Further, SEPs cannot include actions which the defendant/respondent is likely to be required to perform:

(a) as injunctive relief[3] in the instant case;
(b) as injunctive relief in another legal action EPA, or another regulatory agency could bring;
(c) as part of an existing settlement or order in another legal action; or,
(d) by a state or local requirement.

SEPs may include activities which the defendant/respondent will become legally obligated to undertake two or more years in the future, if the project will result in the facility coming into compliance earlier than the deadline. Such "accelerated compliance" projects are not allowable,

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[2] Since the primary purpose of this Policy is to obtain environmental or public health benefits that may not have occurred "but for" the settlement, projects which the defendant has previously committed to perform or have been started before the Agency has identified a violation are not eligible as SEPs. Projects which have been committed to or started before the identification of a violation may mitigate the penalty in other ways. Depending on the specifics, if a regulated entity had initiated environmentally beneficial projects before the enforcement process commenced, the initial penalty calculation could be lower due to the absence of recalcitrance, no history of other violations, good faith efforts, less severity of the violations, or a shorter duration of the violations.

[3] The statutes EPA administers generally provide a court with broad authority to order a defendant to cease its violations, take necessary steps to prevent future violations, and to remediate any harm caused by the violations. If a court is likely to order a defendant to perform a specific activity in a particular case, such an activity does not qualify as a SEP.

however, if the regulation or statute provides a benefit (e.g., a higher emission limit) to the defendant/respondent for early compliance.

Also, the performance of a SEP reduces neither the stringency nor timeliness requirements of Federal environmental statutes and regulations. Of course, performance of a SEP does not alter the defendant/respondent's obligation to remedy a violation expeditiously and return to compliance.

C. LEGAL GUIDELINES

EPA has broad discretion to settle cases, including the discretion to include SEPs as an appropriate part of the settlement. The legal evaluation of whether a proposed SEP is within EPA's authority and consistent with all statutory and Constitutional requirements may be a complex task. Accordingly, this Policy uses five legal guidelines to ensure that our SEPs are within the Agency's and a federal court's authority, and do not run afoul of any Constitutional or statutory requirements.[4]

1. A project cannot be inconsistent with any provision of the underlying statutes.

2. All projects must advance at least one of the objectives of the environmental statutes that are the basis of the enforcement action and must have adequate nexus. Nexus is the relationship between the violation and the proposed project. This relationship exists only if:

   a. the project is designed to reduce the likelihood that similar violations will occur in the future; or

   b. the project reduces the adverse impact to public health or the environment to which the violation at issue contributes; or

   c. the project reduces the overall risk to public health or the environment potentially affected by the violation at issue.

Nexus is easier to establish if the primary impact of the project is at the site where the alleged violation occurred or at a different site in the same ecosystem or within the immediate geographic[5] area. Such SEPs may have sufficient nexus even if the SEP

[4] These legal guidelines are based on federal law as it applies to EPA; States may have more or less flexibility in the use of SEPs depending on their laws.

[5] The immediate geographic area will generally be the area within a 50 mile radius of the site on which the violations occurred. Ecosystem or geographic proximity is not by itself a sufficient basis for nexus; a project must always satisfy subparagraph a, b, or c in the definition of nexus. In some cases, a project may be performed at a facility or site not owned by the defendant/respondent.

addresses a different pollutant in a different medium. In limited cases, nexus may exist even though a project will involve activities outside of the United States.[6] The cost of a project is not relevant to whether there is adequate nexus.

3. EPA may not play any role in managing or controlling funds that may be set aside or escrowed for performance of a SEP. Nor may EPA retain authority to manage or administer the SEP. EPA may, of course, perform oversight to ensure that a project is implemented pursuant to the provisions of the settlement and have legal recourse if the SEP is not adequately performed.

4. The type and scope of each project are defined in the signed settlement agreement. This means the "what, where and when" of a project are defined by the settlement agreement. Settlements in which the defendant/respondent agrees to spend a certain sum of money on a project(s) to be defined later (after EPA or the Department of Justice signs the settlement agreement) are not allowed.

5. a. A project cannot be used to satisfy EPA's statutory obligation or another federal agency's obligation to perform a particular activity. Conversely, if a federal statute prohibits the expenditure of federal resources on a particular activity, EPA cannot consider projects that would appear to circumvent that prohibition

b. A project may not provide EPA or any federal agency with additional resources to perform a particular activity for which Congress has specifically appropriated funds. A project may not provide EPA with additional resources to perform a particular activity for which Congress has earmarked funds in an appropriations committee report.[7] Further, a project cannot be used to satisfy EPA's statutory or earmark obligation, or another federal agency's statutory obligation, to spend funds on a particular activity. A project, however, may be related to a particular activity for which Congress has specifically appropriated or earmarked funds.

c. A project may not provide additional resources to support specific activities performed by EPA employees or EPA contractors. For example, if EPA has developed a brochure to help a segment of the regulated community comply with environmental requirements, a project may not directly, or indirectly, provide additional resources to revise, copy or distribute the brochure.

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[6] All projects which would include activities outside the U.S. must be approved in advance by Headquarters and/or the Department of Justice. See section J.

[7] Earmarks are instructions for changes to EPA's discretionary budget authority made by appropriations committee in committee reports that the Agency generally honors as a matter of policy.

d. A project may not provide a federal grantee with additional funds to perform a specific task identified within an assistance agreement.

D. CATEGORIES OF SUPPLEMENTAL ENVIRONMENTAL PROJECTS

EPA has identified seven specific categories of projects which may qualify as SEPs. In order for a proposed project to be accepted as a SEP, it must satisfy the requirements of at least one category plus all the other requirements established in this Policy.

1. Public Health

A public health project provides diagnostic, preventative and/or remedial components of human health care which is related to the actual or potential damage to human health caused by the violation. This may include epidemiological data collection and analysis, medical examinations of potentially affected persons, collection and analysis of blood/fluid/ tissue samples, medical treatment and rehabilitation therapy.

Public health SEPs are acceptable only where the primary benefit of the project is the population that was harmed or put at risk by the violations.

2. Pollution Prevention

A pollution prevention project is one which reduces the generation of pollution through "source reduction," i.e., any practice which reduces the amount of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise being released into the environment, prior to recycling, treatment or disposal. (After the pollutant or waste stream has been generated, pollution prevention is no longer possible and the waste must be handled by appropriate recycling, treatment, containment, or disposal methods.)

Source reduction may include equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, inventory control, or other operation and maintenance procedures. Pollution prevention also includes any project which protects natural resources through conservation or increased efficiency in the use of energy, water or other materials. "In-process recycling," wherein waste materials produced during a manufacturing process are returned directly to production as raw materials on site, is considered a pollution prevention project.

In all cases, for a project to meet the definition of pollution prevention, there must be an overall decrease in the amount and/or toxicity of pollution released to the environment, not merely a transfer of pollution among media. This decrease may be achieved directly or through increased efficiency (conservation) in the use of energy, water or other materials. This is consistent with the Pollution Prevention Act of 1990 and the Administrator's "Pollution

Prevention Policy Statement: New Directions for Environmental Protection," dated June 15, 1993

3. Pollution Reduction

If the pollutant or waste stream already has been generated or released, a pollution reduction approach -- which employs recycling, treatment, containment or disposal techniques -- may be appropriate. A pollution reduction project is one which results in a decrease in the amount and/or toxicity of any hazardous substance, pollutant or contaminant entering any waste stream or otherwise being released into the environment by an operating business or facility by a means which does not qualify as "pollution prevention." This may include the installation of more effective end-of-process control or treatment technology, or improved containment, or safer disposal of an existing pollutant source. Pollution reduction also includes "out-of-process recycling," wherein industrial waste collected after the manufacturing process and/or consumer waste materials are used as raw materials for production off-site.

4. Environmental Restoration and Protection

An environmental restoration and protection project is one which enhances the condition of the ecosystem or immediate geographic area adversely affected.[8] These projects may be used to restore or protect natural environments (such as ecosystems) and man-made environments, such as facilities and buildings. This category also includes any project which protects the ecosystem from actual or potential damage resulting from the violation or improves the overall condition of the ecosystem.[9] Examples of such projects include: restoration of a wetland in the same ecosystem along the same avian flyway in which the facility is located; or purchase and management of a watershed area by the defendant/respondent to protect a drinking water supply where the violation (e.g., a reporting violation) did not directly damage the watershed but potentially could lead to damage due to unreported discharges. This category also includes projects which provide for the protection of endangered species (e.g., developing conservation programs or protecting habitat critical to the well-being of a species endangered by the violation).

In some projects where a defendant/respondent has agreed to restore and then protect certain lands, the question arises as to whether the project may include the creation or maintenance of certain recreational improvements, such as hiking and bicycle trails. The costs associated with such recreational improvements may be included in the total SEP cost provided they do not impair the environmentally beneficial purposes of the project and they constitute only an incidental portion of the total resources spent on the project.

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[8] If EPA lacks authority to require repair of the damage caused by the violation, then repair itself may constitute a SEP.

[9] Simply preventing new discharges into the ecosystem, as opposed to taking affirmative action directly related to preserving existing conditions at a property, would not constitute a restoration and protection project, but may fit into another category such as pollution prevention or pollution reduction.

In some projects where the parties intend that the property be protected so that the ecological and pollution reduction purposes of the land are maintained in perpetuity, the defendant/respondent may sell or transfer the land to another party with the established resources and expertise to perform this function, such as a state park authority. In some cases, the U.S. Fish and Wildlife Service or the National Park Service may be able to perform this function.[10]

With regard to man-made environments, such projects may involve the remediation of facilities and buildings, provided such activities are not otherwise legally required. This includes the removal/mitigation of contaminated materials, such as soils, asbestos and lead paint, which are a continuing source of releases and/or threat to individuals.

5. Assessments and Audits

Assessments and audits, if they are not otherwise available as injunctive relief, are potential SEPs under this category. There are three types of projects in this category: a. pollution prevention assessments; b. environmental quality assessments; and c. compliance audits. These assessments and audits are only acceptable as SEPs when the defendant/respondent agrees to provide EPA with a copy of the report. The results may be made available to the public, except to the extent they constitute confidential business information pursuant to 40 CFR Part 2, Subpart B.

a. Pollution prevention assessments are systematic, internal reviews of specific processes and operations designed to identify and provide information about opportunities to reduce the use, production, and generation of toxic and hazardous materials and other wastes. To be eligible for SEPs, such assessments must be conducted using a recognized pollution prevention assessment or waste minimization procedure to reduce the likelihood of future violations. Pollution prevention assessments are acceptable as SEPs without an implementation commitment by the defendant/respondent. Implementation is not required because drafting implementation requirements before the results of an assessment are known is difficult. Further, many of the implementation recommendations may constitute activities that are in the defendant/respondent's own economic interest.

b. Environmental quality assessments are investigations of: the condition of the environment at a site not owned or operated by the defendant/respondent; the environment impacted by a site or a facility regardless of whether the site or facility is owned or operated by the defendant/respondent; or threats to human health or the environment relating to a site or a facility regardless of whether the site or facility is owned or operated by the defendant/respondent. These include, but are not limited to: investigations of levels or sources of contamination in any environmental media at a site; or monitoring of the air, soil, or water quality surrounding a site or facility. To be eligible as SEPs, such assessments must be conducted in accordance with recognized protocols, if available, applicable to the type of

[10] These federal agencies have explicit statutory authority to accept gifts of land and money in certain circumstances. All projects with these federal agencies must be reviewed and approved in advance by legal counsel in the agency, usually the Solicitor's Office in the Department of the Interior.

assessment to be undertaken. Expanded sampling or monitoring by a defendant/respondent of its own emissic or operations does not qualify as a SEP to the extent it is ordinarily available as injunctive relief.

Environmental quality assessment SEPs may not be performed on the following types of sites: sites that are on the National Priority List under CERCLA § 105, 40 CFR Part 300, Appendix B; sites that would qualify for an EPA removal action pursuant to CERCLA §104(a) and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR § 300.415; and sites for which the defendant/respondent or another party would likely be ordered to perform a remediation activity pursuant to CERCLA §106, RCRA §7003, RCRA 3008(h), CWA § 311, or another federal law.

c. Environmental compliance audits are independent evaluations of a defendant/respondent's compliance status with environmental requirements. Credit is only given for the costs associated with conducting the audit. While the SEP should require all violations discovered by the audit to be promptly corrected, no credit is given for remedying the violation since persons are required to achieve and maintain compliance with environmental requirements. In general, compliance audits are acceptable as SEPs only when the defendant/respondent is a small business or small community.[11] [12]

6. Environmental Compliance Promotion

An environmental compliance promotion project provides training or technical support to other members of the regulated community to: 1) identify, achieve and maintain compliance with applicable statutory and regulatory requirements or 2) go beyond compliance by reducing the generation, release or disposal of pollutants beyond legal requirements. For these types of projects, the defendant/respondent may lack the experience, knowledge or ability to implement the project itself, and, if so, the defendant/respondent should be required to contract with an appropriate expert to develop and implement the compliance promotion project. Acceptable projects may include, for example, producing a seminar directly related to correcting widespread or prevalent violations within the defendant/ respondent's economic sector.

Environmental compliance promotion SEPs are acceptable only where the primary impact of the project is focused on the same regulatory program requirements which were violated and where EPA has reason to believe that compliance in the sector would be significantly advanced by the proposed project. For example, if the alleged violations involved Clean Water Act pretreatment violations, the compliance promotion SEP must be directed at ensuring compliance

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[11] For purposes of this Policy, a small business is owned by a person or another entity that employs 100 or fewer individuals. Small businesses could be individuals, privately held corporations, farmers, landowners, partnerships and others. A small community is one comprised of fewer than 2,500 persons.

[12] Since most large companies routinely conduct compliance audits, to mitigate penalties for such audits would reward violators for performing an activity that most companies already do. In contrast, these audits are not commonly done by small businesses, perhaps because such audits may be too expensive.

with pretreatment requirements. Environmental compliance promotion SEPs are subject to special approval requirements per Section J below.

7. Emergency Planning and Preparedness

An emergency planning and preparedness project provides assistance -- such as computers and software, communication systems, chemical emission detection and inactivation equipment, HAZMAT equipment, or training -- to a responsible state or local emergency response or planning entity. This is to enable these organizations to fulfill their obligations under the Emergency Planning and Community Right-to-Know Act (EPCRA) to collect information to assess the dangers of hazardous chemicals present at facilities within their jurisdiction, to develop emergency response plans, to train emergency response personnel and to better respond to chemical spills.

EPCRA requires regulated sources to provide information on chemical production, storage and use to State Emergency Response Commissions (SERCs), Local Emergency Planning Committees (LEPCs) and Local Fire Departments (LFDs). This enables states and local communities to plan for and respond effectively to chemical accidents and inform potentially affected citizens of the risks posed by chemicals present in their communities, thereby enabling them to protect the environment or ecosystems which could be damaged by an accident. Failure to comply with EPCRA impairs the ability of states and local communities to meet their obligations and places emergency response personnel, the public and the environment at risk from a chemical release.

Emergency planning and preparedness SEPs are acceptable where the primary impact of the project is within the same emergency planning district or state affected by the violations and EPA has not previously provided the entity with financial assistance for the same purposes as the proposed SEP. Further, this type of SEP is allowable only when the SEP involves non-cash assistance and there are violations of EPCRA, or reporting violations under CERCLA § 103, or CAA § 112(r), or violations of other emergency planning, spill or release requirements alleged in the complaint.

8. Other Types of Projects

Projects determined by the case team to have environmental merit which do not fit within at least one of the seven categories above but that are otherwise fully consistent with all other provisions of this Policy, may be accepted with the advance approval of the Office of Enforcement and Compliance Assurance.

9. Projects Which Are Not Acceptable as SEPs

The following are examples of the types of projects that are not allowable as SEPs:

a. General public educational or public environmental awareness projects, e.g., sponsoring public seminars, conducting tours of environmental controls at a facility, promoting recycling in a community;

b. Contributions to environmental research at a college or university;

c. Conducting a project, which, though beneficial to a community, is unrelated to environmental protection, e.g., making a contribution to a non-profit, public interest, environmental, or other charitable organization, or donating playground equipment;

d. Studies or assessments without a requirement to address the problems identified in the study (except as provided for in § D.5 above);

e. Projects which the defendant/respondent will undertake, in whole or part, with low-interest federal loans, federal contracts, federal grants, or other forms of federal financial assistance or non-financial assistance (e.g., loan guarantees).

E. CALCULATION OF THE FINAL PENALTY

Substantial penalties are an important part of any settlement for legal and policy reasons. Without penalties there would be no deterrence, as regulated entities would have little incentive to comply. Additionally, penalties are necessary as a matter of fairness to those regulated entities that make the necessary expenditures to comply on time: violators should not be allowed to obtain an economic advantage over their competitors who complied.

As a general rule, the net costs to be incurred by a violator in performing a SEP may be considered as one factor in determining an appropriate settlement amount. **In settlements in which defendant/respondents commit to conduct a SEP, the final settlement penalty must equal or exceed either: a) the economic benefit of noncompliance plus 10 percent of the gravity component; or b) 25 percent of the gravity component only; whichever is greater.**

Calculating the final penalty in a settlement which includes a SEP is a five step process. Each of the five steps is explained below. The five steps are also summarized in the penalty calculation worksheet attached to this Policy.

Step 1: Settlement Amount Without a SEP

a. The applicable EPA penalty policy is used to calculate the economic benefit of noncompliance.

b. The applicable EPA penalty policy is used to calculate the gravity component of the penalty. The g component is all of the penalty other than the identifiable economic benefit amount, after gravity has been adj other factors in the penalty policy (e.g., audits, good faith, litigation considerations), except for the SEP.

c. The amounts in steps 1.a and b are added. This sum is the minimum amount that would be necessary to settle the case without a SEP.

Step 2: Minimum Penalty Amount With a SEP

The minimum penalty amount must equal or exceed the economic benefit of noncompliance plus 10 percent of the gravity component, or 25 percent of the gravity component only, whichever is greater. The minimum penalty amount is calculated as follows:

a. Calculate 10 percent of gravity (multiply amount in step 1.b by 0.1).
b. Add economic benefit (amount in step 1.a) to amount in step 2.a.
c. Calculate 25 percent of gravity (multiply amount in step 1.b by 0.25).
d. Identify the minimum penalty amount: the greater of step 2.c or step 2.b.[13]

Step 3. Calculate the SEP Cost

The net present after-tax cost of the SEP, hereinafter called the "SEP COST," is the maximum amount that EPA may take into consideration in determining an appropriate penalty mitigation for performance of a SEP. In order to facilitate evaluation of the SEP COST of a proposed project, the Agency has developed a computer model called PROJECT.[14] There are three types of costs that may be associated with performance of a SEP (which are entered into the PROJECT model): capital costs (e.g., equipment, buildings); one-time nondepreciable costs (e.g., removing contaminated materials, purchasing land, developing a compliance promotion seminar); and annual operation costs and savings (e.g., labor, chemicals, water, power, raw materials).[15]

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[13] Pursuant to the February 1995 Revised Interim Clean Water Act Settlement Penalty Policy, section V, a smaller minimum penalty amount may be allowed for a municipality.

[14] A copy of the PROJECT computer program software and PROJECT User's Manual may be purchased by calling that National Technology Information Service at (800) 553-6847, and asking for Document #PB 98-500408GEI, or they may be downloaded from the World Wide Web at "http://www.epa.gov/oeca/models/".

[15] The PROJECT calculated SEP Cost is a reasonable estimate, and not an exact after-tax calculation. PROJECT does not evaluate the potential for market benefits which may accrue with the performance of a SEP (e.g., increased sales of a product, improved corporate public image, or improved employee morale). Nor does it consider costs imposed on the government, such as the cost to the Agency

To use PROJECT, the Agency needs reliable estimates of the costs associated with a defendant/respondent's performance of a SEP, as well as any savings due to such factors as energy efficiency gains, reduced materials costs, reduced waste disposal costs, or increases in productivity. For example, if the annual expenditures in labor and materials of operating a new waste recycling process is $100,000 per year, but the new process reduces existing hazardous waste disposal expenditures by $30,000 per year, the net cost of $70,000 is entered into the PROJECT model (variable 4).

In order to run the PROJECT model properly (i.e., to produce a reasonable estimate of the net present after-tax cost of the project), the number of years that annual operation costs or savings will be expended in performing the SEP must be specified. At a minimum, the defendant/respondent must be required to implement the project for the same number of years used in the PROJECT model calculation. (For example, if the settlement agreement requires the defendant/respondent to operate the SEP equipment for two years, two years should be entered as the input for number of years of annual expense in the PROJECT model.) If certain costs or savings appear speculative, they should not be entered into the PROJECT model. The PROJECT model is the primary method to determine the SEP COST for purposes of negotiating settlements.[16]

EPA does not offer tax advice on whether a regulated entity may deduct SEP expenditures from its income taxes. If a defendant/respondent states that it will not deduct the cost of a SEP from its taxes and it is willing to commit to this in the settlement document, and provide the Agency with certification upon completion of the SEP that it has not deducted the SEP expenditures, the PROJECT model calculation should be adjusted to calculate the SEP Cost without reductions for taxes. This is a simple adjustment to the PROJECT model: just enter a zero for variable 7, the marginal tax rate. If a business is not willing to make this commitment, the marginal tax rate in variable 7 should not be set to zero; rather the default settings (or a more precise estimate of the business' marginal tax rates) should be used in variable 7.

If the PROJECT model reveals that a project has a negative cost during the period of performance of the SEP, this means that it represents a positive cash flow to the defendant/respondent and is a profitable project. Such a project is generally not acceptable as a SEP. If a project generates a profit, a defendant/respondent should, and probably will, based on its own economic interests, implement the project. While EPA encourages regulated entities to

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for oversight of the SEP, or the burden of a lengthy negotiation with a defendant/ respondent who does not propose a SEP until late in the settlement process; such factors may be considered in determining a mitigation percentage rather than in calculating after-tax cost.

[16] See PROJECT User's Manual, January 1995. If the PROJECT model appears inappropriate to a particular fact situation, EPA Headquarters should be consulted to identify an alternative approach. For example, PROJECT does not readily calculate the cost of an accelerated compliance SEP. The cost of such a SEP is only the additional cost associated with doing the project early (ahead of the regulatory requirement) and it needs to be calculated in a slightly different manner. Please consult with the Office Of Regulatory Enforcement for directions on how to calculate the costs of such projects.

undertake environmentally beneficial projects that are economically profitable, EPA does not believe violators should receive a bonus in the form of penalty mitigation to undertake such projects as part of an enforcement action. EPA does not offer subsidies to complying companies to undertake profitable environmentally beneficial projects and it would thus be inequitable and perverse to provide such subsidies only to violators. In addition, the primary goal of SEPs is to secure a favorable environmental or public health outcome which would not have occurred but for the enforcement case settlement. To allow SEP penalty mitigation for profitable projects would thwart this goal.[17]

Step 4: Determine the SEP Mitigation Percentage and then the Mitigation Amount

Step 4.a: Mitigation Percentage. After the SEP COST has been calculated, EPA should determine what percentage of that cost may be applied as mitigation against the amount EPA would settle for but for the SEP. The quality of the SEP should be examined as to whether and how effectively it achieves each of the following six factors listed below. (The factors are not listed in priority order.)

- Benefits to the Public or Environment at Large. While all SEPs benefit public health or the environment, SEPs which perform well on this factor will result in significant and quantifiable reduction in discharges of pollutants to the environment and the reduction in risk to the general public. SEPs also will perform well on this factor to the extent they result in significant and, to the extent possible, measurable progress in protecting and restoring ecosystems (including wetlands and endangered species habitats).

- Innovativeness. SEPs which perform well on this factor will further the development, implementation, or dissemination of innovative processes, technologies, or methods which more effectively: reduce the generation, release or disposal of pollutants; conserve natural resources; restore and protect ecosystems; protect endangered species; or promote compliance. This includes "technology forcing" techniques which may establish new regulatory "benchmarks."

- Environmental Justice. SEPs which perform well on this factor will mitigate damage or reduce risk to minority or low income populations which may have been disproportionately exposed to pollution or are at environmental risk.

- Community Input. SEPs which perform well on this factor will have been developed taking into consideration input received from the affected community. No credit should be given for this factor if the defendant/respondent did not actively participate in soliciting and incorporating public input into the SEP.

[17] The penalty mitigation guidelines provide that the amount of mitigation should not exceed the net cost of the project. To provide penalty mitigation for profitable projects would be providing a credit in excess of net costs.

- Multimedia Impacts. SEPs which perform well on this factor will reduce emissions to more than one medium.

- Pollution Prevention. SEPs which perform well on this factor will develop and implement pollution prevention techniques and practices.

The better the performance of the SEP under each of these factors, the higher the appropriate mitigation percentage. The percent of penalty mitigation is within EPA's discretion; there is no presumption as to the correct percentage of mitigation. **The mitigation percentage should not exceed 80 percent of the SEP COST, with two exceptions:**

(1) For small businesses, government agencies or entities, and non-profit organizations, this mitigation percentage of the SEP COST may be set as high as 100 percent if the defendant/respondent can demonstrate the project is of outstanding quality.

(2) For any defendant/respondent, if the SEP implements pollution prevention, the mitigation percentage of the SEP COST may be set as high as 100 percent if the defendant/respondent can demonstrate that the project is of outstanding quality.

If the government must allocate significant resources to monitoring and reviewing the implementation of a project, a lower mitigation percentage of the SEP COST may be appropriate.

In administrative enforcement actions in which there is a statutory limit (commonly called "caps") on the total maximum penalty that may be sought in a single action, the cash penalty obtained plus the amount of penalty mitigation credit due to the SEPs shall not exceed the limit.

Step 4.b: SEP Mitigation Amount. The SEP COST (calculated pursuant to step 3) is multiplied by the mitigation percentage (step 4.a) to obtain the SEP mitigation amount, which is the amount of the SEP cost that may be used in potentially mitigating the preliminary settlement penalty.

Step 5: Final Settlement Penalty

5.a. The SEP mitigation amount (step 4.b) is then subtracted from the settlement amount without a SEP (step 1.c).

5.b The greater of step 2.d or step 5.a is the minimum final settlement penalty allowable based on the performance of the SEP.

F. LIABILITY FOR PERFORMANCE

Defendants/respondents (or their successors in interest) are responsible and legally liable for ensuring SEP is completed satisfactorily. A defendant/respondent may not transfer this responsibility and liability to someone else, commonly called a third party. Of course, a defendant/respondent may use contractors or consultants to assist it in implementing a SEP.[18]

G. OVERSIGHT AND DRAFTING ENFORCEABLE SEPS

The settlement agreement should accurately and completely describe the SEP. (See related legal guideline 4 in § C above.) It should describe the specific actions to be performed by the defendant/respondent and provide for a reliable and objective means to verify that the defendant/respondent has timely completed the project. This may require the defendant/respondent to submit periodic reports to EPA. The defendant/respondent may utilize an outside auditor to verify performance, and the defendant/respondent should be made responsible for the cost of any such activities. The defendant/respondent remains responsible for the quality and timeliness of any actions performed or any reports prepared or submitted by the auditor. A final report certified by an appropriate corporate official, acceptable to EPA, and evidencing completion of the SEP and documenting SEP expenditures, should be required.

To the extent feasible, defendant/respondents should be required to quantify the benefits associated with the project and provide EPA with a report setting forth how the benefits were measured or estimated. **The defendant/respondent should agree that whenever it publicizes a SEP or the results of a SEP, it will state in a prominent manner that the project is being undertaken as part of the settlement of an enforcement action.**

The drafting of a SEP will vary depending on whether the SEP is being performed as part of an administrative or judicial enforcement action. SEPs with long implementation schedules (e.g., 18 months or longer), SEPs which require EPA review and comment on interim milestone activities, and other complex SEPs may not be appropriate in administrative enforcement actions. Specific guidance on the proper drafting of settlement documents requiring SEPs is provided in a separate document.

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[18] Non-profit organizations, such as universities and public interest groups, may function as contractors or consultants.

H. FAILURE OF A SEP AND STIPULATED PENALTIES

If a SEP is not completed satisfactorily, the defendant/respondent should be required, pursuant to the terms of the settlement document, to pay stipulated penalties for its failure. Stipulated penalty liability should be established for each of the scenarios set forth below as appropriate to the individual case.

1. Except as provided in paragraph 2 immediately below, if the SEP is not completed satisfactorily, a substantial stipulated penalty should be required. Generally, a substantial stipulated penalty is between 75 and 150 percent of the amount by which the settlement penalty was mitigated on account of the SEP.

2. If the SEP is not completed satisfactorily, but the defendant/respondent: a) made good faith and timely efforts to complete the project; and b) certifies, with supporting documentation, that at least 90 percent of the amount of money which was required to be spent was expended on the SEP, no stipulated penalty is necessary.

3. If the SEP is satisfactorily completed, but the defendant/respondent spent less than 90 percent of the amount of money required to be spent for the project, a small stipulated penalty should be required. Generally, a small stipulated penalty is between 10 and 25 percent of the amount by which the settlement penalty was mitigated on account of the SEP.

4. If the SEP is satisfactorily completed, and the defendant/respondent spent at least 90 percent of the amount of money required to be spent for the project, no stipulated penalty is necessary.

The determinations of whether the SEP has been satisfactorily completed (i.e., pursuant to the terms of the agreement) and whether the defendant/respondent has made a good faith, timely effort to implement the SEP should be reserved to the sole discretion of EPA, especially in administrative actions in which there is often no formal dispute resolution process.

I. COMMUNITY INPUT

In appropriate cases, EPA should make special efforts to seek input on project proposals from the local community that may have been adversely impacted by the violations.[19] Soliciting community input into the SEP development process can: result in SEPs that better address the needs of the impacted community; promote environmental justice; produce better community understanding of EPA enforcement; and improve relations between the community and the violating facility. Community involvement in SEPs may be most appropriate in cases where the range of possible SEPs is great and/or multiple SEPs may be negotiated.

When soliciting community input, the EPA negotiating team should follow the four guidelines set forth below.

1. Community input should be sought after EPA knows that the defendant/respondent is interested in doing a SEP and is willing to seek community input, approximately how much money may be available for doing a SEP, and that settlement of the enforcement action is likely. If these conditions are not satisfied, EPA will have very little information to provide communities regarding the scope of possible SEPs.

2. The EPA negotiating team should use both informal and formal methods to contact the local community. Informal methods may involve telephone calls to local community organizations, local churches, local elected leaders, local chambers of commerce, or other groups. Since EPA may not be able to identify all interested community groups, a public notice in a local newspaper may be appropriate

3. To ensure that communities have a meaningful opportunity to participate, the EPA negotiating team should provide information to communities about what SEPs are, the opportunities and limits of such projects, the confidential nature of settlement negotiations, and the reasonable possibilities and limitations in the current enforcement action. This can be done by holding a public meeting, usually in the evening, at a local school or facility. The EPA negotiating team may wish to use community outreach experts at EPA or the Department of Justice in conducting this meeting. Sometimes the defendant/respondent may play an active role at this meeting and have its own experts assist in the process.

4. After the initial public meeting, the extent of community input and participation in the SEP development process will have to be determined. The amount of input and participation is likely to vary with each case. Except in extraordinary circumstances and with agreement of the parties, representatives of community groups will not participate directly in the settlement negotiations. This restriction is necessary because of the

[19] In civil judicial cases, the Department of Justice already seeks public comment on lodged consent decrees through a Federal Register notice. See 28 CFR §50.7. In certain administrative enforcement actions, there are also public notice requirements that are followed before a settlement is finalized. See 40 CFR Part 22.

confidential nature of settlement negotiations and because there is often no equitable process to determine which community group should directly participate in the negotiations.

J. EPA PROCEDURES

1. Approvals

The authority of a government official to approve a SEP is included in the official's authority to settle an enforcement case and thus, subject to the exceptions set forth here, no special approvals are required. The special approvals apply to both administrative and judicial enforcement actions as follows:

a. Regions in which a SEP is proposed for implementation shall be given the opportunity to review and comment on the proposed SEP.

b. In all cases in which a project may not fully comply with the provisions of this Policy (e.g., see footnote 1), the SEP must be approved by the EPA Assistant Administrator for Enforcement and Compliance Assurance. If a project does not fully comply with all of the legal guidelines in this Policy, the request for approval must set forth a legal analysis supporting the conclusion that the project is within EPA's legal authority and is not otherwise inconsistent with law.

c. In all cases in which a SEP would involve activities outside the United States, the SEP must be approved in advance by the Assistant Administrator and, for judicial cases only, the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice.

d. In all cases in which an environmental compliance promotion project (section D.6) or a project in the "other" category (section D.8) is contemplated, the project must be approved in advance by the appropriate office in OECA, unless otherwise delegated.

2. Documentation and Confidentiality

In each case in which a SEP is included as part of a settlement, an explanation of the SEP with supporting materials (including the PROJECT model printout, where applicable) must be included as part of the case file. The explanation of the SEP should explain how the five steps set forth in Section A.3 above have been used to evaluate the project and include a description of the expected benefits associated with the SEP. The explanation must include a description by the enforcement attorney of how nexus and the other legal guidelines are satisfied.

Documentation and explanations of a particular SEP may constitute confidential settlement information that is exempt from disclosure under the Freedom of Information Act, is

outside the scope of discovery, and is protected by various privileges, including the attorney-client privilege and the attorney work-product privilege. While individual Agency evaluations of proposed SEPs are confidential, privileged documents, this Policy is a public document and may be released to anyone upon request.

This Policy is primarily for the use of U.S. EPA enforcement personnel in settling cases. EPA reserves the right to change this Policy at any time, without prior notice, or to act at variance to this Policy. This Policy does not create any rights, duties, or obligations, implied or otherwise, in any third parties.

ATTACHMENT

SEP PENALTY CALCULATION WORKSHEET

This worksheet should be used pursuant to section E of the Policy.
Specific Applications of this Worksheet in a Case Are Privileged, Confidential Documents.

STEP		AMOUNT
STEP 1: CALCULATION OF SETTLEMENT AMOUNT WITHOUT A SEP.		
1.a.	BENEFIT: The applicable penalty policy is used to calculate the economic benefit of noncompliance.	$
1.b.	GRAVITY: The applicable penalty policy is used to calculate the gravity component of the penalty; this is gravity after all adjustments in the applicable policy.	$
1.c	SETTLEMENT AMOUNT without a SEP: Sum of step 1.a plus 1.b.	$
STEP 2: CALCULATION OF THE MINIMUM PENALTY AMOUNT WITH A SEP		
2.a	10% of GRAVITY: Multiply amount in step 1.b by 0.10	$
2.b	BENEFIT PLUS 10% of GRAVITY: Sum of step 1.a plus step 2.a.	$
2.c.	25 % of GRAVITY: Multiply amount in step 1.b by 0.25.	$
2.d	MINIMUM PENALTY AMOUNT: Select greater of step 2.c or step 2.b.	$
STEP 3: CALCULATION OF THE SEP COST USING PROJECT MODEL.		$
STEP 4: CALCULATION OF MITIGATION PERCENTAGE AND MITIGATION AMOUNT.		
4.a.	SEP Cost Mitigation Percentage. Evaluate the project pursuant to the 6 mitigation factors in the Policy. Mitigation percentage should not exceed 80 % unless one of the exceptions applies.	%
4.b.	SEP Mitigation Amount. Multiply step 3 by step 4.a	$
STEP 5: CALCULATION OF THE FINAL SETTLEMENT PENALTY.		
5.a	Subtract step 4.b from step 1.c	$
5.b.	**Final Settlement Penalty**: Select greater of step 2.d or step 5.a.	$

Mr. OSE. I would appreciate that, because if you have been an egregious violator, and you are found accountable, and you are held accountable for that, and then you mend your ways, and you enter into a SEP of one sort or another, I would hope that it's got a certainty to it, in other words, a safe harbor provision of some sort or another if you comply with the SEP. You might get visited to make sure you are complying with the SEP, but once you've complied with the SEP you have that certainty.

Mr. NASTRI. Yes.

I think that the certainty in this case is the remedy. The SEP is the benefit, so to speak, so there would be no compliance with the SEP, other than the fact that they provided the funds, or they did whatever it was that they committed to do, as part of the SEP.

But, if they met their legal obligation to stop emissions, or stop discharges, or——

Mr. OSE. Or, give back in compliance.

Mr. NASTRI [continuing]. Exactly.

Mr. OSE. I find this a very appealing concept. I think it's very creative, and I want to compliment you on that.

Mr. NASTRI. Thank you, we appreciate that.

Mr. OSE. Now, I have about 170 more questions here. We can stay for the rest of the afternoon, or I can send them to you in writing. I'm going to opt for sending them to you in writing, again, because I know your time is valuable and I want to respect it. So, we are going to go ahead and wrap up.

I do want to say that I have appreciated you coming down here and testifying today. California, has so many different opportunities, but it also has a similar number of challenges. What I've heard today from Mr. Nastri, from the Federal side, Dr. Ellerman on the market side, Dr. Green from the research side, frankly, I think your made some pretty good progress toward coming up with some solutions. And, interestingly enough, they are not the—in business we always called it the cram-down solution, you might use command-and-control in this instance. They are incentive based, instead of pushing people into something we are kind of bargaining with them, and I find that particularly attractive.

These concepts of tradable credits, I think offer real promise. Granted, we've refined it on acid rain, we've still got to work on it here on water. RECLAIM is at least a measurable success, even if it still needs some tweaks, in people's opinions. But out of that, we get less pollution, and we get lower compliance costs. I don't know of a better epithet, if you will; those are positive, both of them, less pollution, lower compliance costs, those are positives.

Now, Congress, I think, is interested in both. Out of 435 of us, I will tell you, I don't know of anyone who says, "I'm for more pollution," or "I'm for higher costs." There's nobody in Congress who says that; we all want less pollution and lower compliance costs. So, I applaud the three of you for your efforts. We'll leave the record open for 10 days for the purpose of other Members submitting comments from across the country.

This subcommittee and this chairman look forward to working closely with Mr. Nastri, and welcome any input you have Dr. Ellerman and Dr. Green. We intend to make this a success. Less pollution, lower compliance costs.

We are adjourned. Thank you, gentlemen.

[Whereupon, at 11:45 a.m., the subcommittee was adjourned.]

[Additional information submitted for the hearing record follows:]

USDA Environmental Quality Incentives Program (EQIP)
Potential Projects in the San Joaquin Valley and California
Partnership with USDA/NRCS/EPA
FY2002

Proposal 1. Target $50million to reduce air quality emissions from agricultural diesel-powered engines in California through conversions to electric or "cleaner-diesel" technologies. 2. Target $50million to control smog inducing emissions and water pollution from California dairies.

Background Section 2301 of the Farm Security and Rural Investment Act of 2002 reestablished the Environmental Quality Incentives Program (EQIP): "The purpose of the EQIP...are to promote agricultural production and environmental quality as compatible goals, and to optimize environmental benefits, by–(1) Assisting producers in complying with local, State and national regulatory requirements concerning (A) soil, water and air quality..... and (2) avoiding, to the maximum extent practicable, the need for resource and regulatory programs by assisting producers in protecting soil, water, air and related natural resources and meeting environmental quality criteria established by Federal, State, tribal and local agencies;...." A total of $400million is authorized in FY2002, with 60% dedicated for livestock operations and 40% for cropland. The amount of funds increases to $1.3billion in 2007. The authorizing language directs the USDA to enter into contracts with producers to use these funds for environmental protection.

California is home to over 32million people and 25,000 farms in the San Joaquin Valley alone. As a result, air quality continues to exceed health standards in many areas of the State. Of particular concern is the San Joaquin Valley, where, unlike the rest of California and most of the U.S., there has been little progress in reducing PM10 and Ozone levels. The area is currently considering voluntarily requesting to be classified to Extreme Ozone Nonattainment and they have yet again missed their 2001 PM10 attainment date. The San Joaquin Valley Unified Air Pollution District (District) and California Air Resources Board (CARB) have estimated the area needs an additional 150 tons/day of both VOC and NOX in order to bring the area into attainment for ozone. Emission reductions will be need from all sources, including agricultural sources. The District has identified livestock operations as the largest source of VOC's and there has been a concerted effort to reduce emission from agricultural diesel-powered engines. Additionally, as a result of a recent settlement, EPA will begin Clean Air Act permitting of major sources of agriculture. If EQIP funds are used to reduce the emissions of agricultural operations to below major source threshold, the producers would not be required to obtain a permit.

Diesel Engine Conversions

California's Carl Moyer Program has been extremely successful in incentivizing diesel engine conversions. In the San Joaquin Valley, farmers have used these funds to voluntarily convert their diesel agricultural pumps to electric or "cleaner diesel" technologies. There are almost 7400 stationary and portable agricultural pumps in California and almost 196,000 other diesel operated pieces of farm equipment. Of these, San Joaquin Valley has almost 3300 ag. pumps and 87,000 other ag. engines. Farm equipment alone is estimated to emit about 84.8tons/day of NOX and 12.2 tons/day of VOC in 1999. To convert a diesel ag. pump to electric or cleaner diesel

ranges from $5000-$25,000 depending on the size of the engine. The State's Carl Moyer Program will receive no funding this year. We propose $50million be made available to CARB or other source to provide funds to convert about 2000 to 4000 pumps during the next year.

Dairy and Other Significant AFO Operations: Air and Water Quality Improvements

With more than 1.5 million dairy cows generating 30million tons of manure each year in California, management of dairy waste on the 2300 dairies is one of the state's most pressing environmental issues. Livestock waste (e.g. dairy and feedlots) is the single largest source of VOC's in the San Joaquin Valley with an estimated 68.1 tons/day emitted in 1999. In addition, dairies are one of the largest causes of nutrient pollution in the Central Valley as well. Building on the successes of the California Dairy Quality Assurance Program (DQAP), target $50million to the control of air emissions and polluted runoff from dairies, focusing initially on lagoons and land application. While additional research is being done, Environmental Stewardship Farm Management Plans are being developed in the state, 1000 dairies have received training on the development of these plans, and there are technologies such as anaerobic and aerobic digesters that are conducive to field study for wide scale application. This program could be administered by California Department of Food and Agriculture or the Natural Resource Conservation Service.

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Amy Zimpfer, Air Division, 415-947-4146
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Laura Tom-Bose, Water Division, 415-972-3538
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United States Environmental Protection Agency

Communications, Education, And Media Relations (1703A)

EPA

Environmental News

FOR RELEASE: FRIDAY, JUNE 7, 2002

EPA AND OMB WORKING TO SPEED THE REDUCTION OF POLLUTION FROM NONROAD DIESEL ENGINES

Contact: Joe Martyak 202-564-9828

In an unusual collaboration, the Office of Information and Regulatory Affairs (OIRA) of the Office of Management and Budget (OMB) and the Office of Air and Radiation of the Environmental Protection Agency (EPA) today released the attached statement agreeing that curbing pollution from diesel-powered non-road vehicles and equipment should be a top environmental priority.

"Non-road engines emit significant amounts of fine particles and nitrogen oxides," said John D. Graham, Administrator of OMB's Information and Regulatory Affairs. "OMB and EPA share a concern that inhalation of fine particles is associated with a variety of adverse health effects. We are interested in addressing these critical issues and protecting Americans from the harmful health effects of diesel pollution."

"I am pleased to begin this collaborative effort with the Office of Management and Budget to address one of the important sources of fine particulates and other pollution in most metropolitan areas," said Jeff Holmstead, Assistant Administrator for EPA's Office of Air and Radiation. "Other than the President's Clear Skies Initiative for power plants, taking action to reduce non-road diesel emissions is probably the most important step we can take to improve air quality throughout the country."

The proposal being developed will evaluate not only new emission control devices that would be required for new engines, but also the reductions in sulfur levels that are likely to be needed to enable the control systems to operate effectively. This comprehensive systems approach is similar to that taken for the heavy duty diesel highway rule for trucks and buses that takes effect in the 2006-2007 timeframe. EPA plans to publish a formal proposal for public comment early next year.

EPA will work closely with OMB and interested stakeholders in developing the non-road diesel rule. In particular, EPA will consult with state and local officials, diesel engine and equipment manufacturers, fuel refiners and marketers, public health experts and environmental organizations, as well as the Departments of Energy, Transportation and Agriculture. Analysis and decision making under this agreement will fully comply with both the Clean Air Act and Presidential Executive Order 12866 on regulatory planning and review.

OMB AND EPA AGREE ON NEED TO CURB POLLUTION FROM OFF-ROAD, DIESEL-POWERED VEHICLES

In an unusual collaboration, the Office of Information and Regulatory Affairs (OIRA) of the Office of Management and Budget (OMB) and the Office of Air and Radiation of the Environmental Protection Agency (EPA) have agreed that curbing pollution from diesel-powered, non-road vehicles and equipment should be a top environmental priority of the Bush Administration. EPA has already been doing preliminary work on a rulemaking to reduce emissions from these sources, but the collaboration between OMB and EPA will allow the rulemaking effort to proceed on a expedited basis. This action will build on the recently reaffirmed EPA rule aimed at reducing pollution from on-road diesel-powered trucks and buses. It will also further the objectives of the Administration's recent Clear Skies Initiative, which is aimed at reducing similar pollutants from power plants.

OMB and EPA share a concern that inhalation of fine particles is associated with a variety of adverse health effects, including hospital admissions and premature mortality among patients with cardiopulmonary problems. For this reason, they believe that all significant sources of emissions that contribute to the formation of fine particulate matter (PM) need to be analyzed to determine whether regulatory action is appropriate. Although non-road diesel engines already are subject to regulation, they continue to represent an important and growing source of fine PM and other pollution in most metropolitan areas. There are currently several million of these engines in use in the U.S., primarily in the construction, mining, farm, and airport service sectors.

OMB and EPA also recognize that controlling exhaust from non-road diesel engines will likely require a lower-sulfur grade of fuel than is currently available. Refiners are already scheduled to begin producing such a low sulfur diesel fuel for on-highway applications in 2006. This is an expensive undertaking, and one that must be evaluated carefully in deciding whether and how to require additional desulfurization of diesel fuel. At the same time, refiners may benefit from the ability to plan for desulfurization of highway and non-road diesel supplies concurrently.

In light of the complex issues raised by this rulemaking, including the need to assure that the fuel supply is compatible with emissions control systems, EPA will work closely with OMB and other experts and interested stakeholders in developing the non-road diesel rule. In particular, the Agency will consult with state and local officials, diesel engine and equipment manufacturers, fuel refiners and marketers, public health experts and environmental organizations, as well as the Departments of Energy, Transportation and Agriculture.

EPA and OMB will also collaborate on the design of an innovative regulatory analysis to support the development of regulatory strategies to reduce emissions from non-road diesel engines. Among other things, this analysis will consider: (1) the use of incentives to encourage the early introduction of clean emission control technologies and low sulfur diesel fuel, (2) the potential use of market-based averaging, banking, and trading programs that might include permission to trade emission-reduction credits between off-road and highway engines, thereby stimulating more emission reduction at less cost; (3) the additional emission reduction benefits that can be achieved from existing off-road diesel engines through the use of very low sulfur diesel fuel; and (4) how risks, benefits and costs might vary by type of off-road engine and geographical location of use. Analysis and decision making under this agreement will fully comply with both the Clean Air Act and Presidential Executive Order 12866 on regulatory planning and review.

EPA Administrator Christine Todd Whitman will supervise this collaborative effort. She asked that day-to-day leadership be provided by Jeffrey Holmstead, Assistant Administrator for Air and Radiation, U.S. Environmental Protection Agency and John D. Graham, Ph.D., Administrator, Office of Information and Regulatory Affairs, Office of Management and Budget.

R-117 ###

The Carl Moyer Program:
Incentives for Cleaner Heavy-Duty Engines

This page updated March 26, 2002

The Governor's Budget allocated a one time appropriation of $16 million dollars to fund the Carl Moyer program through the 2001/2002 fiscal year. Previously, $25 million in ARB's 1998-99 fiscal year budget, $19 million in ARB's 1999-2000 fiscal year budget, and $50 million in ARB's 2000/2001 were allotted for Carl Moyer Program incentive grants, as a means to reduce emissions from heavy-duty engines.

The incentives are grants that would cover the incremental cost of cleaner on-road, off-road, marine, locomotive and stationary agricultural pump engines, as well as forklifts, airport ground support equipment, and Auxiliary Power Units. Beginning in summer 1999, grants became available through participating air pollution control and air quality management districts grants. Heavy-duty engines are a significant source of smog-forming pollutants. In addition, the fine particulate matter exhaust from heavy-duty diesel engines is a toxic air contaminant. The incentive program focuses on reducing emissions of smog-forming oxides of nitrogen (NOx), but will also reduce particulate emissions. In recognition of his work in the air quality field and his efforts in bringing about this program, the incentive program is named after the late Dr. Carl Moyer.

Third Year Status Report

Carl Moyer Program Third Year Status Report *(added March 26, 2002)*

Appendix A

Appendix B

Notice of Postponement Please note that the Carl Moyer Program Public Meeting to Consider A Status Report on the Carl Moyer Program has been POSTPONED. *(added March 18, 2002)*

Notice of Public Meeting on March 21, 2002 to consider a status report on the Carl Moyer Program *(added March 6, 2002)*

Status Report will be added soon. If you would like to receive an email notification when the Status Report is available on this website, please subscribe to the Carl Moyer Program List Serve.

Inter-District Program Solicitation

Notice of the Carl Moyer Program Inter-District Project Solicitation (Word97 - 46K) or (Acrobat - 20K)

Carl Moyer Program Inter-District Project Solicitation (Word97 - 64K) or (Acrobat - 23K)

Appendix A (Word97 - 51K) or (Acrobat - 53K)

Appendix B (Word97 - 57K) or (Acrobat - 47K)

Appendix C (Word97 - 55K) or (Acrobat - 46K)

Guideline Revisions

Final **APPROVED** Carl Moyer Program Revised Guidelines

More Info information

Advisory Board

Carl Moyer Incentives Program Fact Sheet

District Contacts

Frequently Asked Questions

Guidelines Development

On-Road Heavy-duty Engines Certified to Lower-Emission NOx Standards

Status Report

Where Can I Get More information?

Carl Moyer Program grants are issued locally by air pollution control districts and air quality management districts in California. Call ARB toll free at 800-242-4450 (regular business hours) or 800-END-SMOG (after hours) to get the phone number of a local district contact.

To join the Carl Moyer Program list serve click here

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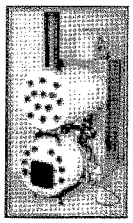
Mobile Source Program

A department of the California Environmental Protection Agency

San Joaquin Valley
Air Pollution
Control District

HEAVY-DUTY ENGINE EMISSION REDUCTION INCENTIVE PROGRAM

AGRICULTURAL PUMP ENGINES



What is the Program?

The San Joaquin Valley Air Pollution Control District (SJVAPCD) ***will pay you*** to reduce emissions from your stationary agricultural irrigation pump engines. If you have an old agricultural pump engine of at least fifty (50) horsepower that needs to be rebuilt or replaced, the SJVAPCD may give you money to retrofit your engine or repower (replace) your existing engine with a new, cleaner burning engine or an electric motor. The SJVAPCD is providing incentives to anyone interested in the purchase of:

- New electric agricultural pump motors on new wells
- Reduced-emission stationary agricultural pump engines or motors for replacement of existing engines (repowers)
- Reduced-emission retrofit technologies meeting certain eligibility criteria

Why is the SJVAPCD Offering These Incentives?

The purpose of the Heavy-Duty Engine Emission Reduction Incentive Program (Heavy-Duty Engine Program) is to assist the SJVAPCD in achieving air quality standards by the early introduction of reduced-emission technologies. The widespread use of lower emitting agricultural engines or motors can provide significant improvements to air quality in the San Joaquin Valley. When you retrofit your existing engine or buy a new low-emission engine or motor, you will contribute to cleaner air for everyone in the Valley.

How Much Money Can I Get?

Since the funding is intended to decrease the expense associated with the purchase of cleaner technologies, the amount of money you can receive will depend on two factors. The eligible incentive amount for a repower project will be the new engine or motor cost minus the rebuild cost. The total incentive provided by the SJVAPCD will not exceed the value of $6.50 per pound ($13,000 per ton) of nitrogen oxide emissions (NOx) reduced. In addition, diesel to diesel repower projects and projects installing a new electric motor on a new well are subject to funding caps shown at right:

Engine hp	Maximum Incentive/Repower
50-99	$5,000
100-174	$10,000
175-299	$15,000
300-499	$20,000
500+	$25,000

How Do I Know If I Am Eligible For Funding?

Anyone may apply to receive an incentive under this program. Funds are available for eligible new engines, engine replacements and/or engine retrofits that meet specific program criteria. The criteria for eligible engines/retrofit technology are as follows:

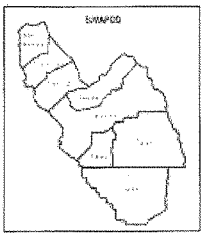
- The engine must be fifty (50) horsepower or greater (equal to 37 kW for an electric motor).
- The reduced-emission engine/retrofit technology must:
  - Be certified for sale in California, and
  - Show at least a 30% (new purchase on new well) or 15% (repower or retrofit) reduction of NOx emissions and no increase in particulate emissions compared to the applicable standards for that engine year and type of application through::
    - California Air Resources Board (ARB) certification testing,
    - U.S. Environmental Protection Agency (U.S. EPA) certification testing, or
    - Emission testing at a laboratory approved by U.S. EPA or ARB.
- The purchase or emission reductions are not required by, or used to comply with, any local, state, or federal rule or regulation, Memorandum of Understanding (MOU) or Memorandum of Agreement (MOA).

San Joaquin Valley
Air Pollution
Control District

HEAVY-DUTY ENGINE EMISSION REDUCTION INCENTIVE PROGRAM

What's the Catch?

There is no catch. We're paying you to help us clean up the air. However, to achieve this goal, your agricultural pump engine has to operate in the San Joaquin Valley. For us to make sure this happens, we'll need the following from you:



- ▲ Assurance that the engine will be based within the SJVAPCD (see map at right).
- ▲ 75% or more of the fuel consumed or hours of operation will be within the boundaries of the SJVAPCD for at least 5 years from the date the new engine or motor is placed into service. If the engine does not complete the minimum 5-year term set forth in this program, a prorated portion of the funds must be returned to the SJVAPCD.
- ▲ Simple annual reports will be required for 5 years from the beginning of engine operation with the new technology. The reports shall include such information as fuel consumed, hours of operation and details regarding maintenance. These reports help us know that we are indeed improving air quality with valuable tax dollars.

How Do I Apply?

Applications will be evaluated and approved on a ***first-come, first-serve basis*** until program funds are exhausted. The process is as follows:

1. Send an application to the SJVAPCD. The application will require contact information and descriptions of the replacement vehicle /technology and operations.
2. SJVAPCD staff reviews the application to determine eligibility. You will be notified if more information is needed.
3. If the application meets minimum criteria, an incentive amount will be determined for the proposed vehicle/technology.
4. Applicants will be notified of application approval or denial. Upon approval of the application, the SJVAPCD will prepare a simple contract for signature by the applicant and SJVAPCD.
5. The applicant orders and places the reduced-emission technology into service within 1 year of contract signature.
6. The applicant submits equipment invoice, receipts, and SJVAPCD Claim(s) for Payment form. The SJVAPCD issues payment upon verification that the vehicle has been placed into service.
7. As mentioned above, the applicant will submit simple annual reports. The SJVAPCD maintains the right to monitor the project periodically to ensure emission reductions are occurring.

Where Do I Get an Application?

You can receive an application by calling the SJVAPCD at (559) 230-5858. For general information about the program, you can call (559) 230-5800 or visit the SJVAPCD website at www.valleyair.org.

San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, California 93726-0244
(559) 230-5800 ♦ Fax (559) 230-6064

January 2001

California Environmental Protection Agency

NEWS RELEASE

Air Resources Board

Release 01-12

FOR IMMEDIATE RELEASE
April 26, 2001

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Air Board's Carl Moyer Program a Success -- Achieves Substantial Toxic and NOx Reductions

SACRAMENTO – The California Environmental Protection Agency's Air Resources Board (ARB) today approved a report to the state legislature on an incentive program that has reduced smog-forming and cancer-causing air emissions from diesel engines.

The Carl Moyer Memorial Air Quality Standards Attainment Program reduces oxides of nitrogen (NOx), which contribute to ozone, one of the most health-damaging components of smog, and also reduces cancer-causing particulate matter (PM).

"Carl Moyer projects reduce high diesel emissions in all communities," said ARB Chairman Dr. Alan Lloyd. "I would like to see at least 50 percent of the Moyer projects go to benefit communities that are disproportionately impacted by air pollution," he said.

The governor and legislature have approved $98 million over the last three fiscal years to fund the Moyer Program. In addition, the 22 local air pollution control districts that administer the funding for ARB provide approximately $40 million in matching funds.

Estimated emission reductions from the program's first two years are about 2200 tons per year (TPY) of NOx and about 70 TPY of PM. When third-year projects are implemented, it is anticipated that annual NOx reductions will reach about 4400 TPY and PM emissions about 140 TPY.

The majority of Moyer Program funding has been spent to upgrade or replace diesel engines in city transit buses, school buses, trash trucks and agricultural irrigation pumps. Upgrades to diesel engines can include replacing existing engines with newer, cleaner models and converting to engines powered by alternative fuels or electricity.

The program's emission reductions are achieved by funding the incremental cost of cleaning up diesel engine NOx and PM emissions below the levels called for by current standards, agreements or regulations.

As an example, under the Moyer program, a company purchasing a $100,000 new truck that meets the state's minimum NOx emission standards, can instead buy a $125,000 new truck that beats the NOx

standards by at least 30 percent. Moyer funding pays the additional $25,000 for the cleaner truck. This framework is also used to determine other Moyer grants, including those for off-road and other equipment, large marine vessels, locomotives, forklifts and airport ground support equipment.

The program is named for the late Dr. Carl Moyer, a visionary scientist who worked to establish government incentive programs to defray the cost of reducing harmful air emissions. Since diesel engines frequently have a "life" of 20 or more years, the Moyer Program has been particularly effective in replacing some of the state's oldest, highest polluting engines.

The Air Resources Board is a department of the California Environmental Protection Agency. ARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy. The ARB oversees all air pollution control efforts in California to attain and maintain health based air quality standards.

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

# # # # #

Carl Moyer Clean Engine Incentive Program

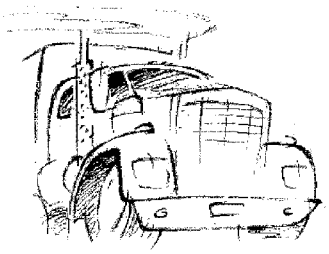
This page updated March 1999.

California's 1998-99 budget contains $25 million to improve the state's air quality by replacing or rebuilding heavy-duty diesel engines that emit high levels of nitrogen oxide (NOx) with new clean-technology engines. Some engines powered by other fuels may also qualify. The incentive program is named for the late Dr. Carl Moyer, in recognition of his work in air quality and his efforts to bring about this program.

The Carl Moyer Program is administered by the California Environmental Protection Agency's Air Resources Board (ARB). Funds are distributed through local air districts. Incentives, in the form of grants for private companies or public agencies operating heavy-duty engines in California, will cover an incremental portion of the cost of cleaner on-road, off-road, marine and locomotive engines. About 525,000 heavy-duty diesel trucks are driven throughout the state, with another 680,000 diesel-fueled engines used in construction and agriculture. Together, diesel engines contribute about 40% of all NOx emissions from mobile sources. NOx is one of the main contributors to ground-level ozone, one of the most health-damaging components of smog.

What equipment qualifies?

Generally, on-road heavy-duty engines qualifying for the Moyer Program are those powering vehicles (trucks and buses) over 14,000 pounds gross vehicle weight. Qualifying off-road equipment includes construction and farm equipment such as combines, cranes, graders, and tractors; marine vessels and locomotives; stationary agricultural equipment; forklifts; and airport ground support equipment.



Moyer Program grants offset the incremental cost of purchasing cleaner engines. For example, a company may be able to buy a new truck for $100,000 which meets the state's minimum emission standards, or buy a lower-emission truck for $125,000. The offsetting cost ($25,000) is available through the Moyer Program in order to buy the lower-emission truck. This framework is used to determine grants for off-road and other equipment; and for retrofitting or repowering existing engines.

Background

Diesel engines are getting cleaner with the use of cleaner fuels and new technology. New engine emission standards and agreements with industry that will be phased in from 2001 through 2010 will result in still lower diesel emissions. The Moyer Program, by encouraging emission reductions beyond those required by law, regulation, or other agreements, accelerates progress to reduce air emissions and helps the state meet federally-mandated clean-air deadlines.

Other Benefits

Cleaner diesel engines and alternative fuel engines are available now, either for new equipment and engines or through repowering or retrofitting older engines. Cleaner diesel and alternative fuel technology will likely be the dominant choice for complying with future emission standards. For businesses considering the Moyer Program, cleaner engines can, in some cases, mean improved fuel economy and reduced fuel costs. Participation also signals to the local community a commitment to environmental improvement. The Moyer Program will be particularly beneficial to companies needing to reduce diesel emissions at trucking yards or shipping terminals in heavily populated areas.

Summary

The Moyer Program is an incentive-based program which taps into available new environmental technologies to help the state advance clean air goals.

Through this program, California can implement incentive-based reductions in diesel engine emissions that are called for in the State Implementation Plan (SIP), the state's "roadmap" for meeting federal clean-air mandates. The Moyer Program provides the added benefit of bringing California cleaner air sooner than otherwise called for by law or regulation and helps the state's air districts reach clean-air goals in time to meet federal deadlines.

Together with other incentive-based measures, the Moyer Program has the potential to reduce NOx emissions, and can do so cost effectively for between $5,000 and $12,000 per ton. By comparison, controls on stationary sources cost between $10,000 - $20,000 per ton.

The $25 million budgeted for the Moyer Program is available in the form of grants through local air districts over the next two fiscal years. However, since distribution of funds will begin in 1999 on a "first-come, first-served" basis in some districts, it is recommended that those interested in the program contact their local air district immediately. Success with reducing air pollutants through this program could lead to additional grant funds in the future.

For more information...

Carl Moyer Program grants are issued locally by air pollution control districts and air quality management districts in California. Call ARB toll free at 800-242-4450 (regular business hours) or 800-END-SMOG (after hours) to get the phone number of a local district contact.

You may obtain this document in an **alternative format** by contacting the ARB's ADA Coordinator at (916) 322-4505 (voice), (916) 324-9531 (TDD, Sacramento area), or (800) 700-8326 (TDD, outside Sacramento).

* * * * * * * * *

Dr. Carl Moyer (1937-97) spent his life seeking practical solutions to environmental and air quality problems, particularly through the development of clean-air technologies. Moyer was sought after by government agencies, industry and environmental groups as a consultant on low-emission technologies, alternative fuels, emissions controls, and many other clean air technologies. He was known for his ability to draw disparate groups into agreement on air quality issues and championed incentive programs as a way to make clean-air gains.

Top of page

The Carl Moyer Program

Mobile Source Program

A department of the California Environmental Protection Agency

THE CARL MOYER PROGRAM ANNUAL STATUS REPORT

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

March 26, 2002

California Environmental Protection Agency
Air Resources Board

In memory of Dr. Carl Moyer
(1937 – 1997)

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

More than 1.2 million diesel engines operate in California. Trucks, agricultural and construction equipment, marine vessels, and locomotives rely primarily upon diesel power to transport goods and people to keep our society functioning. Diesel engines also contribute an inordinate amount to California's smog and toxic air pollution problems. The Carl Moyer Program is providing a positive near-term solution to this challenge.

The Carl Moyer Program is a grant program that funds the extra capital cost of cleaner than required vehicles and equipment in order to provide air quality benefits. It has been successful in getting a large number of clean vehicles on the road today. This includes over 1900 alternative-fueled vehicles, especially transit buses and refuse trucks. The program has also replaced nearly 2000 older diesel engines with new, cleaner diesel engines, primarily in marine vessels, off-road equipment, and agricultural irrigation pumps.

Diesel engines emit a complex mixture of air pollutants that includes oxides of nitrogen (NOx) and particulate matter (PM). NOx emissions are a precursor to smog and although diesel vehicles comprise only a small percentage of the number of on-road vehicles in California, they are responsible for more than 70 percent of the NOx emissions. PM emissions from diesel-powered engines have been identified by the Air Resources Board (ARB) as a toxic air contaminant. One study has estimated that over 70 percent of the risk from toxic air contaminants in the South Coast Air Basin is due to diesel PM emissions.

In its first three years, the Carl Moyer Program has provided reductions of 14 tons per day of NOx and about 800 pounds per day of PM. Most of these emissions benefits will occur for five years (the minimum project life). However, some large engine projects will be providing emission benefits for 20 years or more. In general, the Carl Moyer Program has provided a very cost-effective means of achieving these reductions, averaging below $5,000 per ton of NOx reduced.

California has made progress in reducing the emissions from new diesel engines and significantly more progress will be made over the next ten years. However, this progress will be tempered by large increases in the number of heavy-duty vehicles (12 percent statewide and 23 percent in the South Coast Air Basin between 2000 and 2010). In addition, diesel engines tend to operate for 20 years or more, making a clean air strategy unreliable if it relies solely on new engine standards.

The State Implementation Plan (SIP) is California's long-range plan to achieve clean air. This federally-enforced Plan includes near-term emission reductions from heavy-duty diesel engines in order to achieve our overall air quality commitments. The Carl Moyer Program provides these critical near-term emission reductions to help California meet its air quality obligations.

The Carl Moyer Program's ability to expedite the replacement of diesel engines has made it ARB's key near-term heavy-duty engine emission reduction program. Through the first three years of the program, local air districts and ARB have participated in a variety of conventional outreach methods, including solicitations, brochures and workshops, to attract participants. In the third year of the program, ARB and districts took additional action to attract emission reduction projects that would directly reduce air contaminants or public health risks in communities which were most significantly exposed to air contaminants. These 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.

Beginning with the fourth year of the program, Section 43023.5 of the Health and Safety Code requires districts that contain more than one million inhabitants to spend at least fifty percent of the state funding, until January 1, 2007, in communities most significantly exposed to air contaminants, including communities of minority or low-income populations, or both. ARB staff is currently working with districts to implement this important new criterion and the results will be reported in the next annual report.

The California Energy Commission (CEC) received funding in the second and third years of the program for infrastructure demonstration and 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. The Advanced Technology Development Section helps finance the development of advanced emission-reducing technologies for heavy-duty engines, including add-on and retrofit technologies.

To date, the Governor and the Legislature have appropriated a total of $114 million over the last four fiscal years to fund this important program. Local air districts have provided an additional $41 million in matching funds. Of this funding, CEC administers $9 million for infrastructure demonstration and advanced technology development projects.

This report updates the status of the statewide program for the first three years as required by Health and Safety Code Section 44295. The report also contains information on progress in implementing third year funds (2000/2001 fiscal year). Detailed information is provided regarding local air district programs, which include the status of state funds expended under the program, the types of projects and number of engines funded, and the emission benefits for each local program. Finally, the report addresses how the Carl Moyer Program has reduced public exposure to toxic diesel particulate matter.

I.

BACKGROUND

Diesel-fueled engines, a major source of air pollution, power most trucks, buses, many types of off-road equipment, locomotives, and ships. 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 (PM_{10}), as well as more than forty substances currently listed by the Air Resources Board (ARB) as toxic air contaminants. This chapter describes current statewide NOx and PM emissions and explains the need for incentive programs to assist California in reducing emissions from heavy-duty diesel engines.

A. Total NOx And PM Emissions

Although heavy-duty engines and vehicles account for less than five percent of California's vehicle population, they produce approximately 40 percent of the state's NOx emissions, a smog-forming pollutant. Furthermore, fine particulate matter exhaust from heavy-duty diesel engines has been identified as a toxic air contaminant that can cause cancer. Total statewide emissions of NOx and PM_{10} are about 3600 tons per day and 2300 tons per day, respectively (2000 inventory). Statewide NOx and PM_{10} emissions from selected categories of heavy-duty engines are shown in Table I-1.

Table I-1
Statewide Annual Average Emissions from Selected Heavy-Duty Engine Categories
Tons/day

Source Category		On-road Heavy-Duty Vehicle [a]	Off-Road Equipment [b]	Locomotive	Marine	Total
2000	**NOx**	631	585	145	101	**1462**
	PM_{10}	16	39	3	8	**66**
2005	**NOx**	566	511	106	105	**1288**
	PM_{10}	13	36	3	9	**61**
2010	**NOx**	423	404	78	109	**1014**
	PM_{10}	9	29	3	9	**50**

a) Emissions from heavy-duty trucks and buses over 14,000lbs GVWR. Emissions based on EMFAC2001 v2-8.
b) Emissions from all off-road compression-ignition (Diesel) Engines in the current OFFROAD emissions model.

B. State Implementation Plan (SIP)

In 1994, ARB, along with interested industries, environmental groups, other government agencies, and air quality experts, created a long-term plan designed to clean up California's air. That long-term plan, known as California's 1994 SIP for ozone, relies upon various measures to meet California's clean air goals.

The SIP calls for more stringent emission standards for both on-road and off-road heavy-duty engines in California. For categories where California is preempted by federal law from setting emission regulations, 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), marine vessels, new locomotives and new engines used in locomotives, and aircraft.

The state has made significant progress in setting the emissions standards specified in the SIP. In 1995 and 1996, ARB, U.S. 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. ARB approved a similar 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 achieve 2004 standards in 2002. U.S. EPA and ARB have established even tighter emission standards for heavy-duty trucks starting in 2007. The U.S. EPA and ARB have also adopted more stringent emissions standards for off-road heavy-duty equipment. These Tier 3 standards for hydrocarbon and NOx will be phased in beginning in 2006.

U.S. EPA has adopted more stringent emission standards for off-road diesel equipment, including locomotives and marine engines. In 2000, the International Maritime Organization (IMO) adopted a protocol, which, if ratified by the member nations, will reduce emissions from new ships, and will be retroactive to January 1, 2000. Other actions include a Vessel Speed Memorandum of Understanding (MOU) between the Ports of Los Angeles and Long Beach, the shipping industry, ARB, the SCAQMD and U.S. EPA. This MOU calls for ocean-going ships to voluntarily limit their speeds while entering or leaving the participating ports. The preliminary MOU was implemented on May 1, 2002 as a demonstration project. The full implementation of the MOU is expected to result in regulations to limit emissions from domestic vessels. MOUs with two railroads will further reduce in-use emissions from locomotive engines in the SCAQMD non-attainment area, and a pending MOU will reduce emissions from airport ground support equipment and local ports in the SCAQMD.

In addition 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 long-term emission reduction commitments in the SIP. The majority of future reductions (80 to 90 percent) will be achieved through emission standards for new engines and MOUs, and not through incentives. However, emission reductions must occur in the early years for California to meet its SIP commitments. 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.

Table I-2
NOx Emission Reduction Commitments in the SIP
(South Coast Air Basin)

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.

The draft 2002 Clean Air Plan is ARB's vision of continued progress towards this goal, through a combination of established and new air quality programs. Under state law, ARB is responsible for coordinating the efforts of all levels of government to attain and maintain health-based air quality standards. The Plan is an agglomeration of strategic plans aimed at reducing California's air pollution and meeting ARB's obligations under state law. More specifically, the Plan will help ARB work with environmental justice communities to develop near-term actions to reduce the health risk from air pollution, identify new measures to reduce emissions by 2005 to help attain the federal ozone and inhalable particle standards in the San Joaquin Valley, seek opportunities to reduce exposure to diesel particles statewide, meet the federal one-hour ozone standard in the Los Angeles area, and continue to reduce the adverse health impacts of air pollution beyond 2010.

C. The Role of Incentive Programs in California's Clean Air Commitments

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.

Stringent emission standards will result in significant emission reductions. However, many of the regulated categories are dominated by large diesel engines that last a long time and are typically rebuilt two to 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.

II.

THE GENERAL PROGRAM

The purpose of the Carl Moyer Program is to reduce NOx emissions by providing grants to cover the incremental cost of cleaner heavy-duty vehicles and equipment, thereby reducing toxic PM emissions as well. This chapter includes a discussion of the overall requirements and the administration of the Carl Moyer Program.

A. The Administrative Role of ARB, CEC, and Participating Districts

The Carl Moyer Program provides funds for three types of projects: engine projects, Infrastructure Demonstration projects, and Advanced Technology Development projects.

1. The Administrative Role of ARB

ARB oversees the development and administration of the largest portion of the Carl Moyer Program that covers engine projects. ARB works with the public, local air districts, port authorities, industry, and environmental groups to develop and refine program guidelines. The guidelines describe the types of eligible projects and the criteria to qualify those projects, while providing formulas to calculate the emission benefits and cost-effectiveness. ARB also provides on-going assistance to local air districts with program administration and technology status. In addition, ARB reviews and monitors the progress of local districts' implementation of the program.

2. The Administrative Role of CEC

CEC develops guidelines and oversees two key portions of the program: Infrastructure Demonstration and Advanced Technology Development Sections. CEC received $4 million in the 1999-2000 FY budget and $5 million in the 2000-01 FY budget for these portions of the program. The Infrastructure Demonstration portion of the Carl Moyer Program helps provide districts with the means to fund alternative fuel infrastructure to fuel Carl Moyer funded vehicles. The Advanced Technology Development Section supports the development of advanced emissions-reducing heavy-duty technologies. CEC issues a formal solicitation for both programs. Districts implement projects in the Infrastructure Demonstration Section and CEC administers the Advanced Technology Development projects.

3. The Administrative Role of Participating Districts

Participating local air districts implement the program according to ARB and CEC guidelines. Implementation includes program outreach, project solicitation, project evaluation, award of grants, and project monitoring to ensure the emission reductions

are actually achieved. During the first year of the program (fiscal year 1998/1999), sixteen air districts implemented local programs. In the second year (fiscal year 1999/2000) twenty districts implemented local programs. Projects funded in the first and second year were selected on the criteria outlined in the Carl Moyer Program Guidelines, approved by the Board in February 1999. In the third year (fiscal year 2000/2001) twenty-two districts applied to implement local air programs. Projects funded with third year funds follow criteria outlined in the modified guidelines approved by this board on November 16, 2000.

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. ARB developed the guidelines to provide each district the ability to design a program to meet specific local air pollution challenges. Each district has the option to 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 development grants. Under the Infrastructure Demonstration Section of the Program, CEC must solicit applications for a broad mix of fueling and electrification infrastructure projects. CEC issues a solicitation to local air districts who, in turn, fund specific infrastructure projects. The Advanced Technology Development Guidelines required applicants to provide market projections reflecting a fully commercialized product.

B. Funding

The Governor and the Legislature have appropriated annual funds to the Carl Moyer Program over three fiscal years (1998/1999, 1999/2000, and 2000/2001) which total $98 million dollars.

1. State Funds

In the first year, ARB received $25 million to fund engine projects that met Board approved program guidelines. ARB encumbered the first year funds through subventions to 16 local air pollution/air quality management districts that applied to administer the program. The local air districts expended these funds to cover the incremental costs of heavy-duty engine projects that are cleaner than required by any federal, state, or local government. In the second year (1999/2000), $23 million was appropriated to fund an expanded Carl Moyer Program, which included infrastructure demonstration and advanced technology development sections. Of these funds, $19 million was designated for ARB and local air districts to pay for engine projects. The remaining $4 million was designated for CEC for infrastructure demonstration and advanced technology development projects.

In the second year of the Program, ARB and the Carl Moyer Program 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 $50 million for the third year - $45 million to fund engine projects and $5 million to fund infrastructure and advanced technology development projects. Enacted in 2001, Section 43023.5 of the Health and Safety Code requires participating districts, containing one million or more inhabitants, to expend no less than 50 percent of the funding the district receives from the state until January 1, 2007, in communities most significantly exposed to air contaminants, including communities of minority populations or low-income populations, or both. Districts affected by this section include San Diego APCD (SDAPCD), SCAQMD, San Joaquin Valley APCD (SJVAPCD), Bay Area AQMD (BAAQMD), and Sacramento Metro AQMD (SMAQMD). Each district is responsible for incorporating the requirements of this section into its program solicitation and administration. ARB assists in this effort by providing information on pollution levels and areas of risk throughout the state. In addition, ARB conducts outreach efforts in affected communities to inform citizens about ARB incentive programs.

2. District Matching Funds

The third year program operated under the Carl Moyer Program Guidelines, dated November 16, 2001. In the first three years, state funds for the program totaled $98 million - $25 million for the first year, $23 million for the second year, and $45 million for the third year. During the first 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 have been 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.

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 crucial, because it obligates those responsible for program selection, monitoring, and enforcement to make a monetary commitment to the project.

C. Program Criteria

The program is still in the process of administering the third year funds. A total of twenty-one air districts applied for third year funding. Third year projects will be evaluated according to the Carl Moyer Program Guidelines, dated November 16, 2000.

1. Eligible Heavy-Duty Engine Categories

The engine portion of the Carl Moyer Program, administered by ARB and the local districts, funds the incremental cost of cleaner heavy-duty vehicles and equipment in 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 fund engine research and development, certification testing, training, or operational controls.

2. Replacement 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. In the first three years of the program about 3,867 engines (both on- and off-road) were funded statewide. Of those engines, 1,809 were alternative fuel engines, 209 were electric motors, and the remaining 1,653 were diesel-to-diesel repowers. Chapter III contains a detailed explanation of the projects funded through each local air district.

The program is 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. ARB evaluates 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. ARB's Executive Officer has the authority to determine whether the project is eligible for funding.

3. Infrastructure and Fuel Costs

District-funded infrastructure projects qualify as matching funds for the Carl Moyer Program. Funds used to purchase or upgrade infrastructure must support equipment and vehicles meeting the Carl Moyer Program criteria. In addition, CEC administers the Carl Moyer Infrastructure Demonstration Section of the Program. Air districts apply

directly to CEC to receive those funds. If a district receives funds from 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 air district's budget. Any funds that a district uses to pay for incremental fuel costs count as matching funds. 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 fuel costs that occur as a result of a conversion or new purchase of an engine that qualifies for Carl Moyer Funds.

4. Cost-Effectiveness Criterion

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 NOx reduced. In 2000, the limit was increased to $13,000 per ton to account for cost of living adjustments since program implementation. 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 $5,000 per ton of NOx reduced. In the third year the average cost-effectiveness for a NOx ton reduced was $4,000.

D. Program Changes

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 of making recommendations on the need to continue the program, the amount and source of continued funding, and program modifications, if necessary. The Advisory Board recommended 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 (http:www.arb.ca.gov/msprog/moyer/approved.htm). The revised 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 revised guidelines included various changes to the program:

- A 25 percent PM emission reduction requirement for local programs in districts that are designated as serious non-attainment for the federal PM standard
- A 25 percent PM emission reduction target for the statewide program
- 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 removal of a funding "cap" on off-road and stationary agricultural irrigation pumps
- A new funding category – Auxiliary Power Units (The Carl Moyer Program funds will pay for the installation costs of auxiliary power units on on-road trucks, up to $1,500 per unit for conventional technologies and up to $3,000 for fuel cell APUs.)
- 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 ARB on-road and off-road models
- Allowance of district funding for incremental fuel cost for alternative fuels and alternative diesel fuels on a case-by-case basis

III.

DISTRICT HEAVY-DUTY ENGINE PROGRAMS

The Board approved the original Carl Moyer Program Guidelines in February 1999. To date, the program has received and administered $98 million to fund the program for three years. Of those funds, over 95 percent has been allocated to pay for engine projects. Over the three years of the program, twenty-two 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. ARB distributed the third year funds to districts in January 2001. This section of the report describes ARB's efforts in administering the statewide program, along with a brief description of the program requirements met by each of the local district programs. This section also provides the status of each district's program, the types of engines funded, and the estimated emission reductions.

A. District Participation Solicitation

During the development and implementation of the Carl Moyer Program, ARB established the Incentive Program Implementation Team (IPI Team). The IPI Team is a working group of representatives from local air districts, CEC, U.S. EPA and ARB. The IPI Team meetings provide ARB and districts with an opportunity to exchange ideas that will 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 IPI Team meets several times each year in different districts throughout California.

ARB solicits district participation in the Carl Moyer Program through formal written invitations. Formal solicitations were sent - each representing the year of funding (Year I - $25 million, Year 2 - $19 million, and Year 3 - $45 million).

ARB staff evaluates each district application to ensure that adequate match funding was committed and that already funded matching projects meet the guidelines for each program year. Upon application approval, ARB staff provides each district with a Grant Award and Authorization Form for the district to sign and return to ARB authorizing the districts' participation in the Carl Moyer Program. Each district is authorized to receive an initial disbursement of 10 percent or $100,000 (the larger of the two amounts). As districts provide ARB staff with documentation showing the need for additional funds, along with a disbursement request, ARB staff provides the districts with additional funds. Table A -1 in appendix A illustrates ARB's schedule for solicitations, grant awards, and program evaluations.

ARB staff considered several methods of public outreach to inform Californians about the Carl Moyer Program. ARB designed a statewide brochure describing the agency's mobile source incentive programs and has made it available to the public at conferences and public requests. ARB staff also attends conferences, such as the Tulare Farm Show, the California Trucking Association annual meeting, and the Pacific Maritime Association Convention promoting the program throughout California. At the request of local air districts, ARB staff attends local air district workshops to educate the public on how the Carl Moyer Program would benefit their local community. ARB has also made an effort to conduct workshops in various locations throughout California. ARB staff individually met with districts during the summer of 2001 to discuss each district's specific program needs. In 2001, ARB began a significant effort designed to inform fleets, local government agencies, and others about the opportunities available through the Carl Moyer Program and other state and local incentive programs. This effort is targeted at those communities most severely impacted by air pollution.

B. Participating Districts

A total of twenty-three districts applied and received funding from ARB to implement the Carl Moyer Program in the first three years, as described in Table III-1. Over the course of three years the annual number of participating districts has increased from 16 to 22.

Since the program began, one district has opted to withdraw from the program. Kern County APCD declined second year funding and part of the first year funding. Northern Sonoma APCD missed the second year application deadline, but has since resumed its participation. Overall, the Carl Moyer Program has seen a steady increase in district participation.

Table III-1 Participating Districts
Antelope Valley APCD
Bay Area AQMD
Butte County AQMD
Colusa County APCD
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
Sacramento Metropolitan AQMD
San Diego County APCD
San Joaquin Valley APCD
San Luis Obispo APCD
Santa Barbara County APCD
Shasta County APCD
South Coast AQMD
Tehama County APCD
Ventura County APCD

C. Program Requirements Met By Local District Programs

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

- Districts must provide match funding for any Carl Moyer Program funding received from ARB.
- District-funded match projects must meet the project criteria for the respective source category as described in the Carl Moyer Program Guidelines.
- Projects funded before December 31, 2000 had to meet a maximum cost-effectiveness criterion of $12,000/ton of NOx emissions reduced. Projects

funded after December 31, 2000 must meet the maximum cost-effectiveness of $13,000/ton of NOx reduced.

D. District's Program and Match Funding

For three years of the program, ARB has distributed a total of $87.2 million (24.5 million – 1st year, $18.6 million – 2nd year, $44.1 million) to the participating districts to fund engine projects. The remaining $1.78 million (two percent of $87.2 million) was appropriated to ARB to administer the statewide program. The funds for each district were allocated based on population and the districts' SIP incentive based commitments. Table III-3 lists the districts that have participated in the Carl Moyer Program and the funds allocated to each district by program year.

Table III-2
Final Program Funding

District Name	Allocation Year I	Allocation Year II	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
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
Colusa County APCD	-	-	-
TOTAL	**$24,500,000**	**$18,620,000**	**$44,100,000**

In the first three years of the Carl Moyer Program, matching funds statewide totaled roughly $33.6 million. In the third year, program funds exceeded $25 million. The Carl Moyer Program Guidelines cap the statewide matching funds at $12 million. Each district had to provide $1 in matching funds for every $3.68 received from ARB in the third year of the program.

Table III-3
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[b] Fund, CMAQ[c]	$ 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[d]	$ 963,896	$ 838,521	$ 1,063,838
SDCAPCD	DMV Fund	$ 542,831	$ 404,749	$ 503,495
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		-	-	-
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.
b. Department of Motor Vehicles. Many districts receive funds from a surcharge on motor vehicle registration fees.
c. Congestion, Mitigation, and Air Quality Fund
d. A ballot measure which allocates half a cent of local sales tax in Sacramento for transportation improvements in the county.

Districts may use heavy-duty engine projects, alternative fuel infrastructure, and in-kind administration (up to 15 percent of matching funds) as match funding projects. However, settlements, mitigation, and other funds have been used as well. Most districts use these funds as match funding for the Carl Moyer Program. In fact, several districts have established programs to fund grants for lower-emission on-road and off-road motor vehicle projects with the motor vehicle fee money. The Carl Moyer Program funding augments these existing programs. Many districts receive funds from a surcharge on motor vehicle registration fees (a.k.a. AB 2766, AB 434, and AB 4355 funds).

E. Project Types Funded Statewide

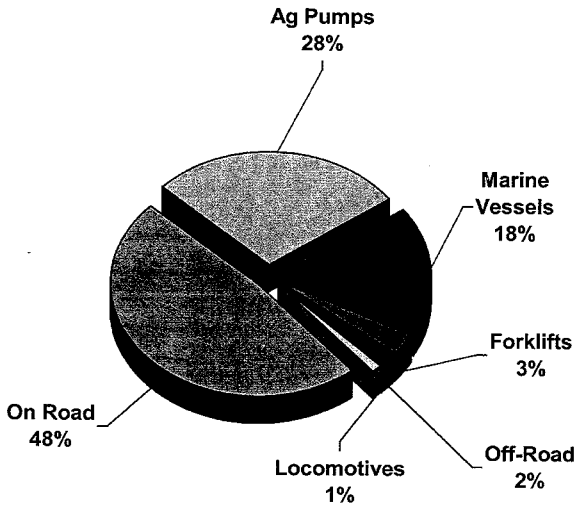
To date, districts have paid for engines for almost every source category under the Carl Moyer Program. Engines were funded for heavy-duty line-haul trucks, urban transit buses, school buses, waste haulers, delivery trucks, off-road equipment, agricultural pumps, marine vessels, locomotives, and forklifts. The types of projects included new diesel engines, new alternative fueled engines and electric motors. Two categories eligible for funding under the Carl Moyer Program which, to date, have not received funding are auxiliary power units (APUs) and ground support equipment (GSE). On-road trucks that would benefit from an APU typically operate in more than one district, hence they have been difficult to fund. ARB hopes to fund APUs through the inter-district solicitation. A pending Memorandum of Understanding (MOU) with the major airports in South Coast, and expansion mitigation requirements for other large airports, have inhibited applications for GSEs. 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-4
Types and Number of Engines Funded Statewide
Years I & II & III

Source Category/ Equipment Type	Number of Engines		Total Funds	
	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:				
Heavy-Duty Line Haul		32		$ 788,661
Refuse Haulers	511	62	$16,023,480	$ 735,077
Urban Transit Buses	850		$11,323,140	-
School Buses	20		$ 374,542	-
Other	327	106	$ 5,025,363	$ 1,862,823
Off-Road Equipment:				
Agricultural		52	-	$ 535,492
Construction		42	-	$ 1,066,286
Other	18	42	$ 194,545	$ 375,603
Locomotives:	2		$ 820,000	-
Marine Vessels:		182	-	$ 14,162,390
Agricultural Irrigation Pumps:	23	1878	$ 362,563	$ 20,414,223
Forklifts (electric):	209		$ 2,083,527	-
Total	**1960**	**2396**	**$36,207,160**	**$39,940,555**

Figure III-1

Percent Funding By Project Type



F. Environmental Justice Efforts

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementations, and enforcement of environmental laws, regulations, and policies. On December 13, 2001, the Board approved Environmental Justice Policies and Actions (Policies) that lay out ARB's plan to incorporate environmental justice issues, consistent with the law, into all of ARB's programs. The Policies focus primarily on the ARB as an organization, but also call for the collaboration of air districts to ensure that environmental justice policies are met.

In addition to these Policies of the ARB, the Health and Safety Code Section 43023.5 requires districts containing more than one million inhabitants to spend at least fifty percent of the state incentive funds, such as the Carl Moyer Program funds, to reduce or eliminate the disproportionate impacts of air pollution on low-income and minority populations. This requirement begins in FY 2001/2002 and impacts the air districts in Los Angeles (SCAQMD), San Francisco (BAAQMD), Sacramento Valley, (SMAQMD), San Joaquin Valley (SJAPCD), and San Diego, (SDAQPCD).

Pursuant to these requirements, SCAQMD adjusted its FY2001/2002 program criteria to ensure it allocates at least half of its Carl Moyer Program state funds to projects directly benefiting areas that are most significantly impacted by air pollution, including low income communities or communities of color, or both. To ensure that they will meet legal requirements, SCAQMD will evaluate all its fourth year projects according to poverty level, PM exposure, and air toxic exposure. SCAQMD has defined its areas of poverty in areas where at least 10 percent of the population falls below the Federal poverty level. The district will also give consideration to all projects operating in areas with the highest fifteen percent of PM concentration. SCAQMD grants all projects operating within areas where the cancer risk occurs at a rate of at least 1,000 per million inhabitants. Those projects that fall under all these criteria will be considered projects directly benefiting areas of environmental justice. Other districts are reviewing the SCAQMD methodology and discussing the environmental justice criteria with ARB staff.

Although the Section Code Section 43023.5 only applies to the few largest districts with a population of over one million inhabitants, other participating districts have reviewed the challenges they need to address to best define their areas of environmental justice. The issue of what variables to include to determine the boundaries around communities of environmental justice was a common theme among the less densely populated districts. Many of the less populated areas have small-disbursed communities whose demographics are hard to define. These disbursed small clusters can be either homogenous with the entire districts or too diverse in population to categorize as an environmental justice area.

Unlike more densely populated districts, smaller communities do not have defined property value depending on their location or neighborhood. This presents a problem when a district uses income or dwelling value as a variable to determine areas of environmental justice. These districts face a dilemma of whether to classify these areas as environmental justice areas or to exclude them. In these less densely populated areas, there may be homes of various values (i.e., a luxury home, a mobile home, and a middle–class home). Hence, the average house value of the community may not be representative of the community's needs.

The second issue less populated districts face is that some districts are extremely demographically homogenous. The low population count and similarity in occupations in some districts devoid them of defined areas of diversity. For example, unlike more populated districts that can establish the minority ratio of certain communities, smaller districts' minority population is small and well distributed throughout the district. Hence the concentration or ratio of minority residents within a community is similar throughout the district. Therefore, depending upon how narrow or broad they interrupt the level of poverty or ethnicity ratio, district officials can find that their entire district is considered an environmental justice area or their entire district is devoid an environmental justice community.

Despite these challenges, the Carl Moyer Program is an ideal program to address disproportionate air pollution in impoverished and minority communities. By design, a significant amount of projects occur in traditionally industrialized and pollution-impacted area. Urban transit buses usually operate in areas where people cannot depend upon personal transportation. A considerable number of alternative fueled transit buses have been funded through the Carl Moyer Program, significantly reducing exposure on inner-city corridors. Street sweepers and refuse trucks that operate daily in the community are also good candidates for replacement of older polluting engines. Citizens of small, rural communities and those who earn their living working in agricultural are exposed to harmful emissions from agricultural equipment. Districts such as San Joaquin Valley APCD have replaced hundreds of older engines in agricultural pumps, tractors and harvesters and other off-road equipment.

IV.

Carl Moyer Program Inter-District Projects

A. Background

Section 44286 of the Health and Safety Code gives ARB authority to reserve up to ten percent of the program's funding for qualifying projects operating in more than one district. Every district is distinct in its methods of administration and operation of the Carl Moyer Program. Within the criteria of the guidelines, districts have found it difficult to coordinate funding a multi-district project. This is particularly true for truck APU projects. Trucks that could benefit from the APUs typically traverse the state, crossing through several air districts. Therefore, ARB created an inter-district projects category with $501,750 in funding.

B. Solicitation

ARB released the solicitation for the Carl Moyer Program Inter-District Projects on December 21, 2001. This solicitation was sent to more than 4,000 interested parties. Staff placed the solicitation on the web and announced it via the list serve/interested parties list. The solicitation was open to three types of Carl Moyer Program qualifying projects: locomotives, on-road vehicles, and marine vessels. Projects must operate at least 30 percent of the time outside of the home districts. Evaluation will be based on a combination of significant impact, administration and evaluation plan, significant emission reductions, cost-effectiveness, project schedule, and the project's ability to reduce or eliminate the disproportionate impacts of air pollution on low-income and minority populations.

C. Inter-District Solicitation Application Schedule

February 15, 2002 was the last day for interested parties to submit their applications to ARB. ARB received nine applications and has begun the evaluation process. Staff anticipates it will begin distributing award letters as early as May 2002.

V.

CEC ADMINISTERED SECTIONS

Sections 44284 and 44285 of the Health and Safety Code direct CEC to administer Fueling Infrastructure Demonstration and Advanced Technology Development Sections under the Carl Moyer Program. CEC received a total of $4.5 and $4.2 million in the 1999-2000 and 2000-2001 FY budget for the respective sections. This chapter explains CEC's administration of these sections and the status of the projects.

A. The Infrastructure Demonstration Section

The Infrastructure Demonstration portion of the Carl Moyer Program was designed to provide districts with the means for funding infrastructure for engine projects, other than standard gasoline or diesel, which would qualify for Carl Moyer vehicle funds. The program guidelines can be obtained on CEC's website at **www.energy.ca.gov**. CEC must solicit applications for a broad mix of fueling and electrification infrastructure projects. The program solicitation is directed to the local air districts. Districts respond to the solicitation with specific project proposals. 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.

1. Infrastructure Demonstration Section Status

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 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 Section 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 million were made to eight qualifying districts. Those qualifying districts and the amount of funds requested and received are listed in Table V-1, below.

Table V-1
Infrastructure Funding Requests and Allocations
1999-2000

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**

When completed, these fuel sites will furnish compressed natural gas (CNG), and liquefied natural gas (LNG) to more than 160 new Moyer-qualified trucks and dispense more than 304,000 million Btus of fuel annually. It is estimated that the projects proposed for funding will reduce NOx emissions annually by over 169 tons. Table V-2 lists the applicants in each district, number of vehicles per site, total Btu's dispensed, and estimated NOx reductions.

$2 million was committed to support infrastructure implementation in 1999/2000, which was matched with more than $7 million from project participants. This means that every dollar of state funding was matched by over three dollars from program participants.

Table V-2
Infrastructure Projects
1999-2000

Air District	Site	Trucks	Fuel	NOx [a]	Btu [b]	CEC	Cost Share
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		
	Burrte Riverside		LNG				
SJVAPCD	Reviewing PONs						
BAAQMD	County Waste Srv.	24	CNG	23	16,329	$ 200,000	$4,900,000
SMAQMD	City of Sacramento	50[c]	L/CNG	12		$ 200,000	$ 400,000
SDCAPCD	Oceanside USD						
VCAPCD	GI Rubbish	14	LNG	52	18,639	$ 100,000	$ 300,000
AVAPCD	Waste Management	14	LNG	91	16,058	$ 100,000	$ 425,111
MDAQMD	City of Victorville		CNG		36,500	$ 100,000	$ 255,000
Total		**164**		**826**	**317,783**	**$1,400,000**	**$7,096,975**

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

Under the third year of the Carl Moyer Program, CEC allocated $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. Districts are currently in the process of finalizing agreements with applicants who have qualified for funds. The awarded districts and funding amounts are listed below in Table V-3.

Table V-3
Infrastructure Program Awards
2000-2001

District	Funding 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**

Table V-4
Infrastructure Projects
2000-2001

Air District	Site	Trucks	Fuel	CEC	Cost Share
BAAQMD	Pending				
Shasta CAQMD	Pending			$ 135,080	
VCAPCD	Pending			$ 135,080	
SJVUAPCD	D.O.N. Investment Inc.	16	LNG	$ 300,000	
SMAQMD	Sacramento County		LNG	$ 216,000	$ 234,000
MDAQMD	ENGR		CNG	$ 125,000	$ 248,000
SCAQMD				$1,188,710	
	County of LA	20	CNG		
	UCLA	60	CNG/EV		
	Desert Sands USD	34	CNG		
	City of Glendale	52	LNG		
	Capistrano USD	20	CNG		
Total		**200**		**$2,099,870**	**$ 482,000**

2. Infrastructure Demonstration Section Challenges

Air districts have had difficulty identifying project participants who are able to meet the requirements of the Carl Moyer Infrastructure Demonstration Section. It was anticipated that public and private fleets would take advantage of the Carl Moyer Program when purchasing new trucks and buses which met ARB's optional NOx emission standard. This has not been the case. Lower NOx emission factors for refuse vehicles as specified in the November 2000 Carl Moyer Program Guidelines, and higher incremental cost for the lowest NOx emitting vehicles combine to make it difficult for fleets to qualify for Carl Moyer new vehicle funding. In addition, the statutory fuel throughput requirement of 14,280 million Btus annually requires a fleet to make a significant up-front monetary commitment in vehicle purchases before they can qualify for Carl Moyer Infrastructure Demonstration Section funding.

Cost sharing of infrastructure projects by itself is not enough to convince fleets and individuals to purchase new vehicles that meet ARB's optional low NOx standard. Those vehicles, which are able to meet the most stringent ARB emission requirements, do have a higher cost associated with them. That higher cost should also be considered in the cost-effectiveness calculation for fueling facilities in an effort to get the cleanest technology available on the road in the shortest possible time. Often, the fleets that purchase this clean technology are also the fleets operating late model or post-1987 vehicles. Their purchase of an optional low NOx vehicle to replace one of their late model vehicles could also create a secondary market or resale market for those replaced late model vehicles. As more of these late model vehicles come to the secondary market, an operator of a pre-1987 high emission vehicle would have an opportunity to purchase a cleaner, mechanically-sound late model vehicle at a reasonable price instead of continuing to repair and operate an older truck.

3. Need for Additional Infrastructure Demonstration Funding

Based on CEC's experience with the infrastructure programs, there is a need for continued infrastructure funding. 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. Without continued funding, a number of infrastructure projects may never be started and additional clean low emission heavy-duty vehicles may never be purchased.

B. Advanced Technology Development Section

The Advanced Technology Development Section helps 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. The CEC received a total of $4.2 million to fund advanced technology projects under the Carl Moyer Program.

1. Program Status

The CEC received a total of $4.2 million ($2 million for 1999/2000 and $2.2 million for 2000/2001) to fund advanced technology development projects under the Carl Moyer Program. The California Legislature has not provided additional funding for future advanced technology development program solicitations.

The CEC released Program Opportunity Notices (PONs) in November 1999 and November 2000 to solicit project applications. The PONs are solicitations for development of new and retrofit or add-on applications of both diesel and alternative fuel low emission technologies. CEC funded three projects with fiscal year 1999/2000 funds.

Table V-5
Advanced Technology Development Section Grants
FY 1999-2000

Recipient	Proposal Description	Grant Amount
Ceryx, Inc.	Quad CAT Converter for NOx Reduction	$632,653
Delphi Energy and Chassis Systems	Development of HD Non-Thermal Plasma Aftertreatment	$583,090
Engelhard Corp.	Development of an EGR with DPX catalysts	$284,257

The CEC awarded an additional $500,000 to the South Coast AQMD as part of a joint solicitation with the Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) to help fund the development of low-emission heavy-duty natural gas engines (Table V-6).

Table V-6
Low-Emission Heavy-Duty Natural Gas
Engine Development Grants
FY 1999-2000

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

The Detroit Diesel Corporation 0.5 g/bhp-hr NOx natural gas engine project will result in a heavy-duty engine certified specifically for the transit market. This engine, announced for sale to transit agencies starting in October 2002, will introduce lean-an advanced burn technology that provides significant NOx emission benefits. NOx reductions for a typical transit bus will be over one-third of a ton per year. The Cummins Westport 0.5 g/bhp-hr NOx natural gas heavy-duty engine is also being developed. This engine will include high-pressure direct-injection (HPDI) technology that provides diesel engine-like power and efficiency. Applications include transit buses, refuse trucks, and over the road trucks.

The second PON solicited applications for FY 2000/2001. CEC received 12 qualifying applications, of which 4 were funded. A description of these projects is detailed in Table V-7. Appendix B contains a description of the program schedule and project description.

Table V-7
Advanced Technology Development Section Grants
FY 2000-2001

Recipient	Proposal Description	Grant Amount
ISE Research Corp.	Development and Demonstration of Turbine-Driven Hybrid Electric Buses	$485,826
SCAQMD/Detroit Diesel Corp.	Development of Very-Low NOx HD Natural Gas Engine Reliability Augmentation Project	$200,000
Sorbent Technologies Corp.	Demonstration of a Retrofit NOx Filter for HD Stationary and Mobile Diesel Engines	$440,000
SCAQMD/NREL	Development and Demonstration of GTL-powered HD Vehicles Retrofitted with Control Technologies for Reduced NOx and PM	$400,000

The CEC awarded $250,000 to CaTIS to emission test CalTrans clean diesel service and the remaining $447,174 to the South Coast AQMD to fund a joint solicitation with NREL for the Next Generation Natural Gas Vehicle Program. Cummins Westport, Inc. was awarded two separate grants..

Table V-8
Low-Emission Heavy-Duty Natural Gas
Engine Development Grants
FY 1999-2000

Recipient	Proposal Description
Cummins Westport Inc.	Review and Development of Technologies for Next Generation Class 3-6 CNG Fueled Engines
Cummins Westport Inc.	Preliminary Vehicle Design Development Proposal for the NREL Next Generation Natural Gas Vehicle

2. Project Commercialization

The Advanced Technology Development Guidelines required applicants to provide market projections reflecting a fully commercialized product. Based on these projections, the estimated California NOx reductions for 1999/2000 projects total over 41 thousand cumulative tons by 2005, and for 2000/2001 projects total over 24 hundred cumulative tons by 2005. The estimated reductions for 1999/2000 projects has been adjusted to reflect the loss of the Ceryx project, which filed for Chapter 11 protection in November 2001.

The successful development of NOx reduction technologies and their commercial ions will determine the actual NOx reductions. The final NOx emission reductions will depend upon: 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 supporting the marketing of NOx reduction technologies to individual customers, and customer use patterns with the vehicles or equipment that incorporate these technologies.

3. 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. The more stringent standards adopted for 2004 and 2007 engines reduce the emission benefits from existing low-emission engines and reduce their cost-effectiveness for prospective customers. Continued development of technologies that provide emission levels lower than required by regulation, or in advance of regulatory requirements, can provide a range of cost-effective options that qualify for Carl Moyer Program incentives.

However, engine and vehicle manufacturers need outside financial support to justify continued development and commercialization of such technology options due to limited market demand.

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

The Carl Moyer Program was primarily designed to substantially reduce NOx, a smog-forming pollutant. Although PM reductions were also expected, they were not required to qualify for funding under the Carl Moyer Program. However, based on the Carl Moyer Program Advisory Board's recommendations and the designation of PM as a toxic air contaminant, the Program now targets PM reductions as well. This chapter explains ARB's estimate of air quality and public health benefits from the Carl Moyer Program.

A. Statewide Program NOx Benefits

All participating districts are required to provide program reports to ARB in June of each program year. That report must include estimated NOx and PM reductions and cost-effectiveness using the emission factors provided in the Carl Moyer Program Guidelines. ARB staff evaluates reports provided by districts and confirms the estimates of NOx and PM emission reductions. Staff also evaluates annual September 30th reports on the status of districts' current year programs.

Districts have funded a variety of projects, with project life for each project varying from five to 20 years. In the first year, total NOx reductions were about 1466 tons per year (or about 4 tons per day). Once all of the third year program funds are obligated, ARB anticipates the program will reduce NOx emissions by about 14 tons per day.

Because many projects last 10 or more years, ARB expects emission reductions to benefit air quality into the next decade. Table VI-1 lists the amount of funds each of the districts obligated in the first three years, resulting in annual NOx emission reductions and cost-effectiveness over the first three years. Table VI-2 describes NOx emission reductions and cost-effectiveness by project category.

Table VI-1
Program NOx Reductions and Cost-Effectiveness
Year I, Year II and Year III [a]

District	State Funds Obligated To Date[b]	Estimated Annual NOx Reductions (tons/year) [c]	Estimated Average Cost-Effectiveness ($/ton)
SCAQMD	$34,259,436	1110	$5,492
SJVAPCD	$10,915,638	1340	$3,307
BAAQMD	$ 10,710,923	596	$1,962
SMAQMD	$ 8,950,401	610	$4,534
SDCAPCD	$ 4,146,976	130	$5,422
VCAPCD	$ 2,090,869	90	$2,878
MDAQMD	$ 1,379,652	32	$5,570
AVAPCD	$ 1,161,513	17	$8,991
SBCAPCD	$ 950,899	38	$4,455
MBUAPCD	$ 467,092	8	$7,231
MCAPCD	$ 88,876	5	$3,545
SLOAPCD	$ 416,504	12	$5,326
ICAPCD	$ 350,600	31	$1,638
NSAQMD	$ 288,030	12	$6,634
NSCAPCD	$ 243,900	9	$5,264
NCUAQMD	$ 381,138	21	$5,454
GCAPCD	$ 99,662	11	$3,007
BCAPCD	$ 75,780	5	$3,043
FRAQMD	$ 245,851	29	$3,072
SCAQMD	$ 61,800	6	$3,478
TCAPCD	$ 176,750	17	$2,208
KCAPCD	$ 35,958	3	$4,182
Total	**$77,498,248**	**4,132**	**$4,006**

Notes: a. Some of the remaining project funds were not enough to fund one project, so the district combined funds to pay for a complete project.
b. NOx reductions have been estimated based on obligated funds only.
c. Average statewide program cost-effectiveness

Table VI-2
Statewide Benefits by Project Category
Year I, II and III

Source Category/ Equipment Type	NOx (tons/year)	Cost-Effectiveness ($/ton)
On-Road:		
Heavy-Duty Line Haul	41	$ 2,570
Refuse Haulers	432	$ 6,563
Urban Transit Buses	413	$ 4,715
School Buses	4	$10,039
Other	116	$ 5,756
Off-Road:		
Farm Equipment	36	$ 4,179
Construction	54	$ 3,627
Other	52	$ 3,587
Locomotives:	22	$ 1,160
Marine Vessels:	698	$ 3,044
Agricultural Irrigation Pumps:	1767	$ 2,353
Forklifts (electric):	163	$ 5,057

B. Statewide Program Diesel Particulate Reductions

The Carl Moyer Program was designed to assist California in meeting the NOx emission reduction goals in the 1994 SIP. Although the program does not focus on PM reductions, many of the funded technologies, such as electric motors, engine repowers and alternative fueled engines also reduce PM. Based on findings regarding the health implications of diesel PM, it has become more critical to include PM reductions in the Carl Moyer Program. The 2000 revised Carl Moyer Program guidelines set a statewide program goal to achieve a 25 percent emission reduction for PM for the third and future year program. Local air districts such as SCAQMD and SJVAPCD, which are in serious non-attainment for the federal PM standard, are required to meet a 25 percent PM emission reduction for the local program.

In SCAQMD alone, more than 1700 alternative fueled engines were funded (in the first three years) which resulted in substantial PM emission reductions. Based on local program data (from the first three years) provided by the districts, ARB estimates PM reductions from the Carl Moyer Program to be about 146 tons per year. Table VI-3 lists the PM emission reductions for the first three years, by district.

Table VI-3
Program PM Reductions
Year I & II & III[a]

District	PM (tons/year)
SCAQMD	71
SJVAPCD	55
BAAQMD	32
SMAQMD	23
SDCAPCD	9
VCAPCD	2
MDAQMD	2
AVAPCD	0.4
SBCAPCD	1
MBUAPCD	1.6
SLOAPCD	4.3
ICAPCD	1.4
NSAQMD	1.3
NSCAPCD	0.5
NCUAQMD	2
GCAPCD	0.7
BCAPCD	0.2
FRAQMD	0.3
MCAQMD	0.89
TCACPD	1.1
SCAQMD[a]	0.4
KCAPCD	0.1
Total	**212.3**

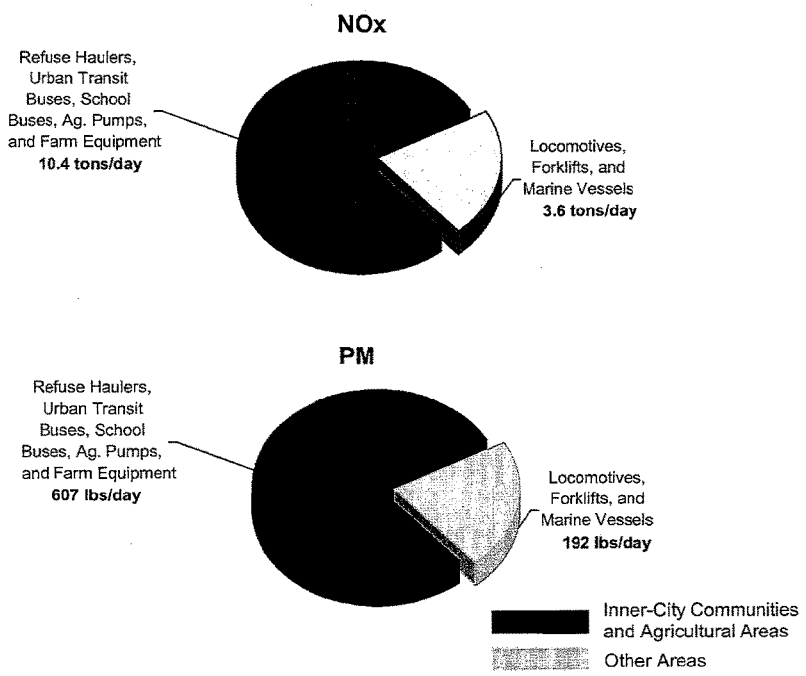
a. Shasta County Air Quality Management District

C. Environmental Justice Benefits

Emission projects reductions from projects such as refuse haulers, urban transit and school buses, and agricultural irrigation pump engines and other agricultural equipment will benefit both inner-city and agricultural communities. Staff estimates that these projects provide NOx and PM emission reductions of about 10 tons per day and 600 pounds per day, respectively. ARB sponsored targeted outreach is ongoing to enhance participation and ensure that emission reductions from this program are realized in areas that are often disproportionately impacted by air pollution.

Figure VI-1

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



IX.

SUMMARY AND RECOMMENDATIONS

A. Summary

The Carl Moyer Program is providing near-term emission reductions that help reduce the adverse health consequences of California's air pollution. This program has resulted in hundreds of tons of NOx reductions, as well as PM reductions. 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, more than 70 percent of the projects funded fall into these categories. These vehicles and equipment operate in inner-city and agricultural communities where the majority of the air quality benefits from this program will be realized.

B. Fourth Year Funding

For fiscal year 2001/2002 the Governor and the Legislature allocated a total of $16 million dollars. All but 2 percent, which will go to ARB administration, will be allocated to engine replacement projects. Since the fourth year funds were less than $25 million, the ratio of state to matching funds reverted to 2:1. A combination of match and Moyer funds will provide $23.5 million dollars for engines replaced in the fourth year.

The formal solicitation was released in December 2001. The seven largest districts have already received their allocations. The remaining districts will receive their grants by the end of March. Colusa County APCD joined the program's fourth year and Mojave Desert APCD declined fourth year funds to ensure the district could spend their current funds. Mojave Desert plans to reapply for any future funding. ARB asks that participating districts, which are affected by Section 43023.5 of the Health and Safety Code, submit a description of their environmental justice guidelines and program implementation along with the Carl Moyer Program annual report due June 30, 2003.

C. Funding Beyond the Fourth Year

Currently, funds for the Carl Moyer Program are not included in the Governor's proposed budget for fiscal year 2002/2003. Proposition 40 was placed on the March ballot when the Governor signed Assembly Bill 1602. A sum of $50 million dollars in bonds was set aside for ARB for grants to air districts, for projects that reduce air pollution in state and local park and recreation areas. Eligible projects shall meet the requirements of Section 16727 of the Government Code and shall be consistent with Section 43023.5 of the Health and Safety Code, the same section of the code which

established the Carl Moyer Program. Each district will be eligible for grants of not less than $200,000 dollars. Five percent of the funds allocated to a district may be used to cover the costs associated with implementing the grant program.

D. 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 NOx and PM emission reductions to meet these objectives and requirements. Without an incentive program, emission reductions would have to be obtained from industry and other sources - reductions not typically as cost-effective - or through regulatory measures. In return, the program has provided a reduction of over a pound of smog-forming pollutants per person as well as significant reductions of toxic particles.

The Carl Moyer Program reduces the economic and societal cost of NOx and PM pollution for all 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 less than $1 per person per year for the 33 million people of California.

Continued funding 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. A continuing market also encourages manufacturers to expand their product offerings.

The vision of the 2002 Clean Air Plan is to attain and maintain health-based air quality standards, reduce emissions of identified air toxins to the lowest level achievable, and systematically attack the serious problem caused by motor vehicles. The Carl Moyer Program is a noteworthy part of this strategic plan.

E. Staff Recommendations

Staff recommends that the Board

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

APPENDIX A
DISTRICT PROGRAMS

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This Appendix describes each district's program including, by project category, the number of engines funded, the amount of funds granted, overall program NOx reductions and cost-effectiveness for statewide funds granted under the Carl Moyer Program. The subsections also describe each district's process for selecting projects as well as the schedule for accepting applications.

Table A-1
ARB's Solicitation Schedule

District Name	1998/1999 Year I	1999/2000 Year II	2000/2001 Year III	2001/2002 Year IV
Guidelines Approved	2/99	Same as Year I	11/00	Same as Year 3
Solicitation for Program App.	5/99	11/99	11/00	12/01
Application Evaluations	6/99	12/99	1/01	½
Funds Awarded	7/99	1/00 – 4/00	2/01	11/01-1/02
District Program Report to ARB	9/30/99	9/30/00	9/30/01	9/30/01
ARB Evaluation of Status Reports	10/99	10/00	10/01	10/01
District Annual Report to ARB	6/30/00	6/30/01	6/30/02	6/30/03
ARB Evaluation of Annual Reports	6/30/00 – 3/1/01	6/30/01 – 3/1/02	6/30/02 – 3/1/03	6/30/03 – 3/1/04
District Final Report Due	7/31/2001	7/31/2002	7/31/2003	7/31/2004

Table A-2
Participating Districts

District Name	1998/1999 Year I	1999/2000 Year II	2000/2001 Year III	2001/2002 Year IV
Antelope Valley APCD	×	×	×	×
Bay Area AQMD	×	×	×	×
Butte County AQMD		×	×	×
Colusa County APCD				×
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	×	×	×	×
San Luis Obispo APCD	×	×	×	×
Santa Barbara County APCD	×	×	×	×
Shasta County APCD		×	×	×
South Coast AQMD	×	×	×	×
Tehama County APCD			×	×
Ventura County APCD	×	×	×	×

1. South Coast Air Quality Management District (SCAQMD)

In the first three years of the Carl Moyer Program, SCAQMD received $39,371,209 in state funding and matched more than $15,185,700. South Coast has obligated more than 75 percent of their third year funds and has been allocated $7,055,564 from the fourth year program.

The SCAQMD program announcement has been sent to more than 15,000 businesses, government agencies, and interested industries annually. Criteria for selecting projects are based on the current 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. All funds in the first and second years of the program have been spent and SCAQMD released its RFP on January 19, 2001 to select projects under the third year program. South Coast has released a Request for Proposals (RFP) in December 2001 to request projects for the remaining $4.5 million in funding from the third year funds along with their $7 million from the fourth year funding.

SCAQMD's program has been very successful. The district has funded more than 1,500 engines in the first three years. Some of the project participants that received funds in the South Coast during the first three 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-1 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.

The staff of ARB estimates that SCAQMD's program, using funds allocated by the state, will result in a total of approximately 1100 tons of NOx reduced annually, with an average cost-effectiveness of about $5,500 per ton of NOx reduced. ARB anticipates that approximately 71.4 tons of PM will also be reduced.

Participating districts with one million inhabitants are required, by Section 43023.5 of the Health and Safety Code, to allocate at least fifty percent of the state funding to projects directly benefiting areas that are most significantly impacted by air pollution, including low income communities or communities of color, or both. In order to comply with this law, SCAQMD will evaluate all its fourth year projects according to poverty level, PM exposure, and air toxic exposure. SCAQMD has defined its regions of poverty where at least 10 percent of the population falls below the Federal poverty level. The district will also give consideration to all projects operating in areas with the highest fifteen percent of PM concentration. Those projects that contain the above

criteria will be considered projects directly benefiting areas of environmental justice.

Table A-3
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		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
Refuse Haulers	86		66		291	25	$12,771,037	$390,683
Transit Buses	117		117		507		$9,908,906	
Other			38		269	33	$4,573,170	$592,777
Off-Road Equipment:								
Other	12						$174,745	
Marine Vessel Engines:		6						$1,841,190
Forklifts (electric):	105				104		$2,083,527	
Total	**320**	**6**	**221**		**1171**	**58**	**$29,511,385**	**$2,824,650**

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

Over the first three years of the Carl Moyer Program, SJVAPCD has received $15,232,232 in state funding. SJVAPCD has matched this amount with $5,873,893 in district funds. Currently, the district has obligated funds for the first, second, and third years.

The district's initial RFP was designed to solicit project applications on a first-come-first-served 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 (CFP) on January 4, 2001 to select projects, and received more than $25 million in funding requests. The district has a waiting list of applicants.

SJVAPCD's program has proven to be a great success, based on the projects that the district has funded in the first three years. The SJVAPCD program has been extremely popular with area farmers. Some of the types of projects that the district paid for include: agricultural pump engines, refuse haulers, street sweepers, tractors, line-haul trucks, and delivery trucks. Table A-4 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. ARB estimates that with three years of funding, SJVAPCD will achieve approximately 1,341 tons of NOx and more than 55 tons of PM reductions annually, over the life of the projects. Based on the amount of funds that the district received from ARB, the district's program cost-effectiveness averages about $3,300/ton of NOx reduced.

The vast majority of SJVACPD projects benefit farming communities. Many migrant workers work directly or in close proximity to the irrigation pumps. The emissions reduced benefit these migrant workers and their families.

Table A-4
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		Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	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-Road Equipment:								
Agricultural		7		18				$240,915
Agricultural Irrigation Pumps:	12	306	2	239		538	$179,551	$13,006,079
Total	**15**	**349**	**2**	**276**		**538**	**$206,118**	**$14,146,786**

3. Bay Area Air Quality Management District (BAAQMD)

Over the first three years of the Carl Moyer Program, BAAQMD received $8,686,133 in state funding, matched with $3,361,737 in district funds. The district's program was a competitive process focusing on cost-effectiveness. The district program focused on paying for locomotives, marine vessels, off-road agricultural equipment and irrigation pumps. To date, 100 percent of first and second year funds have been awarded to projects and the district is in the process of completing contracts for the third year of the program.

ARB estimates that state funds obligated by BAAQMD to date will produce approximately 597 tons of NOx and 33 tons of PM reductions annually, during the life of the projects. The district's program cost-effectiveness for those funds averages about $2,000/ton of NOx reduced. Some of the types of projects that the district funded include marine vessels, on-road engines, one off-road project, and two locomotives. 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 BAAQMD Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road						13		$231,000
Off-Road					1			$ 19,800
Locomotives	2						$820,000	
Marine Vessels		32		14		25		$7,705,323
Total	**2**	**32**		**14**	**1**	**38**	**$820,000**	**$7,956,123**

4. Sacramento Metropolitan Air Quality Management District (SMAQMD)

For the first three years of the program, SMAQMD received $7,514,437 in state funding matched with $2,866,255 in district funding. Since that time, the district has had an on-going heavy-duty incentive program in place and it has incorporated the Carl Moyer Program into that program. The district's program is designed to select the most cost-effective projects to yield the greatest NOx reductions to meet Sacramento's much-needed conformity and air quality plans.

To date, SMAQMD has obligated and awarded both first and second year funds and is working to finalize the contracts from the third year. The vast majority of Sacramento's funds went to agricultural irrigation pumps and agricultural off-road vehicles. The district also funded off-road equipment.

ARB estimates that state funds granted to the district will provide approximately 611 tons of NOx, and 23 tons of PM reductions annually over the life of these projects. Overall, the district's program cost-effectiveness averages about $4,500/ton of NOx 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 SMAQMD Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
School Buses	4						$120,000	
Off-Road:								
Agricultural:						17		$246,312
Construction:						30		$725,704
Other:						7		$116,364
Agricultural Irrigation Pumps:		200		165	3	300	$77,390	$6,025,611
Total	**4**	**200**		**165**	**3**	**354**	**$197,390**	**$7,113,991**

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

In the first three years of the Carl Moyer Program, SDCAPCD received $3,745,503 in state funding and matched $1,451,075 in district funds.

To date, SDCAPCD has obligated all of the first and second year funds, and is completing the implementation of its third year funds. The types of projects funded by SDCAPCD include alternative fuel urban transit and school buses, waste haulers and diesel marine vessel repowers.

ARB estimates that in the first three years, SDCAPCD will reduce approximately 130 tons of NOx, and 9.2 tons of PM annually, over the life of the projects. Overall, the district's program cost-effectiveness averages about $5,500/ton of NOx 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 SDCAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road								
Refuse Haulers			9			1	$234,051	$20,872
Urban Transit Buses	50		16				$677,920	
School Buses	3		5				$195,640	
Other						23		$564,350
Marine Vessels		8		3		17		$1,971,015
Total	**53**	**8**	**30**	**3**		**41**	**$1,107,611**	**$2,556,237**

6. Ventura County Air Pollution Control District (VCAPCD)

In the first three years of the program, VCAPCD received $3,049,342 in state funding and matched these funds with $1,172,908 in district funds. VCAPCD has received project applications for agricultural pump engines, marine vessel engines, and on-road engine repowers. VCAPCD estimated that the funding requests totaled more than $5.5 million, which exceeds the amount of Carl Moyer Program funds that the state allocated to VCAPCD to implement its program over three years.

To date, VCAPCD has obligated all of its first and second year funds and has allocated about sixty percent of its third year funds. The types of projects that the district has funded include alternative fuel refuse haulers, street sweepers, agricultural irrigation pumps, and marine vessels.

The staff of ARB estimates that in the first three years of VCAPCD's program, the district will reduce 90 tons of NOx and 2.1 tons of PM emission annually, over the life of the projects. Overall, the district's program cost-effectiveness averages about $2,900/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 VCAPCD Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
Refuse Haulers	8		9		2		$1,390,353	
Off-Road:								
Other		5						$ 74,070
Agricultural Irrigation Pumps		4				3		$ 71,876
Marine Vessels		15		12		9		$1,498,029
Total	**8**	**24**	**9**	**12**	**2**	**12**	**$1,390,353**	**$1,643,975**

7. Mojave Desert Air Quality Management District (MDAQMD)

In the first three years of the Carl Moyer Program, MDAQMD has received $3,016,999 in state funding to which it matched $1,158,507 in district funding. In the first two years, MDAQMD issued a CFP. 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 following the release of the CFP. If funding requests did not exceed the amount of funds available in the district, projects were selected based on a first-come-first-served basis. If the total funding requests exceeded the money available, projects were reviewed and selected on a competitive basis.

To date, MDAQMD has obligated all of its first year funds to fund 19 natural gas refuse haulers. Under the second year of the program, MDAQMD anticipates funds will be obligated to projects by June 30, 2002 for various on and off-road projects. MDAQMD is in the process of allocating its third year funds. MDAQMD has elected not to participate in the fourth year of the program.

The ARB staff estimates that the first two years of MDAQMD's program will result in approximately 32 tons of NOx reductions and 2.1 tons of PM reductions. Overall, the district's program cost-effectiveness averages about $5,500/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 MDAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:						
Refuse Haulers	19				$ 845,791	
Other			16		$ 394,976	
Off-Road				3		$ 34,678
Total	**19**		**16**	**3**	**$1,240,767**	**$ 34,678**

8. Antelope Valley Air Pollution Control District (AVAPCD)

AVAPCD has participated in three years of the Carl Moyer Program. It has received a total of $977,571 in state funding from the first three years of the program, which it has matched with $386,235 in district funding. AVAPCD will receive $210,149 from the fourth year funds. In the past, AVAPCD has sent out a CFP to solicit applications for program funding.

To date, AVAPCD has obligated all of its first and second year funds, and will finish executing its third year funds by June 2002. AVAPCD's program has primarily funded alternative fueled refuse vehicles. The NOx and PM reductions benefit residential neighborhoods as well as refuse workers who are directly impacted by the trucks' emissions.

Staff of ARB estimates that the first three years of AVAPCD's program will result in a total of approximately 17 tons of NOx and 700 pounds of PM in annual reductions. Overall, the average cost-effectiveness for the district's program is about $9,000/ton of NOx reduced. Table A-10 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-10
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		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
Refuse Haulers	9	1	6		2		$701,034	$17,490
Off-Road								
Construction						7		$287,802
Total	**9**	**1**	**6**		**2**	**7**	**$701,034**	**$305,292**

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

SBCAPCD received a total of $977,571 in Carl Moyer Program state funds, to which it has matched $386,235 in district funds. To date, SBCAPCD has obligated all of its first, second and third year funds to pay for marine vessel repowers, on-road projects such as the Clean Air Express Commuter Bus CNG Repower Project, and agricultural pump engines.

ARB staff estimates that in the first three years, SBCAPCD's program has produced more than 38 tons of NOX and 1.25 tons of annual PM reductions, for the life of the projects. The district's average cost-effectiveness was about $4,500/ton of NOx reduced. Table A-11 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-11
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		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
Urban Transit Buses	3						$169,749	
Refuse Haulers					4	2	$81,214	$40,410
Other				1				$20,818
Agricultural Irrigation Pumps					4	6	$97,622	$138,213
Marine Vessels		5		6		4		$412,728
Total	**3**	**5**		**7**	**8**	**12**	**$169,749**	**$341,004**

10. Kern County Air Pollution Control District (KCAPCD)

KCAPCD participated for the second year of the program only. In the second year KCAPCD was allocated $225,000 and requested $100,000 in program funds to pay for one project that the district selected. 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 district's remaining funds from the second and third year were reallocated to the interdistrict solicitation, which was sent out by the ARB on December 21, 2001. The staff of ARB estimates that KCAPCD will produce about 2.9 tons of NOx and 160 pounds of PM reductions, with an average cost-effectiveness of $4,200/ton of NOx reduced.

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

Over the first three years of the program MBUAPCD has a total of $860,093 in state funding, which it has matched with $327,940 in district funding. Traditionally, 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-served basis. MBUAPCD issued an RFP for the third year of their program in June of 2001. MBUAPCD's program has been extremely successful, with more than 100 applicants seeking funds. MBUAPCD is currently completing the allocation of its third year funds.

In compliance with Section 43023.5 of the Health and Safety Code, MBUAPCD has analyzed its district to find areas of environmental justice. MBUAPCD performed a case study to determine the areas to concentrate its environmental justice efforts. MBUAPCD defined its environmental justice areas as a function of diesel toxicity risk, low income and minority populations. Using these three criteria, MBUAPCD was able to plot communities in need. MBUAPCD determined that more than 80 percent of the district was disproportionately impacted. MBUAPCD will apply these criteria to projects for fourth year funds.

To date, MBUAPCD has obligated all of its first and second year funds, and about seventy-six percent of its third year funds. The staff of ARB estimates that in the first three years of MBUAPCD's program, the district was able to reduce 8.5 tons of NOx and more than 1.6 tons of PM annually over the life of the projects. The district's average cost-effectiveness is $7,200 per 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 MBUAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
Urban Transit Buses	8						$265,800	
Agricultural Irrigation Pumps						3		$131,715
Marine Vessels				6		10		$436,623
Total	**8**			**6**		**13**	**$265,800**	**568,338**

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

SLOCAPCD has participated since the beginning of the Carl Moyer Program. In the first three years of the program, SLOCAPCD received a total of $417,746 in state funding and matched $168,593. In the first year of the program, the district allocated all its funds to the Hearst Castle Historical Monument. The Carl Moyer Program funding helped to replace 15 full size diesel buses and a diesel para-transit bus with a new fleet of CNG buses. In the second year, SLOCAPCD issued an RFP and accepted applications on a first-come-first-served basis. SLOAPCD is in the process of obligating its third year funds, which the district expects to complete by June 30, 2002. Thus far SLOAPCD has obligated third year funds to an LNG school bus, a concrete delivery truck and three marine vessel engines.

The staff of ARB estimates that from its first two years, SLOCAPCD's program will reduce 12.2 tons of NOx and 4.32 tons of PM annually for the life of the projects. Overall, the average cost-effectiveness for the district's program is about $5,300/ton of NOx 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 SLOCAPCD Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:								
Urban Transit Buses	16						$ 157,800	
School Buses					1		$8,902	
Other					1		$30,650	
Agricultural Irrigation Pumps			2					$8,000
Marine Vessel			3			3		$206,482
Total	**16**		**5**		**2**	**3**	**$197,352**	**$214,482**

13. Imperial County Air Pollution Control District (ICAPCD)

ICAPCD has participated in Carl Moyer Program since its start in Fiscal year 1998/1999. Over the first three years of the program, ICAPCD has received $381,543 that it matched with $150,491 in district funds. 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 include 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-served basis and conducted evaluations based on cost-effectiveness.

To date, the district has obligated all of its first and second year funds, and about 20 percent of its third year funds to pay for agricultural irrigation pumps and off-road tractors. The district is completing its contracts for third year funds. The staff of ARB estimates that in ICAPCD's first three program years, it will generate approximately 31.3 tons of NOx and 1.4 tons of PM annually for the life of the projects. Overall, the average cost-effectiveness for the district's program is about $1,600/ton of NOx 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 ICAPCD Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
Off-Road				4				$ 45,000
Agricultural Irrigation Pumps		13				3		$168,800
Total		13		4		3		$213,800

14. Northern Sierra Air Quality Management District (NSAQMD)

NSAQMD has participated in the Carl Moyer Program since the 1998/1999 fiscal year. For the first three years of the program, NSAQMD received $357,142 in state funding, which it matched with $132,291 in district funds. NCAQMD's outreach efforts include news releases, mailings, and radio advertisements. The district accepted applications on a first-come-first-served basis.

To date, the district has obligated all of its first and second year funds, and 60 percent of its third year funds to pay for on- and off-road engines. The staff of ARB estimates in the first three years, NSAQMD's program will result in more than 12.1 NOx tons and 1.3 tons of PM emission reductions annually, for the life of the projects. Overall, the average cost-effectiveness for the district's program is about $6,600/ton of NOx 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 NSAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road								
Refuse Haulers		6		2		1		$120,952
Urban Transit Buses			1					$9,065
Other		1		1		3		$130,922
Off-Road Equipment:								
Other		2						$34,000
Total		**9**	**1**	**3**		**4**		**$294,939**

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

NSCAPCD participated in the first year of the program, but did not participate in the second year. The district rejoined in the third year and will be receiving funds for the fourth year as well. In the first and third year of the program, NSCAPCD received a total of $263,900, which it matched with $97,767 in district funds. NSCAPCD has been allocated $75,000 from the fourth year funds.

In the first year of the program the district sent out an RFP to agricultural industries, farms, transportation associations, school districts, and government agencies. NSCAPCD is in the process of allocating its third year funds to projects. The district has allocated some third year money to alternative fuel school and urban transit buses, and one diesel marine vessel.

To date, the district has obligated all of its first year funds to pay for on- road and marine vessel engines. The staff of ARB estimates that the two years of NSCAPCD's Carl Moyer Program produced approximately 9.6 NOx tons and 1080 pounds of PM emission reductions annually, for the life of the projects. Overall, the average cost-effectiveness for the district's program is about $5,300/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-16
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		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road						
Urban Transit Buses	7		8		$133,900	
School Buses			7		$50,000	
Marine Vessels		2		1		$60,000
Total	**7**	**2**	**15**	**1**	**$183,900**	**$60,000**

16. Glenn County Air Pollution Control District (GCAPCD)

Glenn County has participated in the Carl Moyer Program since the first year. In the three years of the program, Glenn County has received $303,743, which the district has matched with $117,688. In the first and second years of the program, the district solicited applications through an RFP in November 1999 and September 2000, respectively. Projects operating within the county received 90 percent of incremental costs, while those operating outside the county received 85 percent of incremental costs. GCAPCD is completing the contract execution of second year funds. The district will begin allocation of its third year funds at the end of March 2002. GCAPCD will participate in the fourth year of the program, from which it will receive a total of $75,000.

To date, the district has obligated all of its first and second year funds received by the state to pay for agricultural irrigation pump engines, and off-road agricultural engines. From the first year alone, ARB estimates GCAPCD will reduce emissions by 11.5 tons of NOx and 1480 pounds of PM annually over the life of the projects. The staff of ARB estimates that GCAPCD's program will result in a total of approximately 63 tons of NOx reductions and 3.2 tons of PM reductions. Overall, the average cost-effectiveness for the district's program is about $3,000/ton of NOx 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-17
Types and Number of Engines Paid For In the GCAPCD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year I		Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
Agricultural Irrigation Pumps		14		7		$199,337
Total		**14**		7		**$210,700**

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

NCUAQMD has participated in the Carl Moyer Program since the first year of the program. In three years of participation, NCUAQMD has received a total of $350,005 in state funding which the district matched with $126,722. NCUAQMD accepted applications on a first-come-first-served basis. The district is in the process of allocating its third year funds, which it plans to complete by June 2002.

To date, the district has obligated all of its first and second year funds, and about 85 percent of its third year funds for on-road, off-road, and marine vessel engines. The staff of ARB estimates that NCUAQMD's first and second and third year program will result in a total of approximately 21 tons of NOx and 2 tons of PM reductions per year with an average cost-effectiveness of about $5,500/ton of NOx reduced. Table A-18 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-18
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		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road								
Line Haul		2						$64,648
Other		4		4		7		$230,572
Off-Road Equipment								
Construction		3				2		$52,780
Marine Vessels		1						$31,000
Total		**10**		**4**		**9**		**$379,000**

18. Butte County Air Quality Management District (BCAQMD)

BCAQMD began participating in the second year of the program. In the second and third years of the program, BCAQMD received a total of $254,592 in state funding and provided $87,016 in match funding. The district accepted applications on a first-come-first-served basis.

The district has obligated all of its second year funds for agricultural irrigation pump engines. BCAQMD expects to allocate the funds for its third year program by June 2002. ARB staff estimates that BCAQMD's program will result in a total of approximately 4.7 tons of NOx reductions and 480 pounds of PM reductions annually for the life of the projects from its second year funding. Overall, the average cost-effectiveness for the district's program is about $3,000/ton of NOx reduced. BCAQMD will participate in the fourth year of the program, in which it will receive $75,000. Table A-19 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-19
Types and Number of Engines Paid For In the BCAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road				
Off-Road				
Agricultural Irrigation Pumps		6		$75,781
Total		6		$75,781

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

Shasta County AQMD entered the second year of the Carl Moyer Program. In the second and third years of the program, Shasta County AQMD received a total of $249,727 in state funding which it matched with $84,583 in district funding. In the second and third years of the program the Shasta County AQMD solicited project applicants through local newspapers, mailings, and through engine and equipment dealers. For its first two years of participation, Shasta County AQMD staff made a noteworthy outreach effort.. The district was even successful in having their program featured in the local news.

To date, Shasta County AQMD has spent all of its second year funds and is in the process of allocating its third year funds, with projects having an average cost-effectiveness of $3,500 per NOx ton reduced. Shasta County AQMD combined a portion of their second and third year funds in an effort to fully fund the most cost-effective projects. With its second year funds, Shasta County AQMD was able to reduce emissions by more than 6 tons of NOx and 720 pounds of PM per year over the life of the projects. Table A-20 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-20
Types and Number of Engines Paid For In the SCAQMD Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road		2		$19,000
Off-Road		3		$27,800
Agricultural Irrigation Pumps		1		$15,000
TOTAL		6		$61,800

20. Feather River Air Quality Management District (FRAQMD)

FRAQMD began participating in the second year of the Carl Moyer Program. FRAQMD received a total of $245,851, which it matched with $82,645 to implement the Carl Moyer Program in its district. FRAQMD has based its program on a first-come first - served basis. In the first and second years of district participation, FRAQMD funded several agricultural pumps, an on-road line haul truck, and various off-road tractors , reducing emissions by 30 tons of NOx and more than 640 pounds of PM per year, with an average cost-effectiveness of $3,000/ton of NOx reduced. Table A-21 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-21
Types and Number of Engines Paid For In the FRAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year II		Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road:						
Line-haul				1		$11,063
Off-Road:						
Agricultural				10		$48,265
Other				1		$12,550
Agricultural Irrigation Pumps		9		25		$223,676
TOTAL		**9**		**37**		**$295,554**

21. Mendocino County Air Quality Management District (MCAQMD)

MCAQMD began participating in the second year of the program. MCAQMD received $212,018 in the second and third years of the program, which it matched with $71,825. MCAQMD was able to fund projects from four categories during its first year of participation, which include on-road, off-road, agricultural pump and marine vessel engines. With its second year funds, MCAQMD will produce approximately 5.3 tons of NOx reductions and more than 1,540 pounds of PM reductions, with an average cost-effectiveness of $3,500/ton of NOx reduced. The district is currently accepting applications on a first-come-first-served basis for third year funds. MCAQMD is currently working to allocate the remainder of its 2000/2001 fiscal year funds and anticipates third year funds will be obligated by June 30, 2002. Table A-22 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-22
Types and Number of Engines Paid For In the MCAQMD
Carl Moyer Funds Allocated by ARB

Source Category/ Equipment Type	Number of Engines Year II		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel
On-Road		2		$28,615
Off-Road		1		$10,000
Agricultural Irrigation Pumps		1		$7,824
Marine Vessel		2		$15,000
Total		**6**		**$61,439**

22. Tehama County Air Pollution Control District (TCAPCD)

TCAPCD participated in the third year of the program, in which it received $150,000 in state funds and matched $40,817. The district did not participate in the first or second year of the program. In the third year of the program, TCAPCD mailed applications to local trucking firms, repair shops and farms and accepted applications on a first-come first-served basis. The district began receiving completed applications on June 1, 2001, is currently in the process of completing its third year program and has applied for fourth year funds. From its third year funds, TCAPCD was able to fund 17 agricultural pumps. These projects will reduce NOx by 21.19 tons per year, and PM by 1.1 tons per year, with an average cost-effectiveness of $2,200/ton of NOx reduced. TCAPCD was allocated $75,000 from fourth year funding and will match these funds with $37,500. Table A-23 lists the types of projects funded, the number of engines funded, and an estimate of funds obligated by project category.

Table A-23 Types and Number of Engines Paid For In the TCAPCD Carl Moyer Funds Allocated by ARB				
Source Category/ Equipment Type	Number of Engines Year III		Funds Total	
	Alt Fuel	Diesel	Alt Fuel	Diesel
Agricultural Irrigation Pumps		17		$150,000
Total		**17**		**$150,000**

23. Colusa County Air Pollution Control District (CCAPCD)

Colusa County Air Pollution Control District has applied for fourth year Carl Moyer Program funding. This will be the first year for CCAPCD to participate in the program. The district is slated to receive $75,000 in state funds, for which they will be required to match $37,500.

APPENDIX B
ADVANCED TECHNOLOGY DEVLEOPMENT PROJECTS

A. Advanced Technology Development Section Program Schedule

CEC received $2 million dollars for fiscal year 1999/2000 and $2.2 million for fiscal year fiscal year 2000/2001 for the Advanced Technology Development Section of the Carl Moyer Program. Table B-1 illustrates the schedule for the solicitations.

Table B-1
Advanced Technology 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
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

B. PROJECT DESCRIPTIONS/STATUS:

1. FY 1999/2000 Funded Projects

Ceryx proposed to build and demonstrate its QuadCAT Four-Way Catalytic Converter device to reduce oxides of nitrogen (NOx), particulate matter (PM), hydrocarbons (HC), and carbon monoxide (CO) emissions from diesel engines. It was estimated that the proposed technology would reduce NOx by at least 45%, and PM, CO and HC by more than 90%. This technology does not require low sulfur fuel. Ceryx projected over 50,000 tons of NOx would be reduced by 2010 at a cost-effectiveness of $5,604 per NOx ton reduced. The project came to a halt when the company encountered financial difficulty and ultimately declared bankruptcy.

Delphi Energy & Chassis Systems proposed to develop a heavy-duty diesel truck exhaust aftertreatment system using non-thermal plasma technology to reduce NOx by 80%, particulate matter by 90%, and achieve these goals without increasing fuel consumption by more than 3%. The project is proceeding with the following five tasks:

1) develop a durable plasma reactor,
2) identify a durable catalyst system,
3) develop an on-board power supply/controller to energize the reactor,

4) develop an inexpensive lean NOx sensor and closed-loop control system, and
5) design the overall electrical system to avoid electromagnetic interference with or by other vehicle systems.

Engelhard proposed to collaborate with National Renewable Energy Laboratory (NREL) and ARCO to develop a retrofit kit to reduce NOx using an Exhaust Gas Recirculation (EGR) system and a patented catalyzed soot filter (DPX™). The performance targets of 50% NOx reduction, 90% PM reduction, and 80% HC+CO (FTP cycle) would be demonstrated with ARCO's EC-Diesel ultra-low-sulfur diesel fuel. Phase I is the design and construction of a prototype kit for fleet trial installation. Phase II is a fleet demonstration to monitor vehicles in use and perform chassis dynamometer testing.

Detroit Diesel proposed a major redesign of its Series 50G 8.5 liter natural gas engine, primarily marketed for transit buses, based on the Series 50 and Series 60 diesel engines. The redesign involves improvement in cylinder head and piston bowl configurations and particularly air-fuel ratio control to optimize combustion stability, efficiency, and extend the lean misfire limit. These improvements are intended to allow certification to ARB's alternative 0.5 g/bhp-hr NOx standard with no increase above the current PM level of 0.01 g/bhp-hr. The project is proceeding and DDC has announced commercial availability in
Fall 2002.

Cummins Westport, Inc. proposed the further development of it's HPDI (high-pressure direct-injection) natural gas version of the Cummins 1.5 liter ISX diesel engine to attain 0.5 g/bhp-hr NOx emissions. The HPDI system injects a pilot quantity of diesel fuel ($\leq$ 10%) to initiate combustion and then injects the main charge of natural gas, providing the performance and fuel efficiency of a conventional diesel engine. The further development involves the addition of exhaust gas recirculation and a variable geometry turbocharger (to be provided on the diesel base engine to meet October 2002 emission requirements) and recalibration for the higher level of EGR flows tolerable with natural gas to further reduce NOx emissions. The project is proceeding.

2. FY 2000/2001 Funded Projects

ISE Research Corp. proposed to develop and demonstrate a 60 kW Capstone MicroTurbine integrated into propane-powered series electric hybrid 30 ft. transit buses operated by the Los Angeles Department of Transportation. Prototypes of this new engine have achieved emission test results below the 2007-2010 standards of 0.20 g/bhp-hr NOx. The engine is being developed to use diesel fuel, propane, or natural gas. The project is proceeding.

Sorbent Technologies Corp. proposed to further develop a technology originally developed to reduce NOx emissions from jet-engine test facilities, and demonstrate the technology on heavy-duty stationary diesels and large truck engines. The technology

involves adsorption of NOx followed by desorption and Selective NOx Recirculation back into the engine, reducing NOx emissions by up to 90%. The project is proceeding.

SCAQMD and NREL proposed to demonstrate heavy-duty vehicles fueled with Fischer-Tropsch "GTL" synthetic diesel and retrofitted with aftertreatment systems to reduce NOx and PM emissions.

Cummins Westport, Inc. proposed to develop an upgraded B Series Gas engine for truck classes 3-6 with emissions at or below 0.5 g/bhp-hr NOx and 0.01 g/bhp-hr PM. The project will initially upgrade the B5.9G with technologies involving a diesel engine computer system and computer diagnostics that is expected to reach 1.2 g/bhp-hr NOx. This version is expected to be commercialized, followed by evaluation of NOx adsorber aftertreatment technology from Goal Line Environmental Technologies. The addition of the NOx absorber is expected to result in 0.5 g/bhp-hr NOx for possible production in 2004, followed by further development to reach 0.2 g/bhp-hr NOx levels for 2007. The project is proceeding.

Cummins Westport, Inc. separately proposed with PACCAR Inc. to develop a Class 3-6 vehicle designed primarily for CNG, and a Class 7-8 vehicle designed primarily for LNG. The project will involve careful screening of vocations, chassis, and engines, with life cycle cost modeling and customer input, to determine business cases for the final choices. The project is proceeding.

TESTIMONY OF THE
CALIFORNIA INDEPENDENT PETROLEUM ASSOCIATION
SUBMITTED FOR THE RECORD OF THE SUBCOMMITTEE ON ENERGY POLICY OF THE HOUSE GOVERNMENT REFORM COMMITTEE
HEARINGS ON NEW CONCEPTS IN ENVIRONMENTAL POLICY
ORANGE, CALIFORNIA
MAY 28, 2002

The California Independent Petroleum Association (CIPA) appreciates the opportunity to submit written testimony. CIPA has over 400 members comprised of independent domestic oil and gas producers, service companies and related industry companies. Our members are upstream producers whose sole purpose is to extract the natural resources from below the ground. We do not have any refining capabilities.

CIPA is interested in calling the Subcommittee's attention to the need for Federal Environmental Protection Agency (EPA) recognition, that California crude oil and natural gas producers are currently in compliance with Title V of the 1990 Clean Air Act Amendments, by designating California's air quality regulatory compliance regime "equivalent" to Federal Title V requirements.

Although CIPA, the Independent Oil Producers Association (IOPA) and the Western States Petroleum Association seek Statewide Title V equivalency for their members, the San Joaquin Valley (SJV) is currently preparing to "bump up" its air quality designation from "severe" to "extreme" thereby lowering the threshold to include smaller businesses (including oil and natural gas producers) in the requirement to file Title V permits. This creates a greater urgency to act immediately to alleviate the high initial, and unnecessary ongoing, costs of compliance. Industry will focus initially on securing equivalency for the SJV, and subsequently expanding the effort to include other air district basins in the State. DOE is also working on a parallel Title V Permit Streamlining Initiative for small producers.

California's SJV is home to more than 65% of California's crude oil and natural gas production. More crude oil is produced in Kern County than in all of Oklahoma. California crude oil is primarily "heavy" crude oil, which costs more to extract and receives a lower price per barrel than the predominately "lighter" barrels found elsewhere in the United States. California' oil and natural gas infrastructure including it's pipeline system, co-generation facilities and refineries are uniquely configured to handle a heavier slate of crude oil. California is also an "energy island". While the State consumes all of its in-State production, indigenous oil and gas production accounts for only 40% of California's petroleum supply. Any oil or gas not produced in State must be imported by tanker. Thus, the additional environmental benefit of sustaining or increasing production is fewer sea borne tankers delivering crude oil or refined product. Crude oil extraction is price sensitive in that any additional cost levied on producers reduces the incentive to extract the resource. When fewer barrels of oil are produced, national energy and environmental security are at risk. In addition to generally higher regulatory compliance

CIPA TESTIMONY
PAGE TWO

costs and a lower valued product, California producers have also been damaged by higher electricity prices.

Title V compliance costs vary from several thousand to tens of thousands of dollars, are duplicative and time consuming, while providing no environmental benefit whatsoever. This is a significant cost reduction for producers, and other businesses, with no environmental trade off.

California industry's request for equivalency is unique with respect to air quality regulation, but not precedent setting for the EPA. Recent examples of Federal EPA granting equivalency include: 1) Underground Injection Control Program - Class II Oil & Gas Wells – the California Division of Oil, Gas and Geothermal Resources was granted primacy under Federal UIC Program for Class II wells in 1983 signifying that the State Program is administered and enforced consistently with the requirements of the Federal UIC Program; and 2) In 1988, the State of California obtained final authorization under Federal RCRA (Resource Conservation and Recovery Act) to implement and enforce RCRA within the State.

In 1998 producers, as part of a broad coalition of affected businesses, asked the Federal EPA to grant Title V Equivalency for businesses in the SJV. Because the Clinton Administration did not make this issue a priority, EPA never acted on the request. The Bush Administration has made a priority of identifying regulatory constraints to energy production. CIPA, IOPA and WSPA will be meeting with each member of the California Congressional Delegation, EPA and other key Federal agency contacts and California regulatory agencies to secure political, administrative and regulatory support for the equivalency effort.

Equivalency is supported by petroleum, agriculture, and development industries in California's Central Valley; California Air Resources Board, San Joaquin Valley Air Pollution Control District, with no known formal known opposition.