



National Academy of Public Administration

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# LEARNING FROM INNOVATIONS IN ENVIRONMENTAL PROTECTION

## EXECUTIVE SUMMARIES FROM THE RESEARCH PAPERS

compiled for discussion  
at a roundtable  
to be convened by the Academy

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The Panel and staff of the Learning From Innovations in Environmental Protection Project encourage readers to post comments on these papers at [www.napawash.org](http://www.napawash.org).

## **Learning from Innovations in Environmental Protection: Executive Summaries from the Research Papers**

This volume includes the executive summaries of 16 research papers. The papers comprise a series of independent evaluations of innovations in environmental management commissioned by the National Academy of Public Administration's Center for the Economy and the Environment. The entire series is available at the Academy's website, [www.napawash.org](http://www.napawash.org), and will be available in print in late 2000.

The U.S. Congress initiated this study in FY 1998 when it asked the Academy to undertake an independent evaluation of some of the most promising innovations in environmental management. A panel of Academy Fellows and other experts is guiding the project. The panel selected the research topics and researchers, and encouraged the researchers to offer their own findings and recommendations. The reports in this series are the work products of the research teams; neither the Academy nor the project panel endorses their findings and recommendations. The panel will use the research reports as a foundation for its own report and recommendations to Congress and the U.S. Environmental Protection Agency later this year.

The overall project is under the direction of DeWitt John and Richard A. Minard, Jr. The U.S. Environmental Protection Agency has funded the project through contract number 68-W-98-211.

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The Center for the Economy and the Environment undertakes projects that help build the capacity of the nation, states, regions, and communities to produce stronger economies, healthier ecosystems, and safer living and working environments.

## Table of Contents

### *Innovations in Regulation*

1. **Evaluation of the Massachusetts Environmental Results Program.....6**  
by Susan April and Tim Greiner;  
*Kerr, Greiner, Anderson and April, Inc.*
2. **ISO 14001 and EPA Region 1's StarTrack Program: Assessing their Potential as Tools in Environmental Protection.....9**  
by Jennifer Nash and John Ehrenfeld  
*Center for Technology, Policy, and Industrial Development  
Massachusetts Institute of Technology*
3. **The Potential and Pitfalls of Innovative Permits: Learning from New Jersey's Facility-Wide Permitting Program..... 15**  
by Susan Helms, Jennifer Sullivan, and Allen White  
*Tellus Institute  
Boston, Massachusetts*
4. **Green Permits and Cooperative Environmental Agreements: A Report on Oregon's and Wisconsin's Regulatory Innovation Programs ..... 21**  
by Jerry Speir  
*Tulane Institute for Environmental Law and Policy  
Tulane Law School  
New Orleans, Louisiana*

### *Trading Systems to Reduce Air and Water Pollution*

5. **Analysis of Volatile-Organic-Compound Air Pollution Trading Systems ..... 28**  
by Eric Ruder and Michael Hix  
*Industrial Economics, Inc.  
Cambridge, Massachusetts*
6. **Crosscutting Analysis of Trading Programs: Case Studies in Air, Water, and Wetland Mitigation Trading Systems ..... 35**  
including case studies to be posted at a later date:
  - Tar-Pamlico River Basin, North Carolina
  - San Joaquin River, California
  - Wayland-Sudbury, Massachusetts
  - Rahr Malting and the Minnesota River, Minnesota
  - Kalamazoo River, Michigan
  - The RECLAIM Trading Program for SO<sub>x</sub> and NO<sub>x</sub>, California
  - New Jersey Open Market Emission Trading System
  - Wetland Mitigation Banking in Ohio

*by Robert Kerr, John Jaksch and Steve Anderson  
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Reston, Virginia  
and  
Battelle Pacific Northwest Division  
Richland, Washington*

***Governance in Watersheds***

**7. The Watershed Approach – An Empirical Assessment of Innovation in Environmental Management..... 39**

including case studies from:

- Nisqually River and Dungeness River watersheds in Washington
- Black Earth Creek and Tomorrow-Waupaca River watersheds in Wisconsin
- Upper Little Tennessee River and Long Creek watersheds in North Carolina.

*by Stephen M. Born and Kenneth D. Genskow  
University of Wisconsin-Madison  
Madison, Wisconsin*

**8. Environmental Governance in Watersheds: The Importance of Collaboration to Institutional Performance ..... 41**

text and case studies to be posted at a later date:

- Rhode Island’s Salt Ponds: Using a Special Area Management Plan to Improve Watershed Governance
- Delaware Inland Bays Estuary Program: Using a Nonprofit Organization to Implement a CCMP
- The Tampa Bay Estuary Program: Developing and Implementing an Interlocal Agreement
- The Narragansett Bay Estuary Program: A Successful Failure?
- The Tillamook Bay National Estuary Program: Using a Performance Partnership to Implement a CCMP
- Tahoe Regional Planning Agency: the Evolution of Collaboration

<i>by Mark T. Imperial</i>	<i>Timothy Hennessey</i>
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<i>Environmental Affairs</i>	<i>University of Rhode Island</i>
<i>Indiana University</i>	<i>Kingston, Rhode Island</i>
<i>Bloomington, Indiana</i>	

**9. The Navesink Watershed Management Effort ..... 42**

*by Caron Chess and Ginger Gibson  
Center for Environmental Communication  
Rutgers University  
New Brunswick, New Jersey*

**10. Lessons from Large Watershed Programs: A comparison of the Colorado River Basin Salinity Control Program with the San Francisco Bay-Delta (CALFED) Program, Central and South Florida (Everglades) Project, and the Chesapeake Bay Program..... 46**

*by Robert W. Adler and Michelle Straube*

*CommUnity Resolution, Inc.*

*Salt Lake City, Utah*

*Changing the Federal/State Relationship*

**11. Mixing Management Metaphors: The Complexities of Introducing a Performance-Based State/EPA Partnership System into an Activity Based Management Culture ..... 65**

*by Lee Paddock and Suellen Keiner*

*Environmental Law Institute*

*Washington, DC*

**12. The National Environmental Performance Partnership System: Making Good on its Promise? ..... 73**

*by Jeanne Herb, Allen White and Mark Stoughten*

*Tellus Institute*

*Boston, Massachusetts*

**13. Environmental Performance Measures in a Federal System..... 81**

*by William T. Gormley, Jr.*

*Georgetown University*

*Washington, DC*

**14. Reinventing EPA New England: An EPA Regional Office Tests Innovative Approaches to Environmental Protection..... 85**

*by Jodi Perras*

*Perras and Associates*

*Indianapolis, Indiana*

*Compliance Assurance & Superfund: Reforms at EPA*

**15. Reinventing Superfund: An Assessment of EPA's Administrative Reforms 91**

*by Robert Nakamura and Tom Church*

*State University of New York*

*Albany, New York*

**16. Towards Integrated Approaches to Compliance Assurance ..... 94**

*Jeanne Herb, Mark Stoughton, Jennifer Sullivan, and Michael Crow*

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*Boston, Massachusetts*

**PAPER 1****EVALUATION OF THE MASSACHUSETTS ENVIRONMENTAL RESULTS PROGRAM**

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**EXECUTIVE SUMMARY**

The Massachusetts Department of Environmental Protection (DEP) has designed, piloted, and now rolled out to several commercial sectors a first-in-the-nation regulatory system called the Environmental Results Program (ERP). The promise of ERP is that it will deliver superior environmental protection, increase flexibility for business, and reduce costs to the taxpayers. In practice, it is an innovative compliance-assurance system that uses annual self-certification requirements to shift the compliance assurance burden onto facilities. For the first time ever, senior-level company officials certify annually that they are—and will continue to be—in compliance with all applicable air, water, and hazardous waste management performance standards throughout a facility. DEP reviews the certifications with both random and targeted inspections, and appropriate enforcement, when necessary.

This evaluation takes a close look at ERP. Has it made a difference? Did it live up to its promise? How can it serve as a model? We found that, as anywhere, the change process can be difficult—even with committed staff and strong upper-management support. We also found encouraging improvements in compliance and positive environmental results. ERP has evolved over the four years since its inception. Today, due in large part to the types of small business sectors rolled out, there is a strong focus on compliance assistance delivery—plain-language sector-specific workbooks that help firms self-certify by explaining clearly their environmental obligations. And there is a new innovation known as Environmental Business Practice Indicators, or EBPIs, performance measures designed to benchmark and track program, sector, and facility-specific environmental performance.

So what has ERP done? It has brought a number of relatively unregulated small business sectors—dry cleaners, photo processors, and printers—to a much higher level of compliance, assuring that compliance will be on-going, via the EMS-like workbooks. Both the annual certifications and the EBPI methodology give DEP a way to monitor sector progress over time.

What has it not done? The bold vision of performance standards, a new metric that fundamentally simplifies measuring environmental results, has not come through. ERP

regulations developed for the three rolled-out sectors reflect their roots in traditional requirements—and do not represent radical restructuring of rules and regulations. ERP’s innovation is in making those requirements accessible and understandable to all. However with the exception of the printing sector, ERP has not retired a large number of permits. Future ERP efforts are targeted towards greater permit-elimination, but there is considerable debate in the agency regarding the issue.

ERP did not deliver on all of its promises—but the program did deliver on many and in the process was very innovative. This report attempts to capture its complexity, its promise, and its reality. We view ERP dynamically. DEP’s experiment with ERP tools such as self-certification, permit elimination, workbooks, EBPIs, and universe identification continues. More interesting results should come from that effort. EPA should encourage and fund greater experimentation with ERP-type efforts. We strongly support the concept of ERP and recommend to the Academy a number of ways to continue the learning process. The following are our summary recommendations:

### **1. Support and expand self-certification experiments.**

ERP is still early in its evolution and many permutations of the program are possible. EPA should encourage and/or fund quantitative evaluations of ERP components such as the program’s environmental results, EBPI procedure, and costs and benefits. Similar investments should be made in expanding the program to other sectors, including medium-size industries. Many states are looking for means to ensure compliance among small businesses rely less on resource intensive inspection and permitting programs. ERP may be one such means.

### **2. Reduce barriers to federal flexibility.**

DEP has pursued federal regulatory flexibility for the ERP dry-cleaning sector through EPA’s XL program. That effort has been arduous, lengthy, and has produced few results. Having received approval of the “umbrella” XL agreement, Massachusetts has found that specific requests for flexibility seem to go back to square one relative to approval, and the same reinvention battles have to be re-fought. This calls into question whether the XL program is a vehicle for states to pursue reinvention efforts. States need other avenues to seek flexibility or look to Congress to provide a better climate for innovative regulatory policy initiatives.

### **3. Investigate mechanisms for setting performance standards and for eliminating permit trials.**

Efforts to promote performance standards in ERP have produced mixed results. In the case of the small-business sectors in ERP, many firms preferred technology standards to requirements to measure environmental performance. Our research found that a thorough definition and analysis of performance standards was lacking. Similarly lacking was detailed information on the process of setting performance standards. Performance standards are a valuable policy goal and should be encouraged where they are practical. EPA and the states should look to their own programs to better understand where

performance standards have worked and where they have failed. Documenting those cases would move the debate beyond normative statements that performance standards are “good”—and would provide policymakers, permit writers, and regulatory development staff with tools to encourage them.

DEP successfully eliminated permits in the printing industry, replacing them with a performance standard and certification requirement: a replacement that resembles what are known as permits-by-rule or general permits. However, attempts to push permit elimination further ran into many barriers—including federal requirements, the need to incorporate citing concerns in the process, and the tension between a performance standard and the state’s Best Available Control Technology) program. Despite those barriers, there are opportunities. For example, confined animal feeding operations could benefit from the ERP workbooks, annual certifications, combination of performance and technology standards, rather than the traditional permitting approach that lacks education and a regulatory feedback loop.

#### **4. Explore environmental business performance indicators.**

DEP’s effort to measure a sector’s performance using environmental business performance indicators was one of ERP’s significant policy innovations. Rather than the traditional measures of compliance, EBPIs allow the department to look at compliance more comprehensively. DEP’s EBPIs are still unproved, however, although a contractor study on the EBPIs is forthcoming. EPA and the states should follow DEP’s efforts and encourage similar attempts to measure more comprehensively industry environmental performance.

**PAPER 2****ISO 14001 AND EPA REGION 1'S STARTRACK  
PROGRAM:  
ASSESSING THEIR POTENTIAL AS TOOLS IN  
ENVIRONMENTAL PROTECTION**

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**EXECUTIVE SUMMARY**

This report is part of an evaluation of environmental innovation undertaken by the National Academy of Public Administration. The goal of the Academy's evaluation is to "help Congress, the general public, state governments, and EPA understand which [innovations] are working well, which are not, and how to improve the initiatives and environmental management more generally." The environmental innovations of interest to the Academy are defined broadly as regulatory "reinvention."

The central idea of reinvention is today widely accepted—that EPA can and should find more effective and efficient ways of protecting the environment by working cooperatively with its stakeholders. The goals of the EPA Office of Reinvention are the following:

- use incentives and promote environmental management systems (EMSs)
- provide timely and accessible compliance-assistance
- create flexible and streamlined permitting
- help communities make sound environmental decisions

EPA reinvention activities comprise some 30 programs. This research explores two recent initiatives related to those goals: ISO 14001 and the EPA Region I's StarTrack program. We studied ISO 14001 through two approaches—a statistical analysis of the characteristics of early adopters, and case studies at six chemical facilities, five of which had adopted the standard. To study StarTrack, we interviewed managers at four of the six facilities that have participated in the program since its inception, as well as EPA staff members at the regional and national levels, state environmental officials, and representatives of environmental advocacy groups.

## THE ROLE OF ISO 14001 IN ENVIRONMENTAL PROTECTION

ISO 14001 is a private effort to standardize and promote the implementation of environmental management systems. This research seeks to understand the extent to which a facility's adoption of ISO 14001 may serve as a proxy for environmental excellence, that is, environmental performance above a normal baseline. This understanding could help to inform EPA decisions about the role of ISO 14001 in regulatory reinvention. We attempt to answer two questions about ISO 14001: Why do managers choose to adopt that standard, and what changes does it bring about in the organization, management, and ultimately environmental performance of facilities?

Facilities that adopted ISO 14001 between 1996, when the standard was published, and mid-1999, when we completed gathering data for this research, we call "early adopters." We analyzed their characteristics—in terms of size, ownership, management practices, and environmental performance—with a database we developed for that purpose. Our analysis shows that early adopters tend to be large, foreign-owned facilities, that had already adopted ISO 9000, the international quality-management standard. They also tend to emit more toxic pollutants than their peers.

Managers of large facilities who have experience with ISO 9000 are more capable of adopting ISO 14001 than managers of smaller, less-sophisticated plants, due both to managerial experience and plant size. That does not, however, fully explain why some managers have chosen early adoption. The relatively high level of toxic emissions of early adopters suggests a possible motivation: a desire to improve environmental performance, particularly compliance. Managers in the five ISO 14001 facilities we studied cited that desire as a reason for becoming registered. Those managers had determined, for a variety of reasons, that strong environmental management is in their interest. By adopting ISO 14001 early they hoped to assume the designation of "leaders."

How does ISO 14001 change environmental management in early adopters? We found that, in the case-study facilities, ISO 14001 led to some common practices: greater attention to regulatory compliance, increased formalization of environmental practices, and stronger integration of environmental objectives into operating routines. It had little impact on managers' relationships with regulators and other external constituencies.

Managers told us that ISO 14001's greatest contribution was in strengthening regulatory compliance programs. Managers included regulatory compliance in the targets they set in their ISO 14001-structured EMSs. They said that ISO 14001 helped to "indoctrinate" employees so that the goal of compliance became unquestioned. But ISO 14001 did not guarantee compliance, as demonstrated by a major accident that occurred in one of the adopting facilities more than one year after registration. Less significant incidents had occurred at each of the other ISO 14001 plants, as well, but managers we spoke with felt strongly that ISO 14001 will help to reduce such incidents over time.

Within those common trends we found substantial variation. Each of the five ISO 14001 facilities we studied is using the standard in its own way, to achieve its own

objectives. Many facilities are using ISO 14001 to improve their performance beyond what is required by regulation. The extent to which that happens depends entirely on the decision of managers to include "beyond-compliance" goals in their ISO-structured EMSs. In most of the facilities we studied, beyond-compliance goals were pursued only if they resulted in cost savings. In one facility, environmental objectives were pursued for their own sake.

Those findings raise a question for EPA as it considers using ISO 14001 as a tool in environmental policy. Our research shows that early adopters are both capable (due to their large size and experience with ISO 9000) and motivated (as shown by their expressed desire to become environmental leaders) to use ISO 14001 to improve environmental performance. Evidence suggests, therefore, that the improvements in environmental management we observed in our case studies may be attributable to characteristics already established in those organizations: their resources, capabilities, and commitments. What will happen as firms that lack those characteristics adopt ISO 14001?

During the study period, in September 1999, Ford Motor Company and General Motors Corporation announced they will require their suppliers to adopt ISO 14001. Other manufacturers may soon follow suit, imposing ISO 14001 as a requirement for business. We anticipate that firms that adopt ISO 14001 because it is required will experience different outcomes than those that adopt at their own initiative. Later adopters will not necessarily possess the resources, capabilities, and commitments to achieve the results we observed in the early adopters. We have seen that the standard allows managers to implement the standard in their own ways, and that even among early adopters, environmental objectives vary substantially. As the characteristics of adopting firms become more diverse, we expect that the impacts of adoption will also be more varied.

## **THE ROLE OF STARTRACK IN ENVIRONMENTAL PROTECTION**

EPA's Region I office initiated StarTrack in 1996 as a pilot project. The goals of StarTrack are to improve:

efficiency of public and private resource allocation  
protection of the environment  
public understanding of a company's environmental performance

The program's initial goal was test the use of third parties to verify compliance. The original name of the program was the "Third Party Certification Project," and most of the activities of the program appear to support that goal. The program provides benefits to facilities that establish the goal of continuous improvement in environmental performance, audit their compliance and environmental management systems, have results verified by qualified third parties, correct any violations discovered through that

process within 60 days, and disclose environmental performance to EPA and the public. Currently 15 facilities participate.

Is StarTrack achieving its goals? StarTrack's success is most apparent with respect to the third goal, improving public understanding of a company's environmental performance. StarTrack overcomes a major deficiency in ISO 14001, which contributes little to public understanding of facility operations. Firms that participate in StarTrack disclose information about their emissions, product performance, and use of resources. At StarTrack facilities, compliance and EMS audits are public events, in which agencies and environmental groups are invited to participate. Results from the audits are publicly available.

Success with respect to the first and second goals is more ambiguous. At this point, StarTrack appears not to be improving the efficiency of public and private resource allocation. StarTrack is a pilot project, just finishing its second operational year. With StarTrack, EPA is testing a system whereby third parties verify the sufficiency, and the substantive results, of both compliance and EMS audits. Staff members from the regional office and state environmental agencies routinely participate in the third party audits as observers. Observation is necessary, agencies say, in order to verify that participating firms are honoring their commitments and that third parties are identifying all significant issues. Preparing for audits, participating in them, and assessing results require substantial amounts of agency time.

StarTrack will result in improved efficiency as EPA and states find, through careful testing of the program, that it is a reliable substitute for direct agency oversight. StarTrack includes the necessary elements to serve that function. EPA's confusion with respect to the second goal, the role of StarTrack in improving environmental protection, weakens the program, however.

Members of the EPA StarTrack team assert that, in addition to privatizing compliance assurance for firms with strong environmental histories, StarTrack strengthens the environmental performance of firms that participate, as well as firms that may aspire to participate in the future. Our case studies suggest that environmental performance is improving in StarTrack facilities, but not as a result of the program. To be admitted, a facility must have a history of pollution prevention and an EMS that includes environmental performance improvement as a goal. Firms that meet those criteria are managed by people who have already invested in environmental performance improvement, and are committed to continuing to do so. Our cases suggest that, at this point, the factors that push StarTrack managers to develop beyond-compliance programs have little to do with agencies.

StarTrack is impeded by a lack of specific program benefits. The benefits EPA promises are partnerships, penalty mitigation, inspection relief, rapid processing of permits, and recognition. StarTrack team staff members admit that participants are not receiving all of those benefits. Some StarTrack firms are still inspected by agencies; their permit applications are not handled any differently from the way they were before

joining. The only benefit that is consistently delivered is public recognition. Currently, StarTrack facilities receive plaques and notice at a year-end conference. The EPA Region 1 website mentions participating companies by name.

Research presented in this report suggests that recognition from agencies will not, however, on its own, move facilities in the direction of excellence. Larger forces shape the environmental practices of firms.

Like the early adopters of ISO 14001, the facilities currently joining StarTrack are both capable and motivated to strive toward excellence. Those characteristics, established in the facilities prior to joining, are what move firms forward. When adequately tested, StarTrack may prove to be an effective program for privatizing agency oversight in those firms. It is a weak tool, however, for changing firm behavior. EPA should therefore limit participation to firms with established records of strong environmental performance.

## RECOMMENDATIONS FOR STARTRACK

We recommend that EPA improve the specificity of StarTrack goals and the enforceability of StarTrack agreements. One step toward achieving those improvements would be to divide StarTrack into two programs. The first program, which should retain the StarTrack name, would have as its goal improving the efficiency of agency compliance assurance programs. It should focus on changing *agency* behavior. StarTrack should work to reduce the level of direct agency oversight of facilities with strong compliance performance, freeing inspectors to focus on average and poor performers. Candidates for StarTrack should be limited to facilities with strong compliance histories and established commitments to pollution prevention and environmental performance improvement. Only firms with little to hide should be invited to join a program that relies on facility managers to publicly disclose their environmental problems.

Many in the agency believe their roles as environmental stewards extend beyond compliance assurance. They say that EPA's role should include helping firms do more than what regulations require. Promoting beyond-compliance performance could be the focus of a second EPA program. The goal of such a program would be to change the behavior of *companies*. If EPA wants to promote beyond-compliance performance, it need not focus on StarTrack facilities. StarTrack facilities have shown that they are already both capable and motivated to achieve that level of environmental performance.

In designing its beyond-compliance program, EPA should decide which inhibiting factor it will address: lack of capability, or lack of motivation. An appropriate focus might be to attempt to engage firms managed by people who are motivated to improve but do not have the necessary skills, knowledge, or resources. EPA could help to move such firms in the direction of environmental excellence by offering technical assistance. It need not provide such assistance directly; many states have developed exemplary programs in that area.

Alternatively, EPA could attempt to engage firms managed by people who are not yet motivated to strive beyond what is required by law. If it chooses that population of firms, it should focus on developing incentives. Incentives that EPA has been using in StarTrack may not be sufficient or appropriate. Regulatory flexibility could potentially be a strong motivator because it can affect a firm's costs and competitiveness. Flexible approaches, however, are often time-consuming to negotiate, and must be developed on a case-by-case basis.

In summary, we recommend that efforts to change the behavior of agencies—which is the appropriate focus for StarTrack—be separated from campaigns to change the behavior of firms to embrace beyond-compliance goals. Combining those two objectives, as EPA has done in its current design of StarTrack, has made it difficult to evaluate the program, to plan for its expansion, and, ultimately, to achieve either goal.

**PAPER 3****THE POTENTIAL AND PITFALLS OF INNOVATIVE PERMITS:  
LEARNING FROM NEW JERSEY'S FACILITY-WIDE  
PERMITTING PROGRAM****Susan C. Helms****Allen L. White****Tellus Institute****EXECUTIVE SUMMARY**

The facility-wide permit (FWP) pilot project in New Jersey was the first permit innovation program in the United States to issue binding multimedia permits. As the FWP pilot nears completion, it is useful to reflect on what has been accomplished and learned. This report evaluates the effectiveness of the FWP and derives lessons for future permitting initiatives from the FWP pilot and other innovative permitting projects that have evolved during the 1990s.

New Jersey's Pollution Prevention Act of 1991 directed the Department of Environmental Protection (DEP) to undertake a pilot FWP program, with the intent of producing permits that would encourage pollution prevention (P2) while simplifying the permitting process. At the time the act was passed, DEP had already started a pre-pilot with three facilities to test the concept. After the P2 Act came into effect, DEP conducted a full pilot with 15 additional volunteer facilities.

FWPs are innovative in that they establish process-level caps, are multimedia, relate closely to the P2 Plans that many facilities are required to develop in New Jersey, and provide increased operational flexibility. Those flexible, simplified permits reflect some of the general trends in environmental regulation in recent years.

To determine the effectiveness of the FWP program, we benchmark it against three attributes of a successful environmental policy innovation, discussed in greater detail below:

- ensuring that benefits outweigh costs
- having sufficient commitment from all stakeholders to the policy's success
- achieving consistency with existing statutory requirements
- The costs and benefits of the FWP pilot program have been very different from expectations.

While significant benefits for the environment are identifiable, most of those benefits have resulted from the permit development process rather than from the permits themselves. Correspondingly, there have been larger-than-expected costs in the permit development process.

The primary way in which New Jersey expected FWPs to improve the environment was by promoting P2. Indeed, most of the FWP participants (10 of 12) have implemented P2 practices since receiving their FWPs. However, when further questioned, most facility representatives revealed that they probably would have engaged in P2 even in the absence of a FWP. Having FWPs does make it easier for companies to identify and implement P2, but does not generally motivate them to practice P2. The real impetus to implement P2 generally derives from sources unrelated to the FWP per se.

While the FWP staff within the Office of Pollution Prevention (P2 Office) have been committed to making FWPs work, the inconsistency of commitment outside the FWP program has been problematic. Single-medium program staff, fearful of losing responsibilities to the program and skeptical of its advantages, sometimes failed to cooperate, which made issuing the permits difficult for the FWP permit writers. The FWP program has also seen a decrease in higher-level agency commitment over the course of the project, which has affected both the practical ability of the P2 Office to carry out the FWP program and the morale of the responsible staff.

Commitment on the part of participating companies is also critical because of the FWP program's voluntary nature. The level of commitment by participants has frequently been problematic for the program because some companies, particularly those with past compliance problems, have not been fully committed to the program. Because the FWP program has no mechanism for penalizing companies that do not cooperate, that lack of cooperation has resulted in significant delays and frustration in issuing the permits.

The FWP program has achieved consistency with the state's standard permit requirements, but has run into problems related to the permits' equivalency with the new operating permit requirement in Title V of the Clean Air Act Amendments of 1990. For several facility representatives, the issue of whether EPA accepts the FWPs as Title V-equivalent is central to their satisfaction with the program.

### **Lessons from other permitting experiments**

An examination of several other innovative permitting projects conducted through EPA's Project XL and Pollution Prevention in Permitting Program (P4) reveals outcomes similar to the FWP analysis. Those innovative permits do generally provide administrative advantages such as streamlining permit requirements and providing flexibility, often through caps. However, those benefits do come at a cost. Most programs, like the FWP, encountered high up-front costs in developing and implementing the permits.

Environmental outcomes also have been similar to those seen with the FWPs. In most cases, environmental improvements have occurred under the permits, but those

improvements have not necessarily resulted *from* the permits. While the permits often have facilitated P2 or been used as a bargaining chip in a larger project that included P2 requirements, they do not inherently encourage P2. Only in the few rare cases, such as the Merck XL project, in which lifetime caps on emissions were set, and Geon's FWP, in which permit limits decrease with increases in production, does the permit itself explicitly encourage P2 practices.

### Conclusions and recommendations

The findings of that analysis regarding costs and benefits of the FWP program are as follows:

- **A mix of conditions, many unforeseeable and beyond the control of the FWP program, have driven costs for developing the permits far beyond expectations.** Those conditions included uncooperativeness of firms and the lack of support internally from DEP.
- **A major cost and a major benefit have arisen from correcting flaws in the traditional permits.** Such improvements in permit accuracy are achievable without an innovative permit program.
- **The extensive P2 opportunities that DEP anticipated have not been realized.** While there were some instances of the permit *process* promoting P2, the permits *per se* did not encourage P2 as anticipated.
- **Similarly, significant benefits from the multimedia nature of the permit have not materialized.** Most of the difference between FWPs and traditional permits has been in the area of air permits, which was where there was the most room for improvement. In those FWPs that had water and waste segments, those parts were relatively unchanged from earlier permits. That is not, however, necessarily a failing of the program. Because of the difficulty of creating multimedia caps, a multimedia permit may not be the best way to achieve a multimedia perspective at this time.
- **FWP caps are more reflective of actual emissions than traditional permit limits.** In some cases, permit writers were able to set tighter FWP permit caps that reflected actual hours of operation rather than 24-hour-a-day operation, upon which most permit limits are based.
- **Personal attention leads to high-quality P2 Plans.** Because of the FWP writers' high level of involvement in writing them, FWP facilities' P2 Plans are generally of a higher quality than other facilities'.
- **Key factors in high facility costs of participation are lack of preparedness and unreasonable expectations on the part of facilities.** Companies that expected the program to be a shortcut around the permit requirements, or who did not have the necessary data for the application, were disappointed with the program.

- **Process-level air caps (as opposed to source-level) lead to flexibility and reduced costs.** Process-level caps allow facility managers to make changes within processes without notifying DEP as long as total emissions for each process do not increase. That feature of the FWP directly addresses a need expressed by industry in the pre-pilot phase.
- **Because the FWP design mimics the plant design, plant engineers understand the permit more clearly.** Having the permit organized by processes makes it easier for plant managers and environmental managers to understand.
- **A single point of contact is a key benefit for facilities.** Most facility managers that we spoke to cited having their FWP writer as a contact at the agency as a major benefit.

We encountered some impressive models of permitting innovations that reveal the real potential of permit reform. Those permits are the exception rather than the rule, but the vision they embody is promising. The most inventive features of those permits include:

- **Lifetime limits.** In addition to saving facility and agency staff time by avoiding the renewal process every five years, lifetime limits guarantee that emissions at a facility will never exceed that cap. If the company wants to expand the facility's production levels, it must reduce emissions per unit of product.
- **Monitoring and reporting requirements that increase as emissions increase.** That aspect of the Merck permit serves as an incentive to keep emissions well below the cap, while eliminating the collection of unnecessarily detailed information when there is little danger of an exceedance.
- **Facility-wide caps.** Those can provide significant flexibility to facility managers while still limiting overall emissions. However, they must be set carefully to avoid granting companies the freedom to increase emissions beyond current levels.
- **Caps that decrease emissions per unit of production as facility grows.** That kind of cap, utilized in the Geon FWP, essentially forces facility staff to find new P2 or emissions reduction opportunities every time they want to increase production.
- **Reducing the negative effects of the existing system's perverse incentives.** For example, firms currently tend to keep older equipment running, rather than purchasing newer, less pollution equipment, because the old equipment is grandfathered. Also, companies tend to buy equipment that emits close to allowable levels to ensure that those levels will not be decreased. Facility-wide caps can eliminate those perverse incentives.

We have three major recommendations for EPA and states:

1. **EPA or Congress should construct a tiered air permit initiative with compelling incentives for P2.** That permitting program, which would be voluntary, would offer increasing permit flexibility as companies made increasing commitments to pollution prevention. We expect that such a program would attract participation due to the competitive advantage offered by the permits. Following is a sample tiered program, based on the lessons learned from the FWP and Project XL permits:

**Lowest Tier: Reward companies for accepting tighter emissions limits.** That tier would involve the use of a standardized baseline consolidated permit, to avoid the cost of customized permits. The permits would incorporate as many single-medium permits as possible, emissions caps would be set near or below actual current emissions levels, and monitoring requirements would be fewer the further emissions are from caps. Facilities would also be offered a single point of contact within the agency.

**Middle Tier: Reward companies for using materials accounting.** Materials accounting and process-flow diagrams are the keys to increasing resource efficiency and identifying P2 opportunities. The agency could reward companies that use those tools by instituting process-level caps under which facility operators can make certain changes without notification.

**Top Tier: Reward companies for accepting further P2 challenges and emissions restrictions.** The agency could offer even more substantive permit incentives to companies that enter into binding agreements to adopt P2 measures or lower emissions caps over time. The incentives could include a ten-year (rather than five-year) permit, facility-level caps, or changing the notification requirement for certain changes from 7 days before to 120 days after.

**Other features of the permit:**

- The permits should incorporate air permits only. Multimedia permits have little value-added given their incompatibility with single-medium laws and infrastructure.
  - If EPA wishes to explore that approach before implementing it full-scale, we recommend piloting it within one sector. We would recommend the pharmaceutical industry or any other sector that uses batch processes or otherwise places high value on flexibility.
  - We are recommending implementation at the federal level because a federal program would reach a wider audience than a state initiative, be consistent across states, and achieve economies of scale.
2. **States should incorporate key lessons into existing permit programs.** A number of the benefits of the FWP approach would not require the full FWP

approach to achieve, but rather could be integrated into more traditional permit programs. It may be more efficient in those cases to update and enhance existing programs than to create a new program. We recommend that states:

**Require high-quality P2 Plans.** FWP facilities' P2 plans tended to be of a higher caliber than other New Jersey facilities' because of the agency scrutiny they underwent during the permitting process. Over 20 states currently have P2 planning requirements; they can take that one step further by requiring plans to conform to standards and be subject to review. Guidance documents such as the one provided in New Jersey can also help agencies ensure strong plans.

**Leverage the Title V program to enhance compliance.** All states with air permitting authority are in the process of implementing Title V. Rather than develop other permit programs, states can use the opportunity provided by Title V to bring major facilities into compliance, for example by using increased scrutiny or providing incentives for self-reporting violations.

**Experiment with process-level caps.** Depending on their laws and agreements with EPA, some states have the authority to use process-level or facility-wide caps into standard air permits or Title V permits. They can use those as incentives for good facility performance.

**Establish a program to identify and avoid cross-media shifts.** Certain types of equipment are likely candidates for causing cross-media shifts of pollution. A state agency can delegate a person or office to look out for those "usual suspects," and require facility environmental managers to document how such shifts are being avoided.

- 3. If states want innovative programs, they should follow the tiered system outlined for EPA and Congress.** Even if EPA does not establish a tiered program, states that wish to do so can develop similar programs. Because innovative permits can be resource-intensive, they should be considered a reward for good performance. Any agency undertaking such an initiative should screen potential participants to identify cooperative and environmentally progressive companies with sufficient resources to carry out the demands of the program. The agency should also expect participating facilities to invest their share of sweat equity. Such a program would use a series of graduated rewards similar to what we recommended for EPA, but within the scope of the state's authority.

In the meantime, as a short-term measure, we recommend that EPA accept the existing FWPs as Title V permits. In addition to incurring goodwill in New Jersey, such a move would be a simple way of showing EPA's commitment to permitting innovation.

There is much to learn from the New Jersey FWP and other permitting innovations we document in this study. The time is ripe for transforming permitting from a regulatory burden to a driver of environmental improvement and business competitiveness.

## PAPER 4

**GREEN PERMITS AND COOPERATIVE ENVIRONMENTAL  
AGREEMENTS:  
A Report on Oregon's and Wisconsin's  
Regulatory Innovation Programs**

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**EXECUTIVE SUMMARY**

**Introduction**

Oregon and Wisconsin are each in the early stages of implementing pilot projects for alternative regulatory programs for environmental protection. The programs are constructed around “performance tiers” and provide varying levels of incentives for achievement of those tiers, attempting to trade greater freedom (in the way an entity meets the regulatory mandate) for improved performance and greater accountability. That enhanced accountability is typically manifest by additional information requirements and/or by increased “stakeholder involvement.” The implementation of environmental management systems (EMSs) is also central to both programs—and to performance-tier programs generally. Wisconsin’s program includes one such performance- or “green-tier” above the existing regulatory tier; Oregon’s features three performance tiers, with progressively higher levels of flexibility offered for higher levels of performance. Oregon calls its program “Green Permits”; Wisconsin’s program is styled “Environmental Cooperation Agreements.” They are the first state programs to make serious efforts to develop and test performance tiers as part of a regulatory scheme.

Other states are at various stages of similar efforts, and the EPA has announced its own plan to “develop a ‘performance track’ to motivate and reward top environmental performance.”<sup>1</sup> While this report was in process, New Jersey announced a “Silver and Gold Track Program for Environmental Performance” that envisions a Silver Track, Silver Track II and Gold Track, to be developed over the next two to three years. The program developed from a project with the state’s batch chemical industry in 1996, which was a collaborative effort with EPA.<sup>2</sup> Core aspects of the program are to be: the electronic submission of data; the development of “operations and environmental compliance plans” (essentially modified EMSs); and the creation of “community outreach plans.”

Michigan is home to the Clean Corporate Citizen (C3) Program, which is restricted to its Air Quality and Storage Tank Programs. Benefit to participants include:

“faster reviews of air emission source and storage tank permit applications, and expanded waivers for construction and operation of air emission sources during permit review, and plant-wide applicability limits (PALs) for air emissions.”<sup>3</sup> Michigan’s program has EMSs at its core and had 15 “designees” as of November 1999. Among the requirements for participation are: a certified EMS, an “effective” pollution prevention program, an attestation of compliance, no criminal violations within the preceding 10 years, and “an effective public communication process.” The program includes no requirement for “superior environmental performance.”<sup>4</sup>

Among other state programs, Minnesota has regulatory innovations legislation<sup>5</sup> designed to test state XL permits, and EPA and Minnesota embarked on a new attempt to work collaboratively on innovation in September 1999.<sup>6</sup> Louisiana has legislation providing for an innovations program, adopted in 1997, but at present the state is still writing rules for the program.<sup>7</sup> Illinois has a non-statute-based environmental management systems pilot project offering its participants: “assistance from Illinois EPA staff in completing data collection protocols, technical assistance in pollution prevention and public involvement, access to independent research on ISO 14001, and Illinois EPA recognition/publicity.”<sup>8</sup> And there are several others. Presently, no guide to those state programs exists. A subcommittee of the American Bar Association is in the process of developing a website designed in part to bring together that information.<sup>9</sup>

A comprehensive study of those programs is beyond the scope of this report. Instead, we focus on Oregon and Wisconsin because they are the most developed and ambitious. Oregon’s Green Permits program has been in development since 1994. Wisconsin’s got its start in 1997. The two have taken somewhat different tacks. Oregon, after considerable work with focus groups, and feasibility studies, and the creation of numerous reports and guidance documents, passed a brief, enabling statute, which was introduced (in somewhat different form) by industrial trade associations. After passage of the statute, an extensive multi-stakeholder development process ensued, which has resulted in a lengthy set of state rules. Wisconsin, on the other hand, developed a more comprehensive statute within its environmental agency. The statute passed the legislature virtually unchanged, and the state has seen no need for further rule-making. Both programs are now at similar stages--accepting their first applications, and negotiating with EPA over the details of the program’s impact on the state-federal relationship.

Those state-federal negotiations have occupied considerable time and, because of their importance, have been a principal concern of this research. But we have also attempted to understand the concerns of the various stakeholders about those experimental programs.

### **Stakeholder Concerns**

For the public-interest community, the basic issue is accountability. How can new programs be designed to ensure that the actual performance of the participants is superior and worthy of special treatment? What will be the nature of that special treatment? Environmentalists tend to be skeptical of innovation, noting that

“compliance” with existing law is hardly universal, and worrying that a new scheme may over-tax limited staff and resources within the regulatory agencies.

The regulated community, on the other hand, is concerned about the possibility for creating an even more complicated—and expensive—regulatory system than the existing one, of simply adding a new layer of requirements atop the old. Companies worry about the costs, and they are anxious about proposals that suggest they should open their corporate decisionmaking processes to public scrutiny.

State regulatory agencies—and innovation programs like those in Oregon and Wisconsin—are driven by at least two things. Their state legislatures drive them to be more efficient, to do more with less, and to be less intrusive into business operations, while still protecting public health and the environment. Also, progressive administrators and staff members within the agencies foresee opportunities for a performance-based, information-rich approach to regulation that could be both more efficient and more effective than the present system, and they push their agencies to experiment. Some also fear that if they do not find ways to respond to their legislatures’ concerns that they will have programs or restrictions imposed upon them by those legislatures that may ultimately be more burdensome to the agency—or less protective of the environment.

EPA, meanwhile, runs its own innovation programs and has its own innovation strategies. (See “Aiming for Excellence: Actions to Encourage Stewardship and Accelerate Environmental Progress: Report of the EPA Innovations Task Force,” July 1999). When it interacts with states over their innovation ideas, EPA is primarily concerned about maintaining federally mandated procedures (for “notice and comment,” for example) and about ensuring the enforceability of the essential requirements of programs that have been delegated to the states. The agency is also concerned about possible connections between innovation programs and “audit privilege.”

Though a Joint EPA/State Agreement to Pursue Regulatory Innovation (the so-called “ECOS Agreement”)<sup>10</sup> now exists and some EPA commentators believe that it indicates EPA’s interest in working with the states on innovation, many at the state level view it differently. They recall EPA’s “embarrassing about-face,” as it was termed by the New York Times,<sup>11</sup> in which EPA recalled an earlier draft of that agreement, and a follow-up letter to that earlier draft in which EPA’s Deputy Administrator, Fred Hansen, noted that EPA “had in mind the development of a process by which states could raise to EPA *minor, and I stress minor*, changes to interpretations, clarifications and issues of consistency in programs we jointly administer.”<sup>12</sup> Thus, from the states’ perspective, pointing to the ECOS Agreement as an indication of EPA’s willingness to work with the states is a bit of revisionist history. Some, at the state level, would assert that the ECOS Agreement ultimately came into being because “EPA had a gun to its head.” At a minimum, those kinds of lingering disagreements and irritations argue for improving communications between the significant state and federal actors.

From the perspective of some within EPA, on the other hand, states sometimes lose sight of the fact that they are running delegated, federal programs with mandatory

elements. State laws like those creating Oregon's Green Permits Program or Wisconsin's Cooperative Environmental Agreements Program come to EPA as accomplished facts. When EPA then finds in those state laws authorizations for "exemptions or waivers from regulatory requirements as considered necessary" (Oregon's statute, Section 1) or "variance(s) from a requirement that would otherwise apply" (Wisconsin's statute, Subpart (4)(a)), EPA sees only empty vessels, which don't provide much information about the kinds of waivers, variances, or flexibility contemplated. Considerable time and effort is then necessary to understand those state laws and their inter-relationship to the federal role.

Those differing EPA and state positions highlight a need for clarification of EPA's basic intent concerning innovation. State regulators profess that they are not sure whether EPA really prefers and intends to develop its own reinvention models and export them to the states, or to foster innovation at the state level. They also strongly support a national "strategy for cooperation," the creation of some process by which EPA would get systematic input from the states on innovation. Presently, they argue, there is no such process.

### **Program Comparisons**

Both the Wisconsin and Oregon programs are small. Each operates with less than three full-time-equivalent employees and with little or no budget beyond what is pieced together from existing programs. Those limitations of staffing and funding have been key reasons for the slow development of the programs. Each has three pilot companies actively pursuing a permit (or agreement), and each is talking with several others about possible participation. Each expects its first permit (or agreement) under the program to be finalized sometime in 2000. Because the programs are still in their developmental stages, this research concerned itself primarily with the decisional process that has moved the programs from concept to reality, and that has shaped their early development. From that phase, we can learn much that will be instructive and influential in other states' innovation—and in the evolving state-federal relationships on innovation.

Both programs operate from the assumption that many of the entities that state environmental protection agencies regulate perform considerably below their potential. The existing regulatory system has focused its attention on compliance, a standard that neither challenges nor rewards that potential.

Both programs place considerable weight on the implementation of environmental management systems, on enhanced stakeholder involvement, and on qualitatively superior public information as central to the superior environmental performance that warrants the change in the regulatory relationship. "The challenge," as one state regulator put it, "is to frame a process that allows performance to happen but that still provides assurance that it's not a race-to-the-bottom."

### **Findings**

In this early phase, a critical issue has been sorting out the relationship between the states and EPA over the impact of the state initiatives on delegated federal programs. Wisconsin, in particular, has taken the lead on the issue, and those efforts have resulted in a Memorandum of Agreement now being modeled in Oregon. That MOA establishes a process and timeline for considering issues as they arise in the course of these pilot programs.

One of the questions in that state/EPA relationship is the degree to which states may possess a measure of inherent flexibility to modify the details of permits without direct EPA oversight. Definition of the parameters of such state flexibility might significantly expedite considerations of many of the requests for regulatory changes that are surfacing in the pilots—though caution would also be appropriate in that exercise, so as to avoid creating new barriers to innovation.

The kinds of requests for change—at least those that have materialized to this point—are qualitatively different from the sweeping changes that have been the focus of Project XL and that are often the focus of theoretical environmental policy discussions. A theme of the state pilots (although it may be too early in the process for the assessment to hold) is that most of the requests concern permit consolidation and changes in reporting and monitoring requirements. And facilities are willing to make commitments to performance improvements in exchange for these kinds of benefits. Assuming that adequate performance measures or indicators can be developed to demonstrate the efficacy of such changes, considerable overall environmental benefits might be realized from such simplifications or rationalizations of the system that do not involve radical change.

The assumption about adequate performance indicators is not trivial. The issue is not the development of the indicators themselves (a project underway at the Global Reporting Initiative and elsewhere) but development of the criteria for the “trade” between regulatory flexibility and performance. In essence, the notion of “superior environmental performance” lacks critical definition.

Ultimately, that judgment is necessarily one to be resolved in a social context rather than a scientific one, and such judgments are expected, in substantial part, to be the province of the stakeholder involvement processes envisioned in both the Oregon and Wisconsin programs.

And stakeholder involvement is another complex issue for innovation efforts. The statutes in both Oregon and Wisconsin contemplate some level of stakeholder input into corporate decision-making—as part of the accountability and transparency intended to foster trust in these experiments. That is qualitatively different from the public involvement in public decisions that has gone before. Even if the “input” is interpreted to be advisory, rather than decisional, the prospect still raises anxiety among the corporate pilots. And representatives of non-governmental organizations are themselves wary of being drawn into an exhausting series of meetings with no clear idea of the NGOs’ opportunities to influence outcomes. New models (different from, or supplementary to,

the traditional, periodic face-to-face meeting of stakeholder representatives) may be necessary.

## Recommendations

With those ideas in mind, we offer the following recommendations.

### *To EPA:*

**1. Provide leadership targeted to the reasonable facilitation of state programs .**

When the subject is state innovation programs, the states need clear, consistent, oft-repeated leadership from the highest levels of EPA concerning the agency's perspective on the interrelationship between its enforcement function, its programmatic function, and "reinvention.". Presently, states hear mixed messages. Within the context of a limited number of pilot projects, some priority to the reinvention process (without forsaking the programmatic or enforcement function) appears reasonable. Essentially, a "policy on innovation" specific to the state/EPA relationship, could be productive.

**2. Develop a process for receiving systematic input from the states on innovation.**

That process might be anything from a formal advisory committee to periodic, informal roundtable discussions.

**3. Identify states' "inherent flexibility" within current law.** States need clear, consistent guidance on the degree to which they may innovate within the context of delegated programs, without perpetual oversight from EPA.

**4. Develop a means to report, in a comprehensive, programmatic way, on the lessons learned from existing "experiments" of all sorts, at both the state and federal levels.** Many observers believe that such a compilation is critical to developing the strategy for operationalizing the gains of existing programs, and for developing the next steps. Such a compilation could also be of great value to the states as they proceed with their own innovations.

**5. Assist the states in developing facility-specific performance indicators .** Such assistance might include convening national fora for discussion, and providing grants for indicator-development projects.

**6. Assist the states in developing meaningful stakeholder involvement processes.**

Compiling lessons learned in both state and federal programs around the country could also be helpful on the issue.

### *To Congress:*

**1. Authorize a *limited* number of genuine, performance-based experiments, experiments in which verifiable *performance* is the issue, not attention to the detail**

**of every existing regulation and EPA policy.** Provide for adequate funding and for comprehensive, independent monitoring.

**2. Authorize  $\frac{3}{4}$  and encourage  $\frac{3}{4}$  EPA to delegate the running of those experiments to states.** More generally, encourage cooperation with the states.

**3. Encourage the development of facility-specific performance indicators or benchmarking to assist in the evaluation of the experiments.**

That proposal for national legislation recognizes that a significant impediment to the progress for innovative state-based programs has been EPA's lack of authority to deviate from specific statutory requirements. Absent such authority, EPA and the states have been engaged—and are still engaged—in protracted discussions about the details of fitting these innovation programs within existing rules. The point is not to give states free reign, but to create a limited number of real experiments with adequate funding and independent review. The experiments will need funding to be practical, and they will need external oversight to be credible.

We believe that the performance-tier approach to regulation has substantial merit and deserves thorough and careful testing. The two programs we examined now have years invested in laying the groundwork, and are the appropriate places for the test. Support for the effort outlined above, and further elaborated upon in our report, would facilitate completion of the experiment and answer important questions about the efficacy and replicability of such programs.

**PAPER 5****ANALYSIS OF VOLATILE-ORGANIC-COMPOUND AIR  
POLLUTION TRADING SYSTEMS**

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**EXECUTIVE SUMMARY**

Emissions trading has become an increasingly popular tool in combating air quality problems at lower cost than traditional command-and-control regulatory programs. This popularity stems largely from the success of the cap-and-trade system for sulfur dioxide (SO<sub>2</sub>) under the federal acid rain program, which has surpassed emissions reduction targets at lower cost than expected. This paper presents the results of a study designed to evaluate the effectiveness of nascent trading programs that utilize a different structure than the SO<sub>2</sub> program, and that target ground-level ozone rather than acid rain. Specifically, we evaluated offset and open-market volatile organic compound (VOC) trading programs in four of the twelve states that have adopted those programs: offset programs in Louisiana, New York, and Texas, and open-market programs in Michigan and Texas. Overall we found that those programs can achieve substantial economic results and modest environmental benefits. We also identified a number of design and implementation features that constrain the ability of those programs to achieve even greater results.

Cap-and-trade programs differ from offset and open-market systems in several important ways that provide context for the findings and recommendations presented below. Cap-and-trade programs create a regulatory system unto themselves by establishing a targeted level of allowable emissions from a universe of sources. After an initial emissions allocation or auction, participating sources may sell allowances if their initial allocation exceeds their emissions, or may purchase additional allowances to cover emissions that exceed the allocation. In contrast, offset and open-market programs are grafted onto existing command-and-control regulatory structures and do not specify a targeted ambient air quality goal. Offset trading programs allow for the modification or construction of major air pollution sources in areas that fail to meet federal air quality guidelines (i.e., nonattainment areas). Through those programs, sources "offset" emissions from new or modified major sources with the purchase of emissions reductions from other facilities. A portion of the emissions reductions purchased are permanently retired to achieve an environmental benefit. Open-market programs allow emissions sources to purchase emissions reductions from other facilities to meet certain federal and state air quality requirements at lower cost than would be incurred through traditional pollution control strategies. As with offset programs, sources must retire a portion of all credits generated to achieve an environmental benefit. Unlike offset programs, open-

market trading is not limited to nonattainment areas.

Below we present our principal findings regarding the level of trading activity that has occurred under those programs, the factors that affect the degree to which trading occurs, and the actual and potential outcomes of trading. We also present recommendations to the U.S. Congress and the U.S. Environmental Protection Agency (EPA) as those institutions consider options for improving the effectiveness of emissions trading as an environmental policy instrument.

## ***PRINCIPAL FINDINGS***

### **Program Design and Implementation**

*VOC trading creates uncertainty, complexity, and risk concerns not associated with trading other pollutants, such as sulfur dioxide.*

VOCs are an entire class of heterogeneous compounds, some of which present known cancer and non-cancer health effects. Their heterogeneity makes continuous emission monitoring, such as that employed under the SO<sub>2</sub> program, prohibitively expensive. Instead, programs rely on various emission quantification methods that utilize engineering estimates. The quantification methods employed by trading programs have led to controversy between states and EPA over the most appropriate measurement techniques. With respect to health effects of VOCs, the programs we evaluated utilize health risk screening to ensure that trading does not create unacceptable health risks in localized areas. Despite those protections, the environmental justice (EJ) community has criticized VOC trading, claiming that programs can redistribute risk in ways that disproportionately burden disadvantaged and/or minority communities. The use of engineering estimates to measure emissions, and questions over the health implications of trading, have reduced public confidence in VOC trading and delayed EPA's approval of state programs.

*Offset and open-market programs are grafted onto existing command-and-control regulatory structures and lack sufficient motivation for sources to trade.*

The programs we evaluated do not replace traditional regulatory mechanisms. Instead, they layer the ability to generate and use credits onto existing regulatory programs. Sources that already comply with existing regulations have little incentive to trade. For functioning trading programs to emerge, sources need some incentive (i.e., emissions reduction requirements) to participate. Absent this motivation, the disincentives to trading often outweigh the benefits. Those disincentives include the regulatory scrutiny associated with generating and using credits, transaction costs, and market uncertainty. Those factors combine to stifle trading, particularly when sources already maintain compliance with regulatory requirements.

*EPA and states disagree on fundamental program design and implementation issues.*

States would like for EPA to formally approve their programs as revisions to State Implementation Plans, yet none of the programs we studied have received EPA approval. States want flexibility to implement programs and procedures that best meet their needs, and have suggested that EPA has instead forced a "one-size-fits-all" approach. On the other hand, EPA wants to ensure that programs meet minimum requirements before it offers approval. EPA's latest draft Economic Incentive Program (EIP) Guidance, issued for public comment in September 1999, appears to provide states with flexibility in meeting federal requirements for program approval. Despite this added flexibility, several nagging issues remain. Those include identifying suitable emissions quantification protocols, developing a final framework for preventing adverse health effects, and determining how the new guidance affects existing programs. EPA staff indicate that internal disagreements within the agency still exist on the emission protocol issue, and were unable to predict when internal agreement might occur. States do not want EPA's indecision and internal disagreements to stand in the way of program approval.

*Demand for credits has been low due to limited regulatory drivers and a lack of eligible credit uses.*

A number of factors constrain participation in trading programs. Low demand for credits stands as the greatest constraint to more widespread trading. This results from a lack of regulatory drivers and limitations the Clean Air Act places on the eligible uses of credits. In addition, participation in offset and open-market programs is voluntary. Additional barriers to more widespread trading include the lack of formal program approval by EPA, which creates concern about the legal consequences of trading in non-approved programs, and the transaction costs associated with generating and using credits, which reduce the economic benefits of trading.

*States can leverage the private sector to perform program functions.*

State agencies have not devoted adequate resources to promoting and administering their trading programs. We found that states can shift at least a portion of their administrative burden to the private sector. Trading has created an incentive for credit brokers to perform a variety of services, including promoting trading, that can reduce the costs agencies incur in administering programs. Brokers benefit financially from trades and will devote resources to increasing awareness of trading as a compliance option. In addition to promoting trading, brokers can reduce transaction costs and market uncertainty, identify potential credit generators and users, and assist trading participants in navigating the procedural aspects of credit generation and use. Relying on the private sector to promote trading seems appropriate since most trading programs were developed in response to industry requests for greater compliance flexibility and emphasize economic benefits for participants over targeted improvements in ambient air quality.

*Environmental justice concerns may pose a barrier to widespread VOC trading.*

The health implications of exposure to certain VOCs pose a legitimate barrier to the development of mature trading markets. The need to conduct health risk screening when using credits can increase transaction costs for sources purchasing credits, thereby reducing the cost-effectiveness of trading. In addition, the EJ community appears generally opposed to trading on the grounds that it could result in the redistribution of emissions into disadvantaged areas and deprive those areas of the benefits of air quality regulations. Until programs can demonstrate that this will not occur, the EJ community will oppose trading of hazardous air pollutants on the grounds that trading can create or exacerbate unacceptable health risks. In addition, EJ and other advocacy groups have become increasingly critical of state permitting and planning programs that do not provide adequate public health protections for all citizens.

### **Trading Outcomes**

*Programs can lead to substantial economic benefits and modest environmental gains beyond those achieved through traditional regulatory structures.*

We found that trading can achieve improved economic outcomes by allowing construction of new major sources or modifications to existing major sources (offset trading) and by offering compliance and operational flexibility (open-market trading). In addition, offset and open-market programs will yield emissions reductions from the universe of participating facilities. Given the limited number of firms that engage in trading, however, those programs will likely lead to only modest overall emissions reductions.

*Cap-and-trade programs hold more promise than offset and open-market systems in maintaining and/or improving air quality.*

In nonattainment areas, comprehensive cap-and-trade systems hold the greatest promise in combating major air quality problems. Starting from a desired environmental outcome provides the regulatory driver that offset and open-market systems lack. Sources participate in cap-and-trade programs because they must reduce their emissions and can do so most cost-effectively through trading. Alternatively, offset and open-market systems involve only a subset of VOC-emitting sources, and achieve environmental benefits only when sources choose to generate credits. Depending on an area's overall air quality needs, this may or may not be sufficient to meet environmental goals. For areas that do not meet air quality standards, cap-and-trade programs targeted at a desired environmental outcome hold greater promise than offset and open-market programs.

### **RECOMMENDATIONS**

We offer two primary suggestions to Congress and EPA as they consider steps

to improve the use of emissions trading as an environmental policy instrument. Our first recommendation:

*Work with state agencies to overcome design and implementation challenges that hinder the success of trading programs.*

Our specific recommendations for overcoming existing challenges are:

*Improving federal oversight of state trading programs.*

EPA and the states need to create a more effective framework for developing and approving programs. States want the flexibility to develop programs that meet their needs and want to know what it will take to obtain federal approval, while EPA needs to ensure that programs provide adequate safeguards against abuse and public health risks. To date, EPA has not provided programs with clear guidance on necessary program components. Absent clear guidance, states will waste time developing programs that EPA will not approve. EPA's new EIP guidance will help reduce uncertainty and demonstrates that EPA recognizes states' need for flexibility. EPA can further promote flexibility by focusing on desired outcomes rather than specific program elements. EPA could also improve its oversight by identifying the EPA staff responsible for approving state programs and encouraging direct contact between them and state agency staff during the program development process.

*Developing and providing the public with reliable information on baseline health risks and emissions levels, and on the extent to which trading affects those baselines.*

Perhaps the greatest information needs associated with VOC trading relate to reliable data on ambient emissions and health risks. Most health risk analyses performed for individual trades are site-specific and do not incorporate baseline health risks. EPA's new EIP guidance may require programs to identify zones where citizens face unacceptable health risks and restrict or prohibit trading in those areas. Doing so requires measuring ambient air quality conditions and estimating existing health risks. Gathering those data and providing them to the public would help the public determine whether trading programs lead to acceptable outcomes. Assembling and distributing those data poses a substantial technical challenge. EPA might consider assisting states in developing improved methods for gathering, interpreting, and distributing emissions and health risk data.

*Encouraging the adoption of emissions monitoring tools that provide greater certainty than existing methods, and that provoke less controversy.*

The use of quantification protocols for measuring VOC emissions leads to

uncertainty regarding the accuracy of quantified reductions. In addition, disagreement between states and EPA and within EPA's Office of Air and Radiation over appropriate quantification protocols has delayed approval of state trading programs. Developing affordable continuous emission monitors for VOCs would increase the certainty of emissions reductions and would eliminate the need for emission reduction protocols. In addition, continuous emissions monitoring might also boost public confidence in VOC trading by allowing the public to know exactly how much pollution each facility emits. If that proves technically or economically infeasible, regulators should focus trading program on more easily-measured pollutants until affordable continuous emissions monitors become available.

*Expanding the allowable means of credit generation and use.*

Programs experience limited use due, in part, to restrictions on eligible means of credit generation and use. Limitations on use hinder trading to a greater degree than those on generation. Most of those restrictions stem from the Clean Air Act. EPA should work with Congress to determine whether the Clean Air Act should be amended to lift restrictions that unnecessarily constrain functioning trading markets. Allowing sources to employ credits for a wider range of uses that do not adversely affect public health or compromise other Agency priorities will increase the use of trading and its success in achieving improved environmental and economic outcomes.

*Making programs more "market-like."*

EPA and Congress should consider steps to reduce the regulatory oversight associated with offset and open-market trading. That might include establishing zones within which certain trades could occur without conducting health risk screening based on baseline emissions and health risk levels. An additional opportunity for increasing the efficiency of trading would involve shifting administrative functions to the private sector. That might include utilizing state-licensed third parties to conduct health-risk screening and/or evaluate notices of intent to generate and use credits. The private sector would likely perform those functions more efficiently than state agencies. Further, rather than relying on taxpayers to finance programs that primarily benefit industry, the private entities performing administrative functions would likely shift those costs to the parties that reap the greatest benefits from trading.

Our second recommendation:

*Evaluate the costs and benefits of those programs, as well as the distribution of their costs and benefits, to determine whether alternative*

*approaches could yield better results.*

The actual and potential costs and benefits of offset and open-market trading merit further consideration. States have developed offset trading in response to Clean Air Act requirements and open-market systems in response to industry's desire for flexible compliance options. Developing, implementing, and administering those programs has required the investment of substantial state agency and EPA resources. Thus, the limited use of both offset and open-market programs and the need to achieve substantial emissions reductions in many nonattainment areas raises the question of whether those programs represent the best investments of agency resources. A comprehensive cost/benefit analysis of those programs might lead Congress, EPA, and states to consider alternative market-based environmental protection systems, such as cap-and-trade programs.

Cap-and-trade programs hold promise as a market-based environmental strategy in areas with poor air quality because they achieve desired environmental outcomes using a "carrot and stick" approach, with trading as the carrot and the two-pronged stick of an emissions cap and mandatory participation. In that way, cap-and-trade systems instill a strong regulatory driver while providing flexible compliance options. They also typically involve a known universe of sources with clear regulatory requirements. Alternatively, offset and open-market programs offer only the carrot of trading without the stick of mandatory participation and an environmental target. Environmental benefits can accrue without any trading under cap-and-trade systems, while offset and open-market programs require credit generation to occur in order to accrue an environmental benefit. Under cap-and-trade programs, sources do not have to generate credits since tradable allowances exist for every unit of emissions allocated to participating sources. Sources only have to demonstrate that they hold sufficient allowances to account for their actual emissions. That reduces transaction costs and market uncertainty.

Overall, offset and open-market programs offer sources increased flexibility in complying with emissions standards and may result in modest reductions in total emissions; however, they are unlikely to achieve significant emissions reductions. In cases where states face the challenge of achieving significant emissions reductions to meet environmental goals (e.g., in nonattainment areas), cap-and-trade programs may hold greater promise than the programs we evaluated.

**PAPER 6****CROSSCUTTING ANALYSIS OF TRADING PROGRAMS:  
CASE STUDIES IN AIR, WATER, AND WETLAND  
MITIGATION TRADING SYSTEMS**

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**EXECUTIVE SUMMARY**

From the time that EPA introduced the offset program for new sources of air emissions in 1976, numerous analyses have pointed to the potential economic and environmental benefits of trading pollution-reduction credits. The offset initiative prevented a head-on collision between environmental and economic goals. The Clean Air Act imposed a construction ban for new sources in nonattainment areas. If enforced, such a ban would impose enormous market-exclusion costs on both new and expanding companies. If ignored, new emissions could degrade environmental quality. Offsets involved a very basic trading approach. Elimination of existing emissions would provide market-entry for a facility with new emissions. A company could obtain those reductions within that plant, or obtain “credits” from another plant for its reductions.

Since that basic start, EPA has moved gradually to explore broader application of trading such credits. For the most part, however, trading has been a minor component of EPA’s approach to achieving environmental goals. But congressional adoption of the acid-rain program in the 1990 Clean Air Act Amendments brought trading to the fore once again. In fact, it proved a solution to a clash between the environment and economics, ending a 10-year standoff over acid-rain controls. Trading provided a way to meet pollution-reduction goals at a tolerable cost. Current savings estimates from using the trading approach rather than a traditional control approach during Phase I of the reductions (1995-2000) are in the range of \$225 million to \$375 million (in 1995 dollars).

EPA believes that trading could also accomplish savings in the planned multi-year Clean Water Initiative. The agency estimates those savings to be between \$658 million and \$7.5 billion. That is for total incremental costs ranging between \$5 billion to \$9.6 billion. Between 75 percent and 92 percent of the savings could be realized through point source/nonpoint source trading while the remaining savings would accrue with point source/point source trading. Four case studies conducted by Paul Faeth on the

Minnesota, Saginaw Bay and Rock Rivers estimated cost saving accruing to trading ranged between 43 to 83 percent per pound of phosphorous controlled when compared to treating point sources alone. Coupling a trading option with performance based conservation subsidies, focusing money on nonpoint source Best Management Practices, which would achieve the least expensive load reductions, and requiring the point sources and nonpoint sources to share equally the required load reductions, produces even more cost savings.

Such potential savings may not be unique. An EPA analysis suggests trading could lead to even higher potential savings under the water program. But actual progress still seems limited.

### *Scope of the Study*

Given the scope of the potential benefits from trading, why has the growth of trading been so slow? What accounts for some of the differences between the extent of trading within the air, surface water, and wetlands programs? To answer those questions, and to understand the current status of trading activities across the country, this research evaluated nine trading programs in air, water, and wetlands. The programs use a variety of designs: some designed as market systems, some that require case-by-case review and pre-approval. Furthermore, they concern different media: five water programs; three air programs; one wetland mitigation banking system; and one publicly owned sewage treatment works. Four of the cases are offset programs (three in water, one in air), three are cap-and-trade programs (two in water, one in air), one is an open trading program in air, one is a pretreatment interplant bubble program, and one is a wetlands banking program, which has characteristics of both open and offset programs.

In analyzing those varied cases, we focused on fundamental differences in design between market systems and case-by-case trades. In addition, we searched for crosscutting issues that affect the success of trading, as well as the transferability of approaches between different trading situations. Many of the differences between the cases are obvious and striking. But all the programs develop some form of credit that participants can create, buy, and sell. For communities and government agencies, trading provides an opportunity to use market leverage to promote environmental improvement, while avoiding serious adverse impacts to local or regional economies. For participants, the programs provide potential economic benefits—in the vast majority of cases through reduced costs, but sometimes in the form of profit. What makes trading programs effective? We found both common elements and idiosyncratic factors.

### *Conclusions*

The case studies confirm that cost savings can be achieved through trading. The Wayland/Sudbury (Massachusetts) point source/nonpoint source trade, for example, resulted in up-front savings of approximately \$940,000—based on a comparison of the trade with the non-trading alternative. With the Rahr Malting point source/nonpoint source trade, savings are estimated at \$300,000 annually for 30 years, enabling Rahr to

become more competitive. The New Jersey Open Market Emission Trade (NJOMET) resulted in two bakers, whose plants emit volatile organic compounds (VOCs), saving an average of \$150,000 per year.

Findings from those case studies also highlight barriers, complications and drivers at work in the different trading systems. The most important findings from this research are:

- Active markets for trading environmental credits have demonstrated the potential to provide both environmental and economic benefits. Cap-and-trade programs provide the greatest certainty of outcomes in such markets.
- Open-market trading programs provide an opportunity for active trading with significant environmental or economic benefits, but generating activity requires strong regulatory or economic pressures.
- Formal rules and guidance and informal signals from government agencies both play critical roles in fostering or inhibiting trading.
- The prohibition on use of credits to meet technology standards under both air and water programs limits the potential economic benefits of trading.
- Clear monitoring, measuring, and auditing have been key design features of the most effective programs.
- Avoiding toxic hotspots is critical, but flexibility to allow small areas with increased pollution may in some cases allow the use of trading to achieve major environmental benefits.

### *Recommendations*

Current emission reduction, discharge reduction, and wetland mitigation credit programs demonstrate the potential for both economic and environmental benefits. At the same time, it is obvious that the successes are still scattered. What changes would be most important to facilitate more growth of environmentally sound trading programs? While the analysis of drivers and barriers suggests numerous specific changes, the following recommendations suggest those steps—both program-specific and general—that would seem to be most important to the growth of trading in the future.

- Congress should amend the Clean Water Act to encourage market-based approaches for existing nonpoint source discharges through use of cap-and-trade and open-market systems, and to reduce the water quality impacts of agricultural nonpoint source pollution.

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- In the interim, EPA should support state development of cap-and-trade and open-market trading programs to encourage early reductions of existing nonpoint source pollution.
  - EPA should allow market-based trading under TMDLs once they are in place.
  - To facilitate water trading, EPA and the states should identify and use enforcement mechanisms that do not require case-by-case pre-approval.
  - Congress should modify the Clean Air Act and the Clean Water Act to eliminate barriers to using credits from trades to meet technology-based standards under circumstances that ensure environmental progress. EPA should allow opportunities for using credits to meet such standards to the maximum extent allowable.
  - The EPA and states should develop additional safeguards to protect against temporal shifts in pollutants in open-market systems.

**PAPER 7****THE WATERSHED APPROACH:  
AN EMPIRICAL ASSESSMENT OF INNOVATION  
IN ENVIRONMENTAL MANAGEMENT**

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**EXECUTIVE SUMMARY**

Based on an analysis of six collaborative watershed initiatives in three diverse states, we show that these environmental management approaches can result in demonstrable environmental progress as well as other accomplishments. We stress that at this stage in the development of the new approaches, reliance on environmental outcomes as the principal measure of success is inadequate; intermediate environmental results, institutional outputs and other achievements must be considered in assessing progress.

Although these collaborative watershed approaches involve partnerships between “grassroots” nongovernmental partners and federal, state and local governmental agencies, watershed partnerships rely heavily on governmental financing. Congress and EPA should increase funding and support for the new approaches to fully assess their long-term potential.

Among our principal findings:

- local citizens, community leaders and interest groups play pivotal roles in starting most watershed partnerships, but the partnerships rely heavily on the active involvement of governmental environmental and natural resource agencies at all stages;
- project-specific funding has been easier to obtain than unrestricted funding for organizational development activities and staff essential for sustaining those partnerships;
- for agencies to be effective partners in watershed initiatives, they must have a sustained presence in the watershed;
- in our cases, state point-source permitting programs are not well connected to collaborative watershed initiatives;
- our cases show examples of successfully linking local governmental land use planning authority to watershed partnership plans and activities;

- some major innovations in watershed management can be achieved at the state and sub-state levels.

Beyond increased organizational development and maintenance funding for watershed initiatives, our main recommendations include:

- EPA and states should improve linkages between state water-quality management regulatory programs and the concerns, planning activities, and programs of watershed partnerships;
- states should more effectively link local land use planning, growth management, and regulation to watershed initiatives;
- in any reauthorization of the Clean Water Act, or related legislation, Congress should include a title fostering the development of collaborative watershed initiatives; and
- Congress should sustain and strengthen agency programs which provide technical and capacity-building assistance to watershed partnerships.

**PAPER 8**

**ENVIRONMENTAL GOVERNANCE IN WATERSHEDS:  
THE IMPORTANCE OF COLLABORATION TO  
INSTITUTIONAL PERFORMANCE**

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*Editor's Note: The full text of this report and its associated case studies will soon be available on the Academy's website: [www.napawash.org](http://www.napawash.org).*

## PAPER 9

# THE NAVESINK WATERSHED MANAGEMENT EFFORT

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### EXECUTIVE SUMMARY

New Jersey's Navesink Watershed Management Project began in 1981 with a question posed by New Jersey Department of Environmental Protection (NJDEP) and Environmental Protection Agency (EPA): Can waters degraded through nonpoint pollution be improved? Federal, state, county, and municipal agencies; environmental groups; and civic organizations participated in a three-pronged strategy of reducing coliform bacteria from agricultural runoff, urban/suburban runoff, and boats.

More than 15 years later, shellfish beds in one formerly contaminated section of the Navesink River were opened to seasonal, unrestricted harvesting for the first time since the 1960s. Yet even in that small, 95-square-mile estuary, proving the relationship between watershed management and improvements in water quality is difficult. Most of those involved in the watershed management effort point to the reversal of many years of declining water quality as proof of cause and effect. However, more follow-up is needed to better understand the status of water quality in the Navesink, trends over time, and the relationship to watershed management. Gaining a perspective on costs and benefits is difficult, notwithstanding one analysis that suggested a benefit-cost ratio of 3:1. However, as discussed in the report, the estimate does not include a variety of both costs and benefits.

The three-pronged management strategy that was implemented included the following:

- **reducing agricultural runoff.** The Navesink watershed covers a significant portion of Monmouth County, which has more horses than any county in Kentucky. Each equine generates 24 pounds of manure a day, totaling 112,000 tons of manure a year, according to a 1986 estimate. A variety of federal, state, and county agricultural agencies participated in the effort to reduce agricultural runoff with the United States Department of Agriculture (USDA) Soil Conservation Service (now NRCS) providing technical assistance and \$1.2 million in cost-share funds to landowners for implementing water quality improvement practices. In addition, Monmouth Park Racetrack officials met with state agencies, the Monmouth County Health Department, environmental groups, and others to develop and implement a plan to reduce manure runoff from the track.

- **control of urban/suburban runoff.** County and local health agencies, working closely with and funded by NJDEP, identified sources of pollution through water testing and field surveys. The state's role in land use planning is limited by New Jersey's system of home rule, which gives municipalities control over development, and development pressures are not mentioned in the 1986 watershed management plan. However, NJDEP does have permitting functions that impact on development, such as approving large coastal projects and providing stream encroachment permits. In addition, the Monmouth County Planning Board has been coordinating efforts to explore the impact of development and changes in land cover on water quality and quantity. Local health departments also enforced ordinances governing the disposal of waste from thousands of dogs in the area, each generating 0.5 pounds of waste per day.
- **boating/marina pollution control.** The impact of waste from boaters and marinas is not easily quantified. However, in the Navesink several organizations have taken a lead in determining the extent of recreational boating, the infrastructure needed to reduce related sewage, and the need for education to change behavior of boaters and marina operators. NJDEP, for example, requires permits for building and for expansion of marinas. In addition, New Jersey Sea Grant conducted research to determine the number of pumpout stations needed to upgrade the water. Other organizations have determined the extent of recreational boating, the infrastructure needed to reduce related sewage, and the need for education to change behavior of boaters and marina operators. Still others have successfully advocated statutory changes, planning, and other measures to deal with boating-related pollution.

This report analyzes the impacts of watershed management in the Navesink on water quality, and provides suggestions for improving data collection to further such efforts. We then follow with a description of activities in the Navesink, with supporting information from other watershed management efforts in New Jersey. The report then discusses the findings from the case, and their potential implications for watershed management before concluding with a listing of recommendations that pertain to NJDEP and EPA. We end with a summary of the Navesink's relevance to the criteria of the National Academy of Public Administration.

#### *SUMMARY RECOMMENDATIONS*

It is important to state that some of the following recommendations may have already been implemented.

1. *Flexibility of local partnerships:* Building on local needs, civic capacity, and networks may be as important as formal organizational structure.
2. *Greater data coordination:* Improved collaboration in the collection, analysis, and interpretation of data would greatly enhance planning and implementation of watershed management.

3. *Dealing with land use*: Land-use decisions can have profound effects on water quality and quantity. To reduce uses of land that will adversely affect water quality or quantity, watershed management efforts should monitor not only indicators of health such as coliform, but key environmental indicators, such as land use and land cover as well.
4. *Agricultural agencies*: Environmental agencies are viewed with sufficient skepticism by the agricultural community that extensive involvement and funding support of agricultural agencies and organizations is critical. Without matching funds, for example, farmers may not be able to afford to make costly environmental improvements.
5. *Internal dynamics of lead agency*: Senior managers need to acknowledge the barrier of delay in permitting, analyze impediments, and coordinate resolutions that neither compromise existing regulatory processes nor restrict innovation.
6. *Motivation for watershed management*: Based on concerns expressed about total maximum daily loads (TMDLs), local watershed management efforts will need sufficient flexibility so that TMDLs function as a motivator for watershed management rather than as an impediment to progress.
7. *Planning and “Action Now”*: Agencies need to fund and support some activities during the development of plans, otherwise watershed efforts can flounder from lack of momentum.
8. *Outreach and education*: Evaluation and feedback on effectiveness would improve those activities.
9. *Cost-effectiveness and funding*: Federal and state agencies might consider expanding mechanisms to ease applying for—and agency processing of—small grants.

#### ANALYSIS OF FINDINGS

We propose that some watersheds may be better candidates for watershed management than others. The extent of success of watershed management may depend on the intersection of three sets of variables: scientific feasibility, social feasibility, and motivation for watershed management.

Scientific feasibility is tied to variables concerning the nature of environmental problems, the tools to track them, and the scientific processes necessary for progress. Social feasibility may depend on local capacity, diverse leadership, and ability of key organizations and individuals to cooperate. Motivation for watershed management may depend not only on carrots (e.g., funding, interest in improving quality of life) and sticks (e.g., regulatory enforcement, restriction of funding), but also on aids (e.g., iterative

process, statutes, and peer pressure), understanding (e.g., effective outreach), and evaluation (e.g., feedback on education).

We propose that the model has a variety of implications, including: the greater the intersection of the sets (scientific feasibility, social feasibility, and motivation), the greater the likelihood of success of watershed management; and that government agencies (and others) can affect variables within the sets and the extent of the intersection of the sets, and thereby affect watershed management.

We suspect that the potential for short and long-term gains will vary tremendously by watershed. The worst-case scenario would be to impose an inflexible template for innovation. Doing so could drown watershed management efforts in a river of bureaucracy.

**PAPER 10****LESSONS FROM LARGE WATERSHED PROGRAMS:  
A COMPARISON OF THE COLORADO RIVER BASIN SALINITY CONTROL PROGRAM  
WITH THE SAN FRANCISCO BAY-DELTA (CALFED) PROGRAM,  
CENTRAL AND SOUTH FLORIDA (EVERGLADES) PROJECT,  
AND THE CHESAPEAKE BAY PROGRAM**

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**EXECUTIVE SUMMARY**

Watershed restoration and protection programs have been heralded as among the most successful innovations in environmental management. Some observers, however, believe that many watershed programs consist of a lot of talk and little or no action. It is difficult to draw generic conclusions from watershed efforts, because one of the basic values of a watershed approach is that individual programs can and should be tailored to meet the environmental, economic, political and sociological needs and conditions of the locale in question. Nonetheless, there are common attributes of watershed programs that provide important lessons for similar efforts around the country. Some of those lessons also extend beyond watershed programs, and suggest ideas for other innovations in environmental management.

This report evaluates four of the largest, basinwide watershed programs in the United States. We devoted our primary attention to the Colorado River Basin Salinity Control Program; the CRBSCP is one of the oldest continually operating watershed programs in the country. Under that program, federal and state agencies have spent more than \$700 million to implement programs to reduce inputs of dissolved solids (salts) into the Colorado River and its tributaries in the upper and lower Colorado River basins. Based on available information, there is reason to believe that the program has been successful in achieving such reductions in the river system. Moreover, because of the program's longevity, the availability of a relatively extensive, consistent and long-term database—and due to the recent introduction of an innovative, market-based approach to pollution control—several interesting and important lessons can be drawn from studying the program. It appears, for example, that a market-based open-bidding approach to nonpoint source pollution control has the potential to improve the cost effectiveness of pollution-control expenditures, and to stimulate more innovative ways to achieve environmental results. However, information gaps and uncertainties make it difficult to reach firm conclusions about the ultimate effectiveness of the salinity program in reducing ambient salinity levels in the Colorado River.

The validity of those conclusions can be tested by comparison of the CRBSCP with other

large watershed programs around the country. Evaluation of the Chesapeake Bay Program, for example, confirms the importance of long-term monitoring and assessment at both the project-implementation and overall program levels to ensure that limited available funds are spent wisely. While nutrient-reduction efforts in the Bay Program are currently selected and implemented under more-traditional approaches to cost-sharing nonpoint source programs, it is possible that those efforts might be able to use the same type of competitive-bidding process that has shown preliminary success in improving the cost effectiveness of the salinity program. By contrast, some comprehensive ecosystem-restoration efforts, such as the CALFED Program to restore California's Bay-Delta region, and the Central and Southern Florida (C&SF) Project, involve larger, more complex sets of interrelated environmental issues that might be less amenable to a simple competitive-bidding process. Those other programs, however, confirm or augment other important lessons from the salinity program. For example, the establishment of an inclusive, collaborative decisionmaking process and the establishment of measurable program performance standards during the initial phases of a program help to reduce intergovernmental tension and enhance a shared sense of program mission. All of the programs studied confirm the need for comprehensive basinwide assessments, and a rational system of project targeting and selection, coupled with long-term, well-designed monitoring and modeling efforts to ensure that program objectives are met, and that the programs can be modified as necessary to adjust to new information and changing conditions.

### Program Descriptions

#### Colorado River Basin Salinity Control Program

The CRBSCP is among the country's oldest continuously operating efforts to address nonpoint source water pollution, and to coordinate water pollution control efforts comprehensively within an entire watershed. The program is designed and implemented primarily to meet dual regulatory objectives: compliance with international treaty obligations with Mexico regarding the quality and quantity of Colorado River water at the international boundary; and attainment and maintenance of interstate water-quality criteria for salinity adopted by the basin states and approved by EPA pursuant to the federal Clean Water Act.

The salinity program involves at least six federal agencies, as well as all seven states in the Colorado River Basin. The Colorado River Basin Salinity Control Forum is an interstate organization formed in 1973 to coordinate state salinity-control efforts in the basin. The forum, comprising up to three representatives appointed by the governors of each basin state, establishes the overall information and policy framework necessary to assure compliance with the interstate water-quality standards. A related group is the Colorado River Basin Salinity Control Advisory Council, which is also composed of three representatives from each basin state. Federal agencies are not formal members of the forum, but coordinate with one another other and with the basin states through less formal but frequent consultation.

Programmatically, the salinity program can be divided into two parts based on geography, as well as on statutory history and structure. Title I of the Colorado River Basin Salinity Control Act, which consists largely of a massive, federally constructed desalination plant at Yuma, Arizona, and a series of other large, capital-intensive public works programs in the lower Colorado River basin, is designed primarily to meet Mexican treaty requirements. Title II of the act, designed to reduce salinity in the basin as a whole and to meet the interstate water-quality standards, consists of both capital improvements and changes in on-farm management practices.

The salinity program has evolved considerably over time, in several definable periods. Initial program planning and design occurred during the early and middle 1970s. The federal government first negotiated treaty requirements with Mexico. Shortly thereafter, EPA and the states worked together to develop appropriate numeric water-quality standards under the Clean Water Act, and to identify and plan initial control strategies. The second phase of the program, from roughly 1974 to 1984, consisted of much additional research, and the funding and implementation of a large program of public works projects identified by the U.S. Bureau of Reclamation (BOR) and approved by Congress on a project-specific basis, combined with only limited changes in on-farm management practices and other land-use changes. Those programs made some progress in implementing salinity-control programs. However, they were expensive and ignored other, potentially more cost-effective means of controlling salinity through changes in land and water use and management practices. They were also inflexible because they required congressional approval of every specific salinity-control program.

In 1984, Congress added more projects and funding for large irrigation-improvement projects identified by BOR. At the same time, it provided for more on-farm improvements in irrigation water delivery and management by the U.S. Department of Agriculture (USDA) on a basinwide as opposed to a project-specific basis, and directed the Bureau of Land Management (BLM) to implement a basinwide program of changes to grazing and other land-use practices on the huge areas of public lands within the Colorado River basin. Despite those changes, studies by diverse groups concluded that the system resulted in missed opportunities for more cost-effective salinity control. In 1995, the statute was amended again to provide for a basinwide salinity-control program under which BOR could invite any party, public, private or mixed, to bid for salinity-control funding. BOR and the forum have implemented that authority through an open competitive-bidding process under which the most cost-effective salinity-control projects are selected for funding on an annual basis.

The CRBSCP was selected as a principal focus of this study for several reasons. A long-term, consistently maintained database is available to track trends in salinity within the river. High-quality information is also available to track program funding, control programs and accomplishments. Moreover, the program is directed primarily at a single pollutant, making it comparatively easier to evaluate the efficacy and cost-effectiveness of control strategies than for watershed programs directed at multiple problems. Despite that singular program focus, however, the CRBSCP involves a complex set of environmental and institutional interactions that must be understood in

order to evaluate program effectiveness. Finally, the competitive-bidding process initiated in 1996 represents a significant innovation in nonpoint source pollution control. The program is directly relevant to nonpoint source pollution control on other areas that are prone to irrigation-related pollution. Some form of irrigation is used on about 15 percent of U.S. cropland (roughly 964 million acres), to produce approximately 38 percent of all crop value in the United States. A significant percentage of that irrigated land has high potential for salinity-related pollution, as well as pollution from other pollutants such as selenium, nitrogen, pesticides, and herbicides. However, several lessons from the CRBSCP have potential applicability to other watershed-based control programs as well. This study was not designed, however, to compare the existing salinity program, which is based on targeting of public dollars to implement salinity-control programs, with alternative approaches to salinity control, such as enforceable regulatory requirements on nonpoint sources of salinity.

### Chesapeake Bay Program

The Chesapeake Bay Program is governed by the Chesapeake Bay Agreement of 1983 (amended in 1987 and 1992), which sets goals for improving the water quality and viability of natural resources in the Chesapeake Bay. While the program is administered by the multi-jurisdictional Chesapeake Bay Program, with an executive council and many subcommittees, implementation occurs at the state level.

The Chesapeake Bay Program addresses multiple threats to the ecosystem's health. Many seafood species such as striped bass, rockfish and oysters, had experienced such reduced populations that commercial harvesting was restricted. Wetlands were being lost at a rate of eight acres per day. Heavy nutrient loadings, caused primarily by agricultural activities, were contributing to the decline in seafood harvests due to eutrophication and its related effects. Based on those vital signs, the Chesapeake Bay Agreement set a goal of a 40- percent reduction of nutrients entering the bay by 2000. Based on that goal, nutrient-reduction targets have been developed for the bay's tributaries, with implementation strategies to be developed by each state under its individual regulatory authority. The program has addressed other ecological damage in a similar way.

With ten years or more of experience in implementing the Chesapeake Bay Agreement, the program is moving towards meeting its goals. It is also learning, however, that ecosystem restoration is a long-term endeavor, with results that may not be realized until decades after the sources of pollution have been eliminated. That delayed-gratification phenomenon presents a great challenge to a program that relies on voluntary cooperation by its state partners and, in many cases, by private landowners in the watershed.

The Chesapeake Bay Program was chosen for comparison because it addresses pollution from a large number of non-point sources in a far-reaching basin. As in the CRBSCP, the effects of the pollution occur far downstream from the source, possibly offering an opportunity for source-reductions trading. By contrast to the CRBSCP,

however, the Chesapeake Bay Program has a more comprehensive infrastructure of policymaking and coordinating bodies, allowing a comparison of the effectiveness of different management approaches for multi-jurisdictional watershed programs. The Chesapeake Bay Program is also an excellent example of watershed-wide information management as a basis for ecosystem restoration efforts. The coordinating entity has marshaled a wide variety of resources and information to identify the scope of the environmental problems and their possible causes, to brainstorm potential solutions, and to explore approaches that can address multiple environmental concerns. That contrasts sharply with the CRBSCP, which is designed largely to address a single environmental issue. Unlike the CRBSCP, however, the Chesapeake Bay Program cannot target, implement, or fund solutions on its own. It must rely on the political will and financial resources of each of the seven affected jurisdictions, of which four participate actively in the program. The participating states have agreed to a joint restoration goal and to maintain flexibility to take actions in their jurisdiction to meet that watershed-wide goal. In part to create and maintain the political will to act, the Chesapeake Bay Program has an extensive coordination and public involvement infrastructure, with legislators of affected states integrally involved in setting policies and goals for the watershed. Citizens are an important part of the Chesapeake Bay Program as well, participating as volunteer stream monitors and as members of advisory groups and task forces. While that inclusive process is extremely time consuming, it is felt to be worthwhile and necessary to maintain forward momentum on ecosystem restoration.

#### CALFED (Bay-Delta) Program

Initiated in 1995, the CALFED Bay-Delta Program is a partnership between state and federal environmental and natural-resource agencies working together to address water-quality and water-quantity problems in California's Bay-Delta region. The Bay-Delta area provides drinking water for millions of people, and irrigation water for a large portion of the state's agricultural sector. The ecological health of the Bay-Delta area has been affected by urban and agricultural activities. Water quality has been affected by mining, inadequate wastewater treatment, and nonpoint source pollution. Water quantity and distribution have been changed by land-use patterns, as well as the construction of an extensive levee system to manage water distribution, and the large number of dams and diversions in the upstream watershed. The region contains habitat for many endangered and threatened species, including Chinook salmon.

The CALFED Program has its own staff—and borrows staff from the partnership agencies—to accomplish its management mandate. A planning process to develop alternatives for addressing the region's problems is being undertaken over a five-year period. A draft programmatic environmental impact statement (EIS) containing three alternatives was issued in 1998, and a revised programmatic EIS containing the preferred alternative was released in June 1999. During that time, the CALFED Program has also provided more than \$100 million in funding for initial ecosystem restoration projects.

The multifaceted CALFED Program restoration approach is designed to meet four primary objectives related to water quality, habitat, water quantity, and levee

maintenance and stabilization. It seeks ways to coordinate planning, regulatory and permitting processes. It provides funding for and selects projects designed to meet program goals. Its plan, and the projects it funds, include extensive ecosystem restoration, levee system integrity, point and nonpoint source water quality, local watershed management coordination, water-use efficiency, and water transfer policy. While some efforts toward meeting the program's goals have been undertaken, a large part of the implementation activity is yet to come.

CALFED was chosen for comparison for several reasons. Like the CRBSCP, the CALFED Bay-Delta Program involves the relationship between water-quality and water-quantity issues in a large geographic area in the West. Many of the legal and policy issues—large dams and reclamation projects, irrigated agriculture, water rights, public/private land conflicts—are similar. The CALFED Program also selects and funds large construction projects, making the CRBSCP targeting and bidding approach a potentially useful model. The CALFED Program represents a unique state-federal partnering approach between traditional environmental and natural-resource agencies. In an effort to avoid the recurrent disagreements about the “correct” solution that preceded the CALFED partnership approach, the program's planning and decisionmaking are very inclusive, and involve extensive public and stakeholder participation.

The CALFED Program also highlights the relative complexities of a restoration effort focused on multiple potential contaminants or causes, by contrast to a program focused primarily on one pollutant (in the case of CRBSCP, salinity). Like the CRBSCP, the CALFED Program is working toward meeting agreed-upon water-quality standards that have provided a catalyst for coordinated action. Unlike the CRBSCP, however, meeting a water-quality standard is not the only goal of the restoration effort. It is only one component of a watershed-wide strategy to restore the environmental and biological health of the Bay-Delta estuary.

To meet that wide-reaching goal, the CALFED program has established an elaborate project-selection process, which uses cost as one of seven evaluative criteria. The program is in the process of reviewing that process, and might benefit from reviewing the simplicity and focus of the CRBSCP approach. The CALFED federal-state partnership has created a comprehensive multi-issue approach to watershed issues. The program includes an extensive review of the scope of a problem and its potential causes, careful analysis of alternative solutions, and future targeting of restoration projects that address all components of the estuary's health. Unlike the CRBSCP, the CALFED Program has developed an extensive public process that includes all major stakeholders in policy development. Undoubtedly, that grows out of the region's contentious history of water-quality protection. While time-consuming, the process appears to be effective in creating and maintaining universal support for the CALFED program's suggested solutions. Because the program is only several years old, it is too early to determine whether it promotes effective solutions.

Central and Southern Florida Project

Known formally as the Central and Southern Florida Flood Control and Other Purposes Project (C&SF Project), South Florida's 50-year-old water-management system was recently reviewed. The goal of the review was to present a comprehensive plan to Congress, by July 1, 1999, which outlines a 20-year plan to facilitate the restoration of the Everglades/South Florida ecosystem. The study and comprehensive planning project were led by the U.S. Army Corps of Engineers (the Corps) and the South Florida Water Management District. The planning process, however, included more than 30 other federal, state, local and tribal agencies, as well as academic institutions. Those entities also have extensive responsibilities in implementing the comprehensive plan once it is approved by Congress.

The water-management system in southern Florida was designed for flood protection as well as projected human and agricultural water-consumption needs. Based on a three-fold increase in population over projections, increased knowledge about ecosystems, and the obvious detrimental effects of the current system on the ecology of southern Florida, including the Everglades, the water-management system is being altered drastically. Ecosystem-wide problems are reflected in reduced bird populations (for some species, as much as 90 to 95 percent reduction), increased numbers of threatened or endangered species, health advisories for mercury contamination, declining fish populations, excess nutrients, water shortages, and salt water intrusion. The restudy and comprehensive plan focused on re-creating the natural water cycle of the ecosystem by undoing or changing engineered water-flow systems and reducing sources of contamination.

The four stated goals of the comprehensive plan—quantity, quality, timing, and distribution—are addressed through a combination of more than 60 discrete projects. New surfacewater storage reservoirs will be built with the capacity to store 1.5 million acre-feet of water. Additional water will be stored underground in groundwater aquifers for retrieval as needed. Stormwater is to be treated in 35,600 acres of future man-made wetlands. Two wastewater-treatment plants are proposed for Miami-Dade County; the treated wastewater is planned to be clean enough to discharge into wetlands along Biscayne Bay and used for recharging the Biscayne aquifer. Seepage-management tools, such as lining levees, will be implemented. Unlike the CRBSCP, in which conserved water often is available for other human uses, water that is no longer lost to seepage in South Florida will be redirected to water-conservation areas, and to natural areas such as the Everglades National Park. More than 240 miles of existing canals and levees will be removed to facilitate the historical sheet-flow movement of water through the ecosystem. Finally, operational changes in water delivery schedules have been designed to restore natural fluctuations in water quantity (to mimic natural rainfall patterns) that will benefit plant and animal health while still meeting the needs of human and agricultural uses. The comprehensive plan also recommends that a comprehensive, integrated water-quality plan be developed to address treatment options other than water storage in wetlands.

The \$7.8 billion estimated cost of implementing the comprehensive plan over the next 20 years will be shared equally between the federal and state governments, with a

projected annual cost of \$400 million. The federal government requested an initial \$1.2 billion for specific projects. It also is seeking programmatic authority to adopt certain projects that have not yet been designed, but for which the need is known. Some feasibility studies and operational changes can be initiated under existing authority and without funding requests. The state can also implement some components of the plan without requesting additional authority or funding.

Many of the initial projects included in the funding request are pilots designed to explore the uncertainties in, and to develop technologies for, aquifer storage and recovery, seepage management, and wastewater treatment. Based on the lessons learned and restoration goals accomplished from projects built with the initial funding, the comprehensive plan will be reevaluated periodically, and project plans will be adjusted, before additional funding is requested from Congress.

Like the CRBSCP and CALFED efforts, the C&SF Project faces the challenge of managing water quantity while improving water quality. The sources of reduced water-quality, while not fully known, include nonpoint sources that discharge far upstream from the area of ecological impact, and that offer a potential opportunity for source-control tradeoffs. In addition, the restoration effort in south Florida involves the coordination of large construction projects by one federal agency, creating the potential for a successful project targeting and bidding process. Finally, the governmental infrastructure for the C&SF Project bears enough similarity to the CRBSCP to warrant a comparison of public participation approaches for including all affected stakeholders in a decisionmaking process.

Despite many apparent similarities between the two programs, the C&SF Project has followed a very different path from that of the CRBSCP, and the success and cost-effectiveness of the C&SF approach cannot yet be judged. The state has not yet adopted the appropriate water-quality criteria for phosphorus, leaving it an open question whether currently planned actions to address phosphorus contamination will be adequate. The federal agency with primary implementation responsibility under the C&SF Project (the U.S. Army Corps of Engineers) intends to follow its traditional contractor-based construction model and eminent domain powers. The CRBSCP's market-based approach to soliciting project ideas, designs and construction, might provide a useful alternative to that process. Coordination of all efforts affecting water quality and water quantity in southern Florida has not yet become fully effective. Like the other two comparison watersheds, the C&SF Project has found early inclusion of all stakeholders in planning and policy setting to be a wise approach to build political and popular support for the ambitious Everglades restoration effort.

### **Program Analysis**

There is no single way to implement watershed restoration and protection programs. In fact, one of the touchstones of watershed programs and other place-based

environmental initiatives is the flexibility to address local or regional problems in ways that best suit the needs of those places, while still ensuring minimum environmental protections and compliance with baseline environmental standards. However, a standard but flexible model for watershed protection involves the following components: establishment of a consensus decisionmaking process that takes advantage of incentives for cooperation and respects and takes advantage of different roles for a variety of participants; development of comprehensive, watershed-based resource inventories that identify the full range of problems and sources that contribute to those problems; establishment of appropriate, measurable performance goals and standards to guide the program; adequate and stable funding and strategic targeting of solutions; and ongoing monitoring, assessment and adaptive management.

The four basinwide programs studied exhibited a number of common attributes of watershed programs within those five program areas, which provide important lessons for similar efforts around the country. Some of the lessons extend beyond watershed programs, and suggest ideas for other innovations in environmental management.

#### Process, Incentives, and Roles

Basinwide programs often include a geographic scope on the range of hundreds of thousands of acres and a large diversity of landscapes and both terrestrial and aquatic habitats. Such programs also usually involve or affect several layers of government, multiple agencies within each level of government, transboundary issues and impacts, and an even wider range of interested or affected private parties than do smaller watershed efforts. Basinwide efforts must recognize a number of different and usually related environmental issues, whether they are addressed by a single, comprehensive program or through different processes.

A decisionmaking process in which all of the agencies involved in the program at all levels of government meet regularly and participate on an equal basis facilitates intergovernmental communication and coordination, and can minimize intergovernmental tension. Participation by more players at multiple levels makes it more difficult to reach consensus on difficult issues. However, while difficult and time consuming, the process can be well worth the effort because it promotes a common sense of mission, parties who are mutually vested in the results, and enhanced political will to fund and support program implementation. In some cases, it can generate consensus decisions among program participants, although the possibility for consensus is only one of the benefits of collaborative decisionmaking.

Participants can minimize or resolve some of the inevitable intergovernmental differences inherent in watershed processes by searching for common interests and by taking advantage of the proper incentives for cooperation. In some cases, that involves a mutual environmental, economic or other interest in watershed restoration and protection. Other possible incentives include the ability to attract funding from outside sources (such as Congress), improved or expedited cooperation by upstream sources of pollution, or incidental economic or other benefits to program participants. EPA and other federal

agencies should recognize that it may be strategically more important to provide funding for interstate watershed programs in which upstream states are asked to control pollution that causes harm mostly or entirely in downstream states. Incentives to cooperate also may derive from enforceable legal requirements, for example, to adopt water-quality standards and related implementation tools [such as total maximum daily loads (TMDLs) under the Clean Water Act], or to impose growth limitations that will apply if watershed problems are not solved.

The appropriate roles for EPA, other federal agencies, and state and private entities will vary depending on the issues involved in a watershed program, and can legitimately change as that program matures. For example, EPA might play a strong initial role as a program catalyst, but then withdraw to serve as an oversight agency in order to allow implementing agencies to develop flexible and innovative solutions. In other cases, a more direct and active continuing role might be appropriate. Equal participation in the decisionmaking process does not mean that all agencies play the same role in program planning and implementation.

Aggressive public outreach and participation can benefit watershed programs in a number of important ways. They can help to promote outside cooperation, enhance program funding, encourage volunteer participation, identify important sources of information, and minimize the likelihood of litigation or other forms of legal, political or public opposition to a program. The appropriate nature and amount of public outreach and participation legitimately can vary according to program complexity, maturity, and the nature of issues involved and the accompanying degree of public interest. In general, however, it is important to identify and to include in some meaningful way all key stakeholders in the issues being addressed.

#### Basinwide Resource Assessment

Watershed programs benefit from comprehensive and ongoing efforts to monitor, assess and evaluate the relevant environmental resources and problems from a basinwide perspective. In some cases, the purpose of the process is to identify the full range of environmental problems that affect watershed health, and to identify a comprehensive set of restoration strategies in an integrated way. Other programs are guided by a narrower focus. In that regard, program planners must consider and resolve a key set of tradeoffs. Programs that are limited to a single issue—or to a small set of issues—can be quite focused, thus improving the chances that those problems will be solved in a satisfactory way. However, narrowly targeted efforts may miss important opportunities for cross-issue efficiencies. All of the programs studied, however, have taken advantage of opportunities to integrate issues that are often separated, such as water quantity and quality, land use and aquatic resource restoration and protection, and chemical pollution and habitat restoration and protection. One of the most important advantages of the watershed approach is the opportunity to address environmental issues in an integrated rather than an artificially fragmented way.

## Development of Goals and Standards

One of the most important functions of watershed programs is to develop and achieve consensus on a set of measurable performance goals and standards that can be used to drive the rest of the effort. Clear standards enable program officials to identify sources of pollution and other conditions that contribute to the problem, develop solutions that are best tailored to redressing those sources and conditions, target and implement the most efficient and cost-effective of those solutions, and monitor and assess progress toward achieving long-term program goals. To be most effective, program standards should be as precise as possible. Wherever possible, standards should include enforceable, numeric criteria in addition to narrative goals.

It may not always be possible or appropriate to establish uniform performance-standards throughout a large watershed, especially where ecological and other conditions vary. Especially where pollution operates on a basinwide rather than a localized scale, however, it is extremely desirable to establish uniform standards that apply throughout the basin. The very process of establishing consensus goals and standards underscores the common sense of mission within a watershed program, especially one that involves multiple agencies and jurisdictions.

The nature of the standards used for watershed and other comprehensive environmental restoration programs necessarily will vary according to the problems to be addressed. Watershed programs all should include approved water-quality standards. Programs designed to address a broader range of issues, however, such as restoring endangered species, should augment traditional water-quality standards with other types of measurable performance standards. Watershed programs and consensus decisionmaking provide the opportunity to develop innovative forms of water-quality standards, as well as other standards that are better tailored to meet local or regional ecological and technical problems.

## Funding and Targeting Solutions

Development and implementation of sound watershed restoration and protection programs can be quite expensive. Program officials can help to justify heavy program costs by studying and educating both the public and key decisionmakers, especially elected officials, about the economic as well as environmental benefits that successful program implementation will promote. Prospects for funding also improve when cost-sharing programs are established to show that program costs are being shared fairly among public and private sources, and across all responsible levels of government. It is also important for program officials to quantify, using the best possible methodology, the necessary and appropriate costs of restoration and control efforts. Funders will not respond favorably to requests for more money if they are not convinced that the money is

really needed, and that the funds are being spent in the most cost-effective manner possible.

Experience shows that funding stability is as important as absolute funding levels. Watershed programs must be planned and implemented over long time scales, from the initial program planning to the implementation and long-range monitoring phases. It is extremely difficult to manage those programs when funding levels are determined through annual appropriations reviews, and when funding is increased and lowered in an unpredictable way. Congress should consider establishing longer-term funding arrangements for watershed and other environmental programs that must be designed and implemented over long periods of time. One innovative way to accomplish that task is to establish dedicated funding sources that are tied in some logical way to the problems to be solved.

No watershed programs, however, have unlimited funding. Therefore, it is equally important to ensure that available funds are spent in the most cost-effective manner. Specific targeting methods will vary depending on the nature and complexity of problems to be addressed. Single-issue programs can develop relatively focused methods of choosing the most effective control projects. Programs with multiple issues might focus more intensively on identifying control projects that can serve multiple purposes. Ultimately, that approach might be more cost effective in the long run than efforts to address multiple problems through separate programs.

The basinwide competitive bidding program piloted by the CRBSCP is a potentially promising way to improve the cost effectiveness of nonpoint source pollution-control programs, and possibly other ecosystem restoration efforts as well. Under that process, any combination of public and private entities is asked to propose projects to control salinity anywhere in the basin. Projects are selected based on a combination of cost effectiveness and project risk (likelihood of success). Over the first four years of the new program, salinity-control costs per unit of estimated salt-reduction have been cut roughly in half. The basinwide process assumes that reductions in pollution load are fungible throughout the basin, an assumption that has not yet been proven. However, similar assumptions might be valid for other watershed efforts, such as nutrient reduction in the Chesapeake Bay and in the Everglades, as well as water-conservation programs in the Everglades and the Bay Delta.

All watershed programs struggle with various institutional barriers to innovation, although the nature and impact of those barriers varies depending on the nature of the issues and solutions, and depending on political and sociological differences among regions. For example, water saved through new water-management systems in the Everglades is being redirected to restore ecologically important flow-levels downstream of the control projects. Such efforts face more resistance in the CRBSCP, however, because “saved” water may legally have to be reallocated to the next-most senior-holder of water rights under the prior appropriation doctrine of western water law. Similarly, efforts to reduce environmental impacts of agriculture by fallowing lands with marginal economic value and high economic costs present greater economic and sociological side

effects, and therefore more political resistance, in smaller western communities than in areas in which the lands to be retired constitute a much smaller percentage of the overall production base. Successful watershed programs should attempt to overcome those barriers through open stakeholder participation in program development and implementation, if possible by developing consensus approaches among various stakeholders.

### Monitoring, Assessment, and Adaptive Management

Monitoring and assessment sometimes become marginalized in watershed and other comprehensive ecosystem-restoration programs. It is natural to maximize the percentage of program dollars devoted to actual restoration and pollution control efforts. But that tendency may leave monitoring and assessment components of the program badly under-funded. Sound long-term monitoring and assessment serves several key program functions. It provides critical accountability to program funding sources and to the general public by giving some assurance that public and private dollars are being used effectively. It enables program officials to determine whether progress toward long-term goals is actually being made. It allows officials to distinguish between successful and unsuccessful strategies, or to assess which strategies are appropriate under which circumstances. It allows officials to fine-tune control efforts or even to change directions dramatically, through a process of adaptive management, depending on monitoring and assessment results. All of those benefits, of course, assume that monitoring and assessment efforts are sound, consistent, and used properly.

One of the biggest challenges facing watershed programs is the difficulty in monitoring and documenting program success. Even for comparatively “simple” issues such as reducing a single pollutant, program assessment is plagued by a number of uncertainties and unpredictable environmental variables. That problem is even more difficult in multi-issue programs such as the Chesapeake Bay, Bay Delta and Everglades. All of the programs studied face serious questions about the adequacy and reliability of databases, the degree to which computer models properly reproduce ambient data and predict future results and conditions, and the ability to determine whether individual projects contribute to improved conditions. Even more fundamentally, existing watershed programs have relatively little information on individual-project implementation, long-term operation and maintenance, and efficacy.

All of those problems suggest that more funding should be provided and more attention should be paid to monitoring and assessment efforts in all phases of watershed programs. Scientific monitoring must address both overall program success, that is, whether combined program efforts contribute to long-term environmental improvement, and to more focused efforts to determine the efficacy of individual types of control projects. That information can be used to modify programs as appropriate.

Moreover, given that many of the control projects in large-scale watershed programs involve private landowners, it is important to ensure that underlying assumptions about control project implementation and maintenance are correct. At least

two possible strategies to accomplish that goal emerged from the programs studied. First, landowner participation in critical programs, especially in cost-sharing or other voluntary efforts, can be increased by identifying and educating landowners about important incidental benefits of program participation. Those benefits will vary greatly, but might range from immediate health benefits to the landowner and his or her family, to secondary economic benefits such as reduced production-costs or increased yields. In designing voluntary programs in particular, therefore, it is desirable for managers to ask: “What’s in it for the landowner?” Second, efforts to monitor ongoing operation and maintenance of nonpoint source controls have historically been minimal due to limitations in personnel and funding. If long-term program success depends on those factors, however, long-term project monitoring is equally essential. Some experts suggest that should be accomplished by increasing the frequency and scope, but reducing the intensity, of field monitoring so that more operations are inspected on an annual basis.

## Recommendations

### *Process, Incentives, and Roles*

1. Congress should provide additional funding to support interstate cooperation in impaired watersheds that cross state boundaries. Congress should give the highest priority to support for interstate control efforts where pollution generated in upstream states causes impacts in downstream jurisdictions. (States are more likely to devote their own resources to solve pollution problems that have largely or entirely in-state impacts.) Congress should also tie limited available funding to programs that demonstrate the political will to implement effective solutions, as evidenced by such factors as willingness to share program costs fairly.
2. Congress should require or encourage consultation between all federal agencies whose actions and authorities relate to common problems within a watershed. Congress should direct agencies to evaluate opportunities to coordinate their actions in ways that eliminate overlaps and that enhance the effectiveness and cost-effectiveness of their collective actions.
3. To the extent that EPA has discretion to allocate grant funds, it should give the highest priority, where consistent with applicable statutory criteria, to support for interstate control efforts where pollution generated in upstream states causes impacts in downstream jurisdictions.
4. EPA should promote intergovernmental processes in which all levels of government work together to develop consensus goals and implementation strategies. EPA should encourage processes that include all affected decisionmakers, at all levels of government, wherever possible. However, EPA should not insist on direct collaboration where states or other entities believe it would be cumbersome or counterproductive to do so. EPA should serve as a clearinghouse for information on various mechanisms for intergovernmental watershed coordination and cooperation, so that different regions can learn from the experience of other efforts.

5. EPA should encourage intergovernmental watershed programs to develop procedures to involve all interested stakeholders to the maximum extent possible, at phases of the process in which initial decisions or major changes are being made, and periodically thereafter to gauge ongoing public interest. Extensive public participation may be less important during ongoing program implementation phases, or where public interest is demonstrably low.
6. Where necessary to promote needed intergovernmental cooperation within watersheds that cross state and international boundaries, EPA should enforce applicable legal requirements (such as requirements to adopt water-quality standards and to develop TMDLs) in order to catalyze intergovernmental action. As discussed further below (under “Development of Goals and Standards”), EPA should promulgate revisions to its water-quality standards and TMDL regulations to further that goal. EPA has adequate legal authority, where necessary, to require the adoption and implementation of interstate water-quality standards and TMDLs where necessary to address cross-boundary pollution problems. EPA can tailor its ongoing role in such processes as appropriate as programs mature. In some cases, EPA should withdraw to an oversight role in order to encourage state and interstate innovation in designing and implementing solutions. In other cases, more active continued participation by EPA may be desirable. EPA’s role in promoting watershed programs should include, in addition to necessary regulation and enforcement, information-collection and dissemination; training in facilitation, conflict resolution and other procedural skills; and technical assistance.

#### *Basinwide Resource Assessment*

1. Congress should provide funding to federal and state agencies and others for efforts to study environmental problems within watersheds on a comprehensive, ecosystem basis. However, funding should be tied to efforts to conduct coordinated rather than isolated research, and to research designed to identify and evaluate effective and cost-effective solutions to the problems identified. Congress should reward programs that address multiple issues. Appropriate rewards might include additional funding and flexibility.
2. As part of its revised TMDL regulations, EPA should require states and intergovernmental entities to identify, as part of the TMDL process, the most strategic opportunities for cost-effective pollution control within each watershed, so that available restoration efforts can be targeted in the most cost-effective manner possible. In order for that search for cost-effective solutions to be most effective, solutions sought through the TMDL process must include the full range of potential solutions, including nonpoint as well as point sources, habitat restoration as well as pollutant releases, and strategies to address hydrological and physical as well as chemical impacts.

3. Consistent with valid state regulation of water resources, Congress and EPA should find ways to promote, through watershed restoration and protection programs, efforts to integrate water quality and water quantity objectives. Congress and federal agencies should direct available federal funding dedicated to water conservation to projects that will both promote more efficient water use and help to solve water pollution or habitat problems. However, Congress should consider legislation requiring that, when federal dollars are used to promote water use efficiency, at least some of the water must be used to restore depleted instream flows.

#### *Development of Goals and Standards*

1. EPA should enforce fully the requirements in the CWA that states adopt water-quality standards and other performance standards necessary to establish clear performance goals for impaired water bodies. EPA should disapprove state water-quality standards that lack specific, numeric requirements, unless such specificity is not technically feasible or scientifically defensible in particular circumstances.
2. EPA should require states to work together to develop and adopt consistent, basinwide water-quality standards, especially for interstate watersheds in which transboundary pollution problems occur. That does not necessarily mean that water-quality standards must be identical throughout the basin in cases where ecological diversity within the basin suggests that different standards are appropriate in different parts of the watershed. However, the water-quality standards should be developed jointly, using common and coordinated approaches. Where states fail to adopt needed interstate water-quality standards, EPA should disapprove the relevant intrastate standards, and promulgate such interstate standards using its authority under CWA section 303.
3. EPA should consider approving “nontraditional” forms of water-quality standards, such as flow-weighted standards that focus on basinwide pollutant loadings rather than instantaneous concentrations, but only under carefully-prescribed conditions. In particular, load-based rather than concentration-based standards might be appropriate where the pollutant in question does not have any localized (as opposed to basinwide) adverse effects, and where they are useful in promoting a basinwide strategy to reduce overall loadings of that pollutant.
4. EPA should adopt, implement and enforce revised TMDL regulations that require states, for all waters in which technology-based point source controls have not or will not result in attainment of water-quality standards, to: identify the aggregate pollution reductions necessary to assure such attainment; identify all remaining sources of the pollution in question; and allocate the necessary pollution reductions among those sources. EPA should develop and adopt TMDLs in all watersheds in which states fail to do so in accordance with a reasonable regulatory schedule. TMDLs can accommodate source trading and other ways to increase the cost-effectiveness of

pollution controls, using the established TMDL obligations as the appropriate baseline.

5. Congress should enact additional legislation, or amend the CWA or other existing laws, to require the establishment of clear performance goals for environmental problems within watersheds that fall outside of the purview of water-quality standards as currently interpreted by the courts (or in the event of future judicial definition of the limits of the water-quality standards program). Such legislation could expand the range of issues addressed by water-quality standards. Alternatively, it could require state or federal agencies to adopt watershed-specific environmental criteria under other programs (such as the Endangered Species Act), or condition federal funding of collaborative watershed programs on the adoption of such standards.

#### *Funding and Targeting Solutions*

1. Where Congress decides that federal funding is appropriate for watershed programs, it should authorize and appropriate funds on a long-term, rather than annual, basis. Congress should ask recipient agencies to submit budgets based on long-range monitoring, assessment, evaluation and implementation programs, and should then assure long-term, stable federal funding. Annual appropriations, however, can be made contingent on state and other cost-sharing partners meeting appropriate funding matches.
2. Congress should consider establishing more sources of dedicated program funding similar to that used in the CRBSCP, in which revenues derived from a surcharge on federal hydropower sales in the basin are devoted automatically to the salinity program. Such dedicated funding sources will be more acceptable politically where there is some reasonable relationship between the funding source (such as water or fertilizer use) and the resulting environmental problem (such as irrigation-induced pollution or nutrient enrichment due to excess fertilizer application). Possible funding sources include user charges for water, flood control, or recreation.
3. EPA should provide technical assistance and conduct its own studies designed to quantify, to the maximum extent possible, the economic and other harm caused by watershed impairment. Where harm cannot be quantified precisely, or monetized, EPA and watershed program studies should seek valid qualitative assessments of harm. EPA should disseminate the results of such studies in appropriate ways to key decisionmakers and the public.
4. Congress (and EPA) should eliminate any statutory or regulatory barriers to the selection and implementation of the most appropriate pollution control projects on a basinwide basis. For example, Congress should authorize funds for basinwide control efforts, and delegate authority to the appropriate agencies to select the most appropriate projects, rather than insisting on project-specific congressional approval. EPA and other federal and state agencies should replace intrastate decision processes (such as funds that can be allocated only within a single state or other artificially-

defined geographic region, or decisions made solely within state offices) with processes in which funds can be allocated, and projects can be selected, anywhere in the affected watershed.

5. EPA should conduct a study, and submit a report to Congress, identifying other possible applications of the competitive-bidding process piloted in the CRBSCP. Where such approaches appear promising, Congress should authorize or eliminate statutory barriers to the use of such approaches using available federal funds.
6. EPA should conduct a study—or Congress should fund and direct other appropriate federal agencies to conduct studies—assessing the degree to which existing economic subsidies or other incentives promote watershed impairment. One prime example is federal water subsidies that encourage production of marginal crops on environmentally-sensitive lands. Based on the results of such studies, Congress should consider legislation that eliminates, modifies or conditions such subsidies on improved environmental performance.

#### *Monitoring, Assessment and Adaptive Management*

1. Congress should support monitoring and assessment in watershed programs through adequate, stable funding. As with other elements of watershed programs, funding should be provided for long-range monitoring and assessment efforts, and not through volatile annual appropriations. Congress should condition funding on the proper coordination of monitoring and assessment efforts among the various federal, state, and other entities within a basin, or on the consolidation of monitoring and assessment within a single qualified agency (such as USGS).
2. EPA should continue efforts to provide technical assistance in the areas of monitoring and assessment, and to coordinate monitoring and assessment efforts among the various federal, state and other entities. EPA should focus in particular on methods to distinguish environmental changes caused by watershed-protection efforts from those resulting from other environmental variables.
3. Congress should fund, and EPA should conduct or supervise, additional research to improve existing watershed models, and to develop new watershed models, with superior predictive capabilities on a broader range of environmental problems.
4. Congress should condition federal funding for watershed-protection efforts (including EQIP and other USDA programs as well as watershed-specific programs), on adequate field inspections and other methods to verify that recipients of federal funds properly implement, operate and maintain funded projects. EPA and other federal agencies should increase and improve efforts to verify project implementation and to assess the relationship between project implementation and environmental improvement.

5. EPA should conduct a study to identify ways in which landowner participation in cost-sharing and other voluntary nonpoint source pollution-control programs can be increased by identifying and educating landowners about incidental benefits of program participation.

**PAPER 11****THE COMPLEXITIES OF INTRODUCING  
A PERFORMANCE-BASED STATE/EPA PARTNERSHIP  
SYSTEM INTO AN ACTIVITY-BASED MANAGEMENT  
CULTURE**

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**EXECUTIVE SUMMARY**

On May 17, 1995, EPA and representatives of state environmental agencies signed an agreement creating the National Environmental Performance Partnership System (NEPPS). NEPPS was designed to create a new approach to the relationship between EPA and the states through seven principles:

- facilitating continuous environmental improvement
- maintaining a core level of environmental protection
- enhancing the use of environmental indicators
- providing more flexibility for states to address their priorities
- assigning state and federal resources to the highest priority problems
- strengthening public understanding of environmental issues, as well as the governmental programs that address these issues, and
- providing an incentive for state programs to perform well through a differential approach to oversight

Thus, NEPPS is a new approach to the EPA/state partnership but not a new substantive program.

NEPPS, like many other environmental innovations over the last few years, was designed to help both state agencies and EPA find better ways to deal with complex environmental issues, including the very large number of pollution sources, the diffuse nature of both the pollutants and the sources, the cross-media aspects of many of today's environmental problems, and the need to build public consensus in order to achieve often difficult solutions to these problems.

These issues require effective and efficient use of the combined resources of state and federal governments. The architects of NEPPS sought to change the existing working arrangements between EPA and the states, which were dominated by EPA's priorities. Through NEPPS, they sought to (1) provide flexibility for states to re-allocate federal grants so they could address their own priorities, (2) encourage states to involve the public in setting state priorities, and (3) develop environmental goals and indicators to measure the states' results, rather than relying on the current activities-based evaluation and oversight system that is a barrier to differentiating among strong or weak state programs.

Participation in NEPPS is voluntary, and not all states have chosen to be part of the system. NEPPS is implemented through performance partnership agreements (PPAs), which are designed to facilitate joint state-EPA planning and priority setting, promote the use of environmental outcome measures, stimulate greater public involvement, and encourage learning and adjusting through a new accountability system. To accompany the PPAs, Congress authorized a block grant process, known as a performance partnership grant (PPG), which allows EPA and the states to combine grant funds from several programs and then re-allocate the combined funding to state priorities within limits set by EPA. The new PPG grant rules do allow a PPA to serve as a grant workplan and authorize states to use simplified accounting procedures. From the outset of NEPPS, however, EPA has not required states to have a PPA in order to qualify for a PPG or to use a PPG if negotiating a PPA. This separation has seriously undercut the goals of NEPPS because states are able to make decisions about reallocating federal grants without directly connecting them to the strategic planning, priority-setting, and self-evaluations required in a PPA, yet these elements are key to ensuring improvement of environmental results through performance-based management under NEPPS.

NEPPS is based on a management philosophy that differs in critical ways from the system of categorical grants and work plans that it has replaced in 33 states. The categorical grants and work plans grew out of EPA's activity-based management system that focused on defining and refining specific state functions, such as issuing permits or conducting enforcement actions. EPA oversight of the states' program effectiveness has reflected this system by seeking detailed, advance commitments from states about the number of inspections they would conduct and the number of permits they would issue and then assessing whether the states have met these commitments. NEPPS, by contrast, is rooted in performance or results-based management that requires several key steps: identifying priority problems, setting goals to solve those problems, providing flexibility to use different methods for reaching those goals, designing and using measures and indicators to determine if results are being achieved, assessing progress in solving priority problems, and adjusting the methods and measures based on what is learned from the assessment of progress. EPA uses the performance management model in other programs, such as project XL, and the model is widely used in the private sector. NEPPS substitutes a collaborative partnership between EPA and each state for what has been a paternalistic, top-down relationship; and NEPPS is intended to encourage state innovations for responding to increasingly difficult environmental challenges.

To assess whether NEPPS is contributing to a more effective, adaptable, innovative, and efficient approach to environmental management, we have studied eight states and two EPA regional offices where we conducted over 50 in-person interviews. Our findings fall into two categories: issues related to adopting performance management and issues related to NEPPS implementation.

### *Findings on Performance Management*

NEPPS relies on performance-based management and fosters a cross-media partnership for EPA/state relations. It is a clear departure from the past 30 years, when EPA dealt with the states using media-specific, activities-based accounting and oversight. The difficulty of shifting between these two contrasting, and often conflicting, management approaches has greatly complicated integration of NEPPS into both EPA and state programs. Based on our interviews with EPA and state personnel at all levels, we found:

- Collaboration between EPA and the states is critical to protecting this country's environment, especially to regulating the many diffuse and diverse sources of pollution, and to solving today's complex environmental problems
- Performance management systems are important for building more adaptable, efficient, innovative, and effective approaches to environmental management at both state and federal levels
- NEPPS, or a performance-based management system like NEPPS, is critical to strengthening EPA/state partnerships
- NEPPS is not adequately integrated into the management structures of EPA and a number of state environmental agencies
- The embedded media-specific, activity-based culture of many state and EPA program offices threatens the continued viability of NEPPS
- Senior EPA and state officials must focus significant attention on achieving fundamental cultural changes within their organizations so that cross-media, performance-based systems like NEPPS can succeed
- EPA needs a senior level NEPPS champion charged with integrating NEPPS into the agency's programs and with leading the cultural changes necessary for performance-based management to succeed, and states need to continue their own support for constructive improvements in EPA/state relationships
- Because NEPPS has produced vastly different expectations, EPA and the states should consider the joint development of a guidance document for NEPPS

*Findings on NEPPS Implementation*

Our extensive interviews with many state and EPA officials have demonstrated that, after almost five years, NEPPS implementation has reached a critical stage. The basic goals and elements of NEPPS are sound, but the full promise of NEPPS has not yet been realized because its implementation has been erratic. A few states have made significant progress on improving their programs in a number of ways, while changes in other states have been limited. To assess how well NEPPS is being implemented, we have evaluated the data gathered from our interviews by using the seven principles from the 1995 NEPPS agreement.

*Continuous Improvement while Maintaining Basic Environmental Protections*

Two NEPPS principles encourage states to (1) innovate in order to achieve better environmental results while (2) maintaining a core level of environmental protection. As our interviews with both EPA and state program managers clearly pointed out, this balance is challenging. We found that:

- The effectiveness of NEPPS has been limited, at least in part, because EPA has simply layered the potentially conflicting performance-based approach on top of its long standing activities-based management system without providing any mechanisms, such as guidance and training, to facilitate the transition
- Senior EPA regional officials see NEPPS as exceedingly important to improving EPA/state partnerships, but few EPA national or regional program managers are heavily invested in NEPPS
- To make NEPPS more relevant to federal and state program managers, the negotiation of PPAs and PPGs should allow for deferring some work that is not a priority while ensuring that key elements of core programs are considered in the priority-setting process
- To give the NEPPS approach more legitimacy, Congress should consider statutorily authorizing EPA and the states to adopt performance-based, cross-media approaches for controlling pollution and protecting the environment

*Joint Planning, Priority Setting and Resource Sharing*

Joint planning, priority setting and resource sharing are key elements of NEPPS. Some progress on joint planning has occurred in all of the NEPPS states, but more needs to be done to achieve the full promise of NEPPS. The process should ensure that both state and federal priorities are considered, work-sharing opportunities are identified, and resources are shared and reallocated to address the highest priority problems.

- NEPPS has transformed the priority-setting process in Utah, Illinois and Minnesota; it has increased public involvement in Illinois; and it has contributed to building a cross-media performance management system in Minnesota; but its impact has been limited in the other states we studied where agency leadership has not wanted to build a performance management system
- NEPPS has produced the most significant change in states with a strong tradition of strategic planning (Utah), strong and consistent leadership (Illinois), cross-media organizational structures (Minnesota), a focus on performance-based management (Minnesota), or a combination of these factors supporting the underlying principles of NEPPS
- EPA's Administration should direct the agency's Chief Financial Officer to use the agency's strategic planning process and performance reporting to promote integration of NEPPS into the daily operations of all EPA program offices, both at headquarters and in the regions, and should revise EPA's goals for GPRA by minimizing activity-output goals and emphasizing results-based outcome goals
- Performance partnership grants have not produced significant resource sharing or reallocation of EPA funding in any of the states in our study
- EPA should consider making state eligibility to use performance partnership grants contingent upon state adoption of the key elements of performance-based management including strategic planning, priority setting, performance measurement, public reporting, and program evaluation
- Once the Part 35 rules for performance partnership grants are finalized, the states and EPA should examine whether most federal grants should be channeled through the PPG process so that more resources can be shared and reallocated as needed to meet state priorities
- The Office of Enforcement and Compliance Assurance (OECA) should help the states to build performance-based enforcement and compliance programs that adopt better outcome measures, and OECA should provide technical assistance to help the states build more effective measurement systems
- OECA should support the states with information about environmental conditions and sources of pollution that will help the states to direct their enforcement activities toward priority problems and to evaluate the effectiveness of state programs

*Public Involvement and Access to Information*

NEPPS assumes that state agencies and EPA do not have sufficient resources to carry out every possible environmental task and that, therefore, they must set priorities. For both EPA and the states to retain and build public support, these priorities must be accepted by the public. Consequently, the 1995 NEPPS agreement called for increased public involvement and access to information in the joint state-EPA priority-setting process. Only a few of the states in our study have made significant progress on increasing public involvement and information. However, Illinois has been fairly successful in engaging interest groups through a “focus group” process. In addition, Illinois, Indiana and Ohio have published, and Wisconsin will publish in April 2000, annual “state of the environment” reports that provide the public with information about the states’ environmental conditions and priorities. To increase public involvement and information, we recommend that:

- States and EPA should ensure that the public has access to reliable information about environmental conditions, and knows how and when to become most effectively involved in their joint planning, priority-setting and evaluation processes
- States and EPA should make information about monitoring data and environmental indicators readily available to the public over the Internet and in other ways in time to encourage public involvement in the NEPPS process
- States should publish state of the environment reports annually as part of their self-assessments, to increase public understanding of, and involvement in, their environmental programs
- More, not less, data will be needed to address the public’s concerns about the environment and to support performance-based management, so it is critical for EPA and the states to review carefully what data are important to collect and what data need not be reported; NEPPS can be a vehicle for this analysis, but the potential of NEPPS for reducing the states’ reporting burdens has not been realized

### *Oversight*

Although NEPPS has contributed to progress in other aspects of federal-state relations, EPA’s oversight of state environmental programs continues to be a constant source of friction. NEPPS was designed to introduce a more constructive and “differential” approach to oversight that eventually would allow EPA to vary the intensity of its scrutiny based on how well a state performs. State and EPA self-assessments are the principal evaluation and accountability tool introduced by NEPPS, but to improve oversight we recommend that:

- The evaluation and accountability components of NEPPS need further refinement

- The NEPPS self-assessment process should be used primarily by the states and EPA as a method of evaluating what approaches have worked for meeting the priorities established in the PPAs and then adjusting their programs so that they will be more effective
- EPA's regional offices, as well as states, should do self-assessments that complement each other and analyze both environmental conditions and management issues
- To facilitate differential oversight, EPA should establish objective criteria (perhaps program auditing) for evaluating state programs across all media using a process that is open, based on accurate data, and transparent to the states and the public.
- EPA and the states should consider providing program and fiscal accountability to EPA, Congress, and the public through an after-the-fact "program auditing" process, at least on a pilot basis
- If EPA adopts program auditing for state oversight, the agency should ensure that EPA and/or state peer auditors are highly qualified and well trained in this approach before the program is launched
- The results of Region VIII's new enforcement evaluation process should be monitored and, if it is successful in creating a more constructive state enforcement review, the approach should be adopted more widely by EPA and its regional offices

### *Performance Measures*

Performance-based management systems like NEPPS rely on clear measurements of outcomes to assess whether programs are accomplishing their intended results and then to make adjustments accordingly. While this report does not address the methodology for conducting performance measurement, we have found that the absence of well-developed performance measurement systems, both at EPA and in the state agencies, is making it much more difficult to demonstrate the value of adopting richer performance measures, rather than simply counting activities.

- As part of the NEPPS approach, EPA and the states need to continue to develop and use better performance measures to demonstrate that the system can produce improved environmental outcomes

### *CONCLUSION*

Given our federalist legal structure, the EPA/state partnership is critical to protecting our nation's environment. The large number of regulated parties, the diffuse sources of pollution, and the complex nature of today's

environmental problems all make it imperative for the states and EPA to work together effectively. EPA's traditional state oversight, using media-specific work plans and categorical grants, is anchored in activities-based management and is too rigid to deal effectively with many of these problems. States, like many businesses, need a more flexible system that encourages innovation, efficiency, and continuous improvement to produce significantly better environmental outcomes as we head into the 21<sup>st</sup> century. This system also needs to be more accountable to Congress, EPA, and especially the public. Environmental protection that is rooted in performance-based management, like NEPPS, will be a key factor in achieving these objectives. However, thus far, NEPPS has succeeded in producing significant changes in only a few states that have strong strategic planning processes, performance-based and/or cross-media management systems, or consistent high-level champions for performance-based management. Even for these states, the continued viability of NEPPS is threatened by the embedded media-specific, activity-based culture most evident at the program management level, within state agencies and EPA, as well as by EPA's approach to implementing GPRA through activity-based goals. If NEPPS is going to succeed in improving public health and the environment, significant changes in management approaches and agency cultures must occur both at EPA and in the state environmental agencies.

*"I cannot say whether things will get better if we change; what I can say is that they must change if they are to get better." G.C. Lichtenberg*

**PAPER 12****THE NATIONAL ENVIRONMENTAL PERFORMANCE  
PARTNERSHIP SYSTEM:  
MAKING GOOD ON ITS PROMISE?**

**Jeanne Herb  
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**EXECUTIVE SUMMARY**

In 1995, EPA and the states established the National Environmental Performance Partnership System (NEPPS) as a voluntary mechanism to redefine federal and state roles in environmental protection. They piloted the new system in FY96, and brought it to full implementation in 1997. This report evaluates the extent to which NEPPS has fulfilled its promise, based on its first three years of experience. Eight case-study states form the basis of our assessment. Seven of those are participating in NEPPS to some extent, and the eighth, Pennsylvania, is not.

The system of environmental protection in the United States is largely governed by a number of national environmental statutes and regulations. In those statutes, Congress confers on the United States Environmental Protection Agency (EPA) the primary authority for statute implementation. In most states, primary day-to-day responsibility for program implementation rests with a state agency. The national environmental statutes in many cases provide for grants to the states to carry out those delegated programs. The workplans or written commitments states make in return for those grants are the primary documents through which EPA exercises its oversight authority, and ensures adherence to national program guidance.

That system of grant workplans generally entails detailed, prescriptive EPA oversight of states based on program activity commitments, e.g., number of inspections conducted, number of permits issued. As state capabilities and sophistication evolved and responsibilities expanded, many believed that the system imposed unacceptably high transaction costs and insufficient flexibility. Three key ideas emerged: states should be accorded greater financial and program design flexibility; that flexibility should be enacted under and subject to an increasingly performance-based oversight and management regime, informed by strategic priority-setting and self-assessment; and EPA and the states should cooperate in their deployment of resources to address environmental priorities. Support for reforms embodying those principles led to the signing of the NEPPS agreement between EPA and states.

*THE NEPPS VISION*

As described in the original 1995 agreement, NEPPS aimed to “strengthen our protection of public health and the environment by directing scarce public resources toward improving environmental results, allowing states greater flexibility to achieve those results, and enhancing our accountability to the public and taxpayers.”<sup>1</sup>

The agreement sets out seven guiding principles for NEPPS and seven components of NEPPS implementation. Based on those, and on other NEPPS goals and mechanisms documented elsewhere, we articulate the original NEPPS reform agenda in the following way. The agenda has four major elements:

- **Expected outcomes:** a trio of *results* consisting of improved state-EPA relations; administrative savings and burden reduction for both states and EPA; and flexible, performance-based management of delegated programs.
- **Oversight mechanisms:** environmental performance agreements (PPAs); differential oversight; performance leadership programs; and Performance Partnership Grants (PPGs).
- **Foundations for oversight changes:** increased use of environmental goals and indicators; a new approach to program assessments by states; and public input into states’ development of environmental priorities.
- **Development and management of the system itself:** public input to development of the national system; and joint system-evaluation by EPA and states once NEPPS was implemented.

*NEPPS IN PRACTICE*

NEPPS has been put in place without extensive guidance on the national level; thus each state’s NEPPS experience is unique. Some of the key dimensions in which NEPPS implementation has differed across states are:

- The extent to which the PPA has become a “ruling document”—the primary repository of annual state program commitments—within state agencies, and between a state and EPA.
- The extent to which the PPA and PPG have replaced categorical grant workplans.
- The procedures and organizational approaches employed by a state to negotiate its PPA and PPG.
- The degree to which the PPA, PPG, and self-assessment have become integrated with other strategic planning functions and budget planning in each state.
- The extent to which program monies have been truly consolidated and managed as a single budget.

- The degree to which NEPPS has encouraged or aided innovative state initiatives
- The treatment of enforcement under NEPPS.

*FINDINGS: HAS NEPPS MET EXPECTATIONS?*

We assess NEPPS’ progress by comparing what we find in the case-study states to the four major components of NEPPS. Our findings are summarized in the table below.

**Table 1: Outcomes of NEPPS Components**

NEPPS component	Outcomes
<b>1. Expected Outcomes</b>	
Improved state/EPA relations	<ul style="list-style-type: none"> <li>• States see NEPPS as targeted at dysfunction in “other” states and regions.</li> <li>• The NEPPS process has served to more clearly define state-EPA roles.</li> <li>• NEPPS has generally led to more collegial and productive working relationships between states and EPA at higher levels of management.</li> <li>• The opposite sometimes occurred at lower levels.</li> <li>• NEPPS has facilitated work-sharing arrangements in some cases.</li> <li>• Enforcement has been the consistent exception to improved EPA-state relations.</li> <li>• Changes under NEPPS have also resulted in deterioration of relations in a few non-enforcement-related cases.</li> </ul>
Administrative savings and burden reduction	<ul style="list-style-type: none"> <li>• PPGs generally result in administrative savings.</li> <li>• Some states have realized administrative savings through planning integration.</li> <li>• In other states, NEPPS has created additional planning and reporting work.</li> <li>• States and regions believe that two-year PPAs and PPGs are far more likely to produce administrative savings than one-year agreements.</li> </ul>
Flexibility or performance-based management	<ul style="list-style-type: none"> <li>• States have undertaken some marginal exercise of financial flexibility under NEPPS.</li> <li>• NEPPS program design flexibility has facilitated some program innovations.</li> <li>• To the disappointment of states, NEPPS has not involved true performance-based management.</li> </ul>
<b>2. Oversight mechanisms</b>	
Environmental performance agreements (Performance Partnership Agreements (PPAs))	<ul style="list-style-type: none"> <li>• The degree to which PPAs function as a “ruling document” in the federal-state relationship varies widely.</li> <li>• NEPPS has engendered more discussion of mutual priorities, but little true joint priority-setting.</li> </ul>
Differential oversight	<ul style="list-style-type: none"> <li>• In most states, PPAs and PPGs have replaced more detailed categorical workplans as the basis of oversight.</li> <li>• The nature of program review has also changed.</li> <li>• States carry out less conventional, activity-based reporting under NEPPS.</li> <li>• Any reduction in conventional reporting is generally offset by reporting burden increases related to CPMs.</li> <li>• EPA has not pursued formal differential oversight under NEPPS.</li> </ul>

Performance leadership programs	<ul style="list-style-type: none"> <li>• Just as differential oversight has not been officially implemented because of the difficulty of setting criteria, the performance leadership program also has not materialized.</li> </ul>
Performance Partnership Grants (PPGs)	<ul style="list-style-type: none"> <li>• PPGs lead to administrative savings in most cases.</li> <li>• States have shifted some funds under their PPGs, but have not engaged in significant reallocation of resources.</li> </ul>
<b>3. Foundations for oversight changes</b>	
Increased use of environmental goals and indicators	<ul style="list-style-type: none"> <li>• ECOS and EPA have agreed on national core performance measures (CPMs), but some states find the CPMs problematic.</li> <li>• NEPPS has provided a focus for state-level efforts to identify and implement environmental indicators.</li> <li>• CPMs occasionally conflict with state-level efforts.</li> </ul>
New approach to program assessments by states	<ul style="list-style-type: none"> <li>• States generally do not conduct distinct self-assessment efforts specifically for NEPPS.</li> <li>• Most states have a strategic planning process, but the degree of integration between state planning and the PPA varies.</li> <li>• NEPPS has engendered a greater degree of cross-program and multimedia planning within state agencies.</li> </ul>
Public input to development of priorities	<ul style="list-style-type: none"> <li>• A few states have made significant changes or increases in public participation as part of the NEPPS process.</li> <li>• The majority of states, however, have not encouraged any public participation in NEPPS beyond their usual public comment process.</li> <li>• Some states have used NEPPS to aid communication to the public.</li> </ul>
<b>4. Development and management of the system</b>	
Public input to development of the national system	<ul style="list-style-type: none"> <li>• Public involvement in the NEPPS development process did not occur.</li> </ul>
Joint system evaluation	<ul style="list-style-type: none"> <li>• To date, no formal joint evaluation of NEPPS has taken place.</li> </ul>

*CONCLUSIONS*

NEPPS set out alternative oversight mechanisms and enabling components intended to achieve a trio of results: improved federal-state relations; administrative savings and burden reduction; and performance-based flexibility. It was believed that progress in these areas would lead to superior environmental protection. Based on our findings in the seven case-study states that participated in NEPPS, we describe the conditions under which progress in these areas of improvement has been greatest. We also discuss what barriers have prevented NEPPS from fully achieving its vision.

*When Does NEPPS Deliver Maximum Value?*

Based on the experiences of the case-study states, we identify six circumstances under which the value of NEPPS is maximized:

- **When PPAs/PPGs function as “ruling documents.”** PPAs and PPGs have more effectively served as a mechanism for changing EPA oversight of states when they have been ruling documents for annual program commitments—that is, when they

have served as the primary basis for EPA oversight, replacing categorical workplans.

- **When PPAs integrate program commitments with agency resource and strategic planning.** Those states that use the PPA/PPG as “integrating documents,” coordinating internal planning functions under them, have found NEPPS most effective in enabling priority-based management and delivering administrative savings.
- **When grants are consolidated.** States that consolidate grants under PPGs find them to be a source of significant administrative savings, as well as of some flexibility.
- **When there is a high-level state commitment to NEPPS as a tool for change.** States that entered NEPPS with a clear high-level vision and commitment, and that have assertively defended that vision when they disagree with EPA, have found NEPPS to be an effective tool for achieving their vision.
- **When there is a high-level regional commitment.** Likewise, a high-level commitment to NEPPS by the EPA region makes NEPPS a more effective agent of change.

#### *What Obstacles Persist?*

Our interviews identified a set of prominent barriers to the NEPPS reform agenda:

- **Single-medium culture at EPA and state agencies.** States and EPA have struggled to implement NEPPS’ multimedia framework within their existing single-medium systems of environmental protection.
- **Many ruling documents.** While PPAs and PPGs were intended to serve as the primary documentation of annual program commitments and deliverables, in reality NEPPS states still operate under a number of ruling documents in addition to their PPAs and PPGs.
- **Uncertain scope for flexibility and acceptable oversight.** Because EPA has not defined the appropriate extent of flexibility for NEPPS states, EPA staff often feels “squeezed” between the desire to provide flexibility to states under NEPPS, and their accountability to agency headquarters. In particular, the approach EPA has taken to implementation of the Government Results and Performance Act (GPRA) is in conflict with NEPPS.
- **Barriers to measuring and managing by environmental performance.** A lack of appropriate data, and difficulty in attributing environmental outcomes to agency activities, have hampered EPA’s ability to conduct performance-based oversight.
- **Conflicting visions of enforcement.** On several levels, states and EPA do not agree with each other’s visions of enforcement, and these disagreements have prevented

enforcement from being effectively integrated into NEPPS.

### *RECOMMENDATIONS*

*EPA must address conflicts between NEPPS and the traditional system of federal oversight*

To date, NEPPS has been incompletely implemented. It does not replace the traditional system of federal oversight but rather coexists with it in an uneasy accommodation. While NEPPS has achieved significant reform in certain cases, it has not reached its full potential. Further progress will continue to be hampered by the strained coexistence of the old and new systems.

If NEPPS is to continue to make progress toward its original vision, states and regions operating under NEPPS cannot be expected to continue to simultaneously meet the requirements of both NEPPS and the traditional system. EPA must either establish a clear segregation between the oversight and administration of NEPPS and non-NEPPS states and programs, or, alternatively, commit definitively to *either* NEPPS or the traditional system of oversight.

We believe that EPA is unlikely to be able to efficiently and effectively maintain two distinct and separate systems of program oversight and management. Further, the core ideas behind NEPPS remain relevant, and a return to the older system is likely to engender substantial resistance from states.

It is thus our recommendation that EPA definitively re-commit to and aggressively promote the core NEPPS concepts as the environmental management system for the future. That will require accommodating the concerns of states that have so far not joined NEPPS, as well as rigorous efforts to incorporate the lessons learned over the past few years.

#### *Recommendations for Incorporating Lessons Learned*

Both EPA and states can benefit from incorporating the lessons learned over the past three years of NEPPS implementation. Based on our findings, we recommend the following five steps:

- 1. Determine a common understanding of the appropriate level and type of federal oversight under NEPPS.** Confusion and differing interpretations concerning the balance of oversight and flexibility for NEPPS states have hampered the progress of NEPPS and led to tension between EPA and states. EPA should provide clear guidance on that issue to regional offices and states.
- 2. Resolve the conflicts between GPRA and NEPPS.** Because of poor coordination between NEPPS and GPRA, these two systems of performance-based management

are often at odds with each other. EPA and Congress need to coordinate the use of GPRA and NEPPS as tools to set, drive, and monitor progress towards the nation's environmental priorities.

3. **Better integrate enforcement in NEPPS.** As a consistent source of acrimony and ill-feeling, enforcement issues have eroded the principle of partnership that NEPPS represents. EPA and the states should work toward more communication and cooperation on enforcement and toward further incorporation of enforcement into NEPPS. That appears to be occurring, to at least some degree.
4. **Improve the infrastructure for measuring and managing by environmental performance.** Neither the information available through EPA's databases nor the current understanding of how to attribute environmental changes to their causes is sufficient for performance-based management. EPA must make improvements in these areas in order to effectively implement performance-based management.
5. **Establish minimum elements of and best practices for NEPPS programs.** We recommend setting out minimal guidelines for NEPPS. Three of the elements that we would recommend for such guidance stem directly from the components for success described in our conclusions:
  - **Multi-year PPAs/PPGs should be the ruling document for oversight.** It is difficult for PPAs to serve as the principal documentation of annual program commitments when they are only one of an ambiguous mixture of documents. For PPAs to serve that role, they must either subsume or coordinate with these other documents. That is not to say they should subsume delegation/authorization agreements, which serve a distinct legal function.
  - **Multi-year PPAs should tightly integrate into state strategic and resource planning processes.** PPAs that integrate development and documentation of program commitments with agencies' resource and strategic planning efforts can be powerful tools for change. States and EPA should use PPAs as integrating documents for diverse planning efforts.
  - **PPGs should be managed as a single source of funds.** Tracking PPG funds according to their program of origin limits the ability of PPGs to provide flexibility for pursuing priorities. In order to achieve the goal of multimedia, priority-based management, both states and EPA should manage PPGs as single grants.

We recommend two further elements of NEPPS that are based on components of the original vision of NEPPS that have not been implemented:

- **Joint priority setting.** While we found examples of a state and EPA entering into a dialogue to identify common priorities, on the whole, priority setting occurs separately. Joint priority-setting provides a basis for a more cooperative EPA-state relationship, so it should be encouraged and practiced.

- **Public participation** States should incorporate public participation components into NEPPS upstream of PPA/PPG development, at the time the state is determining its priorities and strategic direction. EPA should encourage states to implement that component of NEPPS through guidance and training.

**PAPER 13****ENVIRONMENTAL PERFORMANCE MEASURES  
IN A FEDERAL SYSTEM****William Gormley, Jr.****Georgetown University****EXECUTIVE SUMMARY**

In recent years, many governments in the U.S., including the federal government, have attempted to institutionalize performance measurement as part of a larger quest for greater accountability. In environmental policy, performance measurement received a boost from the National Environmental Performance Partnership System (NEPPS), a 1995 initiative that sought to make state environmental agencies more accountable to the federal government by shifting federal oversight somewhat from processes to results. In some states, efforts to institutionalize performance measurement, including environmental performance measurement, were already underway or were just beginning.

This paper reports on progress towards environmental performance measurement in Florida, New Hampshire, Oregon, and Virginia, each of which is in a different EPA region. Florida and Virginia have relatively well-established performance-budgeting systems, and New Hampshire is establishing such a system. Since 1990, Oregon has had a benchmarks system for measuring progress in several policy sectors. Florida, New Hampshire and Oregon have negotiated Performance Partnership Agreements (PPAs) with the EPA; Virginia has not.

Environmental performance measurement faces technical, political, and administrative challenges in those and other states. Technically, it is not easy to measure desired outcomes, much less the impacts of government activities on such outcomes. Politically, state environmental agencies find themselves under pressure from a wide variety of overseers and interested publics, each of which favors different values, regulatory strategies, and measurement approaches. Administratively, state environmental agencies have trouble overcoming the skepticism of career civil servants, who may regard performance measurement as an unnecessary burden or a significant threat.

Despite growing efforts to measure outcomes, all four states continue to emphasize outputs such as permit and inspection counts in their published reports. They pay scant attention to actual impacts; only Oregon systematically lists causal factors that affect desired outcomes. In addition, data-quality and comparability problems persist. For example, states differ dramatically in how often they assess water bodies, which water bodies they assess, and how they define “fishable” or “swimmable” waters.

On the other hand, all four states have improved their measures in recent years. Oregon has developed a water-quality index with an innovative weighting scheme. New Hampshire has adopted a number of pollution-prevention measures developed in concert with neighboring states. Florida has improved what was already a well-organized, comprehensive, and comprehensible quarterly report. Even Virginia has made some modest progress, though its baseline was weak. Another positive development has been the approval of “core performance measures” by the Environmental Council of the States (ECOS) and the EPA in April 1999. Of the four states, New Hampshire and Oregon are definitely committed to the core performance measures, Florida is somewhat committed, and Virginia is not committed.

Governors have been active promoters of performance measures in all four states. State legislators and legislative staff members support performance measures in theory by overwhelming margins but do not use such measures much, if at all, in their decisionmaking. In Florida, two parallel measurement systems limit legislative use of either set of measures. In Oregon, the perception that the state’s benchmarks are an executive branch initiative has diminished legislative interest. In Virginia, a paucity of measures and legislative distrust of the state environmental agency has limited use of measures. In New Hampshire, legislators have used policy-relevant data (but not necessarily performance measures) to fine-tune or promote environmental legislation.

The EPA has successfully advanced the development of performance measures through PPAs, but problems remain. In particular, the inclusion of performance measures in PPAs does not guarantee use. The EPA has also promoted a common set of measures, but states prefer homegrown measures. Environmental group leaders in the four states were surprisingly unfamiliar with existing performance measures, although such measures could be quite useful in efforts to inform and mobilize citizens.

Like state legislators and legislative staff members, state environmental agency officials support the theory of performance measurement but sometimes balk at its practice. Some senior program officials in Florida, Oregon, and Virginia voice sharp reservations about performance measurement, while New Hampshire’s managers are generally more enthusiastic.

Still, state environmental administrators occasionally use performance measures in all four states. In Florida, the Department of Environmental Protection (DEP) used data on controlled burning in state parks to reallocate resources and purchase new equipment. The DEP also improved its regulation of petroleum storage tanks and shellfish processing plants after learning some lessons from performance measures. In New Hampshire, the Department of Environmental Services used data on waste management backlogs to reallocate resources and redefine criteria for accepting complaints. In Virginia, the Department of Environmental Quality improved its permitting speed and the Department of Conservation Resources increased the number of nutrient-management plans issued after these measures became official indicators of agency performance. In Oregon, the Department of Environmental Quality used data on

shifting sources of air pollution to reallocate resources and devote more attention to area and mobile source pollution.

Environmental policymakers are not unique in wrestling with the challenges of performance measurement. In comparison to education and health care, environmental protection is characterized by relatively weak interstate performance measurement systems. In comparison to all policy sectors, environmental protection is about average in the quality of its intrastate measures.

In 1995 and 1997 the National Academy of Public Administration called for “accountable devolution” as the best way to achieve superior environmental results. The case for devolution rests on the premise that the states deserve greater trust because their technical capacity and political support for environmental protection have improved. The case against devolution rests on the premise that even evolved states are less enthusiastic than the federal government about enforcing federal environmental laws. The case for devolution would be strengthened by the presence of a national database systematically comparing the performance of the states. But the concept of accountable devolution is incomplete unless it specifies the form that accountability should take.

The Government Performance and Results Act (GPRA) and NEPPS both promote political accountability but not necessarily the same kind of political accountability. For example, data standardization is fully consistent with GPRA but may be somewhat inconsistent with the spirit of NEPPS. Ultimately, the federal government must decide which form of political accountability is more important: the EPA’s accountability to Congress or state environmental agencies’ accountability to their respective governors and state legislatures. Furthermore, the federal government must decide how to reconcile political accountability with legal accountability, as exemplified by federal court decisions.

Which state has the best system for measuring environmental performance? Florida has the best overall system: an excellent quarterly report and a Focus/Watch designation approach, which enables the secretary of the DEP to designate a limited number of environmental problems as warranting special attention every quarter, which ensures that performance measures do not simply gather dust. But New Hampshire has the best culture for environmental problem solving. In comparison to their counterparts in other states, New Hampshire’s program managers are more positive and more pragmatic. Absent good comparative data, it is thus difficult to know which state is actually doing the best job of protecting the environment.

Although some progress has been made, additional steps are needed if the U.S. is to develop a viable environmental performance measurement system. This report makes the following recommendations to those concerned with environmental performance.

### *Recommendations for States*

- Streamline and integrate parallel sets of performance measures.
- Encourage environmental agencies to adopt mechanisms that force action to ensure that bureau chiefs take performance measures seriously.
- Offer their environmental agencies greater funding as performance improves.
- Foster collaboration among kindred agencies to identify new measures for environmental protection.

#### *Recommendations for EPA*

- Publish core performance measure data for each of the 50 states, as well as territories and tribes, as quickly as possible.
- Invest in an improved water-quality measurement system, in collaboration with the states, so that water quality measures are comparable across states.
- Utilize data from the Office of Enforcement and Compliance Assurance and other sources to conduct research linking outputs and outcomes.
- Continue to promote PPAs and PPGs, through regional offices.

#### *Recommendations for Congress*

- Encourage use of EPA performance measures by authorizing committees, not just appropriations committees.
- Provide additional funding to improve the EPA's water-quality measurement system and to support research on linkages between outputs and outcomes.
- Instruct the General Accounting Office to conduct a study of state performance acts and their implementation by various state agencies, including environmental agencies.

#### *Recommendations for Environmental Groups*

- Participate in performance-measurement development workshops conducted by federal and state agencies.
- Use EPA data to develop "report cards" on selected topics, and disseminate those reports to the media and the public.

Taken together, those steps would enhance political and professional accountability. And the creative powers of state program managers, if unleashed, could trigger a new wave of policy innovations and reforms. But strong delegation of authority requires strong feedback mechanisms to ensure that the public interest is served. A credible environmental performance measurement system is the indispensable lynchpin for intergovernmental devolution and administrative decentralization, but it requires significant and unceasing effort from all stakeholders.

**PAPER 14****REINVENTING EPA NEW ENGLAND:  
AN EPA REGIONAL OFFICE TESTS INNOVATIVE  
APPROACHES TO ENVIRONMENTAL PROTECTION****Jodi Perras****Perras and Associates****EXECUTIVE SUMMARY**

In 1995, the New England office of the U.S. Environmental Protection Agency (EPA) eliminated its traditional air, water, and waste divisions and created a new, multimedia structure to better focus on the needs of New England stakeholders and the environmental results of its work. EPA Administrator Carol Browner approved the reorganization with the goal of moving the region “toward multimedia, ecosystem, and sectoral approaches in meeting its environmental mission.” Instead of separate divisions for air, water, and waste management, the region organized 46 percent of its staff into two multimedia offices: the Office of Ecosystem Protection (OEP) and the Office of Environmental Stewardship (OES).

OEP incorporated non-enforcement staff and functions from the air, water, RCRA, and pesticides and toxics programs. It created state-based geographic units designed to work on place-based initiatives. OEP’s mission was to establish environmental standards and goals, and build state and community capacity for meeting them.

OES encompassed enforcement, pollution prevention, and technical assistance activities targeted toward the regulated community. Its mission was to encourage and reward responsible environmental management by industry and other regulated entities, and to enforce against those who do not act responsibly.

Regional Administrator John DeVillars used the reorganization as a management tool for shaking up an EPA bureaucracy that he felt was too rigid and disconnected from the people and places of New England. He simultaneously pursued a number of initiatives, policies, and programs designed to achieve five key goals:

- to target EPA’s limited resources better
- to foster more innovative approaches to environmental protection
- to build stronger partnerships with its customers and partners
- to achieve increased flexibility and responsiveness
- to focus more on outcomes and less on process.

DeVillars used the reorganization and other initiatives to redefine the role of EPA's regional office. Those initiatives—many of them based upon EPA's national reforms— included programs emphasizing compliance assistance and market-based trading, providing recognition for environmental leaders in the business community, fostering environmental technology, strengthening state and local partnerships, revitalizing urban neighborhoods, and restoring or protecting important natural resources. Each of those new programs fits within DeVillars' vision of a more dynamic and connected EPA regional office.

In this report, Perras & Associates examines a few key initiatives that shed light on the role of the EPA regional office during this time of environmental reinvention. Through those initiatives, we also examine the interface between EPA New England and the state agencies that run delegated federal programs. What are the respective roles of regions and states? What should they be in the future?

### *Background*

Almost half of EPA's workforce is located in the agency's 10 regional offices. The most common activities of regional staff are overseeing work at individual Superfund sites; issuing, reviewing or enforcing permits; overseeing or providing technical assistance to states; conducting environmental assessments; and managing grants and contracts, including grants to states.

As states mature in their ability to run environmental programs, some have argued that the role of regional offices should diminish. However, under DeVillars' leadership, EPA's Boston office has taken the opposite approach. The region has become both more active and more public in protecting New England's environment, strategically selecting places and opportunities where EPA can pioneer new approaches or achieve greater environmental improvement. DeVillars combines the activist approach with close coordination and consultation with New England states, environmental groups, and business organizations. The region also has reformed its traditional approach to state oversight. That combination seems to have the support of states, businesses, and environmental groups in New England. It also provides a model upon which EPA regions might structure a new approach to environmental protection.

Each EPA region is unique. There are dramatic differences in the politics, economy, ecosystems, and cultures of different regions of the country, and often even within regions and states. While DeVillars' exact approach may not work in all EPA regions, the principles underlying his actions could guide efforts to define a proper regional role in other parts of the country.

### *Major Findings*

*Better Targeting of Federal Resources:* EPA New England appears to have achieved some success in better targeting its resources within the region. The Charles River is cleaner today primarily due to EPA's targeted attention. Enforcement resources—both in oversight and in direct federal activities—are deployed in a more targeted fashion than they were before the reorganization. The region has shifted state oversight from case-by-case intervention to program-wide, limited after-the-fact reviews and stronger joint planning, as envisioned by the 1995 NEPPS agreement. Such a model should work well in any region, regardless of state politics. EPA should examine its utility across the country. Also, while it may make sense to disinvest in some activities, EPA cannot simply ignore a clear congressional mandate. Congress and EPA headquarters might consider offering the regions some funding flexibility tied to measurable outcomes, similar to what states now enjoy under performance partnership grants.

*Fostering Innovative Approaches:* By pioneering new approaches, EPA New England seems to have generated good will and better relationships with many stakeholders in New England. The regional also has received national recognition for its efforts. Yet EPA managers need more than public recognition to know whether those new approaches are, in fact, efficient and effective. As public servants, agency managers need reliable, unbiased information for judging the success of both traditional and innovative programs. Not all innovations succeed; some are bound to be more successful than others. Traditional programs also need evaluation on a regular basis to judge their efficiency and utility. To ensure sound management and wise use of taxpayer dollars, the region needs to invest in systems that allow managers to better track and analyze the results of all their programs—both innovative and traditional.

*Building Partnerships:* EPA New England's reorganization has led to stronger partnerships between EPA and a variety of New England stakeholders. Those partnerships include federal employees working side-by-side with their state counterparts to protect or restore important ecosystems, alliances with business associations to improve compliance in industry sectors, and agreements with citizen volunteers to monitor water quality in the Charles River. Through such partnerships, the region is emphasizing that protecting the environment is everyone's job—not merely the responsibility of government agencies. While EPA New England could have formed such partnerships without the reorganization, the new structure enhanced the need for such relationships. In the future, EPA will have to rely much more on partnerships to achieve its environmental objectives. EPA New England may provide the following lessons:

- Partnerships can help EPA leverage additional resources and expertise toward solving environmental problems.
- Partnerships are strengthened by common goals that have public support and understanding. Goals should be specific and measurable in order to gauge progress over time.

*Increasing Flexibility and Responsiveness:* EPA New England's agreement with Manchester, New Hampshire, over combined sewer overflow repairs demonstrated the region's new flexibility within a framework that focuses on the end results. Under the

agreement, EPA didn't waive any Clean Water Act requirements or delay any remedial work. Instead, the region offered to phase the decisionmaking, buying the city 10 years to collect better information and possibly acquire better technologies that could fix the remaining problem for less money. By moving negotiations out of a protracted stalemate and avoiding a lengthy court battle, both EPA and the city ensured that the most affordable environmental projects to clean up the Merrimack River would proceed in a timely fashion. In addition, local residents will benefit from supplemental projects aimed at preserving rare habitats, restoring urban ponds, reducing asthma and lead poisoning, and teaching students about environmental issues. Although the city and EPA haven't agreed on the scale of the long-term cleanup, the agreement is structured to provide additional information and a better working relationship that may make the tough decisions easier to reach down the road.

*Focusing on Outcomes:* EPA New England has traditionally had difficulty setting goals and creating management systems that measure progress toward those goals. That problem is not unique to New England; it is common throughout EPA and many state environmental agencies. The Charles River initiative shows great promise in focusing on environmental outcomes. By setting a clear goal and tying it to public accountability and action, the initiative is demonstrating how EPA can generate greater progress and community involvement in environmental issues. The chemical company initiative demonstrates how a suite of less-than-perfect measures can provide useful, cost-effective information to program managers. Several other regional attempts to focus on results have been less successful, due to many factors: a lack of clear goals; conflicts with the Government Performance and Results Act; and difficulties in changing the old culture. The GPRA structure within EPA makes it more difficult for regions to develop place-based goals and strategies. The absence of adequate environmental data also is a barrier to results-based management. EPA New England should continue to instill goal-setting habits and practices that enable managers to set meaningful targets for employees, and to assess progress toward important environmental and behavioral goals. The region has taken important steps in that direction, but still has much work ahead.

*Leadership:* The strong leadership of John DeVillars was a vitally important, but somewhat intangible, factor in the region's reinvention. Whether they agreed or disagreed with him, almost all interviewees gave DeVillars credit for particular initiatives or reforms within the region. Not surprisingly, as DeVillars was forcing a change in thinking and practice within the region, he came under attack by some EPA employees. Anyone attempting the breadth of change DeVillars proposed is bound to encounter similar resistance and acrimony. This study does not attempt to prove or debunk any of the criticisms directed at DeVillars personally. Rather, it evaluates the reinvention efforts against the goals DeVillars himself set. Against those goals, the region has achieved significant progress—due in no small part to his leadership. Of course, one person cannot change an organization alone. DeVillars assembled a strong team of office directors, and enjoyed the support of many managers and staff. Without their hard work, DeVillars' reform agenda would not have succeeded. During these times of change and upheaval, EPA's administrator should choose regional administrators who exhibit strong leadership qualities.

*The Role of the EPA Region:* Tapping the unused potential within EPA regions will be a major challenge as EPA continues to reinvent itself in the coming years. Based on lessons learned in New England, a new role for EPA regions could emerge during this time. That role would emphasize:

- *Targeted Federal Activism:* A more-targeted, active federal role in addressing environmental problems in local communities
- *Hands-on Partnerships:* A stronger, hands-on partnership with states, local governments, environmentalists, and business leaders
- *Innovation:* EPA employees need to find a balance between the local dynamics that are driving the need to innovate, and the national need for consistent treatment under the law. That balance can best be developed in the regions
- *State Oversight and Backstop:* EPA must exercise its oversight role through constructive reviews of state programs. Because state capabilities may change over time, regions also need to keep a core technical capacity to assist states that need help.

## Conclusions and Recommendations

Because this study involved only Region 1, it cannot draw firm conclusions about EPA's entire regional system. Thus the following recommendations should be understood within the limited context of one regional case study.

1. EPA regional offices should participate more directly in the communities they serve, without subverting the proper role of the states in carrying out delegated programs.
2. Regional offices must have the flexibility from both Congress and EPA headquarters to design environmental protection approaches and initiatives that fit their states and the unique political, economic and environmental conditions they face.
3. EPA's accountability systems should be designed to better foster place-based initiatives and performance measures.
4. Regional administrators should be held accountable to both headquarters and Congress for identifying and solving important environmental problems in their regions.
5. EPA regions should use reorganization or other management tools to shift employees' focus beyond simple program implementation. EPA managers should re-emphasize the goals behind the statutes, using EPA's regulatory tools, partnerships, and leadership to identify and solve important environmental and compliance problems.

EPA regions will require strong, tenacious leadership in order to transform more staff from process-oriented, desk-bound regulators into outcome-oriented, community-based partners. Such leadership must come not only from the regional administrator, but also from the senior program managers within a region

**PAPER 15****REINVENTING SUPERFUND:  
AN ASSESSMENT OF EPA'S ADMINISTRATIVE REFORMS****Robert Nakamura  
Tom Church****State University of New York at Albany****EXECUTIVE SUMMARY**

The United States Environmental Protection Agency (EPA) initiated a “reinvention” effort in the Superfund program in 1993, beginning three rounds of administrative reforms intended to make the program “faster, fairer, and more efficient.” Two questions have dogged America’s inactive hazardous waste cleanup program since its beginning: “How clean is clean enough?” and “Who should pay?” On the former question, it is clear that different cleanup technologies imply different cleanup costs. Prior to the reforms, industry critics argued that EPA sometimes mandated remedies that cost significantly more than alternative cleanup designs, yet those high cost remedies were often unaccompanied by a commensurate reduction in risk. The reforms encouraged changes in the assumptions used in risk assessment. Those changes, particularly in assumptions involving post-cleanup land use, led to increased use of containment over more expensive remedial technologies. The reforms also established a variety of administrative tools designed to make project managers more sensitive to the costs of cleanup.

On the latter question of “Who should pay?” the reforms left intact the basic principle of “polluter pays.” But they sought to promote fairness through more equitable allocations of cleanup burdens among the businesses and governmental units paying for cleanups (the potentially responsible parties or PRPs), in some instances authorizing use of public funds to supplement private contributions. Reinvention also included reforms furthering such goals as making program processes more “transparent,” increasing the concern with “environmental justice,” and encouraging economic redevelopment at previously polluted “brownfields” sites.

Superfund’s administrative machinery is highly decentralized, with implementation occurring primarily in EPA’s ten regional offices. The broad goals of reinvention thus had to be translated into specific decisions made in the regions, where hundreds of remedial project managers and their supervisors are directly responsible for the more than 1200 federal Superfund sites. Over the years the regions have developed individualized approaches to the engineering, legal, and interpersonal challenges of Superfund; those informal practices have proved resistant to change from Washington.

We followed a research strategy that began with Washington and then looked to the regions. Since the policy changes originated in Washington, we first interviewed Superfund staff in EPA headquarters and in the Environment and Natural Resources Division of the Department of Justice to flesh out the intent and practical meaning of the various reform initiatives. Our interviewees included staff members from the major functional areas of the operating program (remediation, enforcement, brownfields) as well as those dedicated to the reinvention effort itself. We were particularly interested in whether EPA staff members with different operating responsibilities and perspectives shared a common understanding of what the reforms required.

Our Washington interviews gave us a working understanding of the key elements of the reforms and their rationales. We then proceeded to two regions to gauge what was happening at the operational level. We chose Region II and Region III for two reasons. First, each region was reputed to have a distinctive approach to Superfund enforcement, aspects of which could be expected to run counter to parts of the reform package. Region II was known to proceed against PRPs with particularly aggressive, almost prosecutorial approach, attitudes and procedures, while Region III reportedly used enforcement practices that focused more on negotiation and accommodation. We reasoned that the various reforms could pose different challenges for each region. Second, those two regions encompassed states whose relationship with EPA varied from collegial to almost adversarial, and thus posed good interview opportunities to explore a range of federal-state issues raised by the reforms.

Our research indicates that unlike previous attempts at “reforming Superfund,” the recent administrative changes have been successfully implemented at the regional level. We are confident of that finding in the two regions we investigated, and our interviews with national actors and those familiar with other regions suggest that the broad goals of the reform effort have been obtained to a significant degree throughout the country. We attribute that success in implementation to a number of factors, including effective leadership, a carefully designed reform package, and a pervasive sense that if the operation of Superfund were not changed in important ways, the program would be significantly weakened by legislation from an unfriendly Congress. Implementation of the reforms has been accompanied by substantial improvement in aggregate measures of program output, though we are not in a position to determine how much of that improvement is due to operation of the reforms, and how much can be attributed to other factors relating to maturation of the program.

We also found that the regions contributed independently to the reinvention effort. Examples of successful processes and procedures adopted in some regions served as models for the national reforms. And the regional offices successfully adapted to the new requirements while continuing to pursue the main goals of the Superfund program: protecting the public from the effects of hazardous waste and (when possible) getting the polluters to pay the bill.

In our view, the reinvention effort successfully addressed the key challenges facing Superfund, so our recommendations are less about effecting change than responding to its

consequences. “Faster” means that spending will accelerate and Congress must face the issue of how to finance the program in light of the expiration of the taxes that support the Superfund trust fund. And as more construction is completed, and as less permanent remedies are chosen across a number of sites, the issue of continuing oversight and monitoring becomes more significant. Further, the states are expected to play an increasingly prominent role in the future of hazardous waste cleanup, and we found that relationships here continue to be ambiguous and sometimes rocky.

**PAPER 16****TOWARDS INTEGRATED APPROACHES  
TO COMPLIANCE ASSURANCE**

**Jeanne Herb  
Mark Stoughton  
Jennifer Sullivan  
Michael Crow**

**Tellus Institute**

**EXECUTIVE SUMMARY**

There is broad agreement at the federal and state levels that the traditional emphasis on penalty-based enforcement approaches to compliance assurance is inadequate. Through the Office of Enforcement and Compliance Assurance (OECA), EPA has publicly committed to promoting and practicing integrated approaches to compliance assurance. Such integrated approaches involve a combination of three types of tools: enforcement, compliance assistance, and compliance incentives. OECA has long held that neither compliance assistance nor compliance incentives work very effectively without a strong enforcement “hammer.” As a result, OECA views enforcement as an essential part of any integrated approach.

Compliance assurance is, however, among the most contentious issues in the post-2000 EPA policy agenda. The broad agreement between and within EPA and the states regarding the need for integrated approaches breaks down over two sets of issues. The first are essentially disputes over the proper application of federalism in the administration of the national environmental statutes. The second are instrumental: questions concerning the details and efficacy of individual compliance assurance tools, and the most effective means of constructing and implementing integrated compliance assurance approaches. This study focuses on these instrumental questions, with two objectives:

- First, to inform the ongoing effort within EPA and the states to move integrated approaches to the center of compliance assurance policy. This represents a shift in traditional enforcement approaches, and one for which there are few established models. It is thus incumbent upon EPA and the states to derive maximum learning from those models that are available.
- Secondly, to inform an ideologically charged debate between EPA and the states that often conflates instrumental questions (e.g., the efficacy of compliance assistance) with ideological positions concerning the proper conduct of federalism. This and similar research may produce a more constructive base for dialogue between

EPA and the states.

This study examined six EPA national and regional integrated compliance assurance initiatives in detail, using publicly available documents, internal documentation, and extensive interviews with EPA officials and members of the relevant regulated communities. The study also conducted a focused survey of the literature and a set of interviews with enforcement experts in the academic, environmental/NGO, and regulatory communities.

The study focused on three instrumental issues at the center of the debate over the proper conduct of integrated approaches.

1. *The public cost-effectiveness of integrated assurance approaches.*
2. *The proper mix of compliance assistance and enforcement.*
3. *Effective organization and implementation of integrated approaches*

We judged the integrated compliance assurance initiatives examined for this study to have been generally effective. This conclusion is not unexpected, as we selected the initiatives in part on the basis of perceived success. In general, integrated approaches to compliance assurance are strongly indicated by the best current knowledge regarding sources of non-compliance. EPA's stated position that integrated approaches depend for their success on a credible threat of enforcement is supported by scholarship, our interpretation of the case studies, and, indeed, all the stakeholders interviewed for this project.

The six integrated initiatives studied are atypical—a majority of the work conducted by OECA and regional enforcement managers and staff is focused on more traditional enforcement activities. However, these initiatives do demonstrate that innovative, integrated approaches to particular compliance problems are being designed and implemented, both at the headquarters and the regional level. And, rather than standing alone as “reinvention” or “pilot” projects, these initiatives are a part of the day-to-day work of EPA's compliance assurance functions.

The initiatives provide in many cases models that merit wider duplication; they also illustrate the measurement and organizational challenges EPA must meet. We present analysis and discussion, structured around a number of common observations and issues, intended to facilitate such learning. From this analysis, we make the following recommendations to EPA:

1. **Continue and expand the use of integrated approaches.** Because we found the six integrated initiatives we studied to have been effective uses of EPA's resources, and because integrated approaches are strongly indicated by the best current knowledge regarding sources of non-compliance, we recommend continued and expanded use of integrated initiatives, under the conditions outlined by the remainder of our recommendations.

The initiatives we studied do not engage EPA in the essential task of fostering and rewarding innovative approaches to compliance assurance by the states, who are responsible for the large majority of compliance assurance activity. Neither state initiatives nor the state-federal relationship were the subject of this study. However, our earlier research on the National Environmental Performance Partnership System (NEPPS) made clear that there is significant tension between state and EPA enforcement personnel regarding what types of innovative compliance assurance approaches are appropriate; many state personnel have the perception that EPA is not supportive of *any* innovative state activity in this area. EPA should clearly communicate principles for the design of integrated approaches, and reward such activity by the states.

2. **Assure flexibility in the design and implementation of integrated initiatives.** The success of integrated initiatives depends substantially on three key factors: the appropriate selection of tools, the application of these tools to an appropriate target population, and the commitment of adequate resources. EPA must assure that essential flexibility is available in each area to those designing and implementing integrated approaches.
  - **Design flexibility.** In the design of initiatives, those in the agency with the best understanding of the particular compliance problem must maintain the flexibility to balance issues such as the nature and complexity of the industry, nature and severity of violations, compliance history, and the geographic distribution and size of the target universe.
  - **Targeting flexibility.** Effective targeting is essential to the success of integrated initiatives. The basis of effective targeting is appropriate flexibility in regional implementation of national compliance assurance priorities. This implies a more consultative process of regional goal setting than has been employed historically.
  - **Resource flexibility.** Self-disclosure initiatives in particular tend to create unexpected demands on agency resources—from high response rates, from spillovers to other regions, or from poor response requiring increased inspections. EPA offices and regions must retain the resource flexibility to follow through on initiatives to maintain credibility. This may require revisiting MOA commitments, and ensuring that sufficient reserve funds are available nationally to cover unexpected costs.
3. **Continue efforts to institutionalize the audit policy.** In concept, the audit policy represents an important change in the nature of EPA's interaction with the regulated community: the principle that violations assiduously discovered and forthrightly disclosed are treated very differently than those concealed deliberately or by neglect. The audit policy—a key compliance incentive tool for EPA—is only now being perceived within the agency and without as an established tool rather than a novelty or pilot. EPA's recent steps to better institutionalize the policy must be continued,

leveraging the release of the revised policy. The regulated community's awareness of and access to the policy should be improved.

4. **Commit convincingly to new measurement metrics.** OECA's revised compliance assurance metrics and guidance are relatively new; old enforcement activity measures dominate in the perception of regional staff, if not in reality. While EPA and OECA are under significant pressure to quantify program results, failure to institutionalize the new measures—and to give credit to measures which may, inevitably, be less rigorously quantifiable than enforcement activity counts—disadvantage integrated initiatives. In the longer term, further research into outcome measurement and compliance verification technologies will address some—but by no means all—barriers to outcome measurement.
5. **Focus on effective coordination and communication.** Integrated approaches rely on coordination among single-medium programs, between compliance assurance and policy/program and compliance assistance offices, between EPA regions, and among states. The research identifies several approaches that seem to effect better coordination. Initiatives should emulate these models, or employ appropriate substitute mechanisms.

## Endnotes

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<sup>1</sup> U.S. Environmental Protection Agency, Report of the EPA Innovations Task Force, *Aiming For Excellence: Actions to Encourage Stewardship and Accelerate Environmental Progress*, EPA 100-R-99-006 (July 1999).

<sup>2</sup> General information is available at [www.state.nj.us/dep/opppc/silver.html](http://www.state.nj.us/dep/opppc/silver.html)

<sup>3</sup> Letter from Bill Stone, project manager, Environmental Assistance Division, MIDEQ, Nov. 10, 1999 (on file with author). General information is available at [www.state.mi.us/deq/ead/tasect/c3/](http://www.state.mi.us/deq/ead/tasect/c3/).

<sup>4</sup> Mich. Admin. Code r.336.2401 et seq.

<sup>5</sup> Available at <http://www.pca.state.mn.us/programs/projectxl/xl-leg.pdf>

<sup>6</sup> See Letter from Lisa Lund, deputy associate administrator, EPA Reinvention Programs, to Karen Studders, commissioner, Minnesota Pollution Control Agency, September 8, 1999, available at <http://www.pca.state.mn.us/programs/pubs/ei-mpcaltr.pdf>

<sup>7</sup> The statute is available at <http://www.pca.state.mn.us/programs/projectxl/la-bill.pdf>

<sup>8</sup> A program description is available at <http://www.epa.state.il.us/iso14001/summary.html>

<sup>9</sup> The work is being done through the ABA's Subcommittee on Alternative Regulatory Measures of the Government Policy Liaison Committee of the Section of Environment, Energy and Resources. The website will be available through <http://www.abanet.org/environ/committees.html> A partial list is presently available at <http://www.pca.state.mn.us/programs/projectxl/envin-leg.html> (maintained by the Minnesota Pollution Control Agency).

<sup>10</sup> Available at <http://www.sso.org/ecos/Projects/reg%20innovations/reginno.htm>

<sup>11</sup> John H. Cushman, Jr., "EPA Withdraws Plan to Empower States," *New York Times*, Sunday, March 2, 1997.

<sup>12</sup> Fred Hansen, deputy administrator, EPA, memo to reinvention ombudspersons, "Recall of Draft Proposed EPA/State Agreement concerning Process for Dealing with State Requests for Speedy EPA Response to New Approaches They Wish To Pursue," Feb. 25, 1997, emphasis added.