4. Innovations in Core Functions

Description of Core Functions

This section summarizes the progress on 25 XL innovations. These innovations are catalogued by the Agency's core functions: (1) regulations; (2) permit reform; (3) environmental information management; (4) enforcement and compliance assurance; (5) environmental stewardship; (6) stakeholder involvement; and (7) Agency culture change. The core functions are the different processes and operations that EPA must use in order to perform its mission to protect public health and to safeguard the natural environment. These core functions are defined briefly below.

Regulations

A significant portion of EPA's work concerns developing regulations that define for the regulated community and the public the legal requirements that implement Federal statutes passed by Congress. Under Project XL, EPA seeks to identify the potential for, and confirm the usefulness of, new and flexible approaches to be incorporated into regulations. XL projects have provided Agency regulation writers with data and results that allow them to include options that they might not have otherwise. Project XL has been particularly successful at exploring specific regulatory options under the Clean Air Act (CAA) and the Resource Conservation and Recovery Act (RCRA).

Permit Reform

A permit is an authorization, license, or equivalent control document issued by EPA or a State agency to implement the requirements of an environmental statute or regulation. Federal permitting requirements are very important environmental protection tools, but they can pose a burden for regulated entities and regulators alike. Fresh approaches to environmental permitting have been taken in XL, which project participants believe have produced significantly better results for facilities' operations and for the environment than has the standard permitting process.

Environmental Information Management

EPA has national information policy and management responsibilities: these include information content and quality issues for both internal decisionmaking and public purposes. EPA's regulations and permits have data collection and reporting requirements which can be burdensome for facilities to prepare and for regulators to collect, when publicly presenting environmental information and results. In many cases, States are the primary collectors and managers for this information. The required data is often in a specified format that is difficult for the general public to understand and obtain. Several XL projects are exploring different approaches to potentially improve the Federal and State systems of environmental information management.

Enforcement and Compliance Assurance

EPA and authorized States are responsible for ensuring that the regulated community complies with Federal environmental statutes. To do so, an array of approaches are employed, including regulatory enforcement, compliance assistance, and compliance incentives. In XL, the important concept of self-certification is being explored to improve enforcement and compliance. Self-certification approaches give facilities the opportunity to report on

a specified set of environmental performance measures (including sampling actions, sampling results, regulatory compliance, and regulatory violations) which could reduce the need for government inspections. These self-certification approaches have been explored by a number of States, and two XL projects are providing a platform for their testing.

Environmental Stewardship

Environmental management systems (EMS), pollution prevention, and recycling are pathways to environmental stewardship, helping organizations improve their environmental performance and potentially go beyond regulatory compliance. In particular, an EMS allows an organizations to systematically address environmental decisions, and focus on improvements in compliance rates and other measures of environmental performance. Pollution prevention, or "source reduction" as defined by the 1990 Pollution Prevention Act, involves protecting natural resources through conservation or increased efficiency in the use of energy, water, and other resources. Recycling shares many of the advantages of pollution prevention: they both reduce the need for treatment or disposal by conserving energy and natural resources. A number of XL projects have been platforms for testing different EMS approaches, and projects have also incorporated pollution prevention and recycling activities into their agreements.

Stakeholder Involvement

The term "stakeholder involvement" generally means that interested parties are given an opportunity to participate in the development and implementation of projects that may affect them. A stakeholder may be an organization, governmental entity, or individual. Past, present, and potential participants in Project XL have identified the stakeholder involvement process as an area in which all groups (e.g., project sponsors, EPA and State staff, and public participants) would benefit from additional experience and better guidance. Project XL has produced hard-won insights into the site-specific, multistakeholder process and its role in Agency experimentation and innovation.

Agency Culture Change

For EPA, the goal of culture change is to reuse those Agency processes and behaviors which limit its ability to address constantly changing conditions—environmental, technical, socioeconomic, and political— with new, creative solutions. Project XL has served as a laboratory for creating a work environment that supports multi-media innovation. In using XL to design and test potential innovations, the Agency has undertaken management, teambuilding, and experimentation challenges.

Table 5 is a summary of project innovations sorted by core function. This table is designed to give the reader a "roadmap" for the rest of this document. It is not intended to be used as a checklist for future projects. New core functions will be added to this table as appropriate as the XL portfolio of innovations evolves and expands.

Table 5: Project Innovations Sorted by Core Function

	Regulations	Permit Reform	Environmental Information Management	Enforcement and Compliance Assurance	Environmental Stewardship	Stakeholder Involvement	Agency Culture Change	Emerging Innovations
Programwide						X	X	
Intel		X	X					X
Weyerhaeuser	X	X	X	X	X			X
Vandenberg AFB					X			
HADCO	X							
Witco	X				X			
Merck		X	X					
Berry		X	X		X			
Molex	X							
Lucent					X			
Massachusetts DEP				X				
AtlanticSteel								X
Exxon								X
Andersen								X
New York State DEC								X
3M (proposal)	X							

Regulations

Through XL projects, EPA is collecting data about regulatory options that may not otherwise be considered. XL projects are exploring operational flexibilities in air, water, and solid waste regulations. So far, XL project proposals have focused on hazardous air pollution under CAA regulations and hazardous waste recycling under RCRA.

Since the CAA passage in 1990, a large proportion of EPA's rule making activities have involved the ongoing development of National Emission Standards for Hazardous Air Pollutants (NESHAPs). These standards are required by Section 112(d) of the CAA, which dictates that EPA regulate the emissions of 189 hazardous air pollutants (HAPs). The intent of Section 112 is to protect public health by requiring new and existing "major sources" of these HAPs to reduce their generation through pollution prevention or to control their emissions to the level possible through the use of Maximum Achievable Control Technology (MACT). This technology-based requirement must take into account cost, non-air-quality impacts, and energy requirements. NESHAPs are generally structured in terms of numerical emissions limits, although under certain conditions they can specify a design, equipment, work practice, or operational standard. Two projects in implementation—Weyerhaeuser's Flint River Facility and Witco's Sistersville Plant— are testing issues related to existing or forthcoming MACT regulatory provisions.

Aside from XL projects that have reached final agreement and are underway, one XL proposal also has affected a MACT rule revision. The 3M Hutchinson XL proposal did not reach final agreement, however, one of the flexibilities 3M requested in that project was incorporated into the direct final rule (listed in the Federal Register on April 9, 1999) for HAP emissions from magnetic tape manufacturing operations. Based on the 3M proposal and other industry input, EPA determined that it would be useful to offer regulated entities an alternative compliance option for balancing HAP emissions from solvent storage tanks with those from other pieces of process equipment.

RCRA regulations classify hazardous waste as either characteristic or listed. Characteristic wastes have measurable properties which indicate that a waste poses enough of a threat to require regulation. EPA established four hazardous waste characteristics: ignitability, reactivity, corrosivity, and toxicity. Listed wastes come from generic industrial processes, certain sectors of industry, and unused pure chemical products and formulations.[3] For example, the wastes F006, F012, and F019 are electroplating wastes and have been the subject of several XL projects. F006 waste, which is the toxic waste of concern in the HADCO and Molex projects, is defined as wastewater treatment sludges from electroplating operations.

Tables 6 and 7 identify the regulatory flexibilities that are being tested in five different XL projects for MACT and RCRA rules, respectively.

The commitments and results generated by these XL projects illustrate the adaptability that is possible in complying with existing regulatory requirements. These XL examples address several questions that have been raised about existing regulatory requirements. These questions include: (1) Is the approach used in existing rule makings the best way to identify alternative compliance strategies? (2) How can experimental approaches be considered in a regulatory system? (3) Do adaptive, performance-based alternatives create incentives for regulated entities to go beyond compliance? (4) How can recycling alternatives best be identified in a highly restrictive regulatory environment?

As EPA seeks to promulgate new rules, it is expected that current and future XL projects will continue to positively influence how these rules are proposed, interpreted, and implemented. Environmental problems like urban air toxics and persistent, bioaccumulative, and toxic pollutants may present additional opportunities for exploring flexible regulatory approaches that achieve greater environmental benefits at less cost to industry.

Recently, EPA proposed a RCRA rule to ease storage and shipping requirements for F006 wastes that are sent directly to recycling facilities. The electroplating industry claims the reduced regulatory costs will increase the quantities of F006 that are

[3]These wastes are listed according to waste categories, such a F, K, P, and U. Wastes from non-specific sources are F codes, wastes from specific sources are K codes, and wastes from commercial products are U and P codes. Wastes from non-specific sources include material-specific wastes generated by a variety of processes. This category of wastes include solvent wastes, electroplating wastes, metal heat treating wastes, and dioxin-containing wastes.

Table 6: MACT Regulations

Weyerhaeuser Corporation	Witco	3M (Proposal)
For the Integrated Pulp and Paper NESHAP and Effluent Limitations Guidelines Rule, there are three project provisions that offer regulatory flexibility. (1) Pulp mills may be given additional time to comply with the Bleach Plant MACT requirement if they participate in the Effluent Guidelines Voluntary Advanced Technology Incentives Program. (2) Pulp mills can eliminate specific production vent control requirements if they clean up different parts of the mill through participation in the Clean Condensate Alternative Program. (3) Pulp mills will be given an extension of up to 8 years from promulgation of the MACT standards for high-volume vents at kraft-pulping processes. This extension provides an opportunity to adopt pollution prevention technologies that would not be used otherwise.	For the forthcoming Miscellaneous Organic Processes NESHAP, Witco is testing the use of flexible air pollution control technologies similar to the process vent controls that are expected to be required under the rule.	For the Magnetic Tape Manufacturing Operations NESHAP, 3M and others submitted data that suggested existing HAP regulatory requirements could be amended to allow more operational flexibility with no additional HAP emissions.

Table 7: RCRA Regulations

HADCO Corporation	Molex
HADCO is testing the feasibility of a conditional delisting of its copper-laden waste streams to enhance the recycling of this material.	Molex is obtaining a temporary variance from hazardous waste regulations that will allow the company to recover more of the metals from electroplating wastestreams that have been segregated and separately treated.

recycled and reduce the amount of F006 that is currently landfilled. Electroplaters who choose to recycle F006 (rather than landfilling it) will be allowed to double the amount of time F006 may be stored onsite, from 90 to 180 days (or 270 days in some cases), without obtaining a hazardous waste storage permit. The longer storage periods are expected to cut waste handling and shipping costs, making recycling a more affordable option to many electroplaters.

The following section highlights the results these XL projects have achieved in testing compliance options within the CAA and RCRA regulations.

Integrated Pulp and Paper NESHAP and Effluent Guidelines

Experiment(s): The Weyerhaeuser Flint River pulp manufacturing facility in Oglethorpe, Georgia signed an XL Final Project Agreement (FPA) in early 1997 that will verify compliance options in the MACT standard provisions of the Pulp and Paper Cluster Rule. Negotiations with Weyerhaeuser on the XL project affected two major aspects of the Cluster Rule: bleach plant and kraft pulping operations.

With its bleach plant operations, Weyerhaeuser was instrumental in demonstrating that superior environmental performance is possible through the use of innovative technologies. The Effluent Guideline Voluntary Advanced Technology Incentives Program, a compliance option incorporated into the Cluster Rule, encourages bleach plant operators to install advanced technologies or make process changes (e.g., extended delignification or totally chlorine-free processes) that will further reduce releases of toxic pollutants to the environment beyond the Rule's limits. If a mill enrolls in this program and can meet the stricter discharge limits through application of advanced technologies, the facility receives rewards and incentives such as public recognition; reduced monitoring, inspections, and penalties; and additional time to comply with the MACT standards. The Weyerhaeuser mill is likely to go beyond the bleach plant Cluster Rule requirements for the incentives program. Nevertheless, the Flint River plant is confirming the usefulness of this incentives program and its potential for achieving higher environmental performance.

For kraft-pulping operations, the Cluster Rule incorporates another compliance option called the Clean Condensate Alternative. The Weyerhaeuser Flint River facility also expects to exceed the requirements to comply with this option since it is going through a mill modernization program that will reduce condensate vent streams throughout the facility. Nonetheless, the Flint River Facility's will-

ingness to redesign the mill with this option in mind was instrumental in creating this opportunity within the Cluster Rule requirements. The Clean Condensate Alternative focuses on reducing HAP emissions throughout the mill by reducing the HAP mass in process water streams. By lowering the HAP mass loading in these streams, fewer HAPs will be volatized to the atmosphere. To demonstrate compliance, the level of mass emission reduction of HAPs achieved by the alternative technology must equal or exceed the level which would have been achieved by implementing the kraft-pulping vent controls. Many of the pollutants that are ultimately emitted from production vents originate in the mill condensates that are recycled throughout the mill; thus, if a mill could reduce these condensates instead of controlling individual specified vents, it should be allowed to do so.

The Cluster Rule also provides incentives for using pollution prevention technologies in kraft-pulping operations, the air standards provide for an extension of up to eight years from promulgation. For high volume vents at kraft-pulping processes, this extension is designed to encourage mills to install pollution prevention technologies that will reduce toxic air pollutant emissions from the pulping process as well as both air and water pollutant discharges from the bleaching process. EPA Region 4 and the Georgia Environmental Protection Division (EPD) have agreed to provide the Weyerhaeuser Flint River facility the flexibility to test and demonstrate HAP emission reductions through the use of multi-media, pollution prevention approaches. It is expected that Weyerhaeuser will be installing pollution prevention technologies to reduce both emissions from the pulping process as well as multi-media discharges from the bleaching process.

Results: The Cluster Rule will have significant national environmental impacts as mills move to comply with its requirements. Emissions of more than 160,000 tons of toxic air pollutants (59 percent of current levels) will be eliminated. Chloroform discharges to water will be reduced by 99 percent from proposed levels. Dioxin and furan discharges to water will be reduced by 96 percent from proposed levels. Dioxin and furan loading to sludges will be reduced by 96 percent from proposed levels.

The Weyerhaeuser's Flint River Facility's efforts to reduce its environmental burden will be equally impressive. Its long-term goal is to reduce bleach plant effluent flow by 50 percent, to 10 cubic meters per air dried metric ton of finished product (fluff pulp used to make diapers) by the year 2006. The environmental benefits projected to be achieved include: (1) a two million-gallon-a-day, monthly average water-use reduction (the bleach plant water requirements are approximately 50 percent of the total plant water usage); (2) reductions in effluent biological oxygen demand, total suspended solids, and adsorbable organic halides; and (3) HAP emission reductions.

To reach its goal, Weyerhaeuser plans to conduct feasibility studies on its water-use management. The results of these studies will be used by EPA, the State of Georgia, and Weyerhaeuser to negotiate an NPDES permit to be issued in 2002. The permit will contain enforceable measures for reducing effluent flow to an agreed-upon level by 2006. Weyerhaeuser will prepare a site-specific MACT alternative compliance plan (to be followed by an EPA site-specific rule) that will detail how it will reduce HAP emissions to levels equal to or exceeding those required under the MACT rule. This plan will include how Weyerhaeuser plans to use the Clean Condensate Alternative to reduce HAP emissions.

Transferability: The Pulp and Paper Cluster Rule has been promulgated and now regulates toxic air pollutants in 155 of the 565 pulp, paper, and paperboard mills in the United States. It also regulates toxic water discharges from 96 of those 155 mills. Individual mills may choose the control technologies and process change combinations that are the most advantageous for them to meet these regulations. As noted earlier, many of the compliance options associated with the Rule were created as a result of data and information from the Weyerhaeuser XL project.

NESHAP for Magnetic Tape Manufacturing Operations

Proposal: The 3M Hutchinson XL proposal did not reach final agreement. However, one of the flexibilities 3M had requested is being used in the revised Magnetic Tape Manufacturing operations MACT standard. This recent amendment to a 1994 industry-specific HAP rule illustrates EPA's willingness to amend regulatory requirements when the regulated community can provide persuasive data suggesting new alternatives. Since the 1994 rule was issued, 3M provided EPA with data showing that the volume of HAP emissions from uncon-

trolled solvent storage tanks is very close to that of HAP emissions from uncontrolled vessels of mix-preparation process equipment. By balancing emissions from these uncontrolled sources against those sources in the process line that are controlled, 3M was able to suggest alternative control options. EPA accepted 3M and other industrial data, and proceeded to amend the 1994 rule providing facility owners and operators with 25 options for "undercontrolling" tanks and/or mix- equipment vessels based on the level of control they achieve on their coating lines. 3M developed this data in conjunction with a regulatory flexibility proposal the company submitted to Project XL.

Results: EPA published this MACT rule amendment as a direct final rule because it believed that this would be a noncontroversial change. The final rule amendment was effective on June 8, 1999, since no adverse comments were received. EPA believes that this change to the previously promulgated 1994 rule will increase compliance flexibility for affected sources without any adverse environmental consequences.

Transferability: The MACT rule amendment is a permanent change to an earlier promulgated rule. It is expected that this permanent amendment will increase compliance with this regulation, enhance flexibility for affected entities, and save companies money in compliance costs.

NESHAP for Miscellaneous Organic Processes

Experiment(s): The Witco XL project strives to reduce air emissions through a combination of flexible air pollution control and waste minimization/ pollution prevention (WM/PP) activities. The polyether methyl capper unit is the focus of air emission control efforts. The capper unit is the site of a two-step reaction that results in one of Witco's products, methyl-capped polyether. Methyl chloride, dimethyl ether, and methanol emissions generated in the capper unit during production of the methyl-capped polyether will be collected and routed to a new process vent incinerator installed on the capper unit.

EPA and West Virginia Department of Environmental Protection (WVDEP) agreed to a deferral of the RCRA Subpart CC organic air emission standards applicable to Witco's two surface impoundments. These surface impoundments are one-million-gallon reservoirs that hold wastewater from the facility's pollution control equipment and other sources. If not deferred, the Subpart CC standards would have required Witco to install air emission controls on these impoundments. However, Witco could have replaced the existing reservoirs with open-top reservoirs that are not regulated under RCRA Subpart CC, and air emissions would not have been reduced. With the deferral, Witco will now install a vent incinerator on the capper unit and initiate WM/PP activities.

Based on an XL-generated site-specific rule, Witco installed the vent incinerator in lieu of complying with RCRA organic air emission standards. In 2000, EPA plans to promulgate NESHAPs for "miscellaneous organic processes," called "the MON." Production activities at Witco's Sistersville facility are classified as one type of these miscellaneous organic processes. Based on current understandings of its development, it is expected that the MON will require a level of process vent controls similar to the level required for the vent incinerator installed by Witco under the XL project. Therefore, the Sistersville project will provide superior environmental performance only until the MON is in effect. The XL Final Project Agreement (FPA) requires a reevaluation of the project following proposal of the MON. Witco will prepare a project reevaluation report within 90 days following the close of the comment period for the MON. If EPA, the WVDEP, and other stakeholders agree to continue the project, the FPA will be amended to identify new approaches to achieve superior environmental performance beyond the MON requirements.

EPA and WVDEP consider the WM/PP initiatives to be an important contribution to the superior environmental performance offered by the Witco XL project. The applicability of the WM/PP initiatives could be limited if the requirements proposed in CAA Subpart YYY are applied to the initiatives. As proposed, CAA Subpart YYY would apply if Witco begins recovering substances listed in the proposed CAA Subpart YYY. If Witco starts recovering these substances, EPA and West Virginia will consider issuing a limited scope "allowable exclusion/allowable increase" deferral of the regulations on a case-by-case basis. This deferral would be issued with the provision that EPA and West Virginia find that it will not cause an increase in actual emissions of volatile organic compounds or cause a net adverse environmental impact. Further, Witco must re-

main in compliance with the provisions of the project. If such a deferral is granted, EPA and West Virginia will propose site-specific regulations implementing the deferral.

Results: The vent incinerator destroyed at least 98 percent of the organic compounds (by weight) in the vent stream. This is a requirement of the Sistersville site-specific rule. The Witco project provides a pilot demonstration of the potential benefits for allowing air emission control technology flexibility under RCRA regulations in order to provide superior and less expensive environmental protection. Installing a process vent incinerator on Witco's capper unit in return for deferral of air emission standards for its surface impoundments will lead to air emission reductions several years earlier than would have been obtained without undertaking the XL project. In addition, undertaking this project will allow Witco to defer the expenditure of approximately $2 million in environmental control costs for several years.

Transferability: Flexibility in the control of air pollutants by Witco's Sistersville plant shows the adaptability that is possible in complying with air regulatory requirements. These adaptions may be applicable to other plants that are facing similar compliance problems and should be investigated relative to existing and future air emissions issues.

RCRA Conditional Delistings and Solid Waste Variances

Experiment(s): Under the RCRA regulations, regulated entities may petition the Agency to exempt or exclude materials from being classified as a solid or hazardous waste. Two of the RCRA procedures being tested in the HADCO and Molex projects are conditional delistings and solid waste variances, respectively. *Delisting* is a form of relief for generators and handlers of listed wastes with low concentrations of hazardous constituents. Through a site-specific process, a waste handler can submit to an EPA Region or State a petition demonstrating that even though a particular waste stream (generated at its facility) is a listed hazardous waste, it does not pose a sufficient hazard to merit RCRA regulation.

Generators, owners, and operators of hazardous waste management facilities also may petition EPA for a *variance* from their wastes being classified as a solid and hazardous waste. The Agency may determine on a case-by-case basis that certain materials should not be classified as a solid and hazardous waste.

The HADCO project is examining ways to overcome barriers to the recovery of metals that are associated with sludge waste. There are three HADCO facilities, in two different States— New York and New Hampshire— currently involved in the project. The HADCO project is testing various aspects of hazardous materials recycling. Transporting hazardous waste sludges offsite is costly and there are risks inherent in their long-distance transport. Onsite recycling of some of these materials may be economically feasible. The HADCO project is addressing three different waste recycling and reduction questions: (1) Can F006 RCRA wastes be safely recycled by primary metals smelters or other appropriate metal reclamation facilities? (2) Is it possible to recycle copper dusts, a current by-product of HADCO operations that is being sent to a landfill? (3) Does the installation of sludge dryers safely and economically reduce the volume of sludge wastes? The HADCO project hopes to demonstrate that new regulatory approaches to safely handling sludge can favor recycling certain wastes throughout the printed wiring board (PWB) industry.

Molex has upgraded its Lincoln, Nebraska facility's wastewater treatment system to optimize the recovery of metals used in its electroplating processes. Molex is optimizing the recovery of metals by operating a segregated treatment system for nickel, copper, and tin/lead wastestreams. EPA and Nebraska issued Molex a temporary variance from hazardous waste regulations based on the company's agreement to: (1) routinely collect environmental data on the waste sludges and wastewater effluent; and (2) collect appropriate cost information associated with the operation of the segregated treatment system and sludge handling activities. Obtaining the temporary variance classifies its segregated process sludge as a "commodity-like" material rather than as a hazardous waste, allowing Molex to change not only the method of shipping (to common carriers from hazardous waste haulers subject to RCRA regulations), but also the shipping frequency (on an as-needed basis, rather than every 90-days as required for hazardous waste).

Results: HADCO will measure the benefits of its copper recycling experiments by estimating the reduction of air emissions associated with their truck shipments of sludge wastes. The company's 1998 goal is to reduce by 75 percent its air emissions based on F006 sludge shipment records from 1995 through 1997. HADCO's 1999 annual report will describe its progress on meeting this goal. Similarly, HADCO expects to include in its 1999 report the project-related savings from the reclamation of its copper drilling, sawing, and edging dusts, as well as from the reduction in copper use throughout the facility. HADCO installed one sludge dryer in its Derry, New Hampshire facility, and the company's goal is to reduce the sludge from this facility by 40 percent. HADCO will describe the utility of the sludge dryer installation in its 1999 report and discuss the feasibility of installing dryers in other New Hampshire facilities.

The Molex project is approximately one year old, and the company's reports on progress will be available starting in October 1999. Molex intends to document superior environmental performance by demonstrating: (1) that its segregated waste treatment system is technically feasible; (2) that through greater metals recovery the environment will benefit from a reduction of the amount of metals discharged to the community's publicy owned treatment works (POTW); and (3) that a greater quantity of wastewater treatment sludges can be recycled or reclaimed. Molex intends to show that regulatory relief causes no adverse environmental impact and that the strategy is economically feasible. Information concerning status of the project will not be available until late 1999.

Transferability: By offering regulatory flexibility to HADCO and Molex, EPA and the States of New York and New Hampshire, and Nebraska, respectively, will be able to evaluate the effectiveness of offering a conditional delisting or solid waste variance for RCRA-listed wastes, such as F006, so as to encourage metals recycling and reduce solid waste generation. Many PWB manufacturers face similar environmental problems as HADCO, and the results of this experiment may offer some data on how these problems may be addressed at other facilities.

The Molex project expects to reduce metals' loadings in its effluent discharges to the Lincoln, Nebraska POTW by at least 50 percent. This goal should provide a benchmark against which other potential requests for temporary variances may be measured. Fundamental to both of these XL projects will be the environmental and economic feasibility of these alternative compliance strategies. It must be demonstrated that these regulatory flexibilities not only cause no adverse environmental impact but also in fact offer significant environmental benefits.

Permit Reform

Over the past three decades one of the most successful methods of protecting the environment has been EPA and State programs requiring industrial and municipal facilities to obtain permits that limit their emissions and discharges to the air, land, and water. Permits, which contain detailed descriptions of proposed activity and operating procedures, are the chief vehicles through which statutes and regulations are translated into facility-level ordinances. Permit provisions may include any combination of requirements addressing: (1) limits on emissions or effluents; (2) monitoring, reporting, and record-keeping; (3) pollution treatment or control technologies; (4) management practices; and (5) pollution prevention requirements. Permits are typically issued by States, or EPA when a State permitting program has not yet been approved by EPA. Interested stakeholders are encouraged to provide input into the permitting process during the mandated public comment opportunities.

In XL projects, fresh approaches to the process and substance of environmental permitting have been taken, which project participants believe have produced significantly better results for facilities' operations, as well as less burden on the environment. Table 8 briefly describes the permitting innovations used in the these four projects.

EPA's permitting requirements are defined under a variety of Federal statutes and regulations covering air, water, and waste.

Table 9 describes the types of environmental permit requirements by environmental statute for the two media—air and water—in which XL has piloted innovations.

Project XL's experiments with permitting approaches will answer the following questions about EPA's requirements and practices: (1) Is multi-media permitting a viable method for certain applications? (2) Can permits incorporate incentives for superior environmental performance and pollution prevention? (3) How can the surrounding community be better informed and involved in the permitting process? (4) What are the best means to eliminate iterative and costly permit reviews for industry while maintaining, or even improving, environmental performance? (5) Are tailored, sectorwide permitting approaches useful?

Table 8: Permitting Innovations

Jack M. Berry, Inc.	Intel Corporation	Weyerhaeuser Corporation	Merck & Co., Inc.
Would have consolidated multiple operating permits from multiple regulatory agencies into a single multi-media permit.	Establish plant site emission limits (PSEL) caps to allow production changes and facility expansion without recurring air quality permit reviews.	Integrate dual emission caps into an air quality permit to allow production changes without unnecessary recurring permit reviews. Revised effluent limits and streamlined permit renewal process for National Pollution Discharge Elimination System (NPDES) permits	Permit with facilitywide emission caps and tiered reporting to allow production changes without recurring air quality permit reviews.

Many current environmental statutes reflect a single media, "command-and-control" focus that is replicated in Federal and State permitting regulations. Project XL permitting pilots are testing means to go beyond this traditional permitting approach and move toward more performance-based permits. The essence of this performance-based approach is to shift the focus of environmental permitting toward measurement and assurance of performance, while providing flexibility in how a regulated entity meets performance standards. In theory, a system that focuses more on a facility's overall environmental impacts, and less on narrow decisions about particular technologies or process changes, should be more beneficial to the public as well as less prescriptive for the facility.

EPA has underway a series of important initiatives and stakeholder dialogues that are focused on permitting or have a major permitting component. These activities include: the Permit and Sector Action Plans, the EPA's Task Force on Innovative Approaches to Environmental Protection, and the Pollution Prevention in Permitting Program. Project XL's experiments will provide essential information to the cross-agency permit improvement process. In particular, the Innovations Task Force

Table 9: Environmental Permit Requirements by Environmental Statute for XL Pilots

Clean Air Act (CAA)	New major stationary sources of air pollution and major modifications to major stationary sources are required by CAA to obtain an air pollution permit before beginning construction. The process is called New Source Review (NSR) and is required regardless of whether the major source or modification is in an area where the National Ambient Air Quality Standards (NAAQS) are exceeded (nonattainment areas) or in area where air quality is acceptable (attainment area) or unclassifiable. Permits for major sources in attainment or unclassified areas are referred to as Prevention Significant Air Quality Deterioration (PSD) permits, while permits for major sources located in nonattainment areas referred to as nonattainment New Source Review (NSR) permits. PSD permits establish source limitations and serve the primary basis for enforcement of NSR requirements in attainment areas. PSD permits define as clearly as possible what is expected of the air emissions source. They also ensure that major new sources, and major modifications existing major facilities, will be constructed and operated in compliance with the applicable NSR regulations. The Title V State operating permit program requires major stationary sources of air pollution to be permitted in order operate. Title V requires States to establish permitting programs for all major stationary sources to demonstrate that facility is in compliance with all relevant air regulations, such as National Emission Standards for Hazardous Air Pollutants (NESHAP), New Source Performance Standards (NSPS), and applicable State Implementation Plan (SIP) requirements.
Clean Water Act (CWA)	There are two basic operating permits under the Clean Water Act (CWA): Section 404 permits and National Pollutant Discharge Elimination System (NPDES) permits. Water permits regulate discharges with the goals of (1) protecting public health and aquatic life, and (2) assuring that every facility treats wastewater. To achieve these goals, water permits include the following terms and conditions: • Site-specific discharge (or effluent) limits; • Standard and site-specific compliance monitoring and reporting requirements; and • Enforcement provisions, in cases where the regulated facilities fail to comply with the provisions of their permits. The CWA requires an NPDES permit to discharge pollutants from any point source into the waters of the United States. NPDES permits establish effluent limits and specify Best Management Practices (BMPs), as well as monitoring and reporting requirements. They also regulate the discharge from municipal wastewater treatment plants, which collect domestic and industrial wastes through sewers, and from industrial point sources and concentrated animal feeding operations that discharge into other wastewater collection systems or that discharge into ground or surface waters. than 200,000 sources are regulated by NPDES permits nationwide. Sources that discharge indirectly into United waters, for example, facilities that discharge wastewater through publicly owned treatment works with an NPDES must themselves be permitted by the POTW.

was formed to take stock of EPA's reinvention work and find new and improved approaches to environmental compliance and performance. XL projects and other innovations to streamline permit processes in air and water regulations will support the permit reform commitments made as a result of the Task Force's Report, *Aiming for Excellence*.

The section below highlights Project XL's results in two permitting reform innovations: consolidating multiple media permits into a single multi-media permit, and using facilitywide emission caps and effluent limits.

The Consolidated Multi-Media Operating Permit (COP)

Experiment(s): The Berry citrus juice processing plant, like most other manufacturing facilities, has been required to obtain multiple permits from multiple regulatory agencies. Air- quality, water-quality, and consumptive-use regulations govern the plant's boilers, feed mill dryers, drinking water, industrial wastewater, and water use operations. Under Project XL, Berry intended to consolidate these individual permitting requirements into a single Comprehensive Operating Permit (COP). The COP would offer the opportunity for coregulators (in this case the EPA, the Florida Department of Environmental Protection, and the South Florida Water Management District) to eliminate Berry's burdensome requirements for preparing multiple permit applications on differing and sometimes conflicting schedules.

The COP would have consolidated selected operating permits and requirements, maintained all environmental standards, and committed Berry to superior environmental performance. The streamlined permitting approach was also expected to result in cost savings to the facility operator by reducing administrative burdens. In turn, Berry agreed to invest these cost savings into the installation of updated equipment and implementation of updated procedures used in citrus processing, in order to reduce air emissions of volatile organic compounds (VOCs), sulfur dioxide (SO_2), and nitrogen oxide (NOx).

Results: During the initial phase of COP development Berry employees and the State of Florida worked together on the development of detailed work procedures. However, after the Berry XL project had been underway for almost a year, Cargill, Inc. (an international marketer, processor and distributor of agricultural products) took over as the operator, but not as the owner of Berry's LaBelle, Florida facility. Although some project commitments had been met, EPA and the State of Florida chose to terminate the agreement after attempts to engage Cargill in the process failed. The COP was not submitted, and the project was terminated on June 2, 1999.

Transferability: EPA will document the methodology used in preparing the standard work procedures in order to develop a case study of the process that will be available to Federal and State permit writers. Also, Project XL will continue to seek opportunities to test the COP concept at another facility. In March 1999, EPA approved a detailed plan for "The Next Generation in Permitting." The COP concept is an integral part of this plan and is expected to be a key component in the Agency's ongoing permit improvement proces.

Facility-Wide Permit Air Emission Caps & Water Effluent Limits

Experiment(s): The complexities of air and water regulations require a considerable effort by both regulators and facilities in their preparation and review of permit applications for many process modifications. XL is testing how innovations in the air and water permitting systems can reduce the facility's environmental impact, while streamlining the permitting process and reducing paperwork. Using facilitywide emission caps and effluent limits are two ways to bring about such changes. Facilitywide emission caps and effluent limits are facility constraints designed to prevent growth in discharges from both existing and future stationary sources. In general, such provisions require that any emission increase from equipment at a facility be offset by emission reductions from other equipment under the same cap. XL pilot experiments with facilitywide emission caps and effluent limits cover the following air and water permits: Prevention of Significant Air Quality Deterioration (PSD), New Source Review (NSR), Title V of the Clean Air Act, and the National Pollutant Discharge Elimination System (NPDES).

Table 10 describes the variety of facility-wide permit innovations XL projects are testing.

Results: Under Project XL's flexible approach to permitting, businesses have avoided costly production delays. They also have improved their worker health and safety standards, increased the public's access to useful environmental information, and reduced their facility's emissions to the environment:

- During 1997 and 1998 Intel's Chandler facility has remained well under its air emission caps. The facility continues to avoid millions of dollars worth of production delays by eliminating 30 to 50 permit reviews a year. The company has found the facilitywide approach to be so successful that Intel is implementing performance-based concepts for air emissions at two other company facilities.
- During 1997 and 1998 the Weyerhaeuser Flint River facility has remained under its caps. Weyerhaeuser has achieved reductions of 12 to 20 percent in air emissions of particulate matter, total reduced sulfur, NOx, CO, and VOCs relative to actual pre-XL levels. The amount of biological oxygen demand (BOD) and total suspended solids (TSS) per ton of finished product have been reduced by 50 percent. Weyerhaeuser achieved savings of $176,000 during the first year of operation under the XL project.
- Merck's first air emissions report is due in March 2000. The company expects to avoid millions of dollars worth of production delays by eliminating repetitive permit reviews.

Transferability: By focusing on the total emissions of a facility, XL is testing and confirming flexible emission reduction strategies that may be both duplicated at similar facilities across the country and integrated into EPA's existing regulatory regime. Concepts tested by Project XL have already been integrated into the national regulatory system. The recent Pharmaceutical MACT regulations promulgated in April 1998 have incorporated lessons learned from the Merck final project agreement, allowing the limited preapproval of certain types of production changes without requiring permit revision for each modification. The Agency is formally considering further expanding this use of preapproval and "cap permits."

Table 10: XL Projects' Facilitywide Permitting

	Approach	Permit Type(s)	Emission Caps & Effluent Limits
Intel Corporation	EPA and the State of Arizona have provided Intel with the flexibility to make equipment and process changes and construct new facilities at the site without air quality permit reviews, as long as the Plant Site Emission Limits (PSELs) are not exceeded and all other final project agreement and permit limits are met. To provide an additional safety factor, Arizona Ambient Air Quality Guideline limits for hazardous air pollutants (HAPs) will not be exceeded at the Intel facility property line or elsewhere on the site.	Minor NSR	The emissions for the entire facility are capped as follows: VOCs at 40 tons per year; NOx and CO_2 at 49 tons per year each; SO_2 and particulate matter at five tons per year each; phosphine at four tons per year and sulfuric acid at nine tons per year; organic HAPs and inorganic HAPs at 10 tons per year each.
Weyerhaeuser Corporation	EPA and the State of Georgia have modified the facility's existing air quality permit to include dual emission caps for air pollutants. The dual emission caps are (1) a cap that allows the recovery furnace, smelt dissolving tank, calciner, and combination boiler (the facility's four major sources of emissions) to be operated to their design capacity without triggering permit review; and 2) a cap covering all facility sources except those four major sources. The modified air quality permit streamlines the permit renewal process, includes alternate excess emission reporting protocols, and includes a protocol for conducting manufacturing process experiments without triggering a permit review. Revised Weyerhaeuser's NPDES permit to include more stringent effluent limits; streamlined the permit renewal process; eliminated sampling requirements due to improvements in process technology; removed a requirement for additional assimilative capacity studies; and allowed for annual compliance in lieu of periodic discharge monitoring reporting due to a 16-year history of no exceedance.	NSR NPDES	The caps reduce allowable air emissions by 60 percent. The dual emission caps apply to particulate matter, SO_2, NOx , CO_2, VOCs , and total reduced sulfur (odor-causing pollutant). The permit includes more stringent effluent limits on biological oxygen demand (BOD), total suspended solids (TSS), and adsorbable organic halides (AOX). Fish tissue permit sampling requirements were eliminated.
Merck	EPA and the State of Virginia issued a new PSD air quality permit for a facilitywide air emissions cap at the Merck Stonewall Plant. Under the new permit, changes or additions to facility operations that result in emission increases would no longer require prior approval under either Federal or State regulations. The new permit provides the flexibility to implement a change in operations that increases emissions within the constraints of the emission caps. In addition, Merck will have the option of reducing the facilitywide caps instead of implementing specific control technologies prescribed by certain future regulations. A comprehensive monitoring, record keeping, and reporting program will increase in stringency as actual emissions approach the cap,to provide an incentive for Merck to minimize air emissions.	PSD Permit	The facility wide cap limits total emissions of criteria air pollutants to levels 20 percent below baseline (i.e., prior actual emissions), SO_2 emissions to levels 25 percent below baseline levels, NOx emissions to levels 10 percent below baseline levels, and particulate matter to levels approximately equal to baseline levels.

Project XL's tests of facilitywide permit alternatives also have the potential to directly influence many of the Agency's permitting initiatives. For example, case studies concerning particular XL projects might prove useful in the development of permit writer training materials for any of the cross-agency permitting initiatives.

Environmental Information Management

In October 1998, Administrator Browner issued a memorandum titled "Meeting the Information Challenge," which conveyed her decision to establish a new information office. This office will lead the Agency in the collection, management, and dissemination of environmental information, promoting it as a strategic resource to enhance public health and environmental protection. This centralized office will represent a relatively new approach to information management across government: it will identify and coordinate information needs, seek burden reduction for existing requirements, coordinate technology investments, improve public access, and increase the public's ability to use information from multiple sources. In addition, the States and EPA have a dialogue underway to identify burden reduction strategies. The framework of this State/EPA effort centers on four distinct questions: (1) What information is needed to support program goals and help achieve desired environmental results? (2) How is information (i.e., the technology, the format, and the strategy) transmitted between interested parties? (3) How is information being used and released to the public?[4] (4) What standards are needed (e.g., Confidential Business Information) to protect the integrity of the data? To contribute to these reinvention efforts, XL is experimenting with approaches that seek to: (1) improve public access to information through the Internet; (2) gain more stakeholder input into data presentation; (3) build performance-based incentives into reporting requirements; and (4) eliminate obsolete, duplicative and unnecessary monitoring, recordkeeping, and reporting requirements of Federal, State, and local levels. In particular, projects tackle the reporting requirements for the facilities' operating permits that are a significant burden for companies to prepare, regulators to review, and stakeholders to understand. Four projects include an innovative information management component as described in Table 11.

EPA's reporting and recordkeeping requirements are defined under a variety of Federal statutes and regulations. Each EPA media program (air, water, waste, toxics) establishes reporting requirements to document performance under each of its major regulations. For many programs, the specific reporting requirements imposed on a source are defined in a State-issued permit, and States are the initial recipients and primary users of these reports. In other cases, reporting and record keeping requirements are triggered by events rather than permit conditions. Table 12 highlights key reporting requirements, by environmental statute.

Table 11: Environmental Information Management Innovations

Intel Corporation	Merck & Co., Inc.	Weyerhaeuser Corporation	Jack M. Berry, Inc.
Using the Internet to improve public access to the facility's environmental information. Improving data quality by using a multistakeholder group to design the reporting format. Consolidating Federal, State, and local reports into quarterly reports.	Building into reporting requirements, incentives to improve environmental performance by raising environmental monitoring, recordkeeping, and reporting requirements as air emissions approach permit cap levels.	Consolidating multiple routine recurring permit reports for air and water quality into two reports a year. Completing an annual self-certification report that certifies compliance with all applicable effluent discharge limits.	Simplifying, streamlining, and consolidating the reporting burden by using a series of nonstandard forms based on an innovative comprehensive operating permit.

Project XL's experiments with information management address the following questions about EPA's requirements and practices: (1) What are the opportunities to improve the efficiencies—time, cost and personnel—of reporting environmental information for individual facilities and companies? (2) How can surrounding communities gain better access to information that is more timely, clear, and meaningful? (3) What is the appropriate use of facility-based information in a national reporting system? (4) How can electronic media improve the reporting system? (5) Can reporting schemes incorporate incentives for superior environmental performance and pollution prevention? (6) Is per-

[4] *Launching State/EPA Burden Reduction Efforts: A Report From the State/EPA Information Management Workgroup.* March 25, 1999.

Table 12: Overview of Selected Statutes' Reporting Requirements[5]

Clean Air Act	Originally enacted in 1970 and amended in 1977 and 1990, the Clean Air Act (CAA) controls the release to the of more than 380 pollutants. The primary mandates of the initial legislation are to (1) establish National Uniform Ambient Air Quality Standards (NAAQS) for "criteria" pollutants (ozone, sulfur dioxide, nitrogen oxide, carbon monoxide, particulate matter, and lead); (2) establish New Source Performance Standards (NSPS) that apply or modified sources of certain pollutants; (3) establish vehicle emissions standards and fuel content standards control emissions from mobile sources; and (4) establish National Emission Standards for Hazardous Air Pollutants (NESHAP). In addition, the CAA requires EPA to promulgate standards for Prevention of Significant Deterioration (PSD) aimed at keeping areas that are in compliance with NAAQS from backsliding. NSPS and NESHAP requirements vary by sector in some cases. CAA implementation at the facility level is also addressed by Title the CAA, under which EPA has established a permit program for major sources. Title V of the CAA Amendments of 1990 established a permitting process whereby all Federal requirements applicable to a facility are rolled into single permit. Depending on the sector of the facility in question, the permit conditions, applicable standards review processes (e.g., NSPS, PSD) may require some monitoring, record keeping and reporting. For example, sources subject to NSPS may have a continuous emission monitoring system (CEMS); maintain CEMS records; report CEMS startup, shutdown, or malfunction; and submit written quarterly reports of excess emissions.
Clean Water Act	The goals of the Clean Water Act (CWA) are to make U.S. waters fishable and swimmable, and to eliminate discharge of pollution into U.S. waters. The primary means of working toward these goals is the National Pollution Discharge Elimination System (NPDES), which regulate direct discharges from point sources to surface waters through a permit system. Facilities that discharge indirectly to surface waters through publicly owned treatment works (POTWs) are subject to pretreatment standards as well as local ordinances. Direct dischargers must submit discharge monitoring reports (DMRs) on a regular basis, and are also subject to a variety of event-driven reporting requirements, such as written reports of noncompliance with permit conditions. Some indirect dischargers also have regular monitoring and reporting requirements, but event-driven requirements are more numerous. The also contains permit application requirements for stormwater discharges.
Resource Conservation and Recovery Act	The Resource Conservation and Recovery Act (RCRA) and its amendments establish a complex, comprehensive "cradle-to-grave" system to regulate the generation, treatment, storage, and disposal of hazardous waste. It contains provisions regulating underground storage tanks. Some RCRA requirements–most notably the hazardous waste manifest–are designed to track the flow of hazardous wastes to ensure proper disposal. Numerous recordkeeping requirements are associated with tracking requirements.
Emergency Planning and Community Right-to-Know Act	Title III of the Superfund Amendments and Reauthorization Act is known as the Emergency Planning and Community Right-to-Know Act (EPCRA). EPCRA has four main components and types of requirements: emergency planning; emergency notification; community right-to-know; and toxic chemical release reporting. primary EPCRA reporting requirement is the well-known Toxic Release Inventory (TRI), under which certain facilities must submit estimates of total releases of hundreds of hazardous substances. EPCRA also requires facilities to inform designated state and local planning groups about the presence, handling, and release of hazardous substances. Finally, facilities must develop emergency response plans to be used in case of emergency releases.
Toxic Substances Control Act	Unlike most of the other statutes that EPA enforces, the Toxic Substances Control Act (TSCA) is primarily concerned with regulating risks from the use of commercial chemicals rather than production by-products like emissions or wastes. However, TSCA also contains provisions relating to asbestos, indoor radon and lead-based paint. The heart of the program is the premanufacture notice (PMN), which must be submitted at least 90 days to manufacture or importation of a "new chemical substance." The PMN provides EPA with basic information about the substance, such as chemical composition. In addition to the PMN, under TSCA EPA requires quadrennial reporting of annual production volumes of toxic substances, known as the "Inventory Update."
Safe Drinking Water Act	The Safe Drinking Water Act (SDWA) established National Primary Drinking Water Regulations, including Maximum Contaminant Levels (MCLs), for contaminants that may occur in public water systems. SDWA requires regular monitoring, reporting, and associated recordkeeping requirements. Reporting is also triggered by noncompliance events.

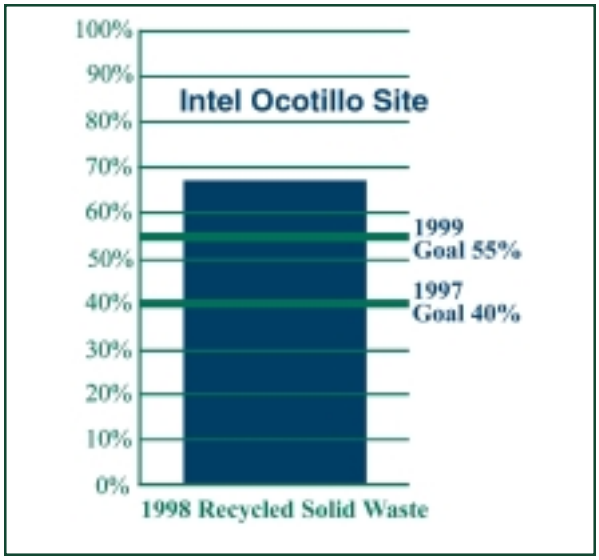
formance-based reporting more effective and efficient than traditional approaches? (7) Are multimedia or integrated reporting effective methods? (8) What will be the best means to reduce the number and frequency of reports, while increasing the quality of the data? (9) Is self-certification by the regulated community, subject to regulator verification, an effective substitute for permitting and routine compliance reporting? Project XL will work with the new EPA Information Office to assess and disseminate lessons learned from these innovations. The Office of Reinvention is planning to evaluate the benefits and challenges of XL's information management approaches to pass on to the new information office in 1999.

[5] *Reporting Reform: The Case for A Joint EPA/State Strategy*, One Stop Reporting Program, April 28, 1998.

The section below highlights XL's results in these areas, some of the issues raised by stakeholders in the XL process, and the questions the Agency's future evaluation of the benefits and challenges should address.

Enhancing Public Access: Internet Reporting and Stakeholder Input

Experiment(s): The Intel project has two innovations designed to improve public access to information: (1) using stakeholder input to help redesign the content and format of the reports on the environmental performance of the Ocotillo semiconductor facility in Chandler, Arizona; and (2) making these reports available on the Internet. The facility's new reporting format was designed in conjunction with the stakeholder team that included EPA, the Arizona Department of Environmental Quality, the Maricopa County Bureau of Air Pollution Control, the City of Chandler, and members of the Community Advisory Panel (CAP). Figure 1 shows a graph from Intel's recent annual report. Based on input from the stakeholder team, Intel agreed to put routine environmental reporting requirements and accountability measures into a single, integrated report that is publicly available on the Internet via Intel's Project XL website, *http://www.intel.com/intel/other/ehs/projectxl/index.htm.* Now citizens, as well as regulatory officials, can routinely monitor progress toward the facility's environmental commitments. This approach tests the value of getting comprehensive environmental information *directly from the company*. While the long-term goal is that Intel's Internet form can be merged directly into the State and local agency information systems, for the time being all data must be re-entered.[6]



Results: Intel set a precedent for making facility-based environmental information publicly available on the Internet, and the regulators and public stakeholders involved with the Intel project have universally endorsed this approach. It is enhancing public access to environmental performance data and the timely availability of information to the public.

However, while the public stakeholders appreciate having facility information readily available on the Internet, they cautioned that the Internet is not a panacea for increasing public access to information. For example, the needs of public stakeholders with limited or no access to computers must be addressed. Other projects enhancing public access in ways supported by public stakeholders include the Witco project, which both appointed a Project XL contact at the facility to serve as a resource for the community, and established public files on the project at the local library. Also, under the XL project, in exchange for reducing the number of reports filed with the State of Georgia, the Weyerhaeuser facility now provides information directly to the public upon request, and the facility has agreed to make even more data available than was previously reported.

The format and data presentation of Intel's redesigned report is also well regarded by Project XL regulators and public stakeholders who have described the report as citizen-friendly, concise, and easy to use. However, there is some feedback that Intel's reports could provide more detail about potential health effects and more cross-references to source documentation.

[6] "The current reporting system relies on a mix of paper forms and electronic information systems. Data originates at a facility, where it is often entered into a computer for storage. Submission of that data to a government agency, however, requires transferring it to a paper form. The agency receiving the paper report must then rekey the same data into its system to make use of it. If a State agency is the first recipient, it forwards the data to EPA, where it then must be rekeyed for use in EPA systems. The technical means for "electronic reporting," the electronic transmission of data directly from facility computers to the computers of regulatory agencies, exists today and is improving rapidly. Electronic reporting has the potential to reduce labor costs for both reporters and regulators, as well as to eliminate errors caused by rekeying of data. [Regulatory changes are needed to permit] electronic reporting for most Federal programs..., but EPA is working to overcome [these hurdles]. In addition, electronic reporting is being piloted in many States." From *Reporting Reform: The Case for A Joint EPA/State Strategy*, One Stop Reporting Program, April 28, 1998.

Transferability: The multistakeholder input approach and the Internet access to information have proven so innovative that EPA has incorporated Intel's approach into the "Guide to XL Project Teams—Project Tracking and Reporting," which strongly encourages that all future projects develop similar Internet reporting formats with interested stakeholders. The Agency has a number of efforts underway to improve public access to facility environmental information. Intel's project can help facility-based electronic reporting gain acceptance by other companies and regulators. Also, the stakeholder involvement approach can create an opportunity to make community participation more meaningful: for example, by allowing firms to redesign reporting mechanisms in ways that enhance community understanding and trust.

Future assessment of the information management transferability of these two innovations must address these questions: (1) Is this an efficient way for companies to exchange data with the States and other regulators directly responsible for collecting facility performance information? (2) How can data standards be sufficiently flexible to implement these innovations? (3) Can the paperless format used in this approach address the needs of the current and potential information customers? (4) How do needs vary among the many different groups of information users? (5) What data standards can be flexible enough to meet local facility and community needs, yet also be manageable on a Statewide and national scale? (6) Can this approach improve EPA's responsiveness to varied customers and needs?

Tiered Reporting – Building Incentives into Data Collection Requirements

Experiment(s): The Merck project provides an innovative three-tiered approach to monitoring, record keeping, and reporting linked to its air quality permit. A site-specific rule and new Prevention of Significant Deterioration (PSD) permit, developed through the Merck project, provide alternative methods for complying with applicable state implementation plan air quality rules, New Source Review (NSR) air emission regulations, and certain provisions of the Resource Conservation and Recovery Act (RCRA) relating to air emission controls on hazardous waste equipment. The new PSD permit includes a facilitywide cap for total criteria air pollutants and subcaps for SO_2, NOx, and particulate matter with a diameter of less than 10 microns. The requirements for monitoring, record keeping, and reporting increase in stringency as the facility's actual total criteria air emissions approach the sitewide emissions cap. Annual reporting is required when facilitywide emissions are less than 75 percent of the cap. Semi-annual reporting is required when facilitywide emissions are between 75 percent and 90 percent of the cap. Monthly reporting is required when emissions are equal to or greater than 90 percent of the total emissions cap. This provides an incentive for Merck to purchase the cleanest available technologies and to maintain low air emission levels.

Results: The three-tiered monitoring, record-keeping, and reporting requirements will become effective no later than 12 months after Merck completes the installation of new equipment which converts its coal-fired powerhouse to natural gas. Powerhouse conversion is required to be completed no later than 30 months after the permit's effective date (project to be complete by August 2000).

Transferability: When this approach is fully underway, the analytical questions for its transferability study must include: (1) How useful is the data for the local, State, and Federal users? (2) What must a facility do to implement this approach? (3) Can it be transferred into a multi-media approach? (4) What are the barriers? (5) Are there upcoming rules or regulations which should consider incorporating this approach?

Consolidated Reporting – Streamlining the Reporting Burden

Experiment(s): Table 13 describes the variety of approaches projects are testing for consolidated reporting of the environmental information required by Federal, State, and local regulations.

Results: The Intel and Weyerhaeuser projects' reporting mechanisms have been underway since 1997. The companies, regulators, and stakeholders involved believe that the Intel and Weyerhaeuser projects have generally resulted in detailed, value-added reporting. However, stakeholders' comfort with this approach is not absolute: for example, one stakeholder for the Intel project wants more technical details to be available to the public, as well as the technical assistance to interpret the information, so that the community can better evaluate the potential impacts on health and the environment, and then influence the company's decisionmaking process for choosing among different available technologies or chemicals. This desire has been

echoed by other national interests. The Merck project's reporting mechanisms are projected to start in 2001. Berry had not initiated the reporting mechanisms before that XL project was terminated in June 1999.

Transferability: A number of State programs are looking to transition to a consolidated "one stop" reporting system. In keeping with this trend, EPA plans to further explore the Federal component of the consolidated reporting and burden reduction opportunities represented by the Intel, Merck, Weyerhaeuser, and the former Berry projects. EPA will ask the following questions: (1) What are the duplicative data elements? (2) Are there regulatory or statutory barriers to eliminating these data elements? (3) How well have the innovations worked for the local, State, Federal, and public users of the data? (4) What efficiencies do companies gain by doing consolidated reporting, and what resources or procedures are required? (5) What company investment is needed to proceed with consolidated reporting? (6) Can these approaches (e.g., the various integrated formats) be transferred to a national reporting structure, and what are the barriers? (7) What incentives could be provided to a company to participate in consolidated or tiered reporting?

Table 13: XL Projects' Consolidated Reporting

	Description	Programs Affected
Intel Corporation	Intel has consolidated recurring and routine reports into four quarterly reports and one annual report. The consolidated reporting format was designed in conjunction with EPA, the Arizona Department of Environmental Quality, the Maricopa County Bureau of Air Pollution Control, the City of Chandler, and a Community Advisory Panel (CAP) consisting of area residents.	Internet reports cover air quality, water quality, and solid and hazardous waste reporting requirements, with the exception of the reports Toxic Release Inventory (TRI) required under the Emergency Planning and Community Right-to-Know Act (EPCRA) which are required to be prepared and submitted separately.
Merck & Co., Inc.	The requirements for monitoring, record keeping, and reporting become more stringent as the facility's actual emissions approach the facilitywide cap under Merck's air quality permit. Monitoring, record keeping, and reporting will be performed by Merck according to the reporting tier determined by the current 12-month rolling total. Tier I has the least stringent requirements; more frequent reporting is required when Tier II or Tier III requirements are in effect.	The tiered reporting covers air quality emissions specified by the innovative PSD permit.
Weyerhaeuser Corporation	The Weyerhaeuser project allows the facility to consolidate reporting into two annual comprehensive reports for some of the Federal, State, and local permitting and regulatory programs that apply to the facility. The reports eliminate some sampling requirements and allow annual compliance self- certification in lieu of periodic discharge monitoring reporting.	The comprehensive, less frequent reports cover drinking water, water quality discharges, groundwater and surface water use, and air quality. Self-certification covers discharge monitoring reporting for the NPDES permit.
Jack M. Berry, Inc.	The Berry project had been designed to have a multi-media consolidated permit in place, and the State of Florida would have allowed Berry to use nonstandard forms in reporting environmental performance.	The nonstandard forms would have applied to air quality, drinking water, industrial wastewater, groundwater monitoring, and fresh water use reporting. Also, the State of Florida may not have required Berry to provide certification of environmental reports by a professional engineer, because the Comprehensive Operating Permit would have been more extensive than a certified professional engineer's application.

Enforcement and Compliance Assurance

One of EPA's most important responsibilities is to ensure that companies comply with the laws that protect human health and the environment. However, while EPA has already established a strong enforcement program, the Agency has also increasingly sought to identify additional tools for the regulated community that may both improve day-to-day compliance and achieve performance at levels beyond compliance. One of these tools is self-certification. Self-certification approaches give facilities the opportunity to report on a specified set of environmental performance measures including sampling actions, sampling results, regulatory compliance, and regulatory violations. Several States have sought to incorporate self-certification into their compliance assurance strategies. Self-certification has been used by States in a variety of ways: to reduce reporting burdens, to reduce the amount of labor-intensive inspections and allow States to reinvest resources into higher priority problems, and to increase the number of facilities addressed by States' enforcement and compliance systems. Two projects are providing a platform for testing self-certification approaches, as described in Table 14.

Table 14: Self-Certification Approaches

Weyerhaeuser Corporation	Massachusetts Department of Environmental Protection
Completing an annual self-certification report that certifies compliance with all applicable effluent discharge limits.	Testing how environmental management systems and self-certification concepts can be used to improve compliance and other performance measures within specific industry sectors.

XL's experiments in self-certification consider the following questions: (1) Is self-certification by the regulated community, subject to regulator verification, an effective substitute for routine permitting and compliance reporting? (2) Is self-certification an effective incentive or reward for environmental performance beyond compliance?

Using Self-Certification as a Means to Verify, Reward, and Improve Compliance

Experiment(s): The Weyerhaeuser project allows the facility to eliminate some sampling activity and to provide annual compliance self-certification in lieu of periodic discharge monitoring reporting for the NPDES permit. This limited self-certification process was allowed due to the company's 16-year history of meeting all required discharge levels, combined with the project's committment to superior environmental performance. Weyerhaeuser is still required to maintain required sampling and lab analysis records, and all upset, malfunction, or non-compliance reporting will continue as required by applicable regulations. These records are available upon request by regulators and the public. Weyerhaeuser will remain subject to the State of Georgia's standard enforcement protocol, as required by the State's NPDES permit program.

The Massachusetts DEP project - known as the Environmental Results Program (ERP) - works to give the regulated community the flexibility to decide the most cost-effective ways to comply with or exceed the State's performance standards. ERP uses self-certification and EMSs, in lieu of State permits, for several small-business sectors (e.g., printers, photo processing, and dry cleaners). Beginning with a demonstration project of 23 companies, industry representatives cooperated with Massachusetts DEP to establish criteria for reporting compliance with the State's performance and operating standards. A key component of ERP focuses on corporate accountability and self-evaluation. ERP provides a period of outreach and training for companies on compliance and other performance standards, after which the companies submit a statement in which they certify compliance with applicable environmental standards and that they will maintain compliance for the coming year. Self-certifications are signed under the penalties of perjury by the facility's owner, president, CEO or other high-ranking official. If a facility is not in compliance when it self-certifies, it must identify the existing violation(s) and include a Return to Compliance Plan that specifies how and when compliance will be achieved. The ERP approach—with clear performance standards written in plain language, targeted compliance assistance, an emphasis on pollution prevention, and required annual

self-certifications—promises to yield environmental results superior to those achieved through traditional permitting. At the same time, Massachusetts DEP has designed ERP with an emphasis on strong enforcement. All companies participating in ERP are, and will remain, subject to regular State inspections and the standard enforcement protocol, including but not limited to the DEP's administrative actions (i.e., notices of noncompliance, administrative orders, and penalties) and referrals to the State's Environmental Strike Force and/or the Office of the Attorney General for civil and criminal prosecution as appropriate. Enforcement will be used against companies that fail to certify, fail to certify on time, submit fraudulent or deficient certifications, or are in violation either at the time of certification or during the subsequent year. While submission of a Return to Compliance Plan does not shield a company from enforcement, ERP recognizes that a firm's due diligence in discovering violations, disclosing problems through the Return to Compliance Plan, and correcting problems quickly provides evidence of a good faith effort to maintain compliance with ERP standards.

Results: The Weyerhaeuser project's self-certification has been underway since 1997, and the company reports that it continues to meet and exceed all of the enforceable discharge levels in the NPDES permit. Weyerhaeuser's records on the required sampling and analysis are now more accessible to the public than previously because all information is available upon request directly from the facility.

The Massachusetts DEP project has been underway for less than a year and does not have results for this innovation yet; the sector-specific addenda required by the FPA will include appropriate evaluation milestones. For example, the umbrella agreement lists anticipated flexibility for the following sectors: Dry Cleaners, record retention; Photo Processors, no flexibility needed; and Printers, expedited State Implementation Plan (SIP) approval, and the VOC limit on alcohol-free fountain solution. Massachusetts DEP plans to measure and evaluate the environmental results of ERP by using environmental business practice indicators (EBPIs),[7] compliance inspection findings, and data reported on certification forms, as well as statistics and random sampling techniques. EPA and Massachusetts DEP acknowledge that some reasonable amount of time must be allowed to pass before final conclusions about a particular sector's response to self-certification can be drawn.

Transferability: When the projects are further along in implementation, EPA's Office of Reinvention plans to evaluate the benefits and challenges of XL's self-certification approaches and then describe how their adoption could affect the current system. The transferability report will cover the following questions: (1) What is the best way to ensure that it is clear who will be doing the self-certification, what will be certified (compliance with the laws, or adherence to some other goal), and what the purposes for the self-certification are? (2) What verification system is needed by States or EPA to support a self-certification process? (3) Can approaches that are effective at the State level be transferred to a national structure? (4) Should self-certification be limited to proven "good performers" or can it be applied on a sectorwide basis? (5) Do companies maintain good performance when allowed to shift from a State's traditional inspection/enforcement regime to a self-certification regime? (6) What efficiencies do companies gain by self-certification, and what resources or procedures are required? (7) Does a sectorwide self-certification approach maintain or improve the environmental performance for the sector? (8) What is required (e.g., inspections) to ensure that those entities not certifying accurately or in good faith are detected and deterred?

[7]EBPIs are essentially industry-specific performance measures that provide a snapshot of a facility's environmental performance. They are practices which, if followed, reflect a facility's level of environmental performance, including both traditional regulatory standards and "beyond compliance " measures. Massachusetts DEP is using data collected from a statistically significant number of random inspections and ERP certification forms to calculate industrywide EBPI scores. Massachusetts DEP does not plan to inspect each regulated facility; instead, the agency will use statistics to determine the appropriate number of facilities from the full universe for random sampling. Inspection data from these facilities will be compared to information supplied on all certification forms. The results of this comparison will be used to determine the accuracy of the aggregate certification data. At that point, an industrywide compliance rate can be determined. *Adapted from Project XL Final Project Agreement for the Massachusetts Environmental Results Program*, July 29, 1998.

Environmental Stewardship

Recent environmental policy studies have concluded that our environmental protection system should "promote high levels of environmental stewardship and continuous improvement in environmental performance."[8] Environmental stewardship is a way of identifying and pursuing good business strategies that are consistent with environmental protection: from choosing environmentally benign raw materials to efficient manufacturing processes and effective environmental management systems (EMSs). Environmental stewardship also means reducing facilities' environmental impacts, increasing operational and economic efficiencies, and improving financial performance. In effect, stewardship allows facilities to derive economic value from environmental excellence.

There are many options regulated facilities can choose to demonstrate their willingness to go beyond regulatory compliance and to improve economic and environmental performance. Under Project XL, organizations are using EMSs, pollution prevention tools and techniques, and recycling to display their commitment to environmental stewardship.

An EMS applies standard business principles to the management of an organization's environmental issues. An EMS does not determine a company's legal obligations; rather, it is a sophisticated tool used by companies to manage compliance and other environmental concerns. In 1998, EPA issued a policy statement that endorsed the use of EMSs that focus on improved environmental performance and compliance, as well as source reduction and system improvement. An EMS can help a company boost efficiency, cut waste, and improve worker safety. It also can bring attention to environmental matters that are not directly addressed through regulation, such as energy use.

Pollution prevention and recycling provide multiple pathways to sustainable development and environmental stewardship. EPA has defined pollution prevention as "source reduction" (which is explained under the 1990 Pollution Prevention Act), and protection of natural resources through conservation or increased efficiency in the use of energy, water, and other materials. Recycling shares many of the advantages of pollution prevention; it can reduce the need for treatment or disposal, and conserve energy and natural resources. Many facilities in fact use a broader definition of pollution prevention that includes recycling.

Tables 15 and 16 identify several projects that are testing EMS, pollution prevention, and recycling options that demonstrate these facilities' commitments to sustainable development.

Table 15: Environmental Management System Experiments

Weyerhaeuser Corporation	Lucent Technologies	Jack M. Berry,Inc.
Establish an EMS and standard operating procedures with links to a Minimum Impact Mill strategy.	Involve regulators in setting annual goals and targets for a corporate EMS. Provide a management framework from which a consolidated multi-media permit can be developed.	Establish an EMS and standard operating procedures with links to a comprehensive operating permit.

Table 16: Pollution Prevention and Recycling Opportunities

Witco Corporation	Vandenberg Air Force Base
Implement a Waste Minimization /Pollution Prevention Plan that will determine whether it is environmentally beneficial to defer regulations as an incentive for encouraging waste minimization/pollution prevention activities. Reduce discharges to wastewater treatment system by reusing/recycling methanol, thereby reducing sludge generation at the facility.	Reduce the facility's air emissions through a performance-based EMS and pollution prevention techniques. This facility is a test bed for the Department of Defense Environmental Investment Program.

[8]"The Environmental Protection System in Transition: Toward a More Desirable Future," Final Report of the Enterprise for the Environment. William D. Ruckelshaus, Project Chairman. January 1998, p. 4.

The environmental stewardship components of these XL experiments will address the following questions: (1) Do EMSs help facilities achieve continuous improvement and environmental performance beyond compliance? (2) How can regulators better participate in the facility use of performance-based environmental management systems? (3) How can pollution prevention and recycling approaches be quantified to demonstrate emission reductions and cost savings? (4) Can pollution prevention techniques and approaches be integrated into regulatory requirements as readily as technology-based approaches? (5) What incentives can be created to encourage pollution prevention and recycling?

The following sections highlight Project XL's current and anticipated results in four areas: (1) linking EMSs to standard operating procedures; (2) using EMSs to streamline requirements; (3) conducting pollution prevention opportunity assessments and investigating recycling options; and (4) pilot testing ways to reduce the regulatory burden at Federal facilities in exchange for increased investment in pollution prevention approaches.

Linking EMSs to Standard Operating Procedures

Experiment(s): Weyerhaeuser is striving to minimize the environmental impact of its manufacturing processes on the surrounding environment by pursuing a long-term vision of a Minimum Impact Mill. Weyerhaeuser will voluntarily institute an EMS at the Flint River facility that conforms to the International Organization for Standardization (ISO) 14001 standard. With the active involvement of its employees, the facility is revising its existing EMS to conform to ISO 14001. The EMS will include operational procedures, record keeping, auditing, quality assurance, and permit requirements. Weyerhaeuser is also developing a comprehensive manual of standard operating procedures for plant employees.

The Berry project also had committed to using ISO 14000. The project was designed to test the EMS approach as a means of promoting continuous improvement in environmental performance, including pollution prevention and source reduction strategies.

Results: For Weyerhaeuser, the overall process of developing ISO 14001 documentation originally was scheduled for completion in mid-1997. The documentation has proceeded slower than expected and is now scheduled for completion in 2000, possibly in 2001. For Berry, the work on the EMS itself had not begun before the project ceased implementation. The company had intended for the standard operating procedures and work instructions developed for the potential Comprehensive Operating Permit to be compatible with ISO 14000. Both Weyerhauser and Berry believe that the strategies they have used to develop the EMSs have resulted in a more environmentally aware workforce. For example, in 1997 Berry reported that developing the standard operating procedures and work instructions helped the company reduce the cost of training and improved day-to-day compliance by focusing on how employees should perform their specific job responsibilities. Also in 1998, Weyerhaeuser reported that engaging their employees in the implementation of the revised EMS had begun to increase staff education and awareness of the environmental aspects of their jobs.

Transferability: When the implementation of the Weyerhaeuser project is further along, the Office of Reinvention plans to evaluate the benefits and challenges of XL's EMS approaches. EPA will seek to work with Weyerhaeuser personnel to collect data assessing the improvement in day-to-day compliance with environment regulations attributable to the EMS. This will assist the Office of Reinvention in meeting a charge by the 1999 Innovations Task Force to report, by 2002, on the use and effectiveness of EMSs in improving environmental performance and achieving results. Also, on March 12, 1998, EPA issued a policy statement in the Federal Register,[9] describing a number of pilot projects—including XL— which will provide data on the actual compliance and environmental benefits of EMS approaches. The Federal Register Notice describes how a group of Federal and State officials involved in EMS pilot projects have been working together to set up a common national database of information gathered through the pilot projects. As part of that process, EPA and States developed a series of data protocols which provide instructions and survey instruments to guide the actual collection of data for the database. The Office of Reinvention's evaluation also will be designed to support the EMS database.

[9] Federal Register: March 12, 1998 (Volume 63, Number 48, Page 12094-12097).

Using EMS Models to Streamline Requirements and Improve Compliance, Highlighting the Involvement of Regulators and Stakeholder in EMS Implementation

Experiment(s): Project XL is testing whether and if different EMS models—corporate models and a small business sector model—can be the basis for streamlining the implementation of State and Federal regulations, consolidating permits, and improving facilities' day-to-day compliance. The goal is to have more cost-effective systems that raise facility managers' awareness of their environmental obligations *before* they make decisions about modifying equipment and operations (rather than at the end of a long, expensive regulatory or permitting process) and allow regulators to focus more on compliance assurance and technical assistance. Table 17 describes EMS models at projects currently underway.

facility's environmental performance that might be attributable to implementation of an EMS. Project XL can collect information on types, amounts, and properties of regulated and nonregulated pollutants that are reduced as a result of an EMS. In particular, XL will be able to provide this information on a multifacility basis (the Lucent project). EPA's EMS Federal Register Notice also states that Federal and State regulators are interested in understanding the involvement of local communities and other stakeholders in the EMS process. The Lucent project can collect data to assess the amount and degree of stakeholder and regulator participation in both the development and implementation of an organization's EMS, and the effect that participation has on the public credibility of the facility's EMS implementation. The EPA Office of Reinvention plans to evaluate the benefits and challenges of these EMS approaches designed to support the Innovations Task Force report and the goals of the EMS database.

Table 17: EMS Models at XL Projects

Company	Description	Goals
Lucent Technologies	Develop a third-party certified, high-quality EMS framework that can be used to: • identify significant, site-specific regulated and nonregulated activities, substances, or processes such as water usage, wastewater discharge, air emissions, energy usage, chemical consumption, raw material consumption, and land use that interact with the environment; • set and achieve site-specific performance goals for reducing environmental impacts; and • ultimately, integrate critical information and performance goals into a single, companywide matrix that facilitates understanding and accessibility for stakeholders, assists in measuring performance and accountability, and potentially serves as the core of a companywide consolidated permit.	To develop site-specific flexibilities that would lead to superior environmental performance and improved environmental management at each Lucent facility. The ultimate goal is to use the EMS as a platform from which the company can, over time, consolidate all Federal and State permits for its domestic facilities into a single companywide multi-media permit. This permit would be based on objectives and targets set annually and jointly by the company and regulators. Involving regulators in this EMS approach would result in a de facto annual review of the permit, eliminating multiyear renewals of individual permits.
Jack M. Berry, Inc.	The Berry project was designed to use the involvement of regulators to conduct courtesy inspections and develop standard operating procedures as part of building its EMS and comprehensive operating permit strategy.	The EMS would have assisted in the implementation of a consolidated, multi-media permit.

Results: The Lucent project has been underway for less than a year, and so specific results are not yet available. Also, although the courtesy inspections by the State of Florida were completed in 1997, the Berry project was on hold for over a year, then terminated, and therefore the EMS was not developed.

Transferability: The EMS Federal Register Notice states that it is critical to measure any change in a

The Lucent project is testing sectorwide applications of EMS concepts using a multifacility corporate model. This experiment will affect EPA's efforts under its Sector-Based Action Plan which seeks to incorporate sector approaches into core Agency functions.

Conducting Pollution Prevention Opportunity Assessments and Investigating Recycling Options

Experiment(s): As part of its project, Witco agreed to (1) reduce air emissions by installing a control device, which is currently not required by regulation; (2) recycle recovered methanol; and (3) implement a comprehensive Waste Minimization/ Pollution Prevention (WM/PP) study. The following discussion focuses on this WM/PP study and methanol recycling.

Normally, WM/PP assessments are conducted as single events and outside of the routine business operations of companies. However, the Witco study was an employee-driven effort that sought to integrate the pollution prevention process into the company's standard business practices, facilitate employee involvement, and implement a site-specific process tailored to the particular needs at the facility. Witco used a multiphased process to conduct the study: (1) identifying and characterizing plantwide wastes and emissions; (2) screening and prioritizing these wastes and emissions; (3) identifying pollution prevention options; (4) screening and prioritizing pollution prevention options; (5) examining the technical and economic feasibility of these options; and (6) developing an implementation plan.

Another aspect of the Witco project is the commitment to recycle methanol. Previously, excess methanol produced in Witco's Sistersville facility was condensed, collected, and either disposed of in the facility's wastewater treatment unit or incinerated. Under the project, Witco is reusing, recycling, or thermally treating 95 percent of the collected methanol. This will minimize the biotreatment of methanol in the facility's wastewater treatment units. An estimated 500,000 pounds of methanol that otherwise would be treated in the wastewater system will be transferred to tank trucks or rail cars for reuse or recycling each year.

Results: A number of pollution prevention options were determined to be technically and economically feasible; Witco is beginning to implement them. Table 18 is a summary of some of the potential cost savings and potential waste or emissions reductions to be gained by the pollution prevention options identified by the Witco WM/PP study.

As a result of the Witco methanol recycling effort, the amount of sludge generated by the wastewater treatment system and disposed of in an on-site hazardous waste landfill will be decreased by about 815,000 pounds per year.

Transferability: Witco's project approach toward pollution prevention and recycling may offer an innovative model for other chemical intermediate-product manufacturers. Some pollution prevention approaches can be implemented through modifications to existing standard operating procedures, combined with careful training on the new procedures, and follow up to ensure those procedures are carried out. This approach requires a clear management commitment on the part of Witco to institute the pollution prevention measures. Witco plans to accomplish this by institutionalizing the approach into the facility's ongoing continuous improvement process. EPA will closely document the results of this experiment to provide useful information for future applications.

Table 18: Witco WM/PP Study Results

Witco Waste Minimization/Pollution Prevention Study		Potential Cost Savings	Potential Waste/Emission Reductions
One-time pollution prevention options - completed in 1998.		$ 42,000	26,000 pounds
Expected recurring/ongoing savings	XL project air emissions reduction and methanol recycle (excludes capital savings).	$ 16,000 per year	1,100,000 pounds per year
	Other pollution prevention options	$620,000 per year*	730,000 pounds per year
	Total savings	$636,000 per year*	1,830,000 pounds per year

*Witco has not yet assigned the expense of implementing these projects, and when it does the net cost savings will be less.

Piloting the Department of Defense Environmental Investment (ENVVEST[10]) Program

Experiment(s): The Vandenberg project will test new budgetary approaches that will allow the Department of Defense (DoD) to spend resources on pollution prevention programs, innovative technologies, and other approaches that will cost-effectively reduce environmental impacts. The Memorandum of Agreement (MOA) established a framework for developing ENVVEST pilot programs at three to five DoD facilities. Vandenberg Air Force Base (AFB), Santa Barbara County, California, has been selected as a prototype DoD facility to pilot the ENVVEST program and implement cost-effective environmental protection.

Through this XL/ENVVEST project, Vandenberg AFB will upgrade ozone-precursor emission controls using resources that would otherwise be spent complying with Title V of the Clean Air Act requirements, such as permitting, record keeping, monitoring, and training. When Vandenberg AFB reduces ozone-precursor emissions to agreed-upon levels, its designation under Title V as a major source of ozone-precursor emissions will be reduced to a designation as a minor source, resulting in a substantial reduction in air emissions and compliance costs for Vandenberg AFB. In the short term, obtaining reductions has focused on boilers, furnaces, and process heaters.

Results: Vandenberg AFB has committed to reducing annual emissions of ozone precursors by two tons per year by April 30, 2000, and by 10 or more tons per year by November 30, 2002. NOx reductions will be accomplished by retrofitting or replacing those boilers with the highest potential for emission reductions, and VOC reductions will be accomplished by assessing the emission reduction potential from solvents, surface coatings, and other VOC emission sources. To date, actual NOx emission data has been collected from nearly 30 preselected candidate boilers to determine baseline emission levels and the potential emission reduction resulting from a boiler retrofit/replacement project. Data on NOx emission reductions (in tons per year) from these boiler retrofit/replacement projects will be available in the next Vandenberg AFB progress report. Similarly, targeted VOC reductions will entail the application of low, and zero-VOC coating substitutions for both architectural and corrosion-control operations. These results will also be available in the forthcoming progress report.

Transferability: The Vandenberg AFB project is testing ways to reduce regulatory burdens at Federal facilities. Likewise, the Vandenberg AFB could be a model and benchmark for other ENVVEST DoD facilities. This innovative approach in applying resources toward high-priority environmental problems that, in turn, will result in lower costs and environmental emissions from the facility, should offer useful data for other DoD applications.

[10]As part of the Administration's reinvention initiative, EPA and DoD signed a Memorandum of Agreement in 1995 that established how the two agencies would interact during implementation of DoD's Environmental Investment (ENVVEST) program. The ENVVEST program emphasizes regulatory compliance through pollution prevention and provides an alternative to prescriptive regulatory requirements through a performance-based environmental management system designed to attain superior environmental results.

Stakeholder Involvement[11]

EPA has learned a tremendous amount in recent years about the value and benefits of opening up its decision-making process and inviting the participation of outside parties, in particular those parties that stand to be most affected by Agency decisions. In this vein, stakeholder involvement is one of the eight Project XL selection criteria. Stakeholder involvement has also proven to be one of the most challenging features of Project XL. The feedback from XL stakeholders[12] in focus group meetings, individual project evaluations, roundtables and stakeholder meetings has exposed a number of different issues, including, but not limited to the following:

- Ground rules for roles and responsibilities are especially important for the sponsor and stakeholders to establish.
- EPA must clarify its role, as well as the role of the project sponsor, in managing a stakeholder group. (In XL, the project sponsor, not EPA, is responsible for initiating and maintaining the stakeholder involvement process.)
- Stakeholders expect that a project sponsor could "orchestrate" stakeholder support.
- Input from local and national stakeholders needs to be obtained early in the project development process.
- In some projects, local stakeholders give the national environmental groups high praise for bringing substantive expertise to the table, which local citizens themselves may lack. However, on other projects the national non-governmental organizations' approach was considered to be "intervention" and disconnected from local citizen involvement.

In using a multi-stakeholder process for XL, the Agency has undertaken several challenges, including: (1) How can stakeholders with different perspectives, agendas, skills, and knowledge best collaborate to produce synergistic solutions to problems? (2) What steps must be taken to ensure that affected stakeholders are aware of and engaged in program activities? (3) How can trust be established between historically adversarial stakeholders? (4) What tools, skills, and resources are needed by the different players in a multi-stakeholder process? (5) What resources in particular do local stakeholders need to be effective participants in the stakeholder process? In response to these challenges, XL has sought out approaches (through principles, tools, and processes) that support collaborative working relationships with project sponsors, government representatives, and stakeholders. Table 19 describes these approaches.

Table 19: XL Approaches to Stakeholder Involvement

Models of Stakeholder Involvement in Experimental Projects	Multi-stakeholder Involvement in a Reengineering Process	Stakeholder Involvement Guide	Capacity and Trust-building Resources
Tracking and assessing the different models of stakeholder involvement that result from the various approaches XL project sponsors' used to manage multi-stakeholder participation.	Using a corporate sector tool called "work process reengineering" to engage stakeholders in major redesign and restructuring of core program practices.	Developing a clear, plain language guide which provides helpful ideas and tools to project sponsors and stakeholders for successful interactions.	Using technical assistance and facilitating meetings in order to improve trust among multi-stakeholder groups, and to build local stakeholder participation.

Currently each program in EPA has its own policies and procedures for involving the public and conducting stakeholder outreach activities. However, the Agency continues to take steps to increase opportunities for stakeholder involvement in its programs, improve the quality of that stakeholder involvement, and share information about various stakeholder involvement strategies. EPA's Stakeholder Involve-

[11]To avoid duplication, this section does not cover innovations in other core functions that address stakeholder involvement issues such as "Enhancing Public Access: Internet Reporting "and "Enhancing Public Access: Stakeholder Input" (environmental information management); and "Highlighting the Involvement of Regulators and Stakeholders in EMS Implementation" (environmental stewardship).

[12]For the purposes of this section, XL stakeholders refer to environmental Non-Governmental Organizations (NGOs), community groups, and individual citizens.

ment Action Plan is a product of the Common Sense Initiative,[13] and is designed to enhance stakeholder involvement throughout EPA by building and sharing lessons learned. Evaluating the adequacy of public participation regulations and policies is also a recommendation of the Innovations Task Force. As the Agency's understanding and capacity to address stakeholder issues evolve, the lessons learned from Project XL can contribute to EPA's overall progress. The section below highlights XL's stakeholder involvement innovations that have potential for broader Agency applicability.

Stakeholder Involvement in Experimental Projects: Identifying Basic Models

Challenge(s): Since the inception of Project XL, EPA has stated that meaningful and organized participation on the part of community and national, non-governmental organization representatives is an important criterion for selecting projects. However, when Project XL was first announced in 1995, EPA did not give specific guidelines for the design of the stakeholder processes. Since the project sponsor, not EPA, is responsible for initiating and maintaining the stakeholder involvement process for projects, EPA left the responsibility for creating models that would meet the stakeholder criterion to those project sponsors. Though sometimes difficult, the experiences of these early projects proved critical to the Agency's understanding of the approaches and resources needed to make the stakeholder process effective.

Results: Project XL has undertaken a commitment to document and evaluate models of stakeholder involvement on an ongoing basis. As a first step, in the report titled *Evaluation of Project XL Stakeholder Processes* (September 1998), EPA examined four early projects with FPAs: Intel, Merck, HADCO, and Weyerhaeuser.

The report found that different models of stakeholder involvement resulted from the original call from EPA for project sponsors to design processes for stakeholder participation. Specifically, the report identified two early models used by the project sponsors: consensus decision-making with stakeholders (used by Intel and Merck), and public consultation and information sharing (used by HADCO and Weyerhaeuser). Weyerhaeuser's project was rated as most effective by survey respondents. This project used a public consultation process that relied heavily on longstanding community-company relationships to establish support for the regulatory experiment. The HADCO project was rated least satisfactory on most measures. This project also used the consultation and information sharing process. The two projects using consensus decision-making processes were ranked in between.

In this evaluation, neither the consensus decision-making model, nor the public consultation and information sharing model was clearly determined to be a superior method of involving stakeholders in the project development process. However, the results did show that clarity of structure and objectives for the process are more important to success and credibility than the type of stakeholder involvement process. The processes that were rated as highly effective — that is, clearly structured with adequate resources — had a combination of broad distribution of benefits (financial, environmental, and public access) among all of the participants and high individual/ organizational satisfaction with the outcome of the negotiation. The processes with barriers to participation (such as lack of technical information, unclear objectives, inadequate resources to participate) were rated less satisfactory regarding the distribution of benefits and the outcome. Thus, process satisfaction and substantive results are closely linked; both are critical elements of the success of future projects. At this time, EPA has chosen to focus on defining the *principles and process* by which stakeholder involvement in projects should be governed, rather than defining a single model. By focusing on principles, the sponsors, as the "managers" of the process, can tailor the stakeholder involvement process to reflect the scope and complexity of the project. EPA expects each project to reflect proportionality between the complexity and uncertainty of the project and the investment in the stakeholder process. This also allows the stakeholders themselves to have a say in how the process is structured and conducted.

Transferability: The lessons learned in managing the stakeholder aspects of Project XL are increasingly being shared with other EPA programs and Federal agencies struggling with similar issues. For example, Project XL's experience and tools were discussed at the President's Council on Environmental Quality's workshop, "Linking Public Par-

[13] EPA launched the Common Sense Initiative in 1994 with the broad purpose of seeking "cleaner, cheaper, and smarter" sector-based approaches to protecting human health and the environment, and has been a primary component of EPA's regulatory reinvention efforts.

ticipation To Environmental Decision Making: An Exploratory Workshop." Also, the program has shared information throughout the network of EPA staff that have responsibility for various stakeholder involvement efforts. EPA plans to complete and share additional in-depth evaluations of the stakeholder processes of past and future projects. Project XL's goal is to promote continuous learning and develop a more comprehensive understanding of the factors that contribute to the success of, and that pose challenges to, involving stakeholders in experimental projects.

Multi-stakeholder Involvement in "Reengineering"

Challenge(s): Based on strong feedback from XL participants, EPA recognized that it needed a more userfriendly process that would be quicker, more cost effective, produce a consistently superior result, and provide more focused stakeholder involvement and information exchanges. So, in 1998, EPA sought to improve Project XL using a process, developed by corporate America, called "business process reengineering."[14] Reengineering refers to the major redesign and restructuring of core business processes. It is most effective when it identifies a particular process that impedes the growth or competitiveness of an organization, or a process that only minimally meets a business need. The process reengineering model used by EPA was designed to bring about meaningful, lasting change to the XL process. EPA convened a workgroup consisting of industry members, non-government organizations (NGOs), State and local regulators, and a community group.[15] Six subgroups were formed, each focusing on a critical XL problem. Each subgroup conducted a step-by-step assessment of existing processes and identified inefficiencies and bottlenecks.

Results: The reengineering workgroup created a new process that is faster, clearer, and more effective for project sponsors, other stakeholders, and for EPA. With the help of a representative group of stakeholders, EPA produced three documents that address the primary concerns of many XL stakeholders. Combined, these documents serve to make all aspects of the XL process transparent to all XL participants, thus promoting understanding, trust, and realistic commitments and expectations. These documents include:

- *Project XL Stakeholder Involvement: A Guide for Project Sponsors and Stakeholders.* This provides helpful ideas and tools to project sponsors and stakeholders for successful interactions. (This guide is further described in the next section below titled, "Guidance for Sponsors and Stakeholders.")
- *Manual for EPA Project XL Teams*. This instructs EPA on how to build effective internal teams to develop proposals. (This manual is further described as an XL innovation in the section on the core function of "Agency Culture Change.")
- *Project XL: Best Practices for Proposal Development*. This helps project sponsors create effective XL proposals. (While very important for Project XL, this type of guidance is not considered an innovation.)

Transferability: The lessons learned from the overall reengineering process, as well as the specific documents produced, are being shared Agency-wide as part of the Stakeholder Action Plan. For example, the *Manual for EPA Project XL Teams* has been distributed to the Reinvention Action Council, shared with the State's environmental commissioners as a model of accomplishing cross-Agency multi-media decision-making. The stakeholder guide is on EPA's Stakeholder Involvement web site at http:www.epa.gov/stakeholders, in order to share the information with Agency professionals and stakeholders. EPA will continue to conduct evalu-

[14] Business process reengineering, as developed by the corporate sector, refers to the major redesign and restructuring of core business processes. Many corporations have found that, over time, core processes within their organization become inefficient, bureaucratic, cumbersome, and lose their intended focus. Routine practices often add tasks and steps that do not add value to the core business goal. These inefficiencies slow down the organization, detracting from the intended goals. Therefore, reengineering is most effective in identifying when a particular process is impeding the growth or competitiveness of an organization, or when a particular process is only minimally meeting a business need. A reengineering initiative targets a process. It is applied across multiple functions within an organization; it must have the support of upper management; and it leverages information technologies to overhaul, support, and dramatically improve work processes.

[15] The participating organizations were: Citizens for a Clean Environment; City of Portland, Oregon; Dow Chemical; Florida Department of Environmental Protection; Environmental Defense Fund; Environmental Law Institute; Massachusetts Department of Environmental Protection; and Union Carbide. In particular, Union Carbide and Dow Chemical played a leadership role in describing and helping EPA apply the reengineering approach.

ations of Project XL that will include questions about how the reengineering products have assisted projects under development (e.g., Atlantic Steel, International Paper, US Filter). EPA will also seek to evaluate and measure the usefulness of the team manual and the stakeholder guide to industry representatives, public stakeholders, State, local government, and EPA staff beyond Project XL.

Guidance for Sponsors and Stakeholders

Challenge(s): One key challenge early in XL was that some industry project sponsors lacked experience with convening and managing a site-specific, intensive stakeholder process, and they feared the inherent costs in time and money to conduct such a process. However, there is reason to believe that the time and money that project sponsors invest in the stakeholder process is less costly than originally perceived, and can accrue unexpected benefits. At least two private surveys of project sponsors (including project sponsors that were not successful in gaining FPAs) show that their XL stakeholder involvement with environmental organizations and community groups has been beneficial to the companies in the long run. The results from one study found that the expense of the stakeholder involvement process is an average of 20 percent of the total transaction cost for the project sponsor—a far smaller proportion than originally assumed.[16] Still, project sponsors looked to EPA for improved guidelines to reduce the early confusion about, and time-consuming nature of, stakeholder involvement procedures.

Another early challenge was that the participation of national NGOs received mixed reviews from the other stakeholders. In some projects, the participation of the national NGOs was consistent, timely, and helped to move the project development process forward. Local stakeholders often gave the national environmental NGOs high praise for being very helpful to local citizens, and bringing substantive expertise to the table, which local citizens themselves may lack. In other projects, however, the participation of the national NGOs was considered by local citizens to be inconsistent, late, and difficult to predict. In these cases, the NGOs' approach was considered "intervention" and disconnected from local citizen involvement.

In the April 23, 1997, Federal Register Notice, *Clarifying the XL Process,* EPA took steps to address these issues for the project sponsors, NGOs, and local citizens. In particular, EPA defined three levels of public participation in Project XL:[17] to bring clarity to the roles of public stakeholders; to move away from "local citizens versus national environmentalists" clashes; and to enable industry project sponsors to be responsive. The Federal Register Notice also covered the importance of well-defined and transparent ground rules.[18] However, while the Federal Register Notice helped define the policy issues, project sponsors and stakeholders still sought clear, plain guidelines that could help lead them to successful interactions.

Results: A product of the reengineering process, *Project XL Stakeholder Involvement: A Guide for Sponsors and Stakeholders* clarifies roles and responsibilities of sponsors and stakeholders, suggests guiding principles, and provides ideas and tools to help develop, negotiate and implement successful projects. It explains the potential benefits of stakeholder involvement to the sponsor as well as to the potential stakeholders. It also explains the EPA and State government role in assessing the stakeholder involvement process.[19] Ultimately, the stakeholder involvement guide provides general information about the project development process and advice to both stakeholder and potential sponsors regarding how to determine what type of process is appropriate, stakeholder needs regarding time commitment and technical assistance, and the appropriate scope and complexity of the involvement process.

[16] *The Cost of Developing Site-Specific Environmental Regulations: Evidence from EPA's Project XL*, Blackman and Mazurek, Resources for the Future, Discussion Paper 99-35, April 1999.

[17] "Direct participants" are involved in the day-to-day aspects of project negotiations; they influence the design of projects; and their views strongly influence the details and development of the project as well as EPA's ultimate decision to approve or disapprove it. "Commentors" are stakeholders who have an interest in the project but do not participate in day-to-day negotiations; EPA requires sponsors to provide information to potential commentors and create periodic forums in which they can express their comments. The "general public" is involved by having clear access to information on the development and environmental results of the project. EPA expects the project sponsor to arrange public meetings when the information is available, allowing the public opportunities to influence decision making.

[18] Key ground rule topics for consideration include the level of the participants'role (advisory, consultative or decisional) and how that input should be expressed (i.e., by consensus or majority vote). These topics, as well as other ground rules, must be discussed and consented to by the direct participants.

Transferability: The *Project XL Stakeholder Involvement: A Guide for Project Sponsors and Stakeholders* is specifically designed to help less experienced project sponsors grasp the essential principles of designing and managing a stakeholder involvement process. Thus, the *Guide* is featured, along with other documents such as the *Constructive Engagement Resource Guide* (March 1999), in the Agency's Stakeholder Involvement Action Plan. Similarly, the *Guide* is prominent on the new EPA Stakeholder web site. The new web site, a product of the EPA Stakeholder Involvement Action Plan, is designed to share lessons, information, and tools on stakeholder involvement, throughout EPA and with external stakeholders. EPA will encourage the other programs to use the *Guide* as a model for initiating stakeholder involvement, and will seek to evaluate and measure its usefulness to project stakeholders and sponsors, other industry representatives, and EPA staff.

Capacity and Trustbuilding Resources to Improve Stakeholder Involvement

Challenge(s): A key lesson from XL is that resources may need to be made available to ensure that all stakeholders, particularly local citizens, have the ability to assess the technical and environmental issues. Repeatedly, EPA found that some form of technical assistance and meeting facilitation was necessary to ensure that all participants had the capacity to understand, and the willingness to engage, in these experimental demonstration pilots. But early on, EPA did not have clear mechanisms or guidelines in place to either assess the needs or supply these resources. EPA needed practical solutions to address the resource gap.

Results: In both *Clarifying the XL Process* and *Project XL Stakeholder Involvement: A Guide for Project Sponsors and Stakeholders*, EPA strongly suggests that newly formed stakeholder groups perform a "needs assessment" to determine whether training or technical assistance is needed to ensure the active participation of all stakeholders. There can be a number of means for local stakeholders to receive technical assistance: for example, the project sponsor, the State government, a national environmental organization or an academic institution might provide technical information or assistance to local stakeholders. However, when these means are not available or appropriate, EPA has set up a mechanism to provide task-specific technical assistance to XL stakeholders: the Institute for Conservation Leadership, which manages this service under a cooperative agreement with EPA. This assistance is available up to $25,000 per project when requested by the direct participant stakeholder group.

EPA has undertaken other activities aimed at building and maintaining stakeholder trust. In particular, EPA provides contract support for meeting facilitation assistance to project sponsors for initiating a project and determining the best overall stakeholder process. Also, because facilitation by a third party, face-to-face meetings, and site visits stand out as demonstrated mechanisms for building trust, EPA staff now actively seek opportunities for scheduling face-to-face meetings and facility site visits.

Transferability: A key action in the Innovations Task Force Report is to "build leadership capacity in communities to participate in local environmental problem solving." EPA will work with the Task Force to incorporate the lessons learned from Project XL regarding how and when to provide key resources into the analysis and recommendations for building local capacity.

[19] While the sponsor has the primary responsibility for the stakeholder group, experience shows that in the most successful processes, the sponsor and the stakeholders share in the process creation. EPA will participate as a member of the overall stakeholder group. This participation is important to help ensure that these processes are transparent; it should not be confused with EPA's ultimate role of guaranteeing an adequate stakeholder process to meet Project XL's criterion for public participation. EPA also retains the authority to approve or disapprove a project—based on how well the criteria are met. States also share the ability to veto projects that do not meet the criteria. While this authority is not delegated to stakeholder groups, the views and recommendations of direct participant groups strongly influence the decisions of the regulators.

Agency Culture Change or Increasing EPA's Capacity to Innovate

While EPA has made many improvements over the years in how we manage internal processes, Project XL has revealed additional opportunities for improving EPA's operations. By beginning to address some of the internal challenges, Project XL has helped to increase EPA's capacity to innovate. Already, Project XL has led to discreet changes in EPA's planning and operational procedures. These changes support EPA's commitment to test and incorporate innovative solutions to environmental problems.

Project XL has served as a laboratory for testing innovative environmental protection strategies. Not only have projects fostered creative approaches to regulatory functions such as rule making and permits, they also have promoted an Agency work environment that supports cross-media approaches to regulatory issues. This section describes Project XL's planning and management innovations that are changing the Agency's culture.

These are the planning and management questions that Project XL is attempting to address: (1) What Agency matrix management approaches should be used to address the multi-media problems posed by XL projects? (2) How can experimental learning be encouraged and supported within the Agency? (3) Are we making appropriate environmental management changes to accommodate the dynamic environmental problems before us? (4) Is system change occurring within EPA, and how can it be promoted?

Through Project XL, EPA is trying to change its organizational behavior to encourage cross-Agency support for innovation. First, EPA has established a cadre of career senior managers to help plan, manage, and measure the progress of Project XL and other reinvention efforts. Second, EPA has prepared a guidance manual for cross-Agency staff working on projects. Third, EPA has prepared a compliance screening guide to assist Agency managers and staff in assessing the eligibility of facilities to participate in XL projects. And finally, EPA has negotiated an agreement with the States to promote local "XL-like" projects that fall under the purview of co-regulator responsibilities. Table 20 summarizes these innovations.

Senior Management Support and Involvement through the Reinvention Action Council

Challenge(s): Senior Agency management must commit to system change for it to occur. Each of the projects has had varying levels of management involvement at different junctures in the projects' development and implementation. In fact, EPA found that there were many instances where a lack of senior management participation in a project hindered or stopped progress. Simply stated, without active senior management support, projects cannot be achieved. This support includes personally

Table 20: EPA Project Planning and Management Options

Reinvention Action Council(RAC)	Cross-Agency Team Manual	Compliance Screening Guidance	ECOS-EPA Innovations Agreement
Across-Agency committee of career senior managers has been created to resolve XL project matrix management issues. Its success in dealing with those issues resulted in broadening their mandate to address Agency-wide reinvention issues.	A *Manual for EPA Project XL Teams* provides Agency management and staff with procedures, best practices, and ground rules for conducting multi-media projects. The Manual also includes a streamlined, step-by-step process to prepare an XL FPA, and identifies the responsibilities of EPA team members within that process.	*Guidance for Compliance Screening for Project XL* standardizes and streamlines the process of screening a potential project sponsor's current compliance status and compliance history. This guidance has served as the basis for conducting enforcement screens on voluntary programs throughout EPA.	The Environmental Council of the States (ECOS) and EPA negotiated an agreement that provides a vehicle to test State-initiated innovative environmental management strategies.

championing individual projects, empowering Agency staff that participate in negotiations, giving clear direction to XL teams, and providing resources.

Results: In early 1996, EPA established the Reinvention Ombudsmen, later called the Reinvention Action Council (RAC), to assist in reaching the Agency's goal of 50 XL projects. Chaired by the Associate Administrator for Reinvention, the RAC consists of the senior Agency managers (Deputy Assistant Administrators and Deputy Regional Administrators) from each of the Headquarters and Regional Offices. Originally, the RAC served as a resource to XL teams when they faced either disagreements or difficult technical, legal, or policy issues. Since then, RAC members have also committed to working directly with the XL Coordinators within their offices to practice hands-on management of the projects, support quick decision making, and ensure that XL teams have the resources (staff, travel funds, and time). Involving senior managers in the various aspects of Project XL has proven to be effective in identifying and resolving problems for XL. In 1997, the Administrator expanded the RAC responsibilities to support the Agency's overall commitment to reinventing environmental protection.

Transferability: The RAC has taken a hard look at reinvention efforts throughout the Agency such as the voluntary partnership programs, community-based environmental programs, and sector-based environmental programs. The Council has also addressed a broad array of ongoing reinvention issues such as incentives, permitting, and environmental management systems, and continues to set new reinvention priorities. For example, the RAC will be a key implementing body of the recommendations from the 1999 EPA Task Force on Innovative Approaches. The RAC's expanded agenda also calls attention to RAC endorsement of innovations throughout the Agency, and ultimately serves as encouragement for staff to experiment.

The types of cross-Agency issues that the RAC was established to address will likely increase as EPA's reinvention efforts proceed.

Effective Cross-Agency Teams for Multi-Media Experimentation

Challenge(s): To institute change within an agency requires creating guidance and procedures for staff action. Projects often test innovations that cut across traditional EPA media programs (e.g., air, water, waste and toxics), which have their own regulations, budgets, policies, and procedures. Projects are region-led, but typically involve national policy issues that require regions and Headquarters' offices to coordinate. Initially, a lack of such coordination was a major challenge with the Project XL, and a major factor in the high transaction costs of participation for EPA and its XL partners.[20]

XL projects require prompt and effective cooperation among various EPA offices in order to properly address project sponsor proposals. Normally, project proposals impact multiple Agency functions, so EPA staff experts are convened who (1) do not normally work together; (2) answer to separate and independently managed "chains-of-command"; and (3) have different priorities (e.g., responsibilities for separate statutes and programs that face very different time, policy, legislative, and budget constraints).

Results: To carry out the XL experiments, EPA had to evaluate its history and effectiveness of working across media doing a major XL reengineering[21] effort. In order to allow EPA to quickly make decisions across Program Offices, speak with one voice to project sponsors, and share a common understanding of the project at hand, EPA created a new paradigm for XL cross-Agency teams. This new paradigm is defined in the *Manual for EPA Project XL Teams.* The *Manual* has a detailed outline of the proposal development process, and clarifies roles and responsibilities among EPA media offices, enforcement staff, and senior managers. These clarifications are helping new XL teams make decisions faster and communicate with project sponsors more clearly and decisively. The *Manual* also explains that the EPA teams are required to have a project schedule for all new projects to help keep the team focused on key milestones and on track. In addition, another tool EPA has designed to assist each new XL team is the option of having a neutral

[20] See *Evaluation of Project XL Stakeholder Processes* prepared by Resolve, Inc. for EPA (September 1998, EPA-100-R-98-009) and *The Cost of Developing Site-Specific Environmental Regulations: Evidence from EPA's Project XL*, Blackman and Mazurek, Resources for the Future, Discussion Paper 99-35, April 1999.

[21] See page 66 for description of the XL reengineering effort.

facilitator kick off the proposal development process and guide the EPA staff in setting the foundation for an open, productive decision-making process.

These new XL teams are beginning to make key decisions in the XL process faster. This is more satisfying to participants both outside and inside the Agency. For example, involving key Agency decision-makers early in the process and improving the functioning of the cross-Agency team has paid off in the complex Atlantic Steel project in Atlanta, Georgia. Several of the streamlined techniques were applied, resulting in an agreement on the project's Phase One, signed by the sponsor and EPA 9 months after initial discussions began—a marked improvement over earlier proposals, some of which lingered more than 24 months without closure.

Transferability: EPA will continue to monitor the effects of these process improvements and the related transaction costs. Currently, EPA has two studies underway to assess progress made since the initiative's earliest days: additional in-depth evaluations of the stakeholder development processes (to be completed in 1999); and a cost/benefit framework for Project XL (to be completed in 2000). The cost/benefit framework will help in developing an analysis plan that will permit effective evaluation of the financial costs and benefits accruing to projects. Ultimately, as part of a sampling plan, the information on transaction costs and project benefits for facilities, EPA, and other stakeholders will be collected. The sampling plan will first focus on the Weyerhaeuser and the New York State Department Environmental Conservation projects. EPA will use this information to continue to improve Project XL, and to help design the next phase of experimentation in the Agency.

As EPA continues to test new approaches to solving environmental problems, the solutions increasingly cross traditional media program lines. The lessons learned and new tools developed for Project XL teams are now widely available for other reinvention initiatives that cross the traditional Agency structure and require cross-Agency team building. Current and future reinvention efforts can now start with a blueprint for avoiding many of the problems inherent to cross-Agency team building, and use tools that focus these new teams on their shared goal of cleaner, cheaper, and smarter environmental protection.

Compliance Screening for XL's Voluntary Project Sponsors

Challenge(s): Despite the experimental nature of Project XL, project sponsors need consistent Agency guidance on critical program components. EPA actively encourages a wide variety of public and private entities to participate, but all project sponsors must have a good history of compliance with EPA regulations. While a potential participant's past record of compliance is not necessarily an indicator of future performance, the participant's overall compliance history is relevant to ensure that undertaking an experimental XL approach will not pose undue risk to public health and the environment. Also, Project XL should avoid situations where EPA and sponsors are simultaneously in cooperative and adversarial positions. To determine eligibility, EPA's Office of Enforcement and Compliance (OECA) was originally tasked with conducting enforcement screens for potential project sponsors. As Project XL matured, its compliance screening needs became more frequent and often resource and time-intensive. The screening process was not well defined, evidence of the need to establish clear compliance screening practices and expectations.

Results: To standardize and streamline compliance screening, OECA developed the *Guidance for Compliance Screening for Project XL,* issued August 4, 1998. The primary purpose of the compliance screen is to provide the Agency with useful information on a participant's current compliance status and history, and of factors which bear on a potential participant's eligibility for Project XL, such as the possibility of a conflict between a proposed project and an ongoing enforcement effort. The guidance specifies the scope, criteria, and process for conducting enforcement screens, and indicates that compliance screens will be updated prior to high-visibility public events.

Transferability: Project XL is one example of a shift in our national strategy for protecting the environment. Increasingly, EPA is trying to achieve its mission through building partnerships with small and large businesses, citizen groups, State and local governments, and institutions. The XL experience has served as the basis for testing and establishing guidance for the growing number of EPA voluntary programs requiring compliance screening. In addition to the XL screening guidelines, on April 5, 1999, OECA and the Office of

Reinvention issued the *Guidance for Compliance Screening for Voluntary Programs*, the Agency's comprehensive screening framework, applicable to all voluntary partnership programs. The XL screening guidance is a program-specific application of the broader framework, and an example of a rigorous screening process for a regulatory flexibility program.

Managing Experiments in Partnership with State and Tribal Governments

Challenge(s): Federal sharing of environmental responsibilities requires that each XL project have the full support of the appropriate State and Tribal government. In fact, the State or Tribal government is a signatory to most projects. Within the framework of XL, EPA, States, and Tribal governments are innovatively working together through uncharted territory. In particular, the challenge of developing, refining, and implementing Project XL together has magnified EPA-State, as well as State-State, similarities, differences, agreements, and disagreements. States and Tribal governments are, and will continue to be, primary partners with EPA in both regulating public health and the environment, and designing and applying innovative approaches. Therefore, it is incumbent that EPA, and State and Tribal governments rectify differences and produce agreements that satisfy each entity. XL serves as a testing ground for managing experiments to the satisfaction of Federal, State, Tribal, and local authorities.

Results: The promise of more efficient and effective government has encouraged several States to develop their own XL-like legislation giving them the authority to test and implement innovative approaches to State environmental programs. To provide an additional vehicle to test innovative environmental management strategies for the future, EPA and the Environmental Council of the States (ECOS) negotiated an agreement to guide environmental regulatory innovations in the future. The ECOS-EPA Innovations Agreement was developed as a result of the Project XL experience. The agreement defines seven principles to guide regulatory innovations and a process that clarifies how EPA and States will put these good ideas to the test.

Transferability: As Project XL approaches its goal of 50 projects, EPA has begun to define what will be the next phase of Project XL. Two issues are certain: (1) EPA will continue to test alternative ways of achieving desirable environmental outcomes that are more supportive of the marketplace and business needs than the current system, and (2) State and Tribal governments will continue to be primary partners in achieving these outcomes. The prominent role of States in the XL process, as well as the ECOS Innovations Agreement, has advanced successful Federal-State partnerships in developing and managing innovation strategies for environmental protection. The experiences of Project XL continue to influence States as they consider, develop, or expand their own programs that offer regulatory flexibility to facilities or industry sectors. For example, the XL model is being considered by New Jersey as it thinks about expanding its "Flexible Track" regulatory reinvention program. As the idea of testing tomorrow's solutions today spreads throughout State and Tribal governments, Project XL will continue to serve as a viable model.

Emerging Innovations

Below are emerging innovations from XL projects recently underway or in negotiation that the Agency plans to assess and track in future XL reports.

Regulations

Smart Growth: The Atlantic Steel project is examining alternative ways to implement CAA regulations that would otherwise prevent additions to the existing transportation infrastructure and which could, in turn, prevent the smart growth approaches of the overall community revitalization plan.

Environmental Management Systems: In the New England Labs project (in negotiation) the EPA, the State of Massachusetts, and the State of Vermont will consider replacing existing RCRA regulations for the participating university laboratories industry with an environmental management plan based on performance standards.

Permit Reform

Alternative Handling of Wastes: Innovations that streamline the process for handling and shipping hazardous waste can be seen in the New York State Department of Environmental Conservation project. New York State applied for a RCRA waiver that would allow utilities to move unsecured wastes generated at manhole covers to a central collection facility much more quickly than they are currently. This will reduce the amount of time the hazardous waste is exposed to the public and the environment.

Reward-based Compliance Scheme: The Andersen project evaluates the unit emissions cap concept. This project will guage environmental compliance with a per unit level of pollution. The unit cap system is also a reward-based compliance system which allows a facility to increase production as long as it does not lose unit efficiency. If emissions rise at a certain per unit rate, this will trigger a corrective action plan approved by EPA, the State of Minnesota, and stakeholders. If the emissions fall below a preset level, the facility will receive rewards, such as commendation letters from the State of Minnesota or EPA, for its performance.

Enforcement and Compliance Assurance

Redevelopment of Contaminated Sites: The Exxon project will implement innovations to the traditional Superfund process to expedite the clean up of a site while considering future redevelopment needs. Exxon will work with local government and community groups to seek developers for commercial or industrial redevelopment of the site.

Alternative Compliance Monitoring: An International Paper project (in negotiation) will test a new form of compliance emissions monitoring for particulate emissions, called Predictive Emissions Monitoring, as an alternative to the Continuous Emissions Monitoring system currently being used in most facilities.

Environmental Stewardship

Incentives for Pollution Prevention: The Department of Defense (DoD) Elmendorf XL/ENVVEST project (in negotiation) will attempt to give Elmendorf the flexibility to refocus their environmental dollars on superior environmental results. At Elmendorf, DoD will receive flexibility in complying with Title V of the CAA. This flexibility is expected to result in savings so that money formerly allocated to reporting and recordkeeping will be used to finance pollution prevention activities (e.g., alternative fuels and vehicles).

Process Modifications to Encourage Pollution Prevention and Recycling: Intel is using process modifications that increased its recycling of solid waste, including hazardous and nonhazardous chemical waste, and used treated effluent water for 100 percent of the water used for cooling tower makeup and landscaping.

Water Effluent Reuse: The City of Chandler, Arizona has received a grant to study the reuse of industrial wastewater. The Intel project's approach to industrial wastewater reuse helped advance this study.

Timberland Best Management Practices: The Weyerhaeuser Corporation is working with other timber suppliers and the Georgia Forestry Commission to promote best management practices on timberland and plantations.