Goal 8: Sound Science, Improved Understanding of Environmental Risk, and Greater Innovation to Address Environmental Problems

EPA will develop and apply the best available science for addressing current and future environmental hazards as well as new approaches toward improving environmental protection.

Background and Context

EPA has a responsibility to ensure that efforts to reduce environmental risks are based on the best available scientific information. Sound science allows us to identify the most important sources of risk to human health and the environment as well as the best means to detect, abate, and avoid environmental problems, and thereby guides our priorities, policies, and deployment of resources. It is critical that research and scientific assessment be integrated with EPA's policy and regulatory activities. In order to address complex issues in the future, the Agency will design and test fundamentally new tools and management approaches that have potential for achieving environmental results. Under Goal 8, EPA conducts core research to improve our understanding of the fundamental principles underlying risk assessment and risk management.

Today's environmental innovations extend beyond scientific and technological advances; they also include new policies and management tools that respond to changing conditions and needs. Examples include market-based incentives that provide an economic benefit for environmental improvement, regulatory flexibility that gives companies more discretion in how specific goals are met, and disclosure of information about environmental performance. As a result of these and other innovations, the nation's environmental protection system is evolving. The focus is on creating a system that is more efficient and effective and more inclusive of all elements of society.

Means and Strategy

EPA is continuing to ensure that it is a source of sound scientific and technical information, and that it is on the leading edge of environmental protection innovations that will allow achievement of our strategic objectives. The Agency consults a number of expert sources, both internally and externally, and uses several deliberative steps in planning its research programs. As a starting point, the Agency draws input from the EPA Strategic Plan, available research plans, EPA program offices and Regions, Federal research partners, and outside peer advisory bodies such as the Science Advisory Board (SAB). This input is used internally by cross-office teams that prioritize research areas using risk and other factors such as National Science and Technology Council (NSTC) research and development priorities, client office priorities, court orders, and legislative mandates. EPA's research program increases our understanding of environmental processes and our capability to assess environmental risks to both human health and ecosystems.

In the area of ecosystem protection research, EPA will strive to establish baseline conditions from which changes, and ultimately trends, in the ecological condition of the Nation's aquatic ecosystems can be confidently documented, and from which the results of environmental management policies can be evaluated at regional scales. Currently, there is a patchwork of monitoring underway in the aquatic systems of the U.S. Due to differences in objectives, methods, monitoring designs, and needs, these data cannot be combined to estimate, with known confidence, the magnitude or extent of improvement or degradation regionally or nationally in this economically critical resource.

Therefore, the ability to demonstrate success or failure of increasingly flexible watershed management policies, regionally and nationally, is also not possible. EPA's ecosystem protection research program is providing the methods and designs to address these weaknesses. In FY 2003, EPA will produce a report on the condition of the nation's estuaries. This report will provide the first integrated, comprehensive, and statistically valid national report card on the health of a specific aquatic resource. This work is an important step toward providing the scientific understanding to measure, model, maintain, and restore the integrity and sustainability of ecosystems.

In order to improve the scientific basis for identifying, characterizing, assessing, and managing environmental exposures that can pose the greatest health risks to the American public, EPA is committed to developing and verifying innovative methods and models for assessing the susceptibilities of sub-populations, such as children, to environmental agents such as pesticides. Many of the current human health risk assessment methods, models, and databases are based on environmental risks for adults. This research is aimed at enhancing current risk assessment and management strategies and guidance to better consider risk determination needs for children. This information will be useful in determining whether children are more susceptible to environmental risks than adults and how to assess risks to children.

EPA's leadership role in protecting both human and ecosystem health requires that the Agency continue to be vigilant in identifying and addressing emerging issues. EPA will continue to enhance its capabilities to anticipate, understand, and respond to future environmental developments. EPA will address these uncertainties by conducting research in areas that combine human health and ecological considerations. Continued research in the areas of endocrine disrupting chemicals and mercury is leading toward the development of improved methodologies for integrated human health and environmental risk assessment and sound approaches for risk management. EPA will conduct research to enhance its capacity to evaluate the economic costs and benefits and other social impacts of environmental policies. These efforts, undertaken in concert with other agencies, will result in improved methods to assess economic costs and benefits, such as improved economic assessments of land use policies and improved assessments for the valuation of children's health, as well as other social impacts of environmental decision-making.

The Agency also seeks to characterize, prevent, and clean up contaminants associated with high priority human health and environmental problems through the development and verification of improved environmental tools and technologies. EPA will incorporate a holistic approach to pollution prevention by assessing the interaction of multiple stressors threatening both human and environmental health, and by developing cost-effective responses to those stressors. Research will also explore the principles governing sustainable systems and the integration of social, economic, and environmental objectives in environmental assessment and management. Emphasis will be placed on developing and assessing preventive approaches for industries and communities having difficulty meeting pollution standards. The Agency is accumulating data on performance and costs of environmental pollution prevention and control technologies that will serve as a basis for EPA, as well as other organizations, to evaluate and compare effectiveness and costs of a variety of technologies developed within and outside the Agency.

In FY 2003, EPA will improve its regulatory and policy development process. The Agency will strengthen the policy analysis of key regulatory and non-regulatory actions, improve the economic analysis underlying Agency actions, and improve the regulatory and policy action information management system.

The Agency also seeks to develop and verify improved tools, methodologies, and technologies for modeling, measuring, characterizing, preventing, controlling, and cleaning up contaminants associated with high priority human health and environmental problems. In order to do this, EPA will develop, evaluate, and deliver technologies and approaches that eliminate, minimize, or control high risk pollutants from multiple sectors. Emphasis will be placed on preventive approaches for industries and communities having difficulty meeting control/emission/effluent standards.

EPA's strategy for solving environmental problems and improving our system of environmental protection includes developing, implementing and institutionalizing new policy tools, collaborative community-based and sector-based strategies, and the

capacity to experiment, test, and disseminate innovative ideas that result in better environmental outcomes. In each area, EPA is looking to advance the application of the innovative tool or approach by promoting broader testing and incorporation into our system of environmental protection and to support collaborative partnerships for environmental management based upon prudent analysis and decision methodologies. For example, EPA's Sector Program Plan 2001-2005 sets forth a vision and specific actions to enhance the effectiveness of innovative sector activities (at the Federal and state levels) and to fully integrate sector approaches into the Agency's overall mission and core programs. Similarly, EPA is strengthening its capacity to evaluate innovative approaches and make institutional changes that adopt successful innovations.

EPA's community-based approach works to provide integrated assessment tools and information and direct assistance for environmental protection in partnership with local, state, and Tribal governments. The work focuses on building the capacity of communities to work effectively at identifying and solving environmental issues in ways that support healthy local economies and improved quality of life.

Sector strategies complement current EPA activities by allowing the Agency to approach issues more holistically; tailor efforts to the particular characteristics of each sector; identify related groups of stakeholders with interest in a set of issues; link EPA's efforts with those of other agencies; and craft new approaches to environmental protection. EPA is building on successful experiences from its current sector-based programs such as the Sustainable Industries Partnership Programs, Design for the Environment, and sector-based compliance assistance programs to expand the ways in which the Agency is working in partnership with industry sectors to meet high environmental standards using flexible, innovative approaches. While these programs are innovative in and of themselves, they also foster the development of innovations at the industry sector level, testing new regulatory ideas, technologies, tools, and incentives in non-adversarial settings. In a somewhat related effort, EPA is exploring the potential for broader use of a sector-based regulatory model for small businesses developed by the state of Massachusetts.

External Factors

Sound science is predicated on the desire of the Agency to make human health and environmental decisions based on high-quality scientific data and information. It challenges the Agency to perform and apply the best available science and technical analysis when addressing health and environmental problems that adversely impact the United States. Such a challenge moves the Agency to a more integrated, efficient, and effective approach of reducing risks. As long as sound science is a central tenet for actions taken by the Agency, then external factors will have a minimal impact on the goal.

Resource Summary

(Dollars in Thousands)

	FY 2001 Actuals	FY 2002 Enacted	FY 2003 Request
Sound Science, Improved Understanding of Env. Risk and Greater Innovation to Address Env. Problems	**$338,261.4**	**$336,066.9**	**$327,837.9**
Conduct Research for Ecosystem Assessment and Restoration.	**$134,525.5**	**$120,594.7**	**$119,114.6**
Environmental Program & Management	$10,237.9	$6,340.9	$5,960.1
Hazardous Substance Superfund	$0.0	$24.2	$21.6
Science & Technology	$124,287.6	$114,229.6	$113,132.9
Improve Scientific Basis to Manage Environmental Hazards and Exposures.	**$52,407.6**	**$53,021.7**	**$56,355.0**
Environmental Program & Management	$3,896.6	$3,118.4	$2,937.3
Science & Technology	$48,511.0	$49,903.3	$53,417.7
Enhance Capabilities to Respond to Future Environmental Developments.	**$48,626.6**	**$64,249.5**	**$50,965.8**
Environmental Program & Management	$6,801.4	$10,147.8	$10,008.5
Science & Technology	$41,825.2	$54,101.7	$40,957.3
Improve Environmental Systems Management.	**$59,130.3**	**$57,757.0**	**$52,274.1**
Environmental Program & Management	$6,310.6	$5,648.9	$2,706.1
Hazardous Substance Superfund	$0.0	$0.0	$2,468.0
Science & Technology	$52,819.7	$52,108.1	$47,100.0
Quantify Environmental Results of Partnership Approaches.	**$9,539.9**	**$8,672.7**	**$9,058.4**
Environmental Program & Management	$9,539.9	$8,672.7	$9,058.4
Incorporate Innovative Approaches.	**$24,887.3**	**$23,324.5**	**$29,787.9**
Environmental Program & Management	$24,488.2	$23,324.5	$29,787.9
Science & Technology	$399.1	$0.0	$0.0
Demonstrate Regional Capability to Assist Environmental Decision Making.	**$6,417.2**	**$6,677.9**	**$6,591.8**
Environmental Program & Management	$3,656.9	$3,622.6	$3,647.1
Hazardous Substance Superfund	$2,760.3	$3,055.3	$2,944.7
Conduct Peer Review to Improve Agency Decisions.	**$2,727.0**	**$3,242.9**	**$3,690.3**
Environmental Program & Management	$2,727.0	$3,242.9	$3,690.3
Total Workyears	**1,006.4**	**989.6**	**996.3**

Objective 1: Conduct Research for Ecosystem Assessment and Restoration

Provide the scientific understanding to measure, model, maintain, and/or restore, at multiple spatial scales, the present and future integrity of highly valued ecosystems.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$250.3	$0.0	$0.0	$0.0
Coastal Environmental Monitoring	$7,467.5	$7,325.3	$7,671.2	$345.9
Congressionally Mandated Projects	$7,773.3	$7,770.9	$0.0	($7,770.9)
Ecosystems Condition, Protection and Restoration Research	$65,261.3	$66,707.9	$67,202.1	$494.2
Environmental Monitoring and Assessment Program, EMAP	$29,470.7	$32,360.0	$38,259.6	$5,899.6
Facilities Infrastructure and Operations	$6,537.9	$5,320.2	$4,963.5	($356.7)
Homeland Security	$0.0	$65.5	$0.0	($65.5)
Management Services and Stewardship	$1,397.6	$1,044.9	$1,018.2	($26.7)

Annual Performance Goals and Measures

Research

Estuarine Ecosystem Conditions

In 2003 Provide the public with a reliable and statistically valid baseline for the condition of the Nation's estuaries against which to measure the success of ecosystem protection and risk management practices.

In 2001 Baseline conditions in the ecological condition of the Nation's estuaries have been established from which changes and ultimately trends can be evaluated at regional scales.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Report describing the condition of the Nation's Estuaries.	1			report
Report on the condition of Nation's estuaries based on a statistically valid sampling design so that data is comparable across the Nation.			1	report

Baseline: The coastal monitoring strategy responds to the needs of EPA and the coastal states and tribes for information on the health of the coastal environment that will inform decisions to protect these vital coastal resources. For the past decade, ORDs Environmental Monitoring and Assessment Program (EMAP) has been working with federal, state, and academic scientists to develop the most cost-effective methods for measuring the physical, chemical, biological, and ecological conditions of coastal waters, bays, estuaries, beaches, and coastal wetlands. The data from this decade of EMAP research and field surveys in select areas of the country were combined with select data from EPA (ORD and OW), NOAA, Department of Interior, and Department of Agriculture to form an assessment of estuarine condition in 2001. Because of the need to determine current environmental health baselines and quantitatively measure improvement for GPRA, EPA developed an initiative that would implement the proven science developed by EMAP for the ecosystems found throughout the US coastal waters. Starting in 2000, survey information has been collected on the condition of estuarine resources, and the kinds of problems associated with them, in each conterminous coastal state and in Puerto Rico. In 2003, these data will be compiled for the first comprehensive National Coastal Assessment of estuarine condition in the contiguous U.S. This report also will compare the condition of estuaries in the period 1990-1997 to the period 2000-2001. For the first time, this will provide the public with a reliable picture of the current and changing condition of the Nations estuaries and coastal waters with known confidence, and using consistent measurements.

Integrated Ecosystem Modeling

In 2002 Produce a report on trends in acid deposition and the acidity of lakes and streams to assess progress toward reducing the impacts of acid rain.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Trends in acidity in lakes and streams in the NE and Mid Atlantic Regions of the U.S.		1		report

Baseline: In response to the Clean Air Act amendments, actions were taken to reduce the causes of acid deposition and aid in the recovery of lakes and streams affected by this deposition. Our understanding of the expected rate and degree of recovery has been primarily based on results of similar actions in northern Europe. Research is being conducted to evaluate the status of acidic lakes and streams in the northeastern United States, a region sensitive to and impacted by acid deposition, to evaluate the degree to which the actions taken have been effective. This research focuses on measuring the end result of controls in place and will provide insights into whether additional controls are needed.

Verification and Validation of Performance Measures

Performance Measure (PM): Report on the Condition of the Nation's estuaries.

Performance Database: Program output, no internal tracking system

Data Source**:** N/A

QA/QC Procedures**:** N/A

Data Quality Reviews**:** N/A

Data Limitations**:** N/A

New/Improved Data or Systems**:** N/A

Statutory Authorities

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
Toxic Substances Control Act
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
Resource Conservation and Recovery Act (RCRA)
The Clean Air Act Amendment
The Safe Drinking Water Act
Pollution Prevention Act (PPA) (42 U.S.C. 13101-13109)
Clean Water Act (CWA) Title I (33 U.S.C 1251-1271)

Objective 2: Improve Scientific Basis to Manage Environmental Hazards and Exposures

Improve the scientific basis to identify, characterize, assess, and manage environmental hazards and exposures that pose the greatest health risks to the American public by developing models and methodologies to integrate information about exposures and effects from multiple pathways. This effort includes focusing on risks faced by susceptible populations, such as people differentiated by life stage (e.g., children and the elderly) and ethnic/cultural background.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$70.1	$0.0	$0.0	$0.0
Congressionally Mandated Projects	$0.0	$731.3	$0.0	($731.3)
Endocrine Disruptor Research	$366.9	$369.3	$372.2	$2.9
Facilities Infrastructure and Operations	$3,370.9	$2,656.7	$2,505.1	($151.6)
Homeland Security	$0.0	$360.1	$0.0	($360.1)
Human Health Research	$49,825.7	$47,225.6	$51,824.5	$4,598.9
Legal Services	$41.9	$51.0	$54.8	$3.8
Management Services and Stewardship	$459.0	$410.7	$377.4	($33.3)
Research to Support FQPA	$1,214.5	$1,217.0	$1,221.0	$4.0

Annual Performance Goals and Measures

Research

Human Health Risk Assessment Research

In 2003 Develop, summarize, integrate, and demonstrate an initial set of tools (methods, measurements, models) so EPA can assess aggregate exposures and risks from environmental contaminants in multiple media and determine how to best minimize/eliminate human and environmental harm from these contaminants.

In 2002 Produce a framework with supporting models and analyses to better link human exposure measurements and health effects outcomes and address complex, high priority risk issues including aggregate/cumulative risk and high to low dose extrapolation.

In 2001 EPA developed a draft research strategy on human health risk assessment. Although publication has

been delayed until FY 2002, the fundamentals of this strategy are being implemented into an analysis of data from the National Human Exposure Assessment Survey (NHEXAS).

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Publish peer reviewed research strategy on human health risk assessment.	0			research strategy
NHEXAS: Begin implementation of Strategic Data Analysis Plan.	1			strategic plan
Develop a prototype source-to-exposure-to-dose modeling framework that enables the complex computation for human exposure modeling.		1		model assessment
Advance the human exposure and dose model by improving the modules for dermal and dietary exposure.		2		modules
External review draft report on framework for conducting risk assessments for children as a sensitive subpopulation.		1		framework
Report on the Contribution of Genetic Polymorphisms of Metabolic Pathways to Susceptibility and Population Variance.		1		report
Report on health effects associated with exposures to indoor and outdoor pollutants using NHANES health effects data and EPA monitoring data.		1		report
Provide access to human exposure data via the world wide web to states, Regions, Program Offices, exposure modelers, and other stakeholders for use in aggregate and cumulative risk assessments.			1	data base
Test and evaluate a framework for modeling aggregate exposures from source through human exposure to human dose.			1	model
Publish data and results from the National Human Exposure Analysis Survey (NHEXAS) that will help characterize exposures to key pollutants and summarize human activities that impact exposure.			1	report
Analyze NHEXAS data for use in updating the Exposure Factors Handbook.			1	analysis

Baseline: Currently, risk assessments often focuses on a small component of the total exposure and risk that people face. Aggregate exposure and risk expands that consideration to include all the pathways and routes by which people come into contact with pollutants: it is a first step in understanding the cumulative total of peoples exposures and

risks. A variety of tools (measuremnt and analysis methods, measurement studies and data, and human exposure/risk models) are currently under development to allow estimation of aggregate exposures and risks. In FY03, research will provide: improved information on sources of exposure; analysis of actual aggregate exposures of people in the U.S. as observed in probabilistic exposure measurement studies; development and demonstration of models for describing the many ways pollutants move from sources to exposures to human dose; and the gathering together and publication of information and techniques needed to assess aggregate exposures and risk for use by the scientific community, risk assessors, and the public. Providing tools to assess aggregate exposure and risk is an initial step in understanding cumulative exposures and risks, and helping us move to more outcome-oriented measures of Agency actions to protect human health.

Statutory Authority

Research

Clean Air Act (CAA)
Safe Drinking Water Act (SDWA)
Clean Water Act (CWA)
Toxics Substances Control Act (TSCA)
Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
Resources Conservation and Recovery Act (RCRA)
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
Superfund Amendments Reauthorization Act (SARA)
Food Quality Protection Act (FQPA)

Objective 3: Enhance Capabilities to Respond to Future Environmental Developments

Enhance EPA's capabilities to anticipate, understand, and respond to future environmental developments; conduct research in areas that combine human health and ecological considerations; and enhance the Agency's capacity to evaluate the economic costs and benefits and other social impacts of environmental policies.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$133.9	$0.0	$0.0	$0.0
Congressionally Mandated Projects	$4,377.8	$3,753.8	$0.0	($3,753.8)
Endocrine Disruptor Research	$12,482.5	$10,353.1	$11,806.5	$1,453.4
Facilities Infrastructure and Operations	$371.4	$2,267.8	$2,177.2	($90.6)
Homeland Security	$0.0	$1,587.6	$0.0	($1,587.6)
Management Services and Stewardship	$426.6	$327.7	$299.1	($28.6)
Regulatory Development	$6,857.6	$7,552.3	$7,532.2	($20.1)
Research to Support Emerging Issues	$23,365.6	$28,658.5	$29,150.8	$492.3
STAR Fellowships Program	$9,704.3	$9,748.7	$0.0	($9,748.7)

Annual Performance Goals and Measures

Research

Mercury Research

In 2003 Support development of regulations on mercury emissions from coal-fired utility boilers by producing data on measurement methods and control technology performance, cost, and residues so that EPA can effectively reduce human health and environmental risk from mercury.

In 2002 Provide methods for quantifying mercury emissions from manmade sources to improve domestic and international estimates of mercury levels, and assess the cost and performance of control/prevention options for key sources, such as utility boilers.

In 2001 EPA developed a new peer-reviewed and consensus IRIS entry for methylmercury, including a reference dose (RfD). The results of bench and pilot testing aimed at managing mercury risks from coal-fired utility boilers was delayed until FY 2002.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Publish results of bench and pilot testing aimed at identifying improved sorbents for mercury mitigation from coal-fired utility boilers.	0			publication
Make recommendations, as appropriate, for revision of EPA's RfD for methylmercury based on analysis of the National Academy of Sciences report on mercury.	30-Sep-2001			recommendations
Report on the parameters that impact both the species of mercury in coal-fired utility boiler flue gas and the performance of promising mercury control technologies.		1		report
Report on the performance/cost of reducing mercury emissions taking into account coal properties,combustion conditions, flue gas cleaning technologies and other air pollution control systems.			1	report

Baseline: EPAs Mercury Study Report to Congress identified emissions from coal-fired utilities as one of the most significant contributors of mercury to the air. On December 14, 2000, EPA determined that mercury emissions from coal-fired utilities needed to be regulated. Regulations are to be promulgated in three years and finalized a year after that. The most cost-effective technological approaches for controlling mercury emissions from utilities are not well understood. Control technologies must be evaluated prior to regulation with a goal of minimizing mercury emissions at the lowest possible cost.

Statutory Authorities

Research

Clean Air Act (CAA) and amendments
Environmental Research, Development and Demonstration Act (ERDDA)
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
Toxic Substances Control Act (TSCA)
Food Quality Protection Act (FQPA) of 1996
Safe Drinking Water Act (SDWA) and amendments
TSCA sections 4,5 and 6 (15 U.S.C 2603, 2604, and 2605)
CWA sections 304 and 308 (33 U.S.C 1312, 1314, 1318, 1329-1330, 1443)
SDWA section 1412 (42 U.S.C. 210, 300g-1)
RCRA/HSWA: (33 U.S.C. 40(IV)(2761), 42 U.S.C. 82(VIII)(6981-6983)
CAA: 42 U.S.C. 85(I)(A)(7403, 7412, 7429, 7545, 7612)
CERCLA: 42 U.S.C. 103(III)(9651)
PPA (42 U.S.C. 13101-13109)
Federal Technology Transfer Act
National Environmental Policy Act (NEPA)

Objective 4: Improve Environmental Systems Management

Provide tools and technologies to improve environmental systems management while continuing to prevent and control pollution and reduce human health and ecological risks originating from multiple economic sectors.

Key Program
(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$92.3	$0.0	$0.0	$0.0
Congressionally Mandated Projects	$8,705.0	$13,512.1	$0.0	($13,512.1)
Environmental Technology Verification (ETV)	$6,294.0	$3,607.7	$3,617.6	$9.9
Facilities Infrastructure and Operations	$3,204.5	$2,290.0	$2,084.0	($206.0)
Homeland Security	$0.0	$40.4	$1,875.0	$1,834.6
Legal Services	$237.1	$251.9	$270.7	$18.8
Management Services and Stewardship	$872.7	$382.0	$351.4	($30.6)
Research to Support Pollution Prevention	$39,156.5	$37,672.9	$44,075.4	$6,402.5

Annual Performance Goals and Measures

Research

Pollution Prevention Tools and Methodologies

In 2002 Improve P2 tools for the industrial sector and other sectors by providing updated/new methods and approaches to help users simulate product, process or system redesign and evaluate resulting pollution levels, impacts and costs.

In 2001 EPA integrated a waste reduction algorithm with costing software and a chemical process simulation package, and completed a decision support tool for life cycle analysis of municipal solid waste to enhance a preventive approach to risk management and the use of pollution prevention options.

Performance Measures:	FY 2001 Actual	FY 2002 Enacted	FY 2003 Request	Units
Integrate the process change/waste reduction algorithm (WAR) with costing software (Icarus) and a chemical process simulation package (Aspen).	1			package
Complete a decision support tool for life cycle analysis of municipal solid waste management options.	1			tool & report
Publish a peer-reviewed protocol for conducting Risk Management Evaluations.	0			protocol
Complete grant on development of tool for predicting biodegradability of compounds.	0			grant report
Enhance the Waste Reduction Algorithm environmental impact assessment tool used to design or retrofit chemical processes with: (1) a better assessment methodology and (2) new features (costing).		1		method
Prepare a pest resistance management framework to prolong the effectiveness of genetically-modified corn pesticide characteristics for the Office of Pesticide Programs during product registration.		1		protocol
Provide a PC-based tool for use by EPA and the metal finishing sector in evaluating exposure and inhalation health risks to workers and residents living near metal finishing facilities.		1		risk tool

Baseline: Although pollution prevention is the preferred approach to protecting human health and the environment, implementation of preventive approaches is hampered by a lack of available information on comparative risks, effectiveness, and costs of alternatives. Current tools for evaluating proposed changes in products, processes, or system designs are focused on only a few sectors; limited in availability, ease of use, and application; and restricted in their capability to determine pollution levels, health and environmental impacts, and costs of the proposed changes. This research will produce a set of improved tools for the chemical, coatings, metal finishing and other sectors that will be widely available, easy to use, and applicable for evaluating alternative approaches and predicting results, at relatively low cost, prior to the investment of capital in these alternatives.

New Technologies

In 2003 Develop 10 testing protocols and complete 40 technology verifications for a cumulative Environmental Technology Verification (ETV) program total of 230 to aid industry, states, and consumers in choosing effective technologies to protect the public and environment from high risk pollutants.

In 2002 Formalize generic testing protocols for technology performance verification, and provide additional performance verifications of pollution prevention, control and monitoring technologies in all environmental media.

In 2001 EPA developed, evaluated, and delivered technologies and aproaches that eliminate, minimize, or control high risk pollutants from multiple sectors. Delivery of the evaluative report on the Environmental Technology Verification (ETV) pilot program is delayed until FY 2002.

Performance Measures:	**FY 2001 Actual**	**FY 2002 Enacted**	**FY 2003 Request**	**Units**
Deliver a Report to Congress on the status and effectiveness of the Environmental Technology Verification (ETV) Program during its first five years.	0			report
Complete performance evaluations of various metal finishing processes aimed at zero-discharge metal pretreatment as replacements for more hazardous processes.	1			report
Complete a capstone report summarizing current knowledge about volatile organic compounds and hazardous air pollutants emissions from paints used indoors.	1			report
Develop new process for drycleaning microelectronic wafers to decrease water usage and toxic chemicals.	0			grant report
Complete 20 stakeholder approved and peer-reviewed test protocols in all environmental technology categories under ETV, and provide them to testing organizations world-wide.		20		protocols
Verify and provide information to States, technology purchasers, and the public on 40 air, water, pollution prevention and monitoring technologies for an ETV programmatic total of 230 verifications.			40	verifications
Complete an additional 10 stakeholder approved and peer-reviewed test protocols in all environmental technology categories under ETV, and provide them to testing organizations world-wide.			10	protocols

Baseline: Actual environmental risk reduction is directly related to performance and effectiveness of environmental technologies purchased and used. Private sector technology developers produce almost all of the new technologies purchased in the U.S. and around the world. Purchasers and permitters of environmental technologies need an independent, objective, high quality source of performance information in order to make more informed decisions; and vendors with innovative, improved, faster, and cheaper environmental technologies need a reliable source of independent evaluation to be able to penetrate the environmental technology market. In FY 02, the first year of

operating, after the pilot period ended in FY 01, the Environmental Technology Verification (ETV) Program will have delivered in FY 02 more than 20 additional protocols, making them available to the entire research and testing community, and will have verified approximately 30 additional technologies for a programmatic total of 180, making data on their performance available for public use as well.

Verification and Validation of Performance Measures

FY 2003 Congressional Performance Measure (PM): Verify and provide information to states, technology purchasers, and the public on 40 air, water, pollution prevention, and monitoring technologies for an ETV programmatic total of 230 verifications.

Performance Database: Program output, no internal tracking system

Data Source**:** N/A

QA/QC Procedures**:** N/A

Data Quality Reviews**:** Technology verifications

Data Limitations**:** N/A

New/Improved Data or Systems**:** N/A

FY 2003 Congressional Performance Measure (PM): Complete an additional 10 stakeholder approved and peer-reviewed test protocols in all environmental technology categories under ETV, and provide them to testing organizations world-wide.

Performance Database: Program outputs, no internal tracking system

Data Source**:** N/A

QA/QC Procedures**:** N/A

Data Quality Reviews**:** Test protocols

Data Limitations**:** N/A

New/Improved Data or Systems**:** N/A

Statutory Authorities

Research

Clean Air Act
Safe Drinking Water Act
Clean Water Act
Toxic Substances Control Act
Federal Insecticide, Fungicide, and Rodenticide Act
Resource Conservation and Recovery Act
Superfund Amendments Reauthorization Act
Clean Air Act Amendments of 1990
Pollution Prevention Act of 1990
Small Business Innovation Development Act

Objective 5: Quantify Environmental Results of Partnership Approaches

Increase partnership-based projects with counties, cities, states, tribes, resource conservation districts, and/or bioregions, bringing together needed external and internal stakeholders, and quantify the tangible and sustainable environmental results of integrated, holistic, partnership approaches.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Congressionally Mandated Projects	$698.5	$700.0	$0.0	($700.0)
Facilities Infrastructure and Operations	$0.0	$215.6	$241.9	$26.3
Legal Services	$42.9	$47.3	$53.3	$6.0
Management Services and Stewardship	$164.1	$100.6	$112.1	$11.5
Regional Geographic Program	$8,192.3	$7,609.2	$8,651.1	$1,041.9
Regional Management	$506.4	$0.0	$0.0	$0.0

Verification and Validation of PMs

None

Statutory Authorities

Multi-media

Objective 6: Incorporate Innovative Approaches

Incorporate innovative approaches to environmental management into EPA programs, so that EPA and external partners achieve greater and more cost-effective public health and environmental protection.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Administrative Services	$64.6	$0.0	$0.0	$0.0
Common Sense Initiative	$1,781.1	$1,838.7	$0.0	($1,838.7)
Congressionally Mandated Projects	$4,729.4	$1,000.0	$0.0	($1,000.0)
Facilities Infrastructure and Operations	$0.0	$1,784.4	$1,821.7	$37.3
Legal Services	$328.8	$380.3	$409.3	$29.0
Management Services and Stewardship	$34.0	$186.1	$168.7	($17.4)
Performance Track	$1,995.6	$1,834.6	$1,834.6	$0.0
Project XL	$2,948.9	$0.0	$0.0	$0.0
Regulatory Development	$10,430.3	$13,251.3	$22,429.6	$9,178.3
Small Business Ombudsman	$3,000.9	$3,049.1	$3,124.0	$74.9

Statutory Authorities

National Environmental Policy Act
The Economy Act of 1932
Toxic Substances Control Act sections 4, 5, and 6 (15 U.S.C. 2603, 2604, and 2605)
Pollution Prevention Act (42 U.S.C. 13101-13109)
Clean Water Act

Objective 7: Demonstrate Regional Capability to Assist Environmental Decision-Making

Demonstrate regional capability to assist environmental decision-making by assessing environmental conditions and trends, health and ecological risks, and the environmental effectiveness of management action in priority geographic areas.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Facilities Infrastructure and Operations	$0.0	$156.1	$43.6	($112.5)
Management Services and Stewardship	$0.0	$2.2	$1.7	($0.5)
Regional Science and Technology	$3,850.3	$3,574.9	$3,601.8	$26.9
Superfund Remedial Actions	$2,993.4	$2,944.7	$2,944.7	$0.0

Verification and Validation of PMs

None

Statutory Authorities

Multi-media

Objective 8: Conduct Peer Review to Improve Agency Decisions

Conduct peer reviews and provide other guidance to improve the production and use of the science underlying Agency decisions.

Key Program

(Dollars in Thousands)

	FY 2001 Enacted	FY 2002 Enacted	FY 2003 Request	FY 2003 Req. v. FY 2002 Ena.
Facilities Infrastructure and Operations	$0.0	$340.2	$326.5	($13.7)
Management Services and Stewardship	$0.0	$14.9	$11.3	($3.6)
Science Advisory Board	$2,775.1	$2,887.8	$3,352.5	$464.7

Verification and Validation of PMs

None

Statutory Authorities

Federal Advisory Committee Act (5 U.S.C. App.)