

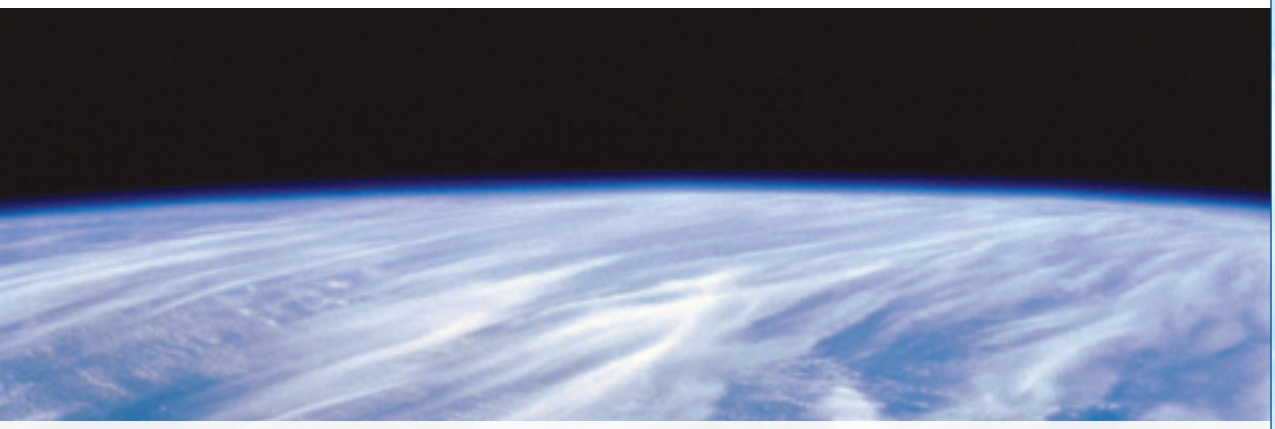

Protecting the Environment and Our Employees

2008 Accomplishments




EPA United States Environmental Protection Agency

Office of Administration and Resources Management



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Introduction

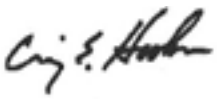
As the Environmental Executive and Designated Agency Safety and Health Official of the U.S. Environmental Protection Agency (EPA), I am pleased to report on the internal safety, health, and environmental accomplishments that EPA achieved during calendar year (CY) 2008. EPA is entrusted with protecting human health and the environment, a mandate that has never been more important, given heightened concerns about global climate change, energy independence, homeland security, and economic stimulation. To lead by example, EPA is actively improving the environmental performance of its more than 200 facilities and instituting safety and health programs to improve the quality of life of its more than 17,000 employees. This publication highlights activities the Agency performed in CY 2008 to advance its environmental performance and protect employees while carrying out the Agency's work.

EPA has earned recognition as a leader in the federal community for its environmental accomplishments. EPA was one of only four federal agencies to receive a green score (the highest mark) on the Office of Management and Budget's (OMB's) Environmental Stewardship Scorecard, a rating we warranted by achieving top marks in the following four categories: environmental management systems, electronics stewardship, green purchasing, and sustainable design. As further testament to the strength of EPA's internal environmental programs, we also received a green score on the OMB Energy Management Scorecard. Moreover, we continued to meet or exceed environmental performance goals established for federal agencies under the Energy Independence and Security Act of 2007, the Energy Policy Act of 2005, and Executive Order (EO) 13423—Strengthening Federal Environmental, Energy, and Transportation Management.



The Agency also continued to maintain a strong safety and health record in 2008, working to achieve one of the lowest injury and illness rates across the entire federal government. Integrating safe and healthful working practices into everything we do makes sense for many reasons. It is the morally responsible thing to do, and it also enhances the productivity of our employees, which enables us to better serve the public and fulfill the Agency's mission of protecting human health and the environment.

Although EPA is meeting or exceeding expectations in many areas, the Agency has no intention of resting on the laurels of past accomplishments. The challenges of our times are simply too demanding to justify complacency. EPA's mantra is "continual improvement," which means the Agency is constantly looking for opportunities to further reduce the environmental impacts of its work, improve the way it conducts business, and fully protect its talented workforce from potential safety and health hazards. Outlining a path for the future, EPA released a document (the *E²PLAN Strategy for Sustainability*) in October 2008 that describes a path forward to improve its overall energy and environmental performance, leadership, and accountability, and, where possible, to achieve carbon neutrality. This strategic document will enable the Agency to continue serving as a leader and to meet the goals and priorities established by the White House, Congress, and OMB.



Craig E. Hooks
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EPA Protects Its Most Valuable Resource—Employees

EPA employees encounter a variety of occupational hazards. All of the Agency's workers confront typical office-related hazards such as tripping or slipping; laboratory workers have the potential to be exposed to toxic chemicals; and field workers encounter a variety of hazards, including environmental stressors (e.g., extreme heat or cold), exposures to chemical and biological hazards, or exposures to unique physical hazards associated with tree-climbing, aquatic sampling, or diving. EPA is committed to protecting all of its employees and has implemented an array of programs to ensure their well-being. Some address the EPA community as a whole, and others focus on the needs of specific groups of employees.



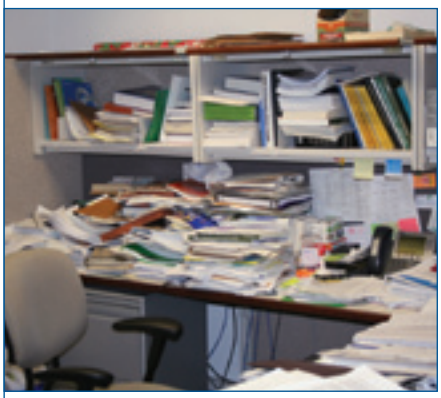
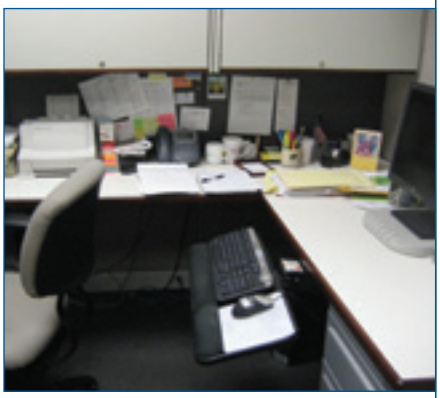

Prevention and Preparedness Pave the Way for Good Health

In 2008, EPA continued to support its Injury and Illness Prevention Program, the goal of which is to bring EPA's injury and illness rate as close to zero as possible. As part of this effort, EPA collected and analyzed injury and illness data across the entire Agency, identified common hazards, and shared information with employees about specific actions they can take to prevent workplace injuries and illnesses. The Agency produced and distributed three safety bulletins in 2008. The first two, *How to Avoid Slips, Trips, and Falls* (issued in May) and *Preventing Muscle Strain* (issued in July), addressed the two leading causes of injury across the Agency. The third bulletin, *Health and Safety Concerns for New Employees*, was issued in December.

In addition to focusing on existing hazards, EPA continued to position itself to address potential future hazards, such as a global influenza pandemic. Responding to concerns expressed by health experts earlier in the decade, EPA developed a draft pandemic influenza plan in early 2006 and followed up with a more detailed guidance document in 2007 that identifies specific actions EPA would take to protect employees in the event of a pandemic influenza outbreak. The guidance document, circulated for review in 2008, will be finalized and distributed in 2009. EPA's commitment to this issue is twofold. First, EPA believes that helping staff stay healthy in the midst of an outbreak is simply a responsible thing to do. Second, the Agency needs its employees to stay healthy because key EPA personnel could be called upon to assist the federal government during national emergencies and to clean up contaminated areas.

Setting a Good Example in the Nation's Capital

For the third year in a row, employees from EPA's Headquarters offices in the Washington, D.C., metropolitan area participated in the Clear Your Clutter Challenge, a friendly competition that encourages employees to tidy their work areas and remove paper piles, extension cords, and other misplaced items that can lead to trips, falls, or other injuries. More than 300 employees participated. In addition, to encourage employees to adopt or maintain a healthy lifestyle, EPA Headquarters sponsored a "Walk to Wellness" event in May 2008, which attracted participation from about 500 employees.

This "before and after" photo demonstrates the impact of the Agency's Clear Your Clutter Challenge.

EPA field employees perform a variety of field operations, including site characterization and sampling activities.

Supporting Emergency Responders

Throughout 2008, EPA continued to strengthen safety and health programs for its emergency responders, a group that addresses sudden releases of oil or hazardous substances (including releases of biological, chemical, and radiological agents), often while wearing personal protective equipment and working under stressful environmental conditions. For example, work progressed on *EPA's Emergency Responder Health and Safety Manual*. EPA finalized six chapters in 2008, released four new chapters for Agency review, and developed training on how to use the manual.

EPA also continued to participate in a variety of interagency workgroups that address the safety and health concerns of emergency responders. For example, EPA participated in the National Response Team's Worker Health and Safety Subcommittee in 2008, assisting in the development and review of a document entitled *Guidance for Managing Worker Fatigue During Disaster Operations*. EPA also participated in the National Response Framework Worker Safety and Health Support Annex, an organization that provides safety and health support during incidents that require a coordinated federal government response, such as the Midwest floods of 2008.

In addition, EPA focused on assessing the medical surveillance and training needs of the Agency's Response Support Corps (RSC)—a group that augments the onsite support that EPA's emergency responders provide during incidents of national significance. When needed, RSC members voluntarily leave their offices to provide support in impacted areas. While some RSC members perform field work, others assist in command centers by providing administrative or communication support or technical guidance.

Playing It Safe in the Laboratory

Throughout 2008, the Agency continued to ensure that operational controls were in place to minimize the risk of laboratory workers being exposed to harmful agents. For example, EPA drafted a document that outlines the Agency's procedures for assessing fume hood performance and assisted two laboratories in performing such assessments in 2008.

EPA also addressed new safety and health concerns as they emerged. A few EPA laboratories are actively preparing to accept environmental samples that could be contaminated with chemical warfare agents (CWA). In response, EPA convened a workgroup to address safety and health concerns related to CWA, compiled a list of design criteria that laboratories must consider if they intend to perform CWA analysis, and reviewed designs and specifications for renovation projects at two EPA laboratories that are preparing to perform such analyses.

Some laboratories are also starting to assess nanomaterials and nanotechnologies, which has prompted the Agency to research whether such materials and technologies pose safety and health risks. As a starting point, EPA produced several nanotechnology fact sheets, which address potential risks, existing safeguards, and chemical properties. EPA also provided an opportunity for its safety and health managers to delve into a discussion on nanotechnology by organizing a panel to address this topic as part of an October 2008 Safety, Health, and Environmental Management Workshop.

EPA Is Its Own Toughest Critic

What can we be doing better? **EPA is constantly asking itself** this question and engaging in a variety of self-evaluation activities in an effort to answer it. These evaluations are designed to help the Agency identify potential weaknesses, seek opportunities for improvements, and ensure compliance with applicable safety, health, and environmental management (SHEM) requirements.

Safety

Health

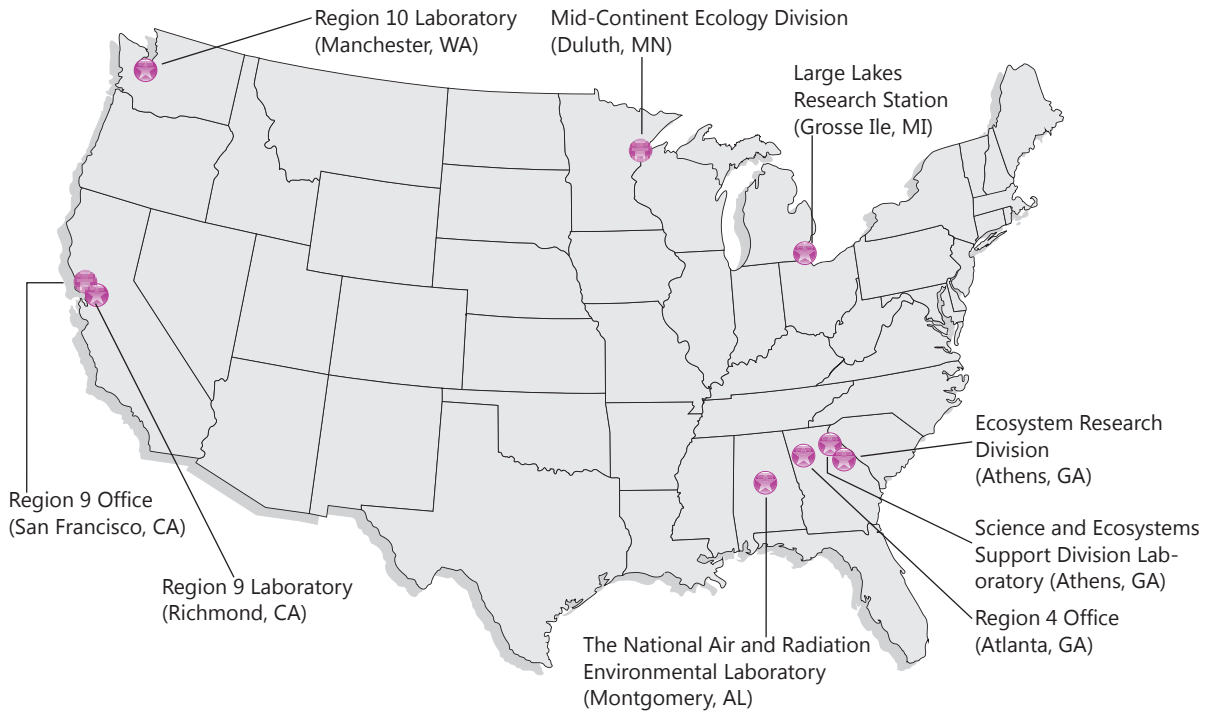
Environment




The SHEM Audit and Evaluation Program

EPA's Office of Administration and Resources Management (OARM) leads and manages the Agency's formal SHEM Audit and Evaluation Program. Under this program, OARM sends auditors (e.g., environmental engineers, industrial hygienists, and fire and life safety experts) to EPA offices, laboratories, and research vessels on a three- to five-year cycle. Auditors determine whether they are complying with applicable SHEM regulations and laws, assess whether management systems are working optimally, and identify areas where EPA facilities require assistance in achieving (or sustaining) strong SHEM performance. Any weaknesses identified during the audits are documented and tracked as "audit findings," and local managers are instructed to develop corrective action plans that explain how they will resolve weaknesses and mitigate reoccurrence. Nine EPA facilities (see map below) were evaluated through the SHEM Audit and Evaluation Program in 2008. OARM also worked closely with local managers throughout the year to resolve 115 audit findings.

Audits Performed From Sea to Shining Sea



EPA facilities audited through the SHEM Audit and Evaluation Program in 2008

The Agency's Self-Assessment Program

EPA is developing a Self-Assessment Program to encourage facilities to perform internal SHEM assessments and to standardize the way assessments are conducted. Preliminary tools were developed for the Self-Assessment Program in 2007, but additional features and checklists were added in 2008. In August and September, EPA piloted the program at three facilities, analyzed lessons learned, and started incorporating those lessons into a guidance document. The Self-Assessment Program will be formally launched in 2009, at which time each EPA facility will be required to perform an annual self-assessment.

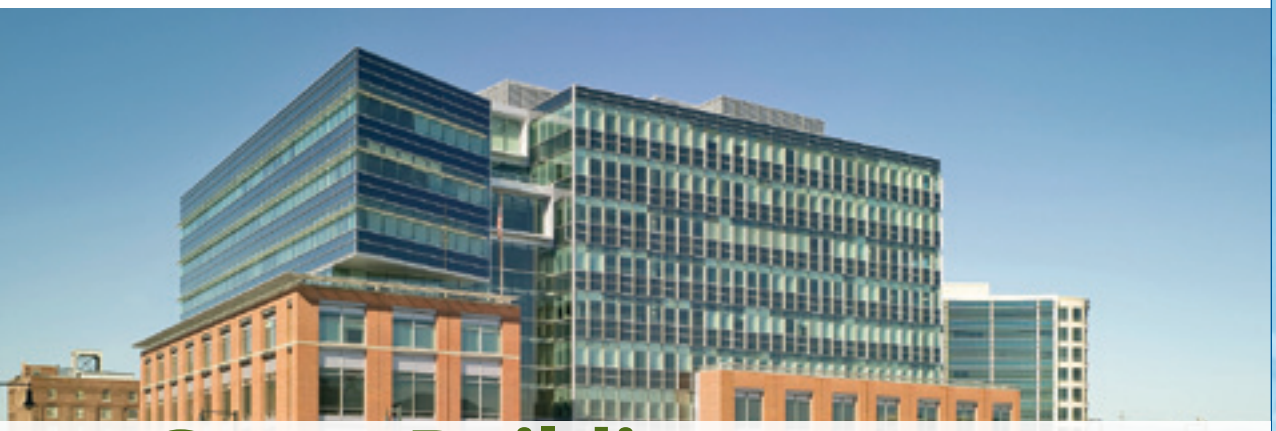
Other Opportunities to Assess Performance

The Agency engages in a variety of other self-evaluation activities, seeking ways to improve performance, achieve better efficiency, save resources, and better protect workers. For example, in 2008, EPA performed recycling/pollution prevention assessments at four facilities to identify additional waste diversion opportunities and continued to assess its Diving Safety Program (see below).

Also in 2008, EPA positioned itself to address the Energy Independence and Security Act of 2007, which requires federal agencies to perform energy assessments, water assessments, and recommissioning at 25 percent of their "covered facilities" each year starting in 2009. To prepare, the Agency formalized its list of "covered facilities" in 2008 and developed a preliminary schedule for assessments and commissioning activities for the first half of 2009.

Assessing the Diving Safety Program

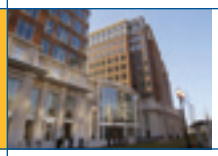
EPA's diving teams assist with search and recovery operations, biological assessments, environmental sampling, and surveying exercises. In 2008, a total of 68 divers performed 1,716 dives for the Agency. To ensure their safety, EPA is conducting a comprehensive evaluation of its Diving Safety Program to determine whether the program adheres to current industry best practices. By the end of 2008, EPA had completed audits at six of the Agency's nine dive units. The remainder will be audited in 2009. Once completed, the Agency will analyze the results and determine whether program adjustments are needed to better protect the Agency's divers.



Green Buildings
Provide a Model for the Nation

In April 2008, EPA announced a Green Building Strategy and unveiled a Green Building Program within the Office of Policy, Economics, and Innovation to strengthen the foundation of green building and to raise national public awareness about green building practices. Leading by example, EPA adopts such practices at its own offices and laboratories, and as these facilities accumulate hands-on experience and performance data, their success stories are helping to build the case for sustainable buildings across the nation.

EPA actively embraces opportunities to incorporate green building principles into the design of new construction and major renovation projects and to improve the environmental performance of the Agency's existing buildings. By doing so, EPA is positioning itself to comply with EO 13423, which states that 15 percent of a federal agency's building inventory must meet the High Performance and Sustainable Buildings Guiding Principles by 2015. The Agency updated its sustainable building implementation plan and rolled out a strategic document in 2008 to explain how it will comply with EO 13423.




Smart Design Attracts Positive Attention

Over the past decade, EPA has been accumulating a portfolio of green buildings, two of which received recognition in 2008 for their exemplary design. The Annex II building in Cincinnati, Ohio, received Leadership in Energy and Environmental Design (LEED®) for New Construction (NC) Gold certification in December 2008, and the Agency's Region 8 Office in downtown Denver, Colorado, which received LEED-NC Gold certification in 2007, continued to attract national and worldwide attention throughout 2008. The building received the Chicago Athenaeum American Architecture Award in 2008 (to recognize the intellectual substance of its design) and the ENERGY STAR® label (to acknowledge its energy efficiency, which earned it a score of 96 on a scale of 100). Furthermore, the Region 8 Office participated in the international Sustainable Building Challenge Assessment and was featured as a model building at the World Sustainable Building Conference in Melbourne, Australia, in September 2008. The building also continued to serve as a national resource for learning. Since opening in early 2007, it has shared information about sustainable design with approximately 9,000 touring individuals.

In 2008, construction was completed on a research building at EPA's Gulf Ecology Division in Florida, a project that merited LEED-NC Silver certification. Renovations also progressed in downtown Boston, Massachusetts, where the Agency is working with the U.S. General Services Administration (GSA) to convert the historic John W. McCormack Post Office and Courthouse into EPA offices. LEED-NC Gold or Silver certification is anticipated for that project as well.

The Gulf Ecology Division's Computational and Geospatial Sciences Building is designed to limit the building's heating and cooling requirements. Extra-thick walls feature a soy-based insulation to maintain temperature, the building's porch provides ample shading, and its reflective roof prevents excessive heat absorption from the sun.

Existing Buildings Seek LEED Recognition

When it comes to achieving sustainability, good building design is critical, but it can only go so far. Proper operations and maintenance activities are essential to ensure that smart design translates into strong environmental performance. To benchmark operations and performance, several EPA facilities are pursuing LEED for Existing Building (EB) certification. Leading the pack, EPA Headquarters Potomac Yard One building in Arlington, Virginia, received LEED-EB Gold certification in July 2008, and additional EPA facilities are actively working to follow suit.

One of them, the Region 8 Office, served as a test model for the Agency throughout 2008 by working to streamline and identify requirements that EPA buildings must meet to satisfy 1) LEED-EB standards; 2) the High Performance and Sustainable Building Guiding Principles; and 3) specific Agencywide environmental objectives, targets, and metrics. The facility's efforts in this regard recently earned it a White House Closing the Circle Award in the Sustainable Design/Green Buildings category. The Region 8 Office also developed plans in 2008 for a sub-metering system (to better track water and energy use) and worked with the University of California's Center for the Built Environment (CBE) to develop performance tests for the building's innovative under-floor air delivery system. CBE published the results, which are being used by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Also in 2008, EPA and CBE partnered to perform an occupancy survey, focusing on temperature control and lighting, to assess how employees perceive their work space. Employees gave the Region 8 Office high marks, lending credence to the argument that comfort does not have to be sacrificed to save resources.

EPA Pressures Leasing Organizations to "Go Green"

EPA leases much of its space through GSA. Exerting marketplace pressure, EPA makes it clear that the space secured on the Agency's behalf must meet specific green criteria. EPA delivers this message by working with GSA to incorporate green requirements into GSA lease documents and solicitations for offers (SFOs), which identify the terms of a lease; the type and amount of space required; and design, operations, and maintenance requirements. In 2008, EPA completed a Best Practices Environmental Lease Provisions document, which compiles environmental provisions to consider for inclusion in SFOs, including:

- LEED-NC and LEED-EB certification.
- ENERGY STAR label.
- Water-saving toilets, urinals, and lavatory faucets.
- Green cleaning plans.
- Mechanisms for tracking water use, energy use, solid waste disposal, and recycling.

In 2008, SFOs were prepared for the Region 9 Office and the Region 10 Office, both of which stipulated an array of environmental requirements that must be met.

EPA Turns Up the Heat
on Energy Projects

The Energy Independence and Security Act of 2007 (EISA), signed into law in December 2007, challenges federal agencies to expand renewable fuel production, increase energy efficiency, and adopt new energy management practices. EPA met these challenges head-on, working aggressively throughout 2008 to conserve energy, promote renewable energy, reduce its carbon footprint, and improve overall environmental performance. In the process, EPA exceeded EISA's requirements, as well as those put forth by EO 13423 and the Energy Policy Act of 2005 (EPAct 2005).

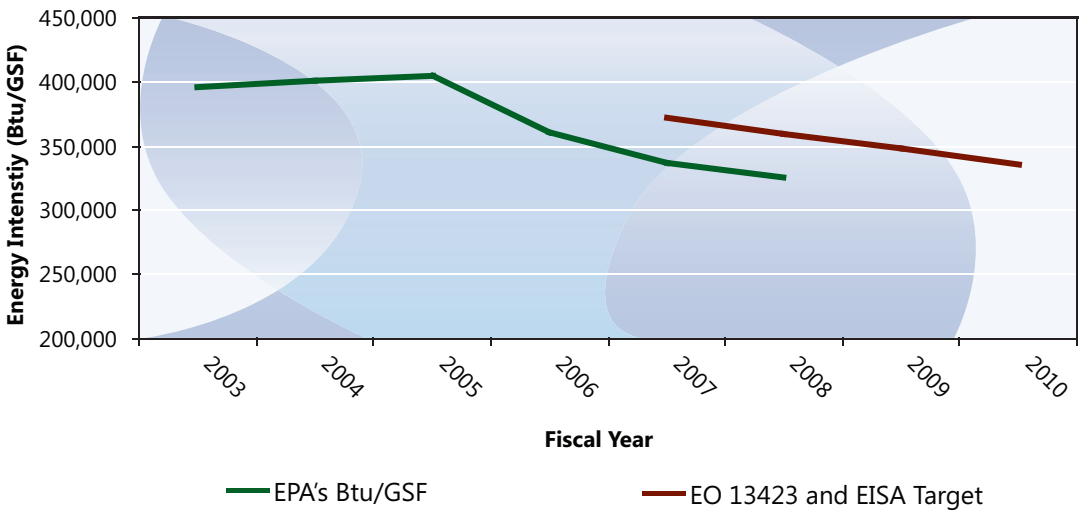



Exceeding Energy Reduction Goals

EISA and EO 13423 require federal agencies to reduce energy intensity (a measure of total energy use per square foot) by 3 percent each year through fiscal year (FY) 2015, with the overall goal of achieving a 30 percent overall reduction by FY 2015 (using an FY 2003 baseline). In keeping with that goal, federal agencies were required to lower their energy intensity by at least 9 percent between FY 2003 and FY 2008.

Clearly, the Agency is well on its way to meeting—and exceeding—its energy reduction goals. Figure 1 shows how EPA's energy intensity has not only fallen in recent years, but has consistently exceeded federal targets. In FY 2008, EPA reduced its Agencywide energy intensity by 10,910 British thermal units (Btu) per gross square foot (GSF), a 3.2 percent reduction compared to FY 2007. Even more noteworthy, EPA has reduced its energy intensity by 69,290 Btu per GSF compared to FY 2003, cutting energy intensity by 17.5 percent in just five years, well ahead of the required 9 percent reduction for FY 2008.

Figure 1: EPA's Energy Intensity



The following are examples of some of the energy-saving projects that helped EPA achieve success in FY 2008:

- EPA's Environmental Science Center in Fort Meade, Maryland, completed a three-phased ventilation upgrade project in 2008, which resulted in a 3 percent energy savings in FY 2008 compared to FY 2007.
- The Science and Ecosystems Support Division Laboratory in Athens, Georgia, achieved a 7.8 percent energy savings in FY 2008 from FY 2007 by making several building control modifications, including implementing nighttime setbacks to reduce energy use in non-laboratory spaces during unoccupied hours.
- The Main Laboratory at the Research Triangle Park (RTP) campus in North Carolina—the Agency's largest research facility and energy consumer—completed several multi-year laboratory air flow optimization projects, which reduced both occupied and unoccupied air flow rates and static pressure. Efforts to recommission the building, improve operations and maintenance, reduce peak demand, and complete mechanical system improvement projects have made a dramatic impact on the laboratory's energy use. These projects reduced energy use at the RTP Main Laboratory by 12 percent between FY 2007 and FY 2008, or 37.1 percent compared to the FY 2003 baseline.

EPA Takes Steps to Reduce Its Carbon Footprint

While there are no specific requirements for federal greenhouse gas (GHG) emission reductions, the Agency is taking a proactive approach to quantify and reduce its emissions. In 2008, the Agency started developing an internal GHG emissions inventory and a quarterly tracking system to better understand its carbon footprint. Drawing on a combination of energy-efficiency projects and extensive green power purchases, EPA reduced the net GHG emissions of its most energy-intensive facilities—the 34 laboratories for which it reports utilities—by 69.5 percent (86,254 metric tons of carbon dioxide equivalent) in FY 2008 compared to an FY 2003 baseline.

Renewable Resources

EPA has long been committed to enhancing the renewable energy market, both through purchasing green power and demonstrating onsite renewable energy technologies at its facilities. In FY 2008, the Agency continued to offset 100 percent of its annual electricity use with green power purchases. EPA purchased approximately 256 million kilowatt-hours (kWh) of green power through individual facility green power purchases or broad renewable energy certificate (REC) contracts in FY 2008. In addition to supporting the clean energy market, these REC purchases offset more than 387 million pounds of carbon dioxide equivalent, which equals the emissions from the electricity used by 24,000 homes for an entire year.

In FY 2008, EPA's existing onsite renewable energy projects generated approximately 94,000 kWh of solar power and 82,663 million Btu of geothermal energy. EPA is looking more aggressively at onsite renewable energy production, including demonstration projects for promising new technologies.

For example, the Agency is developing an economical "power purchase agreement" for a potential photovoltaic (PV) array at the Region 2 Laboratory in Edison, New Jersey, which could be capable of producing up to 1,034 megawatt-hours of electricity per year. Onsite renewable energy projects, such as PV arrays and solar water heating systems, illustrate EPA's continued commitment to advancing clean energy technologies.

Strategies for the Future

EPA has developed a comprehensive strategy for achieving additional energy reductions. To more closely monitor facility energy consumption, part of EPA's strategy involves installing an Agencywide advanced metering network—a collection of meters that measure and record interval data at least hourly and transmit measurements over a communication network to a central collection point at least once a day. Where cost effective, EPAct 2005 requires the installation of advanced electric meters in all federal facilities by 2012, and EISA requires advanced metering for natural gas and purchased steam by 2016. Taking the lead among federal agencies, EPA has decided to exceed these requirements by considering advanced metering for all commodities, including domestic water.

The Agency is applying lessons learned at select EPA locations, like RTP's National Computer Center, to develop and refine an Agencywide advanced metering software system.

To compile energy and water data from advanced meters that will be installed across the Agency over the next several years, EPA initiated the design and development of a custom, Agencywide software system that will enable Web-based data analysis and reporting. In 2008, EPA began the pilot integration of advanced metering hardware into the planned software system for several of the Agency's largest energy users. At the Main Laboratory and National Computer Center at RTP in North Carolina, the Agency reconfigured a pre-existing, stand-alone advanced metering network to communicate with the future national advanced metering software system. EPA also installed new advanced metering hardware at its second largest research facility, the Andrew W. Breidenbach Environmental Research Center (AWBERC) in Cincinnati, Ohio. By the end of FY 2008, these advanced metering efforts collectively enabled EPA to track 46 percent of its reporting facilities' energy consumption. In 2009, EPA plans to collect near-real-time data from both the Cincinnati and RTP metering networks for analysis and to apply the lessons learned to further develop the new Agencywide advanced metering software system.

When installed, EPA's new metering hardware—coupled with its planned advanced metering software system—will greatly improve the Agency's ability to quickly collect and analyze critical energy and water data, helping EPA identify potential opportunities for additional energy and water savings. To ensure that it continues to meet federal energy reduction goals, EPA will also continue to identify new approaches to save energy, implement new energy conservation measures, and assign its facilities energy reduction targets to meet each year.

EPA Storms Ahead With Water Improvements

In 2008, EPA positioned itself to meet EO 13423's water conservation goals and to support responsible stormwater management practices. EPA is leading on both fronts.

A Winning Water Conservation Strategy

Over the past several years, EPA has conducted water assessments at all of its major laboratories and developed facility-specific water management plans to identify water-saving opportunities. In 2008, EPA used this information to develop a comprehensive Agencywide Water Conservation Strategic Plan, which prioritizes the Agency's water conservation projects, outlines a timetable for implementing individual projects, and establishes facility-specific water reduction targets. Throughout the year, the Agency worked closely with individual facilities to encourage water-saving best practices and to complete specific water conservation projects. These efforts were a success. Between FY 2007 and FY 2008, EPA reduced its water intensity by 6.4 percent, surpassing EO 13423's water conservation target of 2 percent. The following are examples of some of the water conservation projects that allowed EPA to surpass EO 13423's target.




- In 2008, EPA introduced an Agencywide faucet retrofit initiative to encourage all EPA facilities to replace or retrofit their lavatory faucets with high-efficiency faucets or faucet aerators that flow at a maximum of 0.5 gallons per minute. Ten facilities retrofitted their faucets in 2008, for a combined water savings of approximately 1 million gallons per year. Several other facilities intend to follow suit in 2009.
- In humid climates, condensate forms as warm humid air passes over the cold cooling coils in the air handlers of heating, ventilation, and air-conditioning systems. In May 2008, the Science and Ecosystems Support Division Laboratory in Athens, Georgia, started capturing the condensate collecting on its roof-mounted air handlers and pumping that water to the laboratory's cooling tower. By using the collected condensate as cooling tower make-up water, the laboratory saved 540,000 gallons of potable water in 2008. Following its lead, the Office of Research and Development's Ecosystem Research Division (also in Athens, Georgia) implemented a similar project in September 2008, which is anticipated to save 260,000 gallons of water per year. In 2009 and beyond, seven other EPA facilities intend to implement similar projects.
- The Agency's RTP campus in North Carolina eliminated single-pass cooling in two laboratories in June 2008, a change that will save about 500,000 gallons of water per year.
- In July 2008, the Environmental Science Center in Fort Meade, Maryland, started routing excess deionized water generated through its reverse osmosis process to the facility's boiler, saving about 100,000 gallons of boiler feedwater per year.

In addition to saving water indoors, EPA also focused on reducing the amount of water used to support landscaped grounds. In August and September of 2008, WaterSense® irrigation partners conducted irrigation system audits at five EPA facilities. Based on the audit results, two facilities decided to shut down their irrigation systems and proceed with xeriscaping, one facility committed to repairing its irrigation system, and two facilities agreed to overhaul their irrigation systems with more water-efficient designs. The irrigation optimization projects, scheduled for completion in 2009, will save about 1.9 million gallons of water per year.

Rain Is a Resource, Not a Waste

The Agency is committed to mitigating the adverse effects associated with stormwater runoff, which can lead to contamination, erosion, flooding, and infrastructure damage. EPA understands that rain is a resource, not a waste, and has embraced low impact development (LID), an approach that focuses on treating rain where it falls, decreasing the amount of runoff that flows into storm drain systems, maintaining or restoring natural hydrologic cycles, pro-

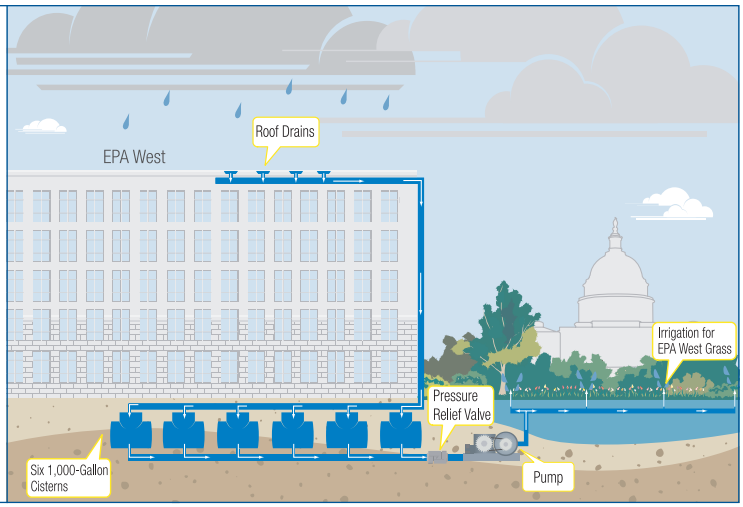
moting ground water recharge, and improving water quality. In support of this approach, EPA has installed bioretention cells (also referred to as rain gardens) and green roofs at select locations, chosen porous surfaces over impervious surfaces, and maximized opportunities for harvesting and reusing rainwater. As an example of the latter, EPA completed a "garage cistern" project (see below) at one of its Washington, D.C., buildings in summer 2008. At this site, rainwater is diverted from the garage roof, collected in a series of six underground 1,000-gallon cisterns, and used to irrigate plants and trees. Also in 2008, the Ecosystem Research Division in Athens, Georgia, completed a major stormwater management retrofit project to reduce the amount of sediment and pollution flowing into local tributaries and to facilitate better aquifer recharge.

The Region 2 Laboratory in Edison, New Jersey, is also supporting an LID project. This location started developing plans in 2008 for a progressive parking lot upgrade project. The goal is twofold: 1) reduce stormwater runoff by removing impervious surfaces and 2) use the site to study the efficacy of three different types of porous paving materials. Current plans call for removing and crushing the existing concrete from the nearly 50,000-square-foot parking lot, grading the surface, reusing the crushed concrete as a sub-base material, and then installing three different types of porous materials on top—porous asphalt, porous concrete, and permeable pavers. Underdrains will be installed below each type of paving surface, which will allow for cross-comparison testing of each material's effectiveness in achieving ground water recharge and pollutant removal. The design of the parking area is currently up for bid, and completion of this project is anticipated in 2010.

EPA will continue to be a strong proponent of LID principles in the years to come. To advance the cause, the Agency started developing training materials and guidelines in 2008 to continue promoting the use of "wet weather green infrastructure" at new facilities (as required under Section 438 of EISA) and to continue supporting retrofit projects at existing facilities.

Garage Cistern Project at EPA Headquarters

Rainwater that falls on the roof of the EPA West building in Washington, D.C., collects in underground cisterns and is used to irrigate 13,500 square feet of landscaped area along Constitution Avenue. The harvested rainwater is pumped several mornings per week between May and October. A rain sensor automatically shuts off the irrigation system if it rains during an irrigation cycle.



Progressive Transportation Initiatives

Gain Traction

EPA employees are always on the go. First, they commute to and from work. Then, as part of their job-related duties, they travel to public meetings or field sites, move between different EPA buildings, or respond to environmental incidents. Not only does this mobility generate greenhouse gases, but it also poses a safety hazard, since motor vehicle accidents can cause serious injury. In response, EPA is finding ways to help employees drive and travel less, use greener driving options, and adopt safer driving practices.




Commitment Starts With the Morning Commute

In September 2008, employees from EPA's Western Ecology Division in Corvallis, Oregon, participated in a Bike Commute Challenge. Over the course of one month, they commuted 9,900 miles and prevented 9,703 pounds of carbon dioxide from entering the atmosphere. As an added bonus, they burned 485,138 calories, which is enough to burn off about 900 cheeseburgers. Safa Shirazi (pictured here) was one of the participants. His daily round-trip commute is 15 miles, and he has been biking to and from the Western Ecology Division for 25 years.

Before the work day even begins, EPA employees can make a positive impact on the environment by choosing an environmentally responsible commuting option. To promote the use of mass transit, EPA supports a Transit Subsidy Program, which roughly 52 percent of the Agency's employees use. At some locations—such as EPA Headquarters, where employees have access to a well-developed public transit system consisting of trains, buses, and subways—participation in the Transit Subsidy Program is even higher, with estimates suggesting that 77 percent of employees use the program. Several EPA facilities also offer a range of other commuter-friendly practices, and nine of them belong to the Best Workplaces for Commuters^{SM} program.

Reducing On-the-Job Transportation Impacts

EPA is committed to reducing the amount of petroleum used to support on-the-job transportation activities. As a first step, the Agency aims to reduce the amount of driving and travel required. For example, some EPA facilities use videoconferencing, teleconferencing, and webinars, which allow employees to attend Regional trainings and hold meetings across Regions without physically traveling to a common location. In addition, at EPA Headquarters, where employees might be required to travel to and from different EPA buildings across the Washington, D.C., metropolitan area, the Agency uses buses fueled by biodiesel to shuttle employees from one location to another. At EPA's Western Ecology Division in Corvallis, Oregon, employees have access to a fleet of bicycles, which they can use to transport themselves around campus and to an adjacent local university.

In fall 2008, EPA partnered with the U.S. Department of Energy to begin testing General Motors' hydrogen fuel cell vehicle, the Chevy Equinox, which is touted as being able to travel for 150 miles on a tank of hydrogen without generating harmful emissions. EPA agreed to test drive the vehicle for a seven-month period, during which time an onboard recording device tracked daily and cumulative performance.

Given the nature of EPA's business, however, there are times when driving simply cannot be avoided. To reduce harmful impacts, EPA is steadily "greening" its vehicle fleet by decommissioning large vehicles and acquiring alternative fuel vehicles, including E85 models, compressed natural gas vehicles, and hybrid electrics. In FY 2008, the Agency acquired 128 new alternative fuel vehicles and reduced its petroleum consumption by 56,449 gasoline gallon equivalents. EPA's achievements in these two areas exceeded EPAct's alternative fuel vehicle acquisition goal and EO 13423's petroleum consumption goal. For example, according to EO 13423, by the end of FY 2008, a federal agency's petroleum consumption should have been 6 percent lower than it was in FY 2005. Surpassing expectations, EPA's consumption was 19.5 percent lower than its FY 2005 baseline.

Keeping EPA's Drivers Safe

For many EPA employees, the most dangerous part of the workday is the time spent in a motor vehicle. To address this hazard, EPA continued to give employees access to an online defensive driving training course developed by the National Safety Council (NSC). This training was first launched in February 2007, at which time it was made available to those who drove government-owned vehicles for an average of two or more days per week. More than 700 employees took the training in FY 2007, an accomplishment that earned EPA an Honorable Mention at NSC's 96th Annual Safety Congress and Exposition, which took place in September 2008. EPA offered the online training again in 2008, opening it up to all employees. In addition, 21 of EPA's major facilities offered training on motor vehicle safety through other avenues. Some offered formal defensive driving courses, and others included a brief unit on motor vehicle safety during annual safety refresher training.

Alternative Fuel Use Gets a Boost

Most of the Agency's alternative fuel vehicles can run on either alternative fuel or conventional fuel (gasoline), which means that drivers must consciously choose alternative fuel over gasoline at the pump to reap environmental benefits. To encourage the right choice, EPA supported an education campaign throughout 2008, which involved holding quarterly conference calls with the Agency's fleet managers, distributing quarterly newsletters, and disseminating maps to help drivers locate fuel stations that offer E85 and compressed natural gas. In addition, the Agency held a contest to reward the EPA Region that used the most alternative fuel over the course of the year. The winner, Region 4, received $10,000 to apply toward the purchase of additional alternative fuel vehicles.

EPA doubled its alternative fuel use between FY 2007 and FY 2008. Despite this progress, EPA still fell short of EO 13423's goal for increasing alternative fuel use. Infrastructure limitations are part of the problem. Put simply, EPA drivers are having trouble finding alternative fuel filling stations. Also, some of the Agency's progressive actions are actually undercutting its ability to meet EO 13423's goal. Although hybrids are technically counted as "alternative fuel vehicles," they use petroleum rather than alternative fuel. Thus, although adding hybrids to the fleet is an environmentally responsible choice, these vehicles do not help the Agency increase its use of alternative fuel.

Efforts Solidify to Promote Electronics Stewardship

EPA's efforts to promote electronics stewardship continued to gain momentum in 2008, resulting in tangible results and external recognition. EPA's Region 8 Office in Denver, Colorado, earned a White House Closing the Circle award for activities it performed in 2008 to promote electronics stewardship, and the Region 9 Office in San Francisco, California, received a Gold award from the Federal Electronics Challenge—a program that supports and recognizes federal electronics stewardship achievements. In addition, taken as a whole, the Agency's electronics stewardship efforts earned a green score (the highest ranking) on OMB's Environmental Stewardship Scorecard. EPA continued to take a holistic approach to electronics issues by acquiring "greener" electronics, reducing operational impacts and extending the useful life of electronics, and donating or recycling used equipment in an environmentally sound manner.




In 2008, nearly all (99 percent) of the new computers and laptops the Agency acquired were registered under the Electronic Products Environmental Assessment Tool (EPEAT), a designation signifying that a product contains environmental attributes such as energy-saving settings, reduced environmentally sensitive materials, less packaging, and a design for recycling. EPA credits its success to at least two factors. First, the Agency requires EPA facilities to use information technology (IT) blanket purchase agreements that provide options for purchasing EPEAT-registered machines. Second, EPA educates its purchase card holders about EPEAT.

The energy used by EPA's computers and other electronics equipment is decreasing due to the efforts of committed IT managers in Regional offices and Headquarters. In conjunction with Earth Day, the Agency issued a memorandum to all EPA employees encouraging them to power down computers at the end of the day and to enable energy-saving settings and duplex printing. In 2008, power management controls had been enabled on about 94 percent of the Agency's monitors and 62 percent of personal computers. To ensure that such activities become standard practice across the Agency, EPA's Chief Information Officer issued a draft procedure in January 2009 requiring monitors to enter sleep mode after 10 minutes of inactivity and computers to enter sleep mode after 30 minutes. It also calls for computers to be powered down at the end of the day except in extenuating circumstances, such as the release of security upgrades.

Stewardship Principles Are Incorporated Into IT Service Contracts

In February 2008, EPA launched a new program to provide computer equipment and IT support services to employees located in Washington, D.C., as well as 20 other programmatic locations nationwide. Environmental considerations are an important aspect of the IT support services, which:

- Provide EPEAT-registered computers and laptops.
- Ensure that ENERGY STAR features are enabled on all deployed machines.
- Set duplex printing as a default.
- Reuse or recycle toner cartridges and supplies.
- Ensure that unneeded computers are either 1) reused within the federal community or by tribes, 2) donated to schools, or 3) recycled in a responsible manner.

Also in 2008, EPA continued to donate and recycle equipment that had exceeded its useful life. For example, the Region 4 Office in Atlanta, Georgia, donated about 90 computers, monitors, and keyboards to the national "Computers for Schools Program," and the Region 6 Office in Dallas, Texas, donated a total of 233 items (e.g., computers, monitors, printers) to local public and private schools, academies, and faith-based organizations. In addition, the Agency continued to recycle obsolete electronics equipment through the Recycling Electronics and Asset Disposition (READ) contract, which guarantees that equipment will be processed by recyclers who use environmentally responsible processes. In fact, in February 2008, EPA issued a memorandum making it mandatory for facilities to use the READ contract, which resulted in the Agency recycling more than 218,000 pounds of electronics in 2008.

The Region 8 Office earned a White House Closing the Circle award for efforts performed throughout 2008 to promote electronics stewardship.

EPA Rallies to Reduce Its Waste Stream

EPA is striving to achieve a solid waste diversion rate of 45 percent by 2010. To support this goal, the Agency launched *Strive for 45,* an initiative designed to improve, expand, and reinvigorate recycling and waste diversion practices at EPA facilities across the country. As part of *Strive for 45,* EPA is offering technical assistance to its facility managers and recycling coordinators and working with them to standardize and improve the way recycling data are reported across the Agency. *Strive for 45* also includes an outreach component, and in 2008, the Agency started laying the groundwork for an Agencywide competition referred to as the Recycling Rally. The competition, which will be held in 2009, will run for six months, at which time the Agency will determine which facility achieved the highest waste diversion rate and which posted the largest percentage increase in pounds of material diverted per person.



In 2008, multiple EPA facilities prevented food wastes and other organic materials from entering landfills. For example, the Agency's RTP facility in North Carolina, which operates a large cafeteria, sent about 600 gallons of used cooking oil to Piedmont Biofuels, a locally owned company that produces biodiesel. RTP also sent about 36,000 pounds of food scraps to a local processing center, where it was composted into fertilizer and sold back to the Agency. As another example, EPA's Mid-Continent Ecology Division Laboratory in Duluth, Minnesota, collected 5,100 pounds of organic material and sent it to the Western Lake Superior Sanitation District's *Garden Green*® program, which composted the waste and sold it to the community. At the Region 1 Laboratory in Chelmsford, Massachusetts, 205 pounds of food waste was collected in 2008 and composted in a designated area outside the facility.

Also in 2008, the Region 9 Office in San Francisco, California, set up small deskside compost collection containers for employees to collect fruits and vegetables, meat bones, eggshells, waxed products, tea bags, coffee grinds, plants, and bio-cups. These materials were sent to the city of San Francisco for composting and used as fertilizer on farms and vineyards. In addition, the Region 9 Office supported a floor-by-floor recycling competition in 2008 and initiated a "Kick the Can" campaign, which involved removing rarely used waste bins from the office.

EPA's National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, revamped its recycling program in 2008 by installing new bins and labels, simplifying recycling categories, and adding more recycling stations. Over the course of the year, the facility recycled 37,600 pounds of paper, 904 pounds of plastic and glass, 56,329 pounds of cardboard, and 72,510 pounds of scrap metal.

Efforts also proceeded in 2008 to reduce the amount of laboratory plasticware and glassware that enters landfills. For example, the Environmental Science Center in Fort Meade, Maryland, de-labeled, cleaned, and reused 126 pounds of laboratory glass containers and 303 pounds of plastic containers. Additionally, the facility recycled 1,415 pounds of laboratory glass and 456 pounds of plastic containers that could not be reused.

Recycling Initiatives at the Region 10 Laboratory

About 50 employees work at EPA's Region 10 Laboratory. This location supports an extensive recycling program, uses small flowerpots to collect trash rather than regular-sized trash cans, and promotes vermicomposting. With regard to the latter, 11 employees deposit food waste into bins populated with worms that convert organic matter into high-value castings and "worm tea." The castings and "worm tea" are used to nourish native onsite plants and are also distributed to participating employees for use in their personal gardens. Since initiating the vermicomposting program in mid-2006, the laboratory has diverted about 245 pounds of food scraps from landfills.

The laboratory's recycling program allows it to divert about 75 percent of its waste from landfills. Such impressive results suggest that the laboratory's employees fully embrace the recycling opportunities available to them—a testament to the strength of the laboratory's outreach efforts. Recycling initiatives are prominently broadcasted on posters and a hallway bulletin board and are highlighted during employee orientation training.

The laboratory's vermicomposting bin encourages employees to "promote global worming."

Management Systems

Provide the Foundation for Continual Improvement

EPA is fortunate in that it attracts employees who are committed to and passionate about environmental, safety, and health programs. There is no question that commitment is critical, but it is not enough when it comes to achieving continual improvement in environmental, safety, and health performance. For continual improvement to occur, there must be a strong process, or framework, in place to ensure that environmental stewardship and worker safety and health matters are considered during all facility-level planning, management, and operational activities. Acknowledging this, EPA is working diligently to implement and integrate environmental management systems (EMS) and safety and health management systems (SHMS) across the Agency. The benefits of these efforts are already apparent. While EMS is proving to be a driving force for better environmental performance, SHMS implementation is prompting EPA facilities to re-examine working conditions and operational practices to ensure that all potential hazards have been identified and properly addressed. As the Agency's management systems continue to strengthen, they will serve as a framework for achieving continual improvement, which will allow EPA to build on its legacy as a federal leader in achieving outstanding performance under its environmental, safety, and health programs.




EMS Programs Continue to Mature

EMS is a management tool that provides a framework for achieving strong environmental performance by identifying environmental impacts; setting environmental objectives, targets, and metrics; and continually monitoring and reporting on progress. All of the Agency's major offices and laboratories have had EMS programs in place since 2005. Following their lead, three smaller EPA facilities completed the EMS implementation and self-declaration process in 2008: the National Enforcement Investigations Center in Denver, Colorado; the Radiation and Indoor Environments National Laboratory in Las Vegas, Nevada; and the Office of Pesticides Programs' laboratory in Bay St. Louis, Mississippi. Additional locations will follow suit in the future.

In June 2008, the EPA Administrator signed a statement reiterating the Agency's commitment to use EMS as a framework for reducing its environmental footprint and demonstrating leadership. In support of the Administrator's statement, the Assistant Administrator of OARM issued a memorandum in August 2008 updating Agencywide EMS Objectives, Targets, and Metrics, which outline top environmental stewardship priorities to be pursued through FY 2010. EPA also provided webinar training to help the Agency's EMS reporting locations integrate the Agencywide Objectives, Targets, and Metrics into their local EMS programs.

EMS—Not Just a Good Idea, It's an Order!

In April 2000, EO 13148 instructed federal agencies to implement EMS at all of their major facilities by the end of 2005. EPA met that deadline. Then, in January 2007, several new EMS milestones were issued in EO 13423. EPA met one of those milestones recently when all of its EMS reporting locations underwent external EMS reviews and documented conformance with the ISO 14001 standard for EMS in advance of a December 31, 2008, deadline.

Also in 2008, in the spirit of continual improvement, EPA started examining alternative organizational EMS structures, an exercise strongly supported by both the Office of the Federal Environmental Executive and the White House Council on Environmental Quality. The Agency has committed to pursuing an overarching "Higher Tier EMS" at EPA Headquarters and "Multi-Site Organizational EMS" for several Regions and Program Offices. Adopting the Multi-Site EMS approach, Region 7 has already created one umbrella EMS to cover its Regional office, laboratory, and field operations. Doing so has streamlined EMS implementation in Region 7 and has elevated accountability for the EMS to the Deputy Assistant Regional Administrator. Regions 5, 8, and 10 are expected to implement Multi-Site EMS programs in the future, and the Agency's Office of Research and Development has committed to developing a Multi-Site EMS that will cover seven EPA research facilities across the country.

Efforts to Implement SHMS Take Root

The Agency's positive experience with EMS and the support of a strong business case has prompted EPA to encourage its facilities to develop SHMS. An SHMS applies the same principles and processes that an EMS does, except it focuses on mitigating safety and health risks rather than environmental impacts. The Agency believes SHMS will help its facilities better identify, manage, and resolve existing and emerging hazards in a methodical fashion, which will, in turn, make EPA a safer and healthier place to work, improve employee morale, and reduce the costs associated with injuries and illnesses. To advance the cause, EPA continued supporting a pilot program in 2008 and organized a panel discussion on SHMS to obtain lessons learned from executives in the private sector.

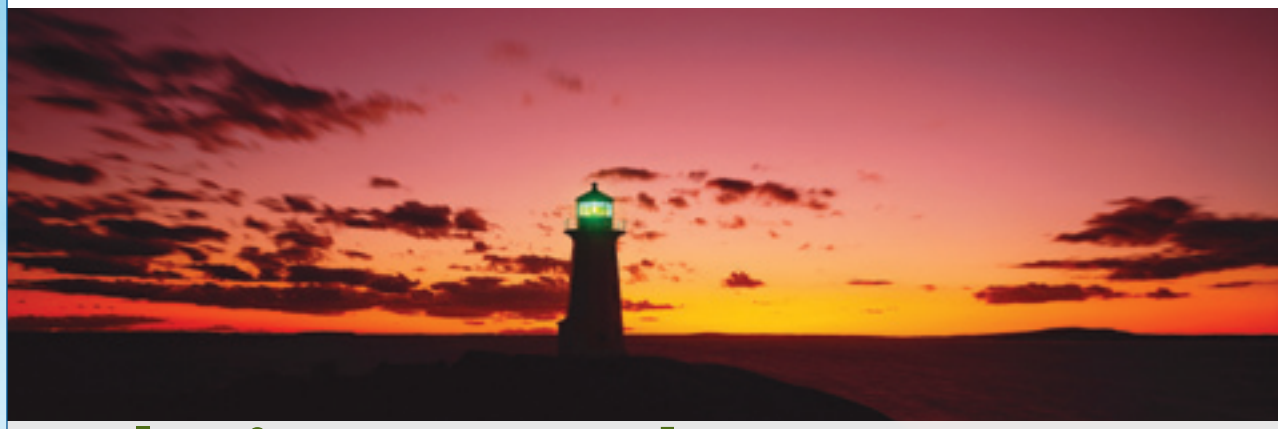
In 2008, EPA's pilot sites marched forward through the Agency's 17-step SHMS implementation process. By the end of the year, one site—EPA's National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan—had reached the final stages of implementation and was making plans to schedule an external SHMS review and certify compliance with OHSAS 18001, an internationally recognized SHMS standard. Another exciting development occurred in 2008 when the Region 10 Laboratory entered the pilot program and volunteered to serve as a test case for a "hybrid" EMS/SHMS model. Recognizing the logical marriage between EMS and SHMS, the Region 10 Laboratory is integrating its management systems, which should help eliminate or reduce the safety, health, and environmental impacts of its operations.

SHMS Implementation Helps EPA Find the "Alligators"

In the process of building SHMS, EPA facilities are revisiting employee work areas to ensure that all potential job-related hazards have been identified and that controls have been adopted to address them. In 2008, the Region 10 Laboratory performed about 40 job hazard analyses (JHAs). As part of that effort, the SHMS team:

- Identified commonly performed laboratory tasks.
- Reviewed standard operating procedures (SOPs).
- Observed laboratory employees at work.
- Produced JHA reports that identified the hazards of each task, as well as controls for mitigating them.

By fall 2009, the JHA reports will be linked to relevant SOPs, at which point the combined JHAs/SOPs will be used to train new employees and raise awareness among current employees. Commenting on the utility of this effort, the laboratory's safety and health manager said, "There is now a paper trail documenting known hazards and their controls that does not rely on a trainer remembering to tell a trainee where the 'alligators' are."



Closing Remarks
and Acknowledgments

EPA is pleased with the progress it made in 2008 in reducing its environmental footprint and protecting employees. The Agency repeatedly proved itself to be a leader, both by consistently meeting or exceeding requirements established under EISA, EO 13423, and EPAct 2005, and by going above and beyond these requirements to voluntarily support other progressive initiatives, such as SHMS and the Agency's greenhouse gas inventory and tracking system. Moreover, the Agency engaged in extensive strategic planning in 2008 to identify ways to further improve its environmental performance and safety and health record. EPA is confident that it will continue to reduce its impacts because the Agency has the right combination for success: sound management systems that support continual improvement; comprehensive and proactive strategies for sustainability; and a talented workforce that is deeply committed to environmental, safety, and health principles.



EPA would like to acknowledge the following staff for contributing to this publication and for their commitment to improving the Agency's safety, health, and environmental performance:

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