

US EPA ARCHIVE DOCUMENT



HEALTHIER FAMILIES
CLEANER COMMUNITIES
A STRONGER AMERICA



Dear Readers,

This year, EPA is celebrating the fortieth anniversary of both Earth Day and the founding of our federal agency in 1970.

As you'll see by reviewing the timeline that runs through this report, EPA, together with our states, Native American tribes, and island territories, have made a great deal of progress in cleaning up the environment and improving human health.

In 1970, Americans were angry at the lack of attention being paid to critical issues of clean air, water and land. Congress responded to the ongoing crisis of smog and polluted water by passing the Clean Air Act (1970) and the Clean Water Act (1972). In 1980, after the toxic tragedy of Love Canal in New York, the Superfund law was enacted to clean up toxic dumps and hold the responsible parties accountable.

Our region is host to the nation's second largest city, Los Angeles, where smog-causing pollution has been reduced in the past 40 years by 70%, thanks to sustained effort at the federal, state and local levels. Ninety-seven percent of the Pacific Southwest's population is now served by community water systems supplying water that meets all applicable health-based drinking water standards. EPA has completed cleanup at more than half of the 128 Superfund sites in the Pacific Southwest. We have a lot to be proud of and much work still to be done.

One thing is clearer today than ever: What's good for the environment is also good for the economy. President Obama's Recovery Act funding aided much-needed infrastructure renewal while helping the nation come back from its worst recession since the 1930s. In the next decade, a green innovation revolution will keep our nation competitive and help us tackle complex new environmental challenges.

Climate change is such a challenge. We can start today to reduce our dependency on foreign oil by deploying cutting-edge renewable energy systems, by developing the next generation of electric vehicles, and by purchasing Energy Star appliances.

This march towards green innovation must lift all boats. We need to meet the needs of our most vulnerable communities first. Across America today, poor and minority communities remain at greatest risk from exposure to environmental health hazards. Green collar jobs are now going to communities that need employment and a cleaner neighborhood.

Earth Day and EPA were both created 40 years ago by individuals who saw the power of simple actions to transform our lives and communities. In this regard, much has remained the same. Everyone still needs do their part. To make it a little easier, we've compiled a list of 40 things we can all do to lighten our footprint on the planet and save a little money—at home, at school, at work, on the road, or anywhere.

We hope you will join us in our commitment to protect the health of our environment, our communities and our families. I look forward to working with you and EPA's many partners, from state governments to remote tribal communities to small businesses, to embrace these challenges and leave the world a better place for our children.

Jared Blumenfeld



Regional Administrator
EPA Pacific Southwest Region





HEALTHIER FAMILIES CLEANER COMMUNITIES A STRONGER AMERICA



SPECIAL FEATURES IN OUR 40TH ANNIVERSARY EDITION

ANNUAL MILESTONES on every page

40 THINGS you can do to save the planet
(centerfold)

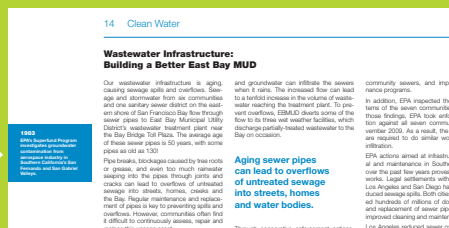


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1970

National Environmental Policy Act signed, Clean Air Act passed. First Earth Day, April 22. President Nixon signs Executive Order creating U.S. EPA, Dec. 2.

40 Things You Can Do to Save the Planet ... Centerfold

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Clean Air



1971

Two Standard Oil tankers collide in heavy fog beneath Golden Gate Bridge, 2:00 a.m. January 19, spilling 840,000 gallons of oil, fouling Bay Area shorelines.

40 things...



AT HOME

Adjust your thermostat
—up in summer, down
in winter

Everyone wants clean air, but there's no simple way to achieve it across a vast region with differing sources of air pollution, topography and weather patterns. EPA works with states, local air districts and communities to develop state and local regulations that are tailored to local air issues while ensuring that air quality will meet federal health standards.

In recent years, EPA's Pacific Southwest Region has partnered with scores of

stakeholder groups on innovative non-regulatory approaches to reduce air pollution in communities that are disproportionately affected.

This chapter looks at the results of cooperative efforts to reduce diesel emissions generated by the ports of Oakland, Long Beach and Los Angeles, which affect the health of people living near the ports and freeways used to move freight inland.

Responding to the concerns of parents of school-age children, EPA has initiated rooftop monitoring of toxic air pollutants at 40 schools across the nation, including four in California. EPA has also partnered with several agencies to create the California Air Response Planning Alliance to help protect people's health during air quality emergencies caused by fires.

West Oakland CARE Grant, Toxics Reduction Collaborative Get Results

EPA has a long history of involvement in West Oakland, Calif., a community surrounded by three freeways, the 4th largest container port in the U.S., a large postal facility and numerous industries. Starting in 2002, with the release of a report from the West Oakland Environmental Indicators Project entitled “Neighborhood Knowledge for Change,” EPA’s West Oakland Toxics Reduction Team focused on addressing the toxics issues raised in the report.

After the EIP report was released in 2002, EPA issued a small grant to a local nonprofit to begin addressing toxics issues. The EPA team began working closely with the community and other stakeholders on specific issues, including toxic emissions from a large yeast manufacturer and diesel emissions from trucks on the streets. The EPA team and its partners provided scientific and regulatory expertise and improved the community’s access to government decision making processes. Early successes included the voluntary, permanent closure of the yeast facility when its owners could not meet emissions standards; and the City of Oakland creating alternate truck routes to keep idling diesel trucks off residential streets.

Encouraged by these results, EIP applied for and received an EPA Communities for a Renewed Environment (CARE) grant. The CARE program is designed to pull together the community, EPA and other stakeholders to assess the toxic impacts in a local area, and then prioritize mitigation efforts for reducing toxics, while working to develop the

community’s long-term capacity to address environmental issues.

EPA’s team worked closely with EIP to develop a collaborative approach to further reduce toxics: the West Oakland Toxics Reduction Collaborative (WOTRC). Co-led by EPA and the EIP, the collaborative included diverse stakeholders, including concerned citizens, state and local agencies, businesses, independent diesel truckers and the Port of Oakland.

The collaborative divided into workgroups to address toxic reduction issues, then brought options to the full group. Results include:

- Providing alternative fuels (biodiesel, compressed natural gas) and a new truck information and service center to assist 2,000 truckers in complying with stringent truck standards.
- Training dozens of households on asthma prevention measures, institutionalizing the program through local agencies and organizations, and using an innovative Health Impact Assessment to get mitigation measures for a senior center and other facilities.
- Developing a “roadmap” for community engagement in Brownfields site cleanup and redevelopment processes.
- Working with industrial recyclers to move out of residential areas while staying in West Oakland.
- Encouraging the Port of Oakland to develop a Maritime Air Quality Improvement Plan. The plan set a goal of reduc-

ing toxic risks in West Oakland 85% by 2020.

- Building leadership and capacity: One of the EIP members was named to the Port Commission, and a local independent truck operator established the Truck Information Center.

In a new phase of the collaboration, now underway, the community continues to engage with local stakeholders to reduce toxics.

The effort is now a national model for community collaboration. EPA Administrator Lisa Jackson even attended one of the collaborative meetings in 2009 on her first visit to California.

EPA’s West Oakland team includes Richard Grow, John Brock, Karen Henry, Mike Bandrowski and Amy Zimpfer. The team’s work in the community wrapped up in October 2009, but the community’s work continues.

1972

Congress passes Clean Water Act. California legislature passes Wild and Scenic Rivers Act. California voters pass Coastal Conservation Initiative. EPA bans DDT.

Mary Nichols, Chairman of the California Air Resources Board, Jack Broadbent, Executive Officer of the Bay Area Air Quality Management District, and Margaret Gordon of the West Oakland Toxics Reduction Collaborative.



Recovery Act Fulfills Promise of Reducing Diesel Emissions

1973

Congress, President Nixon approve Endangered Species Act. EPA begins enforcement action against eight ore smelters in Arizona and Nevada for excessive sulfur dioxide pollution.



When you're behind a big truck or bus, you can usually smell diesel emissions in the air. That's because, while stricter emissions standards for cars took effect in 1975—phasing out dirty pre-1975 models by the 1990s—diesel emissions from heavy-duty trucks, buses, bulldozers, tractors and other vehicles stayed the same.

In the late 1990s, after a thorough review of scientific studies on the subject, EPA found diesel emissions to be a significant health threat, and set stricter standards for new diesel engines. The standards took effect for engines built starting in 2007.

Air quality gains from these cleaner diesel engines will be slow in coming, since the old ones usually last 25 to 30 years. That's why EPA's Pacific Southwest and Pacific North-

west regions started the West Coast Diesel Collaborative in 2003—to get cleaner air quicker, by uniting a variety of stakeholders to replace and retrofit diesel engines sooner. The ongoing effort got a major boost in 2009 with \$300 million that Congress appropriated for the purpose nationwide under the American Recovery and Reinvestment Act.

Diesel Emissions Threaten Health

The scientific data on the health effects of diesel emissions is unequivocal. Diesel emissions contribute to unhealthy levels of fine particles, ozone and air toxics. Fine particles have been associated with an increased risk of premature death, hospital admissions for heart and lung disease, respiratory symptoms such as asthma, and other adverse health effects. Long-term exposure to diesel exhaust may pose a lung cancer hazard.



Above: EPA Regional Administrator Jared Blumenfeld and Nevada Gov. Jim Gibbons in Sparks, Nev., to announce EPA funding for new, cleaner school buses to reduce kids' exposure to diesel emissions.

Below: EPA Administrator Lisa Jackson meets the press at the Port of Long Beach, October 2009.



The collaborative is a public-private partnership working to reduce diesel emissions along the West Coast. It was the first pilot project of EPA's national Clean Diesel Campaign, and has brought together more than 1,000 partners across seven states in EPA's Pacific Southwest and Northwest regions, plus Canada and Mexico.

EPA began awarding funds for innovative technologies and practices to reduce diesel emissions in 2004. By the end of 2008, EPA had provided \$19 million in funding to collaborative partners, leveraging an additional \$28 million and affecting 1,600 engines. Some engines were replaced, others retrofitted with pollution controls. Then came the Recovery Act, bringing \$33 million to the region for this purpose in just one year. This leveraged an additional \$56 million from project partners, for a total of \$89 million.

To announce the new funding, EPA Administrator Lisa Jackson participated in an event in early October 2009 at the Port of Long Beach with Acting Regional Administrator Laura Yoshii, Gov. Arnold Schwarzenegger and the mayors of Los Angeles and Long Beach. Californians who live or work near the ports of Los Angeles, Long Beach and Oakland are particularly affected by diesel

emissions, since diesel trucks and equipment are constantly moving cargo to, from and within the ports.

The fine particles in diesel emissions have been associated with asthma, hospital admissions for heart and lung disease, and other health effects.

The two ports received a total of \$6 million in Recovery Act funds to replace, repower, or retrofit 139 pieces of diesel-burning equipment, including engines on gantry cranes and harbor craft. California, Nevada, Hawaii and Arizona each received \$1.7 million for projects to reduce diesel emissions. The first three of these states are using the money to replace, repower, or retrofit school buses. Arizona is installing electrical outlets at truck stops near the U.S.-Mexico Border to reduce idling when truckers stop for a meal or overnight.

In most of the U.S., it may still be a few years before you can breathe clean air if you're stuck behind a big rig in heavy traffic, but millions of people who live near the ports of Los Angeles, Long Beach and Oakland are already benefiting from cleaner diesel engines.

Learn more:

www.westcoastcollaborative.org/arra-dera-grants.htm

Right: EPA Administrator Lisa Jackson and Gov. Arnold Schwarzenegger take a look at new, cleaner diesel equipment to be used at the Port of Long Beach.



1974

UC scientists Mario Molina and Sherwood Rowland publish study showing chlorofluorocarbons (CFCs) used in spraycans, Styrofoam and refrigeration damage stratospheric ozone layer.

EPA's School Air Toxics Monitoring Program

1975

To comply with Clean Air Act, auto makers put catalytic converters on all new 1975 model cars, which use unleaded gas only. Smog and lead levels start declining.

It's a well-established fact that children are more vulnerable to the health hazards of air pollution than adults; their lungs are still developing and they play hard, breathing more air for their size than adults. Yet schools are often located near major air pollution sources like freeways, factories and airports. To get a more accurate estimate of exposure and the risk to our children in schools, EPA started a School Air Toxics Monitoring Program in 2009, involving 63 schools around the nation.

In the Pacific Southwest, air monitoring began in August 2009 at three Southern California schools, and in June at one Northern California school. EPA is working closely with the local air quality districts, who operate the monitoring equipment. The schools were chosen due to their proximity to sources of air toxics: Felton Elementary is close to the I-405 freeway and Los Angeles International Airport. Soto Street Elementary is at the intersection of four major LA freeways. Santa Anita Christian Academy is near the El Monte Airport, where leaded aviation gas is used by aircraft. Stevens Creek Elementary in Silicon Valley's Cupertino is near a large cement plant.

At the Cupertino school, the Bay Area Air Quality Management District has been monitoring for hexavalent chromium (Cr6+), since that substance had recently been found in the air near two cement plants elsewhere in California. Inhalation of Cr6+ at high levels can damage the respiratory system and cause cancer. So far, the levels of Cr6+ at the school have been well below risk-based

screening levels, but the district will continue monitoring until there is data for a full year, to ensure that all seasonal air patterns have been monitored.

For the three Southern California schools, the initial data indicate that the air is typical for the Los Angeles area. The good news is that the schools do not appear to be "hot spots" for pollution, but air pollution levels throughout the LA area are still too high and need be reduced.

Once EPA finishes the monitoring, EPA will review that data in terms of exposure and risk and report results to the communities. EPA will work with the local school districts, air districts and communities to find ways to reduce levels of air pollution where needed. Additional information, including monitoring data, are posted at www.epa.gov/schoolair.

Indoor Air also a Focus

EPA is also working with many schools to ensure that indoor air is healthy. This is a

priority because we all spend, on the average, 90% of our time indoors. At the Pacific Southwest Regional Office, the Indoor Environments Team of Barbara Spark, Shelly Rosenblum and Katie Stewart brings EPA's Tools for Schools to classrooms through grants and via the team's own efforts.

In 2009, the team funded partners working with schools in the San Francisco Bay Area, the Los Angeles Unified School District and Yuma, Arizona. The team is directly involved with several school districts from the Sacramento area to Napa, and works directly with students and teachers through Earthteam, a coalition of Bay Area science teachers and students. Earthteam provides lecturers to high school classes to educate students on the effects of both indoor and outdoor air pollution on asthma and other health issues.

Air Quality Tools for Schools:
www.epa.gov/schools

More on Indoor Air Quality:
www.epa.gov/iaq



Above: EPA has been monitoring air toxics at Felton Elementary School, which is close to the I-405 Freeway and Los Angeles International Airport.

Enforcement: Cement Plants Initiative Reduces Air Pollution

EPA has prioritized the investigation of cement manufacturing plants across the nation, since they are among the largest stationary sources of smog-forming nitrogen oxides (NOx) and sulfur dioxide. This Clean Air Act enforcement effort will achieve significant emission reductions at dozens of cement plants, including two near Victorville in San Bernardino County, Calif.

The latest actions, against LaFarge North America, require a \$5.1 million penalty and pollution control upgrades at 13 of its U.S. plants. These include the nation's first selective catalytic reduction system to control NOx emissions at a cement plant.

The law's new source review provisions require that the largest emission sources obtain permits and install stringent pollution controls when initially built or making major modifications. EPA found that some cement plants failed to comply. Because NOx emissions and resulting smog can cause respiratory problems, compliance will provide health benefits, especially in areas that fail to meet federal health standards for ozone (smog).

In the largest single-facility settlement yet in EPA's initiative, CEMEX California Cement LLC paid a \$2 million fine and is taking steps to reduce smog-causing pollution by 40% at the company's Victorville, Calif., manufacturing plant, one of the nation's largest cement producers. Air quality in this area, near the eastern border of Los Angeles County, fails to meet the national ozone standard.

An EPA investigation found that the plant had been releasing nitrogen oxides (NOx), sulfur dioxide and carbon monoxide, without permits setting emission limits, which are required under the Clean Air Act. Under the settlement, the facility must meet new limits for these pollutants, including stringent limits for NOx that will reduce emissions by upwards of 1,890 tons per year.

According to 2007 emissions data maintained by the California Air Resources Board, the CEMEX Victorville plant, along with eight other cement plants in California, are among the state's 25 largest stationary sources of NOx. EPA is investigating most of these cement plants, and settled another case involving excessive NOx emissions in 2008. This one, the TXI Oro Grande/Riverside Cement facility, just 10 miles from CEMEX, paid a \$394,000 penalty.

EPA also issued Clean Air Act notices of violation to CalPortland Company's Mojave, Calif., plant in August 2008 and March 2010 and its Rillito, Ariz., plant in August 2003, and Lehigh Cement Company's Cupertino, Calif., plant in March 2010. A notice of violation presents preliminary findings to a company and gives it an opportunity to submit information to EPA or begin settlement discussions.

"These enforcement actions will result in cleaner air in areas where the plants are located," said Deborah Jordan, director of EPA's Pacific Southwest Air Division. "The CEMEX Victorville cement plant is the largest stationary source of NOx in California, so the state-of-the-art air pollution controls that

CEMEX is installing should have a significant positive impact."

The CEMEX settlement resolved EPA's claims that CEMEX violated the Clean Air Act by making plant modifications to its Victorville plant resulting in significant increases in its capacity to pollute, without first undergoing required regulatory review, obtaining required permits, and installing state-of-the-art emission controls to reduce emissions such as NOx.

1976

Congress passes Resource Conservation and Recovery Act, regulating hazardous waste and phasing out PCBs. California legislature restricts new nuclear power plants.



Right: A cement manufacturing plant.

When Smoke Gets in Your Eyes, Call CARPA

1977

Congress and President Jimmy Carter pass Clean Air Act Amendments, strengthening air quality standards.

Air quality emergencies have been increasing in the Pacific Southwest over the past several years, especially wildfires, which have grown in size and destructiveness to life and property. One of the challenges to timely, effective responses to these emergencies is the number of government agencies that respond to them. Dozens of state, local, federal and tribal agencies may get involved.

Air pollution control and public health agencies are now developing the emergency response capability to use portable air monitors and public exposure health guidelines to determine the health impacts of harmful air pollutants to downwind communities. Typically, first responders such as local fire and hazardous materials agencies conduct air monitoring around fires and other harmful releases of smoke and toxic fumes. They use “occupational” health guideline limits to determine health impacts to firefighters and nearby residents. But a new model was needed to bring air quality and health agencies together to develop their capabilities to

address broader health impacts during air quality emergencies.

Following the disastrous 2003 wildfires in Southern California, EPA's regional Homeland Security Coordinator John Kennedy formed a partnership with the California Air Resources Board (CARB) and the state's Emergency Management Agency to bring together agencies involved at the federal, state and local levels in air quality manage-

CARPA tackles the challenge of coordinating the many agencies that respond to air quality emergencies.

ment, emergency response, public health and public information. In 2006, John co-founded the California Air Response Planning Alliance (CARPA).

CARPA's mission is to promote a comprehensive response to air emergencies, and to improve the ability of air agencies to provide public health officials with data and information they can act on immediately. A voluntary organization, CARPA focuses on building a collaborative network at all levels of government in California to develop tools and training to help agencies gather data effectively, to interpret the data into a clear message for the public, and to get the message out quickly during emergencies.



CARPA's three-step response model involves collecting data, crafting a message based on the data, and communicating it. The CARPA Steering Committee's member agencies now include EPA, CARB, the California Emergency Management Agency, and representatives from other federal, state and local air quality, public and environmental health, and emergency response agencies.

CARPA held its inaugural Summit Meeting in October 2008 and convened experts from around the country to present their best practices in data collection, data interpretation and communication. More than 200 people attended. In March 2009, John and CARPA co-chair Jeff Cook of CARB received the Government Innovation Award from the American Society for Public Administration for their work in forming and leading CARPA.

The next CARPA conference is planned for October 2010 in Sacramento.

CARPA Web site:
www.arb.ca.gov/carpa/carpa.htm



Left, right, above: Different views of the Station Fire in Los Angeles, September 2009. Smoke from wildfires can be a greater short-term health threat than smog.

Sona Chilingaryan: Reducing Agriculture's Air Quality Impacts

The San Joaquin Valley has some of the worst air quality in the nation. Valley residents have high rates of asthma, which is aggravated by particulate pollution. Several sources, including agriculture, contribute to this pollution.

Reliable information about how to control dust from farm fields is essential for effective regulation of this particulate pollution. EPA's Sona Chilingaryan, working with the U.S. Department of Agriculture (USDA) on an innovative project for assessing agricultural particulate controls, traveled to farm fields near Hanford and Los Banos.

Project assessing dust controls will help make regulations more effective.

Sona is a native of Armenia who immigrated to Southern California with her family when she was eight years old, in 1989. After ten years in Glendale, she earned degrees at the University of California at Berkeley and joined EPA in 2005.

Sona's job in the regional Air Division's Rule-making Office is to review state and local air quality regulations to see if they're stringent enough to meet the federal Clean Air Act's standards. For the past six years, the San Joaquin Valley Air District has had a Conservation Management Practices rule in effect, requiring farmers to reduce PM_{10} , particulate matter that includes particles up to 10 micrometers in diameter—1/7 the width of

a human hair—emitted by field tillage and harvesting.

One way to do this is by leaving dead plant stalks on the ground, rather than plowing them under, which also saves time and money for farmers. Another way is by a "combined operation," which similarly reduces the number of times a tractor must drag dust-raising equipment through a field. The Conservation Management Practices rule has helped the valley attain federal health standards for PM_{10} , and ongoing research is helping provide data that can help make these regulations more effective.

Sona was part of a joint effort by USDA scientists, the San Joaquin Valleywide Study Agency, the California Air Resources Board, the local air pollution control district and the agricultural community to gather data on how effective conservation management practices are for reducing PM_{10} . In addition to setting up traditional air sampling devices that use filters to measure PM emissions in the field, EPA and USDA contracted with Utah State University's Space Dynamics Laboratory to bring in LIDAR, a light detection and ranging instrument.

LIDAR directs a light beam through the dust plume. The signal that bounces back can help measure properties of the plume. For comparison, the experiment was repeated without any control measures being employed, and was done in spring and fall at different farms to capture different parts of the annual routine of farm operations. While the data had not yet been published when this story went to press, Sona says she

could see that the conservation management practices were effective at reducing emissions.

The results are relevant to agricultural areas with unhealthy levels of particulate pollution throughout the Western states. Over the past year, Sona has also been working with state and local air agencies to develop effective rules to control particulates from sand and gravel mining and volatile organic compounds (VOCs) from facilities that make fiberglass boat hulls and fake marble countertops. "We work with state and local agencies to make these rules more effective over time," Sona says. For people with asthma, that's welcome news.

1978

Stringfellow Acid Pits hazardous waste dump in Riverside County, Calif. threaten to overflow. CFCs banned in spraycans. Toxic waste seeps into homes in Love Canal, NY.



Sona Chilingaryan

Clean Water



1979

EPA Pacific Southwest Region awards more than \$750 million in grants to local governments to build sewage treatment facilities.

40 things...



AT SCHOOL

Help students volunteer for local habitat restoration projects

Water quality is something many of us take for granted. For the vast majority of Americans, healthful drinking water is available at the turn of a tap. However, thousands of miles of water and sewer lines, and drinking water and wastewater treatment facilities, must be built, maintained, upgraded and ultimately replaced.

Today, most of this infrastructure in urban areas is more than half a century old, and long overdue for renewal. In 2009,

EPA provided substantial new funding through the American Recovery and Reinvestment Act to help all 50 states make inroads on this growing backlog, while putting people back to work during the nation's worst economic downturn since the 1930s.

The biggest funding increases came where they were most needed—on Pacific Island territories, where tap water is not always drinkable (see p. 27).

EPA has also been involved in ongoing efforts to restore the ecological health of the San Francisco Bay Delta Estuary, the West Coast's largest estuary. In 2009, EPA used the enforcement tools of the Clean Water Act to require infrastructure renewal, provided partial funding for it through State Revolving Funds, and made targeted grants to reduce polluted runoff from cities and agriculture.

Restoring the San Francisco Bay-Delta Estuary

EPA and other federal agencies have committed to a robust re-engagement in restoring the San Francisco Bay-Delta ecosystem and addressing California's water needs. In 2009, six federal agencies signed a Memorandum of Understanding and produced a plan to achieve on-the-ground results and complement the state government's ongoing work.



EPA's Bay-Delta role includes a wide range of activities to address critical issues throughout this vitally important ecosystem, which stretches from Red Bluff to Bakersfield, and from the Napa Valley to San Francisco to Silicon Valley. Included in these activities is EPA's competitive grant program to support partnerships that protect and restore San Francisco Bay watersheds.

Through the San Francisco Bay Water Quality Improvement Fund, EPA has supported projects to reduce polluted runoff from urban areas and agriculture; limit specific pollutants to restore water quality; and protect and restore fish and wildlife habitat including riparian corridors, floodplains, wetlands and

open waters of the Bay. By early 2010, EPA had selected projects involving nearly 40 partner agencies and nonprofits throughout the San Francisco Bay Area, totaling \$14.7 million in federal grants that are leveraging another \$11.7 million from other sources. These projects include:

Estuary 2100—Resilient Watersheds for a Changing Climate (San Francisco Estuary Partnership/Association of Bay Area Governments) \$11.4 million (Federal: \$5 million)

This includes 19 projects in four program areas: wetland and watershed restoration; monitoring changes in the Bay; low impact development and stormwater best management practices; and public outreach.

Cesar Chavez Street Headwaters Pilot Low Impact Development Project (San Francisco Planning Department) \$2.2 million (Federal: \$1.2 million)

This project will implement a green infrastructure design on a mile-long corridor of Cesar Chavez Street in San Francisco, including installation of stormwater planters, run-off reducing improvements, and permeable concrete. The goal is to reduce runoff to the city's combined sewer/stormwater system, reducing the amount of partially-treated sewage that flows into the bay when rainstorms overwhelm sewage system capacity.

Clean Watersheds for a Clean Bay (Bay Area Stormwater Management Agencies Association) \$6.9 million (Federal: \$5 million)

This is a multi-year regional effort to reduce sediment-bound pollutants in the bay and

restore water quality by limiting the amount of toxic PCBs and mercury in stormwater that reaches the bay.

Estuary 2100 Phase 2—Building Partnerships for Resilient Watersheds (San Francisco Estuary Partnership/Association of Bay Area Governments) \$6 million (Federal: \$3.6 million)

This includes seven projects to reduce polluted urban and agricultural runoff, take actions to limit specific pollutants in the North Bay, and protect and restore vital San Francisco Bay fish and wildlife habitats.

1980
President Carter signs Superfund law, making polluters liable for toxic cleanups, just before President Ronald Reagan takes office.



Right: San Francisco Bay

Above: Children at San Francisco's Aquatic Park, on San Francisco Bay.

Facing page: Klamath River photo courtesy of the Yurok Tribe of the Yurok Reservation.

Recovery Act Generates Green Jobs, Renews Water, Wastewater Systems



America's aging water infrastructure is in need of major renovation. EPA estimates that it will cost approximately \$500 billion over the next 20 years to meet America's drinking water and wastewater infrastructure needs. On top of that, water agencies face great challenges in maintaining their operations as affected by drought, severe storm events, coastline erosion, saltwater intrusion and reduced water storage capacity.

Congress typically provides State Revolving Fund appropriations each year for EPA to distribute to states, tribes and territories for drinking water and wastewater infrastructure. The American Reinvestment and Recovery Act in 2009 significantly increased the funds available (see also SRF Team story, p. 15).

The Recovery Act requires at least 20% of water funding go to innovative projects that promote energy efficiency, water efficiency or innovative stormwater management. In

the Pacific Southwest, all four states have exceeded this requirement. Energy efficiency is vital as approximately one-fifth of California's entire electricity production, and one-third of its natural gas, is used to transport and treat water.

Innovative Water and Wastewater Projects Funded By the Recovery Act

- Arizona is using \$1 million to design water system improvements that incorporate energy and water efficiency, renewable energy use and production, and/or green stormwater infrastructure.
- The Southern Nevada Water Agency is conducting energy audits of the Alfred Merritt Smith and River Mountain water treatment facilities to identify and implement improvements that yield energy and water conservation benefits, while reducing operation and maintenance costs.
- The Eastern Municipal Water District's Anaerobic Digester will allow the Moreno Valley (Calif.) sewage treatment facility to produce 40% of its energy needs through anaerobic digestion of sludge, producing methane that is burned to generate electricity, and reducing the volume of sludge for disposal.
- Peoria, Ariz., has built a 50-kilowatt solar power facility at a wastewater treatment plant to reduce fossil fuel use and minimize its carbon footprint.
- The Inland Empire Utilities Agency's Dewatering Facility Expansion Project is reducing greenhouse gas emissions and energy needed for sludge dewatering by 30% while increasing capacity, reducing hauling costs and fuel use, and creating nearly 200 jobs in Southern California.
- In El Cerrito, Calif., the Green Streets Rain Gardens Project is building gardens within sidewalks and street parking areas to filter stormwater runoff, removing sediment, pesticides and other toxics that would otherwise flow into San Francisco Bay. The rain gardens also provide a green buffer to the asphalt and cement in a high-density urban area.
- Oakland's Rainwater Harvesting Project is providing rain barrels, rebates and guidance for residents to reduce stormwater impacts and re-use rainwater for irrigating gardens.
- Oahu County, Hawaii, is using more than \$5 million to replace corroded cast iron drinking water pipes installed 55 to 70 years ago. New PVC pipes save water by having fewer leaks and save energy by being smoother.



1981

National Research Council reports acid rain in northeastern U.S., Canada making lakes too acidic for frogs, fish. Calif. Gov. Jerry Brown allows malathion spraying to combat medflies.



Left: Peoria, Ariz., used Recovery Act funds to build a solar array to provide power to its water reclamation facility.

Above: This new rain garden in El Cerrito, Calif. reduces polluted runoff entering the city's storm drain system and San Francisco Bay.

Regional Lab Goes on the Road with New Technology, Out to Sea on the *Bold*

Since 1994, EPA's Pacific Southwest Region's laboratory has focused on analyzing samples brought to its Richmond site, as well as gathering data at remote locations, thanks to new technology and an unusual West Coast voyage of EPA's ocean research vessel *Bold*, which normally operates on the Atlantic and Gulf Coasts.

Remote Monitoring and Mobile Lab

At the Leviathan Mine Superfund Site, high in the Sierra Nevada about 200 miles east of San Francisco, water tainted with sulfuric acid emanates from a former mine. Treatment systems on the site do not operate year round, and it's difficult to monitor water quality in nearby creeks that receive mine site drainage in winter, when deep snow covers the landscape. EPA has set up a satellite telemetry system that monitors the water continuously for pH, conductivity and other parameters, and transmits the data hourly to a database provider that posts it on the Internet. The system works entirely off solar-charged 12-volt battery power.

In 2008, the lab acquired a new cargo van that's been outfitted as a mobile lab. In a

water supply emergency—such as a major earthquake that breaches water mains in an urban area—the van can be rapidly re-configured to perform drinking water microbiological analyses to answer the urgent question of whether it's safe to drink. The mobile lab has its own 8 KW generator, and can be used to analyze up to 400 samples for pathogens.

Voyage of the *Bold*

The Regional Lab staff supported ocean survey work aboard the EPA vessel *Bold*, deployed to the West Coast for the first time. The *Bold* provided support to conduct critical ocean disposal site monitoring work that is otherwise impossible for EPA's Pacific Southwest Office.

The *Bold*'s California voyage began with a side scan sonar survey and sediment sampling at an ocean disposal site off San Diego. Similar survey work was conducted at other California sites. The Regional Lab analyzed the chemical make-up of the sediment samples. Off the Southern California coast, the U.S. Geological Survey also profiled the ocean floor to locate offshore earthquake faults in the vicinity of other EPA-approved ocean disposal sites.

In the Northern California port of Eureka, the EPA science crew collected sediment samples from the Humboldt Open Ocean Disposal Site, where dredged material from Eureka's harbor is deposited. In addition to sediment chemistry, the sediment samples yielded marine invertebrates that live in the mud and sand—from polychaete worms up



to 8 inches long, to tiny amphipods barely visible to the naked eye. These marine organisms were identified and counted to see if their numbers and diversity indicate a healthy bottom habitat.

[EPA Blog on the Voyage of the Bold:
blog.epa.gov/blog/category/bold/autumn09](http://blog.epa.gov/blog/category/bold/autumn09)

1982

Toxics found in Silicon Valley groundwater. Dioxin discovered in soil in Times Beach, Mo. Pesticide found in Hawaii's milk. Selenium poisons wildlife at Kesterson refuge, Calif.



Left: EPA's Mobile Lab

Above and right: EPA ocean survey vessel *Bold* made its first West Coast voyage in 2009.



Wastewater Infrastructure: Building a Better East Bay MUD

Our wastewater infrastructure is aging, causing sewage spills and overflows. Sewage and stormwater from six communities and one sanitary sewer district on the eastern shore of San Francisco Bay flow through sewer pipes to East Bay Municipal Utility District's (EBMUD) wastewater treatment plant near the Bay Bridge Toll Plaza. The average age of these sewer pipes is 50 years, with some pipes as old as 130!

Pipe breaks, blockages caused by tree roots or grease, and even too much rainwater seeping into the pipes through joints and cracks can lead to overflows of untreated sewage into streets, homes, creeks and the Bay. Regular maintenance and replacement of pipes is key to preventing spills and overflows. However, communities often find it difficult to continuously assess, repair and replace this unseen asset.

As many aging sewer pipes have cracks, misconnections and other flaws, stormwater

and groundwater can infiltrate the sewers when it rains. The increased flow can lead to a tenfold increase in the volume of wastewater reaching the treatment plant. To prevent overflows, EBMUD diverts some of the flow to its three wet weather facilities, which discharge partially-treated wastewater to the Bay on occasion.

Aging sewer pipes can lead to overflows of untreated sewage into streets, homes and water bodies.

Through cooperative enforcement actions, EPA and the San Francisco Bay Regional Water Quality Control Board have tasked EBMUD and its seven communities to reduce infiltration into the sewers through infrastructure renewal and improved maintenance. The goal is to eliminate discharges from the wet weather facilities. Through a strategy of long-term investment by EBMUD and its communities, primarily through user fees, to achieve sustainable infrastructure.

EPA and the Regional Board entered into a binding agreement with EBMUD in January 2009. EBMUD agreed to identify areas with the highest flows, require repair and/or replacement of damaged private sewer pipes that extend from homes and businesses to

community sewers, and improve maintenance programs.

In addition, EPA inspected the sewer systems of the seven communities. Based on those findings, EPA took enforcement action against all seven communities in November 2009. As a result, the communities are required to do similar work to reduce infiltration.

EPA actions aimed at infrastructure renewal and maintenance in Southern California over the past few years proves this strategy works. Legal settlements with the cities of Los Angeles and San Diego have greatly reduced sewage spills. Both cities have invested hundreds of millions of dollars in repair and replacement of sewer pipes as well as improved cleaning and maintenance.

Los Angeles reduced sewer overflows from 444 in 2004 to just 159 in 2009. San Diego's sewer overflows dropped from 365 in 2000 to just 38 in 2009. Over the past five years, Los Angeles has rehabilitated or replaced 54 miles of sewers and completed nine sewer capacity expansion projects. Over the past decade, San Diego has rehabilitated or replaced 240 miles of sewers.

In each case, EPA has worked in concert with local agencies to find lasting solutions that protect public health and the environment in the San Francisco Bay Area and Southern California, to benefit over 30 million people.

1983

EPA's Superfund Program investigates groundwater contamination from aerospace industry in Southern California's San Fernando and San Gabriel Valleys.



The Oakport Wet Weather Facility processes excess sewage diverted from EBMUD's wastewater collection system.

The SRF Team: Speeding Recovery Act Funding to Shovel-Ready Projects



Thanks to the American Reinvestment and Recovery Act, some EPA staff had greatly increased workloads over the past year. Among them were the regional Water Division's State Revolving Fund (SRF) Team of Jose Caratini and Juanita Licata in San Francisco, and Susan Polanco in Hawaii.



There were no complaints, however, because the Recovery Act made \$610 million available for new loans and grants to cash-strapped states, tribes and local water systems in the Pacific Southwest to build or replace aging drinking water and wastewater

facilities—treatment plants and pipelines that ensure our drinking water is safe and our beaches and waterways are healthy for recreation, fish and wildlife.

After the Recovery Act passed in February 2009, the Drinking Water Program in California alone received applications for more than 2,100 projects that would have cost a combined total of \$6 billion. The state's fiscal crisis had dried up bond money normally used for many of these projects. In the end, EPA provided \$159 million for drinking water projects and more than \$269 million for wastewater projects in California.

The new money funded 252 long-planned, shovel-ready projects in the Pacific Southwest. Most of the money was disbursed through the State Revolving Funds to local governments, who repay loans after their new facilities are built. Then the money can be loaned again, and repaid again, and it keeps revolving. This year, every federal dollar was matched by about \$2 in state and local funds.

Jose, Juanita and Susan reviewed applications, worked with the states to develop use plans, and processed approved funding. They also oversaw the projects to ensure funds are spent according to Recovery Act rules. For example, American-made iron and steel must be used, and 20% of the funds must go to "Green Infrastructure" projects, such as installation of water meters on unmetered properties to prevent water waste, installation of low-friction pipes and efficient pumps to save energy, and use of solar power to run treatment plants.

Nevada's SRF had financed 54 drinking water and wastewater projects in 1999-2008. In 2009 alone, the Recovery Act funded 29 more Nevada projects.

In just one year, the SRF Team approved funds for 146 wastewater projects and 106 drinking water projects in California, Arizona, Hawaii and Nevada. State and local agencies put projects out for bid and awarded contracts. Due to tight deadlines mandated by Recovery Act and state rules, work that usually took months was done in just a few weeks. By February 17, 2010, a year after the Act became law, most of the projects were under construction.



Above: Susan Polanco

Right: Jose Caratini and Juanita Licata

1984

Catastrophic leak at chemical plant in Bhopal, India kills 2,500 people. Congress strengthens 1976 law regulating hazardous waste, creating stricter standards for disposal sites.

Clean Land



1985

Scientists report hole in stratospheric ozone over Antarctica getting larger each Spring. Santa Cruz voters ban facilities for offshore oil, inspiring other coastal localities to do likewise.

40 things...



ON THE ROAD

Walk, bike, carpool or take transit as much as possible

Congress passed the Superfund law in 1980, giving EPA responsibility for cleaning up abandoned hazardous waste sites, enforcement authority to get responsible parties to pay for cleanups, and funding to get the job done quickly when there's an imminent threat to human health or the environment. Cleanup sites range from abandoned mines to schools where students have spread mercury contamination by playing with the toxic liquid metal.

In 2009, funding from the American Reinvestment and Recovery Act accelerated the ongoing cleanup work at Iron Mountain Mine near Redding, Calif., and dozens of short-term cleanups of soil contaminated by leaking underground fuel tanks at abandoned gas stations (pages 18-19).

In the last few years, EPA's Pacific Southwest office has pioneered "cleaner cleanups," where environmental impacts are

minimized by, for instance, using solar power generated on-site, as at the Aerojet site near Sacramento, Calif. (see facing page, p. 39).

Disasters like wildfires, floods and tsunamis can leave containers of fuel and other toxics scattered over a wide area. EPA responds quickly, sending On-Scene Coordinators to organize collection and safe disposal of such toxic debris (see p. 24-25).

Solar-Powered Cleanup at Aerojet Superfund Site

The Aerojet General Corp. Superfund site is a contaminated groundwater site near Rancho Cordova, Calif., east of Sacramento. The plume of contaminated groundwater is nearly 27 square miles in size, including a portion beneath the American River. Since 1953 Aerojet and its subsidiaries have manufactured liquid and solid fuel rocket engines on the site. About 1,200 people are employed there.

In the 1950s through the 1970s, the facility dumped hazardous wastes in surface ponds, landfills, deep injection wells, and leach fields, polluting the groundwater, which ultimately reached the river. Today, a new solar-powered system is pumping and treating the contaminated groundwater, gradually restoring it to drinking water quality.

Since the site was listed on EPA's Superfund National Priorities List in 1983, the company has investigated the extent of the groundwater contamination, and built treatment systems to restore the aquifer. This effort requires pumping and treating millions of gal-

lons of water every day, and will continue for decades.

Cleanups like this have a significant indirect environmental impact that wasn't considered when the pump-and-treat systems were built: The electricity to run them 24/7 year after year comes from remote power plants, either burning fossil fuels like coal and natural gas, or from hydroelectric dams.

Contaminated groundwater is gradually being restored to drinking water quality.

To mitigate some of these environmental impacts, Aerojet partnered with their electricity provider, the Sacramento Municipal Utility District (SMUD) and a solar development company, Solar Power, Inc. to commission and build a 40-acre photovoltaic power array, which converts sunlight into electricity. The first phase broke ground in June 2009, and was completed in November. The array uses a single-axis tracking system to follow the sun through the day to maximize electricity production. The array is made up of more than 11,000 panels with a capacity to generate 3.6 megawatts.

A second phase of the solar "farm" will be completed by summer 2010. Its final generating capacity will be 6.0 megawatts, using almost 30,000 panels, making this the largest single-site industrial solar-powered



system in California, and the largest at a Superfund site in the country. The system will provide more than 20% of the electricity required to operate the groundwater remediation system at Aerojet. It sits on land that was otherwise considered difficult to sell or develop due to the ongoing Superfund cleanup. EPA and state officials worked with Aerojet to build the solar facility in a location that minimized environmental impacts and doesn't hinder ongoing cleanup activities.

During its first year at full power, the system will generate enough clean power to offset enormous amounts of greenhouse gases and smog-forming pollutants that would have been emitted using power from generating plants burning fossil fuel. EPA's online Power Profiler estimates the annual emissions prevented for power used in the Rancho Cordova area at 6,000 tons of carbon dioxide, 4 tons of sulfur dioxide and 5 tons of nitrogen oxide. With a life expectancy of 25 years for the new solar array, it adds up to a significant environmental benefit while protecting the valuable groundwater resources.

1986

California voters approve Proposition 65, requiring disclosure of toxics. Congress passes Emergency Planning/Right-to-Know Act. Los Angeles agrees to upgrade sewage treatment.



Left: Groundwater treatment facility at Aerojet Superfund site.

Above: EPA's Kevin Mayer at the new solar power facility at the Aerojet Superfund Site.

Estimate emissions reductions with the Power Profiler:
www.epa.gov/cleanenergy/energy-and-you/how-clean.html

Facing page: Photo courtesy of the Bishop Paiute Tribe.

Iron Mountain Mine: Recovery Act Funding Advances Cleanup



Mining was a mainstay of the California economy for a century, starting with the Gold Rush of 1849. But the environmental costs of historic mining have come due at places like the Iron Mountain Mine near Redding, California, where EPA's ongoing efforts to protect the Sacramento River from the mine's toxic runoff

accelerated in 2009 thanks to new federal funding.

In April 2009, EPA received \$20.7 million in funding from the American Reinvestment and Recovery Act to speed the long-term cleanup of zinc and copper-contaminated sediments from the Iron Mountain Mine Superfund Site. Rick Sugarek, EPA's project manager for more than 20 years, and Cynthia Wetmore, construction manager for the site for 17 years, put the money to work almost immediately, building a system to dredge and remove contaminated sediment from the bottom of the Spring Creek Arm of Keswick Reservoir on the Sacramento River, which received the mine's toxic runoff for more than 40 years.

The Recovery Act funds, along with another \$23 million provided by EPA, are paying workers to build and operate a system of dredges, pumping stations and pipelines to remove the toxic sludge and transport it to 12-acre, plastic-lined pits for permanent disposal. When the removal is finished in 2011, 18 months ahead of the original schedule, the filled pit will be capped with clay, soil and plants, to keep the contaminated soil in place. Construction was completed in September 2009, a year ahead of schedule. By December, dredging had already removed about one third of the sludge.

Seven-square-mile Iron Mountain, mined for iron, silver, gold, copper, zinc and pyrite from the 1860s to 1963, is honeycombed with tunnels and pits. By 1940, the mine's toxic runoff was dumping a ton of toxic dissolved metals a day into local creeks and the



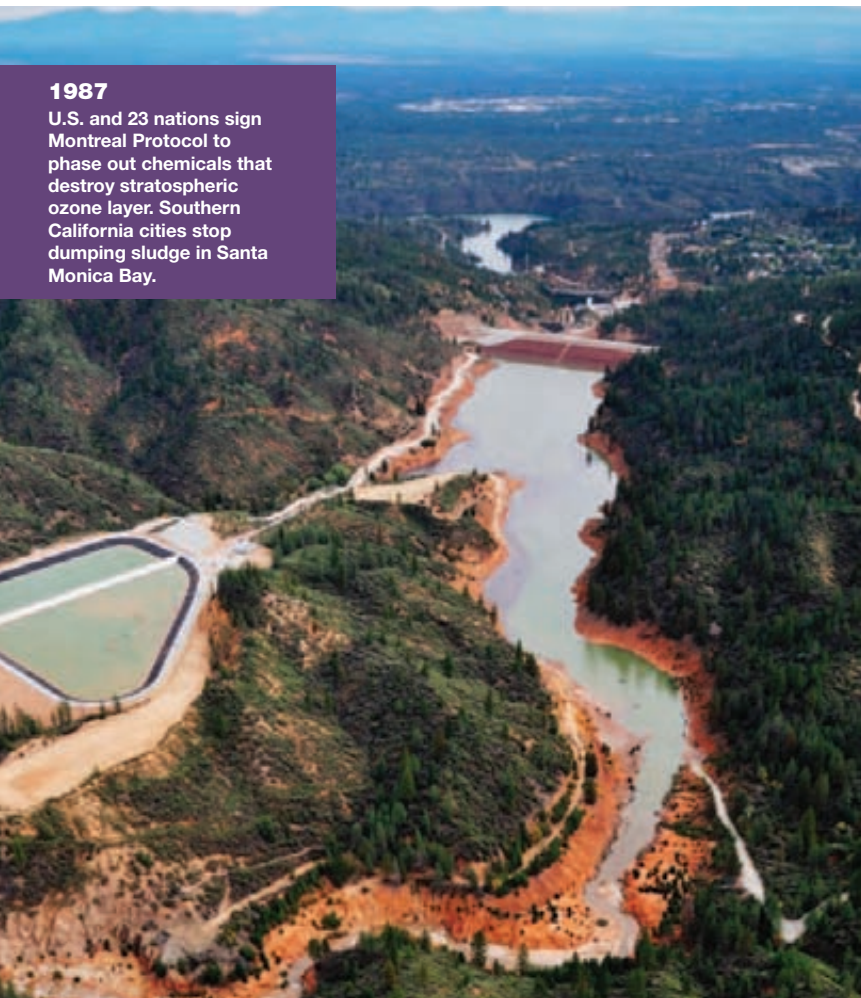
Sacramento River, polluting a drinking water supply used by thousands of people and sometimes killing the river's prized salmon.

World's Most Acidic Water

Pyrite, exposed to water and air, produces sulfuric acid. This acid seeps through the mountain and leaches out copper, cadmium, zinc and other heavy metals. The resulting toxic brew—the most acidic water naturally found on earth—once flowed into sections of three creeks before reaching the river, virtually eliminating aquatic life.

In the 1950s, Keswick Dam was built on the Sacramento, downstream from these creeks. Fish kills were reduced, but not eliminated. In 1983, EPA designated the Iron Mountain Mine as a Superfund site. Since 1986, EPA has overseen many actions at the site to reduce the toxic runoff, and treat the remaining flows to remove contaminants. After completion of a treatment plant in 1994, these actions now capture 98% of the toxics coming out of the mine.

Before the treatment plant was built, heavy metals precipitated into a sludge and fell to the bottom of the Spring Creek Arm of the reservoir, accumulating 200,000 cubic yards of toxic sludge that could threaten salmon if a major storm were to erode the bottom sediment.



1987

U.S. and 23 nations sign Montreal Protocol to phase out chemicals that destroy stratospheric ozone layer. Southern California cities stop dumping sludge in Santa Monica Bay.

Left: Dam and water treatment plant at the Iron Mountain Mine prevent toxic dissolved metals from polluting the Sacramento River.

Above: Bulldozers preparing storage site for contaminated sludge dredged from Keswick Reservoir.

Recovery Act Accelerates UST Cleanups, Protects Groundwater



Throughout the Pacific Southwest, groundwater is an important drinking water source. In many places, it's threatened by hydrocarbon fuels seeping from leaking underground storage tanks (USTs) at abandoned gas stations and other fuel tank sites. The American Recovery and Reinvestment Act has provided \$200 million nationwide, and more than \$21 million in the Pacific Southwest, to clean up these sites. This vitally important work is also delivering on the promise of stimulating the slumping economy and employing people throughout the region.

For example, a former bulk fuel storage site was left vacant for years in Ashland Park, near San Leandro, Calif. Redevelopment was hampered by the need for site assessment and cleanup. There was no responsible party capable of funding the cleanup. In 2009 the California State Water Resources

Control Board granted Recovery Act funds to the Hayward Area Recreation and Park District to clean up the site. The cleanup has cleared the way for redevelopment. Plans call for construction of a youth center, a two-acre park and a school gymnasium.

In 2010, California plans to use more than \$15 million in Recovery Act funds to assess and clean up at least 10 additional UST sites. Investing in these cleanups will jump-start other jobs and investments in communities throughout California.

Throughout the country, Recovery Act funds are being used by EPA in partnership with states, tribes and territories to finance UST cleanups. In the Pacific Southwest, cleanups are underway in Arizona, California and on tribal lands, and are about to begin in Nevada, Hawaii and island territories in the Pacific. Through the Recovery Act, EPA is putting people to work and protecting the environment.



Watch a Video about the Ashland Park Site:
www.epa.gov/region9/eparecovery/video/ashland

More about UST Cleanups in Pacific Southwest Region:
www.epa.gov/region9/waste/ust

1988

Congress bans ocean dumping of sewage sludge and industrial wastes, after medical waste washes up on NJ beaches. Shell Oil refinery spills 365,000 gallons oil into Carquinez Strait.



UST Recovery Act Funding Allocations to Pacific Southwest States & Territories

Arizona	\$3,219,000
California	\$15,577,000
Hawaii	\$1,317,000
Nevada	\$1,266,000
Guam	\$138,000
Commonwealth of the Northern Mariana Islands	\$57,000

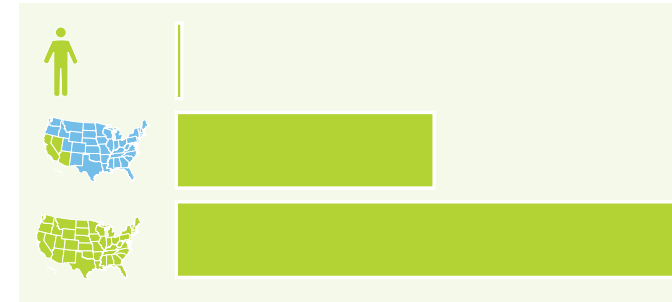
Above and left: Cleanup of a former bulk fuel storage site in San Leandro, Calif. has cleared the way for redevelopment, including future Ashland Youth Campus.

40 THINGS



you can do to save the planet

EPA's mission is to protect human health and the environment. To honor the 40th anniversary of Earth Day, we invite you to join us by taking individual action—here are 40 things we can each do to reduce greenhouse gases and help save the planet:



AT HOME



- 1 Stop junk mail (opt out)
- 2 Replace incandescent bulbs with compact fluorescent lights—and turn them off when not in use
- 3 Buy local, sustainably produced food, and eat less meat
- 4 Adjust your thermostat—up in summer, down in winter
- 5 Install water saving fixtures in bath and kitchen
- 6 Buy Energy Star certified appliances (www.energystar.gov)
- 7 Install solar panels or switch to renewable energy sources
- 8 Shop at thrift stores and buy used or refurbished products

AT SCHOOL



- 9 Perform an energy audit of school buildings
- 10 Teach students how to make eco-friendly choices
- 11 Start a recycled materials art program
- 12 Create a compost bin for food scraps—and recycle cans, bottles and paper
- 13 Create an organic vegetable garden
- 14 Reduce or recycle toxic chemicals in school laboratories
- 15 Help students volunteer for local habitat restoration projects
- 16 Rent college textbooks instead of buying them

ON THE ROAD



- 17 Drive a more fuel efficient car, or join a car share
- 18 Walk, bike, carpool or take transit as much as possible
- 19 Reduce your air travel and use e-tickets instead of paper
- 20 Go easy on the accelerator, use cruise control, and keep your car tuned up and tires well inflated
- 21 Make sure your mechanic recycles used automotive oil and coolant
- 22 Choose a green hotel, eco-tours and other earth-friendly travel choices
- 23 Ask hotel staff not to replace your towels and sheets every day
- 24 Bring a reusable water bottle

1989

Exxon Valdez oil tanker runs aground in Alaska's Prince William Sound, spilling 11 million gallons of oil, fouling hundreds of miles of shoreline, killing fish and wildlife.

if **everyone** did just one thing...

AT WORK



- 25** Print less, use 100% recycled paper and print double sided
- 26** Reduce commuting by working from home when possible
- 27** Use environment-friendly cleaning supplies (e.g. Green Seal approved)
- 28** Buy EPEAT certified computers and monitors (www.epeat.net)
- 29** Use video and telephone conferences to reduce travel
- 30** Green your meetings—replace paper handouts with e-documents, recycle waste
- 31** Start a composting program and set a goal of zero waste
- 32** Organize co-workers to carpool or bike to work

EVERYWHERE!



- 33** Get involved—exercise your rights to promote sustainable choices
- 34** Switch to reusable items, such as bags and lunch containers
- 35** Turn off lights, appliances and electronics when not in use
- 36** Bring your own reusable mug when you go out for coffee or tea
- 37** Buy recycled and recyclable products, eliminate plastic and styrofoam
- 38** Compost your food/organic waste
- 39** Recycle paper, glass, plastics, electronics
- 40** Keep reusable shopping bags handy and use everywhere you shop

DO JUST ONE THING FOR A YEAR... AND IT ADDS UP

If one person drinks tap water instead of one liter of bottled water each day, it would save the energy equivalent 1.6 Kilo-watt-hours per day, 46 gallons of gas per year, or 0.41 metric tons of CO₂.

If all 49 million people in the Pacific Southwest Region did the same, it would save the equivalent of 2.3 billion gallons of gas per year—the amount used by 3.8 million cars, or 20 million metric tons of CO₂.

If everyone in the USA did the same, it would save the equivalent of 14.2 billion gallons of gas per year—the amount used by 24.1 million cars, or 126 million metric tons of CO₂.*

**This is an estimate of the greenhouse gas savings for bottled water produced and used locally. For bottled water from distant locations, the carbon footprint may double! The calculation assumes that the water is bottled using electricity with the U.S. average carbon emissions.*

[Sources: Gleick & Cooley, "Energy Implications of Bottled Water," Pacific Institute, Oakland, Calif., 2009; U.S. EPA, Greenhouse Gas Equivalencies Calculator (www.epa.gov/RDEE/energy-resources/calculator.html)]

40 THINGS



1990

Congress and President George H.W. Bush approve Oil Pollution Act, Clean Air Act Amendments to reduce hazardous air pollutants and industrial emissions, require cleaner gasoline in smoggy areas.

EPA Funds Los Angeles Conservation Corps' Green Building Job Training

EPA awarded the Los Angeles Conservation Corps (LACC) a total of \$700,000 in Brown-fields job training grants in 2009 to recruit and train residents from the city's impoverished Empowerment Zone for environmental careers.

With this funding, LACC is training 160 participants, and hopes to place at least 130 graduates in environmental technician jobs. The training program includes 254-hour and 400-hour training cycles in hazardous waste operations, environmental technologies, lead and asbestos abatement, refinery safety overview, forklift training and general industry standards. Four certifications will be offered.

As part of the program, LACC is collaborating with the LA Housing Partnership (LAHP) to provide skilled workers to help revitalize low-income housing areas across the city. The inner city neighborhood where work

started on the first construction project has significant populations of Mexican, Central American, Filipino, Armenian, Korean, Thai, Cambodian, African and Chinese immigrants. More than 80% of the residents of the district are renters, with 40% of children living in low-income households below the federal poverty threshold.

Green Senior Housing

The development, Rosewood Gardens, will be a 100% affordable senior housing development. The builders are pursuing the Leadership in Energy and Environmental Design (LEED) silver certification for mid-rise homes. The building on Rosewood Avenue will have 54 one-bedroom apartments, a learning center, library, laundry rooms, a central landscaped courtyard, private "porches" and balconies and a large community center at street level. A large open space and "promenade" visually joins the new development with the adjacent Rosewood Methodist church in a landscaped buffer between the two buildings. The new building draws inspiration from the existing church architecture.

Rooftop solar panels will provide on-site energy generation and solar thermal water heating. When complete, the development is expected to be the first certified LEED for Homes mid-size building in southern California.

The LAHP plans to educate residents to use the "green" features and live sustainably. Every resident will attend a "green orientation" when they move in, to learn about the importance of recycling and how to do it, how to



dispose of toxic trash so that it does not end up in the city's landfills, and how to conserve energy and water. The residents will also learn how to buy and use non-toxic cleaners and household materials, and to optimize ventilation.

One of the building's green features is the location: it's an urban infill site in a densely developed area, reducing the residents' need for cars. It has a partial green roof, drought-tolerant landscaping, on-site solar power and solar hot water; individual heating, ventilation and cooling for each unit, on-site filtration of storm water, designated recycling and bicycle storage rooms, natural ventilation in entrance lobby and stairs, Energy Star appliances and electrical fixtures, dual flush toilets and water-saving fixtures. Builders are using no tropical wood, reducing construction waste and recycling 90% of the remainder.

Above: EPA Acting RA Laura Yoshii (right) presents \$700,000 green building job training grant to LACC Executive Director Bruce Saito and trainee Brunny Maria Smith.

1991

Train derailment near Dunsmuir, Calif., spills toxic fumigant metam sodium into Upper Sacramento River, wiping out all life in the river for more than 40 miles.



Left: Trainees learning asbestos abatement techniques.

EPA Adds B.F. Goodrich Site to Superfund List to Expedite Cleanup

In January 2010, after adding the site to the Superfund National Priorities List, EPA released a proposal for an initial groundwater cleanup project at the B.F. Goodrich site. EPA placed the site on the list after contaminated groundwater forced the closure of drinking water wells in the western San Bernardino County, Calif., community of Rialto. Superfund is the EPA program that cleans up the nation's uncontrolled hazardous waste sites while pursuing reimbursement from responsible parties.

"Adding the B.F. Goodrich site to the Superfund list gives EPA the needed tools to clean it up," says Keith Takata, EPA Deputy Regional Administrator in the Pacific Southwest. "EPA is committed to making sure that the cost of cleanup is borne by those responsible for the contamination."

Since the 1940s, the B.F. Goodrich site was used to store, test and manufacture munitions, rocket fuel and fireworks by the government and businesses. The area's groundwater is contaminated with trichloroethylene (TCE) and perchlorate, forcing the closure of public drinking water supply wells.

Work done at the site by EPA in 2009 includes installation of six 900-foot deep groundwater monitoring wells, testing of 14 existing groundwater wells, and soil and soil gas testing at a disposal pit used by the B.F. Goodrich Corp. in the late 1950s and early 1960s.

The 160-acre site was part of a larger area acquired by the U.S. Army in 1942 for an inspection and storage facility for rail cars

hauling munitions to the Port of Los Angeles. After the Rialto property was sold in 1946, it was used by munitions manufacturers, fireworks manufacturers and other businesses that used perchlorate. In 1956 and 1957, West Coast Loading Corp. manufactured two products containing potassium perchlorate. From about 1957 to 1962, B.F. Goodrich Corp. produced rocket fuel there containing ammonium perchlorate, and used TCE in the manufacturing process. After that, the site was used by companies that manufactured or sold fireworks.

TCE and perchlorate contamination has resulted in the closure of public drinking water wells.

Beginning in 2002, the California Regional Water Quality Control Board worked to investigate and clean up the site. Since then, EPA has spent approximately \$6 million to complete soil and groundwater testing, develop a cleanup plan and pursue enforcement efforts at the site.

Trichloroethylene, or TCE, is a metal cleaning solvent. Drinking or breathing high levels of trichloroethylene can damage the nervous system, liver and lungs. Perchlorate is an ingredient in solid rocket fuel and many pyrotechnics, and can affect the thyroid gland.

Nationwide, 1,607 sites have been placed on the National Priorities List, of which 105 are in California. Construction of cleanup facilities and infrastructure has been completed at about 2/3 of the 1,607 sites.

More on the Goodrich Site:
www.epa.gov/region9/bfgoodrich



1992
 EPA launches Energy Star labeling program (now at www.EnergyStar.gov) to help consumers identify energy-efficient products.

Right: EPA contractors constructing a groundwater monitoring well at B.F. Goodrich Superfund Site.

Emergency Response: Earthquake, Tsunami Hit American Samoa

At 6:48 on the morning of September 29, 2009, a massive magnitude 8.1 earthquake shook American Samoa, with an epicenter about 120 miles southwest of the islands. Twenty minutes later, a tsunami followed, striking American Samoa with a series of four to five waves of 15 to 20 feet. Damage was widespread. Local authorities reported 33 people killed.

American Samoa, a territory of the U.S., is in the South Pacific, almost 5,000 miles from the EPA's Pacific Southwest Regional Office. The territory consists of five rugged, volcanic islands and two coral atolls, with a population of about 60,000 people, mostly indigenous Samoans.

Within five hours of the incident, EPA deployed Lance Richman to the FEMA Regional Response Coordination Center in Oakland to coordinate EPA's part in the federal response. EPA's Regional Emergency Operations Center was activated. Soon afterward, FEMA tasked EPA with assessing the tsunami's impacts on oil storage facilities and

toxic hazardous materials, and collecting and stabilizing the "hazmat."

EPA sent On-Scene-Coordinator Chris Reiner to American Samoa to start the work. Reiner worked with American Samoa EPA (A.S. EPA) on the assessment and collection of containers holding toxics and household hazardous waste. Reiner and Duane Newell

EPA responders collect hazardous waste after a devastating tsunami.

from EPA's Environmental Response Team assembled a hazardous materials task force with the U.S. Coast Guard Pacific Strike Team, the Hawaii National Guard Civil Support Team, and contractors. They responded to oil spills, collected household chemicals in devastated villages, pulled 55-gallon drums off beaches and sidewalks, and rounded up many other containers of toxics. They took everything to a staging area for identification and storage.

In three weeks, the hazmat team collected 50 drums of hazardous chemicals (about 35 of which were waste oil); 165 car and boat batteries; 20 gallons of acids; 300 gallons of paint-related wastes; 50 compressed gas tanks and cylinders; and hundreds of smaller containers of hazardous wastes.

Reiner and A.S. EPA met with local village chiefs and advised them on separating hazardous materials from other debris. They



visited each village affected by the tsunami, and set up household hazardous waste collection sites.

There were many challenges. A week after the first earthquake, a severe aftershock occurred, triggering a tsunami watch. All EPA operations ceased while crews moved to high ground for safety. The American Samoa Power Authority was concerned about the structural integrity of a dam, and wanted to lower the reservoir level by releasing water into a stream. But the stream was full of trash and debris from the tsunami. Reiner and his team assessed the stream to see what this new flow might wash into Pago Pago Harbor. They located an oil leak coming from a damaged shipping container that had been thrown about 1/4 mile inland, ending up wedged against a tree and bridging the stream. A.S. EPA built a series of small rock dams and placed absorbent pads, which stopped the oil spill until the USCG Pacific Strike Team could remove its source.

EPA returned to American Samoa in January 2010 to complete the sorting, packing and shipment of the collected hazardous materials for recycling and disposal off-island.

Watch the video of EPA's cleanup effort:
www.youtube.com/watch?v=Va0PWBbMNho



Left and above: U.S. Coast Guard helps remove drums of oil and chemicals scattered by tsunami in American Samoa.

1993

Heavy winter rain and snow ends six-year California drought. EPA sets salinity standard for Sacramento-San Joaquin Delta, to protect salmon and other fish harmed by water diversions.

Michelle Rogow: Managing Urgent Toxic Cleanups

For the past 11 years, Michelle Rogow has been an On-Scene Coordinator for EPA's Superfund Program. She oversees cleanups at sites where toxics pose an imminent threat to human health and the environment—like the abandoned Altoona Mercury Mine in Northern California's Trinity Alps, near Mount Shasta. During 2008 and 2009, Michelle directed a crew of up to 50 people who removed 143,000 cubic yards of mercury-laden waste from a creekbed and the surrounding area.

From July through November 2008, Michelle lived at the isolated site in the Shasta-Trinity National Forest along with the crew, in modular housing units that were trucked to the site. In addition to overseeing the cleanup, she oversaw the construction and maintenance of the camp, including cooking and cleaning staff, water supply and waste disposal. The nearest neighbor was eight miles away.

The crew worked six days a week, giving them only one day to go into town, or to

stay in the national forest and hike around Mt. Shasta to a nearby lake, as Michelle often did. "It was a good balance to my city life the rest of the year," she says. "I enjoyed that area, every day experiencing the reason why we work at EPA—a natural and beautiful ecosystem."

Mercury cleanup sites can range from abandoned mines to busy high schools.

Michelle started her EPA career in the Mid-Atlantic Regional Office in Philadelphia, while she was a civil engineering student at Drexel University. Drexel is a co-op university, where students work at full-time jobs in their field for half of each year. After graduation in 1994, she traveled across America and decided to stay in San Francisco, where she began working as a Superfund enforcement investigator in EPA's Pacific Southwest Regional Office.

Michelle became an On-Scene Coordinator in 1999, and since then she has led numerous emergency responses and cleanups. At these sites she has directed a wide variety of activities, from oil spill response and cleanup to landfill firefighting to creek restoration. In 2009 she responded to Avondale, near Phoenix, Ariz., to oversee a cleanup of mercury that high school students had



spread around their school and community. As in many of the mercury spill cleanups Michelle has led, students had contaminated their clothing, personal items, and, in some cases, their homes. In addition to decontaminating the school, Michelle's team tested the clothing of approximately 500 students and faculty, and also tested 62 homes. Three of them had to be evacuated due to high levels of mercury contamination.

When she's not on-site on the U.S. mainland, Michelle coordinates emergency cleanups in the Pacific Islands, including American Samoa, Guam and Saipan. As a result of her experience on Saipan cleaning up 25 sites contaminated with toxic polychlorinated biphenyls (PCBs) using a thermal desorption unit, she travelled to China last year to advise the Ministry of Environmental Protection on their plans to clean up PCB waste. With Michelle's help, the Chinese agency bought their own desorption unit and will begin operations this year.

1994

President Clinton signs Environmental Justice Executive Order, requiring agencies to prevent disproportionate impacts in communities. EPA launches Brownfields Program.



Left: Heavy equipment prepares disposal site for mercury-contaminated mining waste removed from creekbed.

Above: Michelle Rogow, On-Scene Coordinator, at a cleanup site on Saipan.

Communities and Ecosystems



1995

EPA launches market-based program to reduce sulfur dioxide pollution that causes acid rain. EPA requires municipal waste incinerators to reduce toxic emissions 90% from 1990 levels.

40 things...



AT WORK

Start a composting program and set a goal of zero waste

The Pacific Southwest Region is extraordinarily diverse, both in ecosystems and human communities. Landscapes range from the arid Navajo Nation to the rain forests of Kauai and coral reefs of Saipan. Cultures include 147 Native American tribes and communities, Hawaiians, Samoans, Guamanians, and ethnic groups from around the world who have migrated to Hawaii and North America over the last three centuries.

Indian Country and Pacific island territories have received federal funding through EPA to help build, improve and maintain safe drinking water and wastewater facilities. In 2009, EPA celebrated 25 years of partnership with tribes on environmental issues. In addition, the pace of improvements accelerated with the American Reinvestment and Recovery Act, and a more generous funding formula for Pacific islands and tribes.

EPA also works with disadvantaged communities where residents experience disproportionate impacts of pollution and waste disposal, and often lack the resources and tools to address these impacts. EPA has partnered with these communities to provide technical support and grants to build local capacity to pursue long-term solutions.

Recovery Act Brings Water Infrastructure to Tribes, Islands, Border Communities



Many Native American tribes, Pacific island territories and U.S.-Mexico border communities still lack access to basic water and wastewater service. While some improvements have been made in recent years, the pace greatly accelerated in 2009 thanks to funding from the American Recovery and Reinvestment Act, and a separate, major increase in annual EPA funding for water facilities on tribal lands and Pacific islands.

The projects chosen for Recovery Act grants were “shovel ready”—already planned but just awaiting funding. EPA worked cooperatively with tribal, island, and federal and state governments to award the grants. By October, EPA staff shifted their focus to oversight—monitoring expenditures and tracking progress of Recovery Act-funded projects.

About 13% of homes in Indian Country lack access to safe water, compared with 0.6%

of homes in the U.S. as a whole. More than 30% of Navajo Nation residents lack access to safe running water in their homes. In 2009 and 2010, work funded by the Recovery Act is underway to bring safe, piped drinking water to a total of more than 10,000 tribal homes for the first time. Another 8,000 homes will get wastewater services—flush toilets, sewers and sewage treatment. EPA is overseeing this work in partnership with the Indian Health Service.

The Recovery Act is funding safe, piped drinking water for 10,000 tribal homes.

In the Pacific island territories of Guam, American Samoa and the Commonwealth of the Northern Mariana Islands (which includes Saipan), 27% of people lack access to safe drinking water. The island of Saipan, with a population of 70,000, is the only U.S. municipality of its size without 24-hour water service. Guam is preparing for a U.S. military base expansion which will increase the territory's population 25% by 2014.

In 2009 EPA issued 11 Recovery Act grants for these territories, totaling \$12 million for improvements to drinking water and wastewater infrastructure. This year (2010), \$50 million has been allocated.

Along the U.S.-Mexico Border, one of the biggest challenges is upgrading wastewater



facilities to handle the vastly-increased population that has settled on the Mexican side in recent years, drawn by jobs at factories known as “maquiladoras.” More than 14.6 million people live in the border area, mostly in 15 pairs of sister cities that straddle the border. In one of these cities last year, Nogales, EPA funding helped complete a \$65 million upgrade of the Nogales International Wastewater Treatment Plant, benefiting more than 200,000 residents and improving water quality in the Santa Cruz River, which flows from Mexico into Arizona.

In another border city, Mexicali, EPA funding through the Border Environment Cooperation Commission is being used to construct 124 acres of wetlands to further clean effluent from the Las Arenitas wastewater treatment plant.

Watch a Video on Border Environmental Issues:
www.epa.gov/usmexicoborder/features/border-video

1996

Safe Drinking Water Act Amendments require water suppliers to inform customers about contaminants; Food Quality Protection Act tightens standards for agricultural pesticides.



Left: New storage tanks make it possible to pipe safe drinking water to homes on tribal lands. Photo courtesy of Big Pine Paiute Tribe.

Above: The Nogales Wastewater Treatment Plant expansion, completed in 2009, has cleaned up the Santa Cruz River.

Facing page: Photo courtesy of the Quechan Indian Tribe.

Getting Results Through Tribal/EPA Partnerships: 25 Years of Progress

The year 2009 marked the 25th anniversary of EPA's Indian Policy, which set forth the Agency's trust responsibility to federally-recognized tribes and directed EPA staff to work with tribes on a government-to-government basis to protect the environment and human health. Since then, the policy has been reaffirmed by every new administrator. With funding by EPA grants growing steadily over the years, more than 80% of the 147 federally-recognized tribes in the Pacific Southwest Region now have their own environmental protection programs.

The combined area of these tribes' lands is more than 27 million acres, with a total population of 315,000 tribal members. This timeline shows some of the major milestones

of the past three decades in the Pacific Southwest's Indian Country.

1981: EPA's first grant to a tribe in the Pacific Southwest funds a FIFRA (Federal Insecticide, Fungicide, and Rotenticide Act) program at the Gila River Indian Community.

1982: EPA issues first grant to the Intertribal Council of Arizona.

1984: EPA Administrator John Ruckelshaus adopts EPA Indian Policy (still in effect); EPA issues grant to fund environmental programs at Navajo Nation.

1985: First EPA grant for a tribal air program goes to Navajo Nation.

1991: EPA Region 9 receives \$205,000 for grants to all qualifying tribes in the Pacific Southwest.

1992: Congress approves Indian Environmental General Assistance Program (GAP), providing ongoing grants to tribes.

1995: EPA forms the Regional Tribal Operations Committee (RTOC) to provide guidance from tribes for EPA's budget, programs, regulations and priorities affecting tribes.

1996: Safe Drinking Water Act Amendments authorizes Drinking Water Tribal Setaside Program.

1998: Washoe Tribe of Nevada and California establishes Washoe Environmental Protection Department. Since then, the tribe has recycled more than 600 abandoned vehicles and thousands of white goods (such as washers and dryers) and tires.

Left: Jean Gamache, manager of EPA's Tribal Program Office, addresses tribe members at the dedication of a new drinking water storage tank at the Campo Band of Kumeyaay Indians in Southern California.



The Pacific Southwest is home to about 315,000 tribal members.

1999: Gila River Indian Community starts curbside trash collection to end backyard waste burning; Kaibab Tribe starts Environmental Youth Outreach Program.

2000: First Tribal Border Infrastructure project completed: Cocopah Tribe's sewer construction.

Above: Members of the Reno-Sparks Indian Colony start with a ritual blessing at an event with EPA and the Nevada Department of Environmental Protection. Photo courtesy of the Reno Sparks Indian Colony.



1997

EPA announces tougher air quality standards for smog and particulates (dust and soot), to improve air quality for 125 million Americans over the next ten years.

2001: Throughout the Pacific Southwest, 33 tribes implement hazardous waste programs.

2004: Navajo Nation gains authority to run air permit programs.

2007: The Gila River Indian Community submits a Tribal Implementation Plan (similar to a state's Clean Air Act regulatory plan), later approved by EPA.

2009: The Ramona Band of Cahuilla Indians of Southern California became the first fully "off-grid" reservation, with 100% renewable electric power generated by sun and wind.

Cumulative and 2009 Results

The pace of environmental progress in Indian Country has been accelerating in recent years. The following are among the many goals achieved last year.

- In 2009, 130 tribes and tribal consortia in the Pacific Southwest received a total of \$15.6 million in GAP grants.
- As of 2009, 93 tribes in the region had implemented their own solid and hazardous waste programs.
- Since 1987, in partnership with tribes and the Indian Health Service, EPA's Clean Water and Drinking Water Tribal Set-Aside programs in the region have provided \$112 million for 450 projects to improve infrastructure for 65,000 tribal homes.
- The Water Pollution Control Program has grown from five tribes eligible to receive funding in 1989 to 98 tribes in 2009, of which 93 received funding. The Nonpoint Source Pollution Control Program has grown from 11 tribes eligible in

1997 to more than 77 tribes in 2009, of which 67 received funding.

- EPA's Tribal Border Infrastructure Program has provided \$34 million to tribes for 47 water infrastructure projects serving nearly 10,000 tribal homes near the U.S.-Mexico Border.
- EPA has awarded more than \$4 million to tribes for source water assessment and protection for more than 60% of tribal drinking water systems in the Pacific Southwest. The Navajo Nation has its own program to ensure that 161 tribal water systems meet federal drinking water standards.
- Between 2004 and 2007, the Tohono O'odham Nation cleaned up illegal migrant camps along the U.S.-Mexico Border, removing 13 tons of garbage filling 1,231 large trash bags, plus 109 abandoned vehicles and 235 bicycles.
- Since 1997, EPA has worked with 12 tribes and spent more than \$7 million to investigate more than 120 Leaking Underground Storage Tank sites, and clean up and close 21 of them. In 2009, EPA credentialed two Navajo Nation inspectors, the first tribal tank inspectors in the U.S., enabling the tribe to enforce underground tank regulations.
- By 2009, EPA's regional Pesticides Office funds 10 tribal pesticide programs and one tribal consortium. The Pala Band of Mission Indians and the Blue Lake Rancheria fund their own pesticide regulatory programs. The Tohono O'odham Nation uses GAP funds to monitor pesticide use. Tribes were responsible for 57% of pesticide enforcement actions in Indian Country nationwide.



- The Colorado River Indian Tribes have collected, cleaned and recycled 24 tons of plastic pesticide containers used by farmers on 85,000 acres of agricultural land.
- Between 2000 and 2008, 15 tribes received grants to abate lead (Pb) hazards. Projects funded included awareness programs, soil testing and blood lead screening for children and pregnant women.
- In 2009, EPA awarded 30 tribal air grants totaling more than \$3 million, plus a radon grant to the Navajo Nation. With this funding, 26 tribes are monitoring air for particulate matter, ozone (smog), or air toxics.
- Since 1982, EPA has conducted 61 Emergency Response actions on tribal lands in the region. Most were cleanups of abandoned hazardous waste and contaminated soil. EPA has worked with 20 tribes to support tribal Emergency Response programs.

More on preventing lead poisoning in Indian Country:
www.epa.gov/region9/toxic/lead/lead-child-indiancountry

1998

New national leak detection and prevention standards for underground fuel storage tanks take effect December 22, spurring replacement of leaky tanks.

Above: Tribe members planting trees as part of a wetlands restoration project funded by EPA. Photo courtesy of the Gila River Indian Community.

Environmental Justice in the Pacific Southwest

"The color of your skin or size of your wallet should not determine the quality of your environment," says EPA Regional Administrator Jared Blumenfeld, who is making environmental justice one of his top priorities.

Environmental justice (EJ) is part of EPA's routine work at the Pacific Southwest Office. In addition, EPA's EJ Program supports the regional office in integrating environmental justice considerations into its programs and decision-making. "Environmental justice isn't an afterthought in EPA's Pacific Southwest Region," Blumenfeld says. "It's the first thought."

In Southern California, EPA is collaborating with community groups and government agencies to address the health concerns of people living near the I-710 freeway, where cargo from the Ports of Los Angeles and Long Beach moves inland by diesel truck. Due to constant truck and rail traffic, residents of the densely-populated area are exposed to more air pollution than other Southland residents. EPA designated the area one of the nation's 10 "EJ Showcase Communities"—places where EPA enhances the agency's technical support of community efforts.

A three-year, \$160,000 EPA grant to the state Department of Toxic Substances Control is helping that agency partner with communities to "ground truth" environmental issues and target enforcement and compliance efforts. Just north of the I-710 corridor, the Center for Community Action and Environmental Justice is using an EPA EJ grant to educate residents about air pollution risks from heavy truck and locomotive traffic. The group hopes to ensure that future policy

decisions protect the communities from increased pollution.

In 2009, collaboratives in the Pacific Southwest received two of five nationwide Environmental Justice Achievement Awards, recognizing the successes of multi-stakeholder partnerships. The **Fish Contamination Education Collaborative** was recognized for raising awareness about the dangers of eating fish caught near the Palos Verdes Shelf Superfund site off the coast of Los Angeles. The **Clean Trucks Program** was recognized for its effort to reduce big-rig pollution from the Ports of Los Angeles and Long Beach by 80 percent by 2012.

Other successful projects are underway:

- In **Richmond, Calif.**, the Asian Pacific Environmental Network received an EPA EJ grant to build the Laotian refugee community's capacity to address environmental justice and public health issues associated with local planning, development and land use.
- In **East Oakland, Calif.**, Communities for a Better Environment received an EPA EJ grant to work with youth and volunteers to conduct a diesel truck counting study in the heavily trafficked Hegenberger Corridor, with the goal of changing truck routes to reduce impacts on residents.
- In **San Diego**, the Environmental Health Coalition helped low-income residents in Barrio Logan work with the Port of San Diego to introduce clean plug-in electric power for docked ships, to replace the ships' engines as generators. The group received a \$300,000 Community Action



for a Renewed Environment (CARE) grant to continue its work.

- The small **San Joaquin Valley** city of **Arvin**, which has 25% unemployment and an 88% Hispanic population, has the nation's highest number of days with unhealthy smog levels. A \$20,000 EPA grant is helping the Committee for a Better Arvin bring stakeholders together to understand and address a variety of environmental hazards.
- On the **Wai'anae Coast of Oahu, Hawaii**, the Pacific American Foundation is using a CARE (Communities for a Renewed Environment) grant to work with low-income, mostly native residents to address polluted runoff, mercury-contaminated fish, illegal dumping in streams, proximity to polluting facilities and other concerns.
- In **Black Falls**, on the **Navajo Nation**, the nonprofit Forgotten People used a \$20,000 EPA grant to help families affected by uranium contamination of well water by providing clean, safe drinking water systems for 10 families while also building community capacity to address environmental problems.

1999

Visibility improved at Grand Canyon, thanks to EPA/federal plan requiring scrubbers to reduce sulfur dioxide emissions at coal-fired Navajo Generating Station.

Above: EPA's Pacific Southwest Environmental Justice Team: (Standing) Karen Henry, Deldi Reyes, Sharon Bowen; (below) Debbie Lowe, Zoe Heller.

Reducing Impacts Through Environmental Review

From dams to highways to permits for gigantic open-pit mines, federal agency actions and federal funding often have huge environmental impacts. Under the 1969 National Environmental Policy Act (NEPA), federal agencies must prepare a detailed Environmental Impact Statement (EIS) before making any decision that has a significant impact on the environment. EPA's role is to review the draft EISs, comment on them and make sure they identify all reasonable mitigation measures that could alleviate the environmental impacts.

Last year, EPA's Pacific Southwest Region received 130 EISs for review—27% of the national total. The formidable task of reviewing them falls to the Environmental Review Office, a group of 17 EPA staff and one manager, Kathy Goforth. This behind-the-scenes work resulted in significant environmental

improvements in many of the proposed projects and permits.

For example, the U.S. Forest Service planned a logging operation in California's Shasta-Trinity National Forest to thin dense forest stands to reduce fire danger and improve forest health. As a result of EIS comments by EPA and the public, the Forest Service chose an alternative plan that avoids construction of new roads, removes fire-prone piles of slash (dead branches usually left on the ground after logging), and retains existing forest canopy in riparian areas.

Protecting Vernal Pool Wetlands

At the newest University of California campus in Merced, in the San Joaquin Valley, EPA has been involved for several years, as the campus was developed on rolling grasslands that included numerous vernal pool wetlands. These wetlands provide habitat

for waterfowl, wildflowers and endangered fairy shrimp. EPA's comments on the draft EIS and throughout the planning process led to preservation of 95% of the wetlands originally proposed to be filled, and mitigation for the rest through preservation, restoration and creation of similar wetlands.

In another case in the Southern California city of Hemet, the Federal Highway Administration, Caltrans, and Riverside County Transportation Commission (RCTC) proposed a new alignment for State Route 79 that would have impacted a 1,000-acre alkali vernal pool complex. EPA's extensive early inter-agency coordination on this project focused on the need to avoid impacts to vernal pools. In response, Hemet's city government updated their general plan to remove this alignment as the locally preferred alternative, and the draft EIS will no longer include this alignment. EPA's coordination on this project prior to the release of the draft EIS led to avoidance of the vernal pool complex.

In response to community concerns as well as EPA's comments on the Port of Long Beach's proposed Middle Harbor expansion, the port committed \$15 million to mitigate the impacts of increased air pollution and greenhouse gas emissions on schools and day care centers, and medical and senior centers. The funding will be available for projects like installing air filtration systems in schools, replacing or retrofitting school buses to reduce diesel emissions, and mobile asthma testing and treatment stations for children.

2000

U.S. Army incinerates the last of 400,000 obsolete chemical weapons, destroying their extremely toxic nerve agent, under EPA oversight at Johnston Island in Central Pacific.



Left: EPA's review of the draft EIS for State Route 79 near Hemet, Calif., caused highway planners to avoid paving this 1,000-acre vernal pool/grassland complex.

Looking Back: The Six Originals

Their ranks have thinned in recent years as colleagues retired. Yet six “originals” remain, employees who are still working after 39, 40, even 43 years with EPA and its predecessor, the Federal Water Pollution Control Administration (FWPCA). They could have retired years ago, but they say they still enjoy the work.

PHIL WOODS, civil engineer and now Water Quality Standards Coordinator Emeritus, started in 1967, when the FWPCA regional office had only 40 employees and was located in a small building near Crown Beach in Alameda.

Phil retired in 2000, but took only six weeks off before returning on a part-time basis. Water Quality Standards are limits on each of more than a hundred chemicals and contaminants where EPA draws the lines between drinkable, swimmable, clean enough for fish and wildlife, or too polluted for these uses, for all surface waters in the region. Phil knows how, when and why each standard was set.

MELANIE BLAHA was hired as a writer and editor in January 1970 by FWPCA Regional Administrator Paul DeFalco. Her first job was translating dense technical reports written by agency engineers into plain English, so they could be released to the public.

Melanie wrote the Agency’s first brochure. “Our roles as employees were not yet clear, so we had the freedom to identify a need, fill it creatively, and make a lasting difference—unlike other federal agencies, where everything went by long-standing procedures.”



Today Melanie coordinates international activities, like planning and directing visits by delegations of foreign visitors who come to learn how EPA works.

ARNOLD DEN came to EPA on June 21, 1971, “right out of grad school.” Arnold had Bachelor’s and Master’s degrees in environmental health, physiology, and industrial hygiene from the UCLA School of Public Health.

Arnold recalls two jobs as high points in his career. In 1985, helping conduct EPA’s national lake survey for acid rain, he flew by helicopter to 100 lakes in the Sierra Nevada to take water samples. More recently, he has taught risk assessment and risk communication workshops to federal and state employees. He’s taken the workshop on the road to Australia, Hong Kong, Saipan, American Samoa, and even Switzerland, by request of their governments.

RICH HENNECKE had just graduated from Sacramento State University with a degree in Mechanical Engineering when he started in the Enforcement Division in July 1971, reviewing construction projects planned for wetlands and waters.

Rich now multi-tasks in the Accounting Office. One of his tasks is overseeing the Senior Environmental Employment Program, which hires people over 55 years of age to work at EPA.

WENDELL SMITH came to EPA in November 1971. After the Clean Water Act passed in 1972, he helped set up procedures to carry it out. “It was like being an immigrant at Ellis Island—everybody was trying to figure out what to do next,” he remembers. “It was stressful but exciting.”

When EPA began making grants directly to Native American Tribes in the late 1980s, he established the region’s Tribal Water Quality Program. Many tribal communities lacked safe drinking water and sewage facilities. “What an opportunity to help!” he says. He began an intensive effort to inform tribes about EPA grants, and soon his desk overflowed with grant applications from tribes who began working with EPA.

WALLY WOO got his graduate degree in Environmental Engineering from the University of Massachusetts in December 1971, and was hired by EPA’s Boston regional office to review environmental impact statements. For 25 years, he was a manager, first in Boston, later in San Francisco.

In 1996 Wally became a coordinator of the then-new Brownfields Program, overseeing grants in California, Arizona and Hawaii. “Being a Brownfields Coordinator is fun,” he says. “It’s like playing Santa—selecting and overseeing grants to cities, to recycle industrial lands and reduce urban sprawl.”

2001

Under agreement between EPA, Los Angeles, Indian tribes, and air district, Los Angeles begins irrigating dry Owens Valley lakebed to end nation’s worst particulate air pollution.

Above: The “Six Originals”: Phil Woods, Arnold Den, Wendell Smith, Rich Hennecke, Melanie Blaha, Wally Woo

Russ Frazer: Enforcement Officer, Toxics Release Inventory Team

A native of Bishop, in California's Owens Valley, Russ Frazer grew up in the shadow of the Union Carbide Tungsten mine.

Perhaps it's no surprise, then, that Russ feels right at home when inspecting mines as the enforcement lead for Region 9's Toxics Release Inventory (TRI) Program. He also inspects a wide range of other facilities—from metal platers and chemical manufacturers, to bullet making factories and rendering plants.

Under TRI, certain facilities that use toxic chemicals must report to EPA how much they release into the environment. EPA compiles that information into a database that anyone with a computer can access, making TRI a powerful tool for communities. "The great thing about TRI is that it makes the toxic chemical release information easily available to the public—with no logins or password required," says Frazer.

In fact, TRI is EPA's largest public database, with data on 23,000 facilities nationwide and 1,600 in Region 9. Anyone can punch in their zip code to find and map TRI facilities in their area, or search for air, water, land, and underground releases by industry, city, state and county, and by chemical. TRI even includes the amounts of chemicals that were recycled, treated, used for energy recovery, and transported off-site for disposal.

"I've seen TRI work," he says. "We've seen some facilities, whose TRI data is available for public scrutiny, voluntarily change their practices to reduce pollution, for example

from trying out lead-free solder, instead of using lead-based solder. When they find it works, they are willing to switch."

However, there are facilities subject to TRI that have never reported or have under-reported their chemical releases. On any given day Russ may be researching targets, talking with facilities, analyzing reams of data, writing reports, and working with Region 9 attorneys to resolve complicated case issues. He currently heads up TRI inspections at gold mining facilities, which release more mercury into the environment than any other industry in the U.S. The releases occur primarily from land disturbance of millions of pounds of waste rock and ore (both containing naturally-occurring mercury), fugitive emissions from heap-leach piles, and stack emissions from roasters.

Prior to his environmental career, Russ spent three years on a river patrol boat at the height of the Viet Nam war. These boats (depicted in the film "Apocalypse Now") were easy tar-

gets for shooters hiding in the jungle. Russ was hit with shrapnel from a rocket-propelled grenade, earning him a Purple Heart.

After the war and engineering studies, he worked as industrial waste inspector with the Mountain View fire department. In 1976, Mountain View started its Industrial Waste Monitoring Program at a new secondary sewage treatment plant, which used bacteria to break down pollutants. To keep these facilities operating effectively and prevent toxics from reaching the Bay, cities had to prevent Silicon Valley industries from dumping toxics down the drain.

While there he became impressed with the potential power of the Emergency Planning and Community Right to Know Act that created TRI. Little did he know that, some two decades later, he would be a key player in its enforcement.

**More on the Toxics Release
Inventory:**
www.epa.gov/region9/toxic/tri



Russ Frazer

2002

EPA and its Mexican counterpart SEMARNAT launch Border 2012 Program to cooperate on clean air, water, wastewater, hazardous waste and emergency response in border area.

Compliance and Stewardship



2003

EPA, Los Angeles water board enforcement action requires three major oil companies to clean up Santa Monica's groundwater, which had been polluted with gas additive MTBE.

40 things...



EVERYWHERE!

Bring your own reusable mug when you go out for coffee or tea

EPA's mandate of protecting public health and the environment includes not just enforcing federal laws on waste management and overseeing cleanups, but also preventing waste from being generated in the first place. EPA staff have partnered with other government agencies, communities, nonprofits, tribes and industry to come up with creative solutions to push further down the road to "zero waste."

Two innovative hazardous waste prevention partnerships that EPA initiated in the Pacific Southwest showed remarkable results across the U.S. and worldwide in 2009. The U.S. Postal Service has begun removing toxic lead weights from its 215,000 delivery vehicles (facing page). And EPA's partnership with the computer industry and a nonprofit is driving demand for "green" information technology

in the U.S. and 40 countries around the world (see p. 36).

EPA has piloted a novel method of reducing the environmental footprint of hazardous waste cleanups at a Silicon Valley site (see p. 39). And in California's Klamath River Watershed, three tribes teamed up to remove and recycle 400 abandoned vehicles, along with the fuel and toxic fluids that eventually would have leaked and contaminated the soil (see p. 38).

U.S. Postal Service “Gets The Lead Out” with Help from EPA Program

The complete fleet of U.S. Postal Service delivery vehicles will replace all their lead wheel weights with lead-free ones because of a voluntary partnership that started in the Pacific Southwest with EPA's regional Waste Management Division.

In February 2008, EPA recruited the Pacific Area of the U.S. Postal Service (USPS) for a partnership in the National Partnership for Environmental Priorities (NPEP) to “get the lead out.” The USPS Pacific Area has a fleet of over 30,000 vehicles in 34 maintenance facilities in California and Hawaii. The partnership has eliminated a total of 5.5 tons of lead from USPS vehicles.

The successful West Coast effort served as the catalyst to switch the entire USPS delivery fleet of 215,000 vehicles nationwide to lead-free wheel weights. When the national partnership is completed, USPS will have eliminated as much as 30 tons of lead from entering the environment and the workplace.

Lead is a toxic chemical of concern for EPA because it bio-accumulates in the food chain, damages ecosystems, and can cause brain damage in humans, especially children. Nationally, an estimated 1.6 million pounds of lead fall off vehicle wheels every year. These lead weights are ground into dust on highways, which can be breathed, or ultimately enter waterways as polluted runoff.

The EPA-Postal Service Partnership will prevent 30 tons of lead from entering the environment.

An average of 4.5 ounces of lead is clipped to the wheel rims of every automobile in the United States. Every car owner can do something to get the lead out. When tires are rotated or balanced, consumers should ask



their mechanics to replace the old lead ones with new steel ones.

Part of EPA's partnership with the USPS included raising public awareness by creating a video to promote this partnership and also encourage consumers to ask for lead-free wheel weights at their car shops. The “Get the Lead Out” video was featured on EPA's YouTube channel and was so successful that more than 10 public and private fleet managers in the Pacific Southwest Region also signed up as NPEP partners.

All of these voluntary toxic reduction partnerships are part of NPEP, which has a national goal to partner with industries, municipalities and federal facilities to reduce the use or release of highly toxic chemicals, including lead.

2004

EPA launches West Coast Diesel Collaborative with 300 agencies, groups to reduce air pollution from diesel engines in Pacific Coast states, northern Mexico, British Columbia.



Above: Old lead wheel weights (top) are replaced with new steel weights (bottom).

Left: EPA representatives recognized the U.S. Postal Service team's effort in “getting the lead out.”

It Bears rEPEATing: The Electronic Product Environmental Assessment Tool

In 2003, EPA's Northwest and Pacific Southwest Offices initiated a dialogue with the electronics industry and state and local governments on e-waste: how to reduce the impact of the millions of computers that are sold, used and disposed of every year. The result of that collaboration is the Electronic Product Environmental Assessment Tool (EPEAT).

Today, hundreds of large purchasers, from local governments to corporations, use EPEAT for all their computer purchases. EPEAT has become one of the world's most extensive and influential green IT product rating systems, used in 40 countries. Its registry has more than 1,000 products and more than 30 participating manufacturers.

Minimizing Environmental Impacts

Participants wrestled with a fundamental topic—how to encourage the design, manufacture and purchase of new computers with the least environmental impact. The solution, rolled out by EPA and the nonprofit Green Electronics Council nationally in 2006, is EPEAT (www.epeat.net). It has proven so successful that EPEAT has driven green innovation by electronics manufacturers worldwide.

A personal computer, like a light bulb, doesn't use much electric power—but millions of them add up to a significant share of electrical energy use, with its environmental impacts: Greenhouse gas emissions from fossil fuel-burning power plants; coal, uranium and copper mines (for copper power lines); and dams. Computers have additional

environmental impacts through the metals and other materials they're made of (including toxics like cadmium, lead and mercury), and their packaging and end-of-life management. As recently as 2005, however, buyers had little ability to buy—and manufacturers little incentive to make—more environmentally-friendly models, because there was no common yardstick to demonstrate what was "green."

In EPEAT's first year of operation, registered products helped save 42.2 billion kilowatt-hours of electricity and prevented 124,000 metric tons of hazardous waste.

From 2003 to 2005, EPA helped lead a group of stakeholders to establish that yardstick. Working together, they defined what makes a computer greener and set up a system to ensure products actually met those claims. The EPA provided seed funding in 2006 to the Green Electronics Council to launch the EPEAT registry—a reliable way for buyers to compare the environmental performance of computers and monitors. The registry published comparative ratings of 60 products from three manufacturers, and it's been growing ever since.

Naturally, EPA was one of the first electronics buyers to use EPEAT in purchasing computers for EPA offices. But EPEAT harnessed the purchasing power of the entire federal government—probably the world's largest buyer—with the President's January 2007 Executive Order, and later, Federal Acquisitions Regulations, requiring federal agencies to buy EPEAT-registered products for at least 95% of their electronics. By mid-2007, the EPEAT registry included 500 products from 20 manufacturers, including industry giants Hewlett-Packard and Dell, which registered the first EPEAT Gold products—the top rating for environmental performance.

How Products Are Rated

Products that meet 23 required environmental performance criteria may be registered at the EPEAT Bronze level. Depending on the number of 28 additional optional criteria the product meets, it can be rated EPEAT Silver or EPEAT Gold, the highest level. Products are rewarded with additional points as they

2005

New national health standard for fine particulate pollution—PM_{2.5}—takes effect. EPA Pacific Southwest Office begins helping China set up hazardous waste cleanup programs.



meet additional environmental performance criteria related to every phase of the product lifecycle, including recycling and disposal.

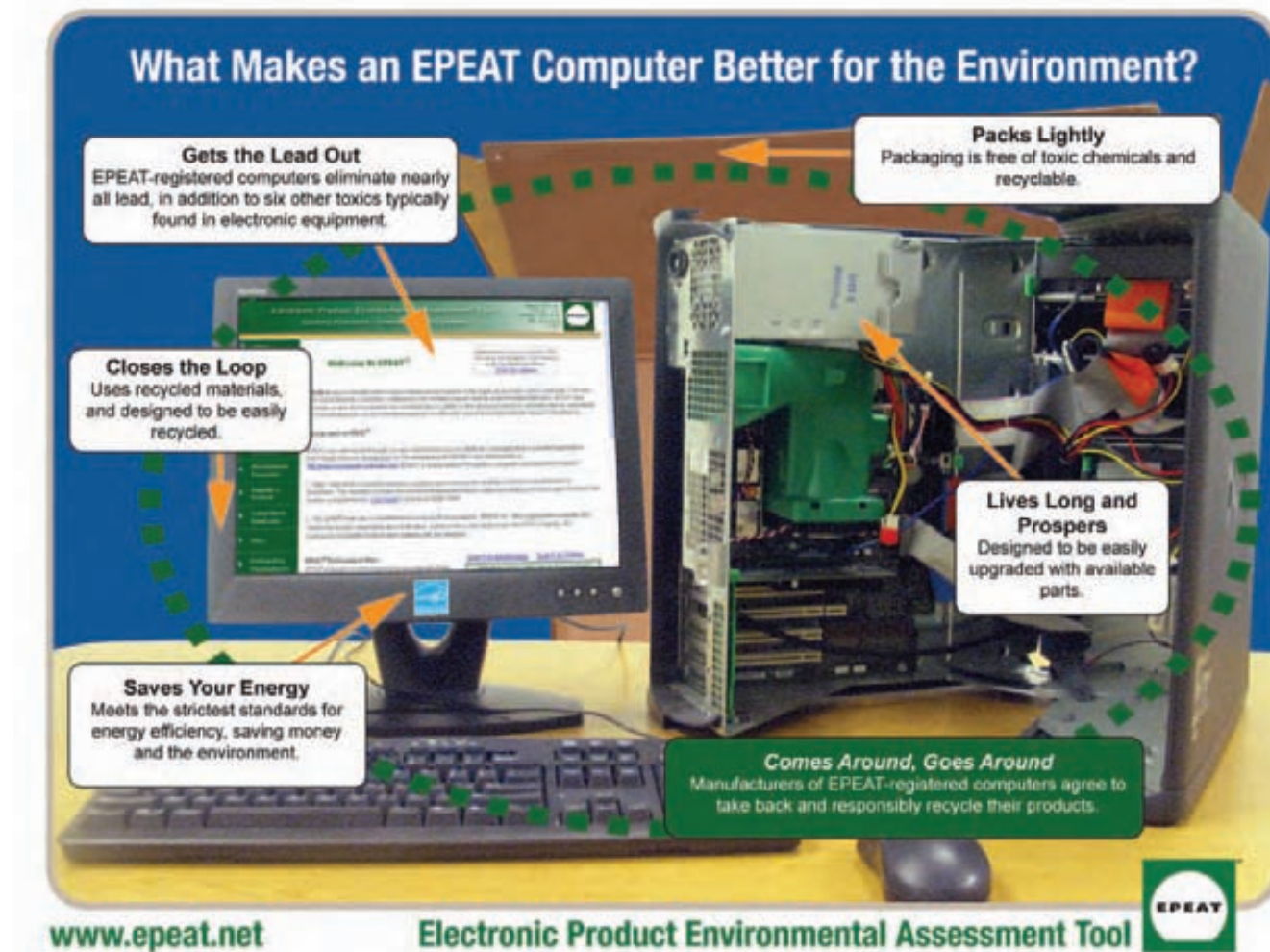
In 2007, EPEAT's first full year of operation, EPEAT-registered products helped reduce use of toxic materials, resulting in the elimination of 124,000 metric tons of hazardous waste. EPEAT products also helped save approximately 42.2 billion kilowatt-hours of electricity—enough to power 3.7 million U.S. homes for a year.

EPA's Pacific Southwest Regional Office has played an ongoing role in the governance and management of EPEAT, including cross-agency coordination, expansion into the consumer market, and expansion internationally.

In August 2009, prompted by the demand from information technology purchasers around the world, EPEAT launched its international registry, enabling manufacturers to list 'green' computers and monitors in 40 countries across the globe. Purchasers in the U.S., Canada, Europe, China, Japan, Taiwan, Australia, New Zealand, Brazil and Mexico can now evaluate, compare and select electronics based on the products' environmental performance in their country.

Expanding EPEAT's Scope

Today, EPA is funding the development of standards for additional products to be included in EPEAT, such as televisions, printers, copiers, multifunction devices and servers. EPEAT also has partnered with major tech-info platforms Channel Intelligence and



CNET, putting the EPEAT marks and ratings onto retail websites such as Ingram Micro, Buy.com and others.

"HP offers EPEAT registered products in 36 of the 40 countries included in the global expansion and supports EPEAT because of its comprehensive, unbiased approach to evaluating the environmental attributes of products," says Steve Hoffman, Director of Strategic Marketing and Sustainability Initiatives for Hewlett Packard's Personal Systems Group.

"We recognized early on that EPEAT provided an effective, credible tool to identify computer hardware solutions for our clients that help reduce greenhouse gas emissions, eliminate toxic substances, increase recycled content and reduce energy usage, at no added cost and with no restrictions on product or supplier choice," says Tashweka Anderson, Sustainable IT Business Manager at ComputaCenter in England.

2006

Construction of cleanup facilities is complete at 1,000 Superfund hazardous waste sites across the nation, including half of the 125 sites in the Pacific Southwest.

More on EPEAT:
www.epeat.net

Above: How EPEAT rates a computer's environmental performance.

North Coast Dump Cleanups: Tribes Partner to Clean Klamath Watershed

One of the most difficult challenges on rural tribal lands is waste management. Nationally, hundreds of open dumps on tribal lands have been cleaned up and closed, but thousands remain, along with thousands of abandoned vehicles.

In 2008 and 2009, the neighboring Yurok, Karuk and Hoopa Tribes in California's Klamath River Watershed joined forces with federal, state and local agencies to tackle waste issues on their lands. Together they removed and recycled more than 400 junk vehicles, and removed 200 tons of trash from three dump sites affecting two creeks and the Klamath River.

The three tribes have worked for over a decade on solid and hazardous waste issues, with funding and other support from federal, state, county and Native American organizations. Efforts to clean up major illegal dumps in the region gained momentum in August 2008, when the California Department of Resources Recycling and Recovery (CalRecycle) approved \$800,000 to clean up three large dump sites on the Yurok Reservation.

The dumps posed significant health threats to residents as well as to fish and wildlife on the Klamath River, a crucial habitat and migration route for salmon. The federal Indian Health Service (IHS) contributed an additional \$30,000 to fund outreach efforts and train a tribal workforce for the project. EPA, United Indian Health Services, the California Rural Indian Health Board, and Humboldt Waste Management Authority also participated.

By September 2008, 18 Yurok tribal members were HAZWOPER (Hazardous Waste Operations and Emergency Response) certified to work on sites with hazardous materials. Dump cleanups began in October. Steep terrain required the use of heavy equipment, including a Sikorsky helicopter to airlift dumpsters filled with waste from the Klamath River Gorge. Over 200 tons of solid and hazardous waste were collected and removed, including tires, appliances, batteries, flammable and toxic solids, and electronic wastes—some of it from a steep slope that spilled trash directly into the Klamath River.



While waiting to begin the second phase of dump cleanups, the Yurok Tribe and CalRecycle teamed with the Hoopa and Karuk Tribes, EPA, and other partners to plan and carry out other waste removal projects. In June 2009, the three tribes removed 400 abandoned vehicles from their lands, eliminating the potential for leaks of oil, antifreeze and other toxic fluids. The tribes also cooperated on holding household hazardous waste collection events in October 2009.

In late 2009, EPA awarded \$86,350 in grants to the Yurok and Karuk Tribes to help them reduce illegal dumping, increase reuse and recycling, and move their communities toward sustainable waste management practices.

The three tribes, working in cooperation with EPA and the other agencies, have restored the natural beauty of their lands while removing about 500 tons of junk vehicles and trash that posed threats to public health and the environment.

Learn More:

www.epa.gov/region9/waste/features/yurok-karuk

2007

New wastewater treatment plant in Mexicali, funded by EPA and Mexico, removes raw sewage from New River, which flows across U.S.-Mexico Border.



Left: Staging area for removal of abandoned vehicles on the Yurok Reservation (photo courtesy of the Yurok Tribe).

Above: Excavator moves down a steep slope to remove trash from an illegal roadside dump (photo courtesy of CalRecycle).

“Green Remediation” Makes Hazardous Waste Cleanups Cleaner

Cleanups of hazardous waste sites can cause pollution, in the form of air emissions from fuel-burning bulldozers and trucks, as well as from power plants or generators that run electric pumps drawing contaminated groundwater through treatment systems.

EPA's Pacific Southwest Regional Office has developed an innovative Green Remediation policy to measure and reduce the environmental footprint of cleanups. The policy requires analysis and efforts to reduce air emissions, conserve water and energy, and minimize the use of toxics in materials and products. In a pilot study at the former Romic East Palo Alto hazardous waste management facility in Silicon Valley, EPA used some of the principles of a Life-Cycle Assessment approach to compare the environmental footprints of three alternative cleanup methods.

Romic East Palo Alto, which closed in 2007, was a 13-acre site on the southern edge of San Francisco Bay. Groundwater beneath the site is contaminated with volatile organic compounds (VOCs, which include paint thinners, metal cleaners, and chemicals used in dry cleaning and computer manufacture). Here, EPA chose enhanced bioremediation—in this case, injecting a mixture of cheese whey and molasses into the groundwater, to fortify the existing population of microorganisms that consume and biodegrade VOCs.

The pilot study compared bioremediation with two equally effective alternative cleanup methods to determine which had the smallest environmental footprint. One alternative was a traditional “pump and treat” remedy:

pumping groundwater to the surface, treating it, and discharging the treated water to the local wastewater treatment plant. The other was a hybrid of bioremediation and “pump and treat.”

Bioremediation had the smallest environmental footprint in terms of fresh water use, air toxics emissions and CO₂ emissions. Traditional pump and treat had the largest environmental footprint.

Calculating the Footprint

The pilot study included off-site activities such as manufacturing and transportation, in addition to on-site cleanup activities. First, the study estimated resources used, waste generated, and air emissions from on-site activities. These included construction materials, fuel, water, and electricity used, and CO₂ emitted. Also included were resources used and air emissions from transportation of people and materials to and from the site. Plus, the study estimated the magnitudes of 15 environmental parameters, including the water needed to manufacture materials used on-site and in transportation, as well as resulting air toxics and CO₂ emissions—including refinery emissions from fuel production.

EPA is now conducting similar pilot studies at two more cleanup sites to further develop a methodology for this type of analysis. This methodology could ultimately be widely used in EPA's decision-making process on cleanup plans. For cleanups plans already approved, it can help reduce environmental footprints. For example, at Romic about 80% of the diesel fuel used in bioremediation will be used on-site. To help reduce the ef-



fects of diesel fuel used on-site, EPA staff are working with Romic to select diesel equipment with particulate filters, and to minimize idling time.

More on EPA's Green Site Cleanups in the Pacific Southwest:

www.epa.gov/region9/climatechange/green-sites.html

2008

EPA and Navajo Nation launch five-year plan to address uranium contamination of land and water from more than 500 abandoned uranium mines on Navajo land.

Above: EPA contractor injecting cheese whey and molasses into contaminated groundwater to enhance biodegradation of VOCs.

Carmen Santos: Keeping Communities Safe from Hazardous Waste



Carmen Santos has been with EPA since 1989. Carmen spent much of her career managing the air, soil and groundwater sampling and preliminary cleanup work at the BKK Landfill site in West Covina, Calif. In the last two years, however, she's been overseeing cleanups of toxic polychlorinated biphenyls (PCBs).

"I enjoy my job," she says. "I love my work protecting the environment."

BKK is a 583-acre (nearly a square mile) site with a closed hazardous waste landfill, a closed municipal solid waste landfill, gas collection and treatment systems, ground

water and leachate treatment systems, and buffer property. Carmen chaired the BKK Landfill multiagency Steering Committee for about 13 years, working with other regulatory agencies plus the City of West Covina.

During her tenure, Carmen finalized the ground water cleanup plan for the BKK site in collaboration with others and required BKK to conduct additional investigations to reduce releases of landfill gas from the site into outside air.

Redevelopment of former BKK property in West Covina, Calif., made possible the award-winning Big League Dreams sports complex.

In her role as the EPA project manager for the BKK site, Carmen helped negotiate a Prospective Purchaser Agreement to allow a buyer, the City of West Covina, to redevelop certain portions of the site. The agreement made possible the award-winning Big League Dreams baseball sports complex and a major retail center, West Covina Heights, anchored by Target and Home Depot.

With development underway, Carmen worked in partnership with other parties to require environmental monitoring and engineering controls to limit the emission of va-

pors from the BKK site. When methane gas was found to be migrating from the Landfill site, she required BKK to increase gas collection so it won't affect anyone at the sports complex. The California Department of Toxic Substances Control (DTSC) now manages the former hazardous waste landfill.

Two years ago, Carmen turned her attention to EPA's PCB cleanup program. PCBs were used in electrical transformers, paint, caulk, and many other applications before manufacture in the United States of PCBs was banned in 1979. Carmen oversees PCB cleanups all over the Pacific Southwest—about a dozen at any given time. If PCBs are found in a property, the PCBs must be managed following the regulatory requirements promulgated under the Toxic Substances Control Act (TSCA).

Sometimes, PCB-contaminated materials such as soils must be removed to an approved hazardous waste landfill. In other cases, Carmen can work with the owners to manage PCB-contaminated surfaces in place where there's little chance for the public or workers to be exposed to it, or find other solutions acceptable and consistent with the TSCA regulations.

"Each PCB site is different, and we have some discretion about cleanup options, depending on the size of the site and the risk to human health and the environment," Carmen says. "Once cleaned up, these sites can be redeveloped."

2009

American Reinvestment and Recovery Act allocates \$710 million in Pacific Southwest for clean air and clean water projects, plus speeding up hazardous waste cleanups.

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