



Indiana Department of Environmental Management



25th Anniversary
State of the Environment 2011



Dear Fellow Hoosiers:

I attended a concert in Bloomington a few months ago, and of the 14 musicians on stage, only six were introduced by name. The other eight musicians hidden at the back of the stage were simply introduced as “the orchestra.” Their names were not even listed in the program.

What struck me was that the music would not be complete without all 14 musicians. Working at IDEM is sometimes like being the invisible, but greatly-needed orchestra member. On any given environmental issue, a public information officer, inspector, permit writer, rule writer, lawyer or manager may be the face of IDEM. However, they could not succeed without the excellent work done by ALL of our team members. IDEM excels because of the commitment of every staff member.

While our team continues to make changes in our quest to find the most efficient way to protect Hoosiers and our environment, we are most successful when our fellow Hoosiers are fully employed by financially successful enterprises. To this end, IDEM continues to issue permits critical for business operations in a timely fashion. We have helped thousands of businesses understand their permit requirements, reduce waste and achieve compliance. Agency efficiency and transparency has been greatly enhanced by the creation of a Virtual File Cabinet, giving users access to over 65 million pages of environmental information online.

We continue to encourage public participation to ensure decisions made with respect to rules and permits are sound and viable. Meanwhile, communities, businesses, child care facilities and schools continue to participate in IDEM programs to save money and reduce pollution. As in years past, IDEM staff are visiting schools and talking with more than 12,000 young Hoosiers to celebrate Earth Day.

As a group, we have successfully improved the quality of Indiana’s environment during times of financial stress as well as times of economic prosperity. As we celebrate Earth Day 2011 and reflect on the past 25 years, we must also look forward and continue building a healthy, environmentally-friendly future. We encourage you to visit www.idem.IN.gov to find out more about Indiana’s environment.

Thomas Easterly, Commissioner
April 22, 2011



EXECUTIVE SUMMARY

Indiana has made great strides toward achieving its mission of protecting Hoosiers and our environment. Through the efforts of citizens, businesses, the Indiana Department of Environmental Management (IDEM), and our federal, state and local partners, measurable successes have taken place in the areas of air quality, land quality, water quality and pollution prevention.

In 2009, for the first time since air quality standards were developed in the 1970s, all Hoosiers were breathing air that met current health-based standards. This was a significant accomplishment, considering as recently as 2005, Indiana had 24 counties and townships in violation of the ozone standard and 17 counties and townships in violation of the annual standard for fine particulate matter. However, the standards continue to tighten, reflecting the ongoing evaluation of potential impacts and advances in technology. In 2010, the United States Environmental Protection Agency (U.S. EPA) set a new standard to further reduce exposure to lead in the air we breathe. As a result, approximately 700 Muncie residents living near West 26th Street and Hoyt Avenue may be exposed to lead concentrations considered unacceptable under the new air health standard. IDEM is working to ensure that these Hoosiers again have air that meets all health-based standards.

To restore and preserve the quality of Indiana's land, IDEM oversees the cleanup of contaminated properties and the proper management of wastes. Multiple IDEM initiatives have resulted in cleaner, healthier land. Since 2005, potential exposure to harmful contaminants has been eliminated or controlled at 58 hazardous waste sites, with ground water contamination being controlled at 55 of those sites; IDEM's State Cleanup program has overseen the completion of 290 site cleanups; 149 new Voluntary Remediation Program (VRP) projects were launched and 77 VRP sites were completed. Over the years, IDEM and U.S. EPA also have implemented remedies at 27 Superfund sites. Figures tracked since 2005 show more than 50 million pounds of illegally dumped tires have been cleaned up—an amount equal to two million passenger tires.

In 2007, the entire 1,269-ton stockpile of VX nerve agent that had been stored in Newport, Indiana since the U.S. chemical weapons program ended in 1969 was safely and completely destroyed. VX is so toxic that a single drop on a person's skin can be fatal. IDEM's handling of the project has been cited by the U.S. Army as a model for other similar projects.

IDEM also has worked hard to improve Indiana's water quality. In 2005, more than 100 Indiana communities were discharging untreated raw sewage to Indiana waterways during rain events. These were communities where sewer systems were designed with combined sewer overflows, allowing partially treated wastewater to be diverted into nearby waterways in times of wet weather. Today, 104 of those communities are working on major projects to reduce discharges and the remaining four are working with IDEM and U.S. EPA to finalize agreements. When all projects are completed, billions of gallons of untreated wastewater will be kept out of Indiana's lakes, rivers and streams annually.

Through the years, watershed management has become the heart of successful water quality restoration and protection. In the past six years, coordinated efforts between IDEM and local



communities have helped launch projects estimated to prevent over 500 million (500,000,000) pounds of sediment, 332,000 pounds of phosphorus and 546,000 pounds of nitrogen from entering rivers and streams annually. Assessments of segments of Big Walnut Creek, Clifty Creek and Pigeon Creek show quality has improved significantly, and previously polluted portions of these streams now meet water quality standards.

Streamlined procedures begun in 2005 under Governor Mitch Daniels and Commissioner Tom Easterly enabled IDEM to improve efficiency, retain staff and continue providing effective environmental protection in a difficult economy. Process improvements enabled efficient turnaround times for the issuance of environmental permits critical for business operations and virtually eliminated IDEM’s permit backlogs, where renewal permits had been delayed for as long as 20 years.

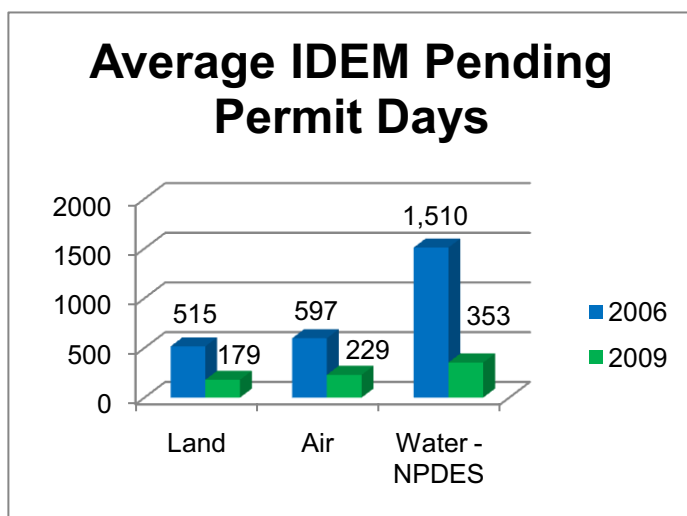


Figure 1. Average Days for Pending Permit Applications, All Permit Types

The cumulative average days for pending permit applications were significantly reduced between 2006 and 2009. In 2009, the average permit was issued within 75 percent of statutorily allowed time—for example, a permit with 365 day statutory limit was issued within 274 days.

IDEM strives to help Hoosier businesses understand and achieve environmental compliance through “assist first, enforce second.” An estimated 190,000 pounds of industrial and chemical wastes were safely managed through the coordinated efforts of IDEM and businesses during recent layoffs and closures. The Office of Pollution Prevention and Technical Assistance (OPPTA), now integrated within the newly formed Office of Compliance Support, worked with over 4,000 regulated businesses to help them understand their permit requirements, conduct sampling, reduce waste and achieve compliance. IDEM has worked to increase voluntary pollution prevention, and dozens of businesses, schools, child care facilities and communities are participating in special environmental stewardship programs. Since 2007, businesses and communities reported reducing approximately 7.3 million pounds of solid waste and 219.5 million pounds of hazardous waste; preventing 81 million pounds of pollution from entering Indiana waters and over 3.1 billion pounds of pollution from entering the air; conserving 2.3 billion gallons of water; and, diverting 831 million pounds of waste from landfills.

The 25th *Anniversary State of the Environment 2011* includes a look at change that began in 1986, recent accomplishments, and issues and challenges we face as we look to the future. Additional information about our progress and current programs, along with the full 25th *Anniversary State of the Environment 2011* report, can be found online at www.idem.IN.gov.

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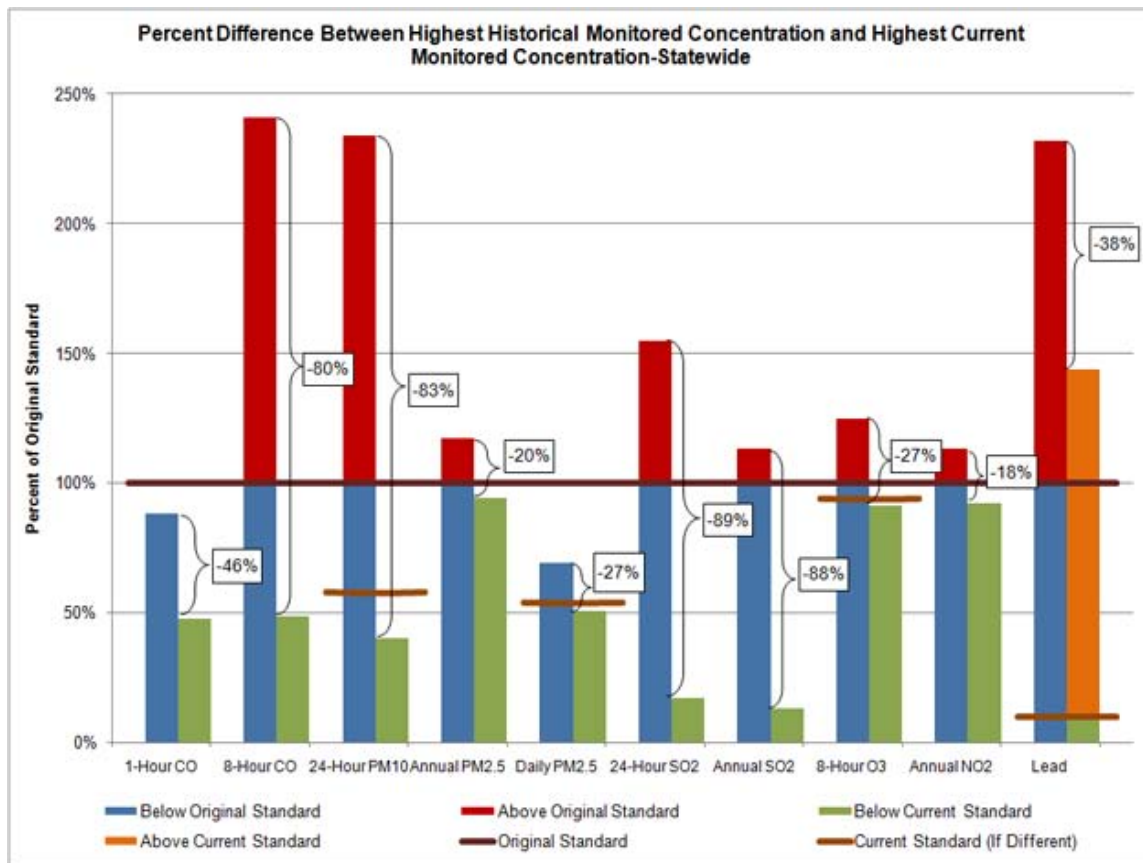
IMPROVED AIR QUALITY

Air quality has improved substantially in the past six years. At the start of 2005, Indiana had 24 counties and townships in violation of the ozone standard and 17 in violation of the annual standard for fine particulate matter (PM). In 2009, all 92 counties in Indiana met all current health-based air quality standards, including those for ozone and fine particulate matter.

MEETING THE AIR QUALITY STANDARDS

IDEM evaluates the quality of Indiana’s air by taking samples and comparing the pollution levels to standards set by U.S. EPA. Until an area meets the health-based standard, businesses are subject to more strict permitting requirements. The graph below shows the improvements in air quality by comparing the highest historical concentration to the highest current concentration.

Figure 2. Air Quality Improvement Compared to the Health-based Standards



U.S. EPA set the standards in three year averages. Federal and state programs have improved air quality in recent years so that the only pollutant remaining above the current health-based standards is lead.



TIGHTENED STANDARDS LEAD TO NEW CHALLENGES

Since 2005, the U.S. EPA has set new ambient air quality standards for five criteria air pollutants: particulate matter, lead, nitrogen dioxide, sulfur dioxide and ozone. Current monitoring data indicates that all of Indiana meets the new particulate matter, nitrogen dioxide and ozone standards; however a small area does not meet the new lead standard and there will likely be areas that do not meet the new sulfur dioxide standard. Once areas not meeting the standard are identified, IDEM works to identify and control the sources of pollution causing the area to exceed the standard.

In 2010, U.S. EPA drastically tightened the health-based standard for lead, making it more protective of public health. Monitors show all regions of Indiana meet the new lead standard with one exception: the new lead standard may be a concern for approximately 700 Muncie residents living near West 26th Street and Hoyt Avenue. IDEM is actively working to ensure that these Hoosiers again have air that meets all health-based standards.



IDEM staff member checking an air monitor.

INDIANA'S COMPREHENSIVE MONITORING NETWORK ENHANCED

Indiana operates and maintains more ambient air quality monitors per capita than other Midwestern states. A strong air quality monitoring network provides relevant data to communities and helps Indiana track the health-based air quality standards.

Indiana has one ozone air monitor for every 154,000 Hoosiers, which is the best among our neighboring states. Ohio has the closest ratio to Indiana, with one monitor for every 230,000 Buckeyes.

While Indiana's air monitors have collected data for decades, public access to this data has been limited in the past. IDEM implemented the Leading Environmental and Analysis of Data System (LEADS[®]) in 2008, to automatically post continuous monitoring data on the IDEM website. There are currently 62 LEADS[®]-enabled monitoring sites uploading criteria pollutant levels in near real-time. Key meteorological information, such as temperature, wind direction, and wind speed, are also available for these monitoring sites. The information is available online at www.idem.IN.gov/airfacts.

PERMITTING EFFICIENCY IMPROVES

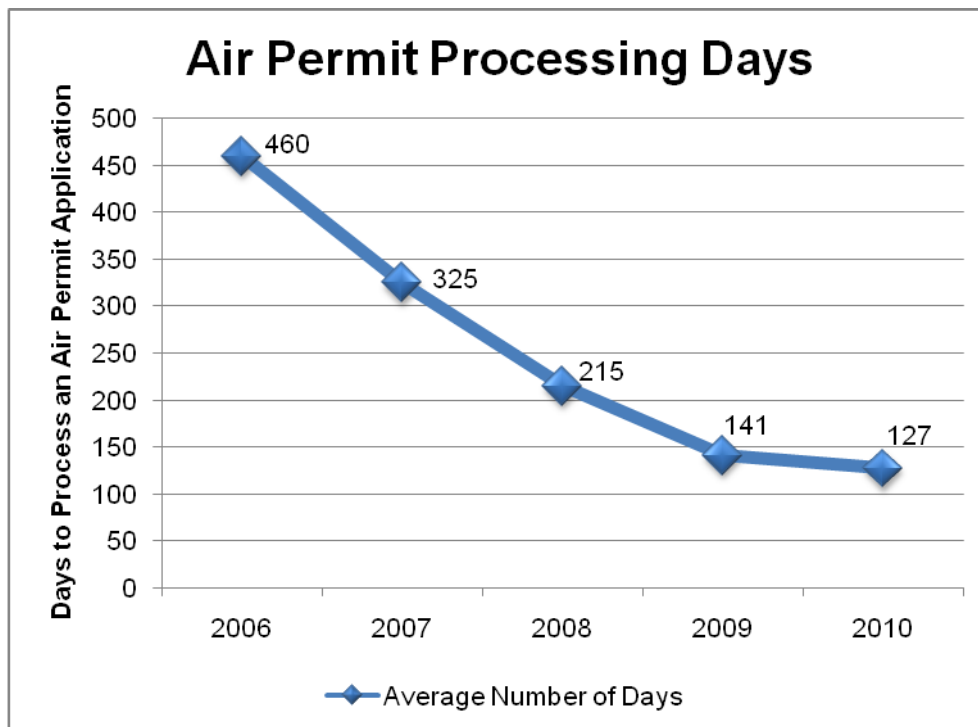
In 2005, IDEM had a substantial backlog of pending air permit applications and renewals. At that time, IDEM staff were writing only 35 percent of the air permits while 65 percent of IDEM's air permitting work was assigned to local agencies and out-of-state contractors, at a cost of over two million dollars per year. Governor Daniels and Commissioner Easterly made it a goal to bring all air permitting work in-house and eliminate the permit backlog.

Starting in 2006, IDEM began to migrate air permit writing back in-house. Through the use of LEAN/Kaizen events, IDEM's Office of Air Quality (OAQ) permitting branch was restructured,

the permit application process was streamlined, workloads were adjusted, and staff were cross-trained. Unnecessary steps were eliminated and a pre-application meeting was added to ensure submitted applications were complete and accurate.

In December 2007, IDEM had 157 backlogged permits, the oldest of which was 2,710 days (nearly 7.5 years). By April 2009, all backlogged permits were completed.

Figure 3. Air Permit Processing Days



This chart shows the average number of days it takes for a permit to go from a submitted application to a final permit.

UNIFICATION OF COMPLIANCE AND ENFORCEMENT FUNCTIONS

The Office of Enforcement was reorganized in November 2008 and placed in the compliance programs of the Office of Air Quality, Office of Land Quality and Office of Water Quality. The reorganization increased efficiency, communication and accountability within each of the compliance programs and created a more efficient process to address and resolve noncompliance. In February 2009, OAQ integrated inspectors and enforcement case managers in the unification of its compliance and enforcement functions.

In addition to conducting inspections, responding to complaints, approving stack tests and reviewing emissions monitors, IDEM offers compliance assistance. In 2008, OAQ implemented a program to help air-permitted facilities with their Title V permits, Federally Enforceable State Operation Permits (FESOPs), Minor Source Operating Permits (MSOPs), permit renewals and significant source permit modifications. OAQ offered to meet with sources, review permit requirements and discuss new air permit requirements. IDEM also provides assistance when new regulations go into effect, such as the surface coating initiative and a foundry carbon monoxide permit limited liability initiative.



CAREFUL EVALUATION OF AIR TOXICS AND PUBLIC HEALTH

Some airborne chemicals are toxic to human health and the environment. Congress regulates these chemicals by categorizing 188 chemicals as hazardous air pollutants (HAPs). Today, the U.S. EPA looks at air toxics, which includes HAPs, to determine potential health effects from breathing the air. Air toxics are pollutants that could cause short-term (acute) or long-term (chronic) health effects and can be naturally occurring or released by human activities, such as manufacturing, burning fossil fuels, using cleaning products and painting. Potential health impacts include cancer, respiratory and cardiovascular diseases, developmental effects, reproductive dysfunction, neurological disorders, inheritable gene mutations, and other serious or irreversible health effects in humans.

IDEM has monitored air toxics around Indiana since 1999 and has released a report, “ToxWatch Data Analysis Report,” evaluating the data from the first ten years (1999-2008) of air toxics monitoring. The report, available at www.idem.IN.gov/6544.htm, confirms that the levels of air toxics are within acceptable levels as recommended by U.S. EPA. Additionally, measured levels of air toxics in Indiana have declined since 1999.

Like the rest of the United States, Indiana’s air contains significant amounts of acrolein and benzene from motor vehicle emissions, as well as one pollutant no longer produced, carbon tetrachloride. Indiana is continuing to work with U.S. EPA to address all motor vehicle-related emissions. IDEM continues to operate 10 air toxics monitors that collect data across the state to ensure that Hoosiers are not exposed to unhealthy levels of toxics in their air. Current air toxics data is available at www.idem.IN.gov/4663.htm.

IDEM also conducted a detailed air toxics study in Southwest Indianapolis from 2006 to 2009. This study found that the concentration of air toxics in the area was acceptable and similar to those in other urban areas in the Midwest. Using air samples, emissions data and computer modeling, the study used real-world air monitoring and virtual air dispersion modeling to characterize the risk from breathing air toxics. The study’s goal was to determine if any of 168 pollutants warranted further attention to reduce potential health risks. A group of external technical experts provided a practical review of technical aspects of the study and served as a source of new ideas to aid the agency. More information about the study can be found at www.idem.IN.gov/4500.htm.

IDEM is also working with U.S. EPA to monitor the air quality at four Indiana schools; Jefferson Elementary School in Gary, Abraham Lincoln Elementary School in East Chicago, Lincoln Elementary School in Warsaw, and Pittsboro Elementary in Pittsboro. This is part of a nationwide initiative by U.S. EPA to obtain air quality information at schools where air toxics may be elevated. While the concentrations found during this study were all within acceptable health-based levels as established by U.S. EPA, concentrations of manganese at two of the schools, Abraham Lincoln Elementary School in East Chicago and Jefferson Elementary School in Gary, were above normal background levels, and sampling at those schools has been continued into 2011.

SUCCESSFUL PARTNERSHIPS AND OUTREACH

Voluntary Idling Program



“The VIP challenge is a commitment to informing not only internal employees but also external employees how to become more effective and efficient in the trucking industry while at the same time being more economically, socially, and environmentally responsible.”

Brent Kress, staff Eco-Strategist, Jasper-based Versteel

IDEM’s VIP initiative assists Indiana freight carriers, manufacturers, distributors and retailers to reduce air pollution emissions by eliminating unnecessary heavy-duty diesel truck idling.

VIP is one of several diesel-related programs implemented throughout the state. Others include a voluntary no-idling program for school buses and diesel retrofitting projects.

As of April 2011, IDEM has 29 VIP Partners. More information can be found at www.idem.IN.gov/4128.htm.

Partners for Clean Air

Partners for Clean Air is a coalition of 200 Northwest Indiana and Chicago area businesses, industries and community groups committed to improving air quality through voluntary actions. Members of the Partners for Clean Air program develop Air Quality Action Plans, which are designed to be implemented on Air Quality Action Days, as a way of reducing ozone, PM_{2.5} and other harmful pollutants. More information about Partners for Clean Air can be found at www.idem.IN.gov/4130.htm.

Clean Air Indiana

In 2008, IDEM created the Ozone Knockout public awareness campaign to educate Hoosiers about small steps they can take to improve local air quality. Renamed “Clean Air Indiana” in 2009, IDEM staff traveled the state throughout May and June, meeting with businesses and citizens to



IDEM’s Southwest Regional Office Deputy Director Dave Holder (on the left) visited Jasper-based Versteel on Oct. 26, 2009 to officially inaugurate the company into IDEM’s Voluntary Idling Program.





offer tips and information about voluntary measures for reducing emissions of ozone-forming pollutants.

Staff encouraged patrons and citizens to avoid idling in drive-through lines, use public transportation, ride bikes or walk to nearby destinations, turn up air conditioners a few degrees, and mow their yards and pump gas during the cooler evening hours.

For more information about the Clean Air Indiana campaign and summer pollutants such as ozone, go to www.CleanAirIndiana.IN.gov.

CONCLUSION

The purpose of IDEM's Office of Air Quality is to assure that every Hoosier has healthy air to breathe. In order to meet this purpose, IDEM routinely samples Indiana's air quality, provides timely air permits to qualified applicants, and verifies compliance with applicable state and federal air pollution laws and regulations.

IDEM strives to issue air permits that are protective of human health and the environment; create industry-specific rules that limit air emissions; and verify that businesses comply with their state permits.

Additionally, IDEM works with regional partnerships and outreach initiatives to ensure that Hoosiers are better educated about air quality. The result of these efforts is that Indiana's air quality continues to improve. U.S. EPA has tightened air quality standards and will continue to do so in the future. IDEM will continue to work to reduce pollutant levels and keep Indiana's air healthy.



In June 2009, IDEM staff spoke to members of the U.S. and British armed forces during a Clean Air Indiana outreach event held on Monument Circle in Indianapolis.

IMPROVED LAND QUALITY

Keeping our land healthy includes properly managing petroleum and chemical releases, as well as cleaning up contamination that may have occurred decades before regulations were adopted to protect the environment. Therefore, it's what we don't find that is a reflection of environmental quality. Looking back just a few decades, it was common to find mismanaged hazardous waste; pest-infested open garbage dumps near every urban area; large tire dumps in woodlands and streams; careless tire fires that contaminated air, land and water; and abandoned warehouses filled with hundreds of drums of caustic, flammable and toxic industrial waste.

While these environmental problems were not uncommon 30 to 40 years ago, today they are essentially extinct. This is the result of the development of a cradle-to-grave system for managing hazardous waste and Indiana's aggressive compliance, enforcement and permitting programs for all types of waste. Our primary focus has shifted from reacting to the imminent threats common in the past to ensuring the long-term protection of Hoosiers and our environment.

ELIMINATING THE PERMITTING BACKLOG

In 2005, there were 367 backlogged land permits, and today there are only three. Additionally, since 2005, the average time to issue a permit has decreased from 515 days to 179 days. Up-to-date permits ensure that livestock operations, solid waste processors and landfills are held accountable for complying with current standards.

OVERSEEING CLEANUPS

Indiana uses six main programs to ensure the cleanup of contamination. The Emergency Response program addresses contamination from spills that are often completely cleaned up during the initial response. If the contamination cannot be cleaned up through emergency response action, the responsibility is transferred to one of IDEM's other cleanup programs. The most serious contamination often qualifies for the federal Superfund program, where U.S. EPA provides financial and technical assistance to assist IDEM in making sure that the contamination is properly addressed and that any identifiable parties contributing to the contamination pay their share of the cleanup costs.

If the contaminated site does not qualify for federal assistance under Superfund, assistance may be available under IDEM's State Cleanup Program, which is Indiana's version of Superfund (IDEM's State Cleanup Program does not receive federal funding). Indiana also has a Voluntary Remediation Program (VRP) that allows responsible parties to clean up contaminated properties under IDEM supervision. When the contamination is successfully remediated under VRP, the owner may receive a Covenant Not to Sue from the state for the pollutants that were addressed.

The management of hazardous waste regulated under the federal Resource Conservation and Recovery Act (RCRA) is overseen by IDEM's RCRA program. Finally, IDEM's Underground Storage Tank (UST) program deals with petroleum contamination from underground storage tanks. Together, these IDEM remediation programs have successfully ensured the cleanup of contamination from thousands of sites in Indiana. More detail on these programs follows.



Emergency Response Program

When spills and releases occur, containment and cleanup is essential to protecting human health and our environment. From traffic accidents involving hazardous cargo or petroleum releases to emergencies at industrial facilities, communities and businesses around the state rely on IDEM's oversight and guidance when emergencies arise. When calls come into the IDEM hotline, highly trained responders work alongside other agencies to help the businesses and individuals responsible for the incident provide effective environmental protection. Environmental emergencies can be reported to IDEM's 24-hour spill line at (888) 233-7745.

Superfund Program

U.S. EPA's National Priorities List, better known as Superfund, addresses highly contaminated sites or those which pose an immediate threat. Since 2005, IDEM has recommended four new Superfund sites and obtained assistance under the federal Superfund program to ensure area residents are being protected from potential exposure to harmful contaminants. At the same time, IDEM and U.S. EPA continue working together on cleanups at 14 sites and monitoring at 27 sites where remediation projects have been completed.

New Superfund sites added since 2005:

- Lane Street Ground Water Contamination Site in Elkhart on October 23, 2009;
- U.S. Smelter and Lead Refinery (USS Lead) in East Chicago on May 11, 2009;
- Lusher Street Ground Water Contamination in Elkhart on March 19, 2008; and,
- Elm Street Ground Water Contamination site in Terre Haute on April 6, 2007.

The Waste, Inc. Superfund site in Michigan City was delisted from the National Priorities List on October 20, 2008. All cleanup objectives were met and monitoring continues at the site.

Indiana received \$10.9 million dollars in 2009 American Recovery and Reinvestment Act (stimulus) funding for the cleanup of the Continental Steel Superfund site in Kokomo and the Jacobsville Neighborhood Soil Contamination Superfund site in Evansville.

State Cleanup Program

IDEM's State Cleanup Program oversees the cleanup of hazardous waste sites and some petroleum contaminated sites. Examples include dry cleaners, manufacturing facilities, petroleum pipelines, refineries and bulk storage facilities. Between 2005 and 2010, 1,178 sites were referred to the State Cleanup Program for oversight. In that time, 290 sites have been completely addressed or closed. IDEM is working to ensure the proper management of all remaining sites.

During the recession of 2008 through 2010, IDEM worked with the Indiana Attorney General's office to file \$27 million in environmental claims during bankruptcy proceedings so that the companies causing the pollution, rather than Hoosier taxpayers, would pay for projects to address the contamination. Indiana has received approximately \$17.5 million to mitigate pollution impacts of those sites. These funds are being managed by program staff to complete

cleanups. Additionally, the State Cleanup Program coordinates with local communities and the Indiana Brownfields Program to facilitate economic redevelopment of contaminated sites.

Voluntary Remediation Program (VRP)

IDEM's VRP was established by the state legislature in 1993 to help property owners or operators voluntarily address environmental concerns. Since 2005, 149 new VRP projects have been accepted into the program, and IDEM has issued Certificates of Completion for 77 projects. Since the program's inception in 1993, 245 projects have been successfully remediated and issued certificates. Program participants investigate and, if necessary, clean up sites under IDEM's oversight.

At the successful conclusion of a project, participants receive a Certificate of Completion from IDEM, and are eligible to receive a Covenant Not to Sue from the Governor's Office after recording the Certificate of Completion onto the property deed. These documents provide liability protection to the VRP participant and subsequent property owners for the releases that were addressed in the project. The VRP may be used to facilitate property transfers, reduce the threat of future litigation, and increase the value of the land.

Cleaning up Hazardous Waste at Industrial Sites

Under the federal Government Performance and Results Act, industrial sites that treated, stored or disposed of hazardous waste are actively assessed for soil and ground water contamination. Since 2005, potential exposure to harmful contaminants has been eliminated or controlled at 58 hazardous waste sites, with ground water contamination being controlled at 55 of these sites. IDEM will continue coordinating with U.S. EPA to meet goals for effective assessments and ensure necessary measures are taken to protect Hoosiers and our environment.

Underground Storage Tank Program

IDEM has successfully ensured the cleanup of leaks and spills from Underground Storage Tanks (USTs). Since 1986, owners and operators of USTs reported 9,170 releases. At the end of 2010, 7,130 cleanups were completed and 2,040 cleanups were on-going. The number of releases has dropped significantly, from an average of over 600 per year from 1989 to 1999, to an average of less than 200 per year from 2000 to 2010. The number of cleanups completed increased from 265 to 375 per year during the same time period.

New IDEM rules regulating USTs that became effective in 2009 require double-wall protection for new and replaced tanks, as well as piping and under-dispenser containment for new dispenser installations. The rule also requires that by 2012, managers, on-site operators and owners must be trained to operate their underground storage tanks correctly and in accordance with IDEM's rule standards. IDEM is currently developing a web-based training program that will be available without charge to all operators to allow them to meet this new training requirement.

HELPING BUSINESSES PROTECT OUR ENVIRONMENT

Businesses that close due to economic hardship often face the added responsibility of managing large amounts of chemicals and waste materials. IDEM identified and conducted site visits at 75 facilities that were in the process of closing and identified over 190,000 pounds of associated waste that needed to be properly managed. IDEM was often able to help companies transfer



their unneeded chemicals to another business that could properly use the material. The sites were identified using the U.S. Department of Labor’s Worker Adjustment and Retraining Notification (WARN) system, which provides advance notice of plant closings and mass layoffs.

Many small businesses that store and dispose of hazardous waste may not be aware of the regulations they must comply with, including the need for registration with U.S. EPA. In partnership with the Indiana Manufacturer’s Association, IDEM instituted a non-notifier program. Under the initiative, IDEM staff contacted manufacturing facilities that were not registered as “notifiers” with U.S. EPA and provided them with compliance assistance documents, including self-audits and self-certifications.

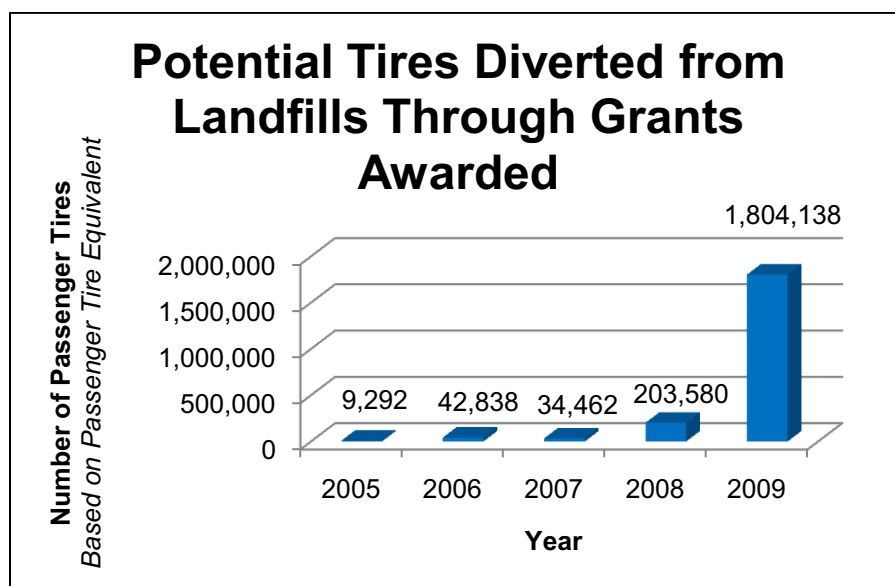
Clearing Away Illegal Tire Dumps

Since 2005, IDEM has cleaned up more than 50 million pounds of illegally dumped tires—the equivalent of more than two million passenger tires—at a cost of nearly \$2.4 million. Large tire piles are breeding grounds for disease-carrying mosquitoes. If set on fire, large tire piles burn with intense heat, blowing thick, hazardous smoke downwind. Tire fires are difficult to extinguish and can burn for days. While most funding has come from Indiana’s Waste Tire Fund, some of the sites have been cleaned up by parties voluntarily agreeing to participate in an environmentally-beneficial project as part of an enforcement settlement with IDEM.

Finding Beneficial Uses for Waste Tires

Since 2005, IDEM awarded \$1 million for projects that will reuse almost two million waste tires through its Waste Tire Management Grant Program. On average, Indiana generates one waste tire per person per year, which adds up to approximately six million waste tires per year. The grant program promotes a cleaner environment by helping communities and businesses properly manage waste tires, while creating jobs and new sources of energy.

Figure 4. Potential Tires Diverted from Landfills Through Grants Awarded



Since 2005, IDEM awarded \$1 million for projects that will reuse almost two million waste tires through its Waste Tire Management Grant Program.

Indiana Clean Yard Program

Since 2006, IDEM has been concentrating on outreach to auto salvage facilities that must manage automotive fluids, refrigerant and mercury switches. These substances can pose significant environmental impacts if mismanaged or improperly disposed.

In the fall of 2009, IDEM launched the Indiana Clean Yard Program, an incentive program to educate and encourage operations to meet their environmental responsibilities and reward those facilities that go above and beyond the requirements of law. To date, 12 facilities have received recognition through the program. Over 47 additional applications have been received by the agency and are currently being reviewed. More information about the Clean Yard Program can be found online at www.idem.IN.gov/4993.htm.



Animal Feeding Operation Programs



Cows at the Fair Oaks Farm in Northwest Indiana.

There are currently 1,988 animal feeding operations permitted in Indiana and inspected on a routine basis. These include 631 concentrated animal feeding operations (CAFOs) and 1,357 smaller feeding operations called confined feeding operations (CFOs). Indiana's standards for CAFOs are stricter than federal regulations. While the federal regulations for CAFOs do not contain standards for the construction of manure storage facilities, Indiana has had construction standards and requirements in place since the mid-1970s.

Although not required by U.S. EPA, IDEM also regulates CFOs under a state rule. IDEM's CFO program includes operational requirements for the land application of manure. Information about IDEM's regulatory program for CAFOs and CFOs can be found online at www.idem.IN.gov/4994.htm.

PARTNERSHIPS

Removal of VX Nerve Agent from the Newport Chemical Depot

In 2008, the entire 1,269-ton stockpile of VX nerve agent that had been stored in Newport, Indiana was safely and completely destroyed. VX is so toxic that a single drop on a person's skin can be fatal. The stockpile had been stored since 1969, when the United States chemical weapons program ended. IDEM's handling of the project has been cited by the U.S. Army as a model for other similar projects.



Natural Resource Damage Assessment Program

At locations where chemical or petroleum releases or spills cause significant damage to Indiana's natural resources and habitat, IDEM partners with other state and federal agencies to ensure restoration. Projects since 2005 include:

- Current dredging for removal of contaminated sediments in over three miles of the Grand Calumet River and the restoration of more than 600 acres of dune and swale along the Grand Calumet River ecosystem in Northwest Indiana;
- Protection of more than 1,585 acres in the Fish Creek Watershed in Northeastern Indiana through conservation easements, land purchases, reforestation, streambank stabilization projects and wetland restoration;
- \$5.8 million spent on projects in the White River in Central Indiana, including the construction of five new public access sites and the acquisition of 79 acres for restoration and preservation; and,
- An agreement for compensation for damage to 300 acres of wetland and vegetation through closure of 13 leaking, orphaned oil wells in Harmonie State Park in Southwest Indiana.

Since its inception in 1993, the program has obtained in excess of \$100 million in damages and over \$3 million in assessment costs; purchased or obtained conservation easements on over 3,000 acres of land; and provided for the restoration of over 3,800 acres.

Defense Environmental Restoration Program

As it decommissions and consolidates operations, the military works to determine cleanup needs at properties being maintained or transferred for other uses. IDEM is working with the Army, Navy, Air Force, Defense Logistics Agency and U. S. Army Corps of Engineers to complete the assessment and cleanup of 20 Indiana properties at former missile silos, ordnance plants, munitions testing grounds and storage depots, and reserve bases. Since the program's inception in the mid 1990s, more than 5,000 acres have been transferred for economic development and reuse as community parks and preserves, and industrial, business and residential developments. IDEM will continue working with the military to complete assessments and cleanups of these active and former military sites to ensure appropriate land reuse.

Clandestine Drug Lab Cleanups

IDEM has developed a program in response to a law passed by the Indiana General Assembly to train and certify contractors and set standards for the cleanup of properties contaminated by illegal drug labs. Currently, 56 contractors have been certified to help property owners, local health departments and communities ensure properties are safe for occupants. For more information, visit www.idem.IN.gov/4184.htm.

Unwanted Medicines

Historical practices have encouraged the disposal of unwanted or expired medicines by flushing them down the toilet or pouring them down a drain. However, wastewater treatment plants and septic systems are not designed to deal with pharmaceutical waste. Medicines pass through the systems and are released into streams, lakes and ground water. Medication traces remaining in surface water may cause adverse effects in fish and other aquatic wildlife, as well as unintentional human exposure to chemicals in the medication. Thrown carelessly in the trash,

unwanted medicines pose a risk of accidental poisoning for pets and children and a risk of identity theft for individuals whose personal information is visible on the labels.

The best way to reduce the impact of pharmaceutical waste on the environment is to dispose of medicine properly. The good news is that more communities are holding collections to help Hoosiers safely dispose of unwanted medicines. Beginning in 2008, IDEM began partnering with Marsh Pharmacies, the Indiana Poison Center, CLS/Med-Turn and Statewide Medical Services to offer biennial collections at 44 central Indiana Marsh Pharmacy locations. Since then, more than 74,000 prescription bottles have been collected.

IDEM, Indiana's pharmacists, educators, health care providers and waste managers are working in partnership to raise public awareness about the proper disposal of unwanted medicines. Hoosiers can find more information, including a list of local collection programs and a recycling database, on the Recycle Indiana website www.recycle.IN.gov.

GENERAL OVERSIGHT

Solid Waste Management Program

Although the number of landfills has decreased since the early 1990s, the average size of each has grown. In 2008, permitted operating solid waste landfills accounted for 5.7 square miles of the state's land area and had a combined capacity of 337 million tons. If disposal rates remain constant, landfill space is predicted to last until 2037.

Local solid waste management districts and communities are working together to offer collection locations and curbside pick-up programs to encourage recycling of paper, plastic, glass, steel and aluminum. Household hazardous waste (HHW) collections are also held in communities throughout the state, which helps the environment by preventing accidental releases of unwanted paints, cleaners, batteries, pesticides, motor oils, used oil filters and unwanted medicines.

Institutional Control Registry

IDEM developed the Risk Integrated System of Closure (RISC) to provide consistency in the closure of cleanup projects. Under RISC, an "institutional control" may be appropriate to prevent public exposure to harmful levels of contaminants at a property by restricting property use or access. The public can find the IDEM Institutional Controls Registry Report, which is a list of sites with institutional controls, on the IDEM website at www.idem.IN.gov/5959.htm.

CONCLUSION

IDEM's Office of Land Quality protects Indiana's soil and ground water by striving to make sure regulated facilities understand and are prepared to meet their environmental responsibilities. Along with educating and providing technical assistance to businesses and communities, IDEM's work to issue permits, conduct inspections, respond to accidental spills and oversee cleanups continues to foster marked improvement in the state's land quality each year.



IMPROVED WATER QUALITY

IDEM has worked hard to improve Indiana's water quality. New rules are in place to ensure that Hoosiers drink the highest quality water from their taps. Meanwhile, over 99 percent of the population served by community public water systems receives water that meets all state and federal requirements for drinking water. Initiatives such as the Nonpoint Source Grant program keep hundreds of thousands of pounds of phosphorus, nitrogen and sediment out of Indiana's waterways. Additionally, IDEM's work with combined sewer overflow (CSO) communities will prevent the discharge of billions of gallons of untreated sewage annually, as infrastructure projects are completed. Finally, the reduction of backlogged water quality permits ensures that facilities around the state are operating within current, more stringent water quality standards.

While IDEM is still learning more about the state of Indiana lakes and streams, the number of assessments of Hoosier waters is at an all-time high, providing vital information necessary to target projects and water quality improvement. Through grants and increasingly stringent permits, IDEM works with Hoosiers to improve the quality of our water.

NPDES PERMITTING

IDEM's Office of Water Quality (OWQ) is delegated by U.S. EPA to issue National Pollutant Discharge Elimination System (NPDES) permits. NPDES permits regulate the discharge of storm water and various types of wastewater by limiting the amount of pollution that can be in water discharged by a facility. These permits contain requirements on the treatment of wastewater before it is discharged to ensure that it meets strict standards that protect and improve water quality.

Backlog of NPDES Permits Dramatically Reduced

In 2005, IDEM had a backlog of 263 NPDES permits. Some had not been renewed for 20 years and had outdated requirements. Working aggressively, OWQ has issued 261 of the original 263 backlogged permits. The two remaining backlogged permits are being drafted and are scheduled to be issued in 2011.

In 2008, U.S. EPA recognized IDEM with a Certificate of Achievement "Gold Award," U.S. EPA's highest honor for meeting or exceeding goals for permit backlog reduction and issuance of priority permits. Indiana was one of only eight states to receive the honor.

Success Story: U.S. Steel permit

The U.S. Steel Corporation has operated an integrated steel mill facility in Gary, Indiana since 1909. Although NPDES permits are typically renewed every five years, the last renewal was issued in 1994, allowing the facility to operate under outdated requirements. That is why IDEM made it a priority to reissue what is the largest and most complex NPDES permit in Indiana. IDEM used the most up-to-date information about the facility, the nature of the discharges, and the condition



In 2008, U.S. EPA recognized IDEM's Office of Water Quality with a Gold Award. Pictured with the award are Jerry Dittmer and Beth Noel of IDEM's Water Permits Branch.

of the waterbodies to determine what kind of new requirements were necessary in this permit. After receiving extensive public input and working in concert with U.S. EPA, IDEM issued a renewal permit on January 22, 2010, that included new requirements that will ultimately protect and improve water quality. The water quality improvements at U.S. Steel, in conjunction with the dredging of the Grand Calumet River downstream from the facility, have resulted in measurable improvements in water quality and the return of various water dependent wildlife species to the river. Studies to fully document these improvements are scheduled to start in the near future.

COMBINED SEWER OVERFLOW COMMUNITIES

In 2005, a total of 108 communities with combined sewer systems were dumping raw sewage into Indiana's waters. Only one community had an IDEM-approved long term control plan (LTCP) to reduce discharges, and 12 had completed the separation of storm and sanitary sewers. The other communities were facing the challenge of meeting federal requirements to dramatically reduce discharges from combined sewers. Over the last six years, IDEM has made substantial progress in reviewing and approving long term control plans. Today, 104 communities have an enforceable agreement with IDEM to reduce discharges, and four communities continue to negotiate plans with U.S. EPA and IDEM.

As communities complete improvements to their systems, the volume of untreated discharges will be dramatically reduced. Estimates currently indicate that system-wide improvements over the next 20 years will reduce raw sewage discharges by over 30 billion gallons annually.

NONPOINT SOURCE PROGRAM AND TOTAL MAXIMUM DAILY LOADS

Where IDEM determines that water quality does not meet standards, or is impaired, the agency prepares a calculation, known as a Total Maximum Daily Load (TMDL), which identifies the maximum amount of a pollutant a waterbody can receive and still meet water quality standards. TMDLs are an important tool IDEM uses to determine what improvements need to be made to ensure that water quality meets strict standards designed to protect aquatic life and be fishable and swimmable. Since 2005, IDEM has completed 863 TMDLs on Indiana streams and has another 131 in progress.

Grant programs are another important tool IDEM uses to ensure lakes, rivers and streams meet high water quality standards. Since 2005, IDEM has awarded over \$21 million through two grant programs to fund projects to reduce nonpoint source pollution. Nonpoint source pollution results from land run-off, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification, when water moving across the landscape picks up contaminants such as oil, fertilizer, sediment and other materials. These locally-led projects prevent more than 500 million (500,000,000) pounds of sediment, 332,000 pounds of phosphorus, and 546,000 pounds of nitrogen from entering Indiana waters annually, according to modeled estimates. These reductions of pollutants are among the highest reductions in the Midwest.

Water quality improvement success stories have been documented in three watersheds, Big Walnut Creek, Pigeon Creek and Lower Clifty Creek.



Big Walnut Creek, in west central Indiana, was impaired with bacteria from livestock, leaking septic systems and wildlife. IDEM added three waterbody segments to Indiana's 1998 303(d) list, identifying the streams as impaired for *Escherichia coli* (*E. coli*) bacteria. After additional monitoring, IDEM added three more segments to the 303(d) list in 2004. Using Clean Water Act Section 319 funds, project partners installed best management practices and educated stakeholders about sound agricultural management throughout the watershed. Recent monitoring data show that the Big Walnut Creek segments meet water quality standards for bacteria, prompting IDEM to propose removing all six segments from the state's 2010 section 303(d) List of Impaired Waters. More information about Big Walnut Creek can be found at www.watersheds.IN.gov/files/watershed_success_epa_bigwalnut.pdf.

Pigeon Creek, in Southwest Indiana, was impaired for chlordane and other priority pollutants. Infiltration came from the use of these chemicals on agricultural lands with poor stream buffers and high historic soil loss. Indiana placed 32 miles of this waterbody on its 303(d) list in 1996, and again in 1998, based on fish tissue data. IDEM, working with other agencies, funded locally-led efforts to install best management practices, such as vegetated buffers and conservation tillage, and provided landowner education. These initiatives produced a measurable improvement in water quality. As a result, Indiana removed Pigeon Creek from the 303(d) list in 2002. More information can be found at www.watersheds.IN.gov/files/watershed_success_epa_pigeon.pdf.

Lower Clifty Creek, in southeastern Indiana, was impaired by bacteria from manure spreading, pasturing of livestock, wildlife, and leaking and failing septic systems. Based on data collected from water quality sampling, IDEM added one waterbody/segment of lower Clifty Creek to Indiana's Section 303(d) list for *E. coli* bacteria in 2002. Using Clean Water Act Section 319 funds, project partners educated stakeholders about sound agricultural management and implemented best management practices throughout the watershed. Recent monitoring data shows that the lower Clifty Creek segment meets water quality standards for bacteria, resulting in IDEM proposing to remove the segment from the state's 2010 section 303(d) List of Impaired Waters. More information can be found at www.watersheds.IN.gov/files/watershed_success_epa_cliftycreek.pdf.

To educate Hoosiers on the correlation between human activity and effect on water quality, IDEM launched the "Stop the Rubber Duckies" campaign in 2009. The capstone of the campaign was the creation of a one-stop shop website, www.watersheds.IN.gov, which offers information on nonpoint source pollution, what is being done to address it, and ways citizens can be part of the solution. Local officials, volunteer groups and individuals who are ready to get involved in local watershed management can link to numerous resources, including a toolkits, grant information and reports on water quality in their communities. With over 350 pages of information on watersheds and nonpoint source pollution, this site is the most comprehensive resource available on watersheds and nonpoint source pollution.

BLUE GREEN ALGAE INITIATIVE

Cyanobacteria or blue-green algae are a common constituent of algal communities in lakes and rivers. Many common cyanobacteria are known to produce potent toxins under certain

environmental conditions, particularly during blooms, die-offs and other stressful conditions. These toxins can affect the liver, nervous system, or skin. They are known to cause illness in humans and there are numerous documented cases of cyanotoxin deaths in dogs and livestock. Toxic cyanobacteria are now recognized as a potentially serious threat to human health. Large cyanobacteria communities can also cause water quality deterioration, including depleted dissolved oxygen levels, fish kills, as well as taste and odor problems in drinking water. The World Health Organization (WHO) has taken a leadership role in establishing cyanotoxin guidance.

IDEM has developed a targeted monitoring pilot program for cyanobacteria and the microcystin toxin. In 2010, five Department of Natural Resources (DNR) swimming beaches were monitored on a regular basis from July through September. In summer 2011, the number will be increased to 11. Samples are analyzed and results are communicated to DNR to assist them in educating area beach-goers. Results are posted at www.algae.IN.gov. The website serves as a one-stop resource for test results for the lakes and reservoirs sampled and provides other information and resources about cyanobacteria.

GROUND WATER MONITORING NETWORK

In 2008, IDEM began collecting untreated water samples from ground water and drinking water wells statewide as part of a Ground Water Monitoring Network (GWMN). The pilot project plans on sampling over 300 public and residential wells on an annual basis. The purpose of the project is to determine a baseline of ground water quality statewide and assess the overall ground water quality of Indiana. The GWMN also fills in the hydrologic cycle gaps between current surface water monitoring strategies and those completed in the late 1990s.

The project aims to resample each well on an annual basis for a number of different parameters. Since 2008, over 600 water samples have been collected and analyzed. Annual sampling will give Indiana an opportunity to explore trend analysis, seasonal variations and hydrogeological setting's relationship to sensitivity. Long-term, the information gathered will be incorporated into the Indiana Water Quality Monitoring Strategy as a component of the integrated water quality strategy.

DOCUMENTING IMPROVEMENTS IN INDIANA'S WATER QUALITY

Because of the way IDEM monitors waterbodies, it is easier to document problems than it is to document improvements in water quality. Our list of impaired waters grows as more streams are sampled each year. Yet, there have been many improvements. For example, the levels of polychlorinated biphenyls (PCBs), dieldrin, DDT and chlordane in Indiana fish have been steadily decreasing since 1983.

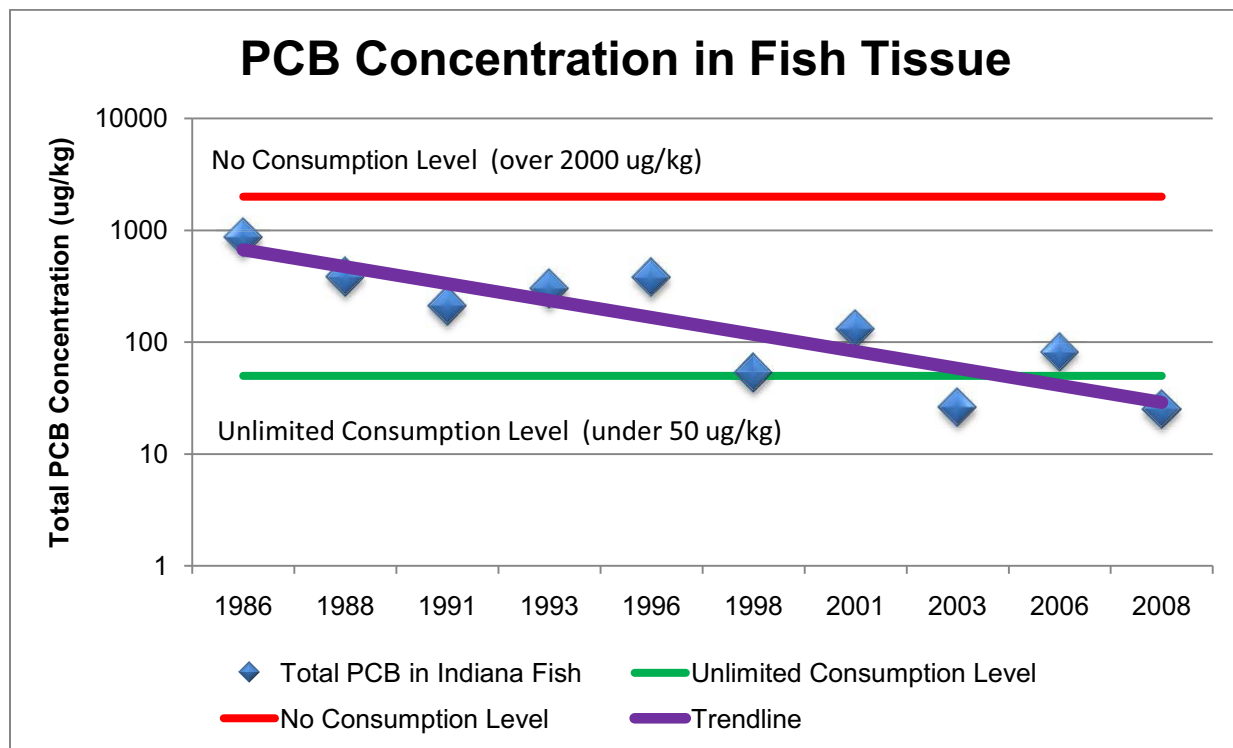
Polychlorinated Biphenyls (PCBs)

PCBs have been used as coolants and lubricants in transformers, capacitors and other electrical equipment because they don't burn easily and are good insulators. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils. PCBs also have been used as plasticizers in paints and plastics, inks, copy paper and adhesives.



Although PCBs were banned in 1979, they are persistent in fish, and as a result, examining fish tissue is a good indicator of PCB levels in the environment. PCBs remain a cause for concern as they are the reason for some fish consumption advisories in specific areas. There continue to be a number of “hot spots” in Indiana where fish still have high concentrations of PCBs, but even these concentrations are decreasing. Overall levels of PCBs in Indiana fish have been slowly decreasing since the discontinuation of PCB use.

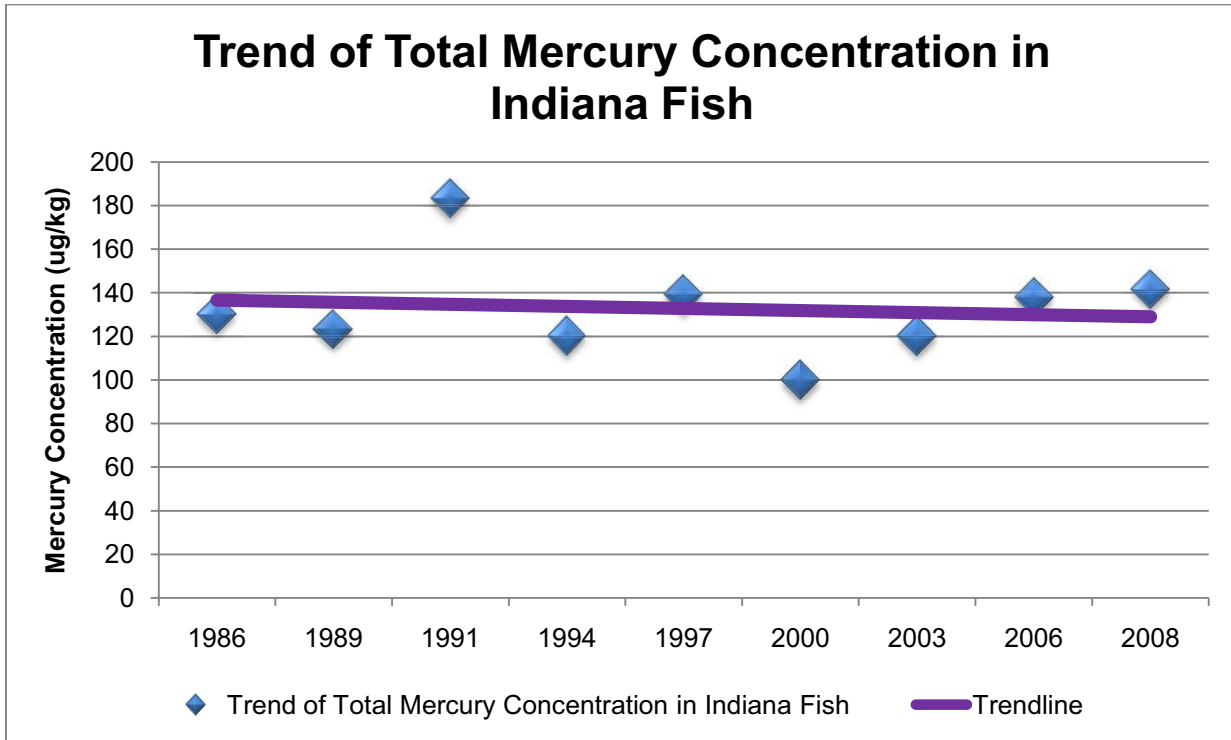
Figure 5. PCB concentrations in Fish Tissue



Mercury

Although the levels of PCBs and pesticides have decreased in fish over time, one challenge remains: mercury. Mercury is an element of the earth and is found everywhere in the environment. Most human mercury exposure is through consumption of fish, and it magnifies up the food chain. IDEM has found Mercury in 90 percent of all fish tissues sampled. Predatory fish, such as largemouth bass and walleye, have been found to have the highest concentration of mercury. Small minnows and sunfish have very low levels of mercury compared with predators. Mercury is a major reason for the issuance of fish consumption advisories in Indiana. In spite of significant reductions in both air emission sources and direct wastewater discharges, mercury concentrations in fish do not appear to be decreasing.

Figure 6. Trend of Total Mercury Concentration in Indiana Fish



Dieldrin, DDT and Chlordane

Dieldrin, DDT and chlordane caused the issuance of fish consumption advisories in the past. However, concentrations of these chemicals have lowered to levels that currently do not trigger fish consumption advisories.

Dieldrin is a pesticide used as an insecticide for soil-dwelling pests, termite control, and in mothproofing. It was phased out of use between 1974 and 1987. Like PCBs, dieldrin is persistent in the environment and is highly bioaccumulative. Although this pesticide still continues to be detected in Indiana fish, concentrations have decreased greatly and no longer drive any advisories against fish consumption.

DDT is a pesticide that was once widely used to control insects on agricultural crops and insects that carry diseases, like malaria and typhus. DDT is used now in only a few countries in some tropical regions to control malaria. After 1972, the use of DDT was no longer permitted in the United States. Like Dieldrin and PCBs, DDT is highly bioaccumulative. While levels of DDTs in Indiana waters once caused the issuance of fish consumption advisories, DDT is no longer measured at levels that would trigger advisories in Indiana fish. The state still monitors for DDT, but sampling has shown steady reductions in concentrations of DDT over time.

Chlordane is a colorless, odorless, viscous liquid that was formerly used as an insecticide for crops, lawns and termite control. Because it can damage the liver and nervous system and remains as a toxin in the environment for many years, chlordane was banned in 1988. Chlordane



is bioaccumulative and is widely detected in Indiana fish. Although chlordane was the cause of fish consumption advisories in the past, concentrations in fish have declined to such a level that this pesticide is no longer detected at levels that would trigger fish consumption advisories.

GREAT LAKES COMPACT

The Great Lakes contain 95 percent of North America's fresh water. In 2007, Governor Daniels signed Senate Enrolled Act 45, making Indiana the first state to ratify the Great Lakes Compact. The goals of the Great Lakes Compact include the prevention of diversion of water from the Great Lakes, fostering economic development in the region, and improving decision-making for future Great Lakes use. The Great Lakes Compact has since been ratified by all eight member states, and was signed into law in 2008 by President George W. Bush.

GRAND CALUMET RIVER DREDGING PROJECT

Located in the northwestern corner of the Hoosier state, the Grand Calumet River stands as a testament to overall improvements in the state's water quality. Industrial development in the Calumet River area began during the 1870s, and by 1890, the west reach of the Grand Calumet River was heavily polluted. Sediment in the Grand Calumet River was contaminated from industrial and municipal discharges long before today's regulations were imposed. These legacy contaminants extend 20 feet deep and continue to restrict industrial, commercial and recreational uses. Additionally, water quality issues have made it nearly impossible for aquatic life to use the Grand Calumet River as a habitat.

In 1987, the International Joint Commission (IJC) listed the Grand Calumet River and Indiana Harbor Ship Canal as an area of concern, or a severely degraded site on the Great Lakes. The IJC is a United States and Canadian-run entity that works to protect shared North American water resources. Two years later, IDEM completed a Phase I Remedial Action Plan to identify the problems in the Areas of Concern, finding that all 14 of the designated beneficial uses for surface water were considered impaired.

In 1998, a group of industries expressed interest in working with Indiana's Natural Resources Trustees to complete a Natural Resource Damage Assessment (NRDA). Eventually, a settlement of \$60 million was reached, with eight industries contributing to the cleanup of legacy contaminants. The settlement was one of the largest NRDA hazardous waste settlements in history.

Efforts have been underway for the past several decades to limit or remove sources of pollutants to the Grand Calumet River ecosystem. While point source pollutants have been greatly reduced, the legacy contaminants found in the sediment continue to affect water quality.

In 2008, the West Branch Grand Calumet River Sediment Remediation project was announced, and as its goal, the removal of 131,000 cubic yards of sediment from a one mile stretch of the Grand Calumet River. It would be followed by adding a reactive cap which would seal off remaining sediment contaminants. Part of this dredging project was completed in 2010, with the remainder scheduled for completion in 2011.

IDEM continues to spearhead remediation projects in the Grand Calumet River with the hope that one day the river will be able to support diverse aquatic life. River dredging and capping projects are underway: construction is scheduled to start in 25 acres of Roxana Marsh in 2011; an additional project in part of the East Branch Grand Calumet River will include over 80 acres of wetlands; and a segment in the West Branch of the Grand Calumet River is also under consideration.

BEACHES PROGRAM

The Beaches Environmental Assessment and Coastal Health Act (BEACH Act) requires states, tribes and territories to identify their coastal recreation waters and to report on monitoring activities at those beaches to reduce the risk of illness caused by *E.coli*. Indiana has one of the few BEACH programs that is funded to sample coastal beaches a minimum of three days per week.

Monitoring data is available online to allow beachgoers to access advisories or closures at particular beaches before they leave the house. Located online at www.idem.IN.gov/beaches, the public can choose a county and beach to see daily water testing results, advisory and closure history, whether a beach is open or closed that day, and general information for participating beaches.



In 2008, Northwest Indiana's Great Lakes BEACH Program created and tested new, improved signage to indicate when water quality is good, when a warning is in effect and when swimming is not permitted due to high *E. coli* levels. The pilot project received positive feedback, and in the summer of 2009, new signs were installed at all participating beaches.

IDEM and IN.gov strive to enhance services and increase the public's access to useful information through new technology. In March 2011, the agencies launched a mobile alert system to notify beach-goers of beach conditions and closings due to *E. coli*. The mobile app also allows users to customize the information they receive and subscribe to specific alerts pertaining to their community or area of the state.

Indiana BeachesAlert monitors beach conditions and alerts at public and private beaches in Lake, Porter, LaPorte and Kosciusko counties. The new service supplements the existing online BeachGuard System, which compiles beaches' water quality data from mid-May through mid-September.

ASSESSMENT

The Clean Water Act requires Indiana to assess the condition of its lakes, rivers and streams. This assessment is critical to provide IDEM and the public with an understanding of local water quality. Where the assessments reveal that a waterbody is impaired for a specific pollutant, the agency and the public have a better understanding of how to improve water quality. Where the assessments reveal that a water body is of high quality, IDEM and the public have information that allows us to protect the waters from becoming polluted. The overall goal of the program is



to gather information so that IDEM can make good decisions about how to meet the strict standards that protect fish and ensure safe recreational use of the water.

Based on the proposed 2010 303(d) List of Impaired Waters, IDEM has assessed over 33,473 stream miles, which is over 83 percent of the streams in Indiana. Prior to 2005, only 18,400 stream miles had been assessed. Out of the assessed streams, 52.8 percent of the streams were impaired, and 47.2 percent met strict water quality standards.

Results of the assessments help IDEM determine permit requirements, where to focus grant expenditures, and make recommendations for water-related advisories.

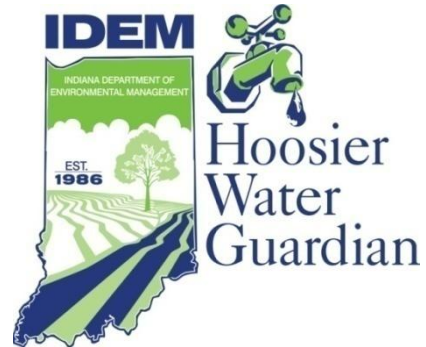


OWQ staffers Todd Davis and Jim Stahl conduct boat safety training for the assessment team in 2008.

HOOSIER WATER GUARDIAN

In 2007, Indiana's Ground Water Guardian team developed a voluntary program to recognize those communities that promote wellhead protection and the protection of ground water as their drinking water source.

All Hoosier Water Guardian award winners must demonstrate that they have gone or will go above and beyond the minimum state requirements. Since 2008, recognition has been awarded to 20 communities.



NEW WATER RULES

IDEM proposed several rules which were passed by the Water Pollution Control board in 2009 to ensure Hoosiers continue to drink safe and clean water.

Ground Water Rule

This rule affects public water facilities that use ground water, ensuring that systems do not contain fecal contamination that can contain disease-causing pathogens. The rule requires public water systems to sample the ground water and requires sanitary surveys of the systems to evaluate critical elements of the system, identify weaknesses in the system and take corrective action.

Stage 2 Disinfectants and Disinfection By-Products Rule

While disinfection of drinking water has played a major role in reducing waterborne epidemics, such as typhoid and cholera, disinfectants react with naturally-occurring materials in water to

form byproducts that can pose health risks. The Stage 2 Disinfectants and Disinfection By-Products Rule requires drinking water systems to evaluate their systems to determine whether chemicals were formed as a result of disinfection and take action to ensure those byproducts are reduced.

Long Term 2 (LT2) Enhanced Surface Water Treatment Rule

The purpose of this rule is to protect people from disease-causing organisms in drinking water. This rule requires surface water systems serving 10,000 or more people to test levels of *Cryptosporidium*, a protozoan parasite, in their source water. It also requires surface water systems serving less than 10,000 people to test for *E. coli*, and if levels are high, to also test for *Cryptosporidium*. If *Cryptosporidium* is found in the source water, additional treatment is required. Treatment options include additional filtration and use of alternative disinfectants, including ultraviolet disinfection, ozone or chlorine dioxide.

Ground Water Quality Standards Numeric Criterion for Arsenic Rule

This rule changed Indiana's ground water quality standard for arsenic to match the federal maximum contaminant level. Arsenic occurs naturally in rocks and soil, water, air, and plants and animals. High arsenic levels can also come from agricultural and industrial practices. It can enter drinking water through the ground or as run-off into surface water sources. Human exposure to arsenic can cause both short-term and long-term health effects.

SUCCESSFUL PARTNERSHIPS

Garden City Trailer Park

Garden City Trailer Park, located near Richmond, is home to approximately 300 residents. The area historically had high arsenic levels in the residential wells, far exceeding the drinking water quality standard.

Faced with eviction and the park's closure, residents worked with IDEM and the Indiana Finance Authority (IFA) to pursue a course of action.

In 2009, IFA determined that it could provide approximately \$1 million to tie the residents into the Richmond-based Indiana American Drinking Water Utility, which volunteered to complete the construction portion of the project.

Groundbreaking took place on December 8, 2009, and now residents of Garden City Trailer Park enjoy clean and safe drinking water.



Officials break ground in December 2009 on the new water main to Garden City Trailer Park in Richmond.



Volunteer Mitigation Map

Organizations that disturb wetlands, streams and lakes through construction or other activities are required to restore or create new wetlands or waterbodies to offset the impact. This is called compensatory mitigation. Finding appropriate mitigation sites is a critical component to successfully replacing wetlands and often takes a great deal of time and expertise.

A new Web application, known as the Volunteer Mitigation Map, was created to help connect landowners willing to provide land and organizations that could benefit from mitigation locations. The application was created through a partnership between IDEM, the Indiana Department of Transportation, the Indiana Department of Natural Resources, and the Indiana Department of Homeland Security. The public portal can be found at <http://idemmaps.idem.IN.gov/apps/MitigationVolunteer/>.

CONCLUSION

IDEM's Office of Water Quality is working toward the future when all of Indiana's waters will be safe for swimming and fishing, and critical ground water will be suitable for all uses, including drinking. Through continued assessment and adherence to water quality health standards, IDEM is working to further water protection and pollution prevention.

Initiatives, such as the nonpoint source grant program, keep millions of pounds of phosphorus, nitrogen and sediment out of Indiana's waterways. IDEM's work with CSO communities will prevent the discharge of billions of gallons of untreated sewage annually as infrastructure projects are completed. New rules have helped strengthen the safety of Indiana's drinking water.

Meanwhile, over 99 percent of Hoosiers served by community public water systems receive water that meets all state and federal requirements for drinking water. Finally, the reduction of a backlog of water quality permits ensures that facilities around the state are operating within current, more stringent water quality standards.

INDIANA BROWNFIELDS PROGRAM AND INDIANA STATE REVOLVING FUND LOAN PROGRAM

In May 2005, several state organizations, including the Indiana Development Finance Authority, the State Office Building Commission, the Indiana Transportation Finance Authority, the Recreational Development Commission, the State Revolving Fund Programs, and the Indiana Brownfields Program, were consolidated into a new and separate entity called the Indiana Finance Authority (IFA). The Indiana Health and Educational Facilities Finance Authority was merged into the IFA in July 2007.

The IFA issues revenue bonds to finance or refinance the cost of acquiring, building and equipping structures for state use. This includes state office buildings, garages, highways, bridges, airport facilities, correctional facilities, state hospitals and recreational facilities related to state parks. The IFA also manages the Wastewater and Drinking Water State Revolving Fund (SRF) Loan Programs and the Indiana Brownfields Program. Through these two programs, IDEM project managers, project engineers, and drinking water and wastewater administrators work in partnership with IFA staff to attract new businesses, create more jobs and improve the health of Hoosiers, a priority of Governor Daniels. Since 2005, both the brownfields and SRF programs have been responsible for significant achievements and partnerships.

Since the inception of the Indiana Brownfields Program through the end of 2010, more than \$39 million in grants and loans have been used to assist in the assessment, remediation and redevelopment of properties throughout the state. The SRF has provided over \$2.8 billion in loans for 374 wastewater projects and 165 drinking water projects.

SUCCESSFUL PARTNERSHIPS—INDIANA BROWNFIELDS PROGRAM

Former Dana Weatherhead Facility, Angola

Sixteen years ago, the Dana automotive parts foundry and machining plant in Angola closed. Because soil on the site was contaminated with a chlorinated solvent, IDEM required Dana to operate an on-site ground water treatment system to keep ground water from contaminating the city's water supply. Dana filed for bankruptcy in 2006, and once it emerged from bankruptcy reorganization, Dana argued that it no longer had a legal responsibility for cleaning up the site or for operating the ground water treatment system. Soon thereafter, Univertical Corp., a company that manufactures materials for the metal-finishing industry, took over the former Dana site.

While Univertical did not cause the contamination, it faced daunting cleanup costs that would have forced the company to relocate if not for public-private participation in the cleanup effort. The bankruptcy court approved a settlement that required Dana to make restitution to IDEM. Based on the settlement, the State assumed responsibility for the treatment system. In August, 2009, the city of Angola agreed to pay \$1 million toward cleanup. Steuben County is contributing \$1 million and Univertical another \$1 million. IFA offered the city a low-interest \$3.5 million loan for the remainder of the cleanup costs. IFA is also administering the contracting process to continue site remediation, as well as handling the financial management of the settlement proceeds. More information about the Indiana Brownfields Program can be found online at <http://www.in.gov/ifa/brownfields>.



SUCCESSFUL PARTNERSHIPS—STATE REVOLVING FUND LOAN PROGRAMS

Wastewater Treatment Plant, Peru

The City of Peru's wastewater treatment plant periodically exceeds its National Pollutant Discharge Elimination System (NPDES) permit limitations. This is due to several deficiencies within the system, both design-related and operational. Contributing factors include the age of facilities, individual processes and equipment that have exceeded their useful service, and insufficient hydraulic and organic capacity to meet future requirements. A proposed project will provide necessary upgrades and improvements to the City of Peru's treatment plant. Peru's subsidized loan of \$5.7 million, which includes funding from the American Recovery and Reinvestment Act, will provide a savings to the city of \$7.78 million over the life of the loan.

More information about the State Revolving Fund Loan program can be found online at www.idem.IN.gov/4103.htm#srf.

POLLUTION PREVENTION AND TECHNICAL ASSISTANCE

The Office of Pollution Prevention and Technical Assistance (OPPTA), now integrated within the newly formed Office of Compliance Services (OCS), provides confidential assistance, funding for source reduction, pollution prevention, and recycling initiatives and community outreach and education to businesses, communities and schools.

Over the past four years, through participation in various IDEM programs, businesses and communities have reported activities and projects that prevented approximately:

- 7.3 million pounds of solid waste;
- 219.5 million pounds of hazardous waste;
- 81 million pounds of pollution from entering Indiana waters;
- 3.1 billion pounds of pollution from entering the air;
- 2.3 billion gallons of water conserved; and,
- 831 million pounds of waste diverted from entering landfills.

Staff is committed to finding ways to help others voluntarily prevent pollution and understand, achieve and exceed environmental responsibilities through confidential technical assistance, education and financial support.

POLLUTION PREVENTION BRANCH

Boating Infrastructure and Clean Vessel Act Grant Programs

Proper sewage management is an important step to keeping Indiana's waters safe. IDEM partners with the U.S. Fish and Wildlife service to reimburse public and private marinas in two separate programs: the Boating Infrastructure Grant Program (BIGP) and the Clean Vessel Act Grant Program (CVAGP). The programs have provided \$600,000 in grants, which have prevented seven million pounds of waste from entering Indiana waters in the past six years. For more information on the CVAGP, visit www.IN.gov/idem/5222.htm, and for more information on BIGP, visit www.IN.gov/idem/5223.htm.

CLEAN Community Challenge

The CLEAN Community Challenge is a voluntary recognition program for Indiana communities that make significant commitments to environmental management. CLEAN helps communities take steps to plan, develop and implement a Quality of Life Plan, which focuses on reducing the potential environmental impacts associated with municipal operations.

As of April, 2011, there are 17 CLEAN participants. Through their environmental initiatives, members have reported reducing air pollution by over 1.25 million pounds. In addition, members have decreased energy use by more than 1 million kilowatt hours, composted over 22.8 million pounds of leaves, collected approximately 212 million pounds of recyclables and planted over 200 trees. More information about CLEAN can be found at www.IN.gov/idem/4135.htm.





Environmental Stewardship Program

In 2006, IDEM created the Environmental Stewardship Program (ESP), a performance-based recognition program for Indiana businesses. The 49 participating businesses have voluntarily committed to maintaining compliance with environmental regulations and implementing at least one environmental improvement initiative each year.



Environmental projects have resulted in significant reductions, for example:

- water use by 91 million gallons, comparable to 139 Olympic-sized swimming pools;
- electricity use by 21.5 million kilowatt hours, comparable to the amount of electricity needed to run 8,308 residential air conditioners for one year;
- natural gas consumption by nearly 9,616 therms, which is like eliminating air pollution from 2,003 propane cylinders used for home barbeques;
- waste by 7.2 million pounds, equivalent to the approximate weight of 1800 automobiles;
- hazardous waste by 185,000 pounds, comparable to the weight of 18 Asian elephants; and,
- recycled over 4.4 million pounds of materials.



IDEM Commissioner Thomas Easterly (left) presented an ESP flag to National Office Furniture staff in 2009.

For more details, visit IDEM's website at www.IN.gov/idem/4132.htm.

Indiana Pollution Prevention Grant Program

The Indiana Pollution Prevention Grant Program has awarded 11 grants totaling \$573,155 since 2008. These grants have supported an array of pollution prevention projects. Projects funded by the Pollution Prevention Grant Program have resulted in the following reductions per year:

- 200,000 kilowatt hours of electricity;
- 66,500 pounds of hazardous waste;
- One million British Thermal Units (BTUs) of natural gas;
- 37 million pounds of solid waste; and,
- over 21.5 million gallons of water.

In 2009, IDEM was awarded \$160,000 in federal grants to reduce toxics in Indiana through pollution prevention. Businesses or communities that use chemicals listed on the Resource Conservation Challenge priority chemical list or regional priority list are eligible to apply for

grants to reduce toxic chemical usage. More information about Pollution Prevention grants can be found at www.IN.gov/idem/5224.htm.

Pollution Prevention Opportunity Assessments

OPPTA offers free, confidential, on-site pollution prevention opportunity assessments to Indiana manufacturers. Since 2005, OPPTA assessments have helped manufacturers reduce natural resource usage and harmful emissions. Some of these reductions include:

- 137,400 gallons of hazardous waste;
- 30,500 pounds of solid waste;
- 73.9 million gallons of water and wastewater;
- 484,680 pounds of air pollution;
- 3.59 million kilowatt hours of electricity; and,
- 75,000 therms of natural gas.

More information about the assessments can be found at www.IN.gov/idem/5298.htm.

Governor's Award for Environmental Excellence



The Governor's Award for Environmental Excellence is open to all Indiana facilities, state and local units of government, individuals and technical assistance organizations that implement outstanding environmental

strategies into their operations and decision-making processes. Since 2008, there have been 48 recipients of the Governor's Awards.

More information about the Governor's Awards for Environmental Excellence program can be found on the IDEM website at www.IN.gov/idem/5147.htm.



Bill Maloney (left) and Gary Maloney (right), Jeffersonville-based Nu-Yale Cleaners, received a 2009 Indiana Governor's Award for Environmental Excellence from IDEM Assistant Commissioner Rick Bossingham (center).

Indiana Partners for Pollution Prevention

The Partners for Pollution Prevention is an organization of Indiana industries and businesses that are interested in pollution prevention (P2) and the financial and environmental benefits P2 projects can bring. The Partners for Pollution Prevention provide a forum where Indiana businesses can network and exchange ideas about P2 experiences and discuss how P2 fits into current and future IDEM programs.

More information about the Partners for Pollution Prevention can be found at www.IN.gov/idem/4129.htm.





SOURCE REDUCTION AND RECYCLING BRANCH

As a result of the recent economic crisis, grants and loans were suspended in December 2008, including the Recycling Promotion Assistance Fund, Solid Waste Fund and Waste Tire Management Fund.

Recycling Market Development Program

Beginning in 2005, IDEM funded 90 projects totaling over \$6.3 million through the grants and loan programs. OPPTA will continue to seek ways to promote the valuable economic impact that the recycling and reuse industry has on the state. For more information on OPPTA's waste reduction efforts, visit www.recycle.IN.gov.

Community Recycling Grant Programs

IDEM uses \$1.2 million from the Solid Waste Management Fund each year for the Community Recycling Grant Programs (CRGPs), which encourages education and outreach programs. Since 2005, CRGPs funded 436 recycling projects totaling \$5.9 million and diverted approximately 316 million pounds of waste from landfills.

e-Waste

In July 2009, the Indiana Electronic Waste Program law was enacted. During the first year of the program, 65 manufacturers registered with IDEM, with total recycling goals of almost 23 million pounds of e-Waste. More than 100 collectors and 52 recyclers also registered to participate in the program, providing households, public schools and small businesses with collection and recycling services at more than 300 locations around the state.

COMPLIANCE AND TECHNICAL ASSISTANCE PROGRAM

The Compliance and Technical Assistance Program (CTAP) is a statutorily-authorized small business assistance program. Since 2005, thousands of Hoosiers have contacted CTAP for free, confidential assistance in achieving compliance with environmental regulations. CTAP has educated thousands of businesses through workshops, presentations and on-site visits. CTAP does not impose obligations on its customers and is bound by Indiana law to maintain confidentiality. More information about CTAP can be found at www.IN.gov/idem/4108.htm.

CTAP's Quality Assurance Guarantee

The CTAP Quality Assurance Guarantee means that IDEM stands behind CTAP's compliance assistance. The guarantee assures customers that IDEM will not issue a Notice of Violation assessing a gravity-based penalty against a regulated entity that has sought out, received and relied upon CTAP's written compliance assistance prior to the alleged violation.

COMMUNITY ENVIRONMENTAL HEALTH AND EDUCATION Five Star Environmental Recognition Program for Child Care Facilities



Over 100 child care facilities reaching an estimated 2,550 children have participated in IDEM's Five Star Environmental Recognition Program for Child Care Facilities. IDEM developed the Five Star Program to help parents and child care facility leaders learn about environmental health and safety threats that may affect children.

Applicants are evaluated based on their efforts to reduce children's exposure to mercury, lead, carbon monoxide and other hazards.

Facilities have also started recycling programs, developed formal written plans for chemical management, made efforts to purchase items made with recycled content material and reduced energy usage and vehicle idling.

The Five Star Program is the first of its kind in the nation and winner of the Innovations Award from the Council of State Governments.

More information about the Five Star Program can be found at www.IN.gov/idem/4413.htm.

Green Steps for Schools

On the heels of the Five Star Program's success, IDEM created a similar initiative for schools. Additional school-related threats such as lab chemical storage and school bus idling are addressed. The Green Steps for Schools program rolled out in 2007 with the mailing of a Green Steps Tool Kit to all school systems in Indiana. The kit is available on-line at www.IN.gov/idem/4123.htm.

Environmental Education

Environmental outreach to young students has been a popular addition to school programming. From April 2008 through April 2011, IDEM staff educated over 56,000 students about careers in the environmental field and how they can protect the environment at home and school. Students spend time discussing environmental topics including air, land, water quality and recycling. Curriculum and information for teachers and students is available online at www.IN.gov/idem/4091.htm.

HOOSIERS CARE PARTNERSHIP

Hoosiers Care is a partnership between IDEM, the Indiana State Department of Agriculture, the Indiana Office of Community and Rural Affairs, the Indiana Office of Energy, the Indiana Office of Utility Consumer Counselor, and the Indiana Housing and Community Development Authority.



The program works to educate individuals statewide on small steps that can be taken to promote a cleaner and healthier environment. Since the Hoosiers Care initiative debuted at the Indiana State Fair in 2008, more than 6,500 people from 89 of 92 Indiana counties have taken the Hoosiers Care pledge. The Hoosiers Care website is located at www.HoosiersCare.IN.gov.



ADMINISTRATIVE ACCOMPLISHMENTS

In 2005, Commissioner Thomas Easterly created an internal “Task Force for Streamlining and Efficiency” to review processes and make recommendations to help the agency function in the most consistent and efficient manner possible. The result: internal efficiencies were identified, best management practices were carefully considered and implemented, and numerous processes were re-evaluated in order to determine the best use of taxpayer dollars. Important administrative changes have resulted in more efficient internal processes and significant cost-savings, beginning with the upgrading of internal fiscal systems, and a streamlining of IDEM’s administrative foundation. Partnering with other state agencies has also resulted in being able to do more with less.

FISCAL RESPONSIBILITIES

By centralizing the agency’s grant programs, IDEM is better able to focus the receipt and distribution of grants for core initiatives. This has allowed the agency to more efficiently coordinate with federal partners, and resulted in more effective use of grant dollars.

Additionally, IDEM created and implemented a program for collecting outstanding debt. With help from program staff, the accounts receivable team and the Attorney General’s Office, IDEM implemented a mechanism to track debtors and has successfully collected in excess of \$1 million owed to the state.

STREAMLINING OF IDEM’S ADMINISTRATIVE FOUNDATION

Within the agency, numerous re-organization initiatives were implemented to increase efficiency:

- Vehicle fleet coordinator positions were created, and the agency fleet was reduced by 32 percent;
- A grants coordinator position was created, and all grant information was placed on the agency website; and,
- Over 75 agency fact sheets were created or modified to better inform the public.

Tools for Environmental Management and Protection Organizations

Implementation of the Tools for Environmental Management and Protection Organizations (TEMPO) database system allows IDEM to integrate environmental data management functions across several programs. IDEM staff use TEMPO as a data tracking and communications tool.

Digital Inspector

Implementation of the Digital Inspector program allows IDEM’s compliance staff to complete inspection forms while at a regulated facility. Before leaving the facility, inspectors can create, transmit and print a copy of the inspection report. In 2008, the digital inspector program won a national innovation award from the Environmental Council of States (ECOS).

IDEM Extranet

The IDEM Extranet website serves as an official internal communication tool for IDEM staff.

OUTREACH PUBLICATIONS

Informational Brochures

Agency publications have been created and revised to serve as a resource to anyone who is interested in learning more about IDEM's programs and guidelines. IDEM created a Print-on-Demand system of brochure procurement in 2010, available online at www.idem.IN.gov/5674.htm.

Agency Publications

These agency publications were created or revised and contain specific, targeted information.

Guide for Citizen Participation - www.idem.IN.gov/5803.htm

The Guide for Citizen Participation informs Hoosiers about IDEM's role as Indiana's environmental agency while providing guidance as to how to take part in the decision-making process. The guide describes how rules are made, how the permit process works and how to learn about hearings, meetings and public comment periods.



Indiana Auto Salvage Manual - www.idem.IN.gov/files/auto_salvage_manual.pdf

This manual provides the auto salvage sector with concise, comprehensive environmental regulatory information in an easy-to-use format. This manual contains information concerning the various environmental rules that apply to auto salvage facilities.

Indiana Small Business Guide to Environmental, Safety and Health Regulations - www.idem.IN.gov/5556.htm.

This guide can help small businesses understand and comply with regulations that apply to their operations. The guide provides an overview of state laws in a format that offers easy access to quick answers.

Indiana Storm Water Quality Manual - www.idem.IN.gov/4899.htm

This manual provides guidelines and specific storm water quality measures for controlling soil erosion, controlling nonpoint source pollution and the management and treatment of pollutants associated with post-construction land uses.

Permit Guide - www.idem.IN.gov/5881.htm

The IDEM Permit Guide provides basic information about the approvals IDEM issues for the construction, expansion and operation of facilities that must manage air emissions, solid or hazardous waste, drinking water, wastewater and wetlands.

Regional Sewer District Users Guide - www.idem.IN.gov/rsd

This guide was created to help citizens and local governments understand more about the regional district creation process and the positive impact these districts can have on human health and the environment.



Waterways Permitting Handbook - www.wetlands.IN.gov

This handbook is a guide to the permit process for activities that affect Indiana's wetlands or other regulated waters, including lakes, rivers, streams and ponds. It provides general information concerning the legal requirements that apply when a person wishes to engage in activities that will impact or affect Hoosier waters.

ONLINE SERVICES

IDEM makes extensive use of the electronic dissemination of information. IDEM implemented a major overhaul of its website, created an internal Extranet system for staff communications, and implemented Webinars for training.

IDEM Website - www.idem.IN.gov

The IDEM website offers essential functions and resources for all sectors of the public. It allows public access to electronic documents, program information and essential electronic links.

e-Services Portal - www.idem.IN.gov/5674.htm

IDEM created an e-Services portal on the agency's website at www.idem.IN.gov/5674.htm. Three major components comprise IDEM's e-Services: the Regulatory Services Portal, Virtual File Cabinet, LEADS[®] and Community Right to Know.

Regulatory Services Portal - www.idem.IN.gov/5964.htm

The Regulatory Services Portal (RSP) allows IDEM customers to submit data and information required by law, permit or regulatory requirement through a database system.

Virtual File Cabinet - <http://12.186.81.89/Pages/Public/Search.aspx>

The Virtual File Cabinet (VFC) offers instant access to public records from any computer. With over 65 million public documents available online, IDEM's VFC is available 24 hours per day. The VFC won a 2009 national innovation award from the Environmental Council of the States (ECOS).

Leading Environmental Analysis and Display System (LEADS[®]) - www.IN.gov/idem/airfacts/

The LEADS site provides access to near real-time data from Indiana's continuous air quality monitoring network online.

Community Right to Know - www.idem.IN.gov/5285.htm

IDEM implemented a new tool that makes it easier for 5,000 Indiana businesses to file online reports on hazardous chemicals under federal Community Right to Know requirements. Businesses can register and file reports at www.idem.IN.gov/5285.htm.

CONCLUSION

Due to the proactive streamlining of IDEM procedures begun in 2005 under Governor Daniels and Commissioner Easterly, IDEM is able to maintain effective programs and provide services for the continued protection of Hoosiers and our environment.

INDIANA'S ENVIRONMENTAL CHALLENGES

The actions necessary to protect Hoosiers and our environment are quite straightforward:

1. Use the latest scientific information to determine the range of a chemical in the air, water, or land that provides for a healthy life, but is not so high that it causes unacceptable adverse impacts.

An example is oxygen in air—too low a level and humans cannot live, too high a level, or in the wrong form, such as ozone or peroxide, causes various adverse health impacts.

2. Establish regulations and permit limits so that human activities do not cause unsafe concentrations of any chemical in the air, land or water, and to ensure that physical and biological conditions necessary for optimal biological activity are maintained.
3. Inspect human activities to ensure that they comply with the limits established to protect Hoosiers and our environment.
4. Use compliance assistance and enforcement to correct any activity operating out of compliance with the safe limits and, if necessary, to clean up the air, land or water that was contaminated by that activity.

U.S. EPA was formed over 40 years ago; Indiana has had a separate environmental management agency for 25 years and both agencies have made great strides in implementing the four steps necessary to protect Hoosiers and our environment. Why haven't we solved all of our environmental challenges?

1. Environmental limits continue to be reduced.
 - a. In the last three years, U.S. EPA has significantly tightened the ambient air quality standards for lead, nitrogen dioxide and sulfur dioxide.
 - b. U.S. EPA also has announced that the current ozone standard, which represents a 12 percent decrease from the pre-2007 ozone standard, may be decreased.
 - c. Blooms of blue-green algae throughout the world are leading some scientists to conclude that nutrient (phosphorous and nitrogen) levels may need to be reduced.
 - d. Greenhouse gasses, which had not been regulated before, became regulated pollutants on January 2, 2011.
2. We don't always know the safe level for a particular material in the air, land or water.
 - a. Some adverse environmental outcomes depend upon specific combinations of a number of substances that are not individually harmful.
 - b. Most of our knowledge of the adverse effects is from studies of healthy workers exposed to relatively high concentrations in the work place. There is scientific uncertainty concerning both the impacts of the much lower levels typically found in



- the environment and the impacts of these concentrations on particularly sensitive populations, including people with other health problems.
- c. Most chemicals have not been studied at all. Scientifically justified air pollution standards exist for six criteria pollutants and, to a lesser extent, about 200 toxic air pollutants. For water and land there are similar values.
 - d. Some chemicals are only harmful as a specific form that is often not directly discharged, but may be transformed in the environment—methyl mercury is one example.
3. Adverse environmental impacts may be caused by activities that are not easily regulated:
- a. Some chemicals such as mercury in air, ozone depleters and greenhouse gasses come from activities all around the world, and even eliminating all Indiana or U.S. sources would not significantly impact the global total or the impact on the Hoosier environment.
 - b. Some impacts, including mercury and PCB concentrations in fish tissue, are largely related to contamination generated before there were environmental regulations. While there are a number of programs, including Superfund, focused on these challenges, the financial and logistical challenges may take decades to solve.
 - c. As we control the more obvious sources of pollution, the remaining sources become a significant portion of the current contribution to the problem.
 - i. *An example is combined sewer overflows. Conventional engineering solutions to municipal wastewater discharges in communities with combined sewers typically control over 90 percent of the sewage generated by the community. Over the past six years, Indiana's 108 combined sewer communities have committed billions of dollars towards projects to address the remaining, relatively small amount of untreated sewage associated with storm events because once the dry weather discharges were properly treated, these sewage overflows became a major remaining source of water pollution, preventing full recreational use of the waters near those communities.*
4. There are unintended environmental and quality of life consequences of regulatory decisions.
- a. When the cost of a home energy source, such as electricity, goes up to pay for the costs of environmental controls, some people can no longer afford to pay their electric bills and their power is disconnected. A number of these people die each year through carbon monoxide poisoning, household fires or hypothermia as they try to survive in their homes without electricity.
 - b. When the cost of complying with an environmental control requirement at an industry makes that facility uncompetitive in the global economy, the facility often closes and the product formerly produced there is imported from a facility outside of the U.S.

that may have a worse environmental profile than the U.S. facility that closed because it could not afford the additional pollution controls.

- c. A number of substances which can be toxic, including lead, arsenic, mercury and cadmium, are elements of the earth that cannot be created or destroyed. Requirements to remove these substances from either the air or water result in more concentrated (and thus, potentially more toxic) waste streams that must be properly managed to prevent environmental harm.
- d. Improving motor vehicle fuel economy results in less environmental impact per mile driven. However, some studies have indicated that people in smaller more fuel efficient vehicles are more likely to suffer personal injuries in an accident than people in larger vehicles.

Indiana's short term environmental challenges

While the rest of this report documents numerous successes in improving protection of Hoosiers and our environment, there are a number of near term issues which must be addressed to continue protecting Hoosiers:

1. Air Pollution:

- a. Additional emission reductions may be required to meet tighter U.S. EPA standards.
- b. Benzene emissions from motor vehicles and residual concentrations of carbon tetrachloride (a chemical banned years ago) contribute to slightly elevated cancer risks in the U.S., including in Indiana.

2. Water Pollution:

- a. Measurement issues:
 - i. While we continuously measure air pollution at representative locations around Indiana, our knowledge of water quality is limited to discrete sampling events that take place at random locations in any river basin once every five years (this will soon change from a five-year cycle to a nine-year cycle). We are implementing a new "Water Quality Monitoring Strategy" to get a better understanding of current Indiana water quality.
 - ii. The current test of whether water is safe for swimming gives results about 24 hours after the sample is collected. This means that we know that it was safe or unsafe yesterday, but not whether it is safe today. While we also use models to predict if water is safe for swimming today, we need (and U.S. EPA is developing) a reliable test that gives results in less than an hour so that people do not get ill from swimming in polluted water.



- b. Safe level and detection issues:
 - i. While scientists agree that nitrogen, phosphorous and temperature are the major causes of excessive algae growth, except for phosphorous levels in lakes, defining the precise levels of nutrients that will cause excessive algae growth in a given waterbody has been problematic.
 - ii. Historically, measurement limitations resulted in relatively few pollutants being detected. Scientists have improved measurement techniques and we are now detecting a much larger number of pollutants at levels well below those historically considered to be safe (no observed effect levels).

3. **Land Pollution:**

- a. The number one concern in land pollution issues is that we do not know the location of, and have not determined the safety of, land contamination activities that occurred before there were regulations to prevent contamination.
- b. A related issue is that there is no master record of which Indiana properties have been investigated and found to be either contaminated or suitable for use. While there is a record of properties that have been investigated or cleaned up with state oversight, for all other property in the state, there is typically no public information on whether a given property is suitable for a given use.

National and International Environmental Challenges

Indiana, like all other States, is impacted by national and international environmental challenges. These challenges are typically based upon the fear that some adverse impact that has never happened before may happen in the future.

History shows that in their quest to improve their own quality of life, humans have sometimes caused significant environmental damage, but that we also find ways to change our behavior to prevent future damage and to remediate the damage caused in the past. One of our successes as a species is that we can use the lessons learned from past experience to help prevent a known problem from occurring in the future.

When environmental degradation is expected to occur somewhere else, or is predicted, rather than actually observed, it is difficult to obtain societal agreement on the importance of the resource expenditure required to prevent the expected impacts. This dynamic greatly influences Indiana's programs on the following environmental issues.

Global Climate Change: The general climate of the earth has been both warmer (medieval warming period) and colder (numerous ice ages) in the relatively recent past. Actual records of measured temperatures in the U.S. are relatively new (about 130 years), and reliable, worldwide temperature measurements from satellites are less than 30 years old. These short term temperature records show the earth both warming and cooling over this period, with no appreciable change since about 1998. We do know that since measurements began in 1959, the atmospheric CO₂ concentrations measured at Hawaii's Mauna Loa observatory have steadily

increased from about 316 parts per million (ppm) in 1959 to 387 ppm in 2009, an increase of 22 percent in 50 years. The increase in CO₂ concentrations has continued since 1998, without an apparent increase in the earth's temperature, as measured by the satellite data.

Over the past few decades, thousands of scientists have spent billions of dollars reconstructing the earth's temperature and greenhouse gas history and developing models to predict the earth's future temperature and climate. Many of these scientists have concluded that our increasing use of fossil fuels and certain agricultural practices (primarily rice cultivation and growing ruminant animals) will result in human-caused climate change with potentially adverse consequences. These scientists have recommended that: 1) global human-made greenhouse gas emissions be reduced by 20 percent by 2020 and 80 percent by 2050, and 2) the countries that have historically used large amounts of fossil fuels make payments to countries that have historically used less fossil fuel. These scientists and their supporters believe that, even if there is some uncertainty over the underlying science, taking action now is wise in case the predictions of adverse impacts are correct.

How would an 80 percent reduction in GHG emissions be achieved? Natural gas has the lowest greenhouse gas emissions per unit of energy of any fossil fuel. The challenge in reaching the suggested reduction goals is best illustrated by looking at fossil fuel combustion used for energy which represents over 85 percent of total human-made U.S. greenhouse emissions. While 8.5 percent of our energy use is nuclear and 7.4 percent is renewable (primarily hydropower) and has no greenhouse gas emissions, the rest is from fossil fuels. If we replaced the coal and petroleum with natural gas, the total energy related greenhouse gas emissions would be reduced by 31 percent—surpassing the year 2020 goal of a 20 percent reduction, but falling far short of the 80 percent goal. In order to get from the 31 percent reduction to an 80 percent reduction, the remaining natural gas emissions would need to be reduced by an additional 71 percent through energy conservation and the substitution of nuclear and renewable energy sources for natural gas. While some of this reduction can be achieved by conservation, the challenge is illustrated by the fact that this level of reduction is equivalent to eliminating all current transportation, industrial and commercial energy use, while maintaining current levels of residential energy use.

Environmental Cancer Concerns: The latest statistics reported by the American Cancer Society show that in the U.S., 44 percent of males and 37 percent of females will be diagnosed with cancer during their lifetimes. The cause of these cancers is normally unknown, leading people to wonder if something in the environment is causing cancer in their neighborhood, especially as they learn that almost one half of the people in their neighborhoods have some history of cancer. There is documentation that a few chemicals have historically existed at levels in the environment (typically in air or drinking water) that have likely caused elevated levels of specific cancers in a community. As chemicals linked to cancer cases are identified, regulations and permits are adjusted to prevent future exposures to excessive levels of these chemicals. Most chemicals in the environment are at levels expected to cause cancer in less than 0.0001 percent of people exposed to that level for 70 years, and the highest levels of carcinogens currently allowed in the environment are expected to cause cancer in less than 0.01 percent of the exposed population. While U.S. EPA and IDEM are always working to reduce public exposure to substances that may cause cancer, public concern over very low cancer risks sometimes results in diversion of society's resources from addressing more urgent societal challenges.



Identifying Environmental Goals: Many of the pollutants that can cause harm to Hoosiers and our environment, including lead, mercury, arsenic and chlorine, are also elements of the earth that cannot be created or destroyed. This makes it impossible to simply ban the offending substance even when there is agreement that it can be harmful. The situation is even more complicated because many elements, including nitrogen, phosphorous and chromium, are necessary for life and health in some forms and concentrations, yet dangerous in other forms or concentrations. Because of this, simply banning the use, discharge and disposal of these pollutants is impossible and will not result in the optimal level of protection of human health and the environment. The environmental protection questions are: “What levels of the various elemental pollutants are acceptable in the environment to protect Hoosiers and our environment?” and “Is it possible to reach those levels?” This is a difficult question to answer because different and sometimes conflicting environmental values are achieved at different levels of pollution. For example:

- The western basin of Lake Erie (which receives water from the Maumee River, that drains a portion of Ft. Wayne, Ind.) is both the most eutrophic (nutrient rich, with high levels of unsightly algae) and most biologically productive area of the Great Lakes. The goal of the Clean Water Act is to protect the physical, chemical and biological integrity of our waters. Is our goal for the western basin of Lake Erie: 1) clearer water with less biological productivity, or 2) maximum production of fish that is safe to eat?
- Another values question is: Should materials that are not recycled be: 1) put in a landfill where they will slowly decompose over time, or 2) burned cleanly for energy recovery leaving a biologically inert ash residue that, if managed properly, will not cause any foreseeable environmental issues?
- The use of chlorine as a disinfectant by public water supplies has virtually eliminated water borne diseases from the U.S. However, the use of chlorine sometimes results in the generation of disinfection byproducts which have been linked to an increased risk of some cancers.

Conclusion: While a number of environmental challenges remain to be addressed at the Indiana, national and international levels, objective environmental quality measurements show that Hoosiers and our environment are safer today than at any time since data has been collected. Our environmental improvements continue to contribute to the increasing life expectancies of Hoosiers, and our history shows that we can expect future environmental challenges will be addressed in a way that builds upon the improvements made to date.



Figure 8. IDEM Offices

IDEM OFFICES

Indianapolis Offices

Indiana Government Center North
100 N. Senate Avenue, Indianapolis, IN 46204
Phone: (317) 232-8603
Toll Free: (800) 451-6027 (within Indiana)

Western Select Building
2525 N. Shadeland Avenue, Indianapolis, IN 46219
Phone: (317) 308-3173
Toll Free: (800) 451-6027 (within Indiana)

Northern Regional Office - Serves the counties of DeKalb, Elkhart, Fulton, Kosciusko, LaGrange, Marshall, Noble, St. Joseph, Starke and Steuben.
300 N. Michigan Street, Suite 450, South Bend, IN 46601
Phone: (574) 245-4870
Toll Free: (800) 753-5519 (within Indiana)
Fax: (574) 245-4877

Northwest Regional Office - Serves the counties of Lake, Porter and LaPorte.
8380 Louisiana Street, Merrillville, IN 46410
Phone: (219) 757-0265
Toll Free: (888) 209-8892 (within Indiana)
Fax: (219) 757-0267

Southeast Regional Office - Serves the counties of Bartholomew, Brown, Clark, Crawford, Dearborn, Decatur, Fayette, Floyd, Franklin, Harrison, Jackson, Jefferson, Jennings, Lawrence, Monroe, Ohio, Orange, Perry, Ripley, Scott, Switzerland, Union and Washington.
820 W. Sweet Street, Brownstown, IN 47220
Phone: (812) 358-2027
Toll Free: (877) 271-0074 (within Indiana)
Fax: (812) 358-2058

Southwest Regional Office - Serves the counties of Daviess, Dubois, Gibson, Knox, Martin, Pike, Posey, Spencer, Vanderburgh and Warrick.
1120 N. Vincennes Avenue, P. O. Box 128, Petersburg, IN 47567
Phone: (812) 380-2305
Toll Free: (888) 672-8323 (within Indiana)
Fax: (812) 380-2304

CONCLUSION

From its inception in 1986, the Indiana Department of Environmental Management has made great strides in attaining its mission of protecting Hoosiers and our environment. Whether looking at Indiana's air, land or water, progress has been realized in all parts of the agency and throughout all parts of the state. The continued participation of citizens and businesses will enhance environmental protection efforts in Indiana as IDEM continues its work to oversee activities that can impact air, land and water quality. The *25th Anniversary State of the Environment 2011* describes how Hoosiers and our environment are protected better than ever before. Additional information about our progress and current programs can be found online at www.idem.IN.gov.