

# Conservation Committee Report

Volume 12 Issue 12

December 2010



## The Conservation Pledge

I give my pledge as an

**American to save and faithfully defend from waste, the natural resources of my country; the soil, the water, the air, the minerals, the plant life and the wild-life.**

**This is my Pledge!**

## Inside this issue:

3

4

5

## DEP Comments on DRBC's Release of Proposed Natural Gas Drilling Regulations

Secretary Hanger Says Rules Will Complement PA's Unprecedented Improvements to Industry Oversight

Department of Environmental Protection Secretary John Hanger responded to a move by the Delaware River Basin Commission today to release proposed regulations for public comment that would govern water withdrawals for natural gas drilling throughout the watershed, as well as how those operations develop wells and manage wastewater.

"The DRBC's action represents a good first step that is necessary to move this process forward," said Hanger.

"It's important to note that these are proposed rules and that they are now open for public comment. It's time for the public to have their say on these matters.

"Changes may still be made before we reach a final product that is clear and enforceable. Once the comments have been addressed and changes made, the rules will be brought back to the commission for a full vote. "

DRBC's proposed regulatory package, available at [www.drbc.net](http://www.drbc.net), establishes requirements to protect the basin's surface and groundwater resources from activities associated with building and operating natural gas wells.

The commission intends to hold three public hearings during the 90-day comment period to receive oral testimony on the proposed rule-making. Details of those hearings and instructions for submitting comments via other means, can be found at [www.drbc.net](http://www.drbc.net), as well.

Secretary Hanger added that, once finalized, DRBC's rule will complement the many measures DEP has implemented to strengthen oversight of natural gas development in Pennsylvania. In the past two years, the commonwealth has more than doubled the number of DEP staff regulating the industry to 202 employees as of today.

(continued on page 2)

## DEP Warns Landowners About Illegal Recreational Vehicle Sewage Connections

Cases That Threaten Environment, Pose Risk to Sewage Systems Discovered in Four Counties

Recent cases in which recreational vehicles, or RVs, used as residences have connected

to sewage systems or holding tanks have prompted the Department of Environmental Protection to warn landowners in the Marcellus Shale region such connections are illegal and dangerous without proper approvals.

"With the tremendous growth of the Marcellus Shale gas industry, there's been a significant increase in the demand for housing," said DEP North-central Regional Director Nels Taber.

(continued on page 2)

# Proposed Natural Gas Drilling Regulations

The department has also advanced a number of new state-specific regulatory requirements. A new regulation enacted in July 2010 requires drilling companies to treat drilling wastewater to the safe drinking water standard for Total Dissolved Solids, or TDS. TDS include chlorides and sulfates, which affect the taste and odor of drinking water and, in high concentrations, can damage or destroy aquatic life. The new regulation ensures the state's streams do not exceed the safe drinking water standard of 500 milligrams per liter.

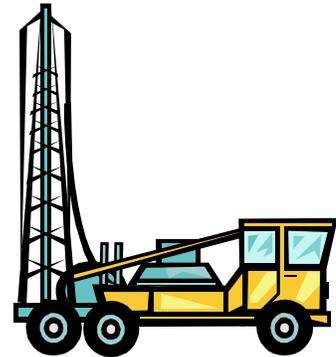
The TDS rule and another new regulation that mandates a 150-foot buffer for the 20,000 miles of Pennsylvania streams

that are the state's most pristine and highest quality provide unprecedented protection for the commonwealth's waters.

In November 2010, the Independent Regulatory Review Commission unanimously approved tough new regulations that require best well design and construction practices, including comprehensive measures to prevent instances of gas migration, which can contaminate water supplies or cause health and safety concerns in homes.

For more information on natural gas drilling in Pennsylvania, visit [www.depweb.state.pa.us](http://www.depweb.state.pa.us).

Source: PA DEP



## Illegal Recreational Vehicle Sewage Connections

“To meet this demand, landowners are opening up their property to RVs and allowing those vehicles to tap into their septic or sewage systems. Doing so is illegal unless the landowner has received the proper approval from us and their local municipality.”

Taber said DEP has found instances of this activity in four counties throughout the north-central region. In one case,

recreational vehicles were discharging sewage over a bank into the Tioga River. In another case, the landowner had RVs connected to the on-lot septic system serving his home, risking a malfunction that could have damaged his property.

“It's important that the proper planning and evaluation be done before making any changes or additions to a sewage system,” said Taber. “Systems are de-

signed with given capacity and adding to that could lead to a malfunction that contaminates the environment or causes costly damage to a family's home or sewage systems.”

It is illegal to connect recreational vehicles to sewage facilities or holding tanks without first obtaining planning approval from the local municipality and DEP.

The Pennsylvania Sewage Facilities Act, or Act 537, requires sewage facilities planning whenever:

A land development proposal on an existing parcel would generate at least two Equivalent Dwelling Units (EDU) of wastewater, or about 800 gallons per day which is similar to two average homes;

Addition to an already developed parcel would generate at least 400 gallons per day, or one EDU of wastewater; or

An existing parcel zoned for residential

purposes changes to commercial zoning designation, or incorporates a commercial component, such as an area accommodating recreational vehicles.

Taber also noted that any proposals for connecting to existing municipal sewer lines or on-lot septic systems require sewage facilities planning, and this planning should be completed and approved by the municipality and DEP before any permits are issued.

Sewage facilities planning involves evaluating sewage infrastructure such as public sewers, on-lot sewage systems, or holding tanks before making any changes or adding flow to ensure those systems can accommodate the additional sewage.

Property owners should contact the local sewage enforcement officer or DEP's sewage planning staff for assistance before siting any recreational vehicles or dwellings on their property.

Sewage enforcement officers are requiring those who have violated Act 537 to remove recreational vehicles used as dwellings from their property or face enforcement action, which could include having a summary citation filed against them with the local district magistrate seeking an appropriate fine.

For more information, call 570-327-3659 or visit [www.depweb.state.pa.us](http://www.depweb.state.pa.us).

Source: PA DEP



## Final Phase of Cleanup Completed at Havertown Superfund Site Thanks to Recovery Act Funding

The U.S. Environmental Protection Agency has completed construction for the third and final phase of the Havertown PCE Superfund site in Havertown Township, Delaware County, Pa.

EPA used funds made available by the American Recovery and Reinvestment Act to complete this final phase of the Havertown cleanup. The construction cost for the final phase was approxi-

mately \$3.6 million and included \$3.2 million in American Recovery and Reinvestment Act funding.

“Completing this cleanup project ends decades of environmental threats,” said EPA Regional Administrator Shawn M. Garvin. “And EPA is especially fortunate to have used recovery act funds to finish the critical final stage that helps ensure that the public’s health and the environment remain protected in the Havertown

community.”

The final cleanup included excavating and disposing of contaminated soil from a residential area and backfilling that area with clean fill; installing additional groundwater extraction wells, which will draw contaminated groundwater to the surface for treatment; and installing an in-situ flushing system that will be used to treat contaminated groundwater.

While the construction activities are completed at the site, the groundwater will continue to be monitored on a regular basis, and the groundwater extraction and treatment will be ongoing until the groundwater meets federal standards.

The Havertown PCP Superfund site, located in a suburban area just west of Philadelphia, was used from 1947 to 1963 by National Wood Preservers to treat wood products. The company allegedly used an on-site well to dispose of diesel-type oil and pentachlorophenol

(PCP), a pesticide and wood preserver and a probable carcinogen. The liquid wastes traveled into nearby Naylor’s Run, a small stream that flows through a residential area into the Delaware River. Liquid waste was also spilled, contaminating soil and groundwater in the area.

The EPA first became involved with the Havertown site in 1976, and has completed a number of cleanup measures to protect the surrounding community and environment. These included installing an

oil-water separator to reduce oil in the storm sewer that was discharging to Naylor’s Run; removing on-site drums and hazardous waste; and in 1991 installing an on-site pump-and-treat system to address contaminated groundwater in the shallow aquifer. This system was upgraded during the final cleanup phase.

(continued on page 4)

# Havertown Superfund Site

For more information on the Havertown PCP Superfund site, go to:  
[www.epa.gov/reg3hwmd/super/sites/PAD002338010/](http://www.epa.gov/reg3hwmd/super/sites/PAD002338010/).

Source: U.S. Environmental Protection Agency



## New DOE-Sponsored Study Helps Advance Scientific Understanding of Potential CO2 Storage Impacts

Duke University Report Provides Data That Can Help Anticipate Issues and Protect Drinking Water Supplies

In another step forward toward improved scientific understand-

ing of potential geologic carbon dioxide (CO<sub>2</sub>) storage impacts, a new U.S. Department of Energy (DOE)-sponsored study has confirmed earlier research showing that proper site selection and monitoring is essential for help-

ing anticipate and mitigate possible risks.

The Duke University study, published in the October 26, 2010 edition of *Environmental Science & Technology*, also pro-

vided information that can be used for advanced detection of CO<sub>2</sub> in the unlikely event of a leak.

CCS comprises a suite of technologies to separate, compress, transport, and store CO<sub>2</sub> produced at power plants and other industrial facilities. Many global

experts view the technology – a major focus of research by DOE's Office of Fossil Energy (FE) – as an important option in a portfolio of strategies for helping reduce the atmospheric buildup of CO<sub>2</sub> resulting from human activity as a means of averting potential climate

change. A particularly important storage challenge is the ability to conduct CCS without affecting underwater sources of drinking water.

The Duke report, "Potential Impacts of Leakage from Deep CO<sub>2</sub>

(continued on page 5)

# Understanding of Potential CO<sub>2</sub> Storage Impacts

Geosequestration on Overlying Freshwater Aquifers," presented the results of a year-long study investigating the impacts of CO<sub>2</sub> injection into different geologic formations and the possible dissolution of metals from specific rocks that naturally contain high concentration of these metals.

The researchers incubated core samples from a variety of freshwater aquifers with CO<sub>2</sub> for more than 300 days, and found

increased acidity and metals concentrations in water surrounding the samples. They concluded that "the relative severity of the impact of leaks on overlying drinking water aquifers should be considered in the selection of CO<sub>2</sub> sequestration sites." This confirms earlier research conducted by FE's National Energy Technology Laboratory (NETL), several other DOE national laboratories, the

U.S. Geological Survey, and others indicating that CCS sites must be carefully selected and monitored.

The Duke researchers also identified three elements—manganese, iron, and calcium—which they suggest should be monitored, along with pH, as geochemical markers of CO<sub>2</sub> leaks.

The Duke research project is one of many being sponsored by DOE to investigate the impact of CO<sub>2</sub> injection into geologic formations, including the dissolution of metals from rock. This has been recognized for many years as a potential risk in CCS projects and it continues to be a focus of research. The research provides fundamental data that

are used to improve risk assessment models and the design of CCS projects and monitoring programs. The risk to drinking water supplies can be mitigated by proper site characterization, having an impervious caprock, and proper construction materials, and by maintaining proper operating conditions as required

by the EPA's Underground Injection Control Program.

Although CCS is an emerging field, it benefits from the experience of oil and gas producers who have more than 40 years of experience injecting CO<sub>2</sub> into

(continued on page 6)

## Third Carbon Sequestration Atlas Estimates Up to 5,700 Years of CO<sub>2</sub> Storage Potential in U.S. and Portions of Canada

Latest Edition of DOE Publication Provides Updated, Additional Information on Geologic Storage Potential

There could be as much as 5,700 years of carbon dioxide (CO<sub>2</sub>) storage potential available in geologic formations in the United States and portions of Canada, according to the latest

edition of the U.S. Department of Energy's (DOE) *Carbon Sequestration Atlas (Atlas III)*.

(continued on page 6)

## Understanding of Potential CO<sub>2</sub> Storage Impacts

deep geologic formations to increase the flow of oil and natural gas. This provides a sound base for DOE's scientific investigations and the development of risk assessment and mitigation strategies.

DOE is committed to continuously supporting research and field projects to make CCS as safe and effective as possible. Through its Carbon Sequestration Research Program, FE is

investigating all aspects of CCS, including the risks associated with geologic storage of CO<sub>2</sub>. Research sponsored by DOE helps to inform future operators, the public, and regulators as they identify safe storage sites, design facilities, and develop plans for a future CCS industry.

Source: U.S. Department of Energy



## Third Carbon Sequestration Atlas

The updated preliminary estimate, based on current emission rates, documents 1,800 billion to more than 20,000 billion metric tons of CO<sub>2</sub> storage potential in saline formations, oil and gas reservoirs, and unmineable coal areas. This suggests the availability of approximately

500-to-5,700 years of CO<sub>2</sub> storage for the U.S. and covered Canadian areas, according to the third edition of the Atlas. Safe and permanent geologic CO<sub>2</sub> storage is an important element in carbon capture and storage (CCS) technology, considered

by many experts as a major component in a portfolio strategy for reducing atmospheric carbon dioxide buildup due to human activity.

The primary purpose of *Atlas III* is to update U.S./Canadian CO<sub>2</sub> storage potential and provide

updated information on the activities of DOE's seven Regional Carbon Sequestration Partnerships (RCSPs), comprised of more than 400 organizations, 43 states, and four Canadian provinces. *Atlas III* also outlines DOE's Carbon Sequestration Program and international car-

bon capture and storage (CCS) collaborations, as well as worldwide CCS projects, and CCS regulatory issues.

In addition, it presents updated information on the location of CO<sub>2</sub> stationary source emissions, as well as the locations and geologic storage potential of

various formations and it provides details about the commercialization opportunities for CCS technologies from each RCSP. The CO<sub>2</sub> geologic storage resource calculation methodology of *Atlas III* was refined to better reflect

(continued on page 7)

## Third Carbon Sequestration Atlas

uncertainties in geologic formation properties.

### MORE INFO

- [View the document](#)
- [NATCARB website](#)

There are two editions of the new Atlas available: An interac-

tive version located at the NATCARB website, and a print version available for viewing and downloading at the NETL website.

The Office of Fossil Energy's National Energy Technology Laboratory has now created three atlases in collaboration with the RCSPs and the National Carbon Sequestration Database and Geographical Information System (NATCARB) team. Act-

ing Assistant Secretary for Fossil Energy Victor Der noted: "The sequestration community has come to rely on the carbon sequestration atlas. The third edition will continue to guide and inform our efforts to mitigate climate change with the environmentally sound, cost-effective storage of carbon dioxide from fossil fuels."

Source: U.S. Department of Energy

## NETL's High-Speed Imaging System Successfully Applied in Medicine, Broad Spectrum of Industry

A groundbreaking Department of Energy-developed imaging system originally designed to help create cleaner fossil energy processes is finding successful applications in a wide range of medical, chemical processing, energy, and other industries.

Developed by the Office of Fossil Energy's National Energy Technology Laboratory (NETL), the high-speed imaging technology known as "particle imaging velocimetry" (PIV) is being put to use by a research consortium of more than 25 major chemical

and energy companies and may soon have other uses as well.

Underscoring its versatility, the high-speed PIV system is finding application in the development of medical devices that handle blood. It is aiding the University of Pittsburgh Medical

Center's McGowan Institute of Regenerative Medicine in studying blood flow in a piece of equipment that functions as an artificial lung.

And earlier this year a version of the PIV software was used to help estimate the amount of oil leaking from the damaged

Macando well in the Gulf of Mexico.

Imaging systems allow researchers to study in detail how particles move inside high concentration flow fields, such as coal particles during the gasification process. Particle motion or dynamics are of critical importance in determining the reaction rate,

efficiency and reliability of various energy systems. The use of imaging systems to study particle behavior in gasses and liquids commonly uses the most advanced high speed, high resolution digital camera technology. NETL's high-speed PIV system is now providing the first

(continued on page 8)

# NETL's High-Speed Imaging System

observations and detailed measurements of particle motion in these environments.

The brain that makes the system work is its software, which simultaneously tracks the motion of thousands of microscopic particles. It is nearly impossible for the human eye to follow a moving particle smaller than a grain of salt. However, the high-speed PIV's software can follow thousands of particles at the same

time while they are moving among billions of particles at high speed.

NETL researchers first used the high-speed PIV system to study flow fields in NETL's cold flow circulating fluidized bed unit, a large cold-flow gasification experiment conducted at the laboratory's site in Morgantown, W.Va. With the aid of the high-speed PIV system, researchers viewed, recorded, and measured the precise motion of microscopic particles that simulate the

motion of coal particles in a gasification chamber.

The PIV system is also being put to work in the labs of Chicago-based research consortium Particulate Solids Research Inc. to provide new insight into an important phenomenon called "particle clustering." This process can affect the design and operation of systems that rely on particle flow fields.

NETL has applied for a patent for this technology and is ex-

panding application of the PIV system to other labs and other particle-flow applications, such as the rapid formation of methane hydrate particles, jet injection of catalysts into particle systems, and visualization of drill tip behavior during experiments conducted in NETL's ultra-deep single cutter drilling simulator.

Source: U.S. DOE

