

Conservation Committee Report

Volume 15 Issue 3

Jack Walters—Conservation Chairman

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DOE Accord Seeks Accelerated Development of Alaska's Vast Unconventional Energy Resources

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 wildlife.

This is my Pledge!

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Development of potentially vast and important unconventional energy resources in Alaska – including viscous oil and methane hydrates – could be accelerated under a Memorandum of Understanding (MOU) signed today by the

state's Department of Natural Resources (DNR) and the U.S. Department of Energy (DOE).

The purpose of the MOU is to "improve cooperation and collaboration" between Alaska's DNR and DOE's Office of Fossil Energy (FE) related to research and

development (R&D) as well as "information sharing" connected to the development of unconventional energy resources in the state.

The Alaska North Slope has two of the
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EPA Survey Finds More Than Half of the Nation's River and Stream Miles in Poor Condition

The U.S. Environmental Protection Agency released the results of the first comprehensive survey looking at the health of thousands of stream and river miles across the country, finding that more than half – 55

percent – are in poor condition for aquatic life.

"The health of our Nation's rivers, lakes, bays and coastal waters depends on the vast network of streams where they begin, and this new science shows that

America's streams and rivers are under significant pressure," said Office of Water Acting Assistant Administrator Nancy Stoner. "We must continue to invest in protecting and restoring our nation's streams and rivers
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DOE Accord Seeks Accelerated Development of Alaska's Vast Unconventional Energy Resources

largest conventional oil fields in North America (Prudhoe Bay and Kuparuk) as well as several other smaller but still significant fields. The state also has significant unconventional petroleum and natural gas resources, including both viscous oil and methane hydrate deposits.

Viscous oil is a type of “heavy” or thicker oil similar in consistency to syrup that presents some special technical and economic challenges for recovery. On the North Slope, it has been estimated that as much as 20 billion to 25 billion barrels of viscous oil are contained within shallow, regionally extensive sands.

Essentially molecules of natural gas trapped in ice crystals, methane hydrates represent a potentially enormous energy resource, possibly exceeding the combined energy content of all other fossil fuels. The U.S. Geological Survey (USGS) has estimated a potentially recoverable resource of 85 trillion cubic feet of gas in favorable hydrate accumulations on the Alaska North Slope alone.

Under the agreement, DOE’s Office of Fossil Energy will be responsible for developing R&D opportunities in Alaska and providing scientific expertise and resources in support of projects. This will be achieved by FE’s National Energy Technology Laboratory (NETL) through collaborations with various federal, industry, international and academic partners.

Alaska will “use its best efforts to resolve land access issues, arrange for the leasing of state land, and coordinate infrastructure, logistics, permitting and regulation where appropriate. These efforts will support “the assessment of unconventional energy resources” and “the field evaluation of potential production technologies” through scientific tests, and may involve “facilitating access to land within existing units, un-leased acreage and leased acreage on state lands.”

Alaska will also support DOE by providing “scientific review and interpretations of data through the divisions of Oil and Gas and Geologic and Geophysical Surveys.” Alaska will also participate in periodic reviews of all scientific data and reports collected or created during the course of the MOU, signed by Alaska DNR Commissioner Daniel S. Sullivan and Christopher A. Smith, DOE’s acting Assistant Secretary of Fossil Energy, at the 17th International Conference and Exhibition on Liquefied Natural Gas (LNG-17) in Houston, Texas.

DOE is one of the world’s leading unconventional oil and natural gas R&D institutions. Among other areas, FE scientists have worked actively with researchers in other nations (mainly Japan, Korea, India, China, Canada), as well as with USGS, the Bureau of Land Management

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DOE Accord Seeks Accelerated Development of Alaska's Vast Unconventional Energy Resources (continued)

the Bureau of Ocean Energy Management and other federal agencies, to advance methane hydrate technology. The Methane Hydrate Research and Development Act of 2000 established DOE (through the efforts of FE and NETL) as the lead U.S. agency for methane hydrate research and development.

Source: U.S. Department of Energy

Innovative Technology Improves Upgrading Process for Unconventional Oil Resources

An innovative oil-upgrading technology that can increase the economics of unconventional petroleum resources has been developed under a U.S. Department of Energy -funded project.

The promising technology, developed by Ceramatec of Salt Lake City, Utah, and managed by the Office of Fossil Energy's National Energy Technology Laboratory, has been licensed to Western Hydrogen of Calgary for upgrading bitumen or heavy oil from Canada. A new company, Field Upgrading (Calgary, Alberta), has been formed dedicated to developing and commercializing the technology.

Heavy oil is crude oil that is viscous and requires thermally enhanced oil recovery methods, such as steam and hot water injection, to reduce its viscosity and enable it to flow. The largest U.S. deposits of heavy oil are in California and on Alaska's North Slope. Estimates for the U.S. heavy oil resource total about 104 billion barrels of oil in place — nearly five times the United States' proved reserves. In addition, although no commercial-scale development of U.S. oil sands or oil shale has yet occurred, both represent another potential future domestic unconventional oil resource.

With sustained high oil prices, unconventional oil resources may become more economically attractive. However, specialized processing is often required both to upgrade them for transportation to refineries and, at the refineries, to produce more useful end-products. Technologies that lower these processing costs can improve the economic competitiveness of unconventional oil resources and help bring more domestic oil to market.

Ceramatec's new technology uses an alkali metal in combination with hydrogen or methane to remove sulfur, nitrogen, and metals from oil that's not suitable for refining without treatment. The technology also encompasses an electrolytic process to regenerate the alkali metal and separate sulfur and metals. Ceramatec tested the process on heavy oil, oil shale, and oil sands feedstocks with a wide range of densities, boiling curves, and sulfur, nitrogen, metals, and asphaltene contents. In nearly 6,000 hours of continuous operation, the process consistently removed sulfur and heavy metals. Nitrogen removal was also achieved, but not to the reduction levels of sulfur.

This new technology has the potential to increase feedstock value through direct quality improvements and through the reduced necessity for expensive capital processing equipment expansions at refineries, such as fluid catalytic crackers and desulfurization units. Using methane as the process feed-gas has the added advantage of reducing the carbon footprint of oil-upgrading by

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Innovative Technology Improves Upgrading Process for Unconventional Oil Resources (continued)

avoiding emissions from steam methane reforming. The process also eliminates sulfur oxide emissions by erasing the need for conventional sulfur recovery processes.

For more information about Ceramatec's research project with the DOE, including the final technical report, please visit the project page on the NETL website. Additional information about the process can be found at the Field Upgrading website.

Source: U.S. Department of Energy

EPA Survey Finds More Than Half of the Nation's River and Stream Miles in Poor Condition (continued)

as they are vital sources of our drinking water, provide many recreational opportunities, and play a critical role in the economy.”

The 2008-2009 National Rivers and Stream Assessment reflects the most recent data available, and is part of EPA's expanded effort to monitor waterways in the U.S. and gather scientific data on the condition of the Nation's water resources.

EPA partners, including states and tribes, collected data from approximately 2,000 sites across the country. EPA, state and university scientists analyzed the data to determine the extent to which rivers and streams support aquatic life, how major stressors may be affecting them and how conditions are changing over time.

Findings of the assessment include:

- **Nitrogen and phosphorus are at excessive levels.** Twenty-seven percent of the nation's rivers and streams have excessive levels of nitrogen, and 40 percent have high levels of phosphorus. Too much nitrogen and phosphorus in the water—known as nutrient pollution—causes significant increases in algae, which harms water quality, food resources and habitats, and decreases the oxygen that fish and other aquatic life need to survive. Nutrient pollution has impacted many streams, rivers, lakes, bays and coastal waters for the past several decades, resulting in serious environmental and human health issues, and impacting the economy.

- **Streams and rivers are at an increased risk due to decreased vegetation cover and increased human disturbance.** These conditions can cause streams and rivers to be more vulnerable to flooding, erosion, and pollution. Vegetation along rivers and streams slows the flow of rainwater so it does not erode stream banks, removes pollutants carried by rainwater and helps maintain water temperatures that support healthy streams for aquatic life. Approximately 24 percent of the rivers and streams monitored were rated poor due to the loss of healthy vegetative cover.

- **Increased bacteria levels.** High bacteria levels were found in nine percent of stream and river miles making those waters potentially unsafe for swimming and other recreation.

- **Increased mercury levels.** More than 13,000 miles of rivers have fish with mercury levels that may be unsafe for human consumption. For most people, the health risk from mercury by eating fish and shellfish is not a health concern, but some fish and shellfish contain higher levels of mercury that may harm an unborn baby or young child's developing nervous system.

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EPA Survey Finds More Than Half of the Nation's River and Stream Miles in Poor Condition (continued)

EPA plans to use this new data to inform decision making about addressing critical needs around the country for rivers, streams, and other waterbodies. This comprehensive survey will also help develop improvements to monitoring these rivers and streams across jurisdictional boundaries and enhance the ability of states and tribes to assess and manage water quality to help protect our water, aquatic life, and human health. Results are available for a dozen geographic and ecological regions of the country.

More information: <http://www.epa.gov/aquaticsurveys>

Source: The U.S. Environmental Protection Agency

2013 Pennsylvania State Envirothon

2013 Pennsylvania State Envirothon

May 21 and 22, 2013

Juniata College, Huntingdon County

Hundreds of teachers and professionals throughout Pennsylvania guide high school students through this natural resource environmental education program that combines classroom learning and outdoor activities. This exposure to nature and seeing how humans impact the natural world provide invaluable lessons for understanding ecosystems and our environment.

At the Envirothon, teams of five high school students compete in field testing using their knowledge in five topic areas – Soils and Land Use, Aquatic Ecology, Forestry, Wildlife, and Environmental Issues. A current environmental issue is chosen each year as the “hot topic” for the focus of this station as well as the oral presentation component.

Students are exposed to scientists and experts in the fields of environmental science and ecology who will coach and guide their learning experience. Teams will first compete in a county Envirothon, with winners advancing to the state contest where over \$10,000 in scholarships and prizes are awarded. State winners earn the chance to compete at the North American Envirothon, North America’s largest high school natural resource education competition, and a chance to win scholarships and North American products.

Pennsylvania Envirothon is a 501 (c) 3 Non-profit Organization and a member of North American Envirothon. Pennsylvania is made possible by a host of generous sponsors and partners.

Why Participate in the Envirothon?

Because it is...

Educational! You will learn about a broad range of environmental topics and compete using your knowledge in five key areas.

Exciting! The competitive format generates excitement and helps to develop your skills in teamwork, oral presentation, and problem-solving. Your participation will give you tools to become a future leader in helping citizens make informed decisions about how to live in balance with the natural world that surrounds us.

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2013 Pennsylvania State Envirothon

Fun! Much of the learning takes place through outdoor, hands-on activities from stream hikes to nature centers. Throughout the competitions, you will meet students from other schools and other parts of the country.

For more information visit <http://www.envirothonpa.org/>

Source: PA Department of Agriculture

DEP Celebrates National Drinking Water Week, Reminds Pennsylvanians to Make Every Drop Count

The Department of Environment Protection is celebrating National Drinking Water Week from May 5 to 11 by encouraging all Pennsylvanians to learn how to better protect and conserve their water.

“This week, we renew our commitment to work with the state’s water quality partners and ensure drinking water meets all federal and state standards,” Acting DEP Secretary Chris Abruzzo said. “With 11 million Pennsylvanians using public water systems and two million using individual household wells, Gov. Corbett is committed to water protection efforts that are vital to ensuring the health of the public and Pennsylvania’s economy.”

National Drinking Water Week recognizes the importance of water source protection and conservation; the fragility of Pennsylvania’s water resources; and that cutting down on pollution and conserving water start at home.

To keep pollution out of water sources, consider these steps:

- Appropriately use, store and dispose of household substances safely, rather than pouring them down the drain;

- Test private well water annually for bacteria contamination;

- Inspect household wells annually; and

- Move possible contamination sources, such as kennels or livestock operations, waste systems or chemical storage areas a safe distance from nearby wellheads.

To conserve Pennsylvania’s water sources:

- Install low-flow plumbing fixtures, such as on showerheads and faucets;

- Check for household leaks and monitor your water bill for high usage;

- Take short showers instead of baths;

- Turn off the faucet when brushing your teeth;

- Run dishwashers and washing machines only with full loads;

- Install a rain barrel outside the house to collect rainwater and reuse it in daily household chores, such as watering the lawn or washing the car; and

- Wash your pets outdoors in areas of the lawn that need water.

To learn more about what is in public drinking water, ask your water provider for a copy of your system’s water quality report, or Consumer Confidence Report. DEP also has an online Drinking Water Reporting System where the general public can find information about their systems.

This year marks the 39th anniversary of the Safe Drinking Water Act, the main federal law that ensures the quality of drinking water in the United States.

For more information about drinking water and to search the online Drinking Water Reporting System, visit www.dep.state.pa.us and click the “Drinking Water Week” banner at the top of the homepage.

Source: The Pennsylvania Department of Environment Protection

USDA and EPA Release New Report on Honey Bee Health

USDA and EPA Release New Report on Honey Bee Health

The U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (EPA) today released a comprehensive scientific report on honey bee health. The report states that there are multiple factors playing a role in honey bee colony declines, including parasites and disease, genetics, poor nutrition and pesticide exposure.

"There is an important link between the health of American agriculture and the health of our honeybees for our country's long term agricultural productivity," said Agriculture Deputy Secretary Kathleen Merrigan. "The forces impacting honeybee health are complex and USDA, our research partners, and key stakeholders will be engaged in addressing this challenge."

"The decline in honey bee health is a complex problem caused by a combination of stressors, and at EPA we are committed to continuing our work with USDA, researchers, beekeepers, growers and the public to address this challenge," said Acting EPA Administrator Bob Perciasepe. "The report we've released today is the product of unprecedented collaboration, and our work in concert must continue. As the report makes clear, we've made significant progress, but there is still much work to be done to protect the honey bee population."

In October 2012, a National Stakeholders Conference on Honey Bee Health, led by federal researchers and managers, along with Pennsylvania State University, was convened to synthesize the current state of knowledge regarding the primary factors that scientists believe have the greatest impact on managed bee health.

Key findings include:

Parasites and Disease Present Risks to Honey Bees:

- The parasitic *Varroa* mite is recognized as the major factor underlying colony loss in the U.S. and other countries. There is widespread resistance to the chemicals beekeepers use to control mites within the hive. New virus species have been found in the U.S. and several of these have been associated with Colony Collapse Disorder (CCD).

Increased Genetic Diversity is Needed:

- U.S. honeybee colonies need increased genetic diversity. Genetic variation improves bees thermoregulation (the ability to keep body temperature steady even if the surrounding environment is different), disease resistance and worker productivity.
- Honey bee breeding should emphasize traits such as hygienic behavior that confer improved resistance to *Varroa* mites and diseases (such as American foulbrood).

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USDA and EPA Release New Report on Honey Bee Health (continued)

Poor Nutrition Among Honey Bee Colonies:

- Nutrition has a major impact on individual bee and colony longevity. A nutrition-poor diet can make bees more susceptible to harm from disease and parasites. Bees need better forage and a variety of plants to support colony health.
- Federal and state partners should consider actions affecting land management to maximize available nutritional forage to promote and enhance good bee health and to protect bees by keeping them away from pesticide-treated fields.

There is a Need for Improved Collaboration and Information Sharing:

- Best Management Practices associated with bees and pesticide use, exist, but are not widely or systematically followed by members of the crop-producing industry. There is a need for informed and coordinated communication between growers and beekeepers and effective collaboration between stakeholders on practices to protect bees from pesticides.
- Beekeepers emphasized the need for accurate and timely bee kill incident reporting, monitoring, and enforcement.

Additional Research is Needed to Determine Risks Presented by Pesticides:

- The most pressing pesticide research questions relate to determining actual pesticide exposures and effects of pesticides to bees in the field and the potential for impacts on bee health and productivity of whole honey bee colonies.

Those involved in developing the report include USDA's Office of Pest Management Policy (OPMP), National Institute of Food and Agriculture (NIFA), Agricultural Research Services (ARS), Animal and Plant Health Inspection Service (APHIS), National Resource Conservation Service (NRCS) as well as the EPA and Pennsylvania State University. The report will provide important input to the Colony Collapse Disorder Steering Committee, led by the USDA, EPA and the National Agricultural Statistics Service (NASS).

An estimated one-third of all food and beverages are made possible by pollination, mainly by honey bees. In the United States, pollination contributes to crop production worth \$20-30 billion in agricultural production annually. A decline in managed bee colonies puts great pressure on the sectors of agriculture reliant on commercial pollination services. This is evident from reports of shortages of bees available for the pollination of many crops.

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USDA and EPA Release New Report on Honey Bee Health (continued)

The Colony Collapse Steering Committee was formed in response to a sudden and widespread disappearance of adult honey bees from beehives, which first occurred in 2006. The Committee will consider the report's recommendations and update the CCD Action Plan which will outline major priorities to be addressed in the next 5-10 years and serve as a reference document for policy makers, legislators and the public and will help coordinate the federal strategy in response to honey bee losses.

To view the report, which represents the consensus of the scientific community studying honey bees, please visit: <http://www.usda.gov/documents/ReportHoneyBeeHealth.pdf>

Source: The U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (EPA)

Hydraulic Fracturing Data Collection Tools Improve Environmental Reporting, Monitoring, Protection

Two data collection tools specifically developed for hydraulic fracturing are available to help regulatory agencies monitor drilling and completion operations and enhance environmental protection.

Developed with support from the U.S. Department of Energy's Office of Fossil Energy (FE), the Risk Based Data Management System (RBDMS) and FracFocus chemical disclosure registry (<http://fracfocus.org/>) provide a way for industry professionals, regulatory agencies and the general public to more easily access information on oil and natural gas activities. These reporting and data collection tools have been developed by the Groundwater Protection Council (GWPC) and various states.

The RBDMS hydraulic fracturing module is used by state regulators to more efficiently track and analyze reports about well completions and fracturing, including the casing and cementing profiles, the quantity and quality of water used for fracturing wells, and the composition of fracturing fluids. It also provides the capability to link inspection and environmental monitoring data and compare the proximity of drilling areas to source-water-protection areas such as public water supply wells.

The State of Colorado currently uses a suite of RBDMS tools to electronically accept, process, and review drilling permits, completion reports and oil and gas locations assessments and to store environmental data (soil, water and air-quality) associated with hydraulic fracturing activities. The hydraulic fracturing module is also being developed for use by other states including Pennsylvania, Ohio, North Dakota, Indiana, New York, Arkansas, Utah, Mississippi, Idaho and Oklahoma, with testing scheduled for summer 2013.

The deployment of advanced data management technology facilitates efforts by states to both implement effective regulatory programs and to increase public access to regulatory information. Public users of the module will be able to select a well from a geographic information system (GIS) map to retrieve site-specific data such as the progress of a permit to drill, the chemical additives used at the well and any associated drinking-water monitoring data.

FE Financial support enabled GWPC to create the RBDMS in 1992 for oil and natural gas operators and state regulators; subsequent DOE funding has allowed the system to be continually updated and improved. Twenty-two states now use the RBDMS to manage oil and gas regulatory and water resources data and to provide important information to local governments, industry, and the public.

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Hydraulic Fracturing Data Collection Tools Improve Environmental Reporting, Monitoring, Protection (continued)

FracFocus is a national chemical registry that provides the public with information about the hydraulic fracturing of oil and natural gas wells. Created by GWPC and the Interstate Oil and Gas Compact Commission (IOGCC), the online registry tracks well locations, operators, and hydraulic fracturing fluid composition.

Since its launch in April 2011, over 41,000 disclosures have been uploaded to FracFocus. The site also features an interactive map for users to find regulations related to groundwater protection and oil and natural gas development, along with contact information.

The states of Alaska, Utah, Ohio, Mississippi, Oklahoma, Texas, Colorado, Montana, Louisiana, North Dakota, and Pennsylvania use FracFocus for required reports about chemicals used in hydraulic fracturing. Local landowners can access useful data through FracFocus on wells in their vicinity and useful topics such as hydraulic fracturing operations, ground water quality, and state regulation.

DOE's National Energy Technology Laboratory (NETL) manages these activities for the Office of Fossil Energy. The GWPC is an organization of state officials dedicated to improving government's role in the protection and conservation of groundwater.

Source: U.S. Department of Energy's Office of Fossil Energy