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HYDRAULIC FRACTURING: THE CONCERNS AND CONSEQUENCES OF RESOURCE DEVELOPMENT

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Hydraulic fracturing to enhance fluid and gas flow in tight geological formations has opened more than the formations. States and communities overlying gas-bearing formations have greeted the influx of exploration and development by energy companies with excitement about economic growth on one hand, and dread for the safety and health of human communities and the environment on the other. We have opened a door onto new challenges far enough to recognize that the problems ahead are more complex than they may have seemed at first.

FEATURE ARTICLES

3 **Hydrofracturing, Water, and Melange: An *IMPACT* Op-Ed ... Richard A. Engberg**

Hydraulic fracturing is the preferred method of extraction of natural gas from deep, dense deposits. The high pressures and chemical and physical materials required in the technique have raised questions about drinking water safety.

6 **HYDROFRACKING: Uncertain Decision-Making in a Value-Laden Conflict ... Richard H. McCuen**

While human values and the associated emotional biases are central to the hydrofracking debate, the difficulty in reaching a consensus is compounded by the uncertainties in technical, legal, and value issues.

8 **Background: Hydraulic Fracturing and Water Resources ... Tim Smith**

EPA's draft plan of study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources includes Retrospective Case Studies to investigate reported instances of drinking water resource contamination and Prospective Case Studies involving sites where hydraulic fracturing will occur after the research is initiated.

10 **Hydraulic Fracturing in Wyoming ... Thomas E. Doll**

The Wyoming Oil and Gas Conservation Commission revised and added new rules and regulations on hydraulic fracturing in September 2010. The rules addressed well operation and location and required industry to disclose all chemical compounds used in well stimulation.

12 **Drill, Maybe, Drill ... Benjamin H. Grumbles**

An expanded scientific review of fracking risks is important as much more information has become available since the practice was first employed, including complaints about methane migration and contaminated water supplies. States and interstate organizations in Shale Gas regions are also stepping up efforts to study, regulate, and monitor the impacts of natural gas drilling and fracking and the management of "flowback" fracking fluids.

14 **Wells or Woods: The Natural Gas Industry Meets the Pennsylvania Wilds ... Kevin Heatley**

The natural gas infrastructure requires a widespread dispersed distribution pattern of wells, roads, and pipelines. This will convert intact forest systems into woodlots surrounded by industrial systems, fragmenting and disrupting both the ecological functioning and benefits of the forest.

16 **Wireless Sensor Networks (WSNs) For Real-Time Situational Awareness of Hydrofracking Operations ... Sterling S. Rooke and Peter L. Fuhr**

The sensor and measurement capabilities of technologies such as Wireless Sensor Networks (WSNs) offer significant opportunities to maintain control of potential environmental contamination from hydraulic fracturing operations.

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