



## Engineering Sciences Section - 2014

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### C26 Minimizing Risks From Natural Gas Production, Distribution, and Use

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After attending this presentation, attendees will have a better understanding of some key environmental risks to water, air, and climate associated with shale gas development in the United States, and some of the regulations and best practices that can help minimize these risks.

This presentation will impact the forensic science community by providing a broad overview of the trade-offs between the benefits of increased natural gas development and the very real risks to public health and the environment.

New supplies of domestic natural gas have caused a drop in price that has benefited consumers and the environment alike. Low-cost natural gas is one reason why proposals for new coal-fired power plants have been withdrawn across the country and why old, inefficient, highly polluting coal plants are finally retiring. While there is no question that natural gas burns cleaner and has roughly half the carbon content of coal, natural gas has its own challenges. Producing new supplies of natural gas entails some fairly significant risks to public health and the environment, and natural gas can have a substantial greenhouse gas footprint in its own right.

Minimizing environmental risks related to natural gas production, distribution, and use is essential. This presentation will outline some of the key environmental risks associated with the increase in natural gas production and how they can be reduced.

**Water:** Oil and gas drilling creates multiple potential pathways for water contamination, including surface spills, improper well construction, and improper disposal of waste water. At the well site, groundwater can be contaminated through faulty well construction or chemical spills at the surface. Poor well casing or cement jobs can increase the chance of methane leaks or groundwater contamination. Groundwater can also be contaminated by mishandling waste water. Water used in the process of hydraulic fracturing, as well as water released from the shale along with the gas, must be treated and disposed of properly. If fracking wastewater is mishandled, it can contaminate surface and groundwater.

**Air Pollution:** Air pollution from gas production can be significant. A study conducted by Southern Methodist University in neighborhoods around Dallas concluded that air pollution produced by the drilling, production, and delivery of oil and gas is equal to the pollution produced by four million cars and trucks driving daily in the Dallas-Fort Worth area. In parts of Wyoming where gas production occurs, once pristine air now fails to meet federal health standards.

**Climate:** Natural gas is primarily methane — a powerful greenhouse gas many times more potent than carbon dioxide; therefore, even small leaks can rapidly accelerate global warming. No one is sure exactly where the methane leaks and releases are or how much escapes. Estimates range from 1-8% of total production. A number of companies and research institutes are working to gather data to better define the leak rate. If leak rates are high, and are not reduced, methane emissions could undermine the greenhouse gas advantage natural gas offers and actually make things worse for the climate system.

Strong regulations can help mitigate some of these concerns and are being developed and implemented. For example, we have seen an increase in the number of states that mandate disclosure of chemicals used in the hydraulic fracturing process, from 3 to 20 over the last three years. These states represent most of the major oil-and-gas producing states, and are governed by both Republicans and Democrats, showing that strong, bipartisan, and effective regulations can be crafted on these issues.

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#### **Natural Gas, Hydraulic Fracturing, Risk**