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Natural Gas 'Gold Rush'

Injury and Occupational Exposure in Pennsylvania From the Marcellus Shale Gas Exploration

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The Marcellus Shale formation in Pennsylvania has spurred a boom in natural gas exploration and led to an explosion in job opportunities, lucrative land leases and concerns over environmental hazards. The process of extracting natural gas from the shale through hydraulic fracturing (fracking) involves use of various chemical additives which return to the surface along with the natural gas. Those working in the field drilling the wells, extracting the natural gas and performing related activities are exposed to these chemicals, along with all of the injury hazards inherent in this work.

This article focuses on the injuries and occupational exposures that Pennsylvania workers may be subject to in the Marcellus Shale workplace, and how those injuries and exposures may be addressed by employers under the Pennsylvania Workers' Compensation Act (WCA) and Occupational Disease Act (ODA).

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SOURCES OF INJURY AND OCCUPATIONAL EXPOSURE

Pennsylvania is at the heart of a natural gas "gold rush" that lies buried thousands of feet below the surface in the Marcellus Shale rock formation that spreads across about two-thirds of the state. The natural gas reserves in the Marcellus Shale have been estimated to contain 500 trillion cubic feet of natural gas, enough to supply the country's needs for heat and electricity for up to 50 years. To tap this enormous reserve, drilling companies were issued roughly 3,300 Marcellus gas well permits in Pennsylvania in 2010. It is estimated that approximately 60,000 Marcellus wells will dot the Pennsylvania landscape by 2030.

To extract the natural gas from the rock, a technology known as hydraulic fracturing or "fracking" is used. This gas extraction technique involves vertical wells drilled to depths of nearly 8,000 feet, with horizontal boring into the shale formation up to two miles. As many as three million gallons of water are mixed with sand and chemical additives and pumped into the well under high pressure to fracture the rock and release the natural gas. The natural gas flows to the surface of the well, along with 10 to 40 percent of the water.

In Pennsylvania, about 1.3 billion gallons of recovered water were produced from Marcellus wells over the past three years. By 2011, that figure is expected to rise to at least 19 million gallons, enough to fill almost 29 Olympic-sized swimming pools every day.

The recovered water returned to the surface from the hydrofracking process carries chemicals, salts and, at times, naturally occurring radioactive material. One government estimate reported that a three-million gallon hydrofrack well produces about 15,000 gallons of chemicals in the returned water.

The chemicals within the water include those introduced to fracture the shale and those that occur naturally in formed elements. The fracking process utilizes proprietary fluids that contain a mixture of chemicals to, for example, reduce friction in the wells. The compounds in the fracking fluid include those listed on Material Safety Data Sheets. An April 2011, study released by the U.S. House Committee on Energy and Commerce evaluated the substances used in fracking and identified 29 chemicals that it called "compounds of concern."

While all the chemicals involved in the Marcellus extraction process are not known since the fluid formulas are often considered trade secrets, reported analyses of wastewater from Marcellus wells have identified the presence of limited traceable amounts of toxic chemicals such as arsenic, barium, benzene, beryllium, cadmium, chloride, lead, radium, selenium and strontium, as well as common, non-toxic calcium, chloride and salts.

In addition to the recovered water, there may be questions about the air emissions from the drilling process. Fracking involves the use of gas wells that are flared into the air to test and release their high-pressured contents, to open air ponds of removed water and to air emissions from the drilling process. Reports from western states where fracking has taken place note complaints of respiratory ailments, headaches and nosebleeds, skin irritations and neurological disorders, claimed to relate to particulates and organic compounds in the air from shale gas drilling. A 2010 study by the Colorado School of Public Health of the ambient air concentrations from natural gas operations there identified the presence of human carcinogens, including benzene, acetaldehyde and butadiene.

OCCUPATIONAL HAZARDS

The Marcellus Shale drilling is a labor-intensive operation that may create, according to one industry estimate, as many as 100,000 jobs. Many of those jobs are involved in the process of getting a well up and running, including site preparation, rigging and drilling. Hazards to employees on-site are those common to the gas drilling industry, such as accidental injuries, burns, loss of limb and death from such events as drilling equipment failures, falls, fires and transportation accidents.

In Pennsylvania, such injuries and accidental death to workers are covered under the WCA. The WCA is a no-fault law that provides employees injured in the course and scope of their employment with wage loss and medical benefits, funded by the employer's self-insurance or workers' compensation insurer. It is an employee's exclusive remedy for workplace injuries, including those that occur in natural gas exploration.

It is in the final phase of the Marcellus gas production, involving the flow back of the fracturing water, sand and chemicals before the gas begins to flow, that workers may be subject to a risk of occupational exposure to toxic or other injurious elements, such as the chemicals contained within the recovery water, fracking fluid and air emissions. Workers' claims for illnesses, diseases or medical conditions that are medically proven to be caused by working with or around such agents may be compensable either as "occupational disease" under the ODA, or as "injuries" under the WCA.

Certain medical conditions are specifically defined as "occupational diseases" under the ODA because the causation between exposure to such naturally occurring elements and the particular work environment is well-established, including coal workers' pneumoconiosis from coal dust inhalation or asbestosis from exposure to asbestos.

Applicable to the Marcellus Shale industry, chemical poisoning is considered an occupational disease with the medical causation presumed. Workers poisoned by contact with or exposure to, for instance, arsenic, lead, mercury and radium in the recovered frack water would have a basis to assert claims under the ODA for an occupational disease. To be compensable, the exposure needs to be sufficient, in terms of duration and/or dose, to cause poisoning.

The ODA also contains a "catch all" provision which applies to other occupational diseases which are caused by work and have a substantially greater incidence in the employee's industry or occupation than in the general population. For instance, poisoning from hydrocarbons to a worker

exposed to fumes from a broken air conditioning system and lead poisoning to a worker in a radiator shop were held to be compensable conditions under this section. Occupational diseases are not limited to poisoning and can include heart disease, lung disease and cancers.

A disease that is not specifically enumerated or does not possess a substantially greater incidence in the natural gas drilling industry may be compensable under the WCA as an "injury." An injury, defined liberally to include any hurtful or damaging effect supported by proper medical proof, may encompass any work-related disease. In a landmark ruling, the Pennsylvania Supreme Court held that a brewery worker suffering from aggravation of his pre-existing, non-work-related asthma because of exposure to chemicals was entitled to compensation as an "injury" even though it did not qualify as an "occupational disease."

The difference between the two provisions focuses on the burden of medical proof, as an occupational disease has the advantage of a rebuttable presumption of work-related causation that is not present in the injury context.

While the burgeoning Marcellus Shale industry in Pennsylvania offers a unique opportunity for substantial job creation and native energy supplies, companies involved in the extraction process are now starting to face workers' compensation injury claims. Claims for toxicity from alleged exposure to chemicals and other compounds in the wastewater have not yet surfaced as the disease processes take time to develop. Such claims would be appropriately questioned, given the dilution of chemicals in the water and the transient nature of exposure to workers at the well site, as well as protective equipment used to prevent substantial skin or inhalation contact.

INFORMATION, PLAN OF ACTION NEEDED

Companies involved in the surge of Marcellus Shale drilling in Pennsylvania are at risk for workers' compensation claims from exposure to potential contaminants in the air and water. John H. Quigley, former secretary of Pennsylvania's Department of Conservation and Natural Resources, is quoted in a *New York Times* article dated Feb. 26 as saying, "In shifting away from coal and toward natural gas, we're trying for cleaner air, but we're producing massive amounts of toxic wastewater with salts and naturally occurring radioactive materials, and it's not clear we have a plan for properly handling this waste." He further talks about the high level of risk in Pennsylvania and lack of a comprehensive federal standards for what constitutes safe levels of radioactivity in drilling wastewater.

An opening to the potential flood of litigation over wastewater contamination injury and disease claims may be seen in the announcement on May 19, 2011, by the Pennsylvania Department of Environmental Protection calling on Marcellus Shale natural gas drilling operators to cease delivery of wastewater from shale gas extraction to waterways in Western Pennsylvania, where it is treated in municipal plants. This announcement followed a public and media outcry that wastewater from Marcellus drilling contains contaminants that, either alone or in combination with the water treatment, polluted waterways.

However, the drilling boom is expected to continue. Whether that activity results in an increase in workers' compensation injury and occupational disease claims remains to be seen, but if the experiences of coal mining, oil drilling and asbestos are any indication, the companies involved in the Marcellus Shale drilling are expected to see such litigation in Pennsylvania.

To address the likely claims of workers' injuries and exposures from the Marcellus Shale play, employers can take action now to prepare themselves. A prime area for proactive management is the safety committees authorized by the Workers' Compensation Act. Safety committees, for which employers obtain a 5 percent reduction on their insurance premiums, should be utilized to study and track employee claims of injuries in the Marcellus Shale work environment. These committees can enlist the support of outside medical and legal experts to guide the tracking and use of information about injuries and exposures that workers may claim. Safety committees, implemented now by employers in the Pennsylvania Marcellus Shale industry, can establish safety goals, needs and procedures to help make the workplace safer. •