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Day One: Setting the Stage and Water Supply and Quality

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CONFERENCE REPORTS

THIRTY-FIFTH ANNUAL CLYDE MARTZ SUMMER CONFERENCE: WATER AND AIR QUALITY ISSUES IN OIL AND GAS DEVELOPMENT: THE EVOLVING FRAMEWORK OF REGULATION AND MANAGEMENT

Boulder, Colorado June 5-6, 2014

DAY ONE: SETTING THE STAGE AND WATER SUPPLY AND QUALITY

This year's two-day Clyde Martz Summer Conference, held in Boulder, Colorado, focused on various air and water quality issues related to oil and gas development. The first day of the conference included a general introduction to today's oil and gas industry and a discussion of water supply and quality issues associated with oil and gas production. In the first session, titled "Setting the Stage," seven speakers presented a broad overview of the oil and gas industry.

Patty Limerick commenced the first session by tackling the issues of uncertainty, terminology, and sensitivity in the oil and gas industry. Limerick is the faculty director and chair of the board for the Center of the American West at the University of Colorado, where she is also a professor of history. Limerick feels that the core problem in the oil and gas industry is a failure of trust as well as a shortage of moderators to balance competing perspectives. According to Limerick, there is currently a tendency for society to question industry studies by discrediting the people or groups who performed the analysis. She believes that the public has unreasonably elevated expectations of the experts performing these incredibly complex studies. She also noted that public health issues are a serious challenge for experts in the field. She offered the example of analyzing the chemicals used in hydraulic fracturing to estimate the potential exposure results to humans and the problem of translating the results into language that the general public can digest. In her concluding remarks, she stated that she hopes that citizens will recognize and acknowledge the difference between association and causation in complicated oil and gas studies.

Stuart Ellsworth, the engineering manager for the Colorado Oil and Gas Conservation Commission, provided the conference with a general overview of the engineering involved in the development of oil and gas from shale resources. Ellsworth began by stating that the oil and gas industry of today is "not your grandfather's oil and gas industry." He explained that conventional resources are capable of flowing through a well without any form of assistance while unconventional resources—todays primary energy industry drivers—require some form of technology for extraction. Unconventional resources are

prevalent in Colorado, for example in the Piceance Basin and Wattenberg field.

Ellsworth next addressed the issue of public concern and the opportunities for mitigating some of the negative aspects of oil and gas drilling. Ellsworth acknowledged that issues such as noise, air emissions, spill containment, traffic, and construction activity can occur with oil and gas operations, but he noted that legislation and voluntary industry action attempt to curtail these variables. Finally, Ellsworth spoke about the vast benefits natural gas can provide for the economic future of Colorado. Natural gas has far less emission levels compared to oil, and a portion of the taxes paid for natural gas production are put towards Colorado schools.

The next speaker, Bruce Baizel, is the energy program director for Earthworks, and is the chair of the board of directors for the national organization STRONGER, the State Review of Oil and Natural Gas Environmental Regulations. Baizel pointed to overproduction, waste, and groundwater impacts as the primary factors that initiated the implementation of increased regulations. Along with those factors, he named some of the environmental impacts believed to be associated with the oil and gas industry, such as surface impacts and salt contaminated soils. He discussed how staying on top of the task as a regulator is difficult because the technology is developing so rapidly. Baizel concluded with the remark that proper management of the issues can take many forms, and that consistent mismanagement by surface operators is the real issue.

The first session concluded with a panelist discussion regarding the phrase "social license to operate." Britt Banks, moderator of the panel, recently retired as executive vice president of legal and external affairs at Newmont Mining Corporation based in Denver, Colorado. He currently serves as the president of the board of trustees for the National Court Appointed Special Advocates Association and as a member of the board of advisors for the Natural Resources Law Center at the University of Colorado Law School.

The panel members included Kate Fay, Dr. Gary Graham, and Lance Astrella. Fay is well known in both the public and private sectors of environmental and energy management and has been involved in the industry for the last thirty years. Currently, she is the senior advisor of environmental and regulatory policy at Noble Energy. Dr. Graham is director of the lands program at Western Resources Advocates. His responsibility is to promote environmentally appropriate renewable energy and transmission throughout the Rocky Mountain West while simultaneously protecting sensitive species and ecosystems. Finally, Mr. Astrella is an attorney at Astrella Law P.C., which commonly handles oil and gas lease agreements.

Banks asked the panel members to discuss how they would define the social license to operate based on their positions in the oil and gas industry. Fay defined the social license to operate as the right to be a part of and operate in a community. She added that this is more of a mind set as opposed to an actual permit to operate. Fay noted that the oil and gas industry is a guest in the communities it operates in, and each company has to earn the right to both enter and remain in the community. Dr. Graham defined the social license to operate using the words measure, disclose, and engage. He feels that in order for oil and gas companies to operate the project must be environmentally, socially, and economically sustainable for the community members. Finally, Astrella

defined the social license to operate as a combination of four influencing factors: (i) quality of life, (ii) property rights and values, (iii) health, and (iv) philosophy. He also mentioned that the issues that accompany the social license to operate depend on whether the drilling areas or pipeline locations are situated in an urban or rural setting.

The second session, titled "Water Supply and Quality," consisted of five speakers who discussed the relevant issues surrounding the utilization of water in oil and gas projects. The first two speakers of the second session, Dr. Joseph Ryan and Dr. Corrie Clark, addressed what is known and not known about water supply and quality impacts in the energy field.

Dr. Joseph Ryan began the second session and concentrated on water quality. Dr. Ryan is a professor and Bennett-Lindstedt Faculty Fellow in the Department of Civil, Environmental, and Architectural Engineering at the University of Colorado at Boulder. His research and teaching is based around the fate and transport of contaminants in natural waters. Dr. Ryan started by discussing water contamination, one of the most prominent public concerns with regard to oil and gas development. People fear that oil and gas, as well as production water, will seep into various water supply sources, especially when horizontal drilling is involved. Dr. Ryan stated that people are only at risk when there is a source, a receptor, and a pathway; all three must be present for there to be any potential risk. He named surface spills and subsurface releases as the most probable pathways for water contamination. Dr. Ryan mentioned that groundwater flow and transport models can be used to analyze the possibility for contamination. However, he concluded by stating that studies can only provide a broad range of the potential for contamination and should not be the sole factor that is considered.

Dr. Corrie Clark provided a "forty-thousand-foot perspective" of the oil and gas industry and its effects on water supplies. At the national level, she stated that produced water is the most abundant by-product associated with oil and gas production, and that there is typically more water brought up from the ground than oil and gas at production sites. The physical and chemical properties of the water vary depending on the type of hydrocarbons extracted. Seventy-five percent of the water produced by the oil and gas industry within the United States comes from Texas, California, Wyoming, Oklahoma, and Kansas. Dr. Clark concluded by listing the life-cycle of water used in hydraulic fracturing, which generally consists of five major steps: (i) water acquisition; (ii) chemical mixing; (iii) well injection; (iv) flowback and produced waters, also known as waste waters; and (v) wastewater treatment and disposal.

The final speaker of the day was Susan Packard LeGros from the Center for Sustainable Shale Development ("CCSD"). CCSD describes itself as providing a rational, middle ground approach to issues concerning the Marcellus shale development projects. The Marcellus formation stretches from the Midwest to the Northeast, and is the source for a large number of oil wells located in Pennsylvania. The section of the Marcellus formation in Pennsylvania contains three main water resources: the Delaware River basin, the Susquehanna River basin, and the Ohio River basin. Separate commissions govern the three distinct basins. Each of the three commissions has the authority over water supply and quality issues within its territory. CCSD created examples of groundwater protection standards to use, and many industry leaders have begun

to adopt similar principles. Some of the main standards include: (i) zero discharge of wastewater until a treatment standard is adopted; (ii) recycling wastewater at a rate of at least ninety-percent; (iii) closed-loop containment of drilling fluids; and (iv) groundwater monitoring both prior to the start of the operation and after the operation has concluded.

Overall, the conference highlighted the importance of water in the oil and gas industry and the need to continue developing environmentally sustainable practices. The speakers covered a wide range of topics, which provided a strong basis for the water issues that can arise within the oil and gas industry.

Dane Mueller

COLORADO WATER CONGRESS 2014 SUMMER CONFERENCE: RALLYING OUR WATER COMMUNITY

Snowmass Village, CO August 20-22, 2014

HISTORICAL PERSPECTIVES: DOES MITIGATION STAND THE TEST OF TIME?

As part of the Colorado Water Congress's ("CWC") annual summer conference, Jim Lochhead, CEO and manager of Denver Water, moderated a four-panelist discussion entitled "Historical Perspectives: Does Mitigation Stand the Test of Time?" The discussion centered on Colorado transbasin water projects and the mitigation of their environmental impacts. The panelists were chosen to represent differing perspectives and to talk about what they have learned from the past and what has changed in regard to today's physical, political, and cultural environment. Lochhead noted that disputes over transbasin diversions are not new and have existed since *Coffin v. Left Hand Ditch Co.* in the nineteenth century. He also pointed out that, in addition to cities on the Front Range of Colorado, many Western Slope cities make use of transbasin diversions on both large and small scales.

Harold Miskel, formerly the water resource manager of Colorado Springs Utilities, and Larry Simpson, formerly the general manager of the Northern Colorado Water Conservancy District ("Northern"), presented the perspective from the East Slope of Colorado. During his career, Miskel was involved in the Homestake Water Project, a water supply project jointly operated by the cities of Colorado Springs and Aurora that transfers Western Slope water from the Eagle River basin to water users on the East Slope. Starting in the early 1960s and for the rest of his thirty-year career, Miskel took part in the conflicts that resulted from the project, many of which are ongoing today. He acknowledged that the basin roundtables happening today are beneficial because they create better collaboration. However, he also stated that in his experience there are