Subject: : Conservation
Topic: : Zoning Boards says No, judge says Yes
Re: Zoning Boards says No, judge says Yes
Author: : trout17
Date: : 2010/9/8 12:40:31
URL:

My understanding is that the trucks haul roughly that much water meaning a fracked well would need better than a thousand loads of water, to be fracked one time.

tomgamer, A measure is correct. The a sucstance in the dissolved solid is the question and how much a stream or other water source can bear. The Dunkard Fork pollution was salt about 5 times that of sea water once tested. The total TDS from Consul Energy was within limits but a spike in that number was higher , obviously, than the stream could handle.

I'm attaching some info that makes it much clearer:

What are the Water-Resource Concerns About Developing Natural Gas Wells in the Marcellus Shale?

Substantial amounts of water are required for the drilling and stimulation of a Marcellus Shale gas well. Fluids recovered from the well, including the liquids used for the hydrofrac, and any produced formation brines, must be treated and disposed of properly. Three important water-resource concerns related to Marcellus Shale gas production are:

. supplying water for well construction without impacting local water resources,

. avoiding degradation of small watersheds and streams as substantial amounts of heavy equipment and supplies are moved around on rural roads, and

. determining the proper methods for the safe disposal of the large quantities of potentially contaminated fluids recovered from the wells.

These concerns are discussed in more detail in the following sections.

Water Supply

Drilling requires large amounts of water to create a circulating mud that cools the bit and carries the rock cuttings out of the borehole. After drilling, the shale formation is then stimulated by hydraulic fracturing, which may require up to 3 million gallons of water per treatment (Harper, 2008). Many regional and local water management agencies are concerned about where such large volumes of water will be obtained, and what the possible consequences might be for local water supplies. Under drought conditions, or in locations with already stressed water supplies, obtaining the millions of gallons needed for a shale gas well could be problematic. Drillers could face substantial transportation costs if the water has to be trucked in from great distances.

Similar shale gas operations in the Barnett Shale of Texas have obtained hydrofrac water largely from groundwater sources (Byrd, 2007). Water supply concerns over the Barnett Shale drilling have been brought up in the past (see, for example, Francis, 2007). Texas State and County agencies now closely monitor volumes of water used during drilling, and a consortium of Barnett Shale drilling companies have developed best management practices for water conservation, with the goal of keeping the pace of drilling and production activities within the bounds of sustainable water use. Similar steps have been discussed in Marcellus Shale gas production areas, but not yet fully implemented.

Transporting Fluids and Supplies

Large hydrofrac treatments often involve moving large amounts of equipment, vehicles, and supplies into remote areas. Transporting all of this to drill sites over rural Appalachian Mountain roads could potentially cause erosion, and threaten local small watersheds with sediment. Drill pad and pipeline construction also have the potential to cause similar problems. Of equal concern is the possibility for spills or leaks into water bodies as the fluids and chemical additives are transported and handled. Little is known about how a Marcellus Shale drilling "boom" might adversely affect the land, streams, and available water supplies in the Appalachian Basin. Even under current Marcellus gas production levels, complaints of rural road damage and traffic disruption from drilling equipment have been received, indicating that this could be a significant problem if carried out across thousands of active drill sites.

Wastewater Disposal

For gas to flow out of the shale, nearly all of the water injected into the well during the hydrofrac treatment must be recovered and disposed of. In addition to the problem of dealing with large bulk volumes of liquid waste, contaminants in the water may complicate wastewater treatment. Whereas the percentage of chemical additives in a typical hydrofrac fluid is commonly less than 0.5 percent by volume, the quantity of fluid used in these hydrofracs is so large that the additives in a three million gallon hydrofrac job, for example, would result in about 15,000 gallons of chemicals in the waste.

Hydrofrac fluids are often treated with proprietary chemicals to increase the viscosity to a gel-like consistency that enables the transport of a proppant, usually sand, into the fracture to keep it open after the pressure is released (fig. 6). The viscosity of these fluids then breaks down quickly after completion of the hydrofrac, so they can be easily removed from the ground. The chemical formulations required to achieve this are highly researched and closely guarded, and finding out exactly what is in these fluids may present a challenge. The data publicly available on Marcellus Shale hydrofrac treatments indicate that a slickwater frac works best on this formation (Harper, 2008). These types of hydrofracs employ linear gels and friction reducers in the water, and utilize only small amounts of proppant, relying instead on fracture surface roughness to hold it open (Rushing and Sullivan, 2007). The potential problems for local wastewater treatment facilities caused by proprietary chemical additives in hydrofrac fluid are unclear.

Along with the introduced chemicals, hydrofrac water is in close contact with the rock during the course of the stimulation treatment, and when recovered may contain a variety of formation materials, including brines, heavy metals, radionuclides, and organics that can make wastewater treatment difficult and expensive. The formation brines often contain relatively high concentrations of sodium, chloride, bromide, and other inorganic constituents, such as arsenic, barium, other heavy metals, and radionuclides that significantly exceed drinkingwater standards (Harper, 2008).

The current disposal practice for Marcellus Shale liquids in Pennsylvania requires processing them through wastewater treatment plants, but the effectiveness of standard wastewater treatments on these fluids is not well understood. In particular, salts and other dissolved solids in brines are not usually removed successfully by wastewater treatment, and reports of high salinity in some Appalachian rivers have been linked to the disposal of Marcellus Shale brines (Water and Wastes Digest, 2008). Another disposal option involves re-injecting the hydrofrac fluids back into the ground at a shallower depth. This is a common practice in the Barnett Shale production area of Texas, and has been utilized for some Marcellus wells drilled in West Virginia (Kasey, 2008). Concerns in Appalachian States about the possible contamination of drinking water supply aquifers has limited the practice of re-injecting Marcellus fluids, however. Another option might be to inject the waste fluid into deeper formations below the Marcellus Shale that are not used as aquifers, such as the Oriskany or Potsdam Sandstones. A third disposal process used in Texas places the wastewater into an open tank to evaporate. The solids that remain behind are then disposed of as dry waste. Although this may be an effective technique in the deserts of the American Southwest, its usefulness in the humid climate of the Appalachians is questionable. A systematic study of the options for Marcellus Shale waste fluid treatment, disposal, or recycling could help to determine the best available procedures.

Summary

Natural gas is an abundant, domestic energy resource that burns cleanly, and emits the lowest amount of carbon dioxide per calorie of any fossil fuel. The Marcellus Shale and other natural gas resources in the United States are important components of a national energy program that seeks both greater energy independence and greener sources of energy. Marcellus gas development has begun in the northern Appalachian Basin, with significant lease holdings throughout Pennsylvania, West Virginia, southern New York, western Maryland, and eastern Ohio. Because of questions related to water supply and wastewater disposal, however, many state agencies have been cautious about granting permits, and some states have placed moratoriums on drilling until these issues are resolved. At the same time, gas companies, drillers, and landowners are eager to move forward and develop the resource.

While the technology of drilling directional boreholes, and the use of sophisticated hydraulic fracturing processes to extract gas resources from tight rock have improved over the past few decades, the knowledge of how this extraction might affect water resources has not kept pace. Agencies that manage and protect water resources could benefit from a better understanding of the impacts that drilling and stimulating Marcellus Shale wells might have on water supplies, and a clearer idea of the options for wastewater disposal.

Sorry, I couldn't attach the file but I thought this was a good explanation of the process and problems.

Jim Kearney