

TOMPKINS COUNTY WATER RESOURCES COUNCIL

April 18, 2011
Meeting Minutes

Voting Members Present (15): Sharon Anderson, Liz Cameron, Bill Garthwaite, Barry Goodrich, Roxy Johnston, Joan Jurkovich, Dan Karig, Darby Kiley, Rick Manning, Jim McGarry, Elaine Quaroni, Marjory Rinaldo-Lee, Damon Rodnac, Cindy Schulte, Mary Shelley

Voting Members Excused (5): Carol Chock, Lynn Leopold, Gregg McConnell, Frank Proto, Craig Schutt

Voting Member Absent (1): Ed Bugliosi

Non-Voting Member Present (1): Jose Lozano (Associate)

Guests Present (4): Mike Atchie (Chesapeake Energy), Dan Lopata (Chesapeake Energy), Geoff Milz (Cayuga County Planning Dept.), Amy Panek (Park Foundation)

Staff Present (1): Kathy Wilsea (T C Planning Dept.)

Vice Chair Barry Goodrich called the meeting to order at 4:25 PM.

Agenda Review and Approval of Minutes – Depending on time, items may be added at the end of the meeting. Draft minutes of March 21, 2011 were moved by Joan Jurkovich, seconded by Liz Cameron and accepted without change.

Water Use & Recycling Program at Chesapeake Energy – Barry welcomed our visitors from Chesapeake Energy: Mike Atchie, Local Government Specialist, and Dan Lopata, Completion Superintendent. Mike Atchie began by saying Chesapeake Energy is the second-largest and most active producer in the US. They operate 9% of the total rig fleet, are based in Oklahoma, and have over 10,000 employees. Showing shale formations on a map of the US, the vastness of the Marcellus was evident, and Mike said it could become the largest natural gas-producing field in the US.

Site preparation involves 4 to 6 weeks of construction, with the pad covering 2 ½ acres. Mike reviewed the containment process used to create a zero-discharge site. They contract baseline water testing for water wells within 2,500 to 4,000 feet of the well pad, and results go to Chesapeake and the landowners, with technical assistance available to help landowners interpret the results. Workers are on site 24 hours a day, with staff scheduled two weeks on and two weeks off. First phase of drilling is done with compressed air, then they use their drilling mud in a closed loop system, and no longer use pits for cuttings. They drill 6,000 to 8,000 feet into the Earth, using a minimum of seven layers of casing and cement. One multi-well pad with six horizontal wells can yield as much gas as 32 vertical wells.

Now the site is ready for the hydraulic fracturing phase, which takes 7 to 10 days per well. The hydrofracturing process is not new – it has been in use for vertical wells since World War II. The fluid is 99.5% water and sand. Other components are acid, friction reducer, scale inhibitors, iron control, corrosion inhibitor, and antibacterial agents. Chesapeake is helping to develop a website, FrackFocus.org, that will provide specifics of chemicals used at each site, and other companies will be allowed to post on it, too. In the hydrofracturing action they perforate the furthest reach of the casing with explosive charges, add fluid to force fractures in the shale, temporarily plug that section, then repeat (typically 8 to 12 times) in the next-closer reach of the casing. They force 4 to 5 million gallons of fluid into each well. Using Chesapeake's AquaRenew system, flowback (typically 15% throughout Chesapeake's operations) is trucked to a separate site, where they restore the flowback using 20-micron filters, and all of the water is reused. Solids that are filtered out are analyzed and disposed of under the regulations of the state. Dan Lopata said they are not finding heavy metals in the solids, so if they exist they remain in the re-used fluids. When the solids have been tested for radioactivity, they have been found to be no more radioactive than other materials. Landfill operators also test, and all materials have been at acceptable levels.

Displaying pie charts in his PowerPoint slide, Mike Atchie showed that 16.2% of overall water use goes to Industrial and Mining operations, and of that portion the natural gas industry is projected to use 0.1%. This is about 1 gallon per MMBtu of energy produced. In Pennsylvania, they get the rest of their water from the Susquehanna River and its tributaries. Once the site is producing natural gas, collection tanks are installed and left on site for 20-30 years, the pad size is reduced, and the remainder of the site is restored.

Chesapeake has no plan right now to refracture these wells when they are not productive. Non-productive sites would be completely restored. Due to the short period of time they have been operating in the Marcellus Shale, they can't produce data yet for water return and gas production. Initial flowback volumes are low in Marcellus so far. Cement typically cures in 24 hours between layers of casing in the site preparation process. In Pennsylvania, permits are for two years, which means drillers must *complete* drilling within those two years, but Chesapeake is interested in moving faster. If a state changed their regulations about allowed technology, old technology would not be grandfathered in and drillers would have to abide by the new regulations. They are very careful about protecting against leaks into the atmosphere, as they don't want to lose their salable product. Leaks are also a safety issue. Dan Lopata pointed out there is an extreme amount of misinformation out there, and the industry needs to provide better education. Flowback recovery in the Marcellus Shale is typically 3 to 5%, sometimes up to 10%, then they start getting gas. Initially, this is burned off (maximum two days) because it still contains some water and debris, then the well is shut in and infrastructure is set. Their goal is no natural gas loss.

In a discussion about controlling the length of fractures, Dan Lopata explained the Marcellus Shale is sandwiched between two layers of rock (Tully Limestone and Onondaga Limestone) and a well may propagate 3,000- to 5,000-foot-long horizontal cracks but be limited to 100 feet above and below by the limestone. Pressure recording devices allow monitoring of propagation, based on volume of hydrofracturing fluid in use. If the process encounters a natural open fracture, fluid will enter, pressure will drop, and sand will drop out of the hydrofracturing fluid and block the fracture. Chesapeake crews have not encountered intersections with natural fractures. Also, natural fractures would show in seismic testing before work begins. Chesapeake avoids working in highly-fractured areas.

Federal regulations stand unless local or state regulations are more stringent. Chesapeake contracts with outside auditors who visit sites to make sure operations meet company standards, which typically exceed those of the states they operate in. State inspectors can inspect at any time, during any phase. Chesapeake enters into road use agreements with local municipalities, agreeing to repair damages. Sometimes they reinforce and/or widen local roads before they begin. They are active all year long, and incorporate stormwater control practices developed with PennDOT. Dan and Mike could not provide figures on how wide cleared areas and rights-of-way are for pipelines, saying pipelines are actually a separate company. But they do try to follow existing roads and boundaries. The extent of the Marcellus and the drilling technology allow flexibility in site selection. Chesapeake does not dispose of any water, they process and reuse both rainwater and flowback. The processor disposes of the concentrated brine. In areas of New York State where vertical wells are hydrofractured outside of the Susquehanna watershed, the water is taken to Ohio, as inter-basin transfers are prohibited. They anticipate construction of a Great Lakes AquaRenew processing site(s) if allowed to drill horizontally in NYS. Dan Lopata explained a couple years ago they did dispose of flowback through municipal wastewater treatment, but now reuse all flowback. Chesapeake is part of the Marcellus Shale Coalition, and sets its standards high.

Concerning the differences between vertical and horizontal drilling methods, Dan Lopata said it is necessary to gel the hydrofracturing fluid during vertical drilling to get it to carry the sand, but other chemistry is similar. Chesapeake has not needed to add a gel agent in their horizontal Marcellus Shale drilling. When asked if water quality information might be made available through USGS or DEC, Dan and Mike were unable to answer with certainty. Dan pointed out acquiring property rights and conducting seismic studies are very expensive, and Chesapeake would probably consider the data proprietary. He speculated it might be made available for a special request or when areas are played out. Chesapeake already shares much data for safety reasons.

In circumstances when a well is abandoned, rights to the site are returned to the owner. They remove the casing to a minimum of 5 feet below the terrain of the abandoned well, as well as some cement near the surface. They do not remove the deep casing. Dan Lopata said the driller must post a bond prior to drilling that covers abandonment, and the abandonment process is strictly governed. But he is not sure how or if locations of deep casings become part of land records. Damon Rodnac pointed out it is important information, especially since construction should not occur over them. Dan said Chesapeake's bond expires when the site is shut in, but liability for problems can go back to the original driller. He and Mike were not able to answer some questions about liability, saying they were best addressed by attorneys. Concerning the integrity of the cement, Dan said it has a much higher compression rating than what is used for driveways. Usually the slurry cures in 24 hours, but crews wait as long as needed. Deterioration would only become evident by the presence of a problem. Any groundwater contamination comes from improper drilling techniques and casing installation prior to the hydrofracturing phase. He pointed out there are wells in West Virginia and even in New York State that are over 120 years old. In northern Pennsylvania, Chesapeake has 24 rigs operating, has completed over 250 wells, and has about 280 wells planned for 2011. Over 1,400 Chesapeake employees work in Pennsylvania. Chesapeake is paying royalties on producing wells in Pennsylvania. Typically, royalty payments begin 4 months after production is achieved.

Adjournment – Barry Goodrich thanked our guests. The meeting was adjourned at 6:07 PM.
Respectfully submitted, Kathy Wilsea, Planning Department Secretary
Adopted by the Council on May 16, 2011.