

**Meeting Minutes of the Water and Waste Management Committee of the  
North Carolina Mining and Energy Commission  
September 5, 2013**

**1. Preliminary Matters**

Committee Chairman Dr. Vik Rao called the meeting to order at 8:32 a.m. He read the ethics statement and asked Committee members whether or not they had any conflicts of interest with respect to any action items on the agenda. None were expressed.

The following personnel were in attendance for all or part of the meeting:

**Committee Members**

Dr. Vik Rao (Chairman)  
Ivan "Tex" Gilmore  
Charles Holbrook  
Charlotte Mitchell  
Dr. Kenneth Taylor  
Amy Pickle

**Attorney General's Office**

Mary Lucasse (legal counsel, substituting for Jennie Hauser)

**DENR Staff Members**

Trina Matta, Office of the Secretary  
Layla Cummings, Office of the Secretary  
Tracy Davis, Director of the Division of Energy, Mineral and Land Resources (DEMLR)  
W.E. "Toby" Vinson, DEMLR  
Walt Haven, DEMLR  
Katherine Marciniak, DEMLR  
Ryan Channell, DEMLR  
Rosalind Harris, DEMLR

**Others in Attendance**

Refer to the meeting sign in sheets (attached to these minutes).

**2. Approval of Minutes from Last Meeting**

Dr. Kenneth Taylor made a motion to adopt the minutes from the last meeting. The motion was seconded by Mr. Tex Gilmore and passed by unanimous vote.

### **3. Southwestern Energy's Approach to Water Treatment**

Mark Mazoch, Water Team Manager for Southwestern Energy, made a presentation about Southwestern's water treatment for oil and gas operations (see presentation attached to the minutes). The Committee asked Mr. Mazoch several questions. He and the Committee addressed the following issues:

- a. Southwestern Energy's experience in the Fayetteville Shale of Arkansas;
- b. Wells in the Fayetteville Shale range in vertical depth from about 2,000 ft. to 6,000 ft., with a two to three month period to complete each well;
- c. Regional aquifers above the Fayetteville Shale are typically at a depth of less than 1,000 ft. below land surface. Mr. Mazoch offered to provide additional information regarding aquifer depths;
- d. Southwestern Energy currently reuses 90 percent of all produced water (this includes flowback water), with the intention to eventually reuse 100 percent of all produced water;
- e. Mr. Mazoch reviewed the water acquisition and use process involving water supplies, water handling, re-use, and disposal;
- f. Retreatment typically involves desalination, with discharge of concentrated brine and reusing or discharging the resulting distilled water;
- g. Distilled water is discharged into surface water bodies pending the addition of dissolved minerals to water so that discharge fluids meet local, natural conditions;
- h. Review of the centralized water treatment facility, where NPDES permitting typically allows for a discharge rate of 4,000 barrels per day (bpd). The site example discussed actually discharges about 2,000 bpd;
- i. The use of mechanical vapor recompression (MVR) for water distillation as well as Induced Gas Flotation (IGF) for removing contaminants before MVR is applied;
- j. Effluent sampling regimen and parameters at the treatment facility;
- k. Use of verification water tanks prior to discharge to ensure compliance with NPDES requirements; and
- l. Southwestern Energy has found that flowback and produced water chemistries are similar.

Mr. Mazoch also explained that Southwestern Energy owns its own treatment facilities, but also receives wastewater from other companies for treatment. He also explained that wastewater is typically transported into a facility via truck hauling. The centralized treatment facility he provided as a discussion example services wastewater from about 700 wells.

Mr. Mazoch stated that Southwestern Energy's NPDES permit was modified from the standard NPDES permit for a wastewater treatment system to establish requirements for oil and gas wastewater treatment and discharge.

Mr. Charles Holbrook asked if Southwestern Energy knew of any examples of water well contamination that had occurred due to fracturing operations. Mr. Mazoch responded that a recent USGS study indicated that contamination from fracturing operations was not known to occur in the Fayetteville Shale play.

The Committee noted that underground injection via disposal wells is currently illegal in North Carolina. Additionally, all members agreed that water should be reused whenever possible.

#### **4. Potential Concerns Related to Wastewater Treatment**

Mr. Dan Mueller from Environmental Defense Fund (EDF) addressed the following matters related to wastewater treatment from oil and gas operations (see attached presentation):

- a. Importance of water management, reuse, treatment and disposal;
- b. Produced water is a combination of fracturing constituents and formation constituents;
- c. NPDES permitting;
- d. No NPDES guidelines exist for the produced water effluent, which would not allow for effluent discharge. However, pre-treatment of this water is allowed prior to discharge to a permitted treatment facility. Mr. Mueller calls this process "indirect discharge;"
- e. EPA is developing pretreatment standards for indirect discharge for publically owned treatment works (POTW), which are due in 2014. However, permits have been issued for indirect discharge to centralized waste treatment facilities (CWT);
- f. Many of the CWTs are not discharging treated water, but are instead providing water to be reused;
- g. EDF has concerns regarding effluent discharge to CWTs, as current effluent guidelines do not cover the full spectrum of constituents potentially present in the wastewater;
- h. EDF has the following suggestions for disposal or reuse of wastewater from hydraulic fracturing operations: reuse for other hydraulic fracturing operations; transportation to a permitted facility to treat the fluid; treatment on-site and transportation to a POTW;
- i. Treatment for reuse poses a unique set of environmental risks, such as transportation of wastewater;
- j. Treatment of water for discharge poses risks of 1) having no federal standards for pretreatment before transport to a POTW and 2) the treatment effectiveness of POTWs is uncertain.

The Committee recognized that any reuse of water could involve environmental risks associated with transportation (for example, accidental releases).

The Committee noted that its members were not considering POTWs as a viable treatment option for oil and gas related wastewater.

#### **5. White Paper on Wastewater Treatment**

Chairman Rao discussed a white paper he wrote for the Committee concerning wastewater treatment and disposal options. He noted that the white paper addresses:

- a. The use of reverse osmosis (RO) for treating wastewater;
- b. Disposal of post-treatment concentrates;
- c. Previous and current use of RO in North Carolina; and

Dr. Rao said that the paper will be modified based on the presentations made during the Committee meeting.

#### **6. Committee Discussion of Draft Wastewater Management Rule Set**

Ms. Katherine Marciniak led Committee discussion regarding the draft wastewater management rules (attached to these minutes). The following matters were discussed:

- a. Definition of the term “contaminated,” wherein staff research noted that definitions of this term in other rules and laws were specific to the needs of a given rule or law;
- b. Removal of the term “uncontaminated” as applied to drill cuttings within a pit (draft section 05H .XXX4 (b)(8));
- c. Definition of corral pits, which are mobile water containment devices and are neither tanks nor pits. The Committee may not need to define corrals, because they chose not to make them an option. Ms. Mitchell offered to review the draft rule set to ensure that it is clear corrals are not permissible under the rule set;
- d. Addition of a rule reference for “radioactive waste;”
- e. Addition of requirements as listed in .XXX3(c), including closure plans, emergency response plans, etc. However, reference to the future permitting rules still need to be added to this section;
- f. The Committee agreed that pits should be certified by engineers (.XXX4(b)(2));
- g. Addition of requirements of tanks to be structurally sound and protected from unauthorized acts of third parties (.XXX4(b)(2));
- h. .XXX4(b)(8)(ii) standards delineating minimum standards of at least 40 mil thickness for HDPE synthetic liners;
- i. Addition of requirements for the recording of and planning for pit leakage .XXX4(b)(8)(ii);
- j. Addition of pit requirements for preventing an influx of stormwater .XXX4(b)(8)(iv);

MEC Chairman Womack suggested that “contaminated” or “contamination” should be worded to include substances that were no longer in a natural state.

Chairman Rao and other members recommended removing the term “uncontaminated” from the rule set as applied to drill cuttings. He also explained that North Carolina would not allow oil-based muds in the drilling process. Thus, cuttings would only have naturally occurring hydrocarbons.

The Committee noted that other DENR rules exist to address the generation and disposal of waste.

Ms. Amy Pickle moved to strike .XXX5 (e) from the draft rule. Ms. Mitchell seconded. The motion passed.

The Committee noted that if a water corral is used, an operator must still abide by all environmental rules related to fluid releases.

Ms. Mitchell made a motion to remove the term “corral” from the draft rules. Mr. Charles Holbrook seconded the motion. The motion passed. However, the Committee noted that a permittee could request a variance to use a corral.

The Committee discussed berm height requirements to protect pits from stormwater. Members noted that pits currently have a two-foot freeboard requirement and that adding another two-foot berm requirement may be too restrictive. Chairman Rao asked staff to research whether or not an additional two-foot berm would be too onerous and to see if other states have similar requirements. He also asked committee members to submit their draft rule amendments to Ms. Katherine Marciniak by September 13, 2013.

## **5. Public Speaker Comment**

Mr. Robert Thrush (Global Environmental Services). Mr. Thrush asked if he could submit information for the Committee to consider regarding electronically monitored well pad systems for leak detection and recycling of wastewater. Chairman Rao advised him to send information to Ms. Marciniak.

## **6. Concluding Remarks**

Mr. Tex Gilmore asked about the opportunity to review Chairman Rao's updated white paper. The chairman explained that he planned to provide the edited white paper by September 13, 2013.

Dr. Kenneth Taylor relayed previous interactions he has had with other division directors. He explained that those directors indicated they were aware of how to handle their rules as related to oil and gas operations.

Ms. Mitchell stated that she planned to further research the terms "pits," and "tanks" and wants to be sure that the draft rule set properly addresses these terms.

Ms. Pickle mentioned that the Committee would need to address regulations related to the transportation of oil and gas related wastes.

The meeting adjourned at 10:31 am.

**DENR Staff Contact for this Committee: Trina Matta, Policy Analyst, Secretary's Office**