April 4, 2013, Raleigh
Three Committees of the NC Mining & Energy Commission met: Water & Waste Management; Administration of Oil & Gas; Environmental Standards

“Draft” water acquisition rule moves to Rules Committee; Composition, disposal and testing for drilling waste; pre-drilling exploration activities, thumper trucks and permit concerns; wellhead construction and standards; how to abandon a well...temporarily; market forces aligning against NC; when is diesel banned/or not; a GIS tool for health, environment, and economic assessment on fracking

(1) Water and Waste Management Committee; Chair, Dr. Vikram Rao and Vice Chair, Charlotte Mitchell
(a) Revision of “draft” Water Acquisition and Management Rules for Oil and Gas Operators modified, approved, and forwarded to Rules Committee, Chaired by Amy Pickle. The definitions section will apply to the entire rule set; definitions that are unique to an individual subchapter will be defined in the subchapter.

(b) Waste Management regulatory framework in 12 states was discussed by Ellen Lorschieder (DENR). Similar on-site waste management practices including solid waste and some separation of hazardous waste. Waste is mainly dry muds and cuttings from the drilling process. Muds that are contaminated with oil from drilling process are going offsite to municipal solid waste facilities (MSW). Bentonite naturally occurs in mud in very small quantities and this waste usually goes to MSWs, too, and is not separated out, but tested. [Note: NC has NO Industrial landfill with appropriate design for shale gas drilling waste; therefore MSW likely to be used.] In LA and MS waste is contained on-site in unlined pits, and there is a closure requirement for those pits. Unanswered question about chloride concentrations (over time) in leachate at landfills, if this material ends up at MSW. Question about quantity of waste generated—drilling one well produces the equivalent of the maximum daily intake for a landfill. [Note: Hazardous waste produced from from a mining hole is exempt from federal regulations, and some states do NOT require any testing if material remains on the site...you don’t know what you don’t know.] Most states require operators to containerize their waste to keep fluids from flowing out; then waste is dried.

Three recommendations: Keep waste on-site in lined pits, OR use MSW (anticipating Anson and Lee counties would accept); OR build an “industrial” landfill in the drilling area for these wastes, after a hydrogeological study. Discussion about what requirements need to be in the on-site permit: a waste-screening plan, leak-proof containers, requirement to handle rainfall the same as leachate. Drill muds have odor problem; and this is inorganic, slippery material. Discussion of best management practices for landfill, since radiation and elevated chlorides
are a potential risk to landfill staff. Any existing NC regulations for on-site disposal? Nope: Inert material [this stuff] is NOT regulated by DENR, nor is testing required.

(c) Comparative Costs of Reuse vs Treatment of Wastewater, Katherine Marciniak (DENR). Flowback fluids from fracking range between 15-25% of volume used, then it is blended with two-thirds fresh water. Get approx. one-third volume returned from each frack. Reuse water is stored in tanks (400-barrel capacity tanker batteries). Many operators reuse water since it is cheaper than buying fresh water, and lowers the cost of transportation. Main cost is creating the reserve pits/pools. Expect lower salinity content in NC (better for reusing this water). Treatment costs (ballpark) are $4.00 to $4.50 per barrel. Suggested that reserve pits be double-lined. Once drilling begins the “flowback” water should go into tanks. Stormwater should be directed away from pits that must have 2-ft freeboard (Marciniak says industry uses 3-ft freeboard). Difference between “flowback“ fluid and “produced water,” which refers to water in the subsurface formation that comes to the surface once the well is in production. Larger operations (we won’t have in NC) can use 100% of their flowback; and smaller operations might not. Reuse water is not pretreated...just reused, resulting in increasing chemical concentrations.

(d) Land application of this waste. John Risgaard, DENR. If waste is applied to land to recapture “nutrients,” the property owner must have a state permit. This permit requires soils and hydrogeologic evaluations, engineering specifications, calculations, operations and maintenance plan [same as for municipal sludge spread all over Chatham by Synagro] and material to be applied at a specific rate and NEVER in the rain because of runoff. DENR inspects operations and paper records [adequate staff?]. According to Risgaard the NC Admin Code requires a reclaimed water permit for all in-ground containment ponds. There are no standards for water reuse within the same industrial process.

(2) Administration of Oil and Gas Committee; Chair, Charles Holbrook and Vice Chair, Jane Lewis-Raymond
(a) Pre-drilling Exploration Activities (seismic and geophysical), Ryan Channell (DENR). He reviewed rules in CO, AR (Arkansas), OK, ND on fees, bonds, notification of owners, use of explosives, filling holes after explosions, reporting. NC rules currently require a permit (valid 6 months) for geophysical exploration that must include a map showing the exact area of operation, give notice one week prior to operation, and requires the exploration crew to include a seismologist. Two different processes: (1) Geophysical exploration uses soundwaves or dynamite, or coring rock to study. NC sets maximum dynamite charge size at 50 lbs. and minimum distance of 300-ft. from a fixed structure. (2) Vibroseis trucks (thumpers) are large heavy trucks with a pan underneath that is repeatedly dropped (from height of 6 meters) to thump the ground to send/receive seismic signals to find gas signature. [NOTE:
These vehicles tear up a roadway and are currently OUTLAWED in NC...if spotted, call State Highway Patrol. DENR recommendations for MEC consideration are:

- Permit fee of $1,000
- Bonding of $15,000 per operation, or $50,000 statewide
- Operator to notify surface owners one week prior to the procedure
- Completion of reports within 60 days with map (latitude/longitude) of each plugged hole, seismic line, area of operation
- The NC Geological Survey will receive a copy of all exploration data within 60 days
- Decrease the current maximum (50 lbs.) charge size, OR increase the minimum distance (300-ft.) from fixed structure to 700-ft.
- Require bentonite (volcanic ash, clay) to plug all shot holes
- Cuttings around the shot hole can not exceed 1-inch thickness
- Stratigraphic surveys will follow rules for surface casings on well bores.

Holbrook asked if any of the states addressed compensation on vibroseis truck damage to roads. Channell said there was no mention of these trucks at all; but the permit did ask the method, and focused on shot holes because of explosives used. Ken Taylor mentioned that what these various explorations uncover is “intellectual property” of that operator that gives it a competitive advantage; AND since the records of the activity must be provided to NC Geological Survey, it becomes a public record and would be available to competitors. Taylor said need to have a period of confidentiality. Holbrook asked Taylor and Channell to make recommendations on length of confidentiality and road repair from vibroseis trucks. Womack said to formulate the rules on protecting intellectual property; then the MEC will go to Legislature to change public records statutes.

(b) Wellhead configuration and standards for production, Walt Haven (DENR). This is what happens at the actual site when well goes into production. OH has best organized requirements/rules that also help inspectors in the field; NC could copy. The Wellhead is the upper terminal of well; the Christmas tree refers to the structure that includes valves, spools, and fittings on the well [Womack rejects the terminology “Christmas tree”... perhaps a Christian issue?], and the API provides a reference for pressure rates for the production casings and tubing. Add additional NC testing/pressure components for surface and intermediate casings? No, per Holbrook, not needed. Discussion about wellhead identification signage: what is on it, where it is posted, the size of lettering, name of county, nearest town, emergency phone numbers and contact information, and 10-ft fencing requirements (8-ft. chain link topped with barbed wire) around well pad with ID signage on all four sides; security allowing DENR to receive key access when requested. Holbrook says everything driven by well location. Typical setbacks of wellhead site (per other states):
- 100-ft from inhabited structures
- 50-ft from public road
50-ft from water well
3-ft between tanks
10-ft from production tanks
Next meeting should have well integrity rules, standard operating procedure, well construction standards ready.

(c) Well Closure, Plugging and Abandonment (both temporary and permanent), Ken Taylor, MEC member [State Geologist]. A review of other states revealed that the shortest abandonment prior to requiring well closure is 6 months; and the longest abandonment (CA) prior to official closure is 25 years. Most states require closure within one-year of abandonment; however, if abandonment is placed in “temporary” status, can stretch out to 25 years. Which brings up leases. Generally, the terms of lease gives operator full control of that property for 25 years, but what if well is not completed to production phase? Current law says a well must either be in production, or abandoned and plugged. What “counts” as production (eg. are gathering lines considered in production timeline?); and if well is “idle” waiting for higher gas prices, is it considered “abandoned”? Holbrook said there could be lag time before gathering lines are built in NC, so might want to have a “temporary” abandonment status. Three possible terms to be defined with regulations: temporary abandonment, plugged abandonment, and shut-in, which assumes well operator is waiting for infrastructure (gathering lines) to be built, or higher gas prices. Ken Taylor said a temporary abandonment is same as “shut-in,” which is considered an intermediate phase lasting 90 days to two years. Holbrook said NC needs to allow more time since we do not have infrastructure in place. AR (Arkansas) allows 10 years, PA allows 6 years for wells to remain idle. Vik Rao says could require cement plugs in these “temporary” abandoned wells that can be removed when well is ready to produce.

(d) Who is going to buy NC gas? Big question. PSNC and Piedmont Natural Gas may or may not be customers for NC gas depending on the price [markets decide; homegrown gas is irrelevant.] The NC Utilities Commission will decide who builds the necessary processing plant or compressor stations [more of this industry in NC] and where those gathering pipelines go. NC’s two largest gas utilities just buy the end product, as cheaply as they can from suppliers. Chairman Womack said we need consumers to build demand: missing in NC. Holbrook said we can develop new markets, hopefully in Asia since a new export operation for liquefied natural gas has been permitted on TX/LA border [NOTE: BBC reported that China expects to begin fracking its ENORMOUS gas reserves by 2015 and stop using coal by 2020...so who needs NC gas?]

(3) Environmental Standards Committee; Chair, George Howard (absent), Vice Chair, Ray Covington convened
(a) **Diesel Fuel.** Ryan Channell (DENR) said the US Safe Drinking Water Act banned 6 specific compositions (CAS numbers) of petroleum-based diesel fuel for use in fracking fluids. However, fracking fluids must contain friction reducers, gels to reduce viscosity, and solvents to break emulsions, which could contain “low amounts” of aromatic hydrocarbons (benzene, toluene, ethylbenzene & xylene–BTEX) that are of environmental concern. Halliburton has made their own CleanStim fluid with products from food industry, or biodiesel better choice because of plant oils. Exxon also has a non-diesel product. Using diesel does not enhance fracking process, according to Halliburton. DENR recommends prohibiting use of EPA’s six banned diesel classification fuels in North Carolina. Vik Rao would like stronger language to use water and not use hydrocarbons at all in fracking fluids. Womack asked if we should we ban diesel for all functions, or should we be specific and state what compounds are actually banned? Rao (formerly worked for Halliburton) said there is no need for diesel in subsurface work, but diesel is used on the surface for various equipment. DENR will draft rule to exclude diesel products from fracking fluids.

(b) **Presentation by Research Triangle Institute.** On spec, they put together a “Health, Environment, and Economic Assessment GIS Tool” using risk modeling. RTI is a non-profit [looking for grants/contracts] that has skills in developing models and hierarchies viewable within a GIS, supposedly by regular people who are NOT GIS experts. They used PA data in their example, but can populate with NC data. RTI said they are marketing this tool to state, federal, industry and stakeholders in the hydraulic fracturing industry who want to look at multiple conditions in the fracking vicinity. Tied to Oracle databases. Womack was impressed and wants the NC Assoc of County Commissioners and NC League of Municipalities to see this presentation, too. **[Diana note: I spoke up that state government has an agency, the Center for Geographic Information and Analysis, that handles large GIS projects and coordinates data gathering/dissemination between federal, state, and local governments. They also could manage this task.]**

Diana Hales, retired