

Minutes of November 5, 2014, meeting of the Marcellus Shale Safe Drilling Initiative Advisory Commission

Approved: November 25, 2014

The Commission held its 33rd meeting on November 5, 2014, at the Frostburg Fire Department Hall in Finzel, Maryland. In attendance were Chairman David Vanko and Commission members Senator George Edwards, Commissioner James Raley, Commissioner William Valentine, Mayor Peggy Jamison, and Commissioners Shawn Bender, Ann Bristow, Steve Bunker, Jeff Kupfer, Cliff Mitchell, Paul Roberts, Nick Weber, Harry Weiss and Secretary Dominick Murray. Commission staff Dr. Christine Conn and Brigid Kenney were present, as well as other agency personnel and members of the public.

Chairman Vanko called the meeting to order. One amendment was made to the draft minutes of the September meeting by Senator Edwards to clarify that western Maryland is medically underserved now and will continue to be whether drilling occurs or not. The minutes were then approved unanimously.

The next agenda item was a presentation by Matt Rowe, Deputy Administrator of MDE's Science Services Administration, on the results of the risk assessment (RA) undertaken by the Agencies. Primary findings for risks to humans and community, in order of importance included traffic, noise, air emissions and setback dependent methane migration risks. Primary findings for ecological risks included forests and farm fragmentation, subsurface migration during fracking, flowback or from produced water, and water appropriations during critical periods. Mr. Rowe stated that peer review was solicited from several expert reviewers and reiterated that November 17th was the deadline for public comments. The timeline for revision will be based on volume of comments.

Commissioner Kupfer assumed that traffic reflects water transport by truck and asked how other water transport mechanisms factor in, such as piping the water. Mr. Rowe responded that these factors would reduce traffic impacts, but the RA needed to use conservative and consistent assumptions. He admitted these risks may be on the high end since recycling and reuse was not considered. Commissioner Kupfer pointed out that road damage risks are very different from loss of life risks. Mitigation is feasible for road damage but not for loss of life. Mr. Rowe agreed that these risks were very different and stated that the risk assessments were based solely on proposed BMPs and that moderate and high risks rankings serve to focus attention on additional practices. Ms. Kenney pointed out that CGDP transportation plan was not weighted heavily because the effects of channeling traffic to certain roads was not predictable. The RA team did consider that road management agreements would have to be developed between applicant and road manager. Ms. Farah Abi-Akar, with MDE's RA team, pointed out that Fort Worth, Texas was still pursuing compensation for damages that were to be addressed under a road management agreement and that legal disputes have been ongoing for the past 10 years. The risk ranking reflects this uncertainty in the efficacy of road management agreements and is also based on judgment; hence the State used conservative assessments.

Commissioner Roberts said he noticed that Chevron is doing away with onsite water storage ponds and that he had heard a rumor that Pennsylvania is going to require closed loop drilling. Commissioner Bender pointed out that earthen pits aren't very common anymore for drill cuttings. Commissioner Kupfer doesn't believe that Pennsylvania has put any regulations in place and noted that the Center for Sustainable Shale Development has adopted a standard that will require managing drilling fluid and flowback water in a closed loop system without the use of earthen pits. Commissioner Weiss pointed out that the Administration will change in Pennsylvania as a result of the previous day's election, which may change this. Ms. Kenney provided information on a centralized water withdrawal site in Pennsylvania operated by Cabot and showed several pictures that Secretary Summers took during a recent tour in Pennsylvania with the Susquehanna River Basin Commission. The slides showed a facility that had been constructed by Cabot to provide water for hydraulic fracturing to multiple well pads. The facility monitors the stream and withdraws water when permitted, then stores it on site, and later transfers it to trucks. The trucks transport the water to a larger tank situated at a high elevation; water flows from this tank through aboveground hoses to frack sites. In one picture, the water lines were seen running along existing utility rights of way. Cabot transports the wastes to a centralized treatment facility. A solid sludge is produced and dewatered on site. The water is reused and the sludge is disposed in a landfill. Commissioner Roberts indicated that the same technology has been used in Fayette County. Commissioner Bender said this is becoming more commonplace.

Commissioner Roberts asked Ms. Kenney to explain the current status of writing regulations. Ms. Kenney stated she has not yet started writing the regulations but assumes she will be writing very soon and is not sure when the proposed regulations will be submitted. Commissioner Roberts asked how many people on MDE has on staff to regulate and enforce new regulations and whether staffing is adequate for the job? Ms. Kenney stated MDE can set permit fees to make funds available for additional positions or contractors. Chairman Vanko thought that enforcement as a best practice should be emphasized in the report since many leaks and accidents could have been prevented in Pennsylvania and elsewhere with adequate enforcement. Mr. Rowe said the team discussed how effective enforcement would be based on the practice in order to appropriately consider the risk ranking. Ms. Kenney mentioned that MDE enforcement staff had participated in the discussions about the best practices, so the feasibility to enforce the requirements was considered. Commissioner Bristow asked for a risk assessment of the efficacy of enforcement and compliance to best practices, knowing that some actions are voluntary and some are not enforceable. She felt that some of the risks may not warrant the risk reduction that staff applied given the uncertainty associated with enforcement and compliance. Mr. Rowe indicated he will take this under consideration and asks that comments be submitted to address specific practices that may not be enforceable. Commissioner Weiss noted that it is a certainty that lax enforcement will increase risk and said we should consider that voluntary actions, such as the water and waste management practices demonstrated by Cabot, are highly effective for reducing risk.

Commissioner Weber asked what the current level of risk is without best practices in place and expressed concern that it is uncertain which best practices would be put into place. Mr. Rowe reiterated that the process of risk assessment with proposed practices are critical for evaluating what the regulations should be and that the process we are following is very important for putting the best set of regulations in order to reduce risks. Ms. Kenney noted that a strong report supporting rigorous best practices is the best approach for making sure that the regulations include those practices. Commissioner Weiss suggested that in all probability when MDE writes the permits, it will focus on minimizing the risk and won't throw caution to the wind. Even if regulations haven't been written, permits will contain appropriate conditions. Commissioner Bender pointed out that MDE can require anything they want in the permit while regulations may actually restrict the agency's options. Ms. Kenney affirmed that MDE can condition permits to adequately protect the environment, public health and the public's use of park land. Commissioner Roberts doesn't feel that best practices in the absence of regulations are adequate. Commissioners Weiss and Bender pointed out that the products of the Commission provide a set of best practices to guide permit conditions and that, in itself, can be very effective.

Commissioner Weiss pointed out that statements made at the September Commission meeting, to the effect that 243 wells had been contaminated in Pennsylvania from fracking, were not accurate. He had reviewed the data provided by the Pennsylvania Department of Environmental Protection and noted that when the complaints were investigated, some of the wells were contaminated but not by gas well activity and some were contaminated but had been remedied. Commissioner Weiss urged the Commission not to be overly influenced by headlines and to investigate the facts. Commissioner Roberts commented that some of the 243 complaints represented multiple drinking water wells and that, while many of the claims may be anecdotal, they are still of great concern to residents whose drinking water may be impacted. Chairman Vanko pointed out that all of the Advisory Commission's recommended financial assurances are not yet in place, such as the State severance tax and a surface owners' protection act, which could help address drinking water concerns.

Commissioner Roberts expressed surprise that the 8 % spill rate in Appendix B led to a low risk ranking. Mr. Rowe pointed out that overall risk rankings includes probability and consequence and that the practices in place on the pad would manage the spill to prevent environmental contamination.

Commissioner Roberts also called into question the criteria of a localized effect being assigned a moderate consequence and wonders if this will factor in to how regulations will be developed. Mr. Rowe said development of regulations and risk consequences are not related and that consequences were defined to support qualitative assessment. Commissioner Bristow noted that in rural areas, extensive human targets will not be present as the population is sparsely distributed and, by definition, will never warrant a serious consequence. She stated that impacts will have serious consequences for people affected even if they are few in number. Mr. Rowe stated that the RA team did not consider population distribution but defined localized at geographic scale based on the physical spread of impact. Commissioners Bristow

and Roberts find the use of the “localized” term inappropriate. Commissioner Weiss suggested firming up the definition of localized by specifically defining what it means, either geographically or by numbers of people affected or some other scale. Secretary Murray noted that the definitions of moderate and serious referred to “considerable” adverse impact and “major” adverse impact as well as the geographical extent. Commissioner Bunker asked whether Ricardo had used similar distinctions in its risk assessment. A discussion followed during which the point was made that major adverse impacts are felt by individuals regardless of how many people may be affected.

Commissioner Kupfer emphasized that enforcement is critical for reducing risk. He also pointed out that the criteria for evaluating risk reduction effectiveness of BMPs are presented and that prescriptive practices were considered more effective by the RA team. Commissioner Kupfer noted that this is not always true in that prescriptive may limit flexibility and if practices are performance based, better ways to achieve the intended goal may be found. Chairman Vanko pointed out that MDE has the flexibility to adjust permit conditions. Commissioner Kupfer feels that performance based practices would be more effective than prescriptive regulations.

Commissioner Bristow found the report difficult to read and to drill down and extract key information. She questioned the math used for quantifying the volume of drill cuttings and is concerned that the public won't see these corrections before the comment period is over. She was concerned that staff was rushed to complete the RA and that there may be many other errors. Mr. Rowe recommended that she submit those comments in writing and that the RA team would reevaluate the calculations to make sure that no errors were made. Commissioner Weber would like more clarity on how the decisions were made, when data was used or when decisions were more judgment based. He asked for a complete rewrite of the report using a consistent format for each risk as follows: “This risk was assigned because of the following X, Y and Z reasons”. Commissioner Roberts asked what NA means. Mr. Rowe stated that NA means “Not Assessed.” A risk may not have been assessed because the event was not associated with the particular phase of development or because the Commission had not identified it as a risk to be assessed. Commissioner Roberts asked that the term NA needs to be clarified in the report. Commissioner Bristow commented that Appendix E, page 5 referenced invoking the precautionary principle and noted that the precautionary principle seemed to be unevenly invoked throughout the report and recommended that it should be invoked more uniformly, especially in situations where there was a lack of information.

Senator Edwards asks that impacts to forest fragmentation be evaluated for the positive impacts of providing habitat for grassland and open space species along right of ways and greater access for hunting. Traffic increases are associated with all new industries and businesses coming to Western Maryland and this anticipated effect is not unique to gas development. He pointed out that the new business could be a distribution center that creates a great deal of traffic. Would a risk assessment be used to turn away these businesses? On road damage, the issue is local roads where weight and other factors can be controlled. The ability to require bonds for local road damages may differ between the two counties and if a County needs authorization for bonding, legislation could be passed at the State level. He

pointed out that MDE has had the authority to permit gas wells, but the governor issued the Executive Order to study the issue. Assumptions are a necessary element in any study. He pointed out that the Departments were not required to do a risk assessment, but they responded to requests and did one. Apparently it doesn't satisfy everyone. The political climate in Annapolis will change. People voted for local officials knowing what their positions were on gas development and other issues. All the recently elected officials have said they want drilling done right, and to do it right means there needs to be rules and regulations. The public voted these officials in based on these and other commitments. Additional financial assurances will be back next year and the elected officials will continue to work on that. Senator Edwards commended staff for their hard work and stated that the process has been as open and responsive as any task force or commission he has ever seen. He urged the Commissioners to keep moving forward and said that if the State says no to drilling it must be prepared to compensate all the landowners for their lost revenue. He reassured the Commission that Governor-elect Hogan will not allow drilling without rules and regulations. He stated that while he did not agree with some of the information and methods used in the economic, health and risk studies, he recognizes the value in compromise in order to move the process along and knows that Maryland will have the strictest regulations in the nation. Maryland already has strict regulations for mining and some companies have won national awards based on their performance in meeting those regulations. He encouraged the Commissioners to acknowledge that there are important economic benefits and that many poor people in western Maryland that will benefit if natural gas is developed.

Chairman Vanko agreed with Senator Edwards that the Departments have done an excellent job and said that draft reports can be improved. He pointed out that the North Carolina Commission lifted a moratorium after a mere four months of study and made that decision with very little attention to environment or health. He commended the Commission for their thorough three year study across all aspects of shale gas development. Commissioner Roberts asked Senator Edwards if he can champion minimizing the risks identified by the report at the local level. Senator Edwards expressed complete confidence in the incoming local elected officials. Commissioner Raley said the existing County Commissioners would be forwarding a report to the new Board on issues that need to be addressed at the local level. Commissioner Roberts asked if Senator Edwards would be directly involved. Senator Edwards recognized his role at the state level and said he would be pleased to discuss these issues with anyone.

Commissioner Bristow pointed out that a quarter of the trucks will be carrying loads of toxic chemicals and that this type of truck traffic is riskier than other traffic increases from different industries. She said it is not the same problem as a distribution center.

Senator Edwards commented that regardless of what the rules and regulations are, the State still needs to monitor and enforce and MDE will raise permit fees to supply the staff. Maryland can't move forward on drilling until the permit funding is in place. Maryland will have a smaller number of wells and the State can ramp up.

Chairman Vanko then opened up the discussion to take questions from the public on the Risk Assessment.

Eric Robeson said the risk assessment conflated flowback and produced water. They are different. He questioned the math on the amount of truck traffic engaged in hauling flowback and produced water and said that the erroneous numbers were used in several appendixes. One area of concern was the quantity of drill cuttings, which determined how many trucks would be required to haul the cuttings away. Commissioner Roberts said that there might be three times as many truck trips as the report suggests. Mr. Rowe asked Mr. Robeson to submit comments in writing. Mr. Robeson also questioned the accident probability since the rate was based on state and federal highways, not rural roads and were also restricted to hazardous material transport. He then stated that any references he made regarding the lack of support for regulations by elected officials were not targeted at officials on the Commission but rather refer to a statement made by Commissioner-elect Tichnell in a letter to the editor published in The Republican.

Rebecca Ruggles encouraged the Commission to make this document as useful as possible to help the new administration. Issues outside the scope should be labeled clearly in a box in the Executive Summary. The table of risks listed in Appendix A should be cross referenced with the relevant appendixes. She noted that the risk rankings should be clarified in Appendix A to include the underlying rankings for both probability and consequence. To a health care person, there is a significant difference between high probability with minor consequence, and low probability with serious consequence. Yet, both these cases result in a final risk assessment of "moderate." Since moderate is equated with considerable adverse impact, she believes this report in some places downplays the risk and should take an approach similar to that taken by MAIEH by ranking the risk as moderately high. She questions the premise of localized and immediate vicinity affecting just a few being rated as a low consequence.

Nadine Grabania commented that Appendix J states that out of state transport poses no risk to Maryland and only deals specifically with disposal, not transport of waste. She would like extra scrutiny of transport of toxic materials on rural roads and suggests that the risk should be higher. She is concerned about the effects on people and said that the consequences are serious, no matter how many people are affected and that localized risks should not be downplayed. She asked if the risks can be associated with economic issues to determine if a portion of the population is being asked to bear risk for others who are benefiting economically but bear no risk.

After lunch, Commissioner Mitchell presented a summary of the public comments received on the Health study. The public comment deadline was October 3rd but he accepted a few additional comments. 1009 electronic comments were received along with a few written submissions. The comments are posted on the DHMH website at <http://phpa.dhmh.maryland.gov/OEHFP/EH/SitePages/MarcellusShale.aspx>. Only substantive comments were posted. Of the 1009 comments, less than 1% of those that indicate location of residency were from western Maryland. Many comments were repetitive, following a form

letter that generally called for more research and a delay in the decision until more study could be completed. He highlighted some comments but encouraged everyone to read them and thought there was some useful information to inform the risk assessment. API provided a very extensive review prepared by a consultant. Chesapeake Climate Action Network claimed that more comments should have come in and, by The Sierra Club's count, should have totaled at least 13,000. Commissioner Mitchell provided the following results:

Comments on baseline health assessment fell into the following categories. The comments generally reflect assumptions and approach of the health team.

1. The baseline health assessment covered many items without considering whether they were related to unconventional natural gas development and production.
2. Inaccurate assessment of cancer risk
3. Ignores healthy worker effects in classifying vulnerable populations
4. Point estimates without confidence intervals
5. "Significance" not used in a statistical sense
6. Did not include a survey of residents

Comments on impact assessment fell into the following categories

1. Lack of air modeling
2. Occupational exposure data are not relevant to population exposures. (Commissioner Mitchell commented that information for population exposure is not generally available because so few studies have been done.)
3. Radon impact is more significant than noted
4. Impact on health delivery system did not capture capacity and resiliency of existing system; the study over overstated the weakness of existing system.

Comments on hazard ranking fell into the following categories. Comments were related to methodological concerns.

1. Positive health benefits were not considered
2. Methodology underestimated risks

Comments on recommendations fell into the following categories

1. Concerns were raised about enforcement
2. Some recommendations were not sufficiently protective because data were inadequate
3. Diesel fuel emissions come from many sources and should be considered together, not separately
4. Recommendations on setbacks were critiqued on data and level of protection
5. New information on the use of diesel in fracking fluids must be considered

Comments on the overall study fell into the following categories.

1. The structure of the study and the MOU precluded MIAEH from recommending that a decision be delayed
2. More research is needed before a decision can be made
3. The study failed to consider the cost of health care and emergency response

4. The study should have included climate change
5. There was no recommendation about whether fracking should occur.

Commissioner Mitchell will provide a crosswalk between health recommendations and what the best practices already address to analyze which recommendations may still need consideration.

The public were invited to ask questions regarding Commissioner Mitchell's findings.

Rebecca Ruggles asked if there were there many comments on cumulative risk. Commissioner Mitchell responded that there were not very many, but will include those that were mentioned during the health symposium.

Members of the public asked that MDE post a direct link to the DHMH website on the MDE Marcellus Shale Safe Drilling Initiative website.

Commissioner Bristow commented that she would like to see the GIS website mapping of health issues and suggests having a citizens' advisory group involved. Commissioner Mitchell stated that DNR, MDE and DHMH have exchanged data and DHMH will work on publishing the interactive mapping site. Commissioner Bristow asked if there will be an opportunity for DHMH to suggest to the new administration a need for additional research. Commissioner Mitchell stated he would convey to any interested party the same information suggested by the health study for additional research in certain areas. Commissioner Bristow reiterated that it would be helpful to clearly define in which areas we need further information and research: "What we don't know is important."

Rebecca Ruggles complimented Commissioner Mitchell on his view that the health study can be useful for framing a State and national health research agenda. She mentioned a few additional sets of comments that need to be posted. She reminded the Commission and the public that Maryland is the only state that has done a public health study and wonders if the comment summary will be part of the report. Commissioner Mitchell needs to work with DNR and MDE on how this could be incorporated. Ms. Ruggles asked if a counter could be posted on the DHMH to indicate the overall number of comments received.

Eric Robeson asked if a cost estimate had been prepared for an evaluation of the health infrastructure in Western Maryland. Such a cost estimate had been discussed previously. Commissioner Mitchell said he had not forgotten, but that he would need a health economist to do it. Mr. Robeson said it would be helpful to give the cost estimate to the County and discuss it with the health officer.

Ms. Kenney reviewed the contents of a white paper that had been distributed before the meeting and was intended to give a rough perspective on the magnitude of the projected increase in truck traffic. The local impact was estimated using three scenarios: (1) the development of one pad with six wells over a two year period; (2) the development of one well

over a 4-month period; and (3) the most intense period of truck traffic for a single well over a one month period. These numbers were compared to actual truck traffic counts at three State Highway Administration Count Stations near Friendsville on roads that had been identified as travel routes on an application for a Marcellus Shale well (since withdrawn). The station with the lowest current truck count would experience an increase in truck traffic of about 51 percent for scenario 1 (from 70 to 106), about 63 percent for scenario 2 (from 70 to 114), and about 121 percent for scenario 3 (from 70 to 155). The station with the highest current truck count would experience an increase of about 12 percent for scenario 1 (from 295 to 330), about 15 percent for scenario 2 (from 295 to 330) and about 29 percent for scenario 3 (from 295 to 380). There was also a discussion of the portion of the draft risk assessment that addressed traffic accidents, road damage and traffic congestion. State and federal roads are constructed to standards that accommodate most truck traffic, and trucks pay fees and taxes that contribute to construction and maintenance of those roads. Local roads are not constructed to withstand heavy truck traffic, and local jurisdictions will need to negotiate with companies in the gas industry for upgrading the roads in advance or maintaining and repairing the roads when the heavy truck traffic ceases. Various estimates of the cost of repairing roads were presented in the draft risk assessment. Traffic accidents are a great concern and driver fatigue can increase the risk of accidents. MDE obtained data on injuries and deaths from traffic accidents involving trucks in Garrett and Allegany Counties with the intention of applying the percent increase presented in the Muehlenbachs and Krupnick work, but the Department was unable to clarify ambiguities in that work and could not use it to estimate the magnitude of any increase in accidents.

Commissioner Bristow asked how cumulative risks were assessed. Ms. Kenney said this will be clarified in the report. Commissioner Kupfer asked for confirmation that the truck trips were estimated using the assumption that all water would be trucked and not piped to the drill site, and that all wastewater would be trucked away rather than recycled. Mr. Rowe confirmed that.

Ms. Abi-Akar stated that the analysis assumed that all trucks would travel on Friendsville road. It was not possible to model the impacts if alternative routes were used. Commissioners Bristow and Roberts and Nadine Grabania pointed out that there are no alternative routes and we can't count on the CGDP to adjust traffic routes. They also asked if the special difficulties of one lane roads was considered. Ms. Kenney pointed out that the State did the best they could with limited data and that one way traffic could be managed with traffic monitors. Halting residential traffic while trucks navigate narrow roads is a nuisance, but it should prevent accidents. Commissioner Roberts pointed out that it takes 7 or so minutes for a semi-truck to turn onto Friendsville Road at one particular intersection and he asked if the State would require development of intersection improvements. Ms. Kenney noted this could be included in road agreements. Commissioner Bender said that companies would voluntarily upgrade intersections to avoid this kind of delay. Commissioners Raley and Bender pointed out that reclamation is usually required once the intensive use ends. Commissioner Weber asked if one way trips were adjusted for in the analysis. Ms. Abi-Akar confirmed that the assessment was

doubled to address one way trips and Ms. Kenney pointed out that road damage would not double because empty trucks are less damaging, but the nuisance factor would be doubled.

Ms. Kenney provided an overview of MDE's analysis of greenhouse gas (GHG) emissions in a paper that had been distributed to the Commissioners before the meeting. Natural gas burns cleaner than coal, producing fewer GHGs and other air pollution, and leaving no contaminated ash. The GHG benefit can be reduced or disappear if fugitive methane emissions exceed about 3 percent. The best practices would help control methane emissions at the well site, but other parts of the system, particularly the distribution systems in older cities, emit substantial amounts of methane. It has been estimated that it would take Baltimore City 140 years to replace all the pipes in its antiquated distribution system. Chairman Vanko noted that different assessment methods give very different estimates of the amount of methane leakage. Satellite assessments have not been "ground-truthed."

Ms. Kenney discussed the plan for producing the final report and provided a draft table of contents for discussion and feedback. Commissioner Bunker asked that a list of proposed best practices to be included. Chairman Vanko asked where health effects from the health study would be included. Ms. Kenney indicated those effects would be addressed in the section on community impacts, emergency response, air and health infrastructure, but not in a separate section. Commissioner Weber asked for an executive summary of all the reports so that readers would have the benefit of more detail. Ms. Kenney commented that the report should not be repetitive of prior studies and would touch on the highlights. Commissioner Roberts noted monitoring is not addressed in the report, asked when the Commissioners would get a presentation on ground water monitoring. He expressed concern over the delay in addressing monitoring. Ms. Kenney said the staff working on it were still discussing the pros and cons of different approaches and that she will check on the status. Dr. Conn indicated that the final details of the surface water monitoring protocol are being refined and that the protocol would be distributed to the public as soon as it was ready. Chairman Vanko asked that the report include a section that reasserts the commitment to the monitoring effort. Commissioner Weber did not see an effort in the final study outline to identify which risks are acceptable or unacceptable. Ms. Kenney said that consideration will be incorporated in the conclusions. Commissioner Bristow asked why the MDE Air and Radiation Management Administration stakeholder meeting to discuss air quality monitoring protocols had been delayed. Ms. Kenney said shifting priorities are causing the delay but that the stakeholder process will occur at some point.

The public was invited to offer additional comments.

Nadine Grabania asked if new data became available, such as county economic data, that is not part of an existing study, would it be considered? Ms. Kenney said that she had requested that information and would include it if it became available in time. She noted that the State will adaptively manage as new information becomes available.

Another member of the public stated that he would like the decision to be made soon, but that it seems like it will be another two years before any permits are issued. He asked why it is taking the State so long to make a decision and whether it was possible for a gas company to extract gas without a landowner's permission or to extract Maryland gas from a well drilled in Pennsylvania. A discussion ensued and Commissioner Weiss explained the "rule of capture" and how that might allow someone to siphon gas from another's property, but that it would not be legal to drill under the property of a person who owned the mineral rights without that person's permission. The gas in Marcellus Shale is trapped in the rock and cannot be siphoned away.

Another member of the public said she heard Dr. Eshleman state that a leaking well is not a matter of "if" but "when." The probability of a leaky well has her concerned, not just for herself, but also for farmers, food systems, and her children. She said private wells and the quality of the soil are important to her because she may someday have to "live off the land."

The meeting adjourned at about 3:30.