CHESAPEAKE PSR PHYSICIANS FOR SOCIAL RESPONSIBILITY

December 14, 2016

Mr. Jeffrey Fretwell
Director, Legislative and Intergovernmental Relations
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Dear Mr. Fretwell:

Please accept these comments from Chesapeake Physicians for Social Responsibility on Maryland's draft regulations on hydraulic fracturing, or "fracking," 43 Md. Reg. 1293 (Nov. 14, 2016). We believe that these proposed regulations are inconsistent with the enabling statute's language and policy goals. Our position is that no fracking regulations can protect the health of Maryland residents or the environment, and that this practice should be banned in the state.

Our major comments are below. Additional comments may be found in Appendix A.

The Regulations Failed to Meet the Requirements of the Oil and Gas Title

The Oil and Gas Title of Maryland's Annotated Code requires that regulations promulgated by the Maryland Department of the Environment (MDE) meet certain standards. The draft regulations promulgated by MDE do not meet these standards. MDE has not demonstrated how the "drilling and production methods" proposed by the state will "prevent adverse environmental consequences that would be detrimental to the general welfare, health, safety, and property interests of the citizens of the state." MDE also has not addressed in any systematic way "when hydraulic fracturing operations will have a significant adverse effect on the environment" and should be "prohibited."[1]

[1] Md. Code Ann., Envir. § 14-101, states that, the "drilling and production of oil and gas should be conducted in a manner that will minimize their effects on the surrounding environment. Furthermore, proper evaluation of a project and the use of the most environmentally sound drilling and production methods are necessary to prevent adverse environmental consequences that would be detrimental to the general welfare, health, safety and property interests of the citizens of the State. In addition, there are certain circumstances where oil and gas exploration or production should be prohibited, such as when these operations will have a significant adverse effect on the environment."

There are three fundamental problems with the proposed regulations. First, they are based on outdated and limited scientific information. Second, they do not account for the significant limitations that exist in our knowledge of the complex industrial technologies and processes required to extract gas from shale rock deep below the Earth's surface and bring it to market. Third, they allow industry to continue to hamper scientific inquiry and block the flow of information to state regulators, health professionals and the public.

The Regulations Are Not Supported by Science

These proposed regulations do not meet the standards in the Oil and Gas Title for two reasons. First, like the 2015 regulations that preceded them, they are largely based on the Best Management Practices (BMP) report, completed in early 2013 by the Appalachian Laboratory of the University of Maryland Center for Environmental Science (UMCES). At the time the report was written, very little data was available on the impacts of shale gas development, as the authors themselves state clearly in the opening pages of the report. In particular, there was almost no data on public health impacts at the time the BMP report was written.[2]

Today there exists a growing body of scientific information suggesting that unconventional natural gas development and production (UGDP) enabled by hydraulic fracturing has a broad array of negative impacts, ranging from diverse climate impacts to earthquakes, to community disruption to contamination of air, water and soil. Toxicants can enter the human body through skin contact, respiration or ingestion, and lead to a wide range of health problems. By the end of 2015, the scientific literature included nearly 700 peer-reviewed publications on the impacts of unconventional natural gas development. Of the studies looking specifically at health impacts, more than 80 percent document risks or actual harms.[3]

While the body of knowledge on impacts has expanded dramatically in the last three years, these regulations do not reflect the new information. Instead, important regulatory decisions are based on political expediency and not on the best available science.

The regulations governing setbacks in Section .20, for example, help to illustrate this point. There is little or no data documenting "safe" setback distances, especially from a public health standpoint. It is highly likely that air pollution is the underlying cause of at least some of the illnesses now being documented in the public health literature in relation to fracking operations, such as asthma, cardiac illnesses and premature births. Fixed setbacks fail to account for variations in topography,

[2] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154164
[3] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154164

prevailing winds, the number of other pollution sources nearby that could compound effects, or other climatic conditions that could affect exposures to community members.

When there is data available, the state has chosen to ignore it. For example, the state has established a setback of 1,000 feet from any "occupied building, school, or church." Yet researchers at Yale demonstrated increases in respiratory and skin ailments among residents living within a kilometer (3280 feet) of drilling operations.[4] Furthermore, a setback of 1,000 feet from schools is completely unacceptable, as children are much more vulnerable to air pollutants than adults because of physiology and activity levels.

Additional setback requirements in the regulations appear to be similarly arbitrary. The current proposed regulations decrease setback distances from streams and caves when compared to the 2015 proposed regulations, and permit drilling on land sloped more than 15 percent, which was not permitted in the 2015 proposed regulations. The current proposed regulations also allow surface owners and mineral rights holders on adjoining properties to waive the setback of 1,000 feet from the boundary of the property, unlike the 2015 regulations. The regulations also propose a setback of 2,000 feet from a private drinking water well, disregarding the state's own findings that there was a moderate probability of groundwater contamination with a set back of 2,000 feet.[5]

Finally, the setback restrictions do not include grazing lands or water supplies, such as springs that may be used by production animals. Although this issue has been raised many times with staff at MDE, it has never been addressed. These regulations offer no protection to the food supply, creating another pathway of risk to human health.

There Are Significant Limitations to Our Knowledge

Inherent in the fracking process are significant engineering, scientific and process limitations that help to illustrate why regulations cannot adequately protect human health and the environment. One example of these limitations is the inability of the industry and government regulators to ensure the structural integrity of wells, and to understand what happens when a well fails.

The proposed regulations attempt to address this in Section .40 by laying out a series of steps the operator must take to "ensure that a well is drilled, cased, and cemented to effectively isolate the borehole from the surrounding formations to prevent the migration of gas or liquids into or out of the casing and formations."

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[4] http://ehp.niehs.nih.gov/wp-content/uploads/123/1/ehp.1307732.alt.pdf

[5] http://www.mde.state.md.us/programs/Land/mining/marcellus/Documents/Appendix_H-Water_Contamination_Risks_from_Well_Construction_and_Formations.pdf

However, there is no evidence that it is technologically possible to guarantee that a well can be isolated in such a way as to prevent migration of gas or liquids out of the borehole. Furthermore, there is no data to support the assertion contained in the proposed regulations: "….the casing and cement will assure integrity throughout the life of the well (C(6))."

Well leakage is an intractable problem that has plagued this industry for decades, both with conventional and unconventional wells. Despite the best efforts of the scientists and engineers in this field, no permanent solutions exist. Over time, cement will fail and steel casings will leak. Adding an extra layer of cement as recommended in the draft regulations does not solve this problem over the long term.

The industry has refused to release comprehensive data on well leakage rates. However, industry publications suggest that roughly five percent of wells leak within the first few years and the rate rises as high as 50 percent by 15 years out.[6] Recent analyses in Pennsylvania corroborate these rates of well leakage, despite stricter regulations and reported improvements in technique.[7] The rate of leakage from unconventional wells is higher than from conventional wells.[8] Once these wells are in place, they are permanent structures that can create conduits for the flow of gases and liquids into the environment, some of which may be toxic or radioactive for decades, even after production ceases and wells are plugged. After abandonment, well integrity is still vital to prevent methane and other gases and liquids from migrating into the environment. Methane continues to leak from hundreds of thousands of oil and gas wells in Pennsylvania alone.[9]

Adding an additional layer of casing and cement has not been proven to overcome the core problem with this entire technology: casings and cement fail over time. No regulatory framework can solve a problem that industry cannot fix**.**

MDE's Regulations Allow Industry to Hamper Science

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[6] Brufatto C, et al. (2003) From mud to cement—Building gas wells. Oilfield Review 15(3):62–76.

[7] Ingraffea, A. R. (2013). Some scientific failings within high volume hydraulic fracturing proposed regulations. http://www.psehealthyenergy.org/data/NYS_DEC_Proposed_REGS_comments_Ingraffea_Jan_2013.pdf

[8] Ingraffea, AR, et. al. (2014) Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000–2012. PNAS, 111 (30) 10955-10960. www.pnas.org/cgi/doi/10.1073/pnas.1323422111

[9] https://www.theguardian.com/environment/2014/jun/20/fracking-wells-pennsylvania-leaking-methane

Throughout the United States, the industry has hampered independent scientific inquiry through the use of nondisclosure agreements, by opposing efforts to eliminate trade secret provisions and by opposing baseline monitoring requirements, as well as a broad array of other tactics. Unfortunately, the proposed regulations allow the industry to operate in a way that will allow them to continue to impede efforts to better understand the actual and potential effects of hydraulic fracturing on human health and the environment.

For example, the regulations in Section .31 allow the operator to attest that chemical information is a trade secret without any explanation or justification, fail to provide an administrative mechanism for medical and health professionals to challenge such determinations; allow the company to require public health professionals to sign nondisclosure agreements covering certain chemical information they receive (commonly referred to as a " gag" rule); allow the operator to keep information secret from local emergency response agencies; and allow companies to use chemicals that have not yet been assessed for a range of toxicities, including carcinogenic, neurotoxic, teratogenic or endocrine-disrupting properties.

We would like to emphasize that requiring health professionals to sign nondisclosure agreements completely undermines the objectives of a publicly accountable regulatory structure. Nondisclosure impedes open research, restricts the ability of health professionals to share information with one another and works to keep the public in the dark about potential health issues associated with exposures to fracking chemicals.

The proposed regulations also undermine independent scientific inquiry through the baseline monitoring provisions found in Section .19. The environmental restrictions and baseline monitoring requirements run contrary to the emerging science on air pollution. The current proposed regulations require that the applicant, as part of an application for a drilling and operating permit for a new well, submit an environmental assessment and data from one year of baseline monitoring of the surface water and ground water in the vicinity of the well pad.

However, the 2015 regulations included two years of baseline monitoring of surface water, ground water and air in the vicinity of the well pad. The reduction to one year of water monitoring and the removal of air monitoring in the vicinity of the well pad is not supported by science and is being driven by industry pressures. In fact, there is a strong scientific consensus emerging that air pollution is a major health risk resulting from fracking. Weakened monitoring requirements will make it difficult, if not impossible, to understand how fracking affects local air quality and human health.

Conclusion

In publishing these proposed regulations, MDE has failed to demonstrate how the "drilling and production methods" proposed by the state will "prevent adverse

environmental consequences that would be detrimental to the general welfare, health, safety, and property interests of the citizens of the state." MDE also has not addressed in any systematic way "when hydraulic fracturing operations will have a significant adverse effect on the environment" and should be "prohibited."

Instead these proposed regulations are based on outdated and limited scientific information, fail to address existing gaps in scientific knowledge about hydraulic fracturing, and allow the industry to continue to hamper scientific inquiry and block the flow of information to state regulators, public health agencies and medical professionals, and the public.

Our conclusion, based on an exhaustive review of the scientific literature, is that there is no evidence that any regulatory framework can adequately protect the public or the environment; therefore, we believe that unconventional gas development and production should not be permitted in our state.

Sincerely,

Gina Angiola, MD
Board of Directors

Tim Whitehouse
Executive Director

Appendix A

Additional Comments of Chesapeake Physicians for Social Responsibility

Comment: The preparatory work that led to the development of the current draft regulations, including LIMITED analyses of the geology and hydrology of the region most likely to be affected first, was focused exclusively on the Marcellus Shale in western Maryland. Nonetheless, these regulations will apply to the entire state, including to regions vastly different than Garrett or Allegany County, a fact that has not been clearly articulated to Maryland residents.

.01 Scope and Applicability
C. The renewal of a drilling and operating permit for a well that has already been drilled:
(1) Is subject to the permit renewal procedures under .18 of this chapter; and
(2) Is not subject to the:
(a) Comprehensive development plan requirements under Regulations .10, .12, and .13 if this chapter;
(b) Requirements for the initial drilling and operating permit application under Regulations .14— .17 of this chapter;
(c) Environmental assessment and baseline monitoring requirements under Regulation .19 of this chapter; or
(d) Location restrictions and setbacks under Regulation .20 of this chapter

Comment: This language is vague regarding when the previous well was drilled and for what purpose. Given that this section would exempt a well that has already been drilled from CDP requirements, environmental assessments, baseline monitoring, restrictions and setbacks, the lack of clarity is concerning.

.02 Definitions
B. Terms Defined
(14) CO2 Equivalent Emissions (CO2e).
(a) "CO2 equivalent emissions (CO2e)" means the amount of greenhouse gas emitted.
(b) "CO2 equivalent emissions (CO2e)"for methane is computed by multiplying the mass amount of emissions, in tons per year, by methane's associated global warming potential.

Comment: The global warming potential (20-year versus 100-year timeframes) that will be used for these calculations involving conversion of methane to CO2 equivalents should be specified.

.27 Well Pad.
C. Except for a well pad for an existing well, the operator shall ensure that:
(1) The pad is capable of containing, at a minimum, the volume of the 25-year, 24-hour precipitation event;

Comment: These regulations fail to consider the rapidly changing realities of climate disruption. The frequency of 500 and 1000-year flood events is increasing, as was demonstrated in Louisiana and Ellicott City earlier this year. This well pad containment requirement is inadequate.

.36 Control and Reporting of Air Emissions.
A. This regulation does not apply to an oil or gas well drilled before January 1, 2017, nor does it apply to a permit to drill a new gas storage well that is a replacement for a gas storage well on the same wellpad, where the gas storage well being replaced was in existence before January 1, 2017.

Comment: Exempting new wells from air emissions control and reporting requirements, even if they are replacing existing wells, endangers the public.

D. Methane Offset.
(1) Each calendar year the operator shall estimate the methane emissions from each well pad including the emissions from the well or wells on the pad and any other equipment on the pad.
(2) If practicable, the operator shall verify the estimates by operational data and from the leak detection and repair program.
(3) By April 1 of each year, the operator shall report to the Department the methane emissions for the previous calendar year, converted to CO2 equivalent emissions.
(4) Upon notification from the Department that CO2 equivalent allowances are available, the permittee shall purchase sufficient allowances to offset its methane emissions and provide documentation to the Department of the purchase

Comment: Operator reporting of methane emissions estimates is inadequate, unless verified by an independent third-party using actual measurements. There is no requirement for continuous monitoring of all potential sources of leakage. There is no clarity regarding how CO2e is calculated and the regulations fail to define the source(s) of CO2e allowances, making this section on methane offsets far from transparent.

Given that methane emissions cannot be reduced to zero throughout the entire lifecycle of gas development and production, even using the best technologies, and "offsets" are of debatable value, these regulations cannot adequately protect the climate.