



CHILDREN'S ENVIRONMENTAL HEALTH & PROTECTION ADVISORY COUNCIL

December 13, 2016

Jeffrey Fretwell, Director, Legislative and Intergovernmental Relations,
Maryland Department of the Environment
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RE: Comments from CEHPAC on COMAR 26.19.01 Oil and Gas Exploration and Production

Dear Mr. Fretwell,

The Children's Environmental Health & Protection Advisory Council (CEHPAC) respectfully submits our formal comments to the Maryland Department of the Environment (MDE) regarding the proposed repeal of existing Regulations .01-.05 and adoption of new Regulations .01-.61 under COMAR 26.19.01 Oil and Gas Exploration and Production. CEHPAC understands that the proposed updates to the regulations are necessary to address new technologies and will establish new oil and gas exploration and production standards intended to provide adequate protection for public health, safety, the environment and natural resources, all of which are critical to the health and safety of Maryland residents, particularly our most precious resource, our children.

CEHPAC (§13–1506) has a duty to "Review and comment on existing rules, regulations, and standards to ensure that the rules, regulations, and standards adequately protect the health of children from environmental hazards by taking into account the special vulnerability of children." CEHPAC seeks to identify environmental hazards that may affect children's health and to recommend solutions to those hazards. CEHPAC's goals were developed in 2001 and are reaffirmed annually. They are to:

- ✓ Ensure that the rules, regulations, and standards of the State protect children from environmental hazards;
- ✓ Educate involved parties regarding the environmental hazards that impact children's health and the means to avoid those hazards; and
- ✓ Enable children in Maryland to grow up in a safe and healthy environment.

The Maryland General Assembly clearly identified children's environmental health as a priority for the State when CEHPAC was established pursuant to Health-General §§ 13-1501-1506. While the proposed changes to COMAR 26.19.01 offer improvements with regard to the impact of Oil and Gas Exploration and Production in Maryland, they do not address the true impact and subsequent consequences to children's environmental health. CEHPAC urges MDE to consider and take action on the concerns raised by members of the Council and documented in this correspondence as they serve to ensure that Maryland's efforts to protect children's environmental health will be successful.

WWW.PHPA.DHMH.MARYLAND.GOV

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In July 2014, the Maryland Institute of Applied Environmental Health (MIAEH) published the Maryland Public Health Report on Marcellus Shale entitled “Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland” (MIAEH Report). The report found a high or moderately high likelihood of negative health impacts in seven of eight categories studied. CEHPAC again asks that the MDE review the 52 recommendations put forth in this report and take proactive actions within the scope of the proposed regulations to address the core of the concerns raised with regard to impact of oil and gas exploration and production on public health in Maryland – particularly children’s health.

In 2011 Executive Order 01.01.2011.11 established the Marcellus Shale Safe Drilling Initiative. The resulting recommended ‘best practices’ and conclusion that, “the risks of Marcellus Shale development can be managed to an acceptable level” raises concerns for CEHPAC, because these ‘best practices’ were issued prior to the release of the MIAEH Report. CEHPAC is concerned that the best practices used by MDE to revised the regulations do not provide adequate protection for children and their environment as the most recent science on the impacts to public health were not considered when the ‘best practices’ were written as they were not yet published. In a letter to the Pennsylvania Department of Environmental Protection Secretary in June 2014, pediatrician Dr. Jerome Paulson, Director of the Mid-Atlantic Center for Children’s Health & the Environment, stated “Neither the industry, nor government agencies, nor other researchers have ever documented that unconventional shale gas development and production (UNGGP) can be performed in a manner that minimizes risks to human health”.

CEHPAC believes that the emerging environmental health concerns related to UNGGP have severe implications for children’s wellbeing and could result in adverse birth outcomes; exposure to carcinogens such as benzene, formaldehyde, and silica; and long-term chronic health burdens. Since the MIAEH Report was released in 2014, additional studies have been published which reinforce CEHPAC concerns. Some of these studies reveal that UNGGP is associated with increased hospital utilization rates¹, increased incidents of congenital heart defects (CHDs), neural tube defects (NTDs), oral clefts, preterm birth, and term low birth weight², and that residential UNGG activity metrics were statistically associated with increased risk of mild, moderate, and severe asthma exacerbations³. Numerous other newly released studies strongly support the need to enhance the protection of children from the environmental hazards resulting from UNGGP as they strongly suggest UNGGP poses a threat to children’s health.

In 2014, New York State (NYS) banned UNGGP based on its Department of Health study (*A Public Health Review of High Volume Hydraulic Fracturing for Shale Gas Development, December 2014*) which concluded there were too many uncertainties about both the potential adverse health and environmental outcomes and the ability for regulations to address health risks. We again urge MDE to ensure that no permits will be permitted in Maryland until the concerns raised in both the NYS Health Study and the MIAEH Report are addressed in our laws and regulations. Additionally, Pennsylvania and Oklahoma⁴ are now taking action to better manage their oil and gas exploration and production based on recent events including the massive increase in earthquakes.

In 2010 the Environmental Protection Agency (EPA) began its ‘*Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources*’. In June 2015, EPA released a draft assessment highlighting the potential impacts of hydraulic fracturing activities on drinking water resources in the United States. The assessment shows that hydraulic fracturing activities in the U.S. have “potential vulnerabilities in the water lifecycle that could impact drinking water. The assessment follows the water used for hydraulic fracturing from water acquisition, chemical mixing at the well pad site, well injection of

¹ **Citation:** Jemielita T, Gerton GL, Neidell M, Chillrud S, Yan B, Stute M, et al. (2015) Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. PLoS ONE 10(7): e0131093. doi:10.1371/journal.pone.0131093

² **Citation:** McKenzie LM, Guo R, Witter RZ, Savitz DA, Newman LS, Adgate JL. 2014. Birth outcomes and maternal residential proximity to natural gas development in rural Colorado. *Environ Health Perspect* 122:412–417; <http://dx.doi.org/10.1289/ehp.1306722>

³ JAMA Intern Med. doi:10.1001/jamainternmed.2016.2436 Published online July 18, 2016.

⁴ https://www.washingtonpost.com/national/health-science/earthquakes-decline-as-states-limit-disposal-wells-for-fracking-wastewater/2016/12/02/82f839f0-b7ec-11e6-a677-b608fbb3aaf6_story.html?utm_term=.d6b3419d2a9c accessed 12/06/16

fracking fluids, the collection of hydraulic fracturing wastewater (including flow back and produced water), and wastewater treatment and disposal⁵.” CEHPAC requests that MDE review and consider the recommendations in this EPA report to ensure that the most recent best practices are employed in under COMAR 26.19.01.

In 2008, Maryland released the ‘*Final Report of the Advisory Committee on the Management and Protection of the State’s Water Resources*’ (a.k.a. ‘*The Wolman Report*’). To date “approximately half of the goals outlined in the science plan have been met. To complete the effort and help insure a clean and adequate groundwater supply for the future of Maryland’s citizens a number of tasks must still be completed”⁶. “Groundwater supply in Maryland may be severely constrained in some areas in the future as a result of overuse of the aquifers and by poor water quality. Permitted withdrawals are assessed on an individual permit (well or well field) basis, while there is no systematic assessment of the effects from domestic withdrawals.

Currently, the cumulative impact of the many thousands of wells pumping from Maryland’s aquifers, or the extent to which the aquifers are being recharged (Coastal Plain region), is not being assessed. Additionally, water-level and water-quality monitoring to evaluate the health of the aquifers is inadequate in some areas.”⁷ CEHPAC requests that MDE ensure that the recommendations related to access to safe drinking water be addressed and protected prior to allowing and determining the sources of water necessary for Hydraulic Fracturing activities under COMAR 26.19.01.

In May 2014, The United States Government Accountability Office (GAO-14-430) issued a Report entitled ‘*FRESHWATER – Supply Concerns Continue, and Uncertainties Complicate Planning*’⁸ Maryland was specifically discussed on page 18; ‘Urban areas within central Maryland rely primarily on surface water reservoirs, and rural and exurban areas in the region rely on groundwater wells to meet their freshwater needs. The officials told us that there is little chance of building new surface reservoirs in the long term and therefore they expect increased groundwater use in this region; however, due to the region’s geology, it is not well suited for high production groundwater wells. These factors make it possible that some towns and small communities in the region may have difficulty finding sufficient water supplies to meet the needs of the growing population, according to the officials.’ CEHPAC urges MDE to ensure that the water needs related to permits issued under COMAR 26.19.01 do not impact the quality or quantity of the water supply for Maryland residents and other businesses.

Maryland’s legacy of mining (particularly in Western Maryland) resulted in unintended consequences related to abandoned mine lands and the resulting acid mine drainage. Maryland’s lack of knowledge of the impacts to public health and the environment during our ‘mining’ history has resulted in a serious and expensive legacy of acid mine drainage.⁹ Addressing the mining legacy has cost Maryland dearly. Parallels can be drawn with existing UNGDP accepted practices and their unintended consequences. . Our children will bear the future financial and health costs of these consequences. For example, states like Oklahoma followed the BMP of UIW to dispose of hazardous wastewater resulting in the earthquakes they now experience. CEHPAC requests that MDE review the proposed regulations and address

- the long-term unintended consequences,
- funding for oversight or remediation,
- if remediation is even possible (e.g. ground water contamination), and
- contingencies for worst case scenarios.

⁵ <http://www2.epa.gov/hfstudy/hydraulic-fracturing-water-cycle> accessed 12/07/16

⁶ <http://www.mgs.md.gov/groundwater/science%20plan.html> accessed 12/06/16

⁷ <http://www.mgs.md.gov/groundwater/gw-status.html> accessed 12/06/16

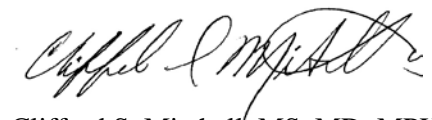
⁸ <http://www.gao.gov/assets/670/663343.pdf> accessed 12/06/16

⁹ (<http://www.mde.maryland.gov/programs/Land/mining/abandoned/Pages/AbandonedMineLandsDivision.aspx>) accessed 12/06/16

Experiences of other States that are already engaged in UNGDP and emerging scientific evidence are shedding a fresh light on the unintended consequences of UNGDP. The Aliso Canyon natural gas leak in California (near Los Angeles) released nearly 100,000 metric tons of methane into the atmosphere¹⁰ and impacting residential areas. Similarly, an April 2016 Study (Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites¹¹) released infrared camera surveys, conducted by helicopter, of more than 8,000 U.S. oil and gas well pads in a number of high producing regions found leaks at 327 pads (4 percent overall). It concluded that the EPA “may be underestimating” emissions caused by oil and gas tanks on these sites in particular. There is much we still do not know. There will be leaks.

Attached are CEHPAC’s specific comments and recommendations regarding the proposed regulation changes to COMAR 26.19.01. CEHPAC urges the MDE to favorably enact recommendations offered by the commission. The opinions of the Council expressed in this letter do not necessarily reflect that of the Department of Health and Mental Hygiene or any other State agency. CEHPAC looks forward to working with the MDE as well as the Governor and the General Assembly on this issue, and thanks you for your leadership with these new regulations.

Sincerely,



Clifford S. Mitchell, MS, MD, MPH
Chair, Children’s Environmental Health and Protection Advisory Council

Enclosure

cc: DHMH Secretary
MDE Secretary
Director, Office of Governmental Affairs
Deputy Secretary, Public Health Services
Director, Prevention and Health Promotion Administration

¹⁰ https://www.washingtonpost.com/news/energy-environment/wp/2016/04/13/the-most-important-mystery-about-u-s-climate-change-policy/?utm_term=.8140237df37a accessed 12/07/16

¹¹ <http://pubs.acs.org/doi/pdfplus/10.1021/acs.est.6b00705> accessed 12/06/16

CEHPAC understands that the standards are intended to provide a suite of best practices that are to be followed for oil and gas production in the Marcellus Shale in Maryland. We applaud MDE for taking action especially in light of the fact that there are no corresponding federal standards to rely on. We agree that the proposed regulations for oil and gas exploration and production will impact many different parties, both positively and negatively. Our concern is for the negative impact these will have on children, their access to clean water, soil, air, and food, as well as how it will impact their ability to grow into health and productive adults. *[Note: sequencing of concerns does not indicate priority.]*

- 1) CEHPAC is particularly concerned that the requirement for making information available to the medical community is inadequate. Toxicological information – including information deemed ‘trade-secrets’ - needs to be given to the regional poison control center. This is the place practitioners will turn for such information and assistance. Therefore, the regulation should have a sentence that reads:

Prior to the use of any hydraulic fracturing fluid use, the complete list of the solution’s contents (including items deemed ‘trade secrets’), with chemical names, CAS numbers and concentrations needs to be provided to the Maryland Poison Center.

- 2) Because water contamination will concern residents near wells, the companies need to regularly test a sampling of private wells and make available the names of accredited laboratories that can do independent testing for the compounds being used. Therefore, the regulation should have a sentence that reads:

Testing of a sampling of private wells, as well as wells that serve the public such as those used in public schools, needs to be performed at periodic times not to be less than yearly. The populace living near wells needs to have the names of accredited, independent laboratories that can assay all of the compounds being used in the wells of their region.

- 3) The proposed regulations indicate that not all impacts can be determined at this time, particularly concerning is the noted inability to calculate ‘Long-Term Impacts’. Prior to issuing any permits for oil and gas exploration and production, CEHPAC therefore requests that MDE determine real and actual impacts, both the direct, indirect and long-term effects on the public;

- (1) Health Protection
- (2) Drinking Water Protection
- (3) Natural Resource Protection
- (4) Environmental Protection
- (5) Impact to sensitive populations, especially children
- (6) Long-Term Impacts (as they may differ significantly from immediate impact)
- (7) Impacts and methods related to waste disposal – including all fluids and chemicals needed and used by permit holders

- 4) CEHPAC concerns reflect our mandate of protecting children health and their environment. The Department of Health and Mental Hygiene must engage in the decision making process. Namely we are calling for the impacts to public health not only to be assessed by the MDE and the Department of Natural Resources, but also by the Department of Health and Mental Hygiene. While we are encouraged by the call for baseline environmental assessment and monitoring, we ask that the baseline assessments include baselines and ongoing monitoring for health and exposure indicators. Equally important is the need to fund healthcare services once an incident has occurred. CEHPAC requests that 2015 baseline proposals be implemented rather than the 2016 baseline protocols.

The new regulations should reflect a source of funding for necessary remedies, when and if a negative impact is realized.

- 5) The proposed regulations outline some of the additional work for the Department in reviewing the Comprehensive Development Plans (CDPs). CEHPAC is concerned that the CDP only requires “plans for exploration and production in the Maryland portion of an oil- or gas-bearing formation for at least the **succeeding five years**”. CEHPAC requests that some provisions be included to address exploration and production in excess of five years as well as once the production is completed to ensure that the impact to Maryland’s air, water, soil, and public health will not become dangerous long after the permit has expired. CEHPAC requests that the 2015 Proposed CDP Review Process be implemented rather than the 2016 Suggested CDP Review Process. The public should have benefit of agency review prior to the public comment period.
- 6) The regulations proposed by MDE would be inadequate to address well casing failures, infrastructure inadequacies such as access to healthcare for a new worker population, or the lack of long-term research on health impacts. As an example, MDE’s action should ensure that Maryland’s acidic ground water will not compromise the abandoned oil and gas wells long after production has concluded, but while the residents of Maryland still rely on the surrounding groundwater as their sole source of drinking water. Additionally, this would include provisions related to the possible and probable seismic activity caused by an earthquake or vibration of the earth, whether due to natural or artificial causes (such as exploration of oil and gas in Marcellus Shale formations).
- 7) With the regulations outlining the additional work for the MDE, including the review of the CDP, the CEHPAC suggested two years of baseline data, and more detailed permit applications, as well as the additional work to monitor compliance with permit conditions, we are concerned that any additional costs to the Department for this work cannot be estimated unless the department takes action within these proposed regulations to identify sources of funding, that such funds may not be available when needed, leaving the children and residents unprotected.

We understand that the Environment Article, §14-105, Annotated Code of Maryland authorized the Department to assess permit and production fees in an amount necessary to operate the regulatory program, with a provision for annual adjustment. Sources of funding for continued monitoring and resources for remedies once an incident has occurred must also be addressed in the revised regulations as does funding for long-term oversight/impacts remediation.

- 8) The proposed regulations for allowing UNGDP to proceed in Maryland are particularly concerning because of the potential exposures to children, particularly but not exclusively;
 - **Proximity to drilling operations:** These regulations are not protective of children’s health because they call for *500 feet* setbacks from schools (for blasting), yet studies have now documented an increased incidence of skin and respiratory ailments in people living within 1 km (3280 ft) of drilling operations. Similarly, the regulations call for 2000 ft setbacks from private drinking water wells, yet studies have documented well contamination 1 km or more away. CEHPAC is particularly concerned about the reduction in setbacks in the 2016 proposed changes to COMAR 26.19.01.

In 2016 NIH published a Study “*Adequacy of Current State Setbacks for Directional High-Volume Hydraulic Fracturing in the Marcellus, Barnett, and Niobrara Shale Plays*”¹² with the conclusion “Our results suggest that setbacks may not be sufficient to reduce potential threats to human health in areas where hydraulic fracturing occurs. It is more likely that a combination of reasonable setbacks with controls for other sources of pollution associated with the process will be required.” CEHPAC requests that the higher setbacks proposed in the 2015 version of COMAR 26.19.01 be reinstated and improved upon based on the most recent science.

¹² <http://dx.doi.org/10.1289/ehp.1510547> accessed 12/06/16

- **Air Emissions:** These regulations are not protective of children’s health because exposure to air pollution is known to be an important factor for health risks. Shale gas development and production creates hazardous air pollution through numerous pathways including vehicle emissions, drilling, and emissions from processing & pipelining shale gas. Among these emissions are particulates and volatile organic compounds that exacerbate asthma and other respiratory conditions, contribute to poor birth outcomes, cardiovascular disease, cancers, and an array of other health problems over time. Benzene and formaldehyde are known carcinogens that have been documented near UNGDP operations.
 - **Vulnerabilities for Children:** Children are especially vulnerable to exposures from shale gas extraction because they take in more pollutants relative to their body size than adults; their organs are still developing; and may be more susceptible to damage. Cancers and chronic diseases that emerge in later life may be related to childhood exposures and interactions that are still poorly understood. While the regulations call for the use of technologies to limit air emissions, there is little empirical evidence that this will be sufficient to adequately protect children's health, nor is it clear there will be adequate oversight to ensure compliance.
 - **Disclosure of chemicals used in the UNGDP processes:** CEHPAC requests full disclosure of chemicals used in the UNGDP process. CEHPAC requests more safeguards against children's possible exposures since many chemicals in UNGDP fluids are known carcinogens, neurotoxins, and endocrine disruptors, as well as chemicals whose effects are unknown. MDE should request that “Trade Secret” status be waived by permit applicants in order to protect public health and natural resources (including air, water and soil).
- 9) Regarding *Economic Impacts* sections of the Proposed Actions Document – There is no evidence presented that there “will be positive economic impacts to the residents in Garrett and Allegany Counties by enacting these more stringent regulations”. Nor that the regulations will “minimize the impacts from drilling to public health, safety, the environment and natural resources in these two Counties”. We believe additional regulations must be adopted in order to accomplish the goal of minimizing these impacts so that the general citizenry of the two Counties will benefit from enhanced public health protection and safety, including better protections for air quality and sources of drinking water. With these added regulations we believe, additionally, the “natural environment of the two Counties will be better protected, including forests, rivers, streams and other water bodies, wildlife, flora and fauna”.
- 10) There is no evidence presented that the proposed regulations will actually benefit the “intended beneficiaries of the proposed regulations”. Please provide evidence on how the residents of and visitors to Garrett and Allegany Counties (identified as beneficiaries) will benefit, particularly since these beneficiaries are identified by MDE as primarily households – presumably many of whom have children in their homes.
- 11) CEHPAC does not believe there is sufficient evidence for the MDE to conclude that there will be “no impact on individuals with disabilities”. Please provide CEHPAC with the data to support this conclusion as it does not correspond with information generally available on this matter.

12) CEHPAC requests expanded protections for all water sources, including but not limited to drinking wells, recreational bodies of water, etc. The proposed regulations *takes no action to deny a permit due to risk to well water for households, schools, etc.* It (.17.D) simply states that the “*The Department shall deny a drilling and operating permit if the Department determines that the proposed activities pose a substantial threat to public health or safety or a risk of [significant] adverse environmental impact particularly to:*

- (1) *The Critical Area;* [question – where is ‘The Critical Area’ defined?]
- (2) *Tidal or nontidal wetlands;*
- (3) *Endangered or threatened species, or species in need of conservation of their habitat;*
- (4) *Historic properties as provided for in State Finance and Procurement Article, §5A-326, Annotated Code of Maryland; or*
- (5) *Populated areas.*

Also, please delete ‘significant’ as it is not defined and open to interpretation. 2015 version did not include the word ‘significant’ rather it referred to ‘environmental damage’

13) CEHPAC requests that MDE address requirements for waste water processing. Of the more than 80,000 synthetic chemicals in use today, few have been tested to determine what effect they have on humans, and the impacts on children is even less documented. MDE must take additional actions to identify and document the means of processing all waste water as it is potentially dangerous due to its chemical content. This is especially necessary since current municipal water-filtration methods cannot remove many of these chemicals, nor is it a US EPA requirement. A recent USGS study of rivers, including the Potomac, reported the same concentrations of some chemicals in the river water before and after it went through a waste water treatment plant. Maryland must ensure that our drinking water is safe after a permit is issued regardless of whether we obtain our water from a ground source, a water-treatment plant or a reservoir. Children are more sensitive at very low levels of contamination and have a longer time to present symptoms of an exposure. We owe our children clean water, soil, air and good health.

14) CEHPAC thanks the MDE for their proposed change to the Title 26 Subtitle 08 Water Pollution Chapter 07 Underground Injection Control, specifically that "a person may not construct a Class II underground injection well in Maryland". While this option for disposing of the wastewater (or flow back) from the 'fracking' operation is good, it leaves open the issue of what Maryland should do with any resulting fracking wastewater or any other hazardous water from the UNGDP that must be disposed of in a safe manner. CEHPAC requests that the issue of disposing of waste water be addressed prior to issuing any permits under COMAR 26.19.01.