

August 12, 2015

George Augustine, Chairman
Frank Zuzek, Vice-Chairman
Rich Berteotti, Secretary
Anthony Menosky, Alternate

Cc: Bruce Bosle, Director of Zoning
Jeff Reis, Zoning Board solicitor

Cecil Township
3599 Miller's Run Rd, Cecil Pa 15321

Dear Cecil Township Zoning Hearing Board members:

The undersigned representatives of environmental and citizens organizations are members of the Pennsylvania-based Protect Our Children Coalition (www.protectourchildrencoalition.org), which is dedicated to protecting school children from the health risks of shale gas drilling and infrastructure. We are writing to you concerning MarkWest Liberty Midstream and Resource's Conditional Use Permit to construct a compressor station near Routes 980 and 50 in Cecil Township.

We applaud the Zoning Board for including conditions in the permit that are designed to reduce pollution and protect quality of life for the residents of Cecil Township. Doing so reflects both the substance and spirit of the Township's Ordinance providing for the zoning of natural gas compressor stations, adopted in 2011. As determined by the Pennsylvania Supreme Court in 2013 with regard to Act 13 (the Oil and Gas Act), municipalities have the right to adopt and uphold local ordinances pertaining to oil and gas operations.

We strongly encourage you to stand firm on the two key conditions that MarkWest is now seeking to overturn: the use of electric engines and air quality testing at the site both prior to and during operations.

We believe such conditions to be reasonable and necessary for protecting public health. We also believe that the elimination of these conditions from MarkWest's permit would signal support for the company's interest in convenience and cost savings over the public's interest in clean air and health. Following are detailed comments and information related to the need to uphold these conditions.

Use of electric engines

Internal combustion engines operating on diesel fuel or natural gas are noisy, cause odors, and release hydrocarbons and methane. These emissions contain volatile organic compounds (VOCs) that can result in respiratory, neurological, and other health problems. A VOC particularly linked to internal combustion engines is nitrogen oxide (NOx), which combines with sunlight to form ozone (smog), a pollutant that can impair breathing, aggravate asthma and, over time, permanently damage lungs.¹

Children are particularly vulnerable to pollution because they have still-developing organs and limited immune systems; they also have a higher respiratory rate, spend more time outdoors, and are more active than adults.² Importantly, the United States Environmental Protection Agency (EPA) classifies all of Washington County, Pennsylvania as being in “non-attainment” for federal ozone standards.³ The proliferation of oil and gas activities may well be exacerbating this problem and increasing the risks of negative health impacts on Cecil Township residents, in particular children. As you are surely aware, MarkWest’s proposed location for the compressor station is less than one mile from the approximately 400 students who attend Cecil Intermediate School.

A 2009 study estimated that gas compressor engines in the Dallas-Ft. Worth area emitted 65 tons per day of smog-forming compounds—the equivalent of about a third of all oil and gas emissions in the area and three times the smog-forming emissions coming from the area’s airports.⁴ The same study concluded that the use of electric engines instead of internal combustion engines would greatly decrease levels of emissions and ozone, while also decreasing costs for operators over time.

Similarly, a research report developed for the Maryland Department of the Environment emphasized the use of electric engines to operate compressors as a recommended best management practice for Marcellus Shale operators.⁵ In addition, Dresser-Rand, a leading supplier of oil and gas field equipment, has stated that electric engines significantly reduce noise and emissions, and that operators may use them in recognition of the “environmental and aesthetic concerns” of communities along pipeline projects (i.e., in compressor stations).⁶

On the federal level, the installation of electric compressors is a recommended practice in the EPA’s Natural Gas STAR program, since such engines reduce the leakage of methane (and therefore VOCs), while also requiring less maintenance and improving efficiency for operators.⁷ The program encourages operator adoption of cost-effective emission reduction technologies and practices. Gas STAR guidelines were developed in partnership with nearly 30 oil and gas production companies.⁸ In July, EPA announced the launch of the “Methane Challenge” program to gain greater commitment by operators to adopt best management practices.⁹

In its Natural Gas STAR program, EPA estimates that using electric compressors will save 32,800 thousand cubic feet (Mcf) of methane per station per year.¹⁰ Using EPA’s global warming potential for methane (currently 25 to 36 over a 100 year time period) this amounts to about 690 tons of methane, or between 17,250 to 24,840 tons of carbon dioxide equivalent (CO_{2e}) per year.^{11 12} This is a significant reduction in methane emissions, equivalent to taking about 3,300 to 4,700 cars off the road.¹³ The use of electric engines would also greatly reduce the amount of VOCs emitted and leaked from the facility.

Notably, MarkWest does not participate in the Gas STAR program; nor does MarkWest appear (based on its website and public communications) to follow any established best practices in its operations. However, Marathon Petroleum Corporation, which just purchased MarkWest Energy Partners in July, has been a Gas STAR program partner since 2006. In light of this, Cecil Township’s condition for the use of electric engines is consistent with the commitment made by MarkWest’s new parent company to the Gas STAR program and emission reductions.

This condition is also consistent with broader efforts to reduce methane and VOC emissions. EPA will soon issue a set of Control Techniques Guidelines for use by the oil and gas industry to reduce VOC emissions; states will be required to follow these guidelines in order to meet federal ozone standards.¹⁴ In addition, both EPA and the State of Pennsylvania are currently developing new

methane emission rules for the oil and gas sector, which could result in the more widespread adoption of pollution reduction strategies.

Electric compressor stations will increase demand on power generation stations that would normally be met on-site; this increase in energy demand means an increase in the amount of natural gas or coal burned at these larger power generation stations. There are advantages in regulating one major source of pollution—such as a power plant that would produce electricity needed at electric compressor stations—as opposed to multiple, spread out minor sources of pollution like gas-fired compressor stations. Minor sources have less stringent standards that are often harder to enforce than major sources of pollution.¹⁵ Power plants are typically classified as major sources and as such are more tightly regulated. Reducing emissions caused by an increase in electricity demand will be easier than trying to curb emissions from hundreds of less-regulated, smaller, geographically spread out compressor stations.

As the new national Clean Power Plan phases in, it will phase out or improve coal-fired or other high emission power plants, favoring lower carbon-emitting natural gas and cleaner renewable energy generation options.¹⁶ A compressor station is a long-term investment and some have been in operation for 30 to 50 years.¹⁷ As the electric grid emits less and less air pollution over time, natural gas-fired compressor stations will most likely continue to emit the same levels of air pollution. However, air pollution associated with electric compressor stations will improve as the electrical grid improves over time and is based on lower-emission energy sources. Electric stations provide a more versatile option for a constantly shifting energy landscape that will likely include a lot more renewable energy.

Due to the reduction in combustion emissions, methane leaks, better and increased regulation and enforcement ability, and the phase-in of more efficient and less polluting energy sources, electric compressor stations are a logical choice for reducing emissions if a facility has to be built in the first place. Electric engines are a sound choice for most new compressor station construction, and as updates for older natural gas-fired stations. Using electric compressor stations in place of a planned gas-fired station will curb greenhouse gas emissions and improve local air quality.

Air monitoring

A 2013 study by the RAND Corporation found that when compressor stations operate below capacity, they fall at the lower end of estimated emissions—but when they operate at full capacity, actual emissions can be higher than estimates stated in permit applications.¹⁸ In addition, the study found that more than half of the total costs of air quality damage from shale gas operations in Pennsylvania could be attributed directly to compressor stations.¹⁹

It is therefore not surprising that the Pennsylvania Department of Environmental Protection (DEP) has received many complaints from residents living near compressor stations, including strong odors, respiratory problems, and throat irritation. Air testing and health surveys conducted by Earthworks in 2012 and 2013 has confirmed that the problems reported by residents near compressor stations are consistent with the scientifically established health effects of the chemicals detected at their homes.²⁰ A growing body of scientific evidence confirms the connection between gas and oil wells and facilities and the health problems experienced by nearby residents, including dizziness, headaches, nausea, fatigue, and nosebleeds.²¹

Yet despite these clear and growing trends, neither the DEP nor oil and gas operators currently conduct regular air monitoring near well sites and facilities to measure local air pollution or spikes in levels of emissions that could result in acute health risks. At the same time, most required air monitoring by state and federal agencies occurs in highly populated areas—not the locations in which much gas and oil activity in Pennsylvania is now taking place.

A lack of regular air monitoring close to wells and facilities is clearly a large gap in efforts to protect air quality and public health. Given this, Cecil Township is right to include air monitoring in permit conditions. The Township is certainly not alone in this request; other municipalities have called for both baseline air testing and ongoing monitoring, which is a recognized way to support public needs and transparency while permitting operations.²²

In addition, the State Review of Oil and Natural Gas Environmental Regulations (STRONGER) issued New Air Quality Program guidelines in 2014. The guidelines emphasize that, “Air quality monitoring is an essential tool both to determine compliance with National Ambient Air Quality Standards and to assess the impact of air pollution sources on air quality. State programs should have an air quality monitoring network in place that meets these needs.”²³ Pennsylvania was the first state to participate in a STRONGER air program review, which took place in July; a final report with recommendations for regulatory changes will be issued by the end of 2015.

Currently, oil and gas operators in Pennsylvania are required to report emissions to DEP for inclusion in the state’s emissions inventory on an annual basis, which has the effect of averaging out potential spikes in air pollution due to data being totaled over long periods of time. While this may comport with current state and federal requirements to track certain pollutants, it fails to account for actual air exposures experienced on the community or individual level. Emerging environmental health research confirms that spikes in air pollution and episodic emission events can cause health impacts immediately or in as little as 1-2 hours, while continuous exposure to even low levels of a mix of chemicals can also have negative effects.²⁴

We strongly support Cecil Township’s condition for air monitoring, both before compressor station operations begin (i.e., to establish a baseline) and at different times of operations (e.g., at times of low- and high-capacity and during blowdowns). As Cecil Township envisions, independent third parties, such as research organizations or academic institutions, should conduct the monitoring.

To ensure accurate data collection, multiple fenceline monitors should be placed in positions around the proposed compressor station that take into account site layout, topography, weather and wind conditions, and the location of impacted residents (including students at Cecil Intermediate School).

Importantly, air monitoring data would give MarkWest and DEP the opportunity to correct problems that may result in pollution and harm health. For example, operators can adopt technologies and change practices in order to capture methane, reduce the frequency and intensity of blowdowns, and eliminate leaks from pipes and equipment.

With a Forward Looking Infrared (FLIR) camera, Earthworks has documented emissions occurring at a variety of oil and gas wells and facilities in several states. The camera is the same kind used by regulators and the industry to identify problems at facilities and is calibrated to distinguish between heat and emissions and to detect the presence of gases that may be in the air, including methane and VOCs.²⁵ In April, Earthworks filmed conspicuous emission plumes during normal operations at several sites in Pennsylvania, including from stacks and engines at compressor

stations operated by MarkWest.²⁶

In closing, we again wish to express strong support for Cecil Township's position that MarkWest must adhere to certain conditions in order to operate a compressor station. The information presented in this letter indicates that it is reasonable to expect MarkWest to install electric engines and allow air monitoring.

The oil and gas industry often emphasizes the commitment of companies to "best management practices" and "performance standards" designed to limit pollution. Given this, Cecil Township is simply asking MarkWest to put such words into action—thereby helping to ensure that Township residents do not end up paying the true cost of the company's operations with their health and well-being.

Thank you for your time and consideration. If you have any questions or would like additional information, please feel free to contact Nadia Steinzor, Eastern Program Coordinator, Earthworks, at nsteinzor@earthworksaction.org, 202-887-1872, ext. 109; or Matt Walker, Community Outreach Director, Clean Air Council, at mwalker@cleanair.org, 215-567-4004, ext. 121.

Sincerely,

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¹ EPA, Air Quality Index, A Guide to Air Quality and Your Health. 2009.
http://www.epa.gov/airnow/aqi_brochure_08-09.pdf, at 5-6.

² Southwest Pennsylvania Environmental Health Project. Fact sheets on children's health and school-related exposure. <http://www.environmentalhealthproject.org/resources/handouts-and-factsheets/>

³ EPA, "Mid-Atlantic Region 1997 8-hour ozone standards Nonattainment and Maintenance Areas."
http://www.epa.gov/reg3artd/airquality/ozone8hrmaintareas_2.htm

⁴ Al Armendariz, *Emissions from Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements*. Report for Ramon Alvarez, Environmental Defense Fund. 2009.
<http://www.edf.org/news/report-finds-barnett-shale-emissions-contributing-dfw-smog>

⁵ Keith N. Eshleman and Andrew Elmore. *Recommended Best Management Practices in Marcellus Shale Gas Development in Maryland*. Final Report for the Maryland Department of the Environment. 2013.

⁶ "New DATUM-C Electric Motor-Driven Compressor Provides Quiet, Emission-Free Solution For Natural Gas Pipeline Applications." *Insights*, Vol. 8, No.1. 2005.

⁷ EPA Gas STAR Partner Reported Opportunities for Reducing Methane Emissions. Fact Sheet No. 103, "Install Electric Compressors." <http://www.epa.gov/gasstar/tools/recommended.html>

⁸ EPA Natural Gas STAR Partners. <http://epa.gov/gasstar/partners/index.html>

⁹ EPA. Natural Gas STAR Methane Challenge Program: Proposed Framework.
http://www.epa.gov/gasstar/documents/methane_challenge_proposal_072315.pdf

¹⁰ EPA Gas STAR Partner Reported Opportunities for Reducing Methane Emissions. Fact Sheet No. 103, "Install Electric Compressors." <http://www.epa.gov/gasstar/tools/recommended.html>

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- ¹¹ 40 CFR Part 98 Subpart A Table A-1: Global Warming Potentials [100-Year Time Horizon]. http://www.ecfr.gov/cgi-bin/text-idx?SID=84232bd907105b7c617426d67cbb3ff2&mc=true&node=ap40.21.98_19.1&rgn=div9
- ¹² EPA. "Understanding Global Warming Potentials." <http://www.epa.gov/climatechange/ghgemissions/gwps.html>
- ¹³ EPA. Greenhouse Gas Equivalencies Calculator. <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>
- ¹⁴ EPA. "EPA's strategy for reducing methane and ozone-forming pollution from the oil and natural gas industry." <http://yosemite.epa.gov/opa/admpress.nsf/0/BA7961BF631C87BF85257DCD00526FF7>
- ¹⁵ John R. Jacus. *Developments and Trends in Clean Air Act Source "Aggregation"*. February 28-March 1, 2013. <http://www.dgslaw.com/images/materials/Jacus-RMMLF-010313.pdf>
- ¹⁶ EPA. 40 CFR Part 60: Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Final Rule. <http://www.epa.gov/airquality/cpp/cpp-final-rule.pdf>
- ¹⁷ Interstate Natural Gas Association of America. Interstate Natural Gas Pipeline Efficiency. <http://www.ingaa.org/file.aspx?id=10929>
- ¹⁸ Aviva Litovitz et al. "Estimation of Regional Air Quality Damages from Marcellus Shale Natural Gas Extraction in Pennsylvania." *Environmental Research Letters*, Vol. 8, No. 1. 2013.
- ¹⁹ Ibid.
- ²⁰ Nadia Steinzor, Wilma Subra, and Lisa Sumi. "Investigating Links Between Shale Gas Development and Health Impacts through a Community Survey Project in Pennsylvania." *NEW SOLUTIONS*, Vol. 23(1) 55-83, 2013. See also Case Studies #1 and #6 documenting emissions and related health impacts in Greene and Fayette Counties, Pennsylvania, in Earthworks' 2014 research report *Blackout in the Gas Patch*, <http://blackout.earthworksaction.org>
- ²¹ See for example, T. Colborn, K. Schultz, L. Herrick, and C. Kwiatkowski. "An exploratory study of air quality near natural gas operations." *Human and Ecological Risk Assessment: An International Journal*, 2013; and Lisa M. McKenzie, Roxana Z. Witter, Lee S. Newman, and John L. Adgate. "Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources." *Science of the Total Environment*, 2012.
- ²² See for example the resolution adopted by Westchester County, New York regarding compressor station development at <https://sape2016.files.wordpress.com/2014/05/080414-wcbol-resolution-no-80-2014-requesting-due-diligence-on-environment-p.pdf>; and the Union of Concerned Scientists' toolkit for municipalities, including how to ensure environmental monitoring and testing, at <http://www.ucsusa.org/sites/default/files/legacy/assets/documents/center-for-science-and-democracy/fracking-informational-toolkit.pdf>.
- ²³ STRONGER, Inc. Air Quality Program Guidelines (Section 10). 2014. <http://strongerinc.org/>
- ²⁴ David Brown, Beth Weinberger, Celia Lewis, and Heather Bonaparte, "Understanding exposure from natural gas drilling puts current air standards to the test," *Rev. Environmental Health* 2014, available at <http://www.environmentalhealthproject.org/wp-content/uploads/2014/04/reveh-2014-0002-Brown-et-al.pdf>.
- ²⁵ Earthworks, Fact Sheet on the FLIR Gasfinder 320 Infrared Camera. https://www.earthworksaction.org/library/detail/flir_gasfinder_320_infrared_camera
- ²⁶ These include the Welling and Day compressor stations in Washington County and the Trillith compressor station in Butler County. See the videos in the Pennsylvania playlist of Earthworks' Citizens Empowerment Project YouTube page: <http://bit.ly/CEP-PA>.