

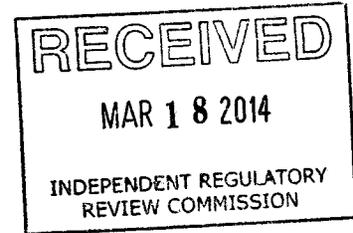
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Submitted by Electronic Mail to RegComments@pa.gov

March 13, 2014

Environmental Quality Board
P.O. Box 8477
Harrisburg, PA
17105-8477



Re: Proposed Chapter 78 Oil and Gas Surface Regulations

Dear Environmental Quality Board:

The Clean Air Council (Council) hereby submits the following comments in response to the Environmental Quality Board's (EQB) proposed revisions to the oil and gas surface activities regulations, 25 Pa. Code. Ch. 78 (Chapter 78).

The Council is a non-profit environmental organization headquartered at 135 South 19th Street, Suite 300, Philadelphia, Pennsylvania 19103. For more than 40 years, the Council has fought to improve air quality across Pennsylvania. The Council has members throughout the Commonwealth who support its mission to protect everyone's right to breathe clean air.

We greatly appreciate the opportunity to comment on the EQB's proposed revisions to Chapter 78. While we are encouraged by the EQB's efforts to improve the regulation of oil and gas activities, we strongly believe that the proposed revisions must be broadened and strengthened. Here, we focus only on the regulation of open pits.

The EQB's proposed revisions allow for the storage of toxic drilling waste and flowback in open pits. Open pits pollute the air and create a significant risk of water contamination. Fortunately, prohibiting open pits—from the natural gas extraction industry's perspective—is both financially and technically feasible. Pennsylvania's Constitution and sound public policy demand that the EQB enact an outright ban on open pits.

An analysis of the text of the proposed revisions at issue, the EQB's obligations under the Pennsylvania Constitution, the environmental harms caused by open pits, and the feasibility of instituting a ban will each be explored below.

I. The Proposed Revisions on Open Pit Storage Must Be Strengthened and Clarified

The EQB's proposed regulations allow for the storage of toxic material associated with natural gas extraction in open pits. To the extent that it was the EQB's intent to prohibit the storage of brine and other drilling waste in open pits, the proposed revisions need to

be strengthened and clarified. If instead the EQB insists on allowing open pits, but is committed to restricting their use to a purely temporary basis, then a maximum allowable time must be set.

A pit is defined in the proposed revisions, in part, by its role as a means for storage of “fluids, semi-fluids or solids associated with oil and gas activities, including but not limited to fresh water, wastewater, flowback, mine influenced water, drilling mud and drill cuttings...”¹ Section 78.56, outlining the temporary storage requirements, directs well operators to “contain regulated substances...including brines, drill cuttings, drilling muds, oils, stimulation fluids, well treatment and servicing fluids, plugging and drilling fluids other than gases in a pit, tank or series of pits and tanks...”² Despite this language indicating that drilling waste and flowback can be stored in open pits, the proposed revisions adds the following prohibition, “Open top structures shall not be used to store brine and other fluids produced during operation of the well.”³ At first glance, this addition provides exactly what we seek, namely, a ban on open pits. But the next paragraph appears to walk back the restriction; it reads, “**Except as provided in § 78.56** (relating to pits and tanks for temporary storage), the operator may not use a pit for the control, handling or storage of brine and other fluids produced during operation, service or plugging of a well.”⁴ The exception highlighted in § 78.57(b) re-opens the door prudently closed by § 78.57(a) in allowing for the “temporary” storage of drilling waste and flowback.

The Pennsylvania Department of Environmental Protection (PA DEP)’s Regulatory Analysis Form states, “[t]he proposed regulation eliminates the use of pits to store produced fluids (brine)”, but the proposed revisions do not make this clear.⁵ If it was the EQB’s intent to prohibit the storage of brine and other fluids produced during drilling in open pits, then the regulations must be clarified. If this was not the EQB’s intent, then it should be. The EQB must ban open pits without any exceptions for temporary use.

Should the EQB insist on permitting temporary open pits, then a maximum allowable time must be set. The proposed regulations require pits to be removed or filled within 9 months after drilling is complete, or longer should the Department grant an extension.⁶ Drilling is not considered complete until the owner or operator drills *all* permitted wells at a given site.⁷ The use of multi-well pads—drilling multiple wells from a single site or pad—has been increasing in Pennsylvania. In 2011, 83% of wells were located at a multi-well pad, with the average number of wells per pad steadily rising over time.⁸ In Pennsylvania, as many as 12 wells can be drilled

¹ Env’tl. Quality Board, *2013 Proposed Rulemaking to Amend Chapter 78* [hereinafter *Proposed Rulemaking*], 25 Pa. Code § 78.1.

² § 78.56(a).

³ § 78.57(a).

⁴ § 78.57(b) (emphasis added).

⁵ Dep’t of Env’tl. Protection, *Regulatory Analysis Form: Environmental Protection Performance Standards at Oil & Gas Sites 7* (2013) [hereinafter *Regulatory Analysis Form*].

⁶ *Proposed Rulemaking*, 25 Pa. Code § 78.56(d).

⁷ § 78.65(d).

⁸ Jim Ladlee, et al., *The Implications of Multi-Well Pads in the Marcellus Shale*, RESEARCH & POLICY BRIEF SERIES, Sept. 2011, available at

from a single site.⁹ Looking at the same shale formation, the New York State Department of Environmental Conservation predicts that 6 to 10 wells will be drilled from a single pad should further development be allowed in New York.¹⁰ Thus, we can expect that multiple wells will be drilled from each pad, and as a consequence, drilling may not be considered complete for years during which time open pits can remain unfilled.

An open pit which can be left unfilled for years on end cannot be called “temporary.” To do so is to ignore the ordinary meaning of the word. To avoid such an absurd result, the EQB must set a clear cap on the amount time a pit can be open before it must be filled or removed. Drilling a well only requires 18-to-25 days,¹¹ and an open pit used to store drilling waste can be filled or removed soon thereafter. Acknowledging the realities of drilling operations, and that unexpected delays may occur, the Council urges the EQB to require that all open pits be filled or removed within 90 calendar days of construction.

II. Environmental Rights Amendment

Article 1, Section 27 of the Pennsylvania Constitution imposes an obligation upon the EQB to act as trustee for Pennsylvania’s public natural resources.¹² These resources include, “not only state-owned lands, waterways, and mineral reserves, but also resources that implicate the public interest, such as ambient air, surface and ground water, wild flora, and fauna (including fish) that are outside the scope of purely private property.”¹³ The Constitution directs the EQB to “conserve and maintain [these resources] for the benefit of all people.”¹⁴ In revising Chapter 78, the EQB must consider this constitutional requirement and craft regulations that protect the corpus of the trust by preserving Pennsylvania’s natural resources.

Open pits needlessly threaten Pennsylvania’s public resources. We urge the EQB to faithfully discharge its duty as trustee by imposing a ban on open pits.

III. Open Pits Harm Human Health and the Environment

Open pits used to store drilling waste and flowback cause significant harms to human health and the environment. Open pits pollute the air by emitting polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and radionuclides. In addition, storage of waste in open pits greatly increases the risk of water contamination.

<http://cardi.cornell.edu/cals/devsoc/outreach/cardipublications/loader.cfm?csModule=security/getfile&PageID=1016988>.

⁹ *Id.*

¹⁰ *Id.*

¹¹ See, e.g., Chief Oil & Gas LLC, Marcellus Shale FAQ, http://www.chiefog.com/marcellus_shale_faq.html.

¹² Pa. Const. art. I, § 27. See *Robinson Tp. v. Commonwealth*, 83 A.3d 901, 957-59 (Pa. 2013) (plurality opinion).

¹³ *Robinson Tp.*, 83 A.3d at 955

¹⁴ Pa. Const. art. I, § 27.

A. Air Pollution

Whether they are water-based or oil-based, U.S. EPA reports that drilling muds typically contain a range of extremely toxic constituents, including heavy metals like cadmium, mercury and arsenic; PAHs like naphthalene, fluorene and phenanthrene; and non-conventional organic pollutants including alkylated benzenes and dibenzothiophenes.¹⁵ Many of these chemicals are VOCs, which evaporate readily into the atmosphere even under normal air pressure and temperature conditions.¹⁶

Flowback from hydraulic fracturing is also a source of air pollution. Methanol and naphthalene, designated HAPs under the Clean Air Act,¹⁷ and glutaraldehyde, a non-criteria air contaminant regulated by the New York Department of Environmental Conservation (NY DEC),¹⁸ are all found in hydraulic fracturing fluid additives and are emitted into the air at significant levels when flowback is stored in open pits.¹⁹

In a Draft Supplemental Environmental Impact Statement assessing the impacts of Marcellus Shale development, the NY DEC found that open pits can emit HAPs at levels that exceed the state's ambient air quality thresholds.²⁰ The VOCs that are emitted may remain present in the lower troposphere after evaporation,²¹ and can be transported by wind to nearby neighborhoods, producing offensive odors for local residents, and potentially neurotoxic effects on drilling workers in the immediate vicinity.²² Further, there may be risks where open pits are located near

¹⁵ U.S. ENVTL. PROT. AGENCY, OFFICE OF COMPLIANCE, SECTOR NOTEBOOK PROJECT: PROFILE OF THE OIL & GAS EXTRACTION INDUSTRY ("U.S. EPA OIL & GAS PROFILE") 57-58 (2000), EPA/310-R-99-006, *available at*

<http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/oilgas.pdf>.

¹⁶ Judi Krzyzanowski, *Environmental Pathways of Potential Impacts to Human Health from Oil & Gas Development in Northeast British Columbia, Canada*, 20 ENVTL. REV. 122, 126 (2012).

¹⁷ 42 U.S.C.A. § 7412 (West 2014).

¹⁸ NEW YORK STATE DEP'T ENVTL. PROT., DAR-1 AGC/SGC TABLES (2010), *available at* http://www.dec.ny.gov/docs/air_pdf/agcsgc10.pdf.

¹⁹ NEW YORK STATE DEP'T ENVTL. CONSERVATION, DIV. MINERAL RES., DRAFT SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS AND SOLUTION MINING REGULATORY PROGRAM: WELL PERMIT ISSUANCE FOR HORIZONTAL DRILLING AND HIGH-VOLUME HYDRAULIC FRACTURING TO DEVELOP THE MARCELLUS SHALE AND OTHER LOW-PERMEABILITY GAS RESERVOIRS 6-90 (2009) [hereinafter Draft SGEIS].

²⁰ *Id.*

²¹ Sahu, L.K. *Volatile Organic Compounds and Their Measurements in the Troposphere*, 102 CURRENT SCI. 1645 (2012), *available at*

<http://www.currentscience.ac.in/Volumes/102/12/1645.pdf>.

²² Earthworks, Sources of Oil & Gas Air Pollution,

http://www.earthworksaction.org/issues/detail/sources_of_oil_and_gas_air_pollution#UvuUbkJdXt9 (last visited Mar. 14, 2014); INT'L PETROLEUM INDUS. ENVTL. CONSERVATION ASSOC. & INT'L ASSOC. OF OIL AND GAS PRODUCERS, DRILLING FLUIDS & HEALTH RISK MANAGEMENT 7-9 (2009), *available at* <http://www.ogp.org.uk/pubs/396.pdf>.

agricultural fields, because airborne PAHs—such as those found in hydraulic drilling muds—can be absorbed directly into crop foliage, producing a possible pathway for the introduction of these toxic chemicals into the food supply.²³ The toxic pollutants found in drilling waste and flowback must not be left in the open air to evaporate freely.

B. Radioactivity

The high levels of radioactivity present in drilling waste and flowback is also a major cause for concern. The U.S. EPA states, “When companies drill for gas or oil, the produced fluids, including water, may contain radionuclides, primarily radium-226, radium-228, and radon. The radon gas may be released into the atmosphere, while the produced water and mud containing radium are placed in ponds or pits for evaporation, re-use or recovery.”²⁴ The prevalence of radioactive material produced by the natural gas drilling industry has not gone unnoticed.²⁵ In 2012, nearly 1,000 trucks in Pennsylvania carrying 15,769 tons of gas drilling waste—mostly drill cuttings—were stopped at landfill entrance gates for exceeding radioactivity detection limits.²⁶ If the waste is radioactive when it left the well pad, then it was certainly radioactive when it sat in an open pit awaiting disposal. Allowing radioactive drilling waste and flowback to evaporate from open pits presents serious risks to human health and the environment.

C. Surface Water Contamination

Open pits too frequently cause contamination of local surface water. For instance, attempts to protect against leaks through linings and requiring the diversion of stormwater have been unsuccessful. In 2013, the State Review of Oil and Natural Gas Environmental Regulations Board found that in Pennsylvania many liner failures occur.²⁷ The experience of other states with stormwater diversion requirements indicates that rainwater and runoff are difficult to control and that berms designed to divert precipitation are often insufficient. In North Dakota, documented stormwater overflows at the Hofflund Wildlife Management Area, Lostwood National Wildlife Refuge, and the city of Ray resulted in significant overflows of reserve pits and costly cleanup.²⁸ Concerns about environmental contamination from the overflows of open

²³ Krzyzanowski, *supra* note 16, at 129.

²⁴ U.S. ENVTL. PROT. AGENCY, RADIOACTIVE WASTE FROM OIL & GAS DRILLING 1 (2006), EPA 402-F-06-038, available at <http://www.epa.gov/radtown/docs/drilling-waste.pdf>.

²⁵ Anya Litvak, *Marcellus Shale Waste Trips More Radioactivity Alarms Than Other Products Left at Landfills*, PITTSBURGH POST-GAZETTE, Aug. 22, 2013, available at <http://www.post-gazette.com/marcellusshale/2013/08/22/Marcellus-Shale-waste-trips-more-radioactivity-alarms-than-other-products-left-at-landfills/stories/201308220367>.

²⁶ *Id.*

²⁷ State Review of Oil and Natural Gas Environmental Regulations, Inc., Pennsylvania Follow-up State Review, September 2013, Finding III.4, available at <http://strongerinc.org/sites/all/themes/stronger02/downloads/Final%20Report%20of%20Pennsylvania%20State%20Review%20Approved%20for%20Publication.pdf>.

²⁸ MIKE MCENROE & AL SAPA, OBSERVATIONS & RECOMMENDATIONS TO REDUCE FISH & WILDLIFE IMPACTS FROM OIL & GAS DEVELOPMENT 5-6, 8 (2011), available at <http://joomla.wildlife.org/NorthDakota/images/Documents/oilgas11.pdf>.

pits led the state of North Dakota to adopt new regulations banning the use of open pits in January 2012.²⁹

D. Low Levels of Industry Compliance

The open pit regulatory revisions proposed by the EQB in § 78.56 are inadequate given the documented low rates of compliance with existing environmental regulations by those in the drilling industry. U.S. EPA Region 8 conducted a comprehensive study of 475 hydraulic drilling sites in Midwestern states between 1996 and 2002, a sample size which represented between fifteen to twenty-two percent of the oilfield pits in the region.³⁰ The study found violations of a broad range of oil and gas regulations at 100% of the commercial facilities that were visited, and at 61% of the production operations sites.³¹ Violations included inadequate wildlife exclusion devices, leaks and spilling, the absence of secondary containment measures, and improper pit siting—even though most operators were warned in advance that EPA agents were planning to visit.³² Allowing open pits subjects the residents of Pennsylvania to unnecessary environmental risks.

Based on the undersigned organizations' concerns about the evaporation of hazardous and volatile chemicals, the radioactivity of drilling wastes, the opportunity for water contamination, and low rates of regulatory compliance with open pit regulations in other states, we urge the EQB to ban open pits entirely.

IV. Open Pits Are Not Technically or Fiscally Necessitated

Open pits are not required for a healthy natural gas extraction industry. Many operators no longer use open pits. Closed-loop systems present a viable alternative which has been endorsed by some of the largest companies in the industry. Banning open pits presents a rare win-win, as studies have found that drillers can actually save money by eliminating open pits. Furthermore, the experience of North Dakota shows that an open pit ban can be successfully instituted.

Many operators in Pennsylvania already choose to use tanks or closed-loop drilling methods instead of open pits. Closed-loop drilling systems have been proven to be a cost-effective

²⁹ N.D. CENT. CODE, § 43-02-03-19.3 (2012), "Earthen Pits and Open Receptacles," available at <http://www.legis.nd.gov/information/acdata/pdf/43-02-03.pdf?20140202223953>; see also North Dakota Petroleum Council, *Industrial Commission OKs Rule Changes Governing Oil Industry*, February 28, 2012, https://www.ndoil.org/news/industry_news/industrial-commission-oks-rule-changes-governing-oil-industry/.

³⁰ Letter from Lisa Kirkpatrick, Conservation Services Division, New Mexico Department of Game & Fish to Florene Davidson, Commission Secretary, New Mexico Energy, Minerals & Natural Resources Department 1-2, Mar. 7, 2006, http://psbweb.co.kern.ca.us/UtilityPages/Planning/EIRS/mckittrick_landfill/Vol5/Kirkpatrick%202007_%20letter%20to%20EMNRD%20Feb%202%202007.pdf.

³¹ *Id.* at 2.

³² LISA SUMI, OIL & GAS ACCOUNTABILITY PROJECT, PIT POLLUTION 2-3 (2004), available at <http://www.earthworksaction.org/files/publications/PitReport.pdf>.

alternative to open pits,³³ and have the potential to reduce well pad size and to reduce surface disturbances.³⁴ DEP's Regulatory Analysis Form estimated last year that "less than 50% of operators use pits in unconventional drilling activities."³⁵ And as further evidence of industry's acceptance of open pit alternatives, the Center for Sustainable Shale Development, a non-profit collaboration between environmental organizations and such energy giants as Shell and Chevron, recommends that all operators "contain drilling fluid . . . in a closed loop system at the well pad, eliminating the use of pits for all wells," by early 2015.³⁶

Studies produced by drilling fluids companies have repeatedly found that drilling without pits is both technically feasible and cost-effective. In New Mexico, a 2006 study commissioned by two major drilling companies, Cimarex and M-I SWACO, tested an "on-site solids control system" as an alternative to the use of open pits in the drilling process.³⁷ That study found that drilling waste could be reduced by more than four times that which is created in a traditional open pit drilling system.³⁸ The study further found that eliminating pits and shifting to the on-site solids control system can save drilling operators money in states where long-term on-site storage of drilling wastes is not an option.³⁹ Eliminating open pits also enables operators to avoid the long-term exposure to liability that comes from open pits that overflow, rupture, or seep underground into the groundwater.⁴⁰

³³ See, e.g., Sue Smith-Heavenrich, *Drilling for Gas: Closed Loop System Offers Alternative to Waste Pits*, BROADER VIEW WEEKLY, Oct. 3, 2008, http://www.tiogag lease.org/images/BVW_10_03_08.pdf ("[T]he results of this analysis indicate that eliminating pits is cost-effective and does not add significant cost to the overall operation. Furthermore, when solids must be transported for off-site disposal, eliminating the pit actually reduces costs."); OIL AND GAS ACCOUNTABILITY PROJECT, CLOSED-LOOP DRILLING SYSTEMS: A COST-EFFECTIVE ALTERNATIVE TO PITS (n.d.), available at http://www.emnrd.state.nm.us/ocd/documents/2007_0110OGAP.pdf.

³⁴ *Drilling for Gas: Closed Loop System Offers Alternative to Waste Pits*, supra note 33.

³⁵ *Regulatory Analysis Form* at 15.

³⁶ CENTER FOR SUSTAINABLE SHALE DEVELOPMENT (CSSD), PERFORMANCE STANDARDS 2 (Aug. 19, 2013), available at <http://www.sustainable shale.org/wp-content/uploads/2013/09/Performance-Standards-rev.-8.19.13.pdf>. These performance standards were created in collaboration with major energy producers including Alcoa, Chevron, CONSOL Energy, Shell, and the EQT Corporation. See CSSD, About the CSSD, <https://www.sustainable shale.org/about/> (last visited Mar. 14, 2014).

³⁷ Dorsey Rogers, Gary Fout & William A. Piper, *New Innovative Process Allows Drilling Without Pits in New Mexico* (2006), available at http://ipec.utulsa.edu/Conf2006/Papers/Piper_5.pdf.

³⁸ By the authors' calculations, the traditional open pit method generates waste at a rate of 21.6 times the volume of the gauge hole where a fracturing well is being drilled. By comparison, the on-site solids control system generated waste at a rate of 4.6 times the gauge hole volume. *Id.* at 4-5.

³⁹ *Id.* at 5.

⁴⁰ Dorsey Rogers, et al., *Closed Loop Drilling System: A Viable Alternative to Reserve Waste Pits*, 227 WORLD OIL (2006), available at <http://www.worldoil.com/December-2006-Closed-loop-drilling-system-A-viable-alternative-to-reserve-waste-pits.html>; see also EARTHWORKS,

North Dakota provides a real-world example of the consequences of an open pit ban. In April 2012, its open pit ban went into effect.⁴¹ Although nearly two years have passed, the pace of unconventional oil and gas extraction in the state has not slowed. North Dakota now produces more oil than any other states except for Texas.⁴²

Conclusion

Open pits are demonstrably harmful to human health and the environment. They are not needed for efficient and cost effective resource extraction. The EQB has an obligation to consider the impact of its proposed revisions on Pennsylvania's public natural resources and to craft its regulations in a manner that protects the trust corpus for future generations. We therefore urge the EQB to discharge its Constitutional duty and to do what is best for Pennsylvania by banning open pits.

Please do not hesitate to contact us should you wish to discuss our comments further.

Regards,



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ALTERNATIVES TO PITS,

http://www.earthworksaction.org/issues/detail/alternatives_to_pits#.Uvvg1kJdXt9 (“[W]henever a closed-loop system is used, the operator reduces the potential future liability associated with a conventional earthen pit, and reduces the waste management and site closure costs.”).

⁴¹ N.D. CENT. CODE, § 43-02-03-19.3 (2012), “Earthen Pits and Open Receptacles,” *available at* <http://www.legis.nd.gov/information/acdata/pdf/43-02-03.pdf?20140202223953>. *See also* North Dakota Petroleum Council, “Industrial Commission OKs Rule Changes Governing Oil Industry,” February 28, 2012, *available at* https://www.ndoil.org/news/industry_news/industrial-commission-oks-rule-changes-governing-oil-industry/.

⁴² Travis H. Brown, *Fracking Fuels an Economic Boom in North Dakota*, FORBES, Jan. 29, 2014, <http://www.forbes.com/sites/travisbrown/2014/01/29/fracking-fuels-an-economic-boom-in-north-dakota/>