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July 1, 2019

Dear Mr. Pritts,

Thank you for accepting the following comments from Earthworks on the Environmental Protection Agency's (EPA) Study of Oil and Gas Extraction Wastewater Management Under the Clean Water Act (CWA), No. EPA-821-R19-001, hereinafter referred to as the "Draft Study."

Earthworks is a nonprofit organization with 48,000 members nationwide dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions.

We appreciate your efforts to study a very important issue – how to manage produced wastewater from the oil and gas industry – holistically. As evidenced by the data gaps noted in the Draft Study, an holistic assessment of wastewater management is impossible until the oil and gas industry discloses and characterizes all chemicals and wastes in oil and gas exploration and production. All stakeholders noted concern with the unknown chemical constituencies of the produced water waste stream.

No CWA Agency Action Without Chemical Disclosure and Waste Characterization

Earthworks urges EPA to employ a precautionary approach to ensure oil and gas produced wastewater treatment and discharge happens safely and scientifically, if at all. EPA should take no action under the Clean Water Act with regard to produced wastewater until we achieve full chemical disclosure and proper characterization. This includes, but is not limited to, changes to applicable Effluent Limitation Guidelines (ELGs), National Pollutant Discharge Elimination System (NPDES) permits, or General Permits for Centralized Water Treatment (CWT) facilities.

EPA should also address agencies' (and our) concerns over Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM). Some agencies noted:

"in ***most areas***, the nature of produced water would require extensive treatment to remove constituents such as barium, TENORM, hardness, organics, and dissolved solids such as Chlorides." [1](emphasis added).

EPA is already aware of documented contamination from "treated" produced water in oil and gas states across the nation. In Pennsylvania, studies show that barium, bromide, ammonia, and cancer-causing radium have accumulated and destroyed aquatic life as a result of "treated" produced water discharges from treatment facilities into rivers. (Lauer, et al. 2018;[2] Burgos, et al. 2017).[3]

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1612 K St. NW, Suite 904
Washington, DC 20006
202.887.1872
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Oil and gas produced wastewater contaminants have also accumulated in the shells of freshwater mussels (Geeza, et al. 2018).[4] The EPA referenced similar studies in its centralized wastewater treatment (CWT) facilities released in May 2018. Nothing has changed since the release of these findings that justify the continued, let alone increased, discharge of produced water to the environment.

Reports from state agencies also indicate that the presence of TENORM in produced water may effectively make NPDES permitting impractical if not impossible. In addition to the prohibitive cost, technical, and public perception challenges, "(s)ome state agency representatives reported that they lack technical expertise in permitting discharges under the NPDES program."[5]

Among the preconditions EPA should satisfy before any Clean Water Act change: 1) secure full disclosure of chemical additives used in all operations, 2) gather and analyze newly disclosed data, 3) update protocols for localized waste characterization and treatment, and 4) design science-based effluent standards that account for all chemicals used by the industry.

EPA Should Consider Greenhouse Gas Emissions Potential from Produced Water

Studies of Greenhouse gas (GHG) emissions from produced water in China reveal another area of much-needed analysis regarding the impacts of produced wastewater management. Yang et al. (2016) confirmed that gas-field-produced water emits carbon dioxide and methane and that the "concentration of CH4 is generally over 90% in gas fields, but is generally 60-90% in oilfields."[6] The study notes that "[n]o scientific literature has presented the carbon emissions from oilfield-produced water under atmospheric conditions until now."[7] Therefore, EPA should study potential GHG emissions from the industry's increasing volumes of produced water as it considers how wastewater should be managed.

EPA Should Consider Environmental Justice Impacts of Prodcued Water Options

Studies and documented impacts across the nation show that discharging produced water into the environment can put surrounding and downstream residents and communities at risk. Industry must be required to disclose all chemicals, rigorously test and track its waste streams, and inform consumers and communities downstream in order to comply with basic principles of environmental justice.

Industrial operations are too often cited in disproportionately underserved communities. For example, of the 44 counties where there are Class II wastewater injection wells in Ohio, twenty-two of the counties are in Appalachia where the median household income is typically below $20,000 per year. Another example is Eureka Resources' centralized treatment facility in Standing Stone Township, Bradford County, Pennsylvania. Despite lack of fracking chemical disclosure by companies taking fracking wastewater to Standing Stone, Eureka is permitted to discharge wastewater effluent into the Susquehanna River.

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According to Eureka's NPDES permit[8], the only parameter tested for daily is pH and radionuclide testing is not required at all.

By permitting wastewater discharges in this manner, EPA and state agencies are prioritizing the oil and gas industry over the health and safety of citizens and communities. Additionally, the commercial products created from produced water, such as the deicer Aqua Salina and Eureka Resources' sodium chloride, currently packaged and sold as Clorox Pool Salt at Standing Stone, have no labeling to inform buyers that the products they are putting on their roadways and in their pools are derived from oil and gas waste that can contain undisclosed chemicals, radioactive materials, and other potential toxins.

Earthworks urges EPA to proactively make the following environmental justice standards part of permit requirements for any current or future uses of oil and gas produced wastewater:

1. Require demographic analysis of all areas where a company wants to discharge or use produced wastewater
2. Require analysis of cumulative impacts and previous violations or releases in the area
3. Require companies to meaningfully inform surrounding and downstream communities of their intent to discharge, prior to submitting an application for approval, through the use of direct mail, newspaper publication, and online media to announce a series of open meetings at varied times and locations
4. Require public disclosure of all chemical additives used in operations from which produced wastewater is derived in all announcements and publications
5. Require independent testing of produced wastewater discharges or by-products that includes all potential chemical and naturally-occurring contaminants, and require that these results be disclosed to the public prior to submission of a permit application
6. Require companies to engage residents in meaningful decision making opportunities and provide language services for hearing impaired and non-English speakers

Conclusion

In conclusion, EPA should take no action under the Clean Water Act until full chemical disclosure and localized waste characterization is a reality. Any action without disclosure places undue risk upon residents, communities and the environment. EPA's produced water study has now documented a growing list of research regarding the risks and impacts from produced water discharges thus far, noted the huge data gaps that currently exist, and revealed consensus among stakeholders, including industry, that the unknown chemical constituency of produced water is a major concern. Therefore, any action taken under the Clean Water Act is impractical and premature.

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[1] See Draft Report page 21

[2] *Sources of Radium Accumulation in Stream Sediments near Disposal Sites in Pennsylvania: Implications for Disposal of Conventional Oil and Gas Wastewater*

Nancy E. Lauer, Nathaniel R. Warner, and Avner Vengosh

Environmental Science & Technology **2018** *52* (3), 955-962

DOI: 10.1021/acs.est.7b04952

[3] *Watershed-Scale Impacts from Surface Water Disposal of Oil and Gas Wastewater in Western Pennsylvania*

William D. Burgos, Luis Castillo-Meza, Travis L. Tasker, Thomas J. Geeza, Patrick J. Drohan, Xiaofeng Liu, Joshua D. Landis, Jens Blotevogel, Molly McLaughlin, Thomas Borch, and Nathaniel R. Warner

Environmental Science & Technology **2017** *51* (15), 8851-8860

DOI: 10.1021/acs.est.7b01696

[4] *Accumulation of Marcellus Formation Oil and Gas Wastewater Metals in Freshwater Mussel Shells*

Thomas J. Geeza, David P. Gillikin, Bonnie McDevitt, Katherine Van Sice, and Nathaniel R. Warner

Environmental Science & Technology **2018** *52* (18), 10883-10892

DOI: 10.1021/acs.est.8b02727

[5] See Draft Report page 21

[6] Greenhouse gas emissions from oilfield produced water in Shengli Oilfield, Eastern China

Shuan Yang, et al.

Journal of Environmental Sciences (2016)

http://dx.doi.org/10.1016/j.jes.2015.11.031

[7] Ibid.

[8] See Department of Environmental Protection Permit No. PA0232351

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