On Residential Fracking Distance and Policies

By *Isabella Camille Alonso*

Executive Summary

Residential fracking is dangerous to people, exposing them to various illnesses and stressors. Despite this, fracking setback distances only require a minimum of 500 ft and do not take into account any scientific assessments of risk on human health in proximity to these residential fracking pads. This policy recommendation proposes changes to the setback distance and fracking regulations that prioritize human health and livelihood. In particular, it calls for science-based setback distances based on pollution range, noise pollution, and other factors. It also highlights the need for the dismissal of all exceptions and loopholes to the setback guidelines as they undermine the necessity for human safety, and the promotion of community engagement and transparency in relation to fracking pad occurrences, dangers, and during site proposals. Additionally, the policy calls for monitoring methods to ensure company compliance with setback regulations and the enforcement of penalties to companies that do not comply with policy safety measures.

Introduction and Scope of Problem

I am writing this brief to inform the audience of the disadvantages of fracking in residential areas, the hazards that come with it, and what can be done to protect the people affected by a nearby fracking pad in a residential area. This information is important because people should be made aware of the risks that residential fracking poses in their lives. Fracking pads built within residential areas can be a big problem, and one of the main issues with these operations is that

the people who are living near and affected by it are often stonewalled on information about the hazards that a fracking pad imposes on human populations living near it. This information affects anyone with a fracking pad currently near or planned to be constructed near their homes, because few people are ever given explanations of what may occur in or near their homes when in proximity of a fracking pad, and this information may sway or spur people affected by fracking pads in their residences or neighborhoods, and gives them the informative power of deciding on whether or not this is something that they want so close to their families and homes. The policy I want to introduce with this brief offers new building distance guidelines for fracking pads planned to be built near or within areas of residence. These guidelines require the setback distance of fracking pads, defined as "the statutory distance between drilling boreholes and nearest houses, apartments, parks, health care facilities, or other protected uses" (Fry, 2017) to take into account underground contamination range, noise level range, and fault line placement to minimize the dangers posed to human health and quality of life near these pads.

Research Overview

From a scholarly perspective, this issue has a lot of risks around the potential impacts on human health. The literature shows that there are a multitude of dangers to the mental and physical health of people who live in areas of proximity to fracking pads. From an underground perspective, chemicals released into the underground environment and water table via fracking increase in detection frequency, including dangerous chemicals like benzene that are known to cause childhood leukemia (Clark, 2022). The fracking companies push narratives that fracking is completely safe, but in addition to the detection of dangerous chemicals in the water in proximity to hydraulic fracturing, many studies are showing connections to human health impacts. Some

examples of this tie in directly to known chemicals like benzene and other carcinogens like heavy metals, radionuclides, and other hydrocarbons, as these have been found in areas of hydraulic fracturing and it's in these zones where connections between the development of childhood leukemia in youth through, most likely, contaminated drinking water (Pascual, 2022) are made. In addition to leukemia concerns, the fracking chemicals "benzene, benzo(a)pyrene, heptachlor, heptachlor epoxide, pentachlorophenol, and vinyl chloride are of concern at the upper-bound values. In addition to increasing the risk of developing cancer, chronic exposure to these constituents can have serious adverse effects on human health, including liver and kidney diseases, neurological damage, and compromised immunity" (Abualfaraj, 2018). The risk of childhood leukemia and various health concerns are not the only human health risks that have been connected to residential proximity with a fracking pad; it also impacts women's reproductive health. Within proximity to fracking, infants have a higher chance of being born prematurely or with low birth weight, and the likelihood of adverse birth outcomes increases with proximity to an oil or gas rig (Hill, 2022). In addition to adverse effects on human health is the impact on human quality of life and mental health. Fracking pads are noisy, even with sound barriers and mufflers. In a 2022 study on the noise levels of fracking, when observing noise levels with sound barriers and mufflers it was noted that "this reduction in noise was not sufficient to reduce the noise below the residential permissible noise level (55 dBA)" (Radtke, 2022). The noise is also constant and stress-inducing, and "Noise and vibrations have documented negative health effects, including high blood pressure, low birth weights, birth defects, annoyance, anxiety, stress, emotional instability, argumentativeness, increase in social conflicts, neurosis, hysteria, and psychosis" among which stress was the most frequently reported around fracking pads (Richburg & Slagley, 2018). Current setback distances are not

based on these findings or any scientific assessment, but on political compromises that with "the absence of scientific and technical protocols for determining setback distances may leave the public vulnerable to explosions, radiant heat, toxic gasses, and air pollution from hydraulic fracturing activities. Therefore, there is a need for policymakers and stakeholders to draw from distances based on actual environmental science measurements, and health and safety technical standards in the course of participatory policymaking" (Fry, 2017).

Policy Alternatives

Historically, setback distances for fracking pads commonly range from 200-1500 ft (Fry, 2017), in 2012 this distance was increased to 500 ft minimum, and as of 2020, the standard setback distance for operations in relation to homes, schools, and daycare facilities has been tentatively set to 2,000ft with exceptions allowed (Pascual, 2022). This is not even a single mile's distance between a fracking site and someone's home or children. Given the range of contamination from normal fracking practices, the minimum range is completely inappropriate. The setback distance guidelines currently in effect are inadequate and do not consider the range of pollution or negative effects on nearby quality of life that can far exceed a measly 2,000ft. It also does not take into account the above-ground effects of noise and the distance of which it can travel, even with the presence of sound barriers and mufflers, the constant noise impacts human quality of life and is not taken into account by the current guidelines. There are clear limits to these current setback guidelines that allow companies to apply for exceptions, and are biased towards the fracking companies as these distances are wholly inadequate in comparison to the contamination range. I propose an alternative here, a policy on setback distances that do not allow for companies to apply for exceptions (or set very clear, specific, and strict guidelines for when why

and how exceptions can be made) and takes a concrete, scientific approach to setting a minimum for setback distance based on the science of pollution and risk assessment of adverse effects. This will lessen or eliminate the negative impact caused by fracking pads set too close, and take into account both underground and aboveground considerations that put human health and livelihood to the forefront rather than pad placement priority.

Policy Recommendations

The literature and research supports a change in the way setback distances are determined, and for a dramatic increase in distance based on the science that measures the threat to human physical and mental health in a radius of fracking. Firstly, the new setback distances should be based on the scientific assessments on the range of pollution dispersion, including noise pollution, and the assessment on the adverse effects on human health based on quantifiable proximity that can be used as guidelines for the new setback distances. The new setback policies need to consider underground contamination range, noise levels, fault line placement, and other relevant scientific factors that put human life and livelihood as the priority. Secondly, the new policy on residential setback distances should include the elimination of exceptions to the setback distances. Companies should be prohibited from applying for any exceptions; human health is the priority of this new policy, and the safety and quality of life of all people living in proximity to fracking pads should not be compromised under any exception. The power of the people has been undermined and the opinion of the people most affected has been undervalued in relation to residential fracking for too long by politicians and company stakeholders who set these initial unsafe and negligent setback guidelines. In these new policies, local communities should be involved in the decision-making processes regarding the implementation and operating

of fracking pads near their communities. Fracking companies should also be required to provide clear and transparent information about the potential risks and benefits of their operations to residents living near proposed sites, and inform residents within proximity to an established operation of any and all negative events that occur at the pad that may affect them. Additionally, fracking policies must be updated for companies to take full, immediate responsibility and provide compensation to residents in case of an accident, and the enforcing of setback distance rules of these fracking pads should be monitored to track site compliance with setback distance guidelines to detect any violations of the set distance. Additionally, penalties for non-compliance with the policy regulations should be implemented to deter any companies willing to ignore these safety measures and put residents at risk. This should also be a dynamic policy that undergoes yearly reviews to update and adjust setback guidelines based on emergent scientific research and safety technology advancements in fracking.

The benefits to these policies include the protection of public health. By establishing science-backed setback distances, this policy recommendation reduces the risk of the public being exposed to harmful chemicals, noise pollution, and other hazards associated with residential fracking operations. They will also enhance community well-being, and ensure that it is a priority when a new fracking site is proposed. Residents living near fracking pads will experience far fewer disruptions to their quality of life with the new distances that take sound and health stressors into consideration upon determining placement distance. Fracking operations in residential areas present multiple hazards to human health and livelihood to those living in the area, and by implementing these policies, the people living in these areas can be better protected and informed about the fracking activities around their residences, and have a say in what is

acceptable to their community. This policy recommendation prioritizes human health, and unlike its historical predecessors, will not be based on company bias and unscientific decisions.

References

Abualfaraj, Noura, Patrick Gurian, and Mira Olson. 2018. "Assessing Residential Exposure Risk from Spills of Flowback Water from Marcellus Shale Hydraulic Fracturing Activity." *International Journal of Environmental Research and Public Health* 15(4):727. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5923769/

Blinn, Hannah N., et al. "Exposure assessment of adults living near unconventional oil and natural gas development and reported health symptoms in southwest Pennsylvania, USA." *PLOS ONE*, vol. 15, no. 8, 18 Aug. 2020, https://doi.org/10.1371/journal.pone.0237325. https://go.gale.com/ps/i.do?p=OVIC&u=viva_jmu&id=GALE%7CA632838155&v=2.1&it=r&aty=sso%3A+shibboleth

Clark, Cassandra J. et al. 2022. "Assessing Unconventional Oil and Gas Exposure in the Appalachian Basin: Comparison of Exposure Surrogates and Residential Drinking Water Measurements." *Environmental Science & Technology* 56(2):1091–1103. https://pubs.acs.org/doi/pdf/10.1021/acs.est.1c05081

Elser, Holly et al. 2022. “Manmade Earthquakes and Healthcare Visits for Anxiety Disorders in Oklahoma, 2010–2019.” *Environmental Epidemiology* 7(1). https://journals.lww.com/environepidem/fulltext/2023/02000/manmade_earthquakes_and_healthcare_visits_for.1.aspx

Fry, Matthew, and Christian Brannstrom. “Emergent patterns and processes in urban hydrocarbon governance.” *Energy Policy*, vol. 111, Dec. 2017, pp. 383–393, https://doi.org/10.1016/j.enpol.2017.09.042. https://www.sciencedirect.com/science/article/pii/S0301421517306122?via%3Dihub

Hill, Elaine. 2022. *The Impact of Oil and Gas Extraction on Infant Health*. Cambridge, MA: National Bureau of Economic Research. https://www-nber-org.eu1.proxy.openathens.net/system/files/working_papers/w30684/w30684.pdf

Pascual, Florencia. 2022. “Fracking and Childhood Leukemia: New Evidence Supports Greater Residential Setbacks.” *Environmental Health Perspectives* 130(9). https://ehp.niehs.nih.gov/doi/10.1289/EHP11982

Radtke, Cameron, Daniel A. Autenrieth, Tiffany Lipsey, and William J. Brazile. 2017. “Noise Characterization of Oil and Gas Operations.” *Journal of Occupational and*

Environmental Hygiene 14(8):659–67. https://web.p.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=a93704c9-88c6-4e02-82a4-9be387d38fb5%40redis

Richburg, Cynthia M., and Jeremy Slagley. "Noise concerns of residents living in close proximity to hydraulic fracturing sites in Southwest Pennsylvania." *Public Health Nursing*, vol. 36, no. 1, 8 Oct. 2018, pp. 3–10, https://doi.org/10.1111/phn.12540. https://onlinelibrary.wiley.com/doi/full/10.1111/phn.12540

Tran, Kathy V., Joan A. Casey, Lara J. Cushing, and Rachel Morello-Frosch. 2021. "Residential Proximity to Hydraulically Fractured Oil and Gas Wells and Adverse Birth Outcomes in Urban and Rural Communities in California (2006–2015)." *Environmental Epidemiology* 5(6). https://journals.lww.com/environepidem/fulltext/2021/12000/residential_proximity_to_hydraulically_fractured.1.aspx