

The Rapid Industrialization of **FRAC SAND**



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The swift proliferation of hydraulic fracturing (fracking) has brought a host of environmental and public health impacts,¹ including those associated with the increased demand for industrial silica sand.² Frac sand is an essential component in the fracking process; it is combined with large quantities of water and toxic chemicals, which are injected underground at high pressure to crack dense rock and release oil and gas. The sand holds open the fractures to allow the oil and gas to escape.³ Typically, 2 to 5 million pounds of frac sand — enough to fill approximately 25 railcars — is needed to frack a single well.⁴

Mining, processing and transporting frac sand generates and spreads dusty particulate matter and crystalline silica, a known human carcinogen. These pollutants can exacerbate or cause respiratory and cardiovascular problems.⁵ Furthermore, mining silica frac sand disrupts landscapes and can pollute the air and nearby freshwater sources.⁶

A whole new industry is taking off to mine this sand from communities, and many people in its path rightfully fear that frac sand mining will damage the environment, their communities and their health.

The Frac Sand Boom's Impact on Communities

After drilling down to a rock formation that holds oil or natural gas, typically drilling sideways through this targeted layer of rock, millions of gallons of water mixed with chemicals and sand are injected under extreme pressure to fracture (or “frack”) the rock.⁷ Sand is the most common “propping agent,” or proppant, that keeps the fractures ajar,⁸ enabling oil or natural gas to flow up the well.⁹



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As more mines and processing plants pop up to supply the oil and gas industry with this material, many people living amid the frac sand boom are increasingly concerned about how the growing industry affects their quality of life. Their worries include air and noise pollution, water contamination, and road damage and public safety risks from heightened truck traffic on local roads.¹⁰

Public Health and Silica Sand

Long-term exposure to fine particles of silica, a component that makes up as much as 99 percent of frac sand,¹¹ can increase the risk of developing silicosis, which damages lung tissue and inhibits lungs function. Breathing silica makes a person more susceptible to tuberculosis and is associated with other diseases such as kidney disease and autoimmune disorders.¹² It can also cause cancer. Studies indicate that workers exposed to crystalline silica dust have increased lung cancer rates.¹³

The National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety and Health Administration (OSHA) have been evaluating potential worker health and safety hazards related to oil and gas extraction.¹⁴

Starting in 2010, NIOSH examined 11 fracking sites in Arkansas, Colorado, North Dakota, Pennsylvania and Texas. The study found that levels of exposure to silica dust in fracking operation fields were significantly higher than occupational health criteria, including the NIOSH Recommended Exposure Limit, sometimes exceeding it by a factor of 10 or more.¹⁵ In fact, more than half of the 111 samples of workplace exposures exceeded the OSHA Permissible Exposure Limit and

more than two-thirds exceeded the NIOSH limit.¹⁶ The amount of silica sand that workers were being exposed to was beyond the federal limits established by NIOSH and OSHA.

Although workers with long-term exposure to fine particles of silica — whether at sand mining operations or at drilling sites — are more prone to developing silicosis,¹⁷ residents living nearby operations may face health risks as well. “The breathing part of it isn’t good. You can just feel it in your throat, feel it in your nose,” explained an individual living across the street from a Wisconsin sand-washing plant.¹⁸

Destruction of Precious Lands, Ecosystems and the Environment

Although sand and gravel mining have been around for decades, and some Midwestern states like Minnesota and Wisconsin have mined silica sand for more than a hundred years, the magnitude and intensity of frac sand mines are far greater than standard sand and gravel mines.¹⁹

The excavation process used for frac sand is a form of open-pit strip mining that is sometimes comparable to mountaintop removal used in coal quarrying by blasting away hilltop landscapes to access silica sand.²⁰ Both mining and the refining process that follows — particularly, washing clay away from the sand grains²¹ — can place a strain on local groundwater resources in nearby communities.²²

In northeastern Iowa, silica sand mining has already devastated landscapes. One mine is blasting away ancient bluffs south of the town of McGregor. “This is why we’re fighting this,”

said a resident of Allamakee County near the mine. “It took hundreds of thousands of years to build this landscape the way it is.” Concerned citizens are fighting to keep historic and beautiful landscapes preserved from the destructive practice of frac sand mining,²³ with current moratoria in Winneshiek and Allamakee counties set to expire in 2014.²⁴

Meanwhile, about 95 miles southwest of Chicago, frac sand mining operations are rapidly expanding around Starved Rock State Park, a major tourist attraction that draws more than 2 million visitors each year. “Millions of visitors to Starved Rock State Park could soon find themselves driving through Illinois’ largest sand box,” the *Chicago Tribune* reported in November 2013.²⁵

In November 2012, the Illinois Department of Natural Resources (DNR) granted approval, despite mass opposition, for a company to mine silica sand in land immediately contiguous to Starved Rock State Park.²⁶ The following month, a coalition of environmental groups filed suit against the Illinois DNR, effectively delaying the company from starting its mining operation.²⁷ (As of January 2014, the case is still pending.²⁸) Residents who are opposed to the mine dread the noise and environmental pollution it would bring to their bucolic lifestyle. It could also hurt tourism and cause ecological damage to the park and surrounding territory of the Illinois River Valley.²⁹

The Importance of Local Control

Tough regulations are vital for protecting residents from the rapid expansion of frac sand mining. Zoning systemically regulates the way that land is used by specifying what can be done where and to what extent.³⁰ Without a zoning ordinance, a locality’s ability to regulate a mining operation, or keep one out, is more limited.

For example, in 2011, Cooks Valley, a small unzoned town in Chippewa County, Wisconsin, passed a local ordinance regulating nonmetallic mine operations (e.g., silica sand) and had to fight a legal battle to keep it.

A group of landowners who wanted to develop sand mines sued the town seeking to overturn the regulations.³¹ They claimed that the town unlawfully created a *zoning ordinance* without county approval,³² but Cooks Valley argued that it was simply trying to protect itself by enacting a *licensing ordinance*.³³ After a circuit court ruled against Cooks Valley, the town appealed the decision that invalidated its ordinance, and the appellate court sent the case to the Wisconsin Supreme Court to determine whether it was a zoning ordinance or a licensing ordinance.³⁴ In February 2012, the Wisconsin Supreme Court ruled in the town’s favor and upheld Cooks Valley’s ordinance.³⁵



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But Cooks Valley and other Wisconsin towns now face a legislative attack that seeks to undermine their local control of frac sand mine operations. In October 2013, state Republican lawmakers introduced state Senate Bill 349, which would eliminate a locality's ability to regulate frac sand and all other non-metallic mining, except through zoning. As of January 2014, this bill was still pending in committee.³⁶

Even though counties and municipalities with zoning ordinances are better able to control mining operations,³⁷ the industry can sometimes find a way around public safeguards.

In LaSalle County, Illinois, some companies are dodging a moratorium on sand mining in unincorporated areas (including farmland) by having villages and cities annex county land.³⁸ Many of these municipal-level planning commissions are not placing as many regulations on frac sand operations, enabling rampant frac sand mining and development.³⁹ "Everything is annexed around us and we are part of a strip of homes that is not," according to an Illinois resident living unhappily in the midst of four sand mines. "Our voices went unheard."⁴⁰

Conclusion and Recommendations

The problems associated with frac sand mining in the Midwest, and other states, demonstrate yet another way that the rapid expansion of hydraulic fracturing is harming communities across the country.

When creating or updating zoning ordinances and comprehensive plans, planning departments and zoning bodies need to act in the best interest of the community and to create stringent and specific guidelines to protect their people, their open space and their agricultural lands from frac sand mining. Communities not yet affected by frac sand mining should proactively pass resolutions against this destructive practice.

States ought to pass legislation that strengthens the ability of local communities to regulate and ban frac sand mining and its facilities as well as oppose state legislation that would weaken the existing ability of local communities to do so.

Our best option is to avoid these problems altogether by moving away from dirty fossil fuels and fracking operations that drive silica frac sand mining, and by investing in clean, renewable energy.

Endnotes

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