



HEALTH IMPACT ASSESSMENT OF INDUSTRIAL SAND MINING IN WESTERN WISCONSIN

Cover photo: Dan Young

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EXECUTIVE SUMMARY

This health impact assessment (HIA) was performed by the Institute for Wisconsin's Health in collaboration with 15 local and tribal health departments in western Wisconsin. The impetus for the assessment was the recent rapid growth of industrial sand mining in western Wisconsin, and related concern from community members about potential environmental and health impacts of industrial sand mining. Four focus areas were selected for further study during the scoping process of this HIA: air quality, water resources, land reclamation and value, and quality of life.

There has been industrial sand mining in Wisconsin for over 100 years. However, the number of industrial sand mines has dramatically increased over the past 10 years. "Industrial sand" includes sand mined for industrial uses as diverse as glass, foundry, water treatment, and hydraulic fracturing. Hydraulic fracturing, commonly called fracking, is a process used by the energy industry to maximize the recovery of oil and gas from deep rock formations. When industrial sand is injected into rock, it props open fractures and allows oil and gas to flow into the well. In 2014, Wisconsin was the nation's largest supplier of industrial sand for oil and gas drilling, providing nearly 44% of the sand used in the United States. Wisconsin sand is desirable for its strength, uniformity, and ability to be shipped by rail to regions where fracking occurs.

The audience for this report is primarily local and tribal health departments, though other interested stakeholders will find the assessment and recommendations relevant. We recommend that this HIA be used in decision-maker discussions about the potential health effects of existing and proposed industrial sand facilities.

This assessment examines the potential positive and negative health impacts of various aspects related to existing and potential future industrial sand facilities in the context of western Wisconsin. Based on this structure, the reader should note that some potential impacts will be specific to the site and community of an existing or proposed facility.

SYNTHESIS OF FINDINGS

This HIA found that the potential exists for both positive and negative health effects from industrial sand mining. For purposes of this report we have characterized the likelihood of potential positive or negative health effects on a spectrum from "insufficient evidence" to "very likely" See page 20-21 of the full report for more information.

AIR QUALITY

Health effects from the impact of industrial sand mining on community-level air quality related to PM₁₀ⁱ are unlikely. In addition, it is unlikely that community members will be exposed to respirable crystalline silica from industrial sand mining as currently regulated; therefore, health effects from exposure are unlikely. Data collected at several facilities in the upper Midwest do not indicate that health-based standards have been exceeded in regard to these potential pollutants.

What is Health Impact Assessment?

Health impact assessment is an unbiased and scientific assessment of the potential positive and negative health effects of a proposed project, program or policy. HIAs are used to inform decision makers of the potential health implications, and provide recommendations to maximize positive health benefits, and reduce negative health outcomes.

ⁱ Particulate matter with an aerodynamic diameter below 10 µm. This size range is generally able to travel into the upper airway and is regulated by national air quality standards.

Why conduct an HIA on sand mining?

The rapid development of the industrial sand industry in Wisconsin and other upper-Midwestern states has generated a number of questions by community members and policy makers regarding potential health risks or benefits to the community. Concerns raised range from environmental topics to changes in local economics and lifestyle. Differing opinions on risks, benefits, and community values have led to divisions within and among many communities regarding whether industrial sand mining should continue in western Wisconsin.

WATER RESOURCES

The potential for health effects from impacts to *groundwater quantity* is possible. Industrial sand mining facilities that withdraw groundwater have the potential to impact surrounding wells and surface water features. However, these impacts are highly site specific and localized. If health effects do occur, the most common effects are expected to be related to stress or anxiety experienced by a limited number of individuals.

Health effects from contaminant impacts to *groundwater quality* are unlikely. In the event that water-soluble polymers are released into groundwater, impurities are expected to readily degrade and would be significantly diluted before they could come in contact with drinking water users near industrial sand sites.

LAND RECLAMATION AND VALUE

Health effects (positive or negative) from reclamation of industrial sand mines are unlikely. No community-level health effects from reclaimed industrial sand mines in Wisconsin have been identified, and reclamation plans implemented in accordance with NR 135 are likely to prevent health hazards at a mine site.

Health effects from impacts to land value from an industrial sand facility are possible. The potential for health effects is highly site specific and depends on a range of factors. The most likely negative health effects due to impacts to land value are feelings of stress for landowners who want to sell their property, especially if they experience difficulty selling it. Impacts to land value are expected to be localized, and not community-wide.

QUALITY OF LIFE

Health effects from the impact of industrial sand mining on cultural heritage or sense of place are likely. This finding does not imply that these effects will be widespread, but some individuals are likely to experience health effects.

Economic impacts from industrial sand mining are likely. Impacts may be positive or negative and will be highly dependent on the community, facility, and individual. The direction of economic impacts may change over time.

Health effects from traffic, light, and noise are possible, though they will be highly dependent on the proximity of residents to industrial sand facilities, facility design, and other factors. If health effects do occur, the most common effects are expected to be stress or annoyance from traffic or nuisance levels of light and noise.

RECOMMENDATIONS

This assessment holds two overarching recommendations for proposed or existing industrial sand facilities:

1. Development of industry standards that help to promote thoughtful review, policy, and project development, as well as positive relationships with community members, and,
2. Representation from local, tribal, or regional public health departments as part of the local permitting or review process.

Focus area-specific recommendations were also developed in consultation with community and industry partners. Those recommendations are found in the full report.



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