

To: National Pollutant Release Inventory, Environment and Climate Change Canada

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HYDRAULIC FRACTURING OF SHALE (FRACKING) - REPORTING TO THE NPRI

Overview

Hydraulic fracturing (aka 'fracking') is a process for obtaining (extracting) natural gas and/or oil from beds of shale buried at various depths below Earth's surface. In the present techniques, water is commonly mixed with sand and a mixture of chemicals. In that the mixture of chemicals is largely unknown, the potential cumulative effects and synergistic impacts to health and environment are not or cannot be fully considered.

The mixture of water and numerous chemicals is injected at high pressure into a wellbore to fracture the shale beds, thus releasing gas. By sending a wellbore down into the shale beds and then drilling horizontally, more gas can be obtained.

Copious amounts of fresh water are required in this process. Adverse environmental impacts include the depletion and or contamination of valuable ground water resources, risks to air quality (particularly from volatile organic compounds [VOCs]), migration of gas to the surface, and contamination from "flowback" of the contaminated water.⁴

The high velocity injection of massive amounts of water laced with potentially toxic chemicals poses the risk of contaminant migration to ground water sources through leaks in the wellbore or fractured geology, contaminating potable drinking water wells and other sources. The oil and gas containing deep shale deposits themselves contain salty water often contaminated with uranium, thorium and radium, referred to as "Naturally Occurring Radioactive Material" (NORM) produced at well sites and gains entry into the wastewater cycle (e.g., storage facilities, pipes, solid wastes).⁵

The returned fracking fluid containing these chemicals is either trucked off or stored in large open-air tarp-lined pits where it is allowed to evaporate. Other portions of the chemical-laden water remain underground, where it can conceivably migrate along the path of least resistance. Other issues not as well-documented or recognized can also occur, for example, naturally occurring radium may be carried to the surface by the frack water effluent and expose organisms or their habitat.

⁴ **Flowback:** Refers to a mixture of water, dirt, sand, and chemicals that flows to the surface after a well has been hydraulically fracked.

⁵ Andrew Nikiforuk - B.C.'s fracking report: published in "All Fracked UP!" Watershed Sentinel Educational Society 2020.

Health Issues Related to Fracking

Many of the chemicals used in fracking are highly toxic. For example, some VOCs are associated with detrimental health effects including direct carcinogenesis and mutagenesis; and the production of ground-level ozone, which is linked to asthma and respiratory deaths. There are also potentially harmful VOCs naturally present in shale gas formations that may be liberated during the extraction process and released as fugitive emissions. In many cases the chemicals used in fracking are considered to be "proprietary" formulations and thus are not publicly known. Some of these can be toxic and long-lived (for example, PFAS (perfluoroalkyl and polyfluoroalkyl substances or newer substances that degrade into PFAS⁶).

The adverse health effects from air pollution sources, such as diesel exhaust from trucks and equipment, VOCs, and elevated ozone levels, and high air benzene concentrations associated with fracking operations are well known.

Although the make-up of fracking fluids is largely unknown, from what we do know, it is reasonable to say that the individual and cumulative health impacts may be diverse and far-reaching, potentially affecting the skin, eyes, and other sensory organs; the gastrointestinal and respiratory systems; as well as the brain; nervous, immune and cardiovascular systems; the kidneys and the endocrine system; and result in cancer or other chromosomal mutations.

A major issue relates to the transfer and disposal of such chemicals, much of which is not known and thus not accounted for. The lack of information on this matter is particularly troubling.

Public Reporting

In Canada, the federal regulations are scant and largely limited to regulatory oversight of the chemicals used. In B.C., the Ministry of Energy has total control of the industry. However, the lack of federal regulation on chemicals used in fracking has resulted in ineffective oversight and inefficiencies within the industry sectors involved in fracking. This has led to a lack of public transparency, and improper or ineffective oversight, resulting in short-changed public knowledge and awareness on issues related to fracking operations. This is particularly worrisome for communities and vulnerable groups (including workers) that may be located in close proximity to facilities involved in fracking.

To date, fracking facilities have not been required to report to the National Pollutant Release Inventory (NPRI), except for some substances listed on the NPRI, despite numerous requests by citizen groups dating back to 2012 that these facilities be included.

While employee thresholds were originally considered a factor in reporting, the NPRI has, in certain cases, removed the employee threshold exemption, and this should be the case for

⁶ <https://www.nytimes.com/2021/07/12/climate/epa-pfas-fracking-forever-chemicals.html>

fracking operations. Further analysis on the composition of chemical mixtures applied in fracking would be substantially important to ensure that the substances used could also be captured through NPRI reporting. At the very least, substances that are already reported to the NPRI should be reported to the NPRI.

In light of the continuous increase in fracking operations, to the point it has much of the conventional gas production, particularly in B.C., this industry must be made accountable and be required to report to the NPRI on its releases, transfers and disposal levels, for all chemicals used and produced, including Naturally Occurring Radioactive Material (NORM) as noted.

This is a role for which the NPRI is well-suited and needs to be pursued.

Submitted by: NGO members of the NPRI Multi-Stakeholder Working Group