

# Tracking fracking pollution: Researchers establish benchmarks to monitor shale gas pollution

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As a result of the fracking revolution, North America has overtaken Saudi Arabia as the world's largest producer of oil and gas. This, despite endless protests from environmentalists. But does drilling for natural gas really cause pollution levels to skyrocket?

## Setting the bar

A team of geochemistry researchers affiliated with Concordia University, l'Université du Québec à Montréal, l'Institut national de la recherche scientifique, and the GEOTOP research group has just completed the first detailed study to examine the natural quality of groundwater prior to fracking.

The resulting report, commissioned by the Strategic Environmental Assessment Committee on Shale Gas, provides a benchmark for naturally occurring levels of pollution. This will help scientists prove definitively whether fracking causes [groundwater pollution](#) by establishing the concentrations of [methane](#), ethane, propane, helium and radon found in the groundwater in a location where fracking has yet to occur—the low-lying areas surrounding the St. Lawrence River, between Montréal and Québec.

## The challenges

Yves Gélinas, study co-author and professor in Concordia University's Department of Chemistry explains: "In several cases in the US where very high concentrations of methane were found in the vicinity of fracking sites, energy companies could not be held legally responsible for the contamination simply because there was no record of pre-exploitation gas levels in the groundwater. This study is the first to document [natural gas](#) levels, plus their sources, so that those levels can be compared to those at fracking sites."

That means that if the government allows the exploitation of natural shale gas resources at some point in the near future, scientists will be able to link any eventual contamination to mining activities.

## **The research**

For this study, 130 residential and municipal wells were sampled in a region covering approximately 14,000km<sup>2</sup> between Montreal, Leclercville and Trois-Rivières, as well as the foothills of the northern Appalachians.

Out of these wells, 14% per cent exhibit concentrations of methane greater than seven milligrams per litre—the acceptable threshold of methane in groundwater specified by the Government of Quebec. In the majority of the wells, the methane occurs naturally; that is, the gas is a by-product of bacteria emitted by surface sediments.

The most highly elevated concentrations of helium, which is an inert gas often observed in association with methane, were seen in the low-lying areas surrounding the St. Lawrence Seaway. These resulted from a particular geological formation in which important concentrations of naturally occurring methane are also observed.

No concentration of radon—a harmful [gas](#) that is both colorless and

odourless—exceeded the level of permissible radioactivity established by Health Canada (2,000 becquerels per litre (Bq/L). However, in 4.6 per cent of the wells, concentrations exceeded the levels recommended by the World Health Organization (100 Bq/L).

Gélinas cautions that, "radon is easily dispersed into the atmosphere and, consequently, there is an increased risk of breathing it in in poorly ventilated locations."

That's important to note because [fracking](#) has been linked to an increase in radon—which, in turn, has been linked to greater instances of cancer. Says Gélinas, "Now that we have established the normal levels of harmful chemicals like radon that naturally occur within a given area, we can carefully monitor whether these levels increase when big energy companies come in to mine for [shale gas](#)—and then hold those companies accountable if we do see [pollution levels](#) go up, as is widely believed."

**More information:** [ees-gazdeschiste.gouv.qc.ca/wo ... E3-9\\_Geotop-UQAM.pdf](https://ees-gazdeschiste.gouv.qc.ca/wo...E3-9_Geotop-UQAM.pdf)

Provided by Concordia University

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