

Earth's cleanest water creates thorny issue

In Tiny Township, a precious resource faces threat from proposed garbage dump

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TINY TOWNSHIP, ONT. -- In this oddly named community in Central Ontario lies the world's most pristine groundwater.

The water bubbling to the surface is so clean the only match for its purity is ice pulled from the bottom of Arctic ice cores from snows deposited thousands of years ago, well before any high-polluting industries existed.

"This is kind of like the old-growth forest of natural waters," says William Shotyk, a geochemistry professor at the University of Heidelberg in Germany. "It tastes excellent. It's the best water on Earth."

The discovery of ultraclean groundwater would normally be greeted with great cheer in a world that is increasingly short of good drinking water.

But in Tiny Township, it has raised a thorny issue. The province has just approved placing a garbage dump on top of it, and the county plans to vote early next year on a budget for building the landfill. Garbage could be arriving within a year, threatening to pollute the water.

Dr. Shotyk, an expatriate Canadian, runs, at the German university, what is considered the world's most sophisticated laboratory for measuring trace metals in water, a facility set up to analyze contaminants in prehistoric ice.

By chance, his family also owns property five kilometres from the proposed dump, which lies northwest of the city of Barrie.

This is an area of artesian wells, where water frequently rises out of the ground under its own pressure. Dr. Shotyk, after running tests on polar ice, got curious, in a scientific way, about how the water under the proposed dump would stack up against the really clean ice from ancient times. He drove over to the landfill site, currently a big grassy field, got some samples, and shipped them in a cooler to Germany for testing.

The results were unexpected. The water was comparable to ice with the lowest concentrations of metals ever measured anywhere on the planet.

Levels for lead and antimony, for instance, were typically only a couple of parts per trillion. That's a concentration equivalent to a few grains of salt dissolved in an Olympic swimming pool and thousands of times cleaner than Ontario drinking-water standards, which limit lead because it causes brain damage. Low levels were also found for cobalt, chrome, vanadium, silver, copper and molybdenum, among others.

The metal content was comparable to the cleanest ancient Arctic ice from Devon Island in Canada's Far North. The ice cores go back 16,000 years, and the metals in the Tiny water matched the cleanest period in the ice record, a long stretch from 4,000 to 6,000 years ago, when snow had very low metal contamination.

Since the finding, Dr. Shotyk has been extolling the virtues of Tiny's water wherever he can. He has spoken to local politicians, urging them not to build the landfill because it might contaminate the water. And he has delivered the same message to staff at Ontario's Ministry of Environment.

In a quirky way, he views the water as the hydrological equivalent of the spotted owl, the rare, endangered bird living in old-growth B.C. forests, the fate of which is frequently the subject of hand-wringing by conservationists. "Somebody has to speak for this water. We've got people speaking for spotted owls out on the West Coast," he said. "I'm trying to speak for this water."

At the ministry, researchers don't dispute his finding that the water is exceptionally clean. "He's not exaggerating when he says it's certainly quite clean as far as metal levels go," says Ray Clement, a senior research scientist. "To be lower than the levels he found, there'd be almost nothing at all."

A different branch of the ministry that handles environmental assessments approved the dump after Dr. Shotyk informed the government of his findings, because it believes Simcoe County will be able to put controls in place to keep seepage from garbage out of most of the water.

The water is so clean because the soil and rocks from which it is drawn don't contain many metals, and it has low acidity levels, which means that any metals present aren't likely to dissolve.

Dr. Shotyk has already made one research discovery using Tiny water. There was so little antimony in it that he couldn't find published accounts of such low amounts, although he did come across a reference suggesting that it might be in bottled water.

That made him test bottled water, and earlier this year, he published a finding that water sold in Canada in plastic bottles made of polyethylene terephthalate, or PET, contains antimony at amounts hundreds of times higher than clean water. The metal, used in making plastic, leaches into bottled water the longer it sits on store shelves.

Dr. Shotyk says Tiny water "is so clean it's become my reference water for studying the contamination of bottled waters."

Water at the proposed dump has been a big issue because there is so much of it. Test wells, capped giant metal pipes that resemble straws, stick out of the ground around the site. Once uncapped, the wells gush the ultraclean water, which rises out of the ground due to pressure.

Paradoxically, given how much people are willing to pay for clean water, the pristine water is a nuisance at the dump site.

In order to dig out a pit for the dump, the county will have to pump millions of litres out of the ground to prevent the landfill from becoming a pond. The pure water Dr. Shotyk uses for his laboratory experiments will be dumped into a nearby creek.

The amounts wasted in this way will be large, enough to slake the needs of up to 250,000 people a day for months.

The landfill is designed so that clean groundwater is supposed to seep into the dump and become contaminated with garbage residue. Then it will be sucked out using a network of pipes and hauled to a local sewage plant. It is hoped that this inward flow of some of the pure water will protect the rest from contamination.

Over the life of the dump, more water will have to be treated for cleaning or dumped into the nearby creek than the weight of garbage planned for the site.

The soiling of all this clean water leaves Dr. Shotyk slack-jawed. "How can we do that and sleep at night when 300 million people in China dream about that water?"