

Biological Water Treatment Discussed at UN

Dr. Hans Peterson, Safe Drinking Water Foundation

On May 10, 2005, an internal briefing note to Environment Minister Stephane Dion was published from an Access to Information request. The document states "Our failure to protect water has caught up with us". It continues, "Diseases from contaminated water cost our health system \$300 million a year. Between 20% and 40% of rural wells are more contaminated than drinking water guidelines recommend."

Scientists working on water inside and outside of the federal government have known this for years. Despite a glossy front, especially following Walkerton and North Battleford, work of real substance on rural water issues is difficult to find.

There are considerable efforts currently being carried out in major cities and universities across Canada. But work on city source waters, which are typically of high quality, translate rarely into effective solutions for small water treatment plants treating poor quality water. The difference between a good city raw water source (big river or lake) and a rural community can be staggering as indicated below.



Yellow Quill First Nation (left) and City of Saskatoon's raw water sources taken the same day

Yes, there are also new rural water treatment plants being constructed through federal-provincial infrastructure grants, but the question is, are they working? The most prominently used tool to determine whether a plant is working or not in rural Canada is based on the presence/absence of total coliforms and E. coli. We don't need water treatment plants to pass that test, we need bleach.

The next photograph shows two cups of tea in which some chlorine was poured into one of the cups. Did we actually make clear drinking water out of the tea? No, we just made it look that way. We need far better



Rural water treatment - add chlorine!

measuring tools to determine whether a water treatment plant is working or not.

When the Safe Drinking Water Foundation was in the process of hiring an engineering company at Yellow Quill First Nation, we resized six glossy proposals from both small and large engineering firms. In our request for proposals, we clearly stated that we needed to know which prior native communities the engineering firm had designed water treatment processes for along with their results for raw and treated water quality. All engineering companies provided us with strings of native communities where water treatment plants had been constructed but none could provide us with the effectiveness of those plants. We even went out with a follow-up letter requesting this information one more time, but again, total silence.

We ended up selecting an engineering company strictly based on cost and with a hope that we could work with them. It turns out that engineering companies are insured by liability insurers and after a plant is complete, getting it signed off so full payment can be received is far more important than ensuring that the constructed treatment plant actually works.

At Yellow Quill, we were fortunate because the engineering company chosen was keen to learn how to treat extremely poor quality water. It was a collaborative

effort involving engineering, science, Indian and Northern Affairs Canada and the Yellow Quill community which took place over a two-year period, where many different water treatment processes were piloted. This culminated in the development of a unique integrated biological and membrane treatment plant. While biological treatment is not unique, that we tackled a cold water source with a string of contaminants was. We have continued to refine the process and we are, for example, now biologically removing 5 mg of ammonium-nitrogen/L at 7 degrees centigrade. We have so far not found any other treatment plant anywhere achieving this.

Yellow Quill's 9-year boil water advisory was finally lifted in 2004 when the new plant came on stream. The Yellow Quill Water Treatment Plant meets both national and international regulations for safe drinking water and Yellow Quill is indeed bottling some water from the plant. There were many innovations at

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the Yellow Quill's water treatment plant and the engineering company responsible for scale-up received two awards of engineering excellence for the project.

Yellow Quill and the Safe Drinking Water Foundation were invited by the Indigenous Environmental Network (U.S) to present the Yellow Quill Story at the United Nations headquarters in New York on April 19, 2005. The Indigenous Environmental Network looked around the world for some positive news in aboriginal communities and drinking water. They ended up choosing Yellow Quill to represent a community's successful struggle for

safe drinking water, even if it did take nine years. The Network wanted to showcase drinking water innovations suitable for implementation elsewhere as well as collaboration between scientists, engineers and government.

For Yellow Quill's water keeper, Roberta Neapetung, to present at the United Nations and to meet people from around the world was very exciting. Roberta had never been outside of Saskatchewan or Alberta before and had never flown. The presentation at the UN looks like the beginning of setting up an Aboriginal R&D Water Treatment Centre in a part of Saskatchewan where there is only one kind of source water quality, extremely poor and mostly salty. We anticipate that this will become a resource for people from around the world to learn more about how to deal with poor quality water sources.

For more information on safe drinking water, visit www.safewater.org.

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