

Crystal Clear Drinking Water – the Red Tap Symbol

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Rural water users around the world have two sources of water: surface water (dugouts, lakes and rivers) and ground water (well water). The major problem with surface water is the presence of disease-causing microbes and dissolved organic material, which can cloud or colour the water and make it taste and smell bad.

Ground water is less susceptible to these problems, but “invisible” chemicals that can’t be seen (in contrast to coloured compounds) or smelled can be present. When a typical analysis for the suitability of a rural water source is done, only nitrates and total coliforms are commonly measured. Nitrate (a common ingredient in fertilizers and manure) leaches into and accumulates in ground water. High levels can cause a rare disease in infants less than four months old, the “blue baby syndrome”. Coliforms are indicator organisms which can signal the presence of disease-causing microbes.

Based on nitrate and coliform levels, health agencies will pronounce whether the water is safe for human consumption. However, this information is not enough to determine if the water is, in fact, safe from both a microbial and chemical perspective. Total coliforms can’t assure microbial safety as most water-borne disease outbreaks in the U.S. over the past 10 years were caused by water that tested negative for total coliforms. Neither can nitrate testing alone assure chemical safety of the water as shown below for a compound with no taste or smell.

The invisible chemical

A chilling story involves an “invisible” chemical in ground water, arsenic. Regulatory agencies have known for a long time that very high levels of arsenic can be fatal (one tenth of a gram in food or water can cause

death). However, only recently has the health effects of low level exposures been realized.

As a result Canada has lowered its guideline level for arsenic to 25 parts per billion from 50 parts per billion (this is more than 1,000 lower than the concentration that would be fatal in humans). A scientist from the U.S. Environmental Protection Agency has stated that a concentration no greater than 2 parts per billion may be required to reduce the risks to the public to an acceptable level.

Because arsenic is showing up in ground water around the world, routine testing of this water should have it included. If a well is low in arsenic, retesting every couple of years would be sufficient.

Arsenic naturally occurs in many soils and rocks. As a result, water from certain areas will have low levels (less than 10 parts per billion), while others can have very high levels (more than 50 parts per billion). Very high levels of arsenic may not be commonly found in Canadian ground water sources.

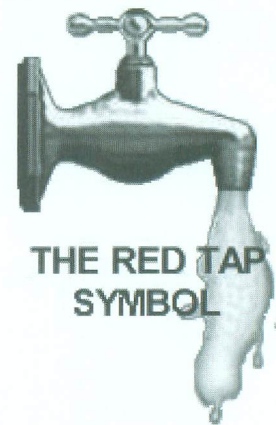
This is not true for some other countries, such as Bangladesh. Twenty years ago, UNICEF and the World Bank and several other agencies felt they solved Bangladesh’s surface water problems. The recommendation: switching to ground water.

Test drilling of wells had shown that crystal clear water could be obtained from simple, hand-pumped wells. Four million of these wells were constructed. This was celebrated as a major public health victory avoiding deaths of tens of thousands from waterborne diseases caused by pond water. The well water was low in nitrates and coliforms: water suitable for drinking even by babies, according to health agencies!

In Bangladesh, ten years after the well construction program began

unusually high numbers of arsenic-related diseases were being documented. In 1993, the wells were analyzed for arsenic. The results were horrific.

The red tap symbol



Most of the wells had arsenic levels above permissible levels, sometimes even 10-100 times greater than acceptable levels. The hand-pumps at these wells are now painted red. Education programs have been started to stop people from drinking water from the “red taps”. Sixty percent of Bangladesh’s 130 million people may be at risk from arsenic poisoning.

Many of the effects of arsenic on humans can’t be reversed, even by switching to water that does not contain arsenic. Arsenic affects almost all human organs (for example liver, heart, and lungs) and while these organs will still function, their functional capacity slowly decreases. After the body starts accumulating arsenic, it can take many years before a doctor can determine that the symptoms are caused by arsenic.

It is disconcerting that even large international aid organizations sometimes fail to ensure that adequate research and development have been carried out before projects are implemented.

Canadian red taps

In Canada, the provinces are responsible for safe drinking water, with the federal government playing an advisory role. It is a great challenge for small provinces to put in place adequate research and development to ensure that people have safe drinking water. Even in larger provinces resources for solving rural water quality problems have not been forthcoming. The question we need to answer is:

How many red taps do we have or should we have in rural Saskatchewan's small communities and homes?

A red tap designation can come from the presence of disease-causing microorganisms, and chemicals. There are large numbers of red taps in rural areas around the world including Saskatchewan. The Safe Drinking Water Foundation is applying solid science to make their numbers smaller.

We need to remember that these are long-term effects and there is no reason to panic if your water has not been tested for arsenic. But, this is only one example of how the quality of your drinking water can be of concern. To solve the concerns of rural drinking water safety all levels of government need to work closely with scientists from around the world; the Safe Drinking Water Foundation was designed to lead such collaborations. The mission of the Safe Drinking Water Foundation is:

To promote safe drinking water through supporting innovative research and development; to increase awareness of health concerns from consumption of poor quality water; to act as a catalyst to ensure that appropriate action is taken to enable the provision of safe drinking water to rural residents.

The Safe Drinking Water Foundation relies on individual, community and corporate donations to carry out research and development on rural water quality issues. Corporate donors to date include the Farm Credit Corporation, the Royal Bank, the ELJB Foundation, and the Arcangelo Rea Family Foundation.

You can help by sending tax-deductible donations to the Safe Drinking Water Foundation, 11 Innovation Blvd., Saskatoon, SK S7N 3H5. ■



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