

## TOWARD SELF-RELIANCE – Our Water Supply

by Vic Berecz

I'm told each of us Americans uses 123 gallons of water a day ... that's over half a ton. Yes, we use water for industrial applications, to water our lawns, to flush our toilets, to wash our dishes and ourselves. But, also **WE MUST DRINK WATER** ... sometimes it's pure water, sometimes it's in the form of soda, beer, whatever. Why must we drink water? Simply because in her infinite wisdom our Creator made us water-based life forms. Our bodies are more than 90% water. No wonder we use a lot of water!

This planet of ours is largely covered with water ... lots of it. Underlying much of our dry land are aquifers ... more water. Water pours down on us from the sky as rain and snow. Water churns up to us from springs and wells. Water is never used up ... it is simply recycled through natural processes. So what's the problem? **WE NEED FRESH, CLEAN WATER** for our most basic needs. And ... you know what ... there's too many of us and most of us are filthy, wasteful slobs! There goes the cleanliness of our fresh water sources.

When I was a kid in the 1940s, we swam all the time in the Long Island Sound. When my kids were young in the 60s and 70s, most people wouldn't dare to swim in those waters because they were so polluted. Now, my grandsons swim there all summer long. Yes, we can do something to clean up our act ... and in some places we have done that. But, common sense tells me it's not the long-term answer. Rather, combining our environmental protection efforts with technological improvements that will ensure plenty of affordable clean, fresh water throughout our world needs to be a high priority for all Americans.

Think about it. Our local communities have very different needs when it comes to providing clean, fresh water. Consider the differences between Poland Spring, Maine and Tucson, Arizona and New York, New York and Green Bay, Wisconsin and Fort Myers, Florida when it comes to providing for their residents' long-term water needs. Yes, we have somewhere in our nation virtually every environment on earth. If we solve our own long-term water problems, we will have solved the problems of the rest of the world ... and probably could generate lots of jobs and goodwill helping the rest of the world implement those solutions. Water technology .... maybe that could be one of America's great exports in decades to come!

So ... you ask ... what do all these platitudes have to do with self-reliance? Here are some of my thoughts on that question. I remember very vividly the aftermath of 2004's Hurricane Charlie which devastated our part of southwest Florida. Municipal water supplies were "down" for over a week in some areas. Price gouging for bottled water was rampant. In Florida, price gouging on essential items during a declared state of emergency is illegal. Personally, I think that's a good law. Yet, I'm not going to criticize (as I wrote at that time) the "so-called conservatives [who] are ranting that this law is an affront to the *Free Enterprise System* and infringes on the freedom of those who were prudent, smart, or wealthy-enough to locally *corner-the-market* on some essential supplies." In reality, the victims of such unconscionable greed do somewhat have themselves to blame, for they have lost all sense of self-reliance.

Some of my Mormon friends advocate setting aside provisions for a year. That kind of self-reliance would make it kind of tight in our tiny retirement apartment. But, a week? Yes, we could always easily go a week on the food and drink we have at home. Anyone can! ... or should be able to! That's step one in personal self-reliance when it comes to water supply.

Throughout the world, 84% of the population has access to improved water sources primarily in the form of indoor piped water. With the continued population growth and urbanization, that percentage will only increase. In our nation, to a great extent we've delegated responsibility for the public water supply to our communities. There are relatively few nations, including Britain, where private companies dominate the water supply market. Community water supply is not a bad thing, and it's been going on for a long time. In the Bible we read of community wells, and ancient Rome had its system of aqueducts; etc.

As population density increased, and our expectations for reliable, clean potable water heightened, a great deal of technology was introduced into our water systems depending upon the assets and needs of individual communities. This need for technology to provide "clean" water to the masses will only increase ... not only because of the degradation of natural water sources, but because our expectations regarding what is "clean" become more stringent. Many of us demand the elimination of *all* pollutants (i.e. "zero tolerance") at a time when our testing technology has improved so much that infinitesimally small contaminations – so small that they couldn't possibly harm anyone – are detectable through testing. Therefore, *realism in expectations* needs to become a part of the water supply debate. It not *all black and white!*

Public water supply systems are a key element of our community infrastructure. Because, in most cases, the water supply system is physically distributed over large areas, it is perhaps the most vulnerable infrastructure element to the threats of terrorism. Therefore, community self reliance demands that we make significant expenditures to minimize the risk of water system compromise and to mitigate the effects of any incidents through continuous testing, emergency procedures, and back-up systems.

Today, water from natural sources is "improved" by filtering, chlorination, and additives (such as fluorides). We need increasing emphasis on other technologies – for instance, irradiation – that may help lengthen the useful life of our existing systems. In many areas dual water systems are being put in place to provide top-quality water for household uses (drinking, cooking, washing, etc.), and a secondary system that employs the outflow from waste-water treatment facilities for other uses, such as irrigation. This is possible because in many communities the water system and waste water treatment system are handled by the same authorities. While this approach is very helpful in extending the useful life of existing water systems, it doesn't address the longer term issues resulting from the degradation or depletion of the natural sources of fresh water in use today.

A lot of approaches have been attempted ... remember the folks who towed an Antarctic iceberg to the Middle East trying to provide fresh water? ... but, the one obvious long-term solution to the world's water supply needs is *desalination* (also referred to as *desalinization*) of ocean water. Desalination makes economic sense only when lower cost options are exhausted ... but that will be happening over large areas of the world in the not too distant future, including parts of the U.S. Desalination typically uses extremely large amounts of energy as well as specialized, expensive infrastructure, making it very costly compared to the use of fresh water from rivers or groundwater. At present, potable desalinated water in seaside communities costs about 50 cents per cubic meter (264 gallons ... probably a couple of days supply for a typical American family) not including distribution costs. Obviously, to pump desalinated water to places that are either/both high or far from the coast (such as Mexico City or Denver) presents major transport costs.

The great majority (85% in 2004) of desalinated water is produced using the energy intensive *multi-stage flash distillation* method. The principal competing processes use membranes to desalinate, applying *reverse osmosis* technology. Membrane processes use semi-permeable membranes and pressure to separate salts from water. Reverse osmosis systems typically use less energy than thermal distillation, thus reducing overall desalination costs in recent years. Many scientists feel that nuclear powered desalination could be done economically on a large-scale. The bulk of progress in desalination has been focused on the Middle East, where lack of natural fresh water sources, nearby coastlines, plentiful energy supplies, and wealth make it an ideal test lab. Other lower cost desalination techniques are being developed worldwide, especially in Australia and Canada.

Are we in the United States adequately participating in the desalination revolution? This is technology we will increasingly need domestically ... and it is technology that will create jobs and exports. Our national government, and our coastal states, ought to be encouraging the development of desalination technology. It's vital to our national interests and should be a focus of national self-reliance. BTW – if you say nobody can afford \$3 for 1000 gallons of water (the typical cost of desalination in the U.S. today) then why are so many of us willing to spend \$8,000 to buy 1000 gallons of bottled water?