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TALK OF THE TOWN

Column: Is desalination solution to water woes?

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"If we could ever competitively, at a cheap rate, get fresh water from salt water," observed President John F. Kennedy 50 years ago, "that ... would really dwarf any other scientific accomplishment."

Desalination technology has improved since Kennedy spoke, but it isn't cheap, there are environmental issues and Arizona is still 60 miles from the sea.

In our Prescott Active Management Area (PrAMA) municipal water demand has more than tripled (1985-2010). Since 1999, our area has been officially beyond safe-yield. Lake Powell and Lake Mead have dropped from full to about half full over the past 15 years. Obviously, indoor and outdoor conservation measures are the cheapest and best ways to keep our costs low.

In recent years, the Arizona Department of Water Resources (ADWR) has pointed to desalination as a possible solution to the state's water needs. There are, however, questions concerning its viability, particularly for the Prescott region with transfer of water rights likely a necessary component.

On April 11, the Citizens Water Advocacy Group (CWAG) will present a discussion of how desalination works and how it could become a factor in Arizona's water future by ADWR Director Tom Buschatzke. In anticipation of that presentation, it is worth reviewing some of the history of desalination.

Did you know that Arizona already has a desalination plant? Built 23 years ago for \$250 million as a partial solution to the drought issues on the Colorado River, the Yuma Desalting Plant (YDP) was designed to treat salty irrigation runoff from the river into a diversion canal.

In 2010-11, [University of Arizona](#) researchers, led by Karl Flessa, obtained funding of \$250,000 to study the environmental impact of running the plant at one-third capacity for one year. Desalted water flowed back into the Colorado River to be counted toward Mexico's allocation and the brine was carried via a diversion canal into the Gulf of Mexico.

Enough fresh water was generated to serve 30,000 residences. And, "The short-term changes associated with the pilot operation of the YDP accompanied by the ~30,000 af [acre-feet] of arranged water did not cause significant changes to the features of the Ciénega de Santa Clara monitored during the period of this study." (Flessa et al.) Then the funding went away and the plant, in need of some upgrades, was idled.

Desalination is also being considered to recover brackish (non-drinkable) water stored in large aquifers in the Picacho basin near Eloy, the Little Colorado River basin and along the Gila River, but nothing near Prescott. In some of those aquifers, the salinity is higher than that of the ocean. Disposal of the briny residue is a huge challenge.

Not surprisingly, the desalination industry took hold in the Middle East where energy is cheap and water is scarce. Early desalination processes used thermal distillation that required vast amounts of energy and

generated large amounts of greenhouse gases. Membrane-based methods dramatically reduced the energy requirements.

In this process, reverse osmosis, high-pressure pumps force sea water through membranes that have become more sophisticated with time, allowing only water to pass through while shutting out salts, viruses, bacteria and suspended solids.

The U.S. was slower to accept desalination. There was simply not the same urgency for implementation in the 1970s. Regulatory restrictions had to be overcome, the cost of energy was high and there were concerns about waste disposal. Meanwhile, the technology continued to advance. Desalination plants completely powered by solar energy are under construction in several locations around the world.

San Diego had become dependent on pipelines from Northern California and the Colorado River for its water supply. The City Council is presently embarking on a project of indirect potable reuse of wastewater as well as the purchase of 48,000 af/year from the nearby Carlsbad desalination plant, the largest in our hemisphere, when it opens later this year. The city will have more water security but the price is going up.

Clean water is precious and it will become more expensive. Because of the distance from the source, any pipeline coming into the PRAMA will be very costly. It behooves all of us who live in this lovely part of Arizona to inform ourselves about water issues and to do our best to retain the vitality of our very special community. We must start with conservation.

See www.cwagaz.org for details on ADWR Director Buschatzke's April 11 presentation, "Is Desalination the Solution to Arizona's Water Challenges?"

Submit questions to info@cwagaz.org.

Dr. Monte Anderson is a retired academic physician who serves on the CWAG Education Committee.

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