

Doug questions the idea of "Cheap Desal"

I doubt that "cheap desal" will ever be an operative term; there are reasons why such things are empty phrases, like "the hydrogen economy" and "secondary treatment is not a perfect process".

The reason water is the "universal solvent" is the extreme electric potential of its covalent bonding, asymmetrical due to the famous 108 degree angle of the H-O-H molecule. The relatively small water molecules surround and, literally, tear apart many organic and inorganic compounds that have weaker bonds.

Water is much more stable than other compounds due to the enormous energy given off in its formation:

$2H_2 + O_2 \Rightarrow 2H_2O + \text{lots of heat energy}$ (that's why creating hydrogen is so expensive).

Ex nihilo nihil fit: There is nothing "for nothing" in nature!

Con men play on the gullible in propounding the glories of Hydrogen, whining that there aren't enough fuel stations, for example, for this "amazing fuel". But to get the powerful fuel, you have to run that equation in reverse; you need to put about 60 kWh of energy into making each 35 kWh of H₂, not counting compression and storage, leakage and inefficiency.

Similarly, the dream of "undoing the universal solvent", or making fresh water out of dirty water, requires undoing a powerful force, that binding power of the asymmetrical water molecule, which defines water chemistry. A microwave, for example, heats substances by intense vibration of the water molecule based on varying magnetic fields of that asymmetrical molecule.

About the only way to ensure pure water is the hydrologic cycle, where the sun evaporates water via heat, and the purified water vapor recondenses into rain.

The idea of using filters or chemicals to purify water is sort of like the alchemists "theory" of finding the philosophers' stone that changes lead into gold. Actually, it can be done, by adding 3 protons in a nuke reactor; but atom by atom and it's incredibly dangerous -- and expensive.

FILTERS are the latest scam. Any filter is EXPENSIVE, and subject to lifespan issues. Dirty water is pushed through the tiny pores of the filter material, which strips most of the contaminants from the H₂O bond, and allows the H₂O molecules to slip through the material.

But not all impurities are larger than the H₂O molecule; some contaminants will slip by the filter.

Moreover, as the filter material gets damaged or clogged, increasing pressure is needed to force-strip the H₂O from the toxic stuff; the filter begins to tear, and the holes get larger and larger, allowing larger and larger toxic substances to slip by the filter.

BACK-FLUSHING, which means scraping the contaminants off the filters, and CHEMICAL WASH/RINSE is necessary to clear the toxic substances from the filters. For this reason, the Israeli plant is designed with a 30% overbuild, so that it can continue producing at capacity even when 30% of its filters are being cleaned or changed.

FIRST CON-JOB: Poseidon claims its water is "purer than distilled water" and that they have to be careful about damaging the pipes. Well, that's true for the first day, perhaps; but water treatment is an intensely physical process, and, as the filters get flushed and reflushed, treated and refreshed, eventually the pores become so loose that a goose could get through. At this point, there is a tension between COST and PURITY. The water that gets through the filter is then somewhat contaminated; moreover, many of the toxins are immune to Chlorination. Does the plant pay the enormous cost of filter replacement, or just blend-in the dirty water with the clean? We know that water utilities do the latter; think about all those "reservoirs" up in the mountains, like Lake Arrowhead, that are used as urinals by animals and boaters.

SECOND CON-JOB: Filtering sea water is much more difficult than freshwater. Looking at a standard under-sink filter, or even a Reverse Osmosis unit, the most important cost is not the unit, but the cost of filters. For one unit, the cost is about \$4 for 100 gallons.

The task of "purifying" tap water is a tiny task, compared to the task of purifying even brackish water; water is "dirty" from dissolved ionic compounds, "salts" or "brine", but also organic and toxic compounds that are much more damaging than what we think of as table salt. So the task might be simple, when it comes to under-sink processing of already potable water, but more difficult with muddy or brackish water; much more difficult with seawater, which is already mysterious and sacred. The "contaminants" in sea water are unique, not simply salts, but a lot of dissolved history of the Earth. Some day, we may figure out how to reproduce seawater from chemicals accurately enough for sea creatures to live in it: until then, a tiny bit of real sea water has to be added to aquariums for fish to live.

HENCE, The idea that there is some magic technology to "cleanse" seawater, or contaminated water such as sewage, is just plain false. About the best idea is microfiltration, tiny tubes, let's say, that allow water to migrate in but stops other contaminants; even then, contaminants smaller than water will get in.

The only real technology that works for seawater is "flash", evaporation and recondensation; which takes a lot of energy. The idea that there's some twirling magnets or secret method looking for investors is just a big con-job.

This latest PRESS RELEASE about one more method of miracle purification:

"...The inaugural unit produced over 200 gallons per day or enough pure water to meet the need for about 15 people..."

LOL that would do for just ONE person in San Diego! And the "force" they are using is not scalable to larger installations.

/Doug