



The Biomimicry Institute

Debunking some poorly presented anti-desalination "facts"

The anti-desalination lobby has been hard at work at stifling potable water provision to a growing global population with very poorly presented articles. I write this short article to try and bring some balance to the equation. I am a neutral water advisor where the best solution or suite of solutions is what I motivate for the given project. I have no commercial interests in desalination whatsoever and am commenting in the Southern African context.

Desalination is firstly and simply biomimicry where we engineer nature's process happening daily in a more focused area, so brine is naturally produced daily on a global scale. So point source impacts may exist that need mitigation that experienced and smart scientists and engineers embark upon very successfully. The desalination debate about significant environmental damage in the middle east is very localised to enclosed water bodies where in SA we have open ocean with vigorous currents to disperse the brine by-product. Brine itself is not the problem but how it is discharged and mitigate the issue at hand to an extent. Brine is also hydrophilic meaning it attracts water resulting in rapid concentration equilibrium to its surroundings.

The second issue is that one cannot compare mass balances for thermal desalination, mostly used in the middle east against membrane desalination successfully used all over the globe with Singapore and Australia showing independently generated environmental reports of their desalination plants having generally positive environmental impacts. Membrane desalination of seawater has up to 60% water recoveries with thermal less than 50%. Membrane desalination of AMD, Acid Mine Drainage, in South Africa has been producing from 90% to 97% water recoveries. These are leading developments opening the way to mining valuable salts, elements and compounds in a concentrated and therefore more economical volume. Similar thinking and approaches will be possible with SWRO, sea water reverse osmosis, where membrane architecture developments currently in progress will allow for lower fouling and energy

consumptions in conjunction with South African developments such as Eutectic Freezing technology currently being field trialed in South Africa.

So biomimicry of the natural process of sea water desalination requires complex engineering and scientific inputs to mimic nature as closely as possible that results in zero negative environmental impact to harness the last water available we need to survive on this planet. It is therefore of prime importance to support the technology so that it can be engineered as closely to nature as possible to afford us a sustainable and dignified future.