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100% Natural Desalination for \$20 AF operating Cost no Environmental issues

Additional submitted attachment is included below.

Zero power desalination & conveyance

Natural Desalination

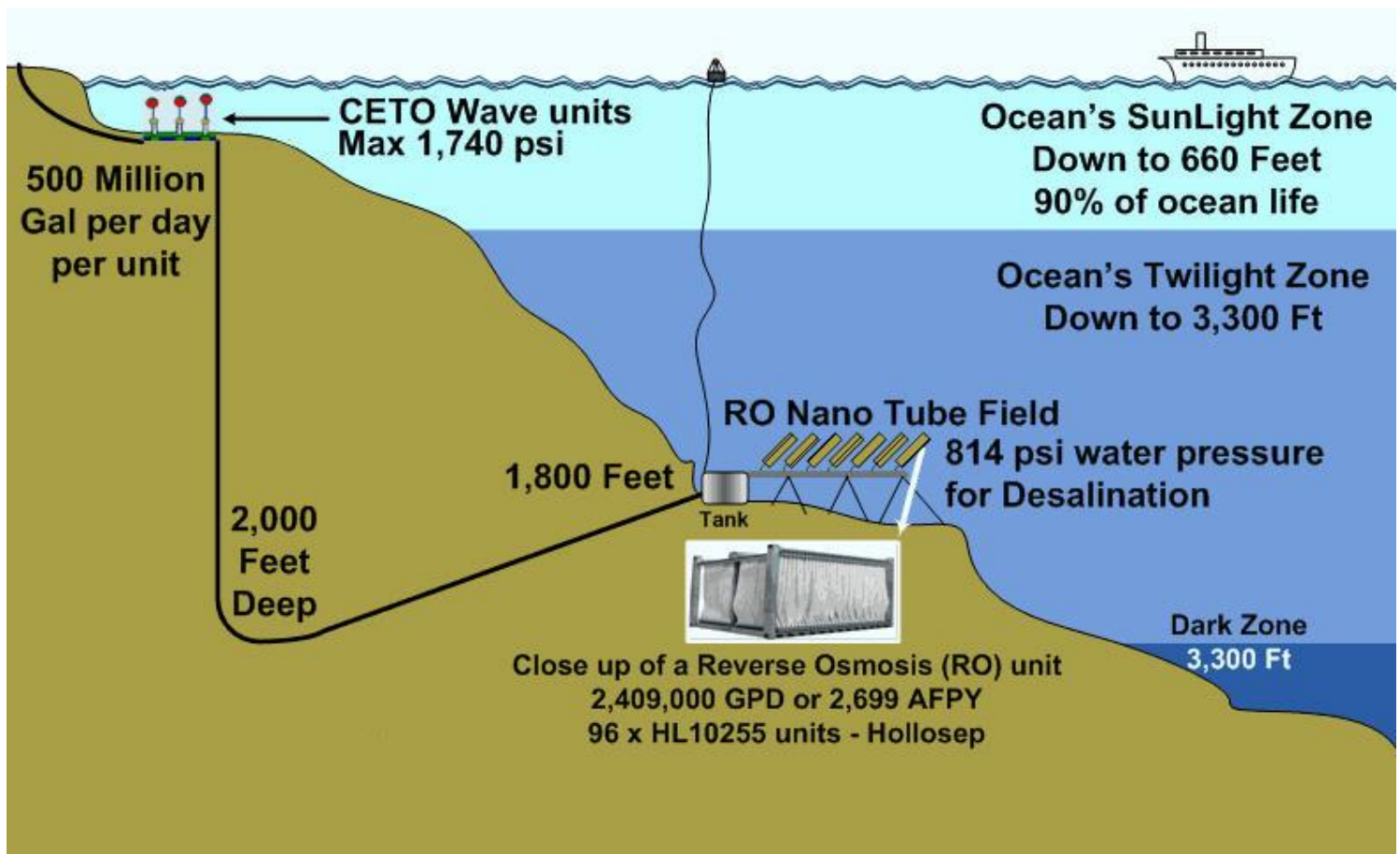
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Newly discovered “**Natural Desalination**” process uses only nature’s power to desalinate new **RIVERS** of fresh water from the ocean, gravity conveyance of the **RIVERS** of water to shore and wave power to bring the water up for use.

Traditional Desalination has many draw backs in that it uses lots of expensive energy to force water through Reverse Osmosis (RO) tubes, the costal land for desalination and power plants is costly and obtrusive in many ways, and the brine concentrate upsets the coastal waters balance. “**Natural Desalination**” eliminates all these problems and more.

Natural Desalination uses **ZERO** man made energy to desalinate and with gravity & wave power conveys the new **RIVERS** of water with no environmental issues. Endless supply of **Trillions** of gallons of fresh water all year long.

- Ocean water needs 800 psi to desalinate using Reverse Osmosis (RO).
- Off shore at 1,800 feet under the water you get 814 psi for the outside of a RO tubes.
- A small flexible pipe from the surface down to the RO system, brings 0 psi pressure down to the inner part of RO tubes and help water flow downhill 2 to 5 miles back to shore using gravity conveyance.
- The difference between the RO outside pressure and inside pressure gives a constant 814 psi, naturally at **ZERO** cost.
- Constant free trickle of salt FREE water into the inner part of the RO tubes. (Like HoloSep by Toyobo)
- Check valves would be strategically places to automatically close the flow of water if there was a break in the system.
- Water from the tubes would flow downhill to a collection chamber using gravity conveyance.
- Gravity would continue to carry the water down hill to the pipe or tunnel and back to the shore.
- Once at shore the water would be lifted using CETO Wave power for use or put in aqueduct or pipelines.



Natural Desalination advantages are:

- Supply all of California with drought resistant water supply for crops and people.
- No brine because only water is taken from the ocean, located far off shore and near the ocean floor helps too.
- Extended life of RO tubes, which would be cleaned by the ocean currents and not need pre filters.
- RO trains (Collection of Tubes) would cost a fraction because the containment vessel is not desired.
- Located off shore offers large areas (miles) for RO system for expansion with no impact to coastal residents.
- Little to no impact to ocean, plants or sea creatures; and no shipping hazard, due to location and design.
- Side benefit of increased water would be more farming, increased economic, more oxygen, cleaner air, etc..
- No Drought issues, Healthy Delta, great water quality, reduce sea level rising and many other water problems can be decreased or eliminated.
- And much, much more!

100% nature powered new endless source of water. Just think of it, new rivers like Sacramento or Colorado rivers of water for the San Joaquin and for southern California. Peripheral channel or tunnels to divert the Sacramento River would not be needed. There would be more fresh water to give better health to the Delta. More water for crops which feed people, increase our economy, improve our air, and help fish with more run off.

All proven concepts - individually but never brought all together until now?!

- RODSS submarine test RO using water pressure to desalinate sea water. <http://tinyurl.com/qcvxmdm>
- Horizontal Drilling to allow water to flow downhill to shore using gravity conveyance.
- CETO Wave power lifts water up to surface and up hills for gravity conveyance. <http://tinyurl.com/nzkfuza>

Educational Opportunities:

- **RO membranes clogging** – hollow fiber offers 10 times the surface area than spiral round which means less clogging. Locating at sea in the Twilight zone means exposure to less than 10% of ocean life as well as suspended from the ocean floor which allows for sea creatures to crawl under RO field. No clogging of filters due to no life growing on it. With RO hollow fibers exposed to open ocean waters allows for heavier particles' and salt to continue on down the canyon via gravity with little to no build up on the fibers. Ocean current mixing helps in the natural cleaning with fibers rubbing against one another. Reverse water pressure can also be used to clean the membranes.
- **Robots for Maintenance** – Working off shore and not on land is scary for most, but look at the energy industry which routinely uses robotics at much deeper waters. Elimination of pretreatment and chemical cleaning makes the RO process simple with less maintenance. Robots with buoyancy would install or replace units as needed. Also Robots can manually, using a duster like device, brush the fibers clean, use a pressure amplifier to shoot water at the RO membranes like a car wash, or hook to the air tank at the bottom and shoot compressed air to help agitate and remove any debris.
- **Pump water to surface** – CETO Wave pumps have more than enough to harness the natural wave power to pump the water to the surface and uphill to continue its journey to the State and Federal aqueducts less than 70 miles from Coast. As a reference water is lifted 3,244 feet in its trip from Sacramento over the Grape Vine and the Tehachapi lift is 1,926 feet by itself. BDCP Twin tunnel proposal is 2 x 35 miles long 40 foot diameter, which will add zero water. CETO wave is currently in operation off the coast of Australia, desalinating water using traditional RO plant, but just getting the water pressure from the wave power.

4 other options to end California's water shortages are 1) Benicia Salinity Control Gates to add 7 MAF in dry years now! 2) CETO wave desalination – more expensive than Natural Desalination but proven and eco-friendly. 3) Solar Distillation desalination on or near Aqueducts using WaterFX or other company. 4) State recycling of water – Toilet to Farm.

More details available upon request.

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