

A PLAN FOR THE SALTON SEA

Salton Sea becomes Imperial Lake

The Plan

We, Solar Power&Water® Inc., propose to flush the Salton Sea with ocean water conveyed by tunnels, pipes, and canals to reduce the salinity to 45,000 ppm TDS or less, long term. 45,000 ppm is known to be fish friendly, demonstrated historically as the salinity increased to 50,000. Gulf water could be used, but the ocean is preferable for these reasons.

- # No cross border with risk of Mexico shutting off the supply.
- # No need to share the pure product water with Mexico as an incentive.
- # No problem with huge tides at water intake.
- # 35,000 ppmTDS ocean rather than 37,000 ppmTDS Gulf, needing less water. 6.6 ocean vs. 8.2 Gulf million af/y
- # Easier brine disposal.
- # No risk of upsetting the ecology of the Gulf.
- # Closer.

Source could be the Pacific Ocean at the Camp Pendleton U.S. Marine Base. We are now suggesting rather than tap the shore at Camp Pendleton, draw the water from Batiquitos Lagoon farther down the coast. The connection to the ocean is already in place and conversion from stagnant to nice would be beneficial. The Lagoon mouth would be adjusted to enable fish navigation. Properly done, the maintenance dredging every few years might become unnecessary. /www.batiquitosfoundation.org/
Disposal outfall to edge of continental shelf so waste salts drain to the ocean depths.

Data

Salton Sea = 243,718 acres* x 6' evap/y = 1,434,600 af/y evap. (*[The Salton Sea Authority, October 3, 1997](#))

From salt balance, supply = 6,580,386 af/y ocean water [say 6.6 million af/y]. For comparison, IID reported the new lined section of the All American Canal is sized for 7.3 million af/yr; Delivery thru the California Aqueduct = 9.5 million af/y with a length of 701.5 miles.

Outflow = supply because the Sea elevation is stable with the ag waste fortuitously matching the evaporation; outflow = 6,580,386 af/y leaving the Lake. Outflow will change if ag waste changes.

Eventually the outflow will reduce to 5,118,078 af/y, accounting for

evaporation. Process the outflow with 60 acre SPPs, our solar pond/power plant systems, each receiving 710 af/y, each producing 190 af/y distilled water, 1 MW, and 160 af/y brine waste. This requires 7,209 SPPs producing 1,153,440 af/y waste and extracting 1,369,710 af/y of pure water. So plan for about 6.6 million supply and about 1.2 million waste, defining the water handling requirements. Referencing [the Salton Sea Authority, October 3, 1997 report showing](#) 22-foot diameter pipelines for 2,000,000 af/y, we would need pipelines or tunnels of diameters 40 feet and 17 feet, respectively. Tunnels at high elevations are shorter but require more pumping. Tunnel costs occur once, pumping expenses continue. Tunnel cuttings could be inventoried for pond berms later. SPPs would be built to order and leased perpetually. Lease cost would include prorated share of water infrastructure. Fewer larger 200 acre SPP ponds would be more efficient and cost effective.

Cleaning the Sea begins immediately upon completion of the water infrastructure, with inflow equal to the waste capacity. With perfect mixing of ocean and Sea water, the TDS reduces from 50,000 to 47,600 after one year, and less than 40,000 after six, depending on increased supply enabled by the SPPs. The benefits of increasing cleaning rate, pure water extraction, and power production proceed as SPPs are installed. Also SPPs can support the transition to hydroponic farming, such that agriculture water needs decrease by 90%, and no ag waste need flow into the Lake. Also the farm yields increase while using less farm land.

Funding

Fund with interest free loans. Logical lenders would include SNWA, Wynn Resorts, SCE, San Diego County Water Authority, MWD, etc,. Agreement on which agencies provide the funding can be negotiated. Amount needed is \$6? billion. Estimated time required to complete the construction is 2 years. Rate of loan retirement is likely to be determined by the rate at which Solar Power&Water® Inc. can build the SPPs.

SNWA is planning its Ground Water Development project at a cost estimate of up to \$15.5 billion. Operating costs are additional. Goal is 400,000 af/y by 2025. SNWA could fund our plan at some level, and buy leases on 10 SPPs. If SNWA were to lease 10 SPPs and buy more with the power sales income each year, the number would increase. After 14 years, the yield would reach 399,988 af/y, and \$3.83 Billion/y or more from power sales. Get 1,900 af/y during the first year. Power sales price

of Electricity (per kWh) will be the published Bureau of Labor Statistics, U.S. Department of Labor price for Los Angeles area consumers . http://www.bls.gov/ro9/cpilosa_energy.htm The result is that the power sale income per SPP is slightly more than 50% of the lease cost and water infrastructure costs. PPAs can be renegotiated after the leases are paid for. Water sales could assist. At a presentation 1/16/2014 to the SNWA Board of Directors, it was ascertained that SNWA does not recognize Solar Power&Water® Inc. and would make no interest free loan.

Wynn Resorts: Because cleaning the Sea begins immediately upon completion of the water infrastructure, WR can proceed to create lake friendly resorts and casinos. All WR casinos can set up kiosks to sell SPP leases at premium prices. This speeds up the retirement of the no interest loans.

SCE faces enormous problems and costs relating to the dismantling of the San Onofre power plants. SPP power to make up for no San Onofre will be cheap, baseload or peaking, and quick response load leveling. A thriving Lake area and the many miles of pristine lakeshore property should be good for SCE.

San Diego County Water Authority will be paying >\$2,000/af for Poseidon water, and plenty for the 200,000 af/y QSA water. The Sea to Lake plan will meet the water needs at low cost.

MWD needs water and power now and in the future. Participation in the Plan could be of great benefit to MWD.

On 1/17/2014, a Drought Crisis in California was declared. Logically California could loan the funds for the water infrastructure. Benefits to California from outstanding features of our plan are extracting slightly more than 1 1/3 million acre ft per year of pure water from the circulating ocean water, producing approximately 1/4 of the entire California electricity consumption, yielding a clean, fish-friendly Salton Sea, elevation stable at -227' independent of QSA transfers, and invigorating the entire valley. The extracted water is immune to drought and climate change. Improved farming practices we advocate can increase the amount of water gained to a little over 3 million acre ft per yr. The water gained can be stored in Lake Mead on a water swap basis for distribution

from there.

Potential Benefits

#Convert the Salton Sea into a full size clean saline fish-friendly resort lake. Important for people and the economy, and for the Western Flyway and some 400 species of birds. Ponds increase acreage for the birds from 243,718 to 676,258 or more. Sport fishing, swimming and water skiing, and boat racing return.

#Meet about 1/4 of California's peak electric power requirement with green renewable power, while providing baseload, peaking, and quick response grid load leveling.

#Encourage lakeshore development and recreation.

#Supplant Colorado River water needs for Imperial Valley plus provide excess.

#End fish die-offs and make beaches into fine sand with a crawling hammer mill.

#Enable 60% increase in agricultural production while eliminating farm diesel and diesel exhaust.

#Stabilize farming, thus reducing unemployment.

#Replace evaporation of about 1,462,308 af/y of Colorado River water with Ocean water.

#Accomplish inland desalinization, with salt management.

#Completely pay for the plan internally.

#Raise Lake Mead level as follows:

The Salton Sea to Imperial Lake plan is a source of water, some of which could raise the level of Lake Mead. As stated under Data, 1,343,675 af/y of pure water are extracted from the outflow. IID receives 3,300,000 af/y Colorado River water, used mostly for agriculture. Of this, 1,434,600 af/y drains into the Salton Sea where it evaporates. Crops consume the difference, or 1,865,400 af/y consumed by crops. Hydroponics would reduce this consumption by 90% to 186,540 af/y, sparing 1,678,860 af/y. This plus the extracted water amounts to 3,022,535 af/y. SNWA may or may not get 400,000 af/y and QSA gets 200,000 af/y, or 600,000 claimed. The remainder is 2,422,535 af/y. This water could be left in Lake Mead, raising its level about 28 ft. above the declared shortage level of 1075 ft.

#Enhance Pacific estuary wetlands and create a first class marina the size of Newport Beach Harbor.

Ideal

A lot of government land abuts the Salton Sea, especially to the south

east. This land is serving no useful purpose. Ideal would be for this land to be made available for SPPs. If SNWA will need 1000 or more SPPs, why not here? Infrastructure development could be very efficient. Best might be to involve the United States Army Corps of Engineers. This agency might also help determine the best placement of the supply and waste tunnels which will be needed.

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Richard McKay & Roger Sprankle

Richard A. McKay