

The Next Step – Focus on the Salton Sea
How we can apply the best of all our lessons learned.
A Seawater Works solution for the Salton Sea.

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The Ambitious but Achievable Goal:
Apply Lessons Learned at the Salton Sea
To Produce an Infinite Supply of Productive Water,
Clean Energy and Abundant Food

The story of the Salton Sea is a classic of tension between nature and humankind. The Salton Sea in Southern California was formed 110 years ago when water from the Colorado River was accidentally diverted from its riverbed. For almost two years, Colorado River water filled the area that is about 250 feet below sea level, creating the largest inland sea in California, covering an area 45 miles by 20 miles. It fills a small part of an old basin that, over many eons, was, at various times, dry salt beds and then five successive lakes that covered an area from the Coachella Valley to the Sea of Cortez. It had been completely dry since 1700. With the accidental diversion, humans and nature “restored” the Salton Sea. But nature is fickle and has not naturally continued to replenish the Salton Sea, reducing the Sea to 35 by 15 miles, falling about half a foot each year. Instead of relying on nature, Congress authorized farm run-off to go into the Salton Sea – but nature evaporates more than humans restore every year. Without a “big idea” and skilled planning, the area around the Salton Sea will continue to decline and environmental and economic problems will become even more severe.

The natural question is: how did fresh water from the Colorado River form a salt water sea. With salt stored in the ground and salty run-off from nearby farms, the Salton Sea eventually has become saltier than the Pacific Ocean. Beginning in the 1930’s, the area became a tourist and recreational center. In the 1950s and 1960s, Hollywood stars like Frank Sinatra and Jerry Lewis joined thousands of nearby residents and tourists along the sunny beaches with swimming and boating in the buoyant water. More recently, the Sea needed saving as the water receded, exposing agriculture sediment, leaving behind serious environmental problems. As the area suffered, musician and local Congressman, Sonny Bono, and others worked to “save” the Salton Sea. With the recent California drought, greater attention has been paid to water in California and the vital **energy-food-water nexus**. Governor Jerry Brown recently appointed a new Assistant Secretary of the Department of Natural Resources, Bruce Wilcox, to serve as

lead for addressing solutions for the Salton Sea. With this new attention, a variety of options large and small have been proposed.

The Big Idea

As I wrote in a companion piece, *The Road Ahead*, I described an ambitious, but achievable concept that integrates seawater agriculture (using oceanwater) with a new term coined by Carl Hodges, Evaposynthesis and ENC Energy. It is an elegant, natural and affordable solution that can offer long term, sustainable agriculture, clean economic development, and environmental benefits. To harness and advance this opportunity, Carl Hodges and Art Gensler founded Seawater Works LLC to achieve the ambitious, but achievable, goal: “An infinite source of productive water, clean energy, and abundant food.”

So, let me try to answer these fundamental questions: *What do we propose to do, why is it better than other proposals, what are the benefits, and how do we move it forward?*

What do we propose to do?

This is a complicated process that will require several stages. Generally, the timeline is 1-2 years in the first stage, 3-5 in the second, and 5 years and beyond in the third stage.

- In **Stage One**, we will plant Salicornia at several sites. We will test the idea of bringing some clean, naturally filtered, seawater from the Sea of Cortez, lifted just 42 feet and placed into the mouth of the New River, where it can flow naturally into the Salton Sea. We will test the use of Salton Sea water, mixed with farm run-off, to a blend that fits the needs of Salicornia. We will develop a Center of Excellence at the Imperial Valley Research Center in Brawley (formerly the Agriculture Research Lab) to test seeds, inform the public and serve as a community resource. We will determine how best to incorporate ENC Energy. We will harvest two crops from the initial planting: the tasty delicacy of Salicornia tips for sale and the full plant and seeds for several uses. We will explore relationships with schools, the junior college and universities to develop a skilled workforce. We will begin exchanges with potential partners in other parts of California, the US, and globally.
- In **Stage Two**, we will increase planting and harvests, scaling up multiple uses for the crops. We will begin to integrate ENC Energy into the process. We will bring more seawater from the Sea of Cortez and consider ways to reverse the flow of the highly saline Salton Sea water back to the Sea of Cortez – to help restore health to the Salton Sea. We will have an active Center of Excellence, with extensive community information and education programs, a strong research capability, and resources for a global audience interested in seawater agriculture and ENC Energy. We will work with local companies to process more agriculture products and related bio-products.

- In **Stage Three**, we will have a fully integrated, self-sustaining system of seawater agriculture and ENC Energy. The Center of Excellence will become a global leader and will become self-supporting with sponsored R&D, information and education programs, and economic development services.

Why is it better than other proposals?

California faces daunting challenges to address its drought, the environmental consequences of a receding Salton Sea, and the need for a robust agriculture industry. Huge projects, costing multi-billion dollars, are being proposed. For the drought, some are considering large scale desalinization schemes. Some look to large, new canals or huge water pipelines. Several large studies, such as the CH2MHill study, assessed multi-billion dollar canal and diversion schemes. A formal proposal is being pursued by the Department of Natural Resources to restore wetlands to reduce dust and pollution.

The fully integrated Seawater Works solution should be far less expensive than desalinization. Canals and pipelines are enormously expensive and would require right-of-way, extensive pumping (and related energy costs), and environmental permits. Restoring the wetlands is a useful first step, but even the Department of Natural Resources acknowledges that it does not address the long term.

Instead, we propose to utilize the existing New River to bring seawater from Mexico over a small rise and then let it flow naturally into the Salton Sea. *Perhaps, more important, the solution we propose has multiple benefits that no other proposal has.* There would be revenue streams from new agriculture and related products; environmental restoration; power generation; increased fresh water; possible water transfer fees; and a likely increases in property values. With the short term results, we will prove the concept and begin to offer hope for a successful future for the region. No other proposal offers this fully integrated approach and multiple benefits.

What are the benefits?

In the related piece, The Road Ahead, I describe multiple economic, environmental, and global benefits. Without listing those again, let me focus on these specific benefits of the Seawater Works proposal:

- It retains and expands a robust agriculture industry.
- It allows unused land to become productive agriculture fields.
- It frees up fresh water for higher value uses.
- It creates a new industry in bio-jet fuel and related bio-products. Salicornia is a crop that can produce seeds that provide fodder, protein, and oil that is particularly well-suited for bio-jet fuel and other bio-based products.
- It produces clean economic development with agriculture processing. There will be downstream facilities for bio-jet fuel and related bio-products. There could be

a re-vitalized tourism industry as the Sea is restored and property values increase.

- It reduces dust pollution and related toxic pesticides and chemical particles. In addition, Salicornia requires fewer pesticides.
- It stimulates significant research in seawater agriculture and establishes the area as a global leader.
- It develops the Imperial Valley Research Center as a Center of Excellence as a hotbed of R&D, practical demonstrations, and community outreach.
- It promotes cooperation with local schools, the junior college, and nearby universities to prepare a trained workforce and undertake practical R&D.
- As we integrate ENC Energy, it generates clean power.
- And, in the long run, it may help the US keep old water commitments to Mexico.

How do we move it forward?

A work plan will be developed that details the three phases and related budgets. With available initial funding, an agreement will be signed and a minimum of two acres of Salicornia will be planted at the Imperial Valley Research Center in Brawley using blended salt water. Work will begin to develop plantings nearby and possibly in Mexico. Discussions will begin to secure the ability to obtain and deliver seawater from Mexico through the New River. Cooperative agreements will be arranged with the Imperial Irrigation District, the California Department of Natural Resources and other relevant organizations. Initial meetings will take place with local schools to explore collaboration. R&D or demonstration funding proposals will be pursued with government sources, foundations or interested private sector investors. Plans will be developed for Phases Two and Three.

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