

SALT GRADIENT SOLAR: POND CONTAINMENT

PROJECT NAME:

Solar Power&Water®

PROJECT LOCATION:

Wellton, AZ

PROJECT APPLICATION:

Salt gradient solar pond containment liner for distilling large ponds of brine water to fresh potable water

MATERIAL USED:

45 Mil black Dura-Skrim® Reinforced Polypropylene (RPP)

PROJECT CHALLENGES:

- A short, one-week timeline available for project completion
- The liner had to be a barrier impervious to the VOCs

PROJECT OVERVIEW:

- Fresh water supplies are a world-wide issue for many areas in relation to access and availability. Geosynthetics have long been a significant factor in environmental water containment solutions. Solar Power&Water pond systems are designed and marketed to address fresh water shortages, agricultural drainage cleanup, and the need for low cost renewable energy. The project scope included a salt gradient solar pond containing a flexible geosynthetic liner system, and with the help of a prime mover (engine), was designed to extract power directly from the pond's hot brine. The hot brine and project geographical location in Wellton, AZ both were considerations that had to be addressed in the initial planning phase to develop a liner solution able to meet and perform to the project parameters. The objective of pond performance was to distill brine water into fresh potable water and energy. Their innovative system provided a renewal water source for water that originated from agricultural wastewater, brackish/saline water (or ocean water) and sunshine. This project and its design remain significant, as a portable technology that may offer a catalyst for the systematic transformation of massive amounts of available brine water into renewable energy and fresh potable water.



Ballast placed immediately after panel deployment due to strong winds and Dura-Skrim® RPP panels staged

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PROJECT SOLUTION:

- The flexible Dura-Skrim® Reinforced Polypropylene (RPP) chosen for this project was based on the following factors: high temp resistance, excellent dimensional stability, and ease of handling and sealing in both factory and field allowing for efficient use of large factory fabricated panels to increase production rates. A total of 130 prefabricated factory RPP panels measuring 220' x 95.94' and 540 ballast tubes were designed and built in at the manufacturer's quality-controlled location and delivered to the project site in Arizona. Construction installation crews completed the project in an impressive 28 days total; well ahead of the 35 days originally projected and budgeted. This saved the client significant days on site, labor and cost, along with any unnecessary weather risks. Effective communication/planning between Raven and Solar Power&Water® additionally attributes to the timely project completion. The project installation was completed, the lake filled to operating capacity, and the project then finished up construction work for the infrastructure. During the project analysis, we seen a significant gain with the engineered use of modular construction prefabricated factory panels. We were able to reduce field seams by over 50% when compared to competitive field installed sheet membranes. In the end, the project was designed, fabricated, installed and completed with high-quality performance and an optimal success rate for the customer install the large panels, also reduces overall project costs.

PROJECT IMAGES:



Anchor trench of pond lined with Dura-Skrim® RPP liner to prepare for anchoring the perimeter



Full site deployment of the Dura-Skrim® RPP panels and ballast tubes



Site sub-grade had to be wet and rolled daily due to hot, dry and windy conditions