



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) <p align="center">Cameron A. Huntley</p>	Project Number <p align="center">J0812</p>
---	---

Project Title
High Pressure Reverse Osmosis for a New Kind of Reservoir

Abstract

Objectives/Goals
I believe that I can get lots of fresh water out of the ocean through Reverse Osmosis using the equivalent natural water pressure of the deep ocean, I believe this will be good quality water. If I can show this to be true, then I will show how this could be used in an innovative way, to fill a reservoir for city drinking water.

Methods/Materials
1. Get five-gallon bucket of seawater. Take seawater to a professional laboratory where I can experiment with high-pressure equipment that will emulate the real deepwater ocean conditions that otherwise I would need a thousand foot pipe to do. 2. Make observations of water being run through membrane at the same pressure as 800-1000 feet deep in the ocean. Find out the quantity and quality of water I would obtain. 3. Document observations and readings with photographs and notes so this study can be used to see how a reservoir could be filled below sea level near a coastal city. 4. Use a Pressure Gauge to measure pressure. 6. Use a digital device to read temperature, salinity. There are some huge RO membrane systems that would convert enough salt water for a small city. I can see a million of them in use some day making fresh water for our cities' drinking water, and agricultural use.

Results
Test results and conversions on the quantity and quality of water
QUANTITY
17ml 24ml 22ml
I obtained 1.8984 Gallons per hour per square foot of membrane.
I learned at the lab that a typical RO unit has 400 square feet of membrane and the size is 8 inches in diameter by 40 inches long. With a standard size unit my rate of RO would be:
 $759.36 \times 24 = 18,224.64$ gallons per day (24 hours).
1,000 units could make 20,404 acre feet per year. Enough water for 40,807 families, 4.3% of San Diego's households.
To make up a 20% loss from other sources like the Colorado River 4,650 8# x 40# RO units would be needed.
QUALITY
440mu 560mu 336mu Mean: 214ppm
Conversion factor 2.7mu=1ppm
I started with 30,000 ppm and ended with average of 214ppm.

Summary Statement
I had an idea that I could get fresh water out of an RO membrane using natural pressure of the ocean, tested it, and had a new idea about it.

Help Received
Used lab Equipment at Unnamable Company