

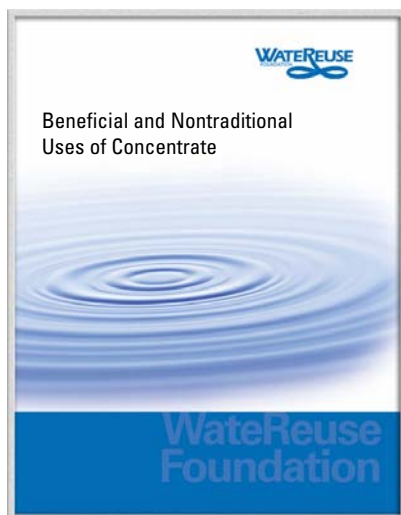
Project PROFILE



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Advancing the Science of Water Reuse and Desalination through Research

Beneficial and Nontraditional Uses of Concentrate



Product Number: 02-006b-01

WRF Subscribers: \$15

WRA Members: \$25

Others: \$45

Project Number

WRF-02-006b

Principal Investigator

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Global demand for water is growing rapidly, and the options for additional sources of supply are limited. Conservation and water use efficiency are crucial components of securing adequate water supplies but are not likely to be sufficient to satisfy the ever-increasing demand for water in the United States.

Desalination almost certainly will be a major means of meeting these projected increases in water demand. Inland areas are looking more to brackish groundwater, and coastal areas are looking to seawater desali-

nation. Increasingly stringent requirements for various emerging constituents and water reuse regulations are also raising the demand for the use of membrane technologies.

Production of low-salinity water from desalination of brackish and seawater results in a byproduct termed "concentrate," having significantly increased total dissolved solids (TDS) relative to the source water.

Concentrate must be properly disposed of, and this disposal is becoming increasingly problematic as the size and number of desalination plants increase. Costs associated with concentrate disposal will become a growing fraction of total membrane plant costs, and difficulties with finding a viable concentrate disposal method have led to the delay and even cancellation of some membrane plant projects. New technical and regulatory approaches to concentrate disposal are desperately needed.

Objectives

This project focused on the beneficial reuse of concentrate or concentrate byproducts. The objectives were:

- To provide a comprehensive review and comparison of the full range of alternative uses of concentrate, and to assess the feasibility of implementation, economic considerations, and environmental safety; and
- To evaluate both direct uses of concentrate and the potential for recovery and marketing of individual salts separated from concentrate.

Benefits

This report identifies several potentially beneficial and nontraditional uses of concentrate that could help agencies develop creative local options for beneficial concentrate disposal.

Highlights

- **Oil Well Field Injection:** Injection may be technically feasible at some locations, and may be used to aid secondary recovery of oil and gas.
- **Solar Ponds:** Concentrate could be used as a feedstock for a solar pond, from which heat energy could be derived.
- **Land Application/Irrigation:** This can be a viable alternative, especially for smaller facilities close to agricultural areas.
- **Aquaculture:** Issues include the existence of a market for the species to be grown, climate, concentrate chemistry and flow rate, and effluent disposal.
- **Wetland Creation and Restoration:** Concentrate could potentially be discharged to naturally occurring or artificially created inland salt marsh areas.
- **Constructed Wetland Treatment:** Treatment wetlands have been tested at an experimental scale for concentrate treatment.
- **Salt Separation:** Technology appears to exist to accomplish the salt separations and recovery.

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About the Foundation

The mission of the WaterReuse Foundation is to conduct and promote applied research on the reclamation, recycling, reuse, and desalination of water.