

Research Update

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Bottom Line

This research project used two case studies to compare the benefits and limitations of treating locally available impaired water versus importing fresh water.

Better, Faster, Cheaper

When communities are evaluating a new supply of water, choices between local and imported supplies need to be carefully considered. Understanding which factors to consider will pave the way for more cost-effective ways to meet local water demands.

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Collaborators

- Reclamation's Technical Service Center
- Oklahoma-Texas Area Office in Reclamation's Great Plains Region

Treat Impaired Water or Import Fresh Water?

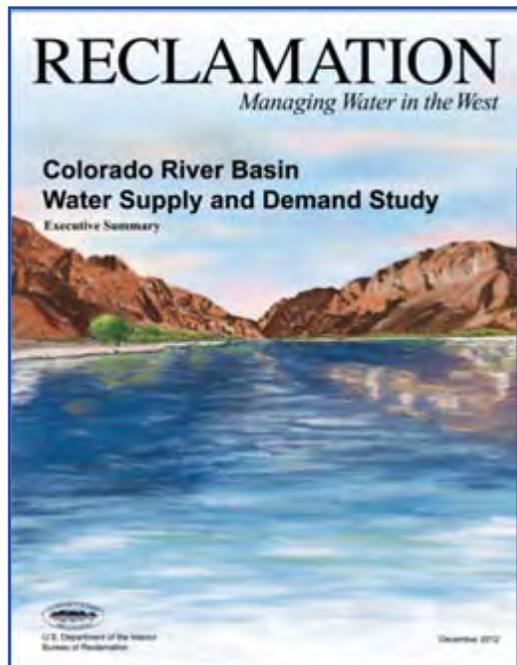
Evaluating the benefits of treating locally impaired water supply sources versus importing fresh water

Problem

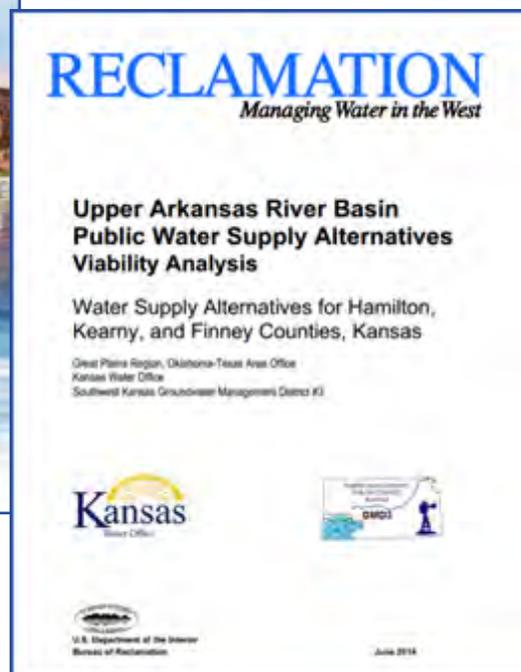
Communities often face a choice between treating local water or importing fresh water. Advanced water treatment technologies are often considered costly; however, high costs and issues also exist when moving water from one location to another. Communities need to evaluate risks and benefits of using advanced water treatment, rather than conventional water supply techniques. For example, a water treatment plant might be able to treat a local brackish groundwater source at a fraction of the cost it would take to construct a lengthy pipeline to deliver fresh water from miles away. At what pipeline length will treatment be cost competitive? Clearly, the answer to this question is site specific and depends on a number of factors. Understanding which factors to consider is crucial to water management decisions.

Solution

Using the information from two previously conducted Reclamation studies (see figure), this Reclamation Science and Technology Program research project compiled a list of key factors used to determine the feasibility of advanced water treatment compared to other water supply methods.



Previously conducted Reclamation studies.



Application and Results

In general, the costs for treating local supplies may be lower than the costs for constructing pipelines to import water, but the annual operation and maintenance (O&M) costs may be higher. The primary concern with treating water, compared to importing water, is disposing of treatment residuals and brine. Yet overall, the lifecycle costs are similar, or slightly lower, for water treatment compared to importing water. Some of the key challenges for importing fresh water are permitting requirements, the potential for land disturbances, and the need for easements and access to land. Additionally, importing water is generally considered to be less sustainable.

Key criteria for comparing treatment and importation include:

- **Annual O&M Costs.** In general, annual O&M costs associated with maintaining an advanced water treatment facility are greater than costs for importing higher quality raw water sources. The O&M costs for importation are significantly influenced by pumping distances and hydraulic gradients.
- **Operations and Serviceability.** Some communities do not have the available resources to operate and maintain an advanced water treatment system. Importing raw water or treated water can help alleviate the concerns with operability and serviceability.
- **Disposal of Waste Streams.** Disposal of waste streams (concentrate) from advanced water treatment facilities creates engineering uncertainties. Local contaminants of concern that will complicate disposal include, but are not limited to, uranium, selenium, and radionuclides.
- **Location.** Construction costs are a key factor in evaluating advanced water treatment versus water importation. Proximity to the nearest viable water source significantly impacts the overall construction cost.



Pipes discharging (importing) water from the Warren H. Brock Reservoir to the All-American Canal, California.



Treated water solutions from the Brackish Groundwater National Desalination Research Facility in Almagordo, New Mexico.

“Treating a locally available, impaired water resource offers advantages over importing fresh water for some applications.”

Katie Guerra
Chemical Engineer
Reclamation’s Lower
Colorado Region

Future Plans

Results from this research project will be used to help planners evaluate options to meet specific planning goals. Moreover, this project helped identify future research needs in advanced water treatment, so that more communities can treat local brackish water as a viable and sustainable water supply.

More information

www.usbr.gov/research/projects/detail.cfm?id=9252