

Option Submittal Form

Contact Information (optional):

Keep my contact information private

Contact Name: _____	Title: _____
Affiliation: _____	
Address: _____	
Telephone: _____	E-mail Address: _____

Date Option Submitted: 2/1/12

Option Name:

Desalination Augmentation

Description of Option:

Assessment and potential implementation of additional desalination projects of three varieties throughout Colorado River Basin: (1) ocean water desalination along Baja California coast, Southern California coast, and Gulf of California; (2) surface water desalination basinwide; and (3) ground water desalination basinwide. Equitable division of obligations -- funding, technical support, etc. -- among federal government, Mexico, basin states, and relevant major water users who would benefit from these projects. Potential establishment of competitive bidding process whereby contracts would be offered to private sector entities for construction and (perhaps) operation of desalination facilities.

Location: Describe location(s) where option could be implemented and other areas that the option would affect, if applicable. Attach a map, if applicable.

Ocean desalination facilities might be considered for Baja California coast, Southern California coast, and Gulf of California. Specific locations of groundwater and surface water desalination facilities would need to be assessed. It would be worth consulting with (among other parties) major water users in the Southern California about optimal locations for all three types of facilities (e.g., MWD, SDCWA) in the Lower Basin.

Quantity and Timing: Roughly quantify the range of the potential amount of water that the option could provide over the next 50 years and in what timeframe that amount could be available. If option could be implemented in phases, include quantity estimates associated with each phase. If known, specify any important seasonal (e.g., more water could be available in winter) and/or frequency (e.g., more water could likely be available during above-average hydrologic years) considerations. If known, describe any key assumptions made in order to quantify the potential amount.

TBD. This quantity of water hinges on the number and scope of desalination projects implemented. Implementation of these projects could be sequenced, prioritizing the most cost-effective, environmentally sound ones initially and relying on accumulated knowledge (and other factors) to assess worthwhile projects for later stages. The Salinity Control Program might provide a useful model in this regard.

Additional Information

Technical Feasibility: Describe the maturity and feasibility of the concept/technology being proposed, and what research and/or technological development might first be needed.

Desalination facilities currently exist in the basin (Yuma) and across the globe. The technology is gradually maturing. Its feasibility in the basin seems to hinge on (among other factors) (1) cost effectiveness; (2) environmental soundness (brine disposal, etc.); and (3) energy requirements.

Costs: Provide cost and funding information, if available, including capital, operations, maintenance, repair, replacement, and any other costs and sources of funds (e.g., public, private, or both public and private). Identify what is and is not included in the provided cost numbers and provide references used for cost justification. Methodologies for calculating unit costs (e.g., \$/acre-foot or \$/million gallons) vary widely; therefore, do not provide unit costs without also providing the assumed capital and annual costs for the option, and the methodology used to calculate unit costs.

The scope and sources of funding for this option depend upon the number and locations of desalination projects. Cost figures undoubtedly exist for the construction and operation stages of similar types of projects -- as well as for water rates associated with them -- although I am unable to provide these figures here.

Permitting: List the permits and/or approvals required and status of any permits and/or approvals received.

Normal NEPA and ESA processes would have to be followed for desalination projects sited in the United States. Basin state NEPA and ESA equivalents likewise would come into play (e.g., in Southern California). Mexican environmental laws would apply to any projects sited there.

Legal / Public Policy Considerations: Describe legal/public policy considerations associated with the option. Describe any agreements necessary for implementation and any potential water rights issues, if known.

Increased reliance on one or more of the three varieties of desalination projects by major water users in Southern California (e.g., MWD, SDCWA) may result in decreased reliance on transbasin diversions from the Colorado River mainstem (i.e., potentially less than full use of MWD's BCPA section 5 contract entitlement). Increased reliance on these projects by agricultural and municipal water users in Mexico likewise might impact U.S. delivery obligations of that country's 1.5 maf annual entitlement under the 1944 Treaty. Innovative (and equitable) cost-sharing arrangements would need to be developed by the parties (sovereign and non-sovereign) with interests in these projects. The ICS provisions of the 2007 Interim Guidelines should be tailored (perhaps amended) to incentivize engagement with these projects in the Lower Basin.

Implementation Risk / Uncertainty: Describe any aspects of the option that involves risk or uncertainty related to implementing the option.

Brine disposal poses environmental risks related to public health and biodiversity. Reliable energy sources would need to be secured.

Reliability: Describe the anticipated reliability of the option and any known risks to supply or demand, such as: drought risk, water contamination risk, risk of infrastructure failure, etc.

The reliability of desalination project seems strong and much less of a concern than cost effectiveness, brine disposal, and energy source issues. Groundwater- and surface water-based desalination projects might be susceptible to drought risks.

Water Quality: Identify key water quality implications (salinity and other constituents) associated with the option in all of the locations the option may affect.

Brine disposal is an important concern -- particularly for ocean desalination projects. Conversely, the operation of groundwater- or surface water-based projects might reduce salinity levels in the relevant water bodies.

Energy Needs: Describe, and quantify if known, the energy needs associated with the option. Include any energy required to obtain, treat, and deliver the water to the defined location at the defined quality.

Energy Required	Source(s) of Energy
Facility Operation	TBD

Hydroelectric Energy Generation: Describe, and quantify if known, any anticipated increases or decreases in hydroelectric energy generation as a result of the option.

Location of Generation	Impact to Generation
Basinwide	Potential increase in hydropower needs for operation of facilities

Recreation: Describe any anticipated positive or negative effects on recreation.

Locations	Anticipate Benefits or Impacts
Lower Basin	Potential higher reservoir and instream flow levels -- more recreation

Environment: Describe any anticipated positive or negative effects on ecosystems within or outside of the Colorado River Basin.

Locations	Anticipated Benefits or Impacts
Basinwide	Brine disposal issues -- coastal and terrestrial
Basinwide	Potential augmented instream flows and decreased salinity levels

Socioeconomics: Describe anticipated positive or negative socioeconomic (social and economic factors) effects.

The financial costs of basinwide development of desalination projects foreseeably would be significant. Yet economic gains also likely would incur to U.S. firms engaged in evolving desalination technology (all aspects of projects) and to the states in which these firms are located (employment, tax revenues). If this option were to result in augmentation of instream flows in the Colorado River System -- particularly, in the Lower Basin via ocean-based desalination projects -- the full range of economic sectors reliant on these flows would benefit from this augmentation (e.g., recreation and tourism, agriculture) as well as aquatic and riparian ecosystems.

Other Information: Provide other information as appropriate, including potential secondary benefits or considerations. Attach supporting documentation or references, if applicable.