

Option Submittal Form

Contact Information (optional):

Keep my contact information private

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

Date Option Submitted: 1/30/12

Option Name:

Aquifer Storage and Recovery

Description of Option:

Comprehensive assessment of potential for increased use of natural and man-made underground aquifers for storage and recovery of water from the Colorado River System – i.e., beyond current aquifer storage and recovery efforts in the Lower Basin. Depending upon assessment outcome, potential implementation of most feasible aquifer storage and recovery projects via joint federal-state funding. Also depending upon assessment outcome (and other factors), potential increased reliance on aquifer storage and recovery in lieu of existing on-stream dams and reservoirs.

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

The assessment itself would be basinwide in scope. The locations of any feasible projects would be determined by the assessment.

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.

The quantity of water provided by a basinwide aquifer storage and recovery program would hinge on (among other things) (1) the collective storage capacity of the projects selected for inclusion in the program and (2) the potential reductions in evaporation losses stemming from increased use of these projects in lieu of existing on-stream dams and reservoirs.

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.

Aquifer storage and recovery is currently occurring in the Lower Basin. This proposal calls for potentially expanding the geographic scope of these efforts to the basinwide level and evolving the concept to include construction and utilization of man-made aquifers (i.e., where natural aquifers are not available). Research would be needed examining the feasibility of constructing and utilizing man-made aquifers -- at least to the extent they would be considered alongside natural aquifers for this option.

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.

Lower Basin entities currently engaged in aquifer storage and recovery (e.g., Arizona Water Banking Authority) likely would possess valuable cost figures and calculation methodologies for projects deemed feasible in the assessment (albeit not with respect to man-made aquifers).

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

Normal NEPA and ESA processes and documentation foreseeably would be required for any projects implemented from the assessment.

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.

So long as basin states' aquifer storage and recovery activities comported with the existing terms of the Law of the River -- entitlements, delivery obligations, etc. -- no modification of this framework inherently would be required to implement projects deemed feasible in the assessment. The federal regulations governing water banking in the Lower Basin likely would provide a useful model for administering aquifer storage and recovery activities in accordance with the existing legal framework.

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

The assessment would be designed to shed light on risks and uncertainties associated with basinwide aquifer storage and recovery activities.

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.

Same as above: reliability and risk issues would be addressed in the assessment.

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

Reduced evaporation losses stemming from aquifer storage and recovery activities might decrease salinity levels (assuming higher overall flow levels).

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
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
TBD	

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

Locations	Anticipate Benefits or Impacts
Basinwide	Potential higher flows due to lower evaporation rates

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

Locations	Anticipated Benefits or Impacts
Basinwide	Same + biodiversity benefits (fish) if less reliance on dams and reservoirs

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

Potential economic benefits to private firms (and other entities) contracted to produce assessment and potentially to implement aquifer storage and recovery projects. If these projects supplant existing on-stream dams and reservoirs, there foreseeably would be tradeoffs related to recreation and hydropower generation, although it is unclear how these respective costs and benefits would compare.

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

As noted in shorthand in the environment section, various biodiversity benefits might flow from increased reliance on aquifer storage and recovery and decreased reliance on on-stream dams and reservoirs, as the latter entail obstruction of fish migration; modification of aquatic and riparian habitat; and alteration of sediment patterns, water temperatures, and seasonality and variability of flows.