SUBMIT OPTION SUBMITTAL FORM BY:

1. EMAIL TO: COLORADORIVERBASINSTUDY@USBR.GOV
2. U.S. MAIL TO: BUREAU OF RECLAMATION, ATTENTION MS. PAM ADAMS, LC-2721, P.O. BOX 61470, BOULDER CITY, NV 89006-1470
3. FACSIMILE TO: 702-293-8418

Option Submittal Form

Contact Information (optional): ☐ **Keep my contact information private.**

Contact Name: _____ Title: _____

Affiliation: _____

Address: _____

Telephone: E-mail Address:

Date Option Submitted: Jan 25, 2011

Option Name:

Water for West ™ Project

Description of Option:

The Water for West ™ Project (WFW) is designed to generate 3.5 million acre feet (3.5MAF) of fresh water in the Los Angeles Basin by means of an offshore deep sea reverse osmosis system. The WFW will provide a secure, uninterruptible source of fresh water to over 80 million residents of the Colorado River Basin with a lower environmental footprint, lower energy consumption and a lower levelized cost than conventional reverse osmosis systems or additional fresh water aqueducts. Since the WFW equipment is located offshore in clean deep ocean water (an infinite watershed), it is resistant to force majeure events such as earth quakes, tidal waves, climate changes and other events which constrain other conventional fresh water delivery systems such as aqueducts or shore based reverse osmosis plants

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

See attached presentations on WFW made to water agencies (Exhibit A)

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 WFW could be made available within the 50 year window contemplated by the Colorado Basin Study as described in the attached Project development plan (Exhibit B)

SUBMIT OPTION SUBMITTAL FORM BY:

1. EMAIL TO: COLORADORIVERBASINSTUDY@USBR.GOV
2. U.S. MAIL TO: BUREAU OF RECLAMATION, ATTENTION MS. PAM ADAMS, LC-2721, P.O. BOX 61470, BOULDER CITY, NV 89006-1470
3. FACSIMILE TO: 702-293-8418

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.

The offshore reverse osmosis system has been validated for recovery of grey waters and a phased program is proposed to advance the basic design to the 3.5MAF capacity required by the Colorado River Basin Study (see Exhibit B)

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.

Please find attached cost information for a WFW system designed as an option for the Delta Conservation Plan with a lower environmental footprint, lower energy consumption and a lower levelized cost than the peripheral canal (see Exhibit C)

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

The permitting matrix for the WFW is considerably shorter than the permitting matrix for other conventional fresh water delivery systems such as aqueducts or shore based reverse osmosis plants. Since the WFW rejects the salt water at the submerged membrane, it only delivers fresh water and the salinity levels at the membrane are within the normal range (not elevated; there is no brine discharge) and the WFW is able to meet Clean Water Act entrainment and impingement specifications (see Exhibit D) .

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.

The legal/public policy considerations associated with the WFW option are less controversial than that of shore based conventional reverse osmosis plants because the WFW equipment is located offshore , has no brine discharge, and complies with Clean Water Act entrainment and impingement specifications (see Exhibit D) .

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

A phased development is proposed for the WFW to manage and mitigate risk and uncertainty (see Exhibit B)

SUBMIT OPTION SUBMITTAL FORM BY:

1. EMAIL TO: COLORADORIVERBASINSTUDY@USBR.GOV
2. U.S. MAIL TO: BUREAU OF RECLAMATION, ATTENTION MS. PAM ADAMS, LC-2721, P.O. BOX 61470, BOULDER CITY, NV 89006-1470
3. FACSIMILE TO: 702-293-8418

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.

Since the WFW equipment is located offshore in clean deep ocean water at 1,00ft depth (an infinite watershed), it is resistant to force majeure events such as earth quakes, tidal waves, climate changes and other events which constrain other conventional fresh water delivery systems such as aqueducts or shore based reverse osmosis plants. Although the WFW relies on the CASIO grid for power with a loss of load probability (LOL) of 1day in 10 years, the Colorado Basin team could add an auxiliary stand-by power supply to the WFW increase this LOL level higher

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

Since the WFW delivers laboratory quality pure water by means of its reverse osmosis system, the Colorado Basin team may elect to add a polishing plant at the distribution level

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
1 GW for a 3.5MAF plant	California Independent System Operator (CAISO) grid

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
	WFW WILL SAFEGURAD EXISITNG COLORADO RIVER GENERATION SINCE IT IS AN INDEPENDET SOURCE OF FRESH WATER

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

Location(s)	Anticipate Benefits or Impacts
LAKE MEAD	WFW HAS THE POTENITAL TO REFILL LAKE MEAD TO ITS DESIGN WATER LEVEL SINCE THE WFW IS AN INDEPENDENT SOURCE OF FRESH WATER AND COULD DISPLACE 3.5MAF OF EXISITNG DEMAND ON THE COLORADO RIVER

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

Location(s)	Anticipated Benefits or Impacts
COLORADO BASIN	WFW HAS THE POTENITAL TO REPLENISH THE COLRADO RIVER BASIN SINCE THE WFW IS AN INDEPENDENT SOURCE OF FRESH WATER AND COULD DISPLACE 3.5MAF OF DEMAND ON THE COLORADO RIVER
SALTON SEA	
MEXICAN WETLANDS	

SUBMIT OPTION SUBMITTAL FORM BY:

1. EMAIL TO: COLORADORIVERBASINSTUDY@USBR.GOV
2. U.S. MAIL TO: BUREAU OF RECLAMATION, ATTENTION MS. PAM ADAMS, LC-2721, P.O. BOX 61470, BOULDER CITY, NV 89006-1470
3. FACSIMILE TO: 702-293-8418

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

WFW HAS THE POTENTIAL TO RECLAIM THE USA AS THE CENTER OF EXCELLENCE FOR REVERESE OSMOSIS WORK.

CONSTRUCTION OF THE WFW HAS THE POTENTIAL TO REVITALIZE THE ECONOMY OF WEST AND CREATE JOBS SIMIILAR TO WHAT HAPPENED IN THE 1902'S WITH THE BOULDER DAM

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

THE COLORADO RIVER BASIN TEAM HAS THE RESOURCES, KNOW HOW AND LEADERSHIP TO ADVANCE THE WFW PROJECT FROM ITS PRESENT STATE TO A 3.5MAF PLANT LOCATED IN THE LOS ANGELES BASIN AAND TO PROVIDE A SECURE, UNITERRUPTIBLE SOURCE OF FRESH WATER TO OVER 80- MILLION RESIDENTS OF THE COLORADO RIVER BASIN WITH A LOWER ENVIRONMENTAL FOOTRPINT, LOWER ENERGY CONSUMPTION, AND LOWER LEVELIZED COST THAN OTHER CONVENTIONAL WATRER DELIVERY OPTIONS.

THE COLORADO RIVER BASIN TEAM HAS AN OPPORTUNITY TO MEET ITS WATER DELIVERY OBLIGATIONS IN AN ENVIRONMENTALLY SAFE AND PUBLIC FRIENDLY MANNER WITHIN ITS EXSITING CHARTER AND RESOURCES BY SPONSORING THE WFW.

Attachments

Exhibit A- Copy of WFW Presentations Made to Water Agencies

Exhibit B- WFW Project Development Plan

Exhibit C- WFW Cost Information

Exhibit D- WFW Permit Matrix