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: ______________

Option Name:

Mississippi River Supply

Description of Option:

On average, Colorado has historically diverted around 497,000 AFY from the Colorado River basin to the Front Range of Colorado (CRC, 2008). Increased demands are expected on the Colorado River to meet growing needs for water along the Front Range. Therefore, using the largest reasonable pipeline size of 144" (12 feet) to deliver 675,000 AFY of water from the Mississippi near Memphis to the Colorado Front range could significantly reduce the need for Colorado to divert from the Colorado River Basin.

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 attached schematic shows water being diverted from the Mississippi near Memphis and delivering water to the terminal reservoir storage for the Colorado-Big Thompson Project, the Frying Pan-Arkansas Project, and the Denver metropolitan area.

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.

675,000 AFY could be transfer with one 144" pipe. Due to the time required for permitting and construction, it is assumed this option would not be operational until 2030.

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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 components associated with this option are pipes, pumps, and canals, which are very established technologies. A significant amount of power will be required for the pump stations and nuclear type power generation facilities may be the most feasible source of power, which could cause permitting challenges. The water quality delivered to the Front Range would be different than the water currently stored in the identified reservoirs. However, the water would be delivered to reservoirs that are used to deliver water directly to municipal and agricultural users and therefore concerns on impact of water quality differences may be significantly less than if the water was being delivered to a headwaters reservoir in the Colorado River Basin.

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 components associated with the alignment option include 150 miles of canal, 660 miles of 144-inch diameter pipe, several miles of smaller pipe, and several pumping stations capable of lifting the water from approximately 200 feet above sea level to elevations of between 4,000 feet and 5,800 above sea level. (See the attached schematic for details.)

The total cost is estimated to be around $15.8 Billion with annual O&M Costs estimated at $541 million per year, assuming energy costs are $0.07/kwh.

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

With approximately 1,000 miles of aqueduct length, permitting and impact mitigation could be significant. A project of this size would require an EIS, likely an act of Congress, and a large number of federal permits combined with permits from possibly every state and county that the facilities traverse. Without going into detail, permitting could take between 10 and 15 years for this option.

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.

Coordination from a large number of stakeholders would be required. Considerable opposition from environmental groups should be expected. However, from a public policy standpoint, the option would be moving water from a flood prone region to a water scare region, which does have benefits.

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

The number of permit and legal items that are required does result in approval risk.

At a cost of over $15 billion, there is a risk of not being able to secure the required funds.

The amount of new power generation required could cause issues in a future that may include carbon cap and trading.

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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 diversion location was selected at a point along the Mississippi River downstream of the confluence with the Ohio River. At this point, 675,000 AFY is reliably available under all foreseeable conditions. The infrastructure includes buried pipe and pumping stations in regions with limited seismic activity and should be a very reliable supply. The largest risk may be to short term outages of power due to winds or tornados.

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

The water quality from the Mississippi at Memphis would be different than water currently delivered to users of Carter Lake, Pueblo Reservoir, and Barr Lake. However, users of water from these lakes are municipal and agricultural entities and the Mississippi River water is of acceptable quality for agriculture without treatment and for municipal uses with conventional water treatment.

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
Between 850 – 1,000 megawatts of generation are required	At this scale, a nuclear generation station may be required.

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
Colorado River Basin Generation Stations	By not diverting as much water from the headwaters of the Colorado, additional water would pass through hydrogenation facilities along the river.

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

Location(s)	Anticipate Benefits or Impacts
Colorado River Basin	By not diverting as much water from the headwaters of the Colorado, additional water would pass through the river system improving recreation.

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 River Basin	By not diverting as much water from the headwaters of the Colorado, additional water would pass through the river system improving environmental benefits in the basin.
Outside the basin.	Depending on the source of energy, there will be different environmental impact to consider related to power generation.

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

More water in the Colorado River Basin would improve conditions for those dependent on Colorado River flows for their businesses. Reliable water supply to the Colorado Front Range would improve socioeconomic conditions in that region. However, the high cost of water will have a negative impact.

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

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