Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
March 22-23, 2017
Agenda Item 24(j)

Applicant & Grantee:	Colorado School of Mines
Water Activity Name:	Designing River Basin Storage Along the South Platte River
Water Activity Purpose:	Agricultural & M&I
County:	Sedgwick
Drainage Basin:	South Platte
Water Source:	South Platte River
Amount Requested/Source of Funds:	$38,089 South Platte Basin Account $11,841 Statewide Account* $50,930 Total Grant Request * The discrepancy between the Statewide Account request in the application, the Roundtable Chair Recommendation Letter ($15,000), and that stated herein, can be attributed to the applicant' voluntarily reducing their request to accommodate the Statewide Account shortfall.
Matching Funds:	Basin Account Match ($38,089) = 330% of Statewide Account request (meets 10% min); Applicant's In-kind Match ($46,442) = 392% of Statewide Account request (meets 10% min); Total Match (Basin & Applicant Match of $85,531 = 722% of Statewide Account request (meets 50% min). (refer to *Funding Summary/Matching Funds* section)

Staff Recommendation:

Staff recommends approval of up to $39,089 from the South Platte Basin Account; and $11,841 from the Statewide Account to help fund the project titled: Designing River Basin Storage Along the South Platte River.

Water Activity Summary: If approved, WSRF grant funds will assist the grantee to develop a quantitative method employed to assist in a decision making process to identify potential storage sites, or combinations of sites, of unappropriated waters along the Lower South Platte River. The proposed method will link StateMod to a mixed integer-linear optimization* program. This optimization model seeks the minimum costs solution of designing reservoir storage utilizing StateMod flow data. The objective of this work is to minimize the costs to meet all demands and shortages by assigning network flow from expanded capacity and pumping, while adhering to the constraints that force the physical and topographical structures of the river in a given time horizon. Additional storage methods considered in this research include: (1) expanding existing surface storage reservoir capacity by raising the height of dams, as well as dredging, (2) constructing new

surface storage reservoirs, (3) constructing new underground storage. WSRF Grant funds, if approved, will be expended to develop a Lower South Platte case study that uses a generalized methodology and structure that can be applied to other basins throughout the State of Colorado.

* In general, an optimization model can be employed to maximize desired outcomes, while minimizing undesirable outcomes. Applied optimization uses a mathematical process to choose the best option (objective) among various alternatives (variables), with regard to some criterion (constraints). Optimization models are useful when: (1) there are many unknown values to be determined (variables), (2) the relationships between unknowns are complex and inextricably linked, (3) the goal (objective) has many tradeoffs, and (4) a repeatable solution, which can be generated quickly, is desired.

Discussion: This project furthers multiple goals and objectives of the South Platte Basin Implementation Plan (SPBIP) in accordance with Section 1.9.4 Goals and Measurable Outcomes: South Platte Storage and Other Infrastructure.

With respect to Colorado's Water Plan, this project supports the Critical Goals and Actions as described in Section 10.3E: Storage, "Promote Additional Storage and Infrastructure".

Issues/Additional Needs: No issues or additional needs have been identified.

Eligibility Requirements:
The application meets requirements of the three subsections of the Eligibility Requirements: General Eligibility, Entity Eligibility, and Water Activity Eligibility.

Eligibility Based on Funding Match Requirements:
The application meets the Statewide Account Matching requirements.

Evaluation Criteria:
This activity has undergone review and evaluation and staff has determined that it satisfies the Evaluation Criteria. Please refer to WSRF Application and Exhibit A (Statement of Work) for applicant's detailed response.

Funding Summary/Matching Funds:

Funding Source	**Cash**	**In-kind**	**Total**
Colorado School of Mines	$46,442	$0	$46,442
WSRF South Platte Basin Account	$39,089	n/a	$39,089
WSRF Statewide Account	$11,841	n/a	$11,841
Total Project Costs	**$97,372**	**$0**	**$97,372**

CWCB Project Manager: Craig Godbout

All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and will help promote the development of a common technical platform. In accordance with the revised WSRA Criteria and Guidelines, staff would like to highlight additional reporting and final deliverable requirements. The specific requirements are provided below.

Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the scope of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Engineering: All engineering work (as defined in the Engineers Practice Act (§12-25-102(10) C.R.S.)) performed under this grant shall be performed by or under the responsible charge of professional engineer licensed by the State of Colorado to practice Engineering.