

**Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
Agenda Item 25.g**

Applicant: Red Mesa Reservoir & Ditch Company

Water Activity Name: Red Mesa Dam & Reservoir – Spillway Alternatives Analysis

Water Activity Purpose: Study or Analysis of Structural and Nonstructural Water Project

County: La Plata County

Drainage Basin: La Plata River

Water Source: La Plata River and Hay Gulch

Amount Requested: \$19,400 (Southwest Basin Account)

Matching Funds: none

Staff Recommendation
Staff recommends approval of up to \$19,400 from the Southwest Basin Account to fund the Red Mesa Dam & Reservoir – Spillway Alternatives Analysis.

Water Activity Summary:

The Colorado State Engineer (SEO) has identified the spillway at Red Mesa Dam as seriously deficient in flood routing capacity and has directed the owners to bring the spillway into compliance with the dam safety requirements for a high hazard dam, or face significant storage restrictions or a possible breach order. A time frame of approximately three years has been established to achieve compliance. The proposed water activity will assist in the selection of an appropriate, cost-effective methodology for complying with the SEO requirement.

In 2009, Red Mesa received WSRA basin grant funding from the SW Basins Roundtable for an Incremental Damage Analysis (IDA) and Emergency Action Plan (EAP), in the amount of \$29,000. Red Mesa provided matching funds of \$3,000. While the IDA did not result in the hoped-for result of a decreased inflow design flood requirement, the study did include a new hydrologic analysis using the SEO's Extreme Precipitation Analysis Tool (EPAT) which was accepted for use by the SEO. The inflow design flood peak obtained via EPAT, while still large, is significantly smaller than that obtained by previous analyses and will serve as the basis for spillway design.

The next logical step in proceeding with spillway design, and the one proposed for funding herein, is to perform an initial evaluation of alternatives available for passing the inflow design flood through the reservoir without endangering the dam, in order to establish expected relative cost levels of the alternatives. At this point, it is clear that a "low-cost" alternative to achieving compliance with the SEO requirements is not available; therefore it is necessary to evaluate the relative cost-effectiveness of all of the alternatives. Alternatives under consideration include the following:

- Constructing a full breach of the dam to SEO requirements to eliminate reservoir storage and the hazard potential it presents (essentially the "do-nothing" alternative).
- Constructing a new, compliant spillway through the left abutment at the same overflow elevation as the current spillway, while utilizing material removed from the spillway channel excavation to raise the dam

crest and provide more routing freeboard. This would be done as an optimization problem to achieve the best balance of spillway width and embankment crest raising.

- Hardening of the existing dam crest and downstream slope with roller-compacted concrete (RCC), to allow it to withstand the overtopping of the dam by the inflow design flood, combined with a much smaller SEO compliant spillway of approximately 100-year capacity.

Because each of these alternatives is likely to present significant costs, Red Mesa would also like to include two reservoir enlargement scenarios for evaluation, to determine if the value of the additional storage would be sufficient to offset some of the cost of spillway and dam modification construction; both enlargement scenarios include spillway size optimization, as described above:

- Raising the normal storage level by 4 feet (approximately 250 AF of increased storage)
- Raising the normal storage level by 8 feet (approximately 550 AF of increased storage)

Threshold and Evaluation Criteria

The application meets all four Threshold Criteria. No Statewide funds are being requested, therefore the evaluation criteria does not apply.

Discussion:

The need for continued and/or improved water supply and storage within the La Plata River drainage, commonly referred to locally as “the dry side,” was identified by the Southwest Basin Water Supply and Needs Report. This conclusion was reinforced by the SWSI 2010 Report, where Water District 33 (the La Plata River Basin) was identified as having a clear and significant deficiency of agricultural water supply, often amounting to more than half of the annual irrigation water requirement for that basin. The La Plata basin is, in fact, identified by SWSI 2010 as one of the most seriously water-deficient basins in the state.

The Animas - La Plata Project, as originally conceived and developed by the U. S. Department of Interior, would have resolved much of the water supply problem on the La Plata River drainage. However, the irrigation water supply component for the La Plata side was ultimately removed from the project as a condition of gaining approval. Thus, irrigation and storage needs on the La Plata drainage were never addressed, and irrigation water remains in short supply, frequently affected by flow delivery requirements of the La Plata River Compact with New Mexico.

The analysis activity currently proposed by this application will assist in the decision-making process for assuring continued usage of the decreed storage within the reservoir, thereby maintaining the existing water supply within the La Plata River drainage, without requiring the need for developing new water sources. A favorable outcome regarding the economics of reservoir enlargement as a component of spillway improvement activities could be expected to ultimately help relieve some of the water supply shortages which currently exist in the La Plata River drainage. The proposed project effectively meets the objectives of HB 1177 and the consumptive needs of the Southwest Basin by rehabilitating existing infrastructure to achieve significant savings of agricultural water.

Issues/Additional Needs:

No issues or additional needs remain.

Staff Recommendation:

Staff recommends approval of up to \$19,400 from the Southwest Basin Account to fund the Red Mesa Dam & Reservoir – Spillway Alternatives Analysis.

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.