Water Supply Reserve Account – Grant and Loan Program
Water Activity Summary Sheet
Agenda Item 11.i

Applicant: South Metro Water Supply Authority (SMWSA)

Water Activity Name: Aquifer Recharge Pilot Study

Water Activity Purpose: Study of Structural Consumptive Project

County: Douglas and Arapahoe Counties

Drainage Basin: Metro Basin Roundtable

Water Source: South Platte, Denver Basin Aquifer, transbasin waters

Amount Requested: $550,000 (Statewide Account)

Matching Funds: $85,000 (Applicant)

Staff Recommendation
Staff recommends partial funding of up to $425,000 from the State Account to contingent on resolution of the items in the issues/additional needs section. This amount puts the award in line with providing 20% match, as required for State Account applications.

Water Activity Summary:
The proposed project will help determine if aquifer recharge can be used as a strategy to help meet municipal and industrial water needs in the South Metro area, which was identified as having the largest gap in the state.

Much of the municipal and industrial uses for the South Metro area comes from non-tributary groundwater supplies found in the Denver Basin bedrock aquifers that underlie it. Due to population increases over the last 20 years, demand on these groundwater sources have led to aquifer water level declines of as much as 30 feet.

The applicant, if approved, will test several aquifer locations by artificially recharging water with varying water quality into the aquifers. The applicant will retrofit existing wells to determine the suitability of that location for aquifer storage and recovery (ASR). The pilot will help understand the effects differing aquifer attributes and source waters have on ASR. Pilot-scale testing is being requested because aquifers vary significantly in their hydraulic characteristics to accept recharge water and to react chemically with injected water. Such unknowns and the costs for conducting pilot-scale field studies have, according to the applicant, inhibited water providers in the region from embarking on this activity.

The study builds upon CWCBs March 2007 study examining potential locations for underground water storage in the South Platte and Arkansas River Basins. Results showed that several areas within the Denver Basin bedrock aquifers scored very well in terms of hydrogeological, environmental, and implementation considerations. The applicant's proposed pilot study would test these locations as part of their sample area.

As stated in the scope of work, the study has five main objectives:

1. Identify a source of renewable water to be used in a full-scale ASR program.
2. Identify two wells within areas identified in the SMWSA Regional Aquifer Supply Assessment study that might be suitable for retrofitting as ASR wells. Undertake the necessary evaluations, including engineering conceptual-level design for retrofit, and geochemical analyses on candidate ASR wells to identify their infrastructure and pre-treatment requirements.
3. Undertake the design and construction needed to retrofit the candidate wells for ASR pilot testing and associated pretreatment.
4. Conduct pilot-scale ASR testing and evaluate the feasibility of implementing long-term ASR operations with two wells.
5. Provide recommendations for full-scale implementation of ASR in the south Metro area, including water pre-treatment needs, well preparation and retrofitting, and O&M.

Threshold and Evaluation Criteria
The application meets all four Threshold Criteria.

The application articulates how the project meets each of the Evaluation Criteria. This water activity does an outstanding job of meeting the following Evaluation Criteria:

Promoting Collaboration & Cooperation: SMWSA is made up of 13 individual water providers working collaboratively to foster long-term reliable water supplies through water acquisition and infrastructure. All 13 members are providing matching funds and/or in-kind services to this project. The project itself is designed to learn about ASR options for the whole region and remove barriers to implementing a shared ASR infrastructure project to lessen the area's dependence on nonrenewable groundwater sources.

Meeting Water Management Goals & Objectives & Identified Water Needs: The South Metro area has the largest identified gap for municipal and industrial water needs in the state. In addition, much of the basin's current water sources are from nonrenewable groundwater. This project would determine the feasibility of using ASR to help meet local water needs while at the same time store water in a way that reduces evaporative losses.

The Water Activity Addresses Issues of Statewide Value: It is a benefit to the state to assist SMWSA and its members to determine viable solutions prior to them becoming a crisis. ASR is one such potential solution that may help meet the consumptive needs of the area with the largest identified gap. However, without a feasibility study, ASR is not likely to be used on a broad or shared approach due to concerns regarding (a) the potential for mineral precipitation (scaling) on well screens, (b) mineral precipitation and/or swelling of clays in the aquifer formation due to incompatibility of native and injected waters, (c) dissolution of minerals in the aquifer materials resulting in water quality degradation during storage, and (d) microbial growth fouling the injection well or adjacent aquifer materials and/or resulting in undesirable taste and odor in the recovered water. Having the study supported by SMWSA's members not only through partial funding, but also through water being donated to test the aquifers, is an indicator that this study will be further used in that region to determine on the ground solutions for meeting consumptive water needs.

Funding Overview
Grant funding in the amount of $550,000 is requested from the State Account. Funding from the WSRA constitutes nearly 87% of the overall project cost ($625,000). SMWSA and its members are providing $85,000 in cash and in-kind match.

Discussion:
As previously described, innovative solutions for this region need to be explored due to the gap identified for the area. While the four staff who reviewed the proposal each consider this an important grant to fund, the amount of match was not equivalent to 20% of the project. In addition, match dollars were not included in the overall scope of the project, making it unclear how they were contributing to it. For that reason, staff's recommendation is for partial funding, where $85,000 is equivalent to 20% of the funded portion of the project.

Issues/Additional Needs:
- Please include a detailed revised budget and scope of work to reflect partial funding and how match dollars contribute to the overall scope.
- Conservation Plans – Project participants that deliver over 2,000 AF of water annually are required to have an approved Water Conservation Plan. Each of the covered entity members of the SMWSA has a conservation plan except for Eastern Cherry Creek Valley Water & Sanitation (ECCV). Prior to execution of a State WSRA contract, all "covered entities" participating in the project will be required to have a CWCB-approved Water Conservation Plan in place. ECCV has been notified and will be working with Veva Deheza, of the CWCB Office of Water Conservation and Drought Planning, on the plan.

Staff Recommendation:
Staff recommends approval of up to $425,000 from the State Account to partially fund the Aquifer Recharge Pilot Study contingent on resolution of the items in the issues/additional needs section.

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.