



COLORADO WATER CONSERVATION BOARD

WATER SUPPLY RESERVE ACCOUNT 2006-2007 GRANT APPLICATION FORM



Southern Denver Basin Bedrock Aquifer Monitoring

Executive Summary

Located east of the Front Range, the administrative portion of Denver Basin aquifer system covers approximately 6,700 square miles and extends from the north at Greeley to the south in Colorado Springs (Figure 1). The groundwater from the bedrock and alluvial aquifers provides water to supply as many as 140,000 homes by individual wells in addition to numerous water districts and agriculture. Recharge to the nontributary bedrock aquifers from natural processes is negligible as compared to amount of water being removed therefore these aquifers are “nonrenewable”. Prior studies have identified areas within the basin that are being significantly depleted in areas of the basin. In these areas, considerable effort by water providers have been undertaken to find renewable alternate sources of water. Although groups of water providers and investors may have the resources to move projects forward with coordinated efforts in finding alternative supplies, similar opportunities for rural individual well users and rural water providers are not as readily available.

One of the major findings from SWSI identified that an “increased reliance on nonrenewable, nontributary groundwater for permanent water supply brings serious reliability and sustainability concerns in some areas, particularly along the Front Range.” There is little information available on the available water within the bedrock aquifers or the degree at which it is being depleted in rural areas. It was highlighted during the SWSI process that there is need to create a common understanding of future water supplies to address alternatives. In developing an implementation plan towards meeting future needs it was suggested that gaps in rural areas and with smaller water providers be addressed. In the area of assessing potential new state roles in implementing solutions, it was recommended that water availability and sustainability estimates be developed for non-tributary groundwater areas, especially the Denver Basin, and promote conjunctive use of surface and ground water resources.

To address these suggestions, Protect Our Wells, a not-for-profit organization, is proposing a local network of existing and new monitoring wells to measure water levels and monitor changes in the bedrock aquifers of the southern portion of the Denver Basin (Figure 1). The objective of the project is to assess the status of the bedrock aquifers to identify areas that are likely to be subject to depletions. The data will be available for water resource managers and planners to develop strategies to optimize existing water supplies.

Statewide benefit will occur through coordination of private and public interests to optimize data collection and generate the greatest return on project funds. Agencies that will directly benefit by different elements of the project include: Colorado Division of Water Resources (DWR), Denver Museum

of Nature and Science (DMNS), Colorado Geological Survey (CGS), and United States Geological Survey (USGS). The data collected will also support current projects including: water budget being developed for Upper Big Sandy Groundwater Management District; water budget and Aquifer Storage and Recovery Project in Upper Black Squirrel Groundwater Management District; and the South Platte Decision Support System.

The approach to collect geologic and well data to establish the network will include:

- development of a stratigraphic model to define the geology
- determination of aquifer designations for existing wells in the state's database that are not in an identified aquifer
- identification of optimal water level monitoring locations using the USGS recommendations from the recent modeling efforts and other evaluations
- selection of existing wells within the Study Area to monitor
- installation of dedicated monitoring wells
- collection and interpretation of water level data over a 3-year period
- identification of areas of depletions and recommendation of strategies to optimize existing water supplies

Upon project completion, the State will incorporate the project monitoring locations in its annual monitoring program and continue to collect data into the future

The monitoring network will include 25 existing wells and the construction of 12 dedicated monitoring wells to monitor water levels in the four bedrock aquifers in the lower reach of the Denver Basin.

There are about 26,000 individual household wells reliant on this water supply in the Study Area in addition to commercial wells. Locating, financing and developing alternate water supplies will be costly and take considerable time therefore optimization of existing resources is critical. The proposed project will contribute to the understanding of the nature and extent of the existing water conditions in rural areas, identify gaps to address future needs, and identify strategies for optimizing existing water resources.