Water Resources in Grand and San Juan Counties, Utah

Overview

June 2005

Background Information

Public Facilities Analysis or the Build Out Study
In 1996, the City of Moab and Grand County completed a Public Facilities Analysis that determined total future infrastructure demand if all developable lands (private, BLM disposable, and SITLA) were developed to the maximum density permitted under current zoning. With respect to water, the study found that Moab City has adequate source capacity, water rights and distributional system to serve build-out projections. Grand County Water Conservancy District (GWSSA) needed to obtain sufficient water rights (2,625 gallons per minute peak source capacity and 4,234 acre-feet per annum) to meet projected build-out in the Grand County portion of Spanish Valley (this study did not include the San Juan County portion of Spanish Valley.)

BYU Hydrologic Model
To determine if an adequate amount of additional water could be withdrawn from the Glen Canyon Group Aquifer (Moab's EPA designated Sole Source Aquifer), GWSSA contracted with Dr. Wayne Downs, Department of Civil and Environmental Engineering, at Brigham Young University. Dr. Downs and a graduate student constructed a computer model of the aquifer utilizing existing information from past studies, plus data from GWSSA and City of Moab. Groundwater flow and particle tracking models were developed using GMS, MODFLOW and MODPATH to stimulate both existing and future stressed conditions of the groundwater system. An initial run of the model showed that pumping 2,625 gpm from the wells along the west side of Johnson's Up-On-Top would dry up over 100 acres of the Scott M. Matheson Wetlands Preserve and would reverse the flow direction of the City of Moab's well field. Second run of the model increased the input into the aquifer by adding 3,300 acre-feet per annum of infiltration from Ken's Lake leaking into the Valley Fill Aquifer. The adverse affects on the City's well fields were removed and the water table at the Matheson Preserve dropped approximately one inch. Due to the lack of actual data in certain areas, the model had accuracy rating of approximately 40%.

Utah State Water Plan
This need for additional information is reiterated in the *Utah State Water Plan Southeast Colorado River Basin* (October 2000), page 19-14:

> *"There is a need to provide assistance to obtain new 'hard data' regarding the ability of various aquifers to yield culinary quality water. Some of the most recent data is nearly 15 years old and was not much beyond a reconnaissance level of study."*

Grand County Request to USGS
In December 2000, at the urging of The Nature Conservancy, the Grand County Council wrote a letter to the US Geological Survey-Water Resources Division requesting a

proposal to investigate the hydrology of the Moab/Spanish Valley and establish a water budget for the valley. That $1.4 million proposal was tabled due to budgetary constraints and other pressing issues such as a mass-balance study of the San Juan County portion of Spanish Valley.

Water Protest

In November 2001, Grand Water Conservancy District filed two Change Applications with the state of Utah Division of Water Rights, to change the points of diversion, place of use, nature of use, and period of use for 4.0 cfs of water; as well as to convert prior irrigation rights to municipal use. Ten applicants protested this change, including City of Moab, The Nature Conservancy and eight other private well owners. In February 2003, Jerry Olds, State Engineer, issued a Memorandum Decision. This Memorandum Decision approved a portion of the proposed project subject to certain conditions. The *Memorandum Decision* (February 2003) states on page 6:

> *He (the State engineer) agrees that there is not comprehensive understanding of the geology and hydrology of the valley that would allow for a precise interpretation of the extent of the water resources…. If the applicants were allowed to proceed, they must do so cautiously. A monitoring plan must be implemented to determine the effect the pumping of the Spanish Valley and Chapmen wells may have on water resources in the vicinity of the new wells, specifically those of the protestants. The State Engineer encourages local government entities who provide oversight for water development in the valley to consider further studies to better understand the water resources*.

Hydrologic Studies of the Scott M. Matheson Wetlands Preserve:

The Nature Conservancy contracted with the University of Utah to delineate the ground and surface water sources to the Matheson Wetlands Preserve and to investigate the connection, if any, with the Moab Mill Tailings, located on the opposite bank of the Colorado River. Dr. Kip Solomon, Head of the Department of Geology and Geophysics and Director of the Noble Gas Laboratory at the University of Utah conducted the research. His findings, published in October 2004, supply additional information about the hydrology of the Moab Valley. The data indicate a subsurface connection between the Matheson Preserve and the contaminated groundwater emanating from beneath the tailings pile. Furthermore, very little of the wetland groundwater has the geochemical signature of the water from the Glen Canyon Group aquifer. This information points to one of two possibilities: 1) the Glen Canyon Group aquifer is currently being mined or 2) the Glen Canyon Group aquifer is exiting the system in a different location than the Matheson Wetlands. Either scenario points to the need for additional studies.

Partners and Resolutions:

Because of these many uncertainties and because many details of the groundwater regime of Grand and San Juan Counties are unknown, the Conservancy has formed a partnership

to look at the issue of water, with the goal of better understanding the hydrology of the Moab Valley. The Nature Conservancy, Grand County, City of Moab, Grand Valley Water and Sewer Service, Utah Division of Wildlife Resources, the United States Geological Survey are all participating. To this end in the fall of 2002, the City of Moab (No. 30-2002), the Grand County Council (No. 2584, Series 2002) and the Grand County Water and Sewer Agency (No. 2004-06) all passed resolutions with unanimous support of initiating further studies to perform a hydrologic characterization of the Glen Canyon Aquifer and Moab Valley Aquifer system. Recently San Juan County has also indicated their support. In May 2005, the USGS met with the concerned partners and presented an updated proposal and budget to improve the understanding of the hydrology of the Moab Valley.

Potential Funding Sources:
The USGS proposal seeks funding of $2,000,000 for the characterization of the Glen Canyon and Moab Valley aquifers. At the urging of the Conservancy, Congressman Matheson has included approximately 2,000,000 for Grand and San Juan Counties to further study the Glen Canyon Aquifer in the Water Resources Development Act. Congressman Matheson's office has sent letters to the ranking chairs on the Senate side, urging their support of this bill.

Summary:
There is a pressing need and strong support for a thorough and comprehensive understanding of the hydrologic regime of Grand and San Juan Counties. This study will help narrow down the range of uncertainty regarding water resources and provide local decision makers with additional information from which to make sound water development decisions – decisions that not only pertain to storage and distribution, but also environmental stewardship and protection of water rights held by other parties. A comprehensive long-term hydrology study is one strategy – and perhaps the best – to protect the water quality and quantity in Grand and San Juan Counties, while meeting the current and future demands for water use.