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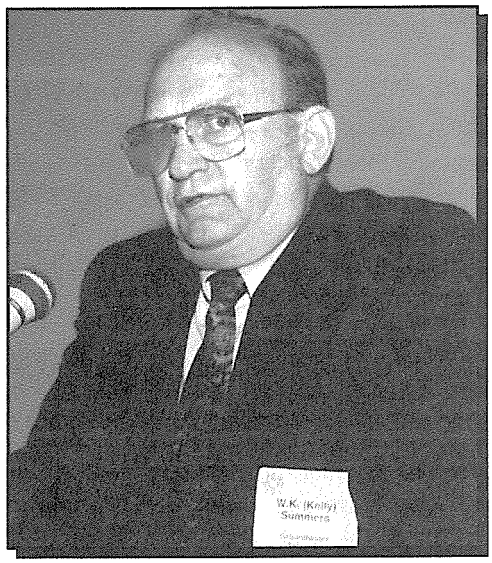

ALBUQUERQUE'S WATER SUPPLY: A PESSIMIST'S ARMCHAIR VIEW

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Years ago our state engineer and water scientists recognized that the volume of groundwater in the Albuquerque Basin exceeded the needs of Albuquerque and other users in the basin for the next thousand years or so by a considerable margin. The basin still holds enough groundwater to supply any forecasted demand for hundreds of years. The problem is not that we are running out of groundwater, but that we are running out of cheap groundwater.

Because of its immediate need to continue supplying water to its patrons, the principal users of groundwater in the basin, the burden of dealing with the groundwater supply and alternate sources of cheap water falls first on the City of Albuquerque. Remember though that each public water utility in the basin from Bernalillo to Belen has an implied open-ended contract with its patrons that says in effect, "We intend to deliver water to you and your heirs forever." In time each utility will face the problem of needing deeper, more expensive wells that yield less water that may have to be treated to meet drinking water standards. Those public water utilities also are running out of cheap water—they just don't admit it yet.

Municipally owned utilities have small budgets to minimize rates. Their planning horizons focus on the next election. After all, what politician

says, "I choose to manage our water resources for posterity so I advocate much higher rates to discourage water use and to make money available to solve problems our children will face."

Of political necessity, the City of Albuquerque's approach to preventing water shortfalls looks to engineering advancements to provide feasible solutions that will sustain its water supply without significantly increasing its cost. This economy-driven approach leads to a self-interest water-resource management that focuses on the next 20 to 30 years.

Privately owned utilities look to maximize their profits. When problems loom, they can sell out—as Amrep did in Rio Rancho—or they can walk away when bankruptcy looms.

To maximize our water resource economics and minimize the one-hundred-year-plus degradation of the supply, we need long-term integrated water-resources management. Surface-water management nowadays means flood control and distribution of river water to irrigators. Jobs engineers do very well, but what constitutes long-term groundwater resources management?

Groundwater management means controlling both recharge and discharge. Recharge can be natural, artificial or induced. Recharge in the basin obviously occurs along the mountain front and along the Rio Grande. It probably occurs to some limited extent on the mesas and during arroyo floods. Artificial recharge occurs when managers deliberately put water into the ground. Water could come from reclaimed sewage, storm runoff, or water from the Rio Grande or another stream. Induced recharge occurs where pumping withdrawals alter the groundwater flow system and induces recharge in areas where it would otherwise never have occurred.

Discharge occurs to wells. By controlling the location of wells and the amount of discharge from each, the water-level history in the basin could be strategically controlled—slowing the rate of decline and forcing induced recharge. Artificial recharge wells will offset the effects of some pumpage, but the effort must be made basinwide.

At a minimum, the following three ideas will surface and eventually take hold:

1. An integrated basinwide water management approach, which encompasses both groundwater and surface-water re-sources and controls the disposition of wastewater, will sustain our prosperity and our quality of life.
2. Short-term individual greed should never hold sway over long-term community benefits. Consistent far-sighted water-resources management leads to long-term prosperity and quality of life for those of us who live in the basin.
3. Money spent on exploration and monitoring comes back manyfold as the knowledge gained improves our management skills.

Basinwide management involves integration of water-supply systems and coordination of irrigation, flood control, and wastewater programs with other basinwide plans. It presumes the management of water rights. It infers that local authorities must give up their jurisdiction to promote a healthy whole.

Development proceeds, if and only if, it improves water-resource management. Local short-term self interest must give way to community benefits. Every proposed change in the landscape should be evaluated in terms of its long-range impact on water resources.

Exploration and monitoring will cost millions. We need to know much more about the rocks and the water they contain and how the groundwater system operates at depth. We can only learn these things by installing appropriately constructed monitoring wells throughout the basin. After dedicated monitoring wells with pumps are installed, they need to be visited and sampled routinely and the results stored in a universally accessible data base.

Complete climatological stations should be established throughout the basin to monitor precipitation and evapotranspiration. The flow, and its chemical characteristics, in drains, canals, and ditches should be monitored continuously at many points so that reliable water budgets can be obtained. Data in the files of local, state, and federal agencies as well as published data need to be incorporated into the data base. Our capacity to manage wisely the Albuquerque Basin's water resources will improve in direct proportion to our knowledge.

Water behavior concepts should be tested and evaluated to establish how well they apply to the

basin. To manage the basin's water resources, we must understand how the groundwater and surface-water systems operate, how they influence one another, and how much weight to assign hydrologic, geologic, engineering, and planning concepts.

The question of who should pay for this information raises its ugly head. Federal agencies that once were the mainstay of data collection have suffered manpower and budget cutbacks. Should we look to changes in the federal budget? To state funds? One can argue that since the data benefits the people who live in the basin, they ought to pay for it. In practice the basin is part of a still larger system; good management of the Albuquerque Basin's water resources should contribute to better management of that larger system.

Management of the water resource as a whole will not come easily and will require leadership that bites the bullets instead of dodging them.