



**HYDROLOGY AND STEADY STATE GROUND-WATER
MODEL OF SNAKE VALLEY,
EAST-CENTRAL NEVADA, AND
WEST-CENTRAL UTAH**

1993



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Water for Nevada's Future
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INVENTORY OF WATER RIGHTS, PUMPAGE, AND LAND USE

Currently the State Engineer does not conduct a periodic pumpage inventory in Snake Valley. As stated above, the majority of ground water is used in late summer and early fall when surface-water flows resulting from snow melt are at a low. The following summarizes the water rights for the Nevada part of Snake Valley and estimates the ground-water pumpage and land use for all of Snake Valley.

Present Development

The level of development of water resources in a basin can be illustrated by the water right allocations and the current water usage within that basin. There has been very little development over what was reported by Hood and Rush (1965). Their estimate of land under irrigation from both spring and ground water are probably still relevant order of magnitude approximations. The following sections discuss the present development.

Water Right Status

Table 7 summarizes the water right status for the Nevada part of Snake Valley which is based on information supplied by SEC. The numbers in the table are consumptive use numbers based on 50 percent for municipal and domestic uses, 75 percent for irrigation uses, and 100 percent for stock watering. Appendix B contains a detailed listing of all the permits and applications. Please note that Desert Land Entries (DLE) are not included in the table since, historically, less than one percent of these water rights are ever developed. A single water right application senior to the Districts applications is pending; this water right will be for a limited quantity of water, probably a duty of 14 acre feet per year.

Table 7.--Water rights (consumptive use) Snake Valley, Nevada, in acre-feet per year.

	Surface	Underground
PERMITS	15,180	6,203
APPLICATIONS	0	14 ¹⁾

¹⁾ Excludes 15,360 acre-feet per year (consumptive use) Desert Land Entries (DLE) applications

Pumpage

Data on actual water use is not available for ground or surface water in Snake and Hamlin Valley. Hood and Rush (1965) estimated that about 7000 acre-feet per year of ground water was being used in Snake and Hamlin Valleys, with about one half being used south of Gandy and

north of U.S. Highway 50 which includes the Eskdale area. The remaining half being used is supplemental to surface water in the remaining developed areas. The actual total acreage irrigated presently appears to be slightly less than the USGS estimate, and is conservatively estimated to be about 6,000 acres requiring 18,000 acre-feet per year consumptive use (24,000 acre-feet per year total) for all of Snake Valley. The distribution between ground and surface water was assumed to be about the same as reported in Hood and Rush (1965) and satellite imagery was used to calculate the acreages south of Gandy and U.S. Highway 50 which was found to be about 640 acres. Based on this estimation of acreages consumptive use pumpage was rounded to 2,000 acre-feet/year south of Gandy and north of U.S. Highway 50. For the remainder of Snake Valley about the same numbers used by Hood and Rush (1965) for ground-water supplementary to surface supplies were used which equals about 4,000 acre-feet per year. Therefore, the total estimated consumptive pumpage was rounded to about 6,000 acre-feet per year, about a third of all consumptive use.

For purposes of the steady state model pumpage was not considered. As discussed in the previous section regarding historical water levels, and shown in Figures 8 and 9, ground-water levels have remained fairly constant over the years in Snake Valley. However, historical pumpage for Snake Valley will be included in the transient simulations which will be included as part of the District's regional modelling effort.

Land Use

Most of the land in Snake Valley is public-domain land administered by the Bureau of Land Management. The primary land use is livestock production with agriculture primarily limited to the irrigation of pastures and alfalfa fields.

As discussed above, satellite imagery (Landsat Thematic Mapper (TM) data) was used to delineate wetlands and irrigated fields. Based on this imagery and field reconnaissance, the District determined that in 1990 there was about 11,000 acres of wetlands and 6000 acres of irrigated fields in central and southern Snake Valley. The very northern area of Snake Valley was not examined with satellite imagery. These agricultural numbers are slightly less than those reported in Hood and Rush (1965). Detailed landuse maps and discussion for Snake Valley are part of the Cooperative Water Project's environmental report.

Future Development

Other than the District's plans for ground-water withdrawal, there is no other development known to be planned in Snake or Hamlin valleys.