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Meeting Southern Nevada's Future Water Requirements *
by George B. Maxey

During the past thirty years southern Nevada communities have grown from a group of scattered, loosely-knit, largely transient settlements, dependent on ephemeral agriculture and mining, to an almost contiguous area boasting a large resort and entertainment industry and substantial national defense facilities and defense-related industry. In addition, agriculture and mining still constitute significant factors in the southern Nevada economy. The agricultural segment particularly require substantive quantities of quality water for irrigation.

With the predicted population and industrial expansion in southern Nevada by the mid 1980's, the existing and planned water supply systems will be fully utilized. Therefore, plans must be made soon for additional future water supplies of good quality. With limited supplies of good quality ground water in the Las Vegas Valley and somewhat less good quality water from Lake Mead, there will be increasing demands for high quality water at times before the planned Lake Mead supply is fully developed.

Currently Las Vegas Valley produces most of the water used in the area from underground sources at a rate between two to

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*This is a summary of an address given by Dr. George B. Maxey, Director, Center for Water Resources Research, University of Nevada, to a group of Southern Nevada business and community leaders at the Sahara Hotel, Las Vegas on May 16, 1968.
three times the annual rate of natural recharge to the underground water-bearing geological formations. With the inception of the Southern Nevada Water Project which has recently been authorized, the current and near future demands for water in the Southern Nevada area will be satisfied. The early stages of the Southern Nevada Water Project will alleviate existing demands for water supply not only in Las Vegas Valley, but also in some adjacent areas.

As the communities of southern Nevada contemplate their water requirements, they must also consider the most desirable quality of water for municipal and industrial uses. The water presently being produced from wells by the Las Vegas Valley Water District and other privately owned wells is superior in its chemical characteristics to the water which is scheduled to be introduced to the community from Lake Mead. As the proportion of water demands in Southern Nevada communities are increasingly fulfilled by new supplies from Lake Mead the blending of this water with water from underground sources will result in the chemical quality of these ground-water supplies being somewhat degraded. After this water is used for municipal, industrial and irrigation purposes the quality of the water will further deteriorate, thus creating an additional waste water treatment and disposal problem for the residents and industries of Southern Nevada.

General predictions indicate that these water-related problems will confront Southern Nevada in the next two decades.
The onus is upon industrial and community leaders with foresight in the state of Nevada to support water resources planning and research for the entire state and with particular emphasis on the population and industrial growth centers including southern Nevada.

Studies of the U. S. Geological Survey in cooperation with the Nevada State Department of Conservation and Natural Resources have developed substantial background information in many areas of the state through a series of reconnaissance studies and in some cases more detailed investigations which have delineated many largely undeveloped ground-water reservoirs in the State of Nevada. In Nevada, within a two hundred and fifty mile radius of Las Vegas, there is annually about 600,000 acre feet of ground water recharge, very little of which is being productively used. In most cases where ground-water supplies have been developed outside of Las Vegas and North Las Vegas, the water is not being put to a very high economic use. The increasing demands for new supplies of high-quality water in Southern Nevada communities will require either very high costs for purification of water from existing supplies or the importation of water from outside the immediate vicinity. In addition to the 600,000 acre feet of perennial recharge to ground-water systems in southern and Central Nevada, there are several million acre feet of ground water in storage below the water table in the valleys within a 250 mile radius of Las Vegas. Most of the perennial natural discharge, which theoretically
is equal to the annual recharge of 600,000 acre feet, in this region is wasted back to the atmosphere by evaporation from spring and salt marsh areas in unreclaimable desert basins. Minor amounts of this water are utilized for stock watering and marginal small irrigation projects in a few areas.

A few obvious examples are the springs in the vicinity of Ash Meadows which discharge to the atmosphere about 25,000 acre feet annually. Another 25,000 acre feet annually might be purchased from Pahranagat Valley. Approximately 50,000 acre feet of ground water can be produced from Railroad Valley. These figures are for illustrative purposes only to indicate the order of magnitude of the amounts of water that can be produced perennially. Very large additional amounts of water are available as withdrawals from ground-water storage for an interim period of years before it becomes economically feasible to import water from more distant sources or obtain water through technological advances in desalination or treatment processes.

Although detailed studies have not been made, it is estimated that large quantities of this water could be delivered to Las Vegas and contiguous communities, at prices competitive with the cost of water to be delivered from Lake Mead by the Southern Nevada Water Supply Project. The price of such water would certainly be much lower than that for water imported from the Columbia River Basin or produced by desalination of salty inland water or sea water at some future time. It is presently
technically feasible and economically attractive for Southern Nevada communities to look to some of the ground water basins immediately to the north and northwest of Las Vegas for abundant future supplies of fresh water to meet the needs of a dynamically expanding industrial and resort area. Without enlightened foresight in the development of the Nevada State Water Plan combined with local community programs to identify and justify local and sectional needs, many vital communities may suffer. State, community and private allocation of funds to complete the necessary research and planning studies can be used to obtain matching grants from Federal and other sources in a very favorable ratio of between 1 to 2 and 1 to 8. Plans for conducting these needed studies have been developed by the Center for Water Resources Research, Desert Research Institute, and can be implemented as soon as funding is made available.

Large supplies of good to excellent quality water are available in the state of Nevada for use in areas where the economic justification for their development exists. There are many and complicated legal problems and some economic and engineering research aspects of water and related resources development which must be carefully examined before a large-scale water development project as suggested here, can be implemented. Nevertheless, the research capabilities are available and the resource is identified and available. It is up to the enlightened business and community leaders to
organize support for the state and regional planning through the Nevada Department of Conservation and National Resources and for related research activities which can provide assurance of abundant supplies of good quality water for Southern Nevada's future.