

CLARK COUNTY

Moapa area [24]

Warm springs and wells 6 miles northwest of Moapa are at the head of the Muddy River (fig. 14) and have reported temperatures that average 90°F. The springs issue from alluvium but probably are supplied by water which is transmitted through Paleozoic carbonate rocks which crop out nearby. Preliminary analysis of minor long-term spring discharge variations suggest a 15-to 20-year lag in response to recharge from precipitation (Eakin and Moore, 1964). The water at Iverson's Warm Springs has been used for irrigation and bathing (Eakin, 1964).

Las Vegas Valley [33]

Many water wells and several springs in Las Vegas Valley have water temperatures between 70° and 106°F. The area has a high mean annual temperature (probably over 60°F) and this is a factor in the reported water temperatures. However, when water temperatures from wells are adjusted for the increase of temperature with depth (the geothermal gradient), a number of wells still seem to be anomalous. A geothermal gradient of 1°F per 75 feet was selected as the lower limit, and only those wells with a gradient above that were included in this report. Any surface temperature over 70°F was considered anomalous, as has been the practice elsewhere in this report. Therefore, the 1°F/75' line on figure 15 was begun at 70°F, and only wells which fell to the right of that line were considered. Much of the water data for Las Vegas Valley was obtained from Maxey and Jameson (1946, 1948).

In Las Vegas Valley the warm-water springs and wells seem to be concentrated in three areas. The most northerly of these, Kyle Spring in S15,T20S,R61E, has a reported

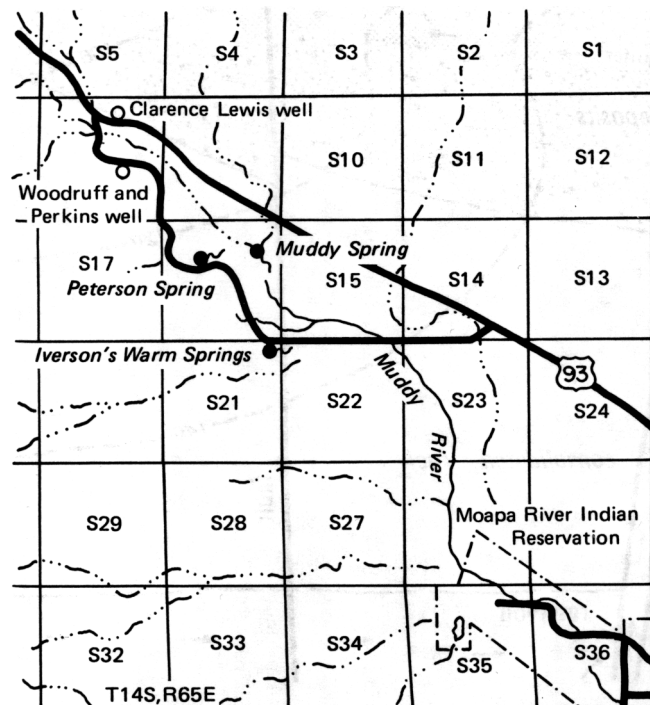


FIGURE 14. Locations of warm springs and wells 6 miles northwest of Moapa, Clark County.

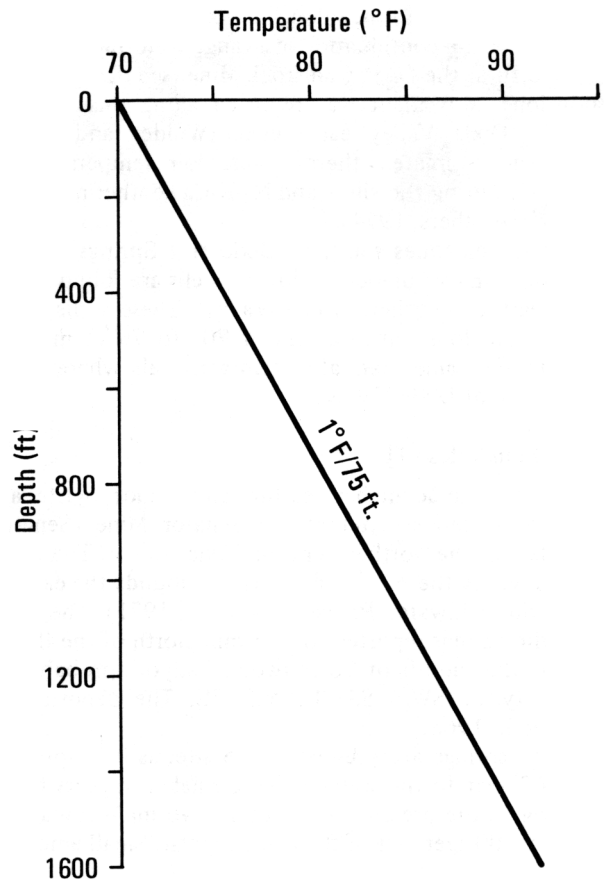


FIGURE 15. Graph of temperature vs depth; only Las Vegas Valley wells which fall to the right of the 1°F/75 ft-line were included in this report.

temperature of 75°F. Several warm-water wells in the surrounding sections seem to indicate that their source is also related to this spring. These anomalous spring and well temperatures probably indicate that the water at this area has circulated to depths greater than much of the rest of the water in Las Vegas Valley.

Las Vegas (or Vegas) Springs are located in S30 and 31, T20S,R61E east of downtown Las Vegas and have temperatures up to 79°F. Frémont stopped here on May 3, 1844 and reported that the waters were "two narrow streams of clear water, 4 or 5 feet deep, with a quick current, from two singularly large springs." The water had a pleasant taste but was too warm to be agreeable (Carpenter, 1915). The springs were used locally for irrigation, but have gone dry due to intense ground-water development. They originally flowed 2,567 gallons per minute, and are reportedly along a fault which displaces the basin alluvium (Mifflin, 1968).

More than 20 wells with anomalous temperatures are clustered around Warm Springs Ranch in S10,T22S,R61E (fig. 16). No temperature data are available for springs which may have been present at Warm Springs Ranch, but nearby well waters are 90°F, and temperatures of 79° to 84°F are encountered in an area up to 1 to 1.5 miles north and west of the ranch. A 106°F water well is present in NW/4 S16,T22S,R61E about 1 mile southwest of Warm Springs Ranch (Malmberg, 1965). Several other warm-water wells are found in the southern part of Las Vegas Valley, but do not seem to be concentrated in any one area. The

CLARK COUNTY (continued)

warmer water probably represents a deeper source area, and may be useful in determining areas of maximum ground-water discharge from deep aquifers or faults. An exploration well (the Joe W. Brown Wilson—Government No. 1) was drilled for oil in 1957 in C NW/4 NW/4 S24, T21S,R61E and encountered hot water. The well was plugged below 6,050 feet and converted to a hot (137°F) artesian water well. The hot water entry point was approximately 5,210 feet, in the Permian Kaibab Limestone (Schilling and Garside, 1968). Waters similar to this could be the source for warm springs and wells in the Las Vegas Valley.

Other warm springs and wells in Clark County

Seven additional warm springs or spring areas have been reported in Clark County, mainly in its northern half. Several springs are found in Arizona and Nevada along the Black Canyon part of the Colorado River east of Boulder City (S32,T22S,R65E; S5,8,21,T23S,R65E) with temperatures of 78° to 145°F. Rogers Springs are the next warmest with temperatures up to 86°F, and the springs at the Virgin River Narrows reportedly range from 75° to 80°F. Indian Springs (79°F), White Rock Spring (78°F), Brown's Spring (75°F), and Ash Creek Spring (72°F) are somewhat cooler. Warm-water wells in Clark County range from 70° to 88°F and are 60 to 825 feet deep.

DOUGLAS COUNTY

Walley's (Genoa) Hot Springs [45]

Walley's Hot Springs are about 2.5 miles south of Genoa on the west edge of Carson Valley (S21 and 22, T13N, R19E). The springs are named for David Walley, who built a large hotel and spa on the site in 1862. The resort had 40 bedrooms and, for a time, a physician in attendance. Later, the hotel was partly destroyed by fire, and completely demolished in 1929–1930 (Dangberg, 1972). At present, Ed and Helen Johnson have a bar and dining room in their home on the site of the old hotel. The Johnsons provided the authors with copies of the U. S. Steel Corp. maps and well logs from geothermal investigations done there in 1962 and 1963.

The hot springs themselves occur over an area of several acres, and range in temperature from 136° to 160°F (Waring, 1965). The flow of the springs has been estimated at 600 gpm (Lamke and Moore, 1965). The springs are along the trace of a major fault (fig. 17), which forms the edge of the Carson Range in this area for at least 12 miles (Moore, 1969). This fault has had recent movement, although the plainly visible scarp has been in existence since before 1854. Lawson (1912) has measured the recent displacement on this fault at 44 feet at Walley's Hot Springs, and believed it to represent movement from a single earthquake. The springs flow from a salient on a topographic low which occurs here along the trace of the fault.

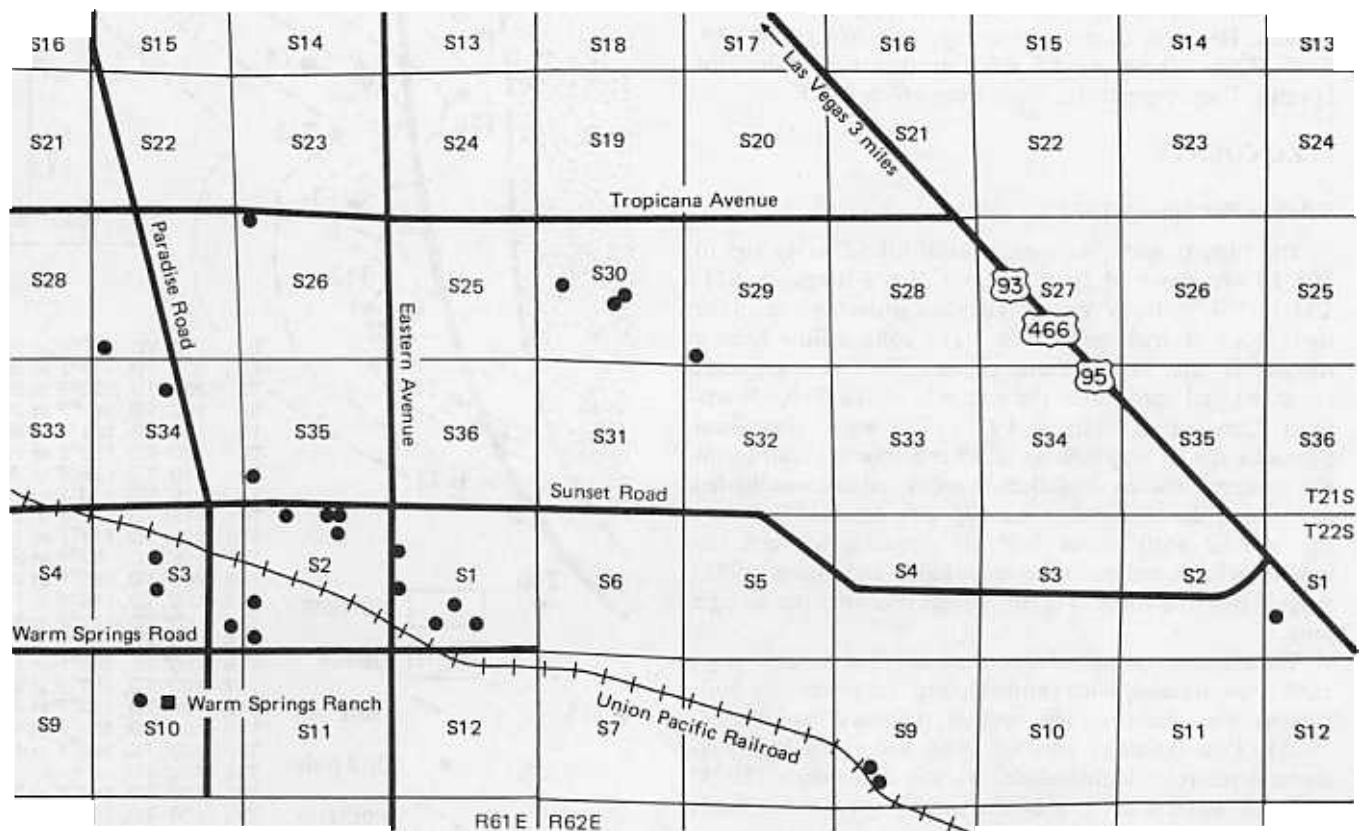


FIGURE 16. Selected thermal water wells in south Las Vegas Valley (wells shown have temperatures greater than or equal to 70°F after adjustment for a geothermal gradient effect of 1°F per 75 feet of well depth).