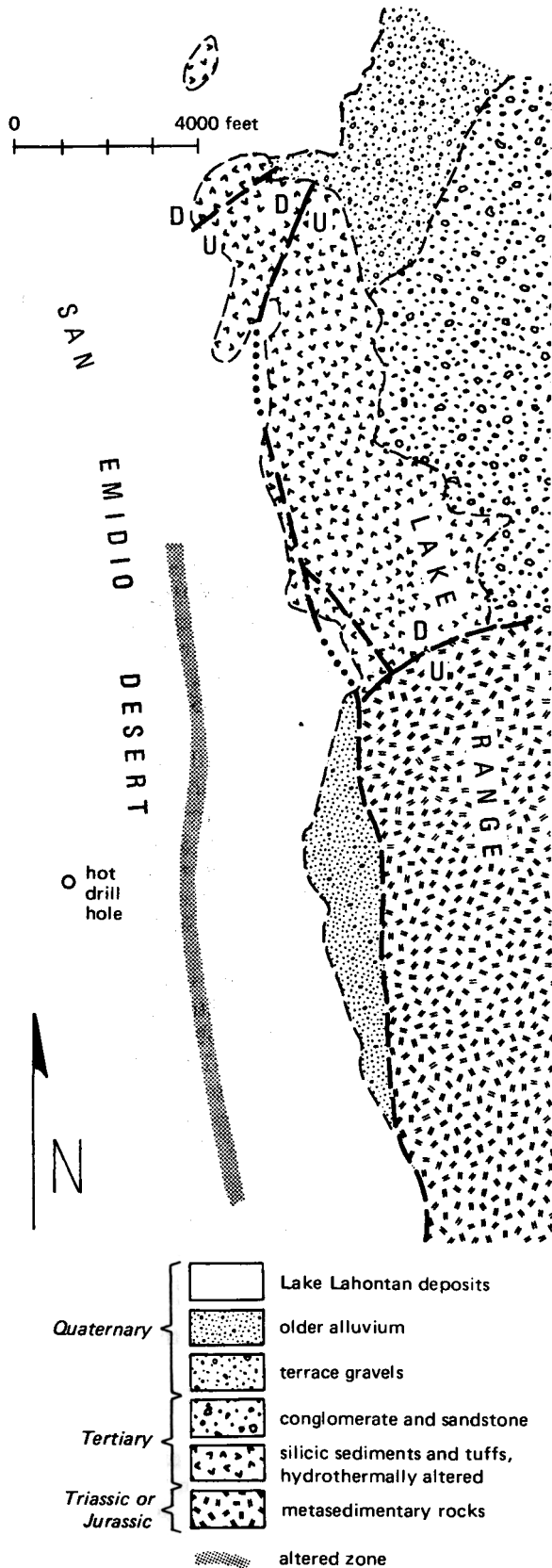


WASHOE COUNTY (continued)



and lacustrine deposits (Bonham, 1969). The alteration and mineralization represent the deposits of hot springs which were probably more active in the past. The zone is near the high-water level of Lake Lahontan, to which the mineralization may be related in some way (Papke, 1969).

The zone is still thermally active, and the ground is often warm 2 to 3 feet below the surface. Water standing in shallow bore holes is up to 128°F 3 feet below the ground surface, and a flowing spring or old well in S9 is approximately 86°F. Also, a drill hole encountered boiling water at 87 feet in 1955 in this same section (fig. 53), according to T. A. Alberg (written communication, 1975). Chevron Oil Co. drilled a 4,013-foot geothermal test to the west of this area (S8,T29N,R23E) in 1975. No information is available on the temperatures encountered. Peterson and Dansereau (1975) have reported principal facts for gravity stations in the San Emidio Known Geothermal Resource Area.

**Bowers Mansion (Franktown) Hot Spring [280]**

Bowers Mansion is a recreational park located to the west of Washoe Lake and developed around a mansion built in 1864 by Sandy Bowers, a prosperous miner on the Comstock Lode. The restored two-story sandstone structure is operated by the Washoe County Department of Parks and Recreation. Two swimming pools are open to the public during the summer season.

The hot spring has been utilized for the swimming pools in the past, but is now used for irrigation (Peterson, 1976). In 1962 an attempt to drill a cold-water well encountered 117°F water at 207 feet, and this well now supplies the thermal water for an olympic-size pool and a 15- by 25-foot pool for younger children. The pool waters are reduced to 76° to 78°F by addition of 54°F water from Riter Springs, about 5,500 feet northwest of the mansion.

The hot spring issues from the granodiorite-alluvium contact, which is an obvious fault scarp along the east side of the Carson Range. The hot water well probably intersects this same normal fault at depth. The geology of the area has been mapped by Tabor and Ellen (1975).

**WHITE PINE COUNTY**

**Monte Neva (Melvin, Goodrich) Hot Springs [288]**

The Monte Neva (Melvin, Goodrich) Hot Springs in SW/4 S24, NW/4 S25,T21N,R63E on the west edge of Steptoe Valley, are by far the hottest in White Pine County. Although a temperature of 193°F was reported by Stearns and others (1937, no. 98) other observers reported the temperature as 174°F in 1917 (Clark and others, 1920, p. 47), again in 1966 (Mifflin, 1968), and in 1974 (Hose and Taylor, 1974).

There is one main spring plus several smaller ones, all issuing from alluvium. The main spring flowed 625 gpm in 1917 (Clark and others, 1920, p. 47). A 20- to 40-foot-high mound of travertine, covering about 12 acres, has been built up. Mineral water is presently being deposited, and considerable CO<sub>2</sub> (?) gas is escaping from the springs.

Magma Power Co. drilled a 402-foot well at the springs in 1965. Hot water but no steam was encountered; the maximum temperature reported, was 190°F (Koenig, 1971). Audiomagnetotelluric data for the geothermal area is reported in Long and Batzle (1976a).

FIGURE 53. Geologic sketch map of the San Emidio cinnabar prospect, Washoe County (after Bonham, 1969).

## WHITE PINE COUNTY (continued)

### Cherry Creek (Young's) Hot Springs [284]

The Cherry Creek (Young's) Hot Springs on the west side of Steptoe Valley, in the north part of T23N,R63E, are the second-hottest springs in White Pine County. There are three small springs, which had temperatures of 188°F, 124°F, and 135°F, and a total flow of 3.6 gpm in August 1918 (Clark and others, 1920, p. 48, 49). In 1918, the water was being used to supply a bathhouse. Small amounts of gas (CO<sub>2</sub>) escape from the springs; one is slightly radioactive (Davis, 1954, p. 21).

Waring (1965, no. 96) reports that Shellbourne Hot Springs are "about 100 feet from Cherry Creek Hot Springs," consist of two springs, have a temperature of 124°F and are used for bathing and irrigation. If this location is correct, they should be considered part of the Cherry Creek Springs. Some miles to the southeast are the Upper and Lower Schellbourne warm springs (see below). An 8,406-foot-deep exploratory oil well in S19,T24N,R64E (Shell Oil Co. Steptoe Unit No. 1) reported a maximum temperature of 304°F. This well is 7 miles northwest of Cherry Creek Hot Springs.

### Williams Hot Springs [294]

Apparently the third-hottest group of springs in White Pine County are the Williams Hot Springs at the intersection of S29,30,31,32,T13N,R60E. There are two springs with temperatures of 124° to 128°F and flow rates reported at 50, 50–135, and 185 gpm. The water is used for irrigation (Stearns and others, 1937, no. 103; and Maxey and Eakin, 1949).

### Other springs in Steptoe Valley

Most of the hot springs, including the two hottest groups in White Pine County, occur along the margins of Steptoe Valley. The Monte Neva and Cherry Creek Springs are described above. A spring (name unknown) with a flow rate of

450 gpm and temperature of 83°F is reported (Snyder, 1963) in S31,T24N,R65E, on the east edge of the valley.

**Collar and Elbow Springs [282].** The Collar and Elbow Spring is at the north end of Steptoe Valley in S33,T26N,R65E. It had a temperature of 92°F and flow rate of 18 gpm on August 2, 1918. It is in old lake beds and has formed a "tufa" mound (Clark and others, 1920, p. 44, 49).

**Schellbourne Springs [288].** There are two hot springs in Schellbourne Pass in the Schell Creek Range on the east flank of Steptoe Valley. The Lower Schellbourne Warm Spring has a temperature of 77°F and issues from the alluvial fan at the mouth of the canyon in S12,T22N,R64E. The Upper Schellbourne Spring has a temperature of 73.5°F; it is near or on a fault in SE/4 NW/4 S8,T22N,R65E. Both reportedly flowed at 450 gpm in 1966 (Mifflin, 1968).

**Campbell Ranch (North Group) Springs [291].** Numerous springs ranging in temperature from 58°F to 76°F occur in a line at the foot of the steep alluvial fan, nearly parallel to the Egan Range. These springs have also been called the Campbell Springs or North Group Springs.

**McGill-Schoolhouse zone [292].** There are springs for a distance of about 5 miles along the base of the steeper alluvial slope paralleling the Duck Creek Mountains on the east side of Steptoe Valley. The springs increase in temperature from north to south. Schoolhouse Spring at the north end of this zone, in the NW/4 SE/4 S3,T18N,R64E, had a temperature of 76°F and flow rate of 450 gpm on July 5, 1918 (Hardman and Miller, 1934).

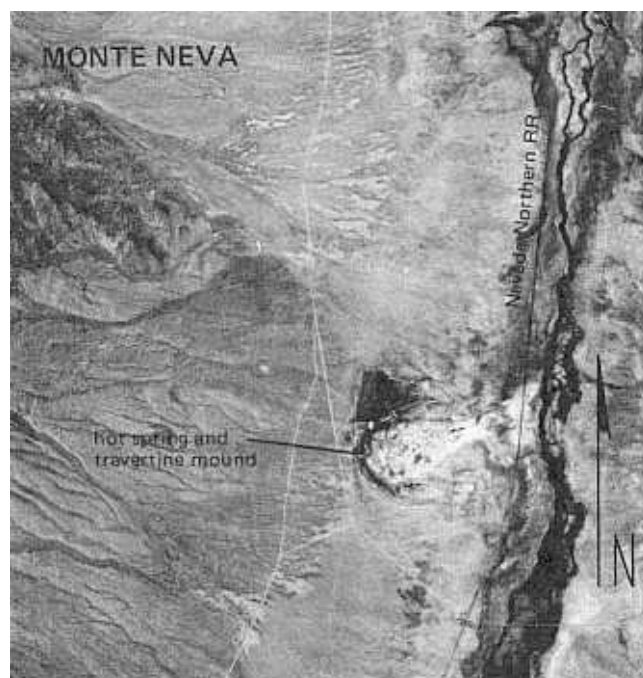
The McGill Warm Springs at the south end of the zone range up to 84°F in temperature and flow 4,500 gpm (Clark and others, 1920). There are three main springs; a pool has been excavated at the largest. Several additional springs apparently are covered by tailings from the huge Kennecott Copper Corp. mill. The water is used in the mill and in a municipal swimming pool (Eakin and others, 1967).

**Ely-Lackawanna zone [293].** Hot springs occur just north of Ely along the west edge of Steptoe Valley. The northernmost five springs in NE/4 S3,T16N,R63E, are called the Lackawanna Hot Springs. They flow 135 gpm and have temperatures variously reported as 70°F and 90° to 95°F. In 1966 the water was being used in the Silver King Mines mill. (Eakin and others, 1967; and Holmes, 1966, p. 21).

The Ely Warm Springs, to the south in section 10, had a flow rate of 22 gpm and temperature of 85° in April 1918. There are no spring deposits at the springs, but "tufa" occurs nearby (Clark and others, 1920, p. 43, 46). In some cases "Ely Warm Springs" has been used for all the springs in this zone including the Lackawanna Springs.

### Other White Pine County thermal springs

**Giocoechea (Simonsen) Warm Springs [287].** The Giocoechea Warm Springs (Simonsen Warm Springs; Warm Springs Ranch; Moore's Ranch Springs) are in Newark Valley in the NE/4 NE/4 S1,T22N,R56E and S36,T23N,R56E. Reported temperatures range up to 76°F and flow rates from 900 to 270 gpm. The springs form several ponds in alluvium and sand dunes; their levels are up to 20 feet above the general water table in the area. The water is



## WHITE PINE COUNTY (continued)

used for irrigation. (Eakin, 1960, p. 12; Snyder, 1963; Waring, 1965, no. 102a; Lamke and Moore, 1965; Mifflin, 1968).

**Big Blue Spring [294].** Nothing is known about the Big Blue Spring in S23,T14N,R56E except that the water is warm and has been used for bathing (Stearns and others, 1937, no. 103).

**Preston Springs [296].** There are a number of warm springs near Preston in T12N,R61E. These springs include the Preston Big Spring in SW/4 NE/4 S12, Nicholas Spring in SW/4 SE/4 S12, Arnoldsen Spring in SE/4 S12, and Cold Spring in SW/4 NW/4 S12. All the springs issue from alluvium. Temperatures vary from 70° to 72°F, flow rates from 630 to 5,700 gpm. Williams Hot Spring, the third-hottest spring in White Pine County, is 8 miles to the west.

**Warm Sulphur Springs.** Stearns and others, (1937, no. 106) locate Warm Sulphur Springs in T11N,R65E at the head of Warm Creek, in the south end of Spring Valley. The water is "warm," flows at 972 gpm, and is used for irrigation. Its exact location could not be determined.

**Others.** Stearns and others (1937, no. 99) mention a "warm" spring at the east base of the Kern Mountains in about T21N,R70E. There are also one or more warm springs at the head of Big Spring Creek (Stearns and others, 1937, no. 107, 107a; Waring, 1965; and Maxey and Mifflin, 1966). Temperatures up to 64°F and flow rates of 4,570 gpm are reported. The USGS Lund 1° x 2° sheet suggests that the spring or springs are in S33,T10N,R70E.

### Water wells

Four water wells, all in Spring Valley, are known to have temperatures higher than one might expect. Only the 600-foot-deep flowing Lawrence Henroid well at the north end of the valley in S31,T23N,R66E had a significantly higher temperature—89°F; the nearby Hans L. Anderson well also is artesian, is 1,040 feet deep, and has a temperature of 79°F.

Two Bureau of Land Management artesian wells (396 and 407 feet deep) at the south end of the valley in S2, T12N,R67E and S35,T13N,R67E have water temperatures of 75° and 73° respectively (Rush and Kazmi, 1965).