Site Description

Hot Creek Canyon
(updated 2010)

Geologic setting:

Geothermal features: (Map)

A number of springs issue from Hot Creek Canyon (T8N, R49-50E), six of which are thermal (figure). The thermal springs have a total discharge of about 3,217 L/min and temperatures of 22-82°C. There are nine or more cold springs interspersed with the thermal springs. In 2002, six springs (12 to 86°C) were sampled and analyzed in collaboration with Dick Benoit. Reservoir temperatures indicated by the chalcedony geothermometer are 136°C, whereas the Na-K-Ca temperature is only 82°C, but the chemistry indicates that the water is not fully equilibrated.

Hot Creek Ranch Spring:

Old Dugan Place Springs: The Old Dugan Place (Warm) Spring (NE¼ NW¼ Sec. 25, T8N,R50E) is near the center of the canyon, a half of a kilometer west of the Old Dugan Place (an abandoned ranch) on the north side of the canyon floor. Water issues from several orifices in thin alluvium overlying Paleozoic limestone. It is fenced and ditched to increase the flow into Hot Creek. In September, 1967, a gaging station consisting of a 90 V-notch weir and water-stage recorder was built by the U.S. Geological Survey; preliminary records indicate a steady flow of about 1,874 L/min. On October 15, 1967, a temperature of 36°C was recorded (Fiero, 1986). A flow rate of 1,360 L/min at 32°C had previously been measured in 1966(?) (Rush and Everett, 1966). Like other hot springs in this area it is believed to tap water from a deep, regional groundwater flow system. A cold spring between this spring and the Old Dugan Place has a flow of 5.7 L/min. and a temperature of 19°C on August 14, 1967 (Fiero, 1986).

Pat Spring: Pat Spring (SE¼ NW¼ SE¼ Sec. 21, T8N, R50E) 0.8 km northeast of Upper Warm Spring had an estimated flow of 189 L/min. and a temperature of 22°C on March 19, 1967 (Fiero, 1986). There are two cold springs 0.8 km downstream from Pat Spring at the Old Page Place; the westernmost, Cress Spring, flows about 32 L/min at 8°C (April 19, 1967; Fiero, 1986); Cold Spring, the easternmost, flows at about the same rate and has a temperature of 6°C (April 19, 1967; Fiero, 1986).
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**Upper Hot Creek Ranch Springs:** The hot spring at the Upper Hot Creek Ranch (NE¼ SE¼ Sec. 33, T8N, R50E) is at the east end of the canyon 183 m southwest of the ranch house. Discharge occurs from several orifices in thin alluvium overlying Cambrian Tybo Shale. The spring is fenced and ditched to take the discharge to Hot Creek; like the other springs, it contributes to irrigation and stock needs. Preliminary U.S. Geological Survey gauging records in 1967 indicate a flow of 1,060 L/min at 76°C (Fiero, 1986). A flow of 2888 L/min at 71°C was recorded in 1966 Rush and Everett, 1966). A spring about 1.5 km to the east, on the "Mine" fault, has an estimated flow of 473 L/min at 21°C (Fiero, 1986). Mariner and others report a temperature of 67°C, and estimate a reservoir temperature of 143°C using a silica geothermometer, and 36°C using the Na-K-Ca geothermometer (1983, p. 99, 106).

**Upper Warm Spring:** The westernmost, upstream thermal spring is Upper Warm Spring (SE¼ SW¼ SW¼ Sec. 21, T8N, R50E), located just north of the road up the canyon. The spring is used by stock; otherwise it is undeveloped. A flow rate of 121 L/min at 34°C was recorded on March 18, 1967 (Fiero, 1986). Reed and others reported a temperature of 40°C with a similar estimated reservoir temperature, and a flow rate of 102 L/min (1983, p. 44,106). It is in an area of Tertiary volcanic rocks underlain by Paleozoic carbonates. There is no evidence of structural control at the surface; however, it is thought to be along a permeable fault zone that allows water to rise from deep circulation within a regional, intrabasin groundwater flow system (Fiero, 1986). Upper Spring, upstream, 1.5 km to the southwest, is a cold spring.

**Warm Spring:**

Leasing information: