Site Description

N Big Smoky Valley

(updated 2010)

Geologic setting:

Geothermal features:

Carvers Ranch:

Charnock Ranch: Springs at Charnock Ranch, including Big Blue Spring, have reported temperatures from __ to 32ºC (Fiero, 1968; Trexler and others, 1979, Table 1). These springs are in Secs. 16, 29, and 32, Tl3N, R44E on the east side of Big Smoky Valley, where they issue from a large mound. Travertine is reported in the vicinity of Sec. 28, Tl3N, R44E. Big Blue Spring is associated with a fault scarp cutting alluvium (Fiero, 1986).

According to Garside and Schilling (1968, p. 55), thermal waters are also reported in this general area at Turk's Ranch (T13N, R43E)? and R.O. Inc. Ranch (Tl2N, R43E)?.

Darroughs Hot Springs (Map): Darroughs Hot Springs are located in northern Big Smoky Valley ~97 km north of Tonopah, where the hot spring waters are used for a spa (Sec. 7 and 8 T11N, R43E). The hot springs discharge near-boiling water at several hundred liters per minute. A 247.5-m-deep well drilled in 1962 (and redrilled in 1963) by Magma Power Co. encountered temperatures up to 129.4°C with a rapid outflow and minor steam (Koenig, 1970). Ranch wells also hit boiling water at shallow depths; water from one well was reportedly used to heat a ranch house in the 1970s. Anomalous radioactivity (75 µR/hr) is reported from near the edge of a fenced pool (Wollenberg, 1974b). Travertine and a trace of siliceous sinter are reported (Mariner and others, 1974).

The springs issue from valley fill on an alluvial fan. The mountain front about 2.4 km west is a fault scarp of a major basin-and-range fault (the ___ Fault, which traces the eastern Toiyabe Range). The amount of displacement on this fault is unknown. Fiero (1986) suggested that hot springs emerge from a fault parallel to this major fault, whereas Trexler et al. (1980) believes they trace the northerly extension of a range-front fault segment. Best estimates for thermal aquifer temperatures at Darroughs Hot Springs are in the 93-135°C range. The upper limit of the range was nearly attained in the Magma well. Geophysical data for Darroughs Hot Springs are reported in Kaufmann (1976), Long and others (1976), O'Donnel (1976), and Peterson and Dansereau (1976a).

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Leasing information: Oski Energy's Silver State project is located near Darrough's Hot Springs. Oski performed geophysics on the property, but no other information is available on this project.

Raser Technologies also holds a lease north of Darrough's, called the "Smoky Valley" property. Nothing further is known.

Kingston Creek Ditch: Fiero (1986) reported a 28.9ºC water well 36.6 m deep in NW¼ Sec. 24, T16N, R44E. However, Trexler, Koenig, Flynn, and others (1981; Table E2) reported that it is no longer warm.

McLeods Ranch: Hot springs at McLeods Ranch 24 km north of Darroughs (SE¼ NE¼ SW¼ Sec. 34, T14N, R43E) issue from a large tufa mound in the alluvium and have a relationship to the [major Basin and Range fault] similar to Darroughs Hot Springs. Temperatures at McLeods are reported as 62.7°C (Trexler and others, 1980) and 82°C (Trexler and others, 1979, Table 1).

Round Mountain Mine: Round Mountain Gold Corp. operates a large open-pit gold mine and heap-leach gold recovery facility about 17 km southeast of Darroughs Hot Springs. Geothermal fluids (about 82°C) from shallow (approx. 300 m) wells were used in a heat exchanger to transfer heat to cyanide heap-leach solutions (Trexler and others, 1990). The wells are located in NE¼ Sec. 36, T10N,R43E, about 1.5 km southwest of the mine. The heated cyanide solutions were reported to increase gold extraction during periods of freezing or near freezing weather; additionally, the heating of solutions may enhance total gold recovery. Geothermal heating is not used at the present time (2002) at Round Mountain.

Spencer Hot Springs: The hot springs and wells at Spencer Hot Springs are located mainly in the SE¼ Sec. 13, Tl7N, R45E (projected). There are also springs east of the main spring area (figure), in Sec. 14, Tl7N, R45½E (Fiero, 1968). Meinzer (1917, p. 50, 91) reported the presence of a travertine terrace nearly 1.6 km long and 0.8 km wide with spring deposits not more than 15 m thick. According to Meinzer (1917), the main spring is 62°C, the north spring is 47°C, and the east spring "normal." Both excavated and developed stock-watering pools on the site are used for bathing by visitors, although no exact temperatures are reported (Williams, 1996, p. 40). Some flow may be from open wells, drilled in the 1940s (U.S. Bureau of Land Management Environmental Assessment NV063-Eao4-59, 2004). Hot water from the main spring is carried by steel pipe to a concrete-lined pool. The temperature of the hottest spring was measured in June 2002 to be 72.1°C (Sanders and Miles, 1974). Wollenberg (1974b) reported that the spring has slightly anomalous radioactivity (19 µR/hr).

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Except for Sanders and Miles (1974), who reported that the springs are at the boiling point, the highest temperature (72°C) was recorded by Mariner and others (1974), who suggested that the best estimate of the reservoir temperature is 123°C, using the silica geothermometer. Trexler and others (1980) reported a 72.5ºC temperature from the spring. Fiero (1968) believed that the water discharging at Spencer Hot Springs may originate in Monitor Valley to the east after flowing through the intervening Paleozoic carbonate and clastic rocks. The geology of the hot springs and surrounding area is also shown on the 1:62,000 geologic map by McKee (1968). Phillips Petroleum Co. drilled 4 temperature-gradient drill holes in the vicinity of Spencer Hot Springs in 1980 to depths ranging from 29.6 to 64.0m and encountered temperatures no higher than 16.8ºC (Sass and others, 1999).

Leasing information: Spencer Hot Springs, a former Sierra Geothermal Power property, reverted to RAM Power during SGP's acquisition by RAM in 2010. No information is available on this 4,841 acre project.