



Site Description

Yucca Mountain

(updated 2012)

Geologic setting: Yucca Mountain geology is predominantly volcanic with over 1000 meters of silicic volcanic tuff, underlain by Paleozoic sedimentary rocks (Byers et al., 1976; Sargent et al., 1970). Yucca Mountain lies within a faulted, 25-km-wide Neogene graben (Fridrich, 1999), bounded on the west by the Bare Mountain fault and on the east by a normal fault (Potter et al., 2004). Small basalt flows and cinder cones erupted in Crater Flat, west of Yucca Mountain, as recently as 80,000 years ago (Heizler et al., 1999, p. 767-8).

Crater Flat has numerous Holocene fault offsets (Ramelli et al., 1988, 1989), with basaltic cinder cones throughout the piedmont slopes (Peterson et al., 1995). Crater Flat may have formed through volcanic caldera eruptions (Snyder and Carr, 1984), detachment faulting (Hamilton, 1988), or graben faulting (Langenheim, 1995?).

Geothermal features:

Yucca Mountain: Of 13 wells measured at Yucca Mountain, six are hot (37.2 to 41.7°C) and seven are warm (26.1 to 34.2°C). The thermal anomaly encompasses Busted Butte and Jackass Flat east of Yucca Mountain, as well as Crater Flat to the west. The reservoir temperature, as estimated by geothermometry, is moderate: chalcedony-based calculations give $73.4 \pm 6.5^\circ\text{C}$ and Na-K-Ca-Mg calculations, $70.6 \pm 14.8^\circ\text{C}$ (Penfield et al., 2012).

Crater Flat: Four thermal features have been measured in Crater Flat: three warm wells and one warm spring (Specie Spring). Apart from the cooler 22.5°C spring, well data are narrowly distributed over a 30.5 to 35.5°C temperature range, with reservoir temperatures of $61 \pm 6^\circ\text{C}$ (Ca-Na-K geothermometer; Fournier, 1981a) and $61 \pm 15^\circ\text{C}$ (chalcedony geothermometer; Fournier, 1981b). No non-thermal waters have been measured in Crater Flat (Penfield et al., 2012).



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Leasing information:

N/A

Bibliography:

Byers et al., 1976

Fournier, 1981a

Fournier, 1981b

Fridrich, 1999

Hamilton, 1988

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Ramelli et al., 1988, 1989

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