Site Description

Granite Springs Valley

(updated 2010)

Geologic setting: The Blue Wing Range northwest of Granite Springs Valley (GSV) contains Triassic-Jurassic metasediments and Cretaceous granodiorite intrusions. Locally, older rocks are capped by Tertiary-age rhyolite and sediments (Johnson, 1977). The Sahwave Range, comprised of Cretaceous-age granodiorite, bounds west and southwest GSV. Limited copper and tungsten mining took place from the early 1900's until 1962 (Johnson, 1977). Tungsten mineralization is found within calc-silicate roof pendants and narrow garnet and epidote tactite zones (Bonham et al., 1985).

Geothermal features: Granite Springs Valley (GSV) extends northward from the known geothermal resource area of Hot Springs Flat and Bradys Hot Springs. Reconnaissance sampling was recommended by Mark Coolbaugh based on NBMG Map 151 (Geothermal Potential Map, 2005), the general absence of samples within Granite Springs Valley, and reports of seasonal playa seeps along Bluewing Playa. UNR samplers were limited to springs along the Granite Springs Valley perimeter, with the exception of West Ragged Top Well. The sampling campaign was performed in August 2007 for all sites but Porter Spring, which was sampled October 2007.

Phillips Petroleum measured high temperature gradients in the Trinity Range and Granite Springs Valley. The drilling area is roughly rectangular, 18.5 km E-W by 44.6 km N-S, centered in southeastern Granite Springs Valley 9 km west of Ragged Top Mountain (GeothermEx, 2004). 39 gradient holes were completed, termed "Southern Pacific" by SMU, Richards and Blackwell (2002), and Sass and others (1999). Drill holes are as deep as 91 m, and have bottom-hole temperatures up to 36.1ºC. Location: 40.06ºN, 118.89ºW. Gradient holes also outline thermal groundwaters within Blue Wing Flat in northwestern GSV (Richards and Blackwell, 2002; GeothermEx, 2004). An isothermal temperature of 89.7°C was logged between ~1,700 ft and 1,805 ft depth (maximum drilled). Location: 40.22ºN, 118.92ºW. Blue Wing Flat is also termed Adobe Flat and Adobe Valley in the literature.

Bach Well: Bach Well measures warm, at 20.5ºC (NWIS Well 078 N29 E29 06D), according to the USGS National Water Information Service (http://waterdata.usgs.gov). The water chemistry suggests reservoir temperatures of 66.0°C (Na-K-Ca-Mg geothermometer) and 89.6°C (chalcedony).

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Granite Spring, Bluewing Spring: Granite Spring flows along the western margin of Granite Springs Valley. The 21.2ºC spring originates in a sandy, weathered granite valley, and is piped 50m south. A thick algae mat was removed to avoid sample contamination. Location coordinates in NAD83 are 40.08001 N, 119.05315 W. Geothermometer values are low, at 46.5°C (Na-K-Ca-Mg) and 53.6°C (chalcedony).

The 20.4ºC Bluewing Spring is 3 km north of Granite Spring. The outflow emerges from a small rocky cave, and seeps downslope too slowly to assume minimal interaction with air and evaporation. No sample was taken.

Lowry Well: At the eastern central edge of Granite Springs Valley, Lowry Well (15.0°C) sits within bentonite mud-ash hills. The cavern opening is 0.5 x 1m, with water pooled inside. There were no local plants apart from isolated green sage. Location coordinates are 40.1682 N, 118.75079 W (NAD83). Geothermometer values are moderate, at 81.4°C (Na-K-Ca-Mg) and 71.3°C (chalcedony).

North Cottonwood Spring: North Cottonwood Spring flows along a 400-m riparian zone west of Blue Wing Flat, northwestern Granite Springs Valley. UNR staff sampled the uppermost spring. Sample chemistry does not reflect the temperature anomaly identified by Phillips in Blue Wing Flat: geothermometers are low, at 67.4°C (Na-K-Ca-Mg) and 78.3°C (chalcedony). Location coordinates are 40.41522 N, 118.86152 W (NAD83).

Porter Spring: At the northern end of Granite Springs Valley, Porter Spring flows into a 12 x 15m pond. UNR samplers augered a 20cm long tube into the spring source, and waited 20 minutes for the water to flow clear. Sampled water was clear, unscented, and warm (21.2ºC). Nearby hills are composed of bedded rhyolite ash. Geothermometer values are low, at 67.4°C (Na-K-Ca-Mg) and 78.3°C (chalcedony). Location coordinates in NAD83 are 40.41522 N, 118.86152 W.

Sage Hen Valley: Sage Hen Spring (16.6°C) has the only flowing water in Sage Hen Valley. Burros, sage hens, and water striders were found in the vicinity. The sampled water was cool, clear (despite the slightly rusted pipe), and unscented. The surrounding hills are layered with basalt flows. Geothermometer values are low, at 38.5°C (Na-K-Ca-Mg) and 39.3°C (chalcedony). Location coordinates are 40.05477 N, 119.22051 W (NAD83).

Telephone Well: Telephone Well is located in Copper Valley, at the southern end of Granite Springs Valley. The well has a newly-installed control pad, but needs a 220V generator to operate (as observed in July 2007). Phillips Petroleum Co. drilled about 36 temperature-gradient wells and two slim holes over an area of 50 km^2 in the vicinity of Telephone Well in the 1980s (SMU; Sass and

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others, 1999; Richards and Blackwell, 2002). The wells have temperatures up to 45.6ºC at about 190 m (GeothermEx, 2004). Location: 40.00ºN, 119.03ºW.

West Ragged Top Well: West Ragged Top Well (26.0°C) is located in the central playa of Granite Springs Valley. UNR samplers released the windmill handbrake to initiate flow, and sampled from the outflow pipe after letting water run for 20 minutes. Outflow water had a visible orange tint from interior rust. Geothermometer values are low and divergent, at 66.7°C (Na-K-Ca-Mg) and 23.1°C (chalcedony). Location coordinates in NAD83 are 40.09961 N, 118.91086 W.

Leasing information:

N/A

Bibliography:

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