



## Site Description

### Deeth

(updated 2010)

#### Geologic setting:

**Geothermal features:** Three spring systems are found between Twin Buttes and western Deeth, a 22 km distance: Devils Punch Bowl (SW $\frac{1}{4}$  SW $\frac{1}{4}$  Sec. 15, T39N, R59E), Cress Ranch Hot Springs (SW $\frac{1}{4}$  Sec. 11, T38N, R59E and SW $\frac{1}{4}$  SE $\frac{1}{4}$  Sec. 14, T38N, R59E), and Winter Creek Warm Springs (SW $\frac{1}{4}$  Sec. 26, T37N, R59E). The thermal anomaly is associated with deep meteoric waters along the northerly-trending Marys River fault, which coincides with Marys River Valley along the eastern Twin Buttes.

**Devils Punch Bowl:** The Devils Punch Bowl spring group, north of Twin Buttes, has temperatures from 47 to 52°C. An adjacent travertine mound is roughly 15m high and 70m long (Tower, 1982). Estimated reservoir temperatures are near surface values, at 64.7  $\pm$  5.2°C (Na-K-Ca-Mg) and 62.5  $\pm$  6.4°C (chalcedony).

**Cress Ranch Hot Springs:** Five springs south of Twin Buttes have temperatures from 30 to 36°C. The sodium bicarbonate springs yield geothermometers of 185.3  $\pm$  11.7°C (Na-K-Ca-Mg) and 157.5  $\pm$  5.9°C (quartz).

**Winter Creek Warm Springs:** UNR field samplers visited the Winter Creek warm springs in July 2008. The eastern seep measured cold (15°C), with no salt crusts or other evidence of thermal activity. The western spring is inaccessible from the southern frontage road (fenced) and northern dirt road (overgrown). We suspect that it, too, is a non-thermal feature, despite appearing in USGS 7.5' and 100K maps as a warm spring. No historical temperatures or chemistry have been measured for either spring.

**Leasing information:** The main Marys River project, leased by Standard Steam Trust, encompasses 34,138 acres of privately and federally-owned land. Geothermal indicators include active hot springs at the "Devil's Punchbowl", tufa mounds and fossil hot spring terraces, and high bottom hole temperatures (173°C) in deep oil wells in the basin to the east. Temperature gradient holes drilled by Amax Geothermal Inc. had values ranging from 32°C/km to 336°C/km. Geothermometer (Na-K-Ca)



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temperatures range to 200°C at Cress Ranch and 215°C at the Devils Punchbowl. In 2010 SST is permitted 29 thermal gradient or 'observation' holes.

A second 10,310 acre lease, also held by Standard Steam Trust, is located SW of SST's Mary's River project. Detailed gravity and seismic data revealed strong faulting through the property along which hot springs and warm springs occur. Temperature gradient drilling program was completed by AMAX in the late 1970's and two deep wells which lie on the property had bottom-hole temperatures of 173°C at 2,734m and 148°C at 2,990m.