

# Update on the Geochemistry and Geohydrology of the FORGE Deep Well Site, Milford, Utah

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## Keywords

*EGS, FORGE, geothermal, fluid geochemistry, hydrology, Basin and Range*

## ABSTRACT

The Utah FORGE deep well site is located on alluvial fan deposits (200-600 m thick) that overlie a large volume of hot crystalline basement rock primarily composed of Tertiary granodiorite and Precambrian gneiss. It lies 4-5 km outside the western boundary of the Roosevelt hydrothermal system within an area of anomalous heat flow ( $\sim 100 \text{ km}^2$ ) that extends west from the Opal Mound fault. Modern to recent hydrothermal activity is responsible for steaming ground steam-heated acid alteration in the vicinity of fumaroles and steaming ground north of the Negro Mag fault and silica sinter deposition along the Opal Mound fault. The compositions of groundwaters are affected by three main elements: 1) a regional hydraulic gradient that flows westward across the FORGE site, from the crest of the Mineral Mountains to the middle of the north Milford Valley; 2) the supply of neutral pH hot water from Roosevelt Hot Springs reservoir that leaks out the north end of the Opal Mound fault; 3) formation waters that occupy the basin fill west of the site. Groundwater data from shallow wells trace shallow hydrothermal outflow to the northwest and west, consistent with temperature profiles in gradient wells. These shallow waters are chemically benign, non-potable, and suitable for EGS heat transfer experiments. Soil gas data provides further information about subsurface flows of hydrothermal fluids.