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GEOLOGY AND HYDROLOGY OF HOT SPRINGS WEST OF LOWMAN, BOISE COUNTY, IDAHO  
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Four hot spring areas were studied along the South Fork Payette River, west of Lowman, Boise County, Idaho. Much of the study area is underlain by Cretaceous granodiorite. The NE-trending Idaho porphyry belt, a complex of Tertiary dike swarms and granitic stocks, transects the east-central portion of the study area. NE- and NW-trending major fault zones cut these units and control the course of the South Fork Payette River. Minor structures also exhibit strong NE and NW trends consistent with the regional structural pattern suggesting NE and NW extension during the Eocene and Oligocene.

Three thermal spring areas, Goller, Corder and Pine Flat are associated with Tertiary dike swarms related to the Idaho porphyry belt. Hot spring vent locations are controlled by the dikes having the highest hydraulic conductivity which act as conduits. Geochemical thermometers yield source temperatures of 71°C which, combined with a measured geothermal gradient of 80°C/km, suggest a circulation depth of 1 km.

Deer Creek hot springs is distinct geologically and geochemically from the others. Situated in an area lacking dikes, thermal water rises 2 km along the intersection of two major faults from a thermal aquifer at 142°C.

In all four areas meteoric water recharge occurs along major fault zones. Residence times of thermal waters range between 9,000 and 28,800 years; little or no mixing occurs during ascent. Recurrent fault movement has kept open conduits that would otherwise be closed by mineral precipitation.