Stratigraphic Characterization of the Mountain Home Bore Hole, Western Snake River Plain

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Abstract:
From 2010 to 2012 Project HOTSPOT completed three drill holes in the Snake River Plain to depths of ~2 km each. The three drill sites (Kimball, Kimberly, and Mountain Home) were strategically chosen to sample a nearly continuous chronostratigraphic record of emplacement and disposition of the northeast migration of the Yellowstone Hotspot relative to the North American Plate. The objective of the drilling project was to investigate geothermal potential in three distinct regimes of the SRP. We characterize the flux-unit scale stratigraphy of whole-rock core from the western-most drill hole (Mountain Home) and identify and describe cutout analogs. The methods used for this characterization include identification of volcanic facies, observations, stratigraphic and textural relationships, and sedimentary and volcaniclastic marker horizons. We correlate the lithologic logs acquired at Mountain Home to the borehole geophysical data in an effort to identify signatures that represent fine-scale variations in stratigraphy, composition and/or alteration.

Flow boundaries are identified by key flux-units. Major flux-units include vesicular oxidized flow tops, massive flow interiors, and rubbly flow bases. Periods of non-emplacement are marked by sedimentary deposition. Hyaloclastites indicate rapid quenching and proximal water sources or sub-aerial emplacement. The oldest basalts are highly fractured, and the flow units are much easier to discern. Fractures and vesicles are filled with calcicaceous and zeolitic alterations, indicating a history of hydrothermal fluid-rock interactions.

The horizon used to correlate the three, is the package from Pliocene Glenns Ferry to Pleistocene Bruneau.

References: