

GEOCHEMISTRY, PETROGENESIS AND TECTONIC SETTING OF IGNEOUS ROCKS
OF THE HARTVILLE UPLIFT, EASTERN WYOMING

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ABSTRACT

The location of the eastern margin of the Wyoming Province and its Proterozoic evolution are still debated. I have studied Precambrian Igneous rocks in the Laramide-age Hartville Uplift (HU). The Uplift is elongated, NNE trending and at least part of it is bisected by the Hartville Fault (HF). The objective is to use the geochemical features of the igneous rocks to infer the tectonic setting in which they formed.

Mafic rocks are represented by the Muskrat Canyon metabasalt, with an E-MORB signature; and the Mother Featherlegs metabasalt and the metadiabase dikes of the Rawhide Buttes, both of them with N-MORB characteristics.

Concerning granitoids, the ca. 2.6 Ga Rawhide Buttes and Flattop granites have a clear pelitic geochemical signature, suggesting melting during collision. At ca. 1.74 Ga, the Twin Hills diorite intruded, probably as a result of a westward subduction. Immediately after, the Haystack Range granite, again with a strong pelitic geochemical signature intruded.

The Archean granitoids may be related to accretion along the Oregon Train Structure in southern Wyoming. Basalts indicate that the region subsequently underwent rifting. The Twin Hills diorite and the Haystack Range granite appear to be related to westward subduction and collision (respectively) during the Black Hills-Dakotan collisional orogeny. Enigmatic migmatitic, tonalitic pods with an age of 1.715 Ga mark the latest deformation event that is attributed to the terminal collision of Wyoming and Superior Province.