

# PALEOGEOGRAPHIC RECONSTRUCTION OF THE JURASSIC WANAKAH FORMATION AND ADJACENT UNITS OF THE MORRISON FORMATION IN WESTERN COLORADO, USA

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## Abstract

The Jurassic Wanakah Formation is a regionally important, well-exposed, but poorly studied mudrock that extends throughout western Colorado, Utah and New Mexico. The Wanakah Formation overlies the Middle Jurassic Entrada Sandstone and underlies the Upper Jurassic Morrison Formation in the study area, which encompasses southeastern Utah and western Colorado in the Paradox and Piceance Basins – petroleum-producing basins. The Wanakah Formation is bounded by regional unconformities; the J-2 and J-5 Unconformities. Provenance of the Wanakah Formation and adjacent units (Entrada Sandstone and Tidwell Member of the Morrison Formation) is yet to be determined substantively. Preliminary studies suggest that Wanakah Formation is sourced from the reworked Triassic Chinle-Dockum Formation in central Colorado; it also suggests a major shift in provenance from the Wanakah Formation to the overlying Tidwell Member of the Morrison Formation. Detailed study of the provenance and depositional environment of the Wanakah Formation and its adjacent units is critical to interpret the middle to late Jurassic paleogeography of the western Colorado and southern Utah region. Representative sandstone samples from these formations shall be collected and tested using traditional field methods, laboratory analyses (bulk geochemistry and x-ray diffraction), novel techniques like QEMSCAN (quantitative elemental mineralogy using scanning electron microscope) and U/Pb age dating of detrital zircons. The results will provide accurate stratigraphic and sedimentological sequence of events as well as establish the provenance of the Jurassic Wanakah Formation. These data will be applied to reconstruct the paleogeography and also refine the petroleum basin system of the western Colorado area.

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