MONTEZUMA CANYON DISTRICT

The Montezuma Canyon mining district is a part of the Monticello U mining area in east-central San Juan County. Mineralization was initially discovered in the district during the radium prospecting period of 1910 to 1924 and the vanadium exploration phase from 1935 to 1944. Montezuma Canyon has been a modest U-V producing district. Total district metal production at modern metal prices is estimated at $7.3 million. The most productive area is the Middle Montezuma Canyon group, including the Cottonwood, Lucky Boy, Strawberry, and Verdure underground mines.

The Montezuma Canyon district occurs in the Paradox Basin on the Colorado Plateau. Montezuma Canyon is deeply dissected into flat-lying Jurassic- to Cretaceous-age strata. The U-V ores are hosted in the Upper Jurassic Salt Wash Member of the Morrison Formation. The Salt Wash Member is a light-colored, massive, cross-bedded sandstone with siltstone and mudstone lenses. The Salt Wash thickens to the north and pinches out toward the south end of the district. The best U-V deposits (USGS Model 30c) are in the central part of the district in the thickest sandstone lenses with the most abundant carbonaceous trash.

Huff and Lesure (1962) describe the orebodies as zoned lenses: “The concentric zones consist of a brown nonmineralized core, an olive-gray mineralized shell, and a gray nonmineralized outer zone. The brown core is an Fe-stained, porous sandstone commonly containing abundant carbonaceous material. The curved mineralized layer completely encloses the brown core and is composed of oxidized U-V minerals that impregnate the host sandstone. The outer gray zone is light-gray sandstone tightly cemented with calcite and commonly freckled with limonitic specks.”

The U-V ore deposits probably resulted from diffusion of metals in slowly circulating connate water around a brown reduced core formed by abundant organic material. The surrounding olive-gray ore zone is the boundary between the reducing core and the surrounding oxidizing fluid with U and V in solution. The ore zone averages about 0.19% U_3O_8 and 3.46% V_2O_5 and samples show a geochemical association with Fe, Ti, Ag, Co, Mo, Ni, Zr, and Y (Huff and Lesure, 1965).

Huff, L.C., and Lesure, F.G., 1962, Diffusion features of uranium-vanadium deposits in Montezuma Canyon, Utah: Economic Geology, v. 57, p. 226–237.

Huff, L.C., and Lesure, F.G., 1965, Geology and uranium deposits of the Montezuma Canyon area, San Juan County, Utah: U.S. Geological Survey Bulletin 1190, 102 p., 8 plates, various scales.