

3450 0014

(134)  
Item 16MCDERMITT MINE GEOLOGY

McDermitt Mine, located 11 miles southwest of the town of McDermitt, is in the Opalite Mining District. The mine is situated in the McDermitt caldera complex (a series of overlapping volcanic collapse structures). The volcanic eruptions and associated collapse occurred from 16.1 to 15 million years ago when molten rock forcing its way up in the earth caused a bulge in the earth's surface. As the bulge grew, circular cracks formed around its edges (ring faults). The ring faults deepened as the bulge grew until they breached the chamber of molten rock below. The resulting pressure release caused the eruption of a cloud of super hot gases and droplets of molten rock. This cloud spread out across the surface forming an ash flow as it cooled. The rapid evacuation of molten rock from the chamber beneath the bulge caused the rock capping it to collapse. The depression that was formed is called a caldera. At various times between major eruptions, molten rock forcing its way upward, has pushed large blocks of solid rock up reopening the existing fractures. Viscous molten rock was extruded onto the surface through the reopened cracks. This renewed uplift and activity (resurgence) formed dome shaped hills and ridges (resurgent domes) near the center and at points along the edges of the rim. Through time, several overlapping calderas were formed by this process. As the calderas developed, lakes formed in the remaining low areas filling them with sediments. The topography was later altered by high angle Basin and Range faults.

McDermitt Mine pit is located adjacent to the Long Canyon caldera ring fault (an arcuate fault or series of faults defining the edge of a caldera) and just north of the Washburn caldera rim. Rocks in the pit area consist of Quaternary gravels underlain by lake sediments and a thick sequence of volcanic rocks. It is estimated that mineralization of the lake sediments and underlying volcanic rocks occurred 12 million years ago when ore bearing solutions migrated along high angle fractures into volcanic rocks and sediments. The fluids then moved laterally through the permeable sediments cooling and depositing cinnabar, pyrite, stibnite, and silica. Part of the cinnabar later altered to corderoite in the more acidic, oxidizing surface conditions. Minor amounts of kleinite, calomel, native mercury, and schuetteite have been identified. Several of the mercury minerals are unique in that they are light sensitive and darken on exposure to sunlight. The ore mined consists of approximately 2/3 cinnabar and 1/3 corderoite with minor contributions from the other mercury minerals.