

## OPALITE (CORDERO) DISTRICT

## LOCATION

The Opalite mining district is located on the north central border of Humboldt County and extends north into southern Malheur County, Oregon. The Nevada portion of the district is centered about 15 miles west of the town of McDermitt near the head of the Quinn River Valley.

## HISTORY

The Opalite is mainly a mercury-producing district. Cinnabar was discovered in 1917 at the Bretz deposit in Oregon, just north of the Nevada border. The Opalite Mine, which gave the district its name, was discovered near the Bretz in 1924. These two properties produced mercury intermittently over the years between 1926 and the late 1960's. The first discovery in the Nevada portion of the district was made in 1924 by Tomas Alcorta of McDermitt. This discovery, the Cordero Mine, became the major producer in the district and, by 1941, was the largest producer of mercury in Nevada. Between its discovery and the time the district ceased production in 1970, the Cordero and its smaller neighbors in the Nevada part of the district produced over 115,000 flasks of mercury (Roper, 1976). Underground mining ceased in the district with the closure of the Cordero Mine and the dissolution of the Cordero Mining Co. Exploration in the district continued, however, and in the early 1970's, Placer Amex, Inc., announced the discovery of a new, near-surface blanket-like mercury ore body with reserves of approximately 3,000,000 tons of 10 lb/ton mercury ore. At the present time this operation, the McDermitt Mine, is the largest, and only, mercury mine in production in the United States, and its production will far outweigh any of the older properties in the Opalite district.

## GEOLOGIC SETTING

According to Rytuba (1976), the Opalite district is within the McDermitt caldera, a volcanic collapse structure of Miocene age which lies along the Nevada-Oregon border. The collapse structure is oval-shaped with a diameter of 28 miles in a northerly direction and 22 miles in an easterly direction. The northern margin of the caldera corresponds to the southeastern scarp of the Trout Creek mountains in Oregon and the southern margin of the caldera is defined by the northern, easterly-trending scarp of the Double H Mountains in Nevada. The eastern caldera margin is modified by Basin and Range faulting and is projected to extend along the western side of the Quinn River Valley. The western margin of the caldera is defined by several coalescing rhyolite domes that have been emplaced along a north-striking fault zone. Within the caldera are several arcuate fault zones which may define one or more smaller calderas nested within the larger McDermitt caldera (Rytuba, 1976).

The Tertiary volcanic rocks in the McDermitt area consist of early Miocene basalt and andesite flows and late Miocene rhyolite ash-flow tuffs associated with the McDermitt caldera. The flows rest unconformably on



granitic rocks of Cretaceous age and range in age from 24 to 18 m.y. After eruption of the ash-flow tuffs and formation of the caldera, resurgence of the central portion occurred so that at present the maximum elevation of the resurgent dome is slightly greater than the caldera rim. Rhyolite domes were emplaced along the western and northern ring fracture zones, and tuffaceous lake sediments and rhyolite flows and tuffs were deposited within the caldera. The last stage of volcanic activity resulted in the intrusion of rhyolite domes within the central resurgent dome of the caldera (Rytuba, 1976).

## ORE DEPOSITS

The mercury mines of the Opalite district are in the northern part of the McDermitt caldera, the Opalite and Bretz mines are adjacent to the northern ring fracture zone; the Cordero, McDermitt, and Ruja mines are adjacent to a normal fault that may define a smaller collapse structure nested within the larger McDermitt caldera. The Bretz, McDermitt, and Ruja ore bodies occur in lake-bed sediments, those of the Cordero and Ruja occur in volcanic rocks. Ore bodies in lake beds are generally conformable to the strata, the ore bodies in volcanic rocks occur along faults. Cinnabar is the dominant ore mineral in all mines, but at the McDermitt Mine, corderoite (a mercury chloride) comprises about a third of the ore (Roper, 1976). Marcasite and pyrite are present in ore bodies in volcanic rocks while iron oxides predominate in lake-bed ore bodies. Nearly complete silicification of the lake beds and volcanic rocks has locally occurred to form a rock termed "opalite" (Yates, 1942). Opalite is commonly developed along and adjacent to faults, along certain lake-bed strata, and within conglomerate and talus deposits near the caldera margins. It is the host for the mercury ore bodies at Opalite and for some of the ore at Cordero. At the McDermitt Mine, opalite is present near the ore bodies, but the ore primarily occurs in the unsilicified, argillically altered sediments.

Other mines associated with the McDermitt caldera and within the Opalite district include the Moonlight uranium mine on the western side of the Trout Creek Mountains south of Disaster Peak, and small mercury prospects to the north of the Moonlight, near the base of Disaster Peak. The Moonlight deposit and others nearby are associated with rhyolite domes intruded along the southwestern ring fracture zone of the caldera. The uranium ore, in the form of pitchblend and autunite, is localized along a breccia zone that parallels flow foliation planes within the dome. Gangue minerals are quartz, fluorite, and pyrite (Rytuba, 1976).

The ore deposits of the Opalite district were not visited during this project. The district is described in detail in Yates (1942), Bailey and Phoenix (1944), Willden (1964), Roper (1976), and Rytuba (1976). These works should be consulted for detailed descriptions of the ore deposits.

## SELECTED REFERENCES

- Bailey, E. H., and Phoenix, D. A. (1944) Quicksilver Deposits of Nevada: NBMG Bull. 41.

McKee, E. H. (1976) Origin of the McDermitt Caldera in Nevada and Oregon and Related Mercury Deposits: AIME Preprint 76-S-83.

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Willden, R. (1964) Geology and Mineral Deposits of Humboldt County, Nevada: NBMG Bull. 59.

Yates, R. G. (1942) Quicksilver Deposits of the Opalite District, Malheur County, Oregon, and Humboldt County, Nevada: USGS Bull. 931-N.