UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SHEET 1

STRATEGIC MINERALS INVESTIGATIONS
PRELIMINARY MAP

FIGURE 1—INDEX MAP OF NORTHERN CALIFORNIA SHOWING LOCATION OF TUNGSTEN DEPOSITS NEAR DOROTHY LAKE

TUNGSTEN DEPOSITS NEAR DOROTHY LAKE, YOSEMITE NATIONAL PARK, TUOLUMNE COUNTY, CALIFORNIA

Deposits of scheelite (calcium tungstate) were discovered in 1941 near Dorothy Lake, Tuolumne County, Calif., within the boundaries of Yosemite National Park (fig. 1). These deposits were examined for the Geological Survey, United States Department of the Interior, in July and August 1942 by Dwight M. Lemmon and Paul C. Bateman, with the assistance of Howard Stagner and M. E. Beatty of the National Park Service. Officials of the Park Service made all arrangements for the examination and Messrs. Stagner and Beatty collaborated both in the field work and in the preparation of the resulting report.

Dorothy Lake is in sec. 20, T. 4 N., R. 22, E., Mt. Diablo Base and Meridian, barely within the northernmost projection of the boundary of Yosemite National Park. It may be reached by several trails from Yosemite Village, the shortest route being 26 miles from the road at Miguel Meadow near Hetch Hetchy, or by two trails from the Sonora Pass road, 10 miles due north. Altitudes in the immediate vicinity of Dorothy Lake range from 9,000 to 11,000 feet, and winter snowfall is heavy.

The deposits were being developed in the summer of 1943 by an agent of the Metals Reserve Company, under an agreement between the Company and the National Park Service.

In the Dorothy Lake region granodiorite and a younger granite have invaded metamorphic rocks of sedimentary origin, which comprise quartzite, schist, hornfels, and marble. Numerous granite sills are intercalated with the metamorphic rocks. The region has been glaciated and the valleys contain a veneer of glacial till.

The metamorphic rocks constitute three large, elongate bodies, separated by granodiorite containing many isolated, smaller masses of metamorphic rocks. The scheelite is irregularly disseminated in tactite, a garnet-epidote rock formed by alteration of limestone. Four limestone beds, partially altered to tactite, were observed in the area. These beds vary in thickness from 5 to 200 feet along the strike, the changes being so marked as to give the beds a lenticular appearance.

Ore bodies were examined at two prospects, the Dorothy No. 1 and the Dorothy.

The Dorothy No. 1 prospect, the most promising in the area, is a quarter of a mile southwest of Dorothy Lake and 360 feet northwest of Cave Creek, which drains the lake. It is on the northwest edge of a roughly circular mass of complexly folded and squeezed sedimentary rocks, which have been strongly altered by the injection of granodiorite. A rich streak of scheelite ore, 6 feet wide and 60 feet long, is enclosed in a lenticular mass of tactite 73 feet long and 25 feet in greatest width (fig. 2). Forty feet north of this body and separated from it by an area of schist, there is a second, smaller body of tactite that is lower in scheelite content.

The tactite contains scheelite crystals ranging in diameter from one-quarter inch to 2 inches. The tungstic oxide (WO_3) content of the tactite is estimated to range from 1 percent to 30 percent, and that of the rich streak to average 10 percent.

Exposures are sufficient to permit limiting the possible scheelite-bearing areas to those shown in fig. 2, but they do not indicate clearly the attitude of the principal ore body. Traces of vertical banding in the scheelite, however, suggest that the ore body may be approximately vertical. The ore probably extends to a depth of at least 10 feet beneath the surface, possibly to a depth of 50 feet, but the absence of bedding and the obscurity of the contacts make it difficult to estimate the depth. Three factors may limit the downward extent of the ore: (1) squeezing out of the limestone bed by the intense folding that preceded metamorphism; (2) decrease in the tungsten content of the bed; (3) cutting off of the tactite bed by granodiorite.

The Dorothy prospect extends across Cave Creek about half a mile southwest of Dorothy Lake. The creek cuts across a partly exposed mass of schist and hornfels which have a northwesterly strike and dip steeply southwestward. These rocks are overlain by marble and surrounded by granodiorite. Glacial till partly conceals the contacts with granodiorite. The creek flows underground for most of the distance across the marble belt, coming to the surface where it reaches the hornfels. The maximum depth of the underground channels beneath the surface is limited to 25 feet by the water table, and their positions are determined by bedding and jointing. Abandoned channels are represented by dry caves.

A tactite bed 6 feet thick extends along the contact between schist and marble where the stream first reaches the contact (fig. 3). In the southern part of the area of outcrops, this tactite is separated from the schist by a sill of granodiorite. Most of the tactite bed is barren, but on its western edge, along its contact with the marble, there is a narrow streak of tungsten ore that ranges from 0.5 to 1.5 percent in WO_3 content. The streak extends 380 feet to the south and is exposed wherever the tactite crops out, but, as its maximum width is only 6 inches, it is too narrow to be of commercial value.

A second narrow streak of scheelite-bearing rock is exposed in a cave about 130 feet south of the creek and 10 feet west of the tactite bed. It appears to be plastered on the wall of the cave and to be separated from the other streak by barren rock that is probably marble.

Other prospects, northeast and southwest of Bond Pass, were examined, but the scheelite-bearing tactite bodies occurring in them are so small and so lean that they cannot be considered as commercially workable.

The Dorothy No. 1 prospect contains a small reserve of rich ore, which should be mined by open cut methods until it is proved that the deposit is sufficiently deep to warrant sinking a shaft. This ore is of sufficiently high grade to bear the expense of packing it out to the north on muleback. The lower grade ore in the prospect, however, would have to be concentrated in a small mill close to the deposit. The Dorothy prospect does not appear to contain any appreciable amount of commercial ore.

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