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Reno

Measurement of Mercury in Soil Gas:

An Aid to Mineral Exploration in Nevada

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science
in Geology

by

James Irvin Barnes
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of the basalt. Thus, although the few holes previously drilled through the basalt have been unproductive according to reports, additional probing by sampling for mercury on approximately 100-foot centers might be rewarding.

Study D.

Talapoosa Mine

Talapoosa District

Chief metal occurrence: Gold

Type: Epithermal gold

Sect. 3, T 18N, R 24E

Principal objective: Seek possible extension of concealed mineralized vein.

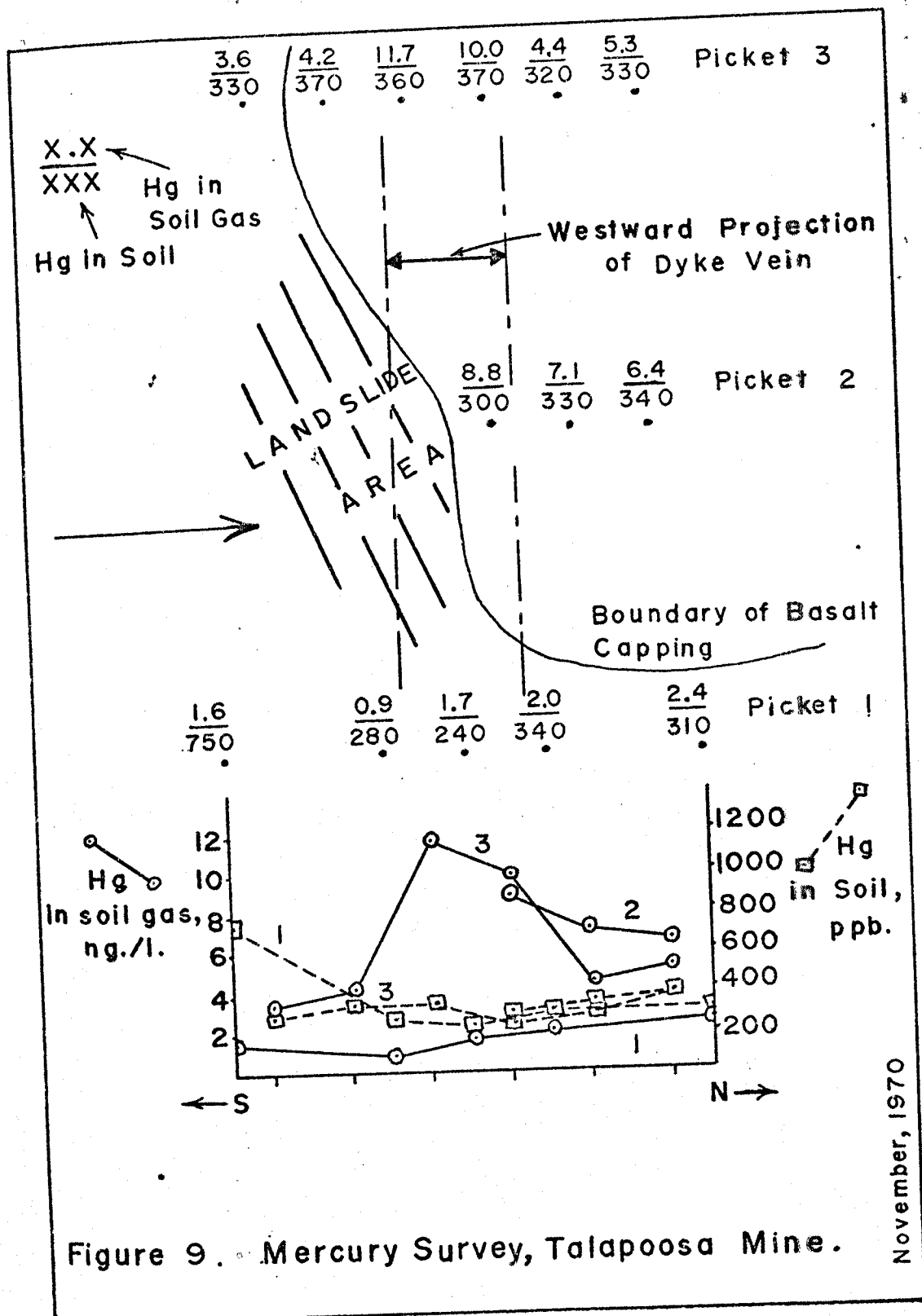
Subsidiary objective: Determine mercury level in tuff.

The Talapoosa mine is a more or less typical small epithermal gold mine located 4 miles northwest of Silver Springs, Lyon County. The country rock is Tertiary Hartford Hill rhyolite tuff, which has been cut by east-striking silicified dikes and capped by Pleistocene basalt flows (Moore, 1969, p. 24). The principal mine, which has produced about \$320,000 in gold, silver and copper, consists of two main levels of drifts and crosscuts which penetrate and follow one of the large dikes where it outcrops above the camp. Numerous deep pits, shafts and trenches visible along the eastward projection of this dike indicate that it was probably mineralized sporadically over much of its length in that direction, although a good deal of the dike has now eroded away.

About 200 feet west of the upper mine portal the dike passes under an extensive basalt capping. As noted, the mine itself also runs in this generally westerly direction. Ore grade had dropped off at the mine when mining ended in 1942, but there is a persistent idea that good gold values may recur farther west along the dike's continuation, which might have been displaced by intervening faults. Stakes still in place in the basalt attest to recent geophysical exploration. In addition, a large portion of the hillside that might have carried some ore was removed by prehistoric landsliding and now lies at the foot of the hill, where the ruined camp headquarters stands today.

The mercury study here was set up as a brief preliminary attempt to locate a concealed vein extension. Three picket-lines of sample points running north-south on 50-foot centers were set up at distances of 100, 400 and 700 feet from the dike's easternmost outcrop on the hillside. The first picket-line was in the exposed tuff, while the two farther west were in residual basaltic soil. The picket-lines were centered on the presumed original dike extension, except No. 2 which was abbreviated because a large part of the hillside to the south had been removed in the landslide mentioned above.

The test data are shown in Figure 9. Soil samples throughout the survey show only normal mercury values typical of western Nevada volcanics (240-370 ppb), except



for one sample from a spot near a mine dump, which analyzed 750 ppb. Background mercury level in the Hartford Hill rhyolite tuff is indicated to be in the range of 240-340 ppb in soils and 2 ng./liter in soil gas.

In the soil gas part of the survey, the samples from the easternmost line gave very low values ranging from 0.9 to 2.4 ng./liter. The meaning of these low values is not clear. The westernmost group of samples exhibited good mercury peaking, with values of 10.0 and 11.7 ng./l. at the center of the spread. The middle group, consisting of but three samples, gave substantial concentrations increasing from north to south, up to the edge of the basalt capping. These readings, taken together, although too few to define a convincing pattern are consistent with the idea of partial removal of the dike by landslide, with the concealed dike continuing again west of the slide area, displaced laterally by no more than 50 feet by faulting, if at all. Possible vertical displacement is unknown.

The mercury values say nothing definite about presence of gold in the dike continuation.