suggests that they date back at least to World War II, but there also are large cuts both here and across the canyon where more recent drilling has been done. Presumably this drilling did not find commercial ore. In any event, the mineralized area, both here and at other workings visible to the south, has been thoroughly prospected. In view of this fact and the fact that tungsten is the metal, no further work seems justified in this immediate area.

No. 13. Dry Hills area. Some of the Garvey lands on the lower west slope of the Osgood Range lie in an area of Tertiary volcanic rocks in the west central part of T. 38 N., R. 41 E. This block of ground is called "Dry Hills" on some maps. In view of the probable presence of strong faults bounding and probably cutting this block, as well as the adjoining Paleozoic sedimentary rocks, a fairly thorough inspection was made by working off old ranch roads. No signs of any zones of alteration or mineralization were found.

(127)

No. 14. Central Hot Springs Range. The geologic map shows two small igneous intrusions in the southeast part of T. 39 N., R. 40 E., on or near the crest of the Hot Springs Range. As some such bodies are loci for mineralization, these were checked. A badly washed desert road leads from the Eden Valley road to a point near Willow Spring on the middle east slope of the range. From here I climbed on foot to the crest of the range and examined an area of about two square miles.

Paleozoic sedimentary rocks occupy most of the area. They include extensive beds of hard, fine-grained, light brown quartzite,

and smaller amounts of drab to purple fissile shale and thick-bedded bluish gray limestone. Structure in these rocks is obviously complex. There is no single large mass of intrusive igneous rock, but only scattered small dikes or sills. There is very little vein quartz, and little or no bleaching or similar evidence of mineralization - the entire area looks "lean and dry". Neither were any prospect diggings seen anywhere in this part of the range. No further work is warranted.

At Willow Spring a steep bank shows outcrops of iron-stained shale cut by quartz veinlets and small apophyses of igneous rock, all considerably altered. One sample of chips from the outcrops was taken, which proved negative on the assay.

Sample No.	Gold Oz./ton	Silver Oz./ton	Value per ton
G-WS-1	Trace	Nil	-----

(127) No. 15. Dutch Flat area. The Dutch Flat mining district is in the west central part of T. 38 N., R. 40 E., on the lower west flank of the Hot Springs Range. Placer gold and cinnabar were discovered here in 1893. The district has had a minor production of gold and silver from placer and underground operations, and a substantial production of quicksilver from the Dutch Flat mine, which is being reopened at the present time (June, 1969). Because of the presence of gold and silver it was thought that this general area might be favorable for broad geochemical prospecting for a large low-grade gold deposit, but it now appears that the gold and silver are largely restricted to one relatively narrow zone.

The Dutch Flat quicksilver mine is in a short little canyon or notch in the range front, which is bordered on the south by a high sharp ridge that extends northeastward into higher ground in the range. South of the ridge is Sodarisi Canyon, which extends far into the range to the northeast. In the lower part of Sodarisi Canyon a line of old workings extends northeastward from the canyon bottom up a spur ridge nearly to the top of the main ridge. The workings, consisting of a number of vertical or nearly vertical shafts and a few adits, were dug for gold and silver. Garvey lands lie immediately to the north and east and a little farther to the west and south.

The rocks in this part of Sodarisi Canyon are dominantly fine- to medium-grained feldspathic sandstone. Along the crest of the spur ridge these rocks are cut by a broad, nearly vertical shear zone or a series of subparallel normal faults that strike northeastward and dip steeply northwestward or southeastward. The country rocks along the faults are hydrothermally altered and bleached, and the zones also contain much white quartz, which occurs as irregular and discontinuous veins and veinlets in the altered and sheared rock. Minor amounts of pyrite and other sulphides also occur sporadically. Eight samples from the old dumps all show small amounts of gold & silver.

Sample No.	Gold Oz./ton	Silver Oz./ton	Value per ton
G-DF-1	0.005	1.25	$2.47
G-DF-2	0.02	3.72	7.56
G-DF-3	0.01	1.22	2.63
G-DF-4	0.02	3.51	7.18
G-DF-5	0.015	6.27	11.94
G-DF-6	0.02	0.30	1.40
G-DF-7	0.01	0.23	0.84
G-DF-8	0.005	0.15	0.49

Gold @ $43.00/oz. Silver @ $1.80/oz.

Sample G-DF-1, chips and fines from big dump in canyon bottom below ranch reservoir.

Sample G-DF-2, chips and fines, much quartz, from westernmost of three high dumps where spur ridge branches off main ridge.

Sample G-DF-3, chips and fines, middle one of three high dumps, 50 feet east of DF-2, same structure.

Sample G-DF-4, chips and fines, much quartz, from lower of two adjoining dumps high on spur. Vertical shaft in shear zone.

Sample G-DF-5, chips and fines, abundant quartz, from dump of vertical shaft 40 feet S.W. of DF-4 shaft.

Sample G-DF-6, chips and fines, much less quartz, from dump of deep shaft on crest of spur ridge, about 200 feet down to S.W. from DF-5, fault N. 40° E., 70° S.E.

Sample G-DF-7, chips and fines, from dump of old adit on fault N. 39° E., 75° N.W. Minor vein quartz in altered & bleached sandstone, about 200 feet N. 67° E. from DF-1, above canyon bottom.

Sample G-DF-8, chips and fines, from dump of adit in canyon bottom about half a mile below DF-1, in light gray igneous rock, no true vein.

In conjunction with the above sampling I covered a large surrounding area on foot, including climbing several of the high ridges, and found no evidence of alteration or mineralization. It appears that the area of the Dutch Flat mine and associated quicksilver prospects, and the gold-silver area in Sodarisi Canyon are the only mineralized localities in this vicinity. Presumably the Sodarisi Canyon zone supplied the placer gold that has been mined, although silver seems to be the dominant metal. This zone is much too narrow and low-grade for present day mining. In view of these facts and the general nature of the area, it appears that no further work is warranted in the Dutch Flat district.

(127) No. 16. Last Chance area. An excellent road now leads from the Eden Valley road to a microwave station on the crest of the Hot Springs Range near the bench mark in the east central part of Sec. 21, T. 38 N., R. 40 E. The Last Chance quicksilver prospect is on the upper west slope of the range not far below this locality. I scouted along this road to the crest but found nothing of possible economic interest. The rocks at the crest are thin-bedded purple clay shale and massive drab sandstone. One sample of gouge and associated white quartz from a minor fault in sandstone near the crest of the range gave negative assay results.

Sample No.	Gold Oz./ton	Silver Oz./ton	Value per ton
G-LC-1.	Trace	0.03	$0.05

Silver @ $1.56/oz.

(127) No. 17. Front faults, Hot Springs Range. The geologic map shows two major faults or parts of a single fault separating Paleozoic sedimentary rocks from Tertiary volcanic rocks along the lower east slope of the Hot Springs Range in the east part of T. 38 N., R. 40 E. These faults were scouted for possible evidence of alteration or mineralization, but none was found.

(127) No. 18. Red Devil area. The area of the Red Devil and other quicksilver prospects at the extreme south end of the Hot Springs Range was examined to check geology and intensity of mineralization and possible presence of other minerals. The rocks are interbedded feldspathis sandstone, silty shale, and drab fissile shale. The quicksilver workings comprise a couple of shallow shafts and one adit. There is considerable alteration, but apparently very little cinnabar.

About 1000 feet to the east and across a deep gulch there is a partly caved old inclined shaft sunk on a 1-foot wide vein of milky white quartz. The vein strikes about due east and dips 60° north. The quartz looks very lean, and no sulphide minerals were seen. There appears to be nothing of interest in this district.

(128) No. 19. Southern Osgood Range. The central part of this large block of Tertiary volcanic rocks at the south end of the Osgood Range was scouted for signs of hydrothermal alteration that might indicate mineralization. A poor road leads to the base of the range, whence I climbed on foot to the crest and traversed several of the high ridges, from which large areas of the block could be seen. The rocks are essentially all fresh, scoriaceous basalt or andesite, with a few beds of coarse tuff at different elevations. No significant color changes were noted such as might indicate zones of alteration.

(141) No. 20 and No. 21. Bloody Run Hills. The Bloody Run Hills, a southern extension of the Santa Rosa Range, include two fairly large intrusive stocks that cut clastic rocks of Jurassic age. The intrusive rock is very light gray, medium- to coarse-grained granodiorite or quartz monzonite. The sedimentary rocks are phyllite, slate, and fine-grained quartzite.

The Garvey lands include extensive holdings in and around these hills. Examinations were made of the central part and some of the north contact zone of the south stock (No. 20), and of part of the south contact zone and adjoining areas of the north stock (No. 21). The latter area includes the Basque "mine", a minor gold and silver