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GEOLOGY AND MINERAL DEPOSITS OF CHURCHILL COUNTY, NEVADA

(Prepared Cooperatively by the United States Geological Survey)

By

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1936	222		4,081		1,570	294	[illegible]
1937	230		2,706			294	10,143
1938	73		385			66	[illegible]
1939	297		3,710			881	12,913
1940	1,139		14,012			3,415	49,829
1941	511		5,348			1,872	21,688
1942	270		2,513			896	11,232
1943	66		491			60	2,659
1944[1]							
1945[1]							
1946	177		1,620		14,000	211	9,030
1947	23		829			186	1,555
1948	56		455			98	2,372
1949	71	$2,485	426	$386		135	2,671
1950	22		592		3,800	67	1,819
1951	16	560	13	12		20	572
1952	28		379			37	1,323
1953	2		7			14	76
1954	11		51			60	431
1955	16		30			44	587
1956	6		26			35	234
1957	2		5			5	75
Total	3,247		38,152			8,724	$143,881

[1]Not disclosed.

Eastgate District

The Eastgate district is a large, poorly defined district that includes most of that part of the south half of the Desatoya Mountains that lies in Churchill County. The date of the earliest discovery of mineral in the district is not known, but the deposits at the west base of the Desatoya Mountains east of the Pony Express station could have been discovered while the station was in use. Building stone was quarried from a deposit of tuff about 3 miles west of Eastgate in the 1860's (Vanderburg, 1940, p. 23). Production from the district during the period from 1935 to 1957 (table 15) amounted to $143,881 from 8,724 tons of ore that had a silver-to-gold ratio of about 11 to 1.

Geology and Ore Deposits

The Desatoya Mountains are made up largely of volcanic rocks of early Miocene to probable early Pliocene age. Sedimentary deposits of Miocene age consisting largely of tuffaceous and diatomaceous shale and pebbly mudstone are exposed along Buffalo Canyon. Pre-Tertiary rocks consisting of coarse-grained quartz monzonite which is intrusive into a complex of metavolcanic rocks are exposed at two places south of Carroll Summit. The metavolcanic rocks are cut by dikes of biotite quartz diorite. High-angle faults displace all these rocks, and an earlier period of compressive deformation is shown by folds in the Miocene deposits and a reverse fault south of Eastgate.

The district contains several silver-gold deposits, which occur as quartz veins in altered rhyolitic rocks or as irregular disseminations in the altered and silicified rhyolite, and one small deposit of iron ore. A small deposit of manganese that cements a gravel-capping on Miocene sedimentary rock has been almost completely mined out. A lignite deposit has been investigated as a possible source of uranium (Staatz and Bauer, 1954), and a rather poor quality building stone has been obtained from water-laid tuff deposits to the west of the range (Vanderburg, 1940, p. 23). The diatomaceous shale deposits have been prospected in several places, but their impurity and the considerable distance from shipping points have prevented their development.

Buffalo Hump mine. The Buffalo Hump mine is on the crest of the ridge west of Buffalo Canyon road, about 1 mile north of the boundary between Churchill and Lander Counties. The workings are in altered rhyolite lithic tuff and consist of one inclined shaft, adits at several levels, and raises and winzes that connect some of the level workings. Only a small amount of stoping has been done in the part of the mine visited, but some of the material removed

EXPLANATION

Shaft at surface

Raize or foot of winze; chevrons pointing downward indicate inclined workings

0 25 5

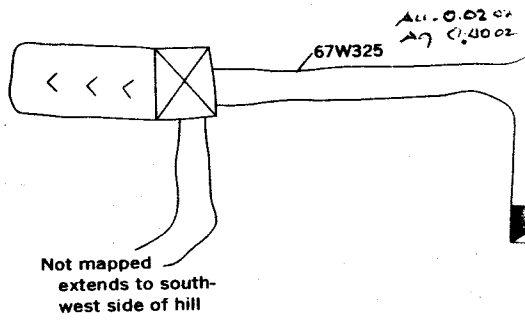

FIGURE 16. Brunton-pace sketch ma

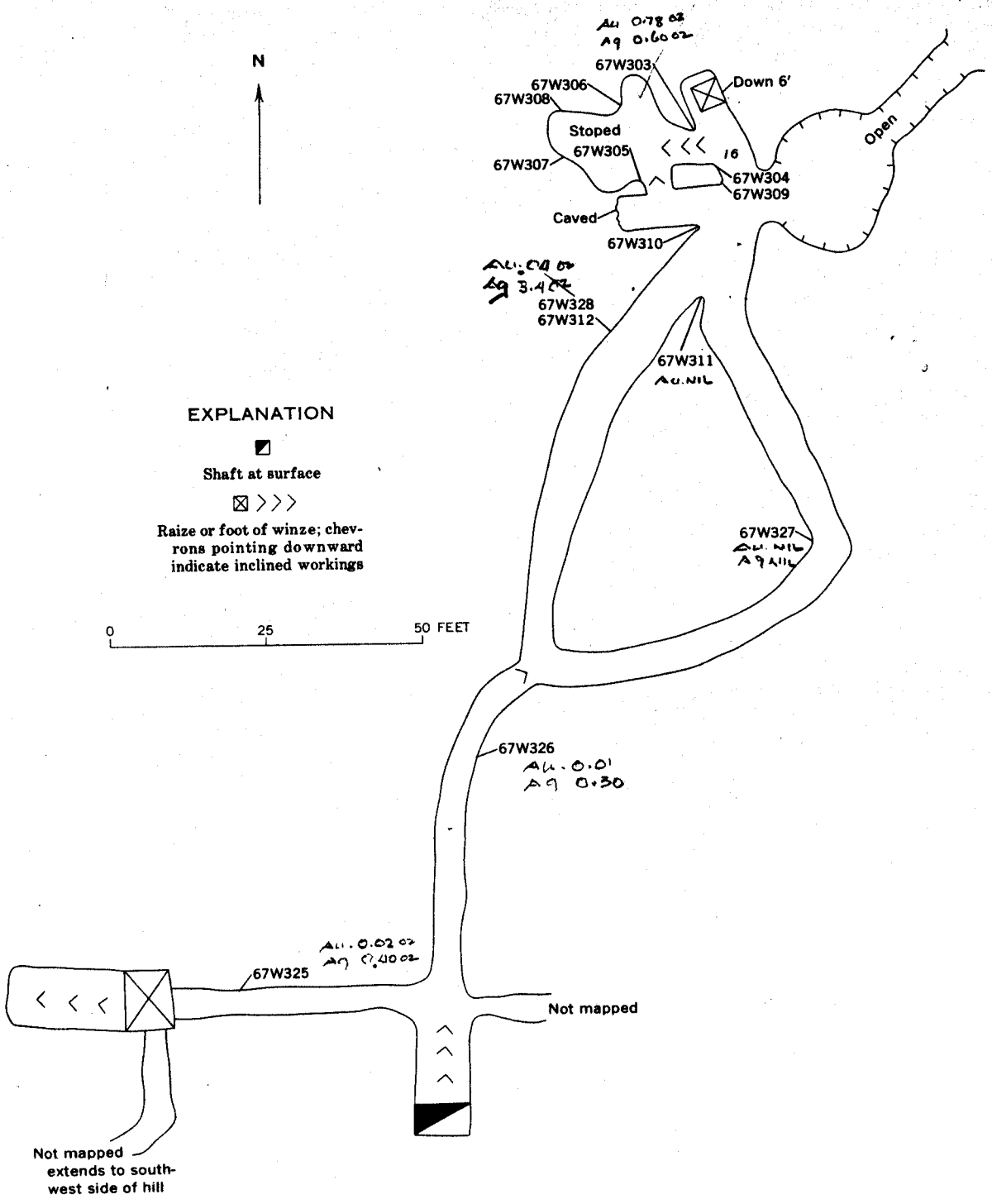

FIGURE 16. Brunton-pace sketch map of part of workings of Buffalo Hump mine showing sample locations.

TABLE 16. Gold and silver content of samples from Buffalo Hump mine.

[Samples 67W303-67W312 determined in laboratories of U.S. Geological Survey: samples 67W325-67W331 and 67W303 determined by fire assay by Colorado Assaying Co. Geological Survey determinations for gold by cold extraction and atomic absorption methods by E. Martinez, and by fire assay (supplemented by atomic absorption) by W. D. Goss and C. Huffman, Jr. Silver determined by rapid 6-step spectrographic analysis by J. C. Hamilton]

Sample number[1]	Sample width	Gold content (in parts per million[2])		Silver content (in parts per million)
		Cold methods	Fire Assay[3]	
	Ft. In.			
67W303	4	28.92	20.0	30
67W304	18	33.15	35.4	15
67W305	16	22.90	18.8	100
67W306	18	1.70	—	200
67W307	12	8.32	5.3	200
67W308	12	1.57	—	70
67W309	2	21.55	22.9	15
67W310	2½	0.16	—	15
67W311	18	0.32	—	15
67W312	18	34.95	44.0	500

		Gold content		Silver content	
		Ounces per ton	Value[4]	Ounces per ton	Value[4]
	Ft. In.				
67W303	4	0.78	$27.30	0.60	$1.08
67W325	6	0.02	.70	0.40	.72
67W326	6	0.01	.35	0.30	.54
67W327	6	None		None	
67W328	6	0.04	1.40	3.40	6.12
67W329	Grab	0.08	2.80	0.20	.36
67W330	Grab	0.05	1.75	1.00	1.80
67W331	Grab	None		0.10	.18

[1]Sample locations shown on figure 16 except for samples 67W329-67W331, which are composite grab samples from dumps.
[2]One part per million gold is approximately equivalent to $1.00 per ton.
[3]Those samples with no values reported by fire assay were not analyzed by that method.
[4]Based on silver price of $1.80 per ounce and a gold price of $35.00 per ounce.

in driving the workings may have been shipped. Vanderburg (1940, p. 21-22) reported that several carloads of ore had been shipped from the property. One shipment had a net value of about $15.00 per ton based on a silver content of 5½ ounces per ton at $0.4475 per ounce and a gold content of 0.515 ounces per ton.

Ore occurs in northeast-trending, gently northwest-dipping kaolinized and iron-stained zones in the rhyolite tuff. Some of the tuff has been silicified, but the silicification appears to have been early and not structurally related to the later alteration.

Three samples of the kaolinized iron-stained rhyolite tuff were collected from this mine on the first visit. A gold content of 854 ppm was reported for one of these samples, so the mine was revisited, partially mapped, and more samples were collected. The resampling did not confirm the high gold content, but it did show appreciable amounts of gold and silver at places in the mine. Sample locations are shown on figure 16, and the analytical results are shown in table 16. No attempt has been made to calculate the grade of ore in the mine because the samples are more in the nature of chip samples than channel samples. But an unweighted average of those samples assayed by Colorado Assaying Co. is about $7.00 per ton in combined gold and silver. If this value could be confirmed for the entire mine area, the deposit might be profitably mined by open-pit methods.

Gold Ledge mine. The Gold Ledge mine is in a steep westward-draining canyon in the west spur of the Desatoya Mountains, about 3 miles south of Eastgate (about 5 miles by road). Vanderburg (1940, p. 20) reported the property was located in 1906 and has been worked intermittently by various individuals and companies and had shipped about $20,000 worth of ore by the time of his visit.

The mine is developed by a main adit level several hundred feet long, an inclined shaft from the surface that extends an undetermined distance below the main adit level, crosscuts from the main level to other structures and drifts along these structures, and a vertical shaft. The total extent of the workings was not determined but certainly exceeds the 1,500 feet developed at the time of Vanderburg's (1940, p. 20) visit.

The main adit level explores a shear zone in a rhyodacite tuff. The zone strikes N. 26° E. and dips 66° SE. and is occupied in places by a quartz vein that is generally brecciated and is from 1 to 6 feet wide. Parallel veins are present about 50 feet east and 80 feet east of the vein on the main adit. These two veins are only locally brecciated and generally narrower, up to about 3 feet wide.

The ore from one shipment was reported by Vanderburg (1940, p. 21) to contain 0.91 ounces gold, 13.44 ounces silver, and 2.0 percent lead per ton. A sample of brecciated quartz collected from the main vein as part of this study was found to contain 16 ppm gold, 70 ppm silver, and virtually no lead. A sample from the vein 50 feet to the east contained 2.5 ppm gold and 10 ppm silver.

Gold Trail group. The Gold Trail group is on the west flank of the Desatoya Mountains about 2 miles west of the east boundary of Churchill County in sec. 36 (projected), T. 16 N., R. 37 E. It can be reached by way of a road extending about 2 miles east from the Buffalo Canyon road to a Weather Bureau remote station and then by a jeep trail eastward and northward to the property. It is held by location by Fred and Cleo Erb of Fallon.

The property is developed by several inclined shafts, some trenches, and a number of shallow pits. The southernmost shaft, which is caved shut, is located on a large westward-dipping normal fault that brings quartz monzonite on the east into contact with somewhat altered and locally iron-stained sedimentary deposits of Miocene age. The next shaft to the north is in the quartz monzonite a short distance to the east of the fault, and the northern-most shaft is wholly in the sediments to the west of the fault.

The deposits are tuffaceous shale and volcanic-debris sandstone, some of which is pebbly. Near the large fault the sediments dip northwest at 20° to 35°; farther west the dip is to the east. Alteration of the sediments is most prevalent near the fault but is not intense anywhere. Clay minerals and sericite are developed in the tuffaceous beds, and small clasts of volcanic rocks in the sandstone beds show alteration of their feldspar to clay.

Aplite and pegmatitic aplite dikes are common in the quartz monzonite, and there are some thin quartz veins. Shallow prospect pits have been dug on the veins and on some high-quartz pegmatite pods.

Other deposits. The rhyodacite tuffs exposed on the low hill at the west base of the Desatoya Mountains east of the Pony Express station contain silicified zones that have been explored by a number of shafts and adits. All the workings are shallow, and there is no record of any production from these prospects. But one sample of silicified tuff from a shallow inclined shaft on the southeast side of the hill near its crest contained 16 ppm gold and 100 ppm silver. Quartz veinlets in the silicified tuff at this locality contained only 1.1 ppm gold and 7 ppm silver.

A small deposit of magnetite-hematite ore is exposed by bulldozer trenches on the west slope of the Desatoya Mountains about 2 miles south of Carroll Summit. The iron occurs in the metavolcanic rocks near contacts with a biotite quartz diorite.

A deposit of manganese is exposed beside the road that extends from the Buffalo Canyon road to the Weather Bureau remote station southwest of the Gold Trail group. The deposit is a poorly sorted gravel that is thoroughly impregnated with manganese oxides. The gravel formed a nearly horizontal capping on the Miocene deposits. Most of the deposit has been mined, but there is no record of the production or to what use it was put.

Some lignite beds in the Miocene section to the west of the Gold Trail group contain small amounts of uranium. The deposit has been described by Staatz and Bauer (1954, p. 76-77) as follows:

> "The lignite beds are composed of light-brown to black carbonaceous material, intermediate in character between peat and lignite. Most beds are underlain by light- to dark-gray clay. It is soft and porous, shows many imprints of leaves and bark, and has greenish-yellow-stained clay along some of the partings. Selenite is common on bedding planes in the lignite, but is not found in the surrounding sediments. The ash content of the lignite ranges from 59 to 75 percent. Five lignite beds were found in a section of sediments 10 feet thick. The No. 1, No. 2, and No. 4 beds are less than 0.3 feet thick, clayey, and of little economic interest. Bed No. 3 averages 0.6 feet in thickness, and the one sample taken contained 0.052 percent uranium in the lignite and 0.95 percent in the ash. Bed No. 5 averages 3.5 feet in thickness, and the uranium content ranges from 0.006 to 0.059 percent in the lignite and from 0.008 to 0.100 percent in the ash."

Fairview District

The Fairview district includes the area on both sides of Fairview Peak and extends from U. S. Highway 50 south to Crown Canyon. The district can be reached by roads extending south from U. S. Highway 50 on both sides of Fairview Peak. Crown Canyon is reached by a road extending east from Nevada Highway 31 about 8 miles south of U. S. Highway 50. Access to part of the western part of the district is restricted by the Bernard Navy bombing target area.

History and Production

The early history of the district was summarized by Vanderburg (1940, p. 23) as follows:

> "The first locations in the district were made by F. O. Norton and associates in 1905. The Nevada Hills mine was located by P. Langsden in January 1906. The discovery of rich silver-bearing float and ore in croppings created considerable excitement, and a boom ensued the following year, which gave the district a temporary population of several thousand. By 1907 the town of Fairview, laid out on the flat west of the mines, had a population of 1,000 and boasted two hotels, several restaurants, stores, and two newspapers. Daily stages and telephone lines connected Fairview with Fallon and Wonder, the latter being 18 miles north. During the first years of the camp's history, mining was in the hands of lessees and numerous wildcat companies, most of the latter being very short lived. Until 1911, all the ores produced were shipped to smelters for reduction, and in consequence only the higher-grade ores were mined. The freight rate on ore from Fairview to Fallon in 1907 was $12.50 per ton. In 1910 the Nevada Hills Mining Co., incorporated in 1906, acquired control of the Fairview Eagle Mines Co., a contiguous property, and the