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MEMORANDUM FOR:
Edward Wisser

January 19, 1966

Outline Geology
Broken Hills-Penelas Mine (Bruner Mine)
Mineral and Nye Counties, Nevada

ROCKS IN THE DISTRICT

Conrad Martin has used the volcanic stratigraphy as developed by Charles Vitaliano in his U.S.G.S. Map MF-255, Cenozoic Geology of the Ione Quadrangle, Nye County, Nevada". Oldest rocks of the district are the Mesozoic meta-sediments occurring near the old mining camp of Quartz Mtn. Overlying the Mesozoic basment rocks unconformably is a rhyolitic ignimbrite that is, according to Vitaliano, some 1500 feet thick. Resting unconformably on these [redacted] rhyolites is a latite with some andesite that is, according to Vitaliano, 2000 feet thick, The Esmeralda formation overlies the latites and andesites unconformably and Vitaliano estimates 4000 feet of tuffs and sandstones in this unit.

Martin splits out a unit from the Esmeralda which he calls the Penelas beds and which he thinks are the upper part of the Esmeralda formation. The Oddie rhyolites rest unconformably on the Esmeralda formation and Vitaliano estimates 1000 feet of rhyolite tuffs and rhyolite ignimbrites in this formation. The Toyabe quartz-latite rests unconformably on the Oddie formation and is composed of 2000 feet of rhyolites and rhyodacite tuffs and ignimbrites. Resting unconformably on the Toyabe quartz-latite is a unit called the upper division volcanics by Vitaliano. He estimates that this formation is 300 feet of andesites, trachyandesites and basaltic andesites.

At the northern end of the map, that portion which is labled "from Nevada Bureau of Mines, Mineral County Report: is taken from that map and according to the author, the rocks in this area correlate with the Oddie rhyolite and in part with the Toyabe quartz latite.

Martin correlates the earliest rhyolite tuffs and ignimbrites in this area with the so-called A-1 rhylite, the earliest rhyolite at Wonder and Alpine. Martin further correlates the next younger latite and andesite, [redacted] the so-called A-2 unit, at Wonder with the lower Esmeralda [redacted] in the Penelas-Broken Hills area. Thus the entire latite and andesite section ocaurring at Broken-Hills-Penelas is missing in the Wonder-Alpine area. I personally think a better correlation would be the Wonder A-2 unit with the Broken Hills-Penelas latite and andesite. Martin correlates his B unit of the Wonder-Alpine district, a purple-green latite and latite tuff, with the Toyabe quartz-latite of the Broken Hills-Penelas area, and I think this is probably a reasonable correlation.

In the Broken Hills-Penelas area we have once again the same situation that we have seen everywhere else. The earliest volcanics are acid tuffs and ignimbrites followed in time by more basic flows. Whether you call these units Hartford Hill, Lower Lower or A-1 unit, they all point to a rather violent initiation of volcanism in early Tertiary time throughout western Nevada, followd by a period of more quiet ejection of more basic lavas.

STRUCTURE

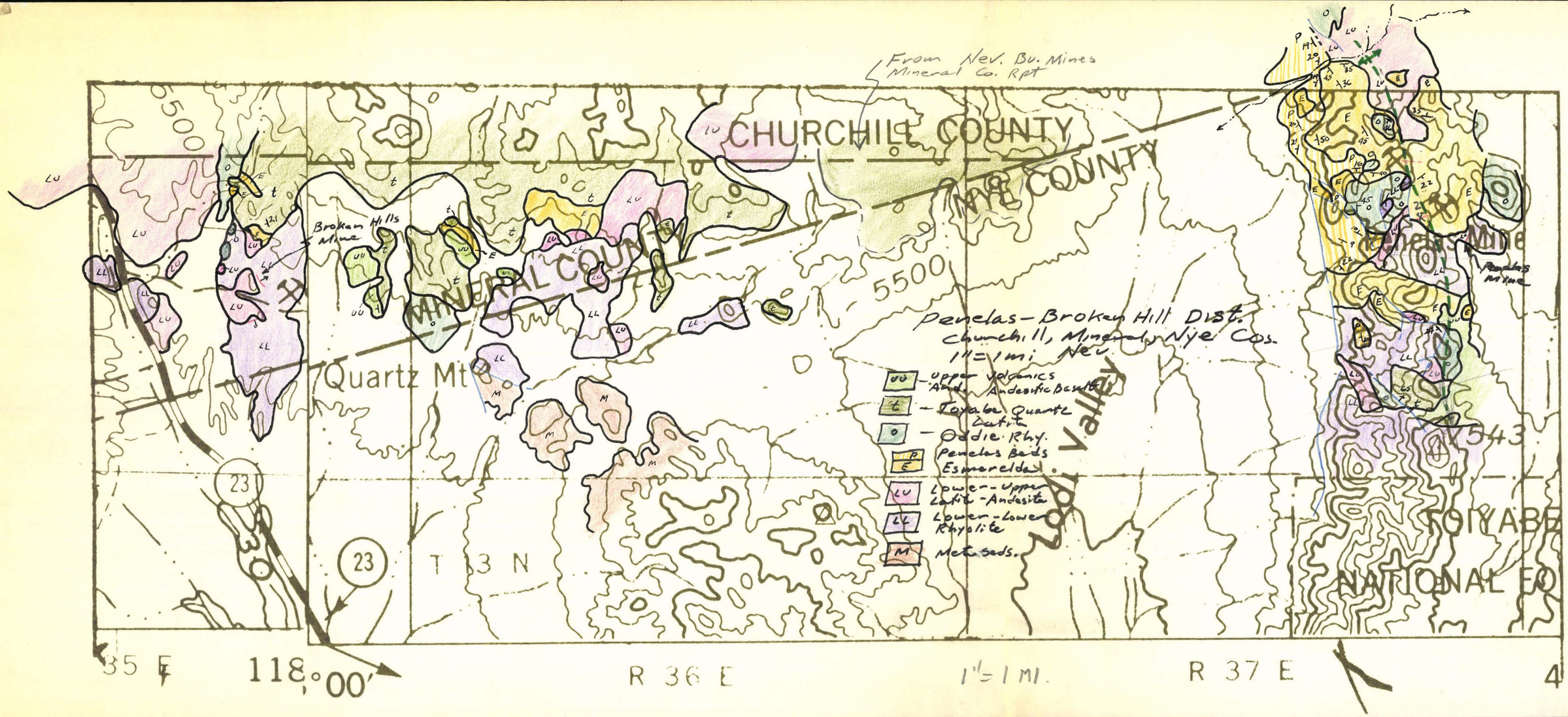
Martin maps almost no faults in the Broken Hills-Quartz Mtn. area. Martin alludes to an anticline trending northeasterly lying north of Quartz Mtn. Since the rocks are in general becoming younger to the north and since Martin has mapped so few bedding trends, I am not sure I see his anticline. At Penelas the dominant structure is the northerly trending Basin Range fault system and a northwesterly trending fault system which is probably earlier and may reflect structures as old as the Antler orogeny. Martin postulates an anticline trending north-northeast and centered just east of the top of the ridge at Penelas, as noted on the accompanying map. This anticline or dome is much more evident and I had no trouble visualizing it.

OREDEPOSITION

At Broken Hill what ores were mined came from the lower rhyolite. As you will recall, the main vein at Broken Hill is a northwesterly striking structure with a steep northeasterly dip. The vein proper is about 3 feet of gouge and rubble with very sparse vein quartz. There is some minor silicification of the walls along with rather extensive clay alteration flanking the veins.

At Penelas the only production of any consequence came from the Penelas mine as noted on the accompanying map. At the surface this vein is marked by a very pronounced silicified coxcomb. On the dumps, how ever, there is much clay altered rock which would seem to dindicate that some of theproduction came from unsilicified areas. The other prospects in the Penelas district are in the Esmeralda and are very insignificant. The prospect marked No.2 on the map is a shallow prospect shaft put down along the side of a short andesite dike. The vein material here appears to be about a foot of iron-stained and clay latered material.

E. H. Lindsey


From Nev. Bu. Mines Mineral Co. Rpt
CHURCHILL COUNTY
NYE COUNTY
MINERAL COUNTY
Broken Hills Mine
Quartz Mt
5500
Penelas-Broken Hill Dist.
Churchill, Mineral, Nye Cos.
1"=1mi Nev.
UU - Upper Volcanics And. Andesitic Basalt
t - Toyabe Quartz Latite
O - Oddie Rhy.
P E Penelas Beds Esmeralda
LU Lower-Upper Latite-Andesite
LL Lower-Lower Rhyolite
M Met. Seds.
Lodi Valley
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TOIYABE NATIONAL FO
23
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118°00'
R 36 E
1"=1 MI.
R 37 E
4

BRUNER, NYE CO. Millett sheet.

Sources: F.C.Lincoln,1923,161-162.

V.E.Kral,1951, Mineral Resources of Nye Co.,Nev. Univ.Nev. Bull.,Geol.& Mining Ser. No.50,26-28.

REGIONAL SETTING

Structure: Unknown.

Production Belts: In National-Mina high production belt.

Lithology: At S end of volcanic field. Relief low;volcanics do not rise in elevation much for 5 miles to the N.

LOCAL GEOLOGY

Country rock/Ore deposits Rhyolite, andesite. The 1000-ft. Penelas shaft did not penetrate the basement. Penelas mine only important producer. Ore in two veins cutting andesite and rhyolite;each about 5 ft.wide. old, silver, quartz gangue. Nine levels,100 ft.apart;most prouctive were the 600,700,800. No ore below 900. Main shoot about 150 ft.lomg.

Production:/(Penelas mine) Kral,$899,000,ave.grade,1936-1940 prices, $13 per ton. Bull.37 gives Brunertotal production as $1,549,000,average grade, 1926-1940 prices,$15.60 per ton.

CONCLUSIONS

Erosion has cut into the ore zone in this area of moderate relieve. However,the volcanic section is thick here,and apparently much thicker to the N. The districts seems worth a look.

BROKEN HILLS, MINERAL CO. Reno Sheet

Sources: F.C.Lincoln, 1923,2.

W.O.Vanderburg,1937, Reconn.of mining districts in Mineral Co.,22-24.

D.C.Ross,1961,Geology and mineral deposits of Mineral Co..Nev. Nev.Bur.Mines Bull.58,p.80 and Table 6.1.

REGIONAL SETTING

Structure: Unknown

Production Belts: In National-Mina high production belt.

Lithology: Probably toward N edge of volcanic field about 15 mi.N-S x 7 mi.E-W.

LOCAL GEOLOGY

Country Rock: Basalt
Tuff
Andesite (Nevada Bibliography, Geol.& Min.Series No.43).

ORE DEPOSITS

Two veins,strike N30W,dip steep W,width 18"-2 ft. Vein filling crushed andesite and minor qtz. Silver ore as rich as 100 oz/ton in bunches. Silver-lead ore in stockwork lenses in the andesite outside the vein. Production,about $90,000 (Ross). Bull.37, 180,000 in lead,silver, zinc,gold.

Considerable exploration: Broken Hills shaft 600' deep,Belmont, several hundred feet deep;6000 ft.of underground workings.

Elevation of camp about 6100';Monte Cristo Mts.to S rise to 6600'.

CONCLUSIONS

Higher elevations probably expose post-mineral basalt;but there may be fairly large areas of tuff exposed;tuff may be premineral,and although probably unfavorable for fracturing,it might exhibit a fracture pattern which could be priductive in the underlying andesite. Worth a visit.

BROKEN HILLS-ADDENDUM

Source: Unpublished report on the Carson Sink area, Nevada. F.C. Schrader. Field work, 1911-1920.

125. 22 miles E of Rawhide.

127. Elevation 5300'. Open, low hilly country.

Stratigraphic Section

Basalt 40'
Unconormity
White volcanic ash 40' Esmeralda formation?
Unconformity
Andesite breccia and uff 40' exposed. Total thickness over 350', but additional thickness can be only several hundred feet.

The highly altered andesite breccia and tuff has been intruded by younger andesite and basalt dikes.

128. The volcanic series is underlain by granite.

Ore Deposits: Silver -lead. There are 6 veins, to 2000' in length, to 9' in width. Walls are well defined but carry little or no gouge. Silicification is not marked. The veins do not crop out-they were found by cross trenching. The outcrops weather even with the surface, and appear merely as iron-stained zones.

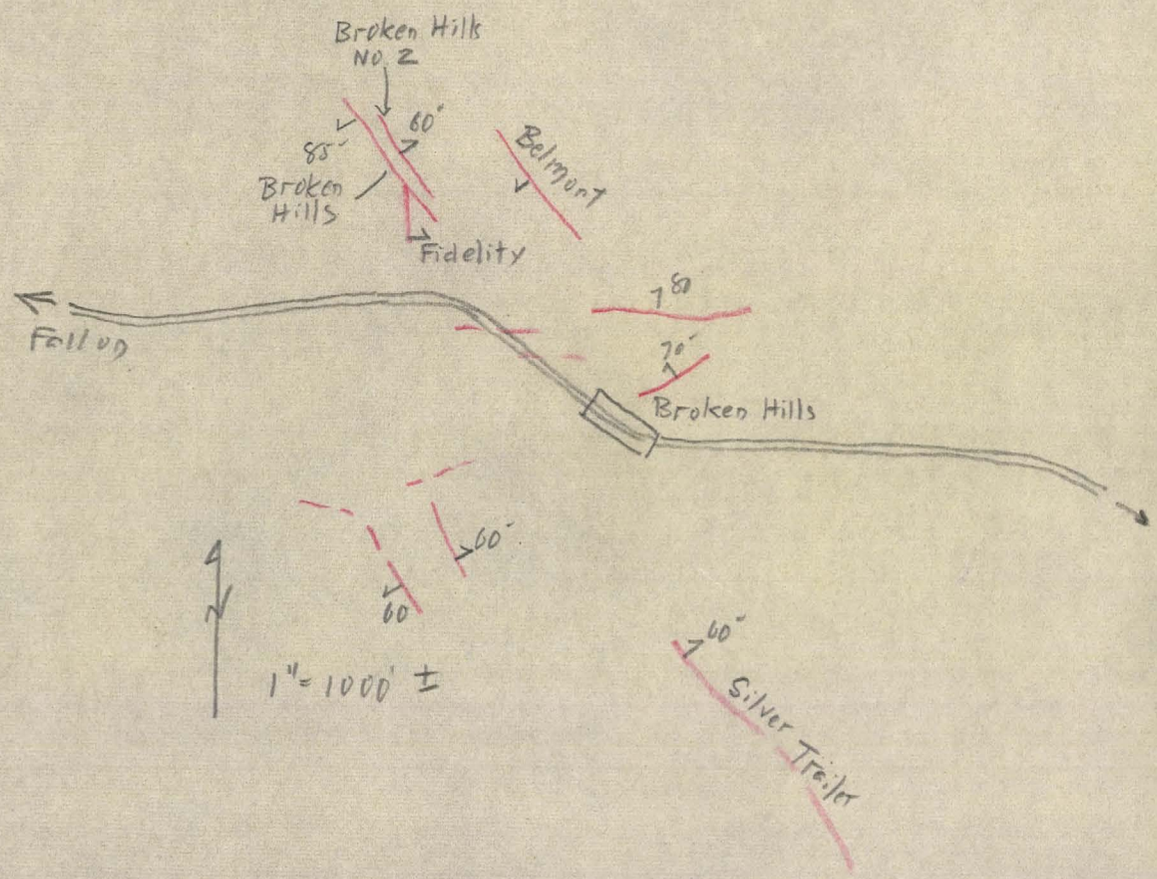
Main zone of mineralization 400' wide (Belmont-Broken Hills veins-see map).

129. Vains are mainly hydrothermally altered and kaolinized andesite breccia and tuff, plus sparse quartz. The ore minerals occur in the altered rock, and consist of hornsilver, argentite, stephanite, proustite, pyragyrite, wire silver, argentiferous galena, sphalerite, molybdenite, pyrite, chalcopyrite, hematite.

130. Broken Hills vein 2000' long (does not check map); average width 4'. Ore formed by replacement of the breccia.

CONCLUSIONS

If the present surface cuts the ore zone, the absence of strong veins with abundant promising gangue minerals is not encouraging; if the ore zone lies below the surface, the thinness of the volcanic series is especially discouraging: underlying granite is usually unfavorable for ore. The large extent of mine workings with the low production is also discouraging, as is the "low, hilly country" which would deny the presence of premineral rock above ore. I am inclined to write off Broken Hills.




BROKEN HILLS, NEV.

Fig. 48

70 EAST WILLIAMS, FALLON, NEVADA • 423-2194, AREA CODE 702

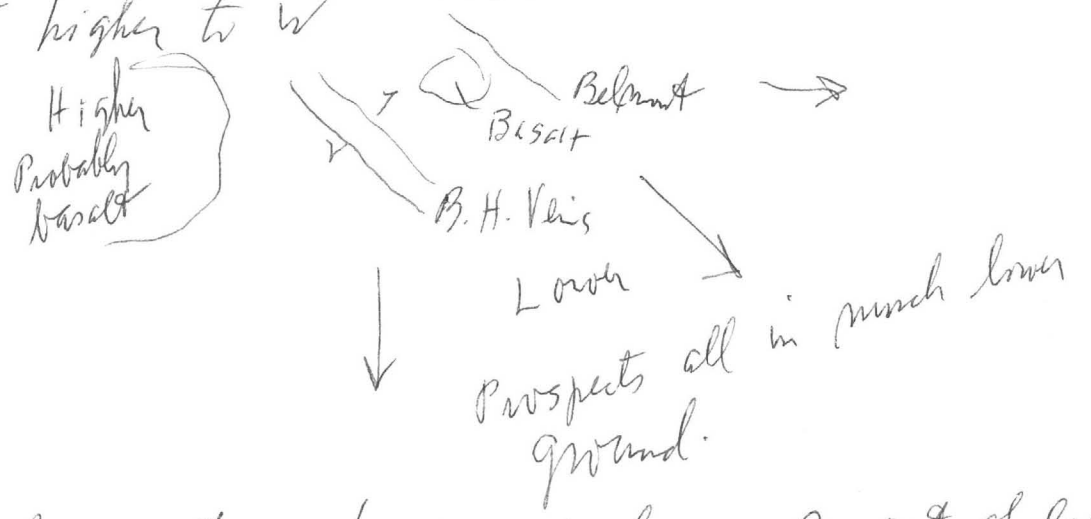
FALLON

TRAVELODGE

Hecla 5/26/65

Broken Hills — Low rolling country

I higher to W




Mature topography suggests large amount of erosion. This is strengthened by presence of basalt between the Belmont & the Broken Hills veins. B.H. veins stepped to surface. Erosion has not only cut down into the ore zone but may have cut nearly through it.

Hence the veins exposed in the lower ground to the S & SW may have had their ore, if they ever had any, completely eroded away.