Report on the Battleship Group
of patented mining claims
Lordsburg Mining District
Hidalgo County, N.M.

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INTRODUCTION

The Battleship group of mining claims in the Lordsburg (Virginia) mining district have lain dormant for over 40 years. These claims, like hundreds of others, were located during early part of the20th century, produced for a time, then rapidly faded into obscurity. This preliminary report is an attempt to shed some light on the history and development and to assess the potential value of the group in terms of today's mineral market.

PURPOSE AND SCOPE

The New Mexico Bureau of Mines and Mineral Resources was contacted during the month of September, 1980, by Mrs. Kathleen Sullivan Martin, 935 Sunset Cliffs Boulevard, San Diego, California, for advice on the value and potential of her above named properties. The claims were subsequently visited by the authors on November 6,1980 and again by Robert North on January 15, 1981. Nearly two days were spent examining the claims and workings, observing geology and collecting samples and other data. Only one of the underground openings, a short tunnel northwest of the upper shaft was accessible. Therefore, no underground mapping, ore reserve calculations, etc., could be done. Such data as are herein presented are based upon surface observations, sampling, geologic interpretation, and the few available documents and references.

Acknowledgements Gratitude is due and hereby expressed to Robert Lowery, Melvin Coolbaugh, Robert Schick, and Robert Luning, all previously employed by Federal Resources at Lordsburg. Each gave freely of their time and ideas. Special thanks are due to Mrs. K.S. Martin for searching through family records for facts and historical data.

LOCATION, ACCESS AND PROPERTY DESCRIPTION

The Battleship group of patented mining claims (Battleship, Gila Monster, Lookout, mineral survey 1592, area 45.185 acres) is located in the Lordsburg (Virginia) mining district in sections 11 and 12, T23S, R19W, NMPM, Hidalgo County, N.M. (fig. 1). The properties can be reached by travelling south from Lordsburg on N.M. highway 494 a distance of 1.9 miles; thence, right at intersection 0.7 miles; thence, left at intersection 1.2 miles through Valedon to the foot of Lookout Hill, a prominent geographic feature with microwave antennae on the crest. The main workings and dumps can be seen on the northeast slope of the hill just across a small arroyo west of the road (figs. 4, 5).

HISTORY AND OWNERSHIP

The ground presently covered by the Battleship and Gila Monster claims was originally located as the Flagship and Battleship (also referred to as west extenstion Flagship) lodes on August 29, 1898 and December 12, 1899, respectively. The claimant was H.E. Hoffman.[1] The Battleship Mining and Milling Company, with offices in Denver, Colorado, was organized ca 1900

[1] Mining Records Hidalgo County Courthouse, Lordsburg, N.M.

LIST OF MINING CLAIMS

Includes all claims officially surveyed for patent and unsurveyed claims in group holdings of patented claims.

Group Holdings

1. Mikesell (Phoenix) group
2. Phelps Dodge Corp., Eighty-five Branch.
3. Pacific Copper Co. (Bonney group)
4. Misers Chest group.
5. Manilla group
6. Alamo Mining Co. (Atwood group)
7. Anita group

No.	Name	Survey No.
1	Sterling	1958
2	Monday	1958
3	Daisy	1958
4	Copper Nugget No. 1	1958
5	Copper Nugget No. 2	1958
6	Ada Etta	1958
7	Big Dike	1958
8	Summit	1958
9	Lone Star	1958
10	Florence May	1958
11	Copper Nugget No. 3	
12	Copper Nugget No. 4	
13	Amigo	1928
14	Vandegrift	1928
15	Lawrence	1928
16	Pittsburg	2009
17	Pittsburg No. 2	2008
18	Knight	1928
19	Sunday	1928
20	Black Cat	1928
21	Anna Mary	1916
22	Carlos	1928
23	Clementine	1916
24	Copper Link	
25	Phoenix	1916
26	Old Virginia	
27	Mono No. 2	
28	Ontario	
29	Dewey	
30	Queen	
31	Pittsburg No. 3	
32	McGinty	
33	Lucy	
34	Kathryn No. 4	
35	Last Chance	1153
36	Dacotah Pearl	1153
37	Belle	1153
38	Peton	1444
39	Bonnie Jean	423
40	Goodsight	1444
41	Montana	1444
42	Pittsburg No. 4	2009
43	Pittsburg No. 6	2009
44	Pittsburg No. 5	2009
45	Lookout	1592
46	Gila Monster	
47	Battleship	1592
48	Western Extension of Eighty-five No. 4	1933
49	Western Extension of Eighty-five No. 1	1933
50	Western Extension of Eighty-five No. 2	1933
51	Western Extension of Eighty-five No. 3	1933
52	Western Extension of Eighty-five No. 5	1933
53	Winchester	1604
54	Monteray	1602
55	Western Extension of Eighty-five No. 6	1933
56	Remington	1603
57	Beloit	1601
58	Ninety-nine	1430
59	Eighty-five	1430
60	Dundee	1284
61	Eighty-six	1430
62	Hobson	1616
63	Johnson	1677
64	Schley	1618
65	Oxley	1620
66	Dewey	1617
67	Chalcocite	
68	Azurite	
69	Cuprite	
70	Malachite	
71	Bornite	
72	Black Sam	1504
73	Cobra Negra	1504
74	Tom Cat	1504
75	Oversight	
76	Black Copper	1504
77	Cafe	1605
78	Jim Crow	1619
79	Wedge	
80	Carlos	1690

No.	Name	Survey No.
81	Superior	49
82	Reckhart	1606
83	Royal	1608
84	Pasadena	1611
85	Venice	1610
86	Dutchess	1609
87	Princess	1607
88	Emerald	1430
89	Mohak	1430
90	Rockford	1595
91	Nevada	1431
92	Playmate	1596
93	Carrie	1766
94	Oakland	1597
95	Dry Town	1936
96	Sacramento	1598
97	Lookout	1599
98	Monrovia	1600
99	Tioga	1935
100	White Cloud	1613
101	Comstock No. 1	1742
102	Comstock No. 3	1742
103	Comstock No. 2	1742
104	Goodnight	1676
105	Excelsior	1612
106	Old Town	1937
107	Yellow Jacket	66
108	Valedon	1768
109	Road	1768
110	Triangle	
111	Southern	1768
112	Valedon No. 1	1768
113	Plumbo	1768
114	Florence	1484
115	Henry Clay	70
116	Bessie	1483
117	Atwood	68
118	New Year No. 2	1768
119	New Year No. 1	1768
120	Lieutenent	
121	General Jerry Boyle	935
122	Unsurveyed holdings of Hidalgo Copper Co.	
123	Napoleon	
124	Belle Tower	
125	Friday	
126	Kingfisher	1801
127	Rosemary	1832
128	Copper Reef	2013
129	Copper Reef No. 2	2013
130	Copper Reef No. 3	2013
131	Johannesburg	1871
132	Congress	1870
133	Nellie Gray	1870
134	March No. 2	1870
135	March No. 1	1870
136	August	
137	Teddy	1591
138	Sunrise	1591
139	Lone	1591
140	Cochise	1591
141	Shoo Fly	1591
142	August No. 2	
143	Chance	1945
144	Fort Savage	1462
145	Little Annie	1462
146	Misers Chest	1462
147	Copper Regent	1462
148	Virginia	1462
149	S. W. B.	1462
150	Columbia	1462
151	Bonney Extension	1913
152	Manilla	1913
153	Copper Dick	1913
154	Mulberry	1913
155	Happy Hooligan	1913
156	Red Copper	1913
157	Green Copper	1913
158	Blue Copper	1913
159	Aberdeen	1882

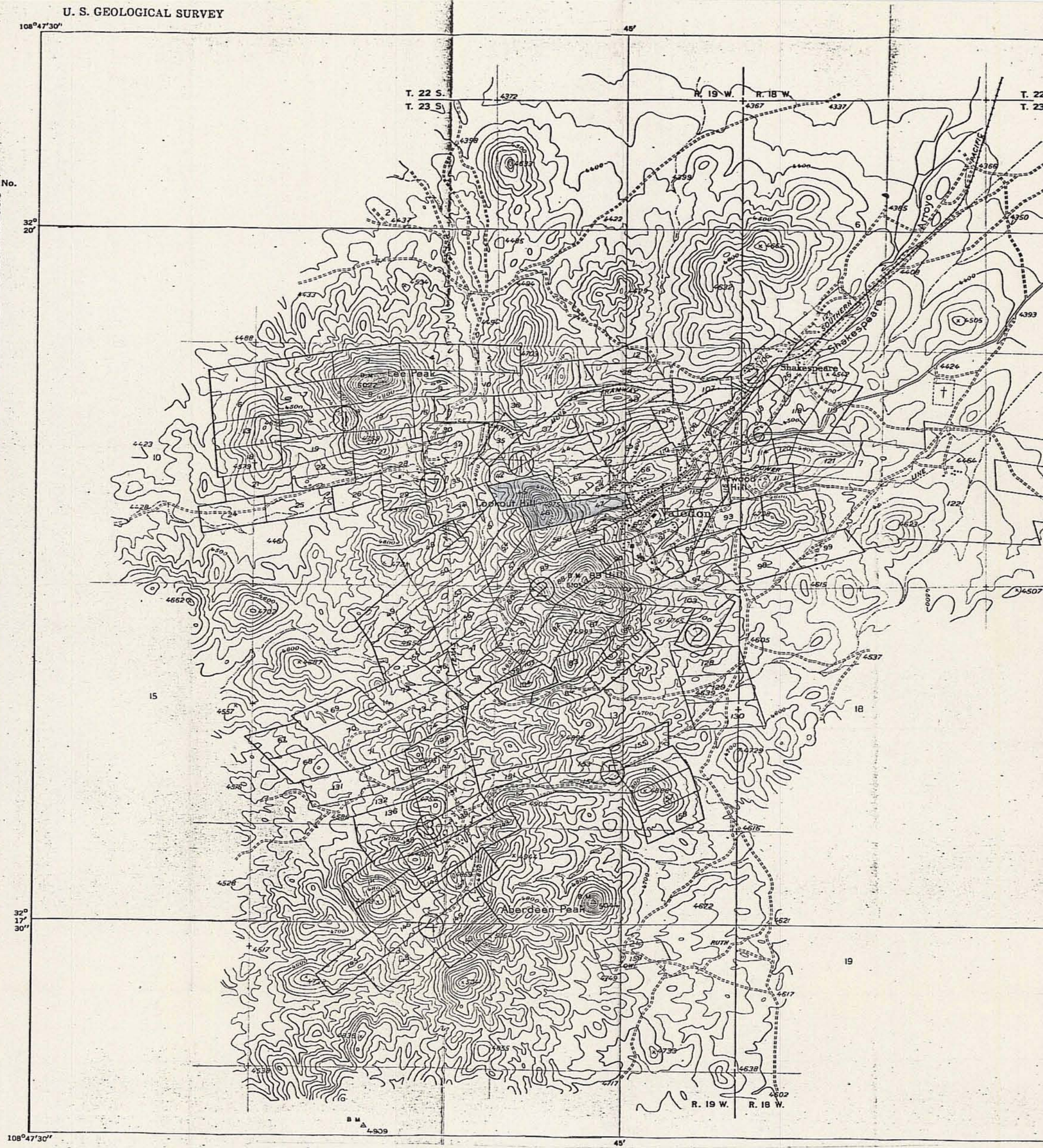

Fig. 1: Claim map of the Lordsburg Mining District, Hidalgo County, New Mexico. Battleship group of mining claims (key #'s 45, 46, 47) highlighted in blue. From USGS Bulletin 885, Plate 14, following p 42.

Scale 1/24,000

1 0 1 Miles

1938

to develop these and other claims, which included, in addition to the above, the Wasp and Hornet. The four claims were collectively called "The Navy Group". By 1906, the claims were developed by a total of 478 feet of cuts, drifts and shafts. Shipments to El Paso were said to have yielded good copper, lead, silver, and gold values.[2] This company was unable to develop a successful mine, however, and passed from the scene by 1908.[3]

In 1909, W.T. Scarborough and W.A. Blondon took a lease on the Dundee (#60, fig. 1), a property less than a quarter mile southeast of the Battleship properties, and shipped a substantial amount of copper-gold-silver ore to the Copper Queen smelter in Arizona.[4] These men were doubtless familiar with the defunct Battleship company's properties. Thus, when the original claims were allowed to lapse, Scarborough, along with M.W. Wright and F.A. Sprouse located the Battleship and Gila Monster Lodes Jan. 1, 1909. The Lookout was located by Scarborough, Blondon, and Frank Parker November 1, 1910.[5]

The claims, especially the Battleship, were developed and worked throughout 1916. Intermittent shipments were made, the largest during 1912.[6] The claims were surveyed during 1914 and patent was issued in late 1915 (see appendix). Production at the Battleship Mine rose and fell with the metals market, and finally ceased by 1917. Although various members of the Scarborough

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[2] Copper Handbook, Vol IV, 1906, p. 239
[3] Copper Handbook, Vol VIII, 1908, p. 359
[4] NMBM&MR file data
[5] Mining Records Hidalgo County Courthouse, Lordsburg, N.M.
[6] Mineral Resources, 1912-1917

family attempted to operate the mine during 1917-1919, and a shaft is said to have been sunk at great expense during the latter year,[7] no shipments resulted. Except for a short period during 1928, the property was idle until 1935-1937 when it was operated by lessees.[8]

Ownership passed to Kathryn Sullivan, (another member of the Scarborough family, via a tax certificate in 1944. Mrs. Sullivan grubstaked a few prospectors over the years and at one time considered hiring a mining contractor to rehabilitate the mine during the late 1940's. These efforts were apparently unsuccessful. Federal Resources leased the claims during 1973-75 but did no work on the ground. Parts of the surface on Lookout Hill were sold or leased to the Southern Pacific R.R. Co. and El Paso Natural Gas Co. during the late 1970's for communication facilities.[9] The properties are presently owned by Mrs. Kathleen Sullivan (Martin).

DEVELOPMENT AND PRODUCTION

The Battleship group of claims is not extensively developed. Such development as exists on the Lookout and Gila Monster lodes is limited to a few open cuts and shallow pits. The largest opening is a shaft and cut (fig. 2) approximately 16 ft. deep and 25 ft. long, respectively. These workings, apparently excavated after the patent survey, are located on the north sideline of the Lookout near survey station no. 1 as shown on the plat. Numbers, such as "shaft No. 7" refer to plat and field notes of the mineral survey.

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[7] Letter from Kathleen Sullivan (Martin) 10/20/80; this may have been an attempt to clean out and rehabilitate the tunnel shaft.
[8] Mineral Resources, 1928; Minerals Yearbook, 1935, 1936, 1937.
[9] Letter from Kathleen Sullivan (Martin), 9/23/80.

Fig. 2: Open cut and shaft on Lookout claim.

Fig 3: Open cut and portal of tunnel No. 3, Battleship.

All of the larger workings are located on the Battleship claim. These consist of one tunnel (fig. 3) and two shafts (figs. 4-7) which, judging from the volume of dump material, contain the majority of development.

The tunnel is 54 ft. in length and was apparently driven prior to 1914 to test a narrow vein structure. It was abandoned when the vein proved to be uneconomic. The two shafts are open, but due to their condition were not entered.

Shaft no. 7 (fig. 6), also known as the "tunnel" shaft, was the center of most of the early (1910-1916) development. This shaft was 164 ft. deep, nearly vertical, with levels at 65 ft. (the 60 ft. level) and at or near the bottom (the 150 ft. level). The shaft is presently open to 104 ft. below the collar; it is caved at this point and has been, apparently, for some time. This caving is probably indicative in part of stoping above the 150 ft. level. Heavy ground, however, is known to have been encountered in this shaft.[10]

Shaft no. 1 (fig. 7), also known as the "lower" shaft, was, in 1914, 80 ft. deep with short drifts at the bottom driven to the east and west. This shaft, inclined ≈65° to the southeast, was the center of activity during the later (1920-37) period. During this time, it was extended below the 100 ft. level where, at 103 ft., a drift was driven to the west a distance of 208 ft. and another to the east 25 ft.

Small stopes were developed above each drift and around the

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[10] Letter from Ed Scarborough to Kathryn Sullivan, 5/12/48.

Fig. 4: View of Lookout Hill looking West. Dumps of shaft No. 7 in center of photo.

Fig. 5: View of dumps, looking East from foot of Lookout Hill. Dumps of shaft No. 7 at point A; dump of shaft No. 1 at point B. Abandoned townsite of Valedon in right background.

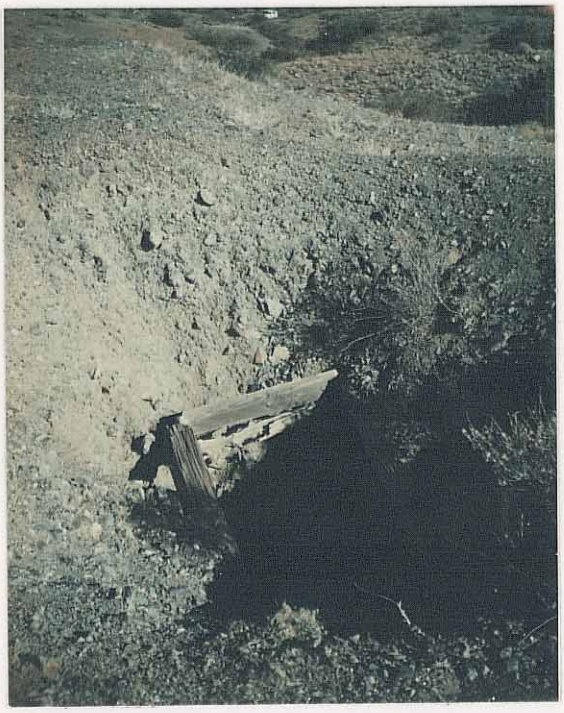


Fig. 6: Collar of shaft No. 7, Battleship.

Fig. 7: Dump and collar set, shaft No. 1, Battleship

shaft. An idealized cross-section of the two shafts and stopes is shown in fig. 8. Calculations suggest that tonnage produced from these stopes amounts to ≃ 1200 tons.

GEOLOGY

The Battleship Group is located in an area of Cretaceous andesite which has been intruded by a number of Tertiary events. Tertiary extrusive rocks also crop out in the Lordsburg district, but none are exposed on the Battleship group of claims [14] (fig. 9).

The Cretaceous andesite was first intruded by a large mass

[14] Thorman, C.H., and Drewes, H., 1978 Geologic Map of the Gary and Lordsburg Quads, USGS Map I-1151.

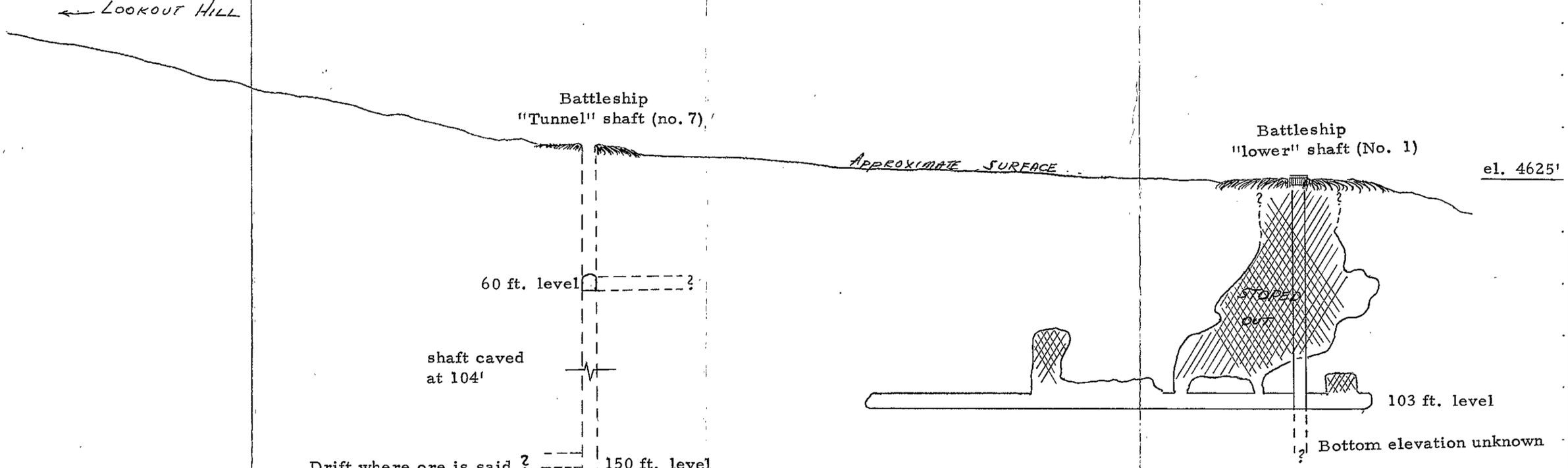
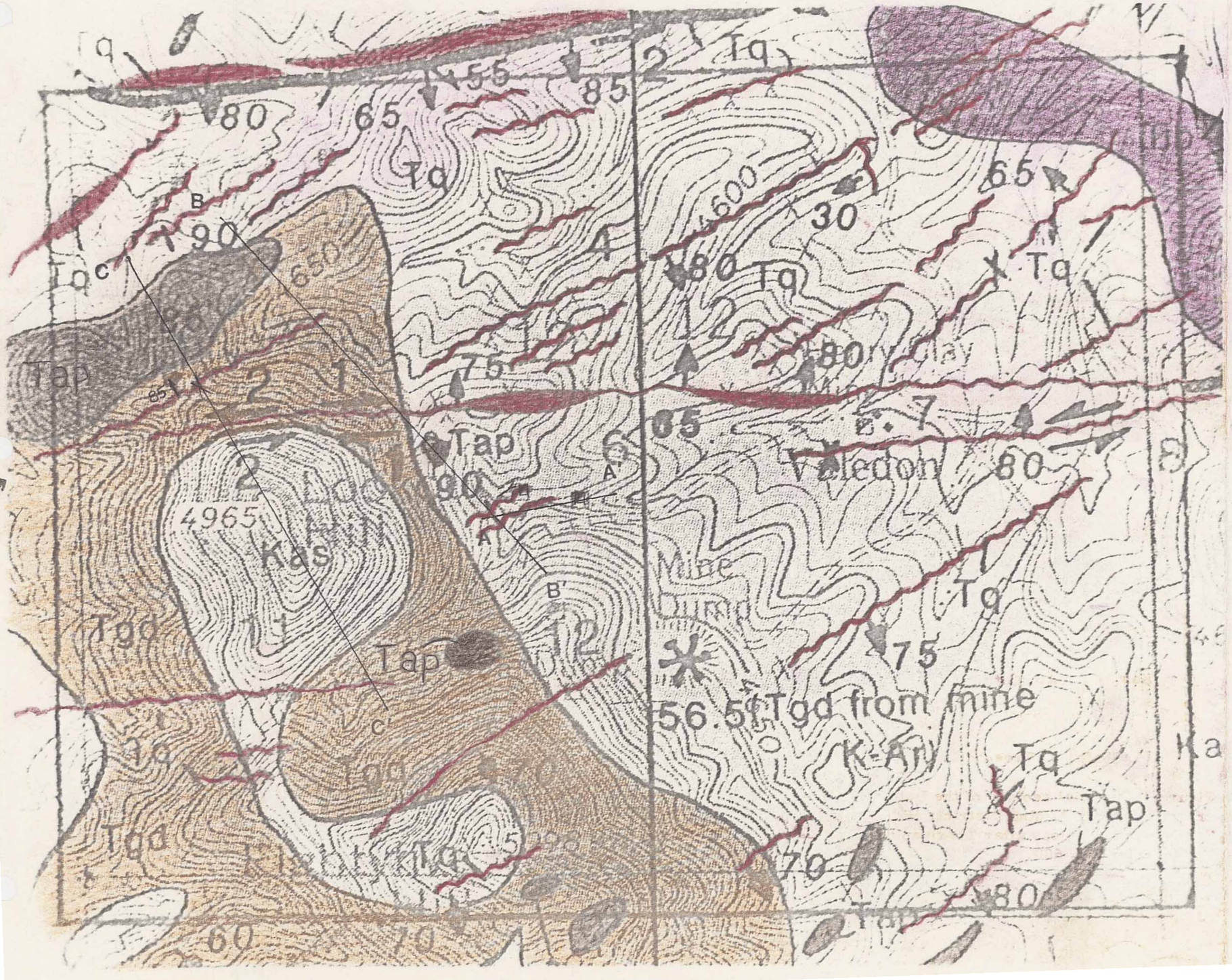


Fig 8: Sketch map of Battleship Workings
Section A - A' along N80°E (Sections shown in fig. 9)
Base map after Mineral Survey Description , 1914,
and US Bureau of Mines, 1943.
Scale: 1" = 50'; RWE



TERTIARY

Tq — Shear zones; dominately quartz breccia

Tib — Intrusive rhyolite breccia

Tap — Aplite dikes

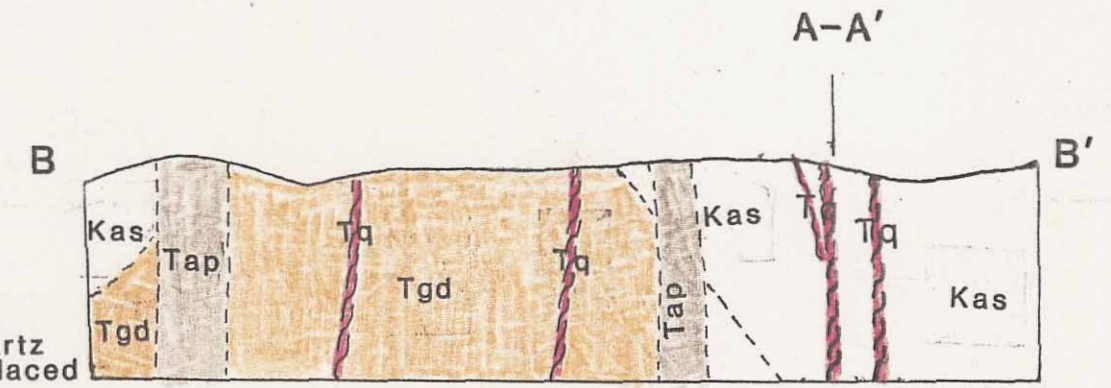
Tgd — Granodiorite

CRETACEOUS

Kas — Andesite

Shaft Prospect 75 Shear zone showing dip

Figure 9: Surficial geology of the Battleship Group area, Lordsburg Mining District, Hidalgo County, New Mexico. Geology after Thorman and Drewes, 1978. Scale: 1" = 500'

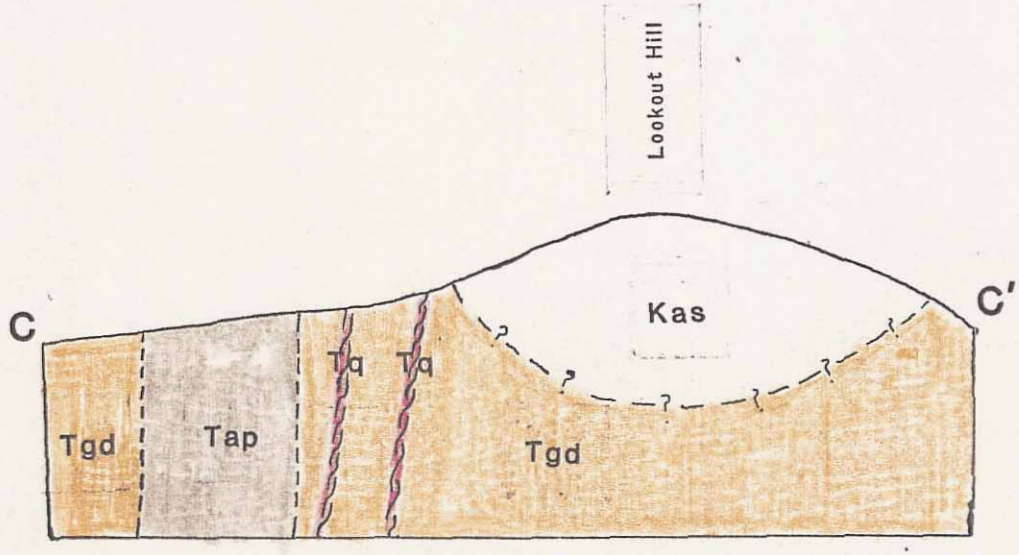


Tq — SHEAR ZONES. Dominately quartz breccia. Ore deposits are emplaced in this unit.

Tap — APLITE DIKES.

Tgd — GRANODIORITE.

Kas — ANDESITE.



Scale: 1″=500′. No vertical exaggeration.

Fig. 10: Geologic cross sections across the Battleship group, Lordsburg mining district, Hildago County, N.M.

Geology from Thorman and Drewes, 1978.

TERTIARY

CRETACEOUS

FIGURE 10

of granodiorite during the Paleocene. Two K-Ar dates on biotite have given ages of 56.5 ± 1.2 m.y. and 58.5 ± 2.0 m.y.[15]

Following the granodiorite were late-stage intrusions of aplite dikes. Intrusive rhyolite, in places brecciated (mapped by Thorman and Drewes as intrusive breccia in those places) was then intruded into the Tertiary granodiorite and Cretaceous andesite. This event was apparently associated with faulting and and intense shearing and filling of the fractures by mineralizing solutions which bear the ore in the district. The major faults and shearing are in the north end of the district, with fault motion dominantly strike-slip in an east-west direction, yielding large quartz veins striking E-W along the faults and smaller tension gashes running approximately NE-SW. The Battleship group is just to the south of the large fault-shear zone. The quartz veins cut the Cretaceous andesite, the Tertiary granodiorite, aplites, and intrusive rhyolite breccia, indicating that mineralization is younger than these rocks. However, the Tertiary rocks are all Paleocene[16], and it is likely that the intrusion of the aplite, rhyolite, rhyolite breccia and mineralized quartz veins were all associated with the intrusion of the granodiorite as late-stage events.

Ore Deposits. Lasky[17] recognized six stages of mineralization in the district. The mineralizing fluids were emplaced along existing fracture zones caused by faulting and resultant shearing.

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[15] Ibid
[16] Thorman and Drewes, op. cit.
[17] Lasky, 1938, op. cit.

The six stages of mineralization are associated with reopening of the fracture zones by continued movement along the faults. The stages of mineralization are as follows:[18]

TABLE 2

	Fracture Filling	Wall Rock Alteration
1st Stage	Tourmaline specular hematite	calcite[a], sericite, chlorite
2nd Stage	Quartz, chalocopyrite, galena, pyrite, manganosiderite, sphalerite, barite, specular hematite[b], chlorite[a]	calcite, sericite
3rd Stage	Quartz, chalcopyrite pyrite, chlorite[a]	
4th Stage	Calcite, chalcopyrite[a], galena[a]	
5th Stage	Calcite	
6th Stage	Calcite, pyrite, quartz[a], fluorite	sericite

a - minor amounts b - very minor amounts

The important ore mineralization occurred during the second stage of mineralization.

Four mineralized shear zones (veins) are shown on the geologic map of the Battleship Group (fig. 9). In addition, the tunnel on the Battleship claim (#3 on List of Improvements, Appendix I) is driven on a minor shear trending N 70° E, dipping 80° to the south. The tunnel is 66'∿N 20° W of the "tunnel shaft" (#7). The veins on the Battleship group show evidence of the first two stages of mineralization, with a second stage mineral assemblage dominant. The vein material also shows alteration from exposure to oxygen and meteoric water. The chalcopyrite has altered to malachite, covellite and chalcanthite, and the pyrite to limonite and jarosite.

[18] Modified from Lasky, 1938, op. cit. figure 8, p. 33.

The dominant primary minerals from the vein material of the Battleship group are quartz, pyrite, chalcopyrite, sphalerite, galena and tourmaline. Chlorite, sericite, and calcite were also identified in minor amounts.

Samples. Six samples were collected from the Battleship and one from an adjacent claim (see descriptions, appendix 3). Assay and mineralogical results are summarized in Table 3. The ore deposits of the Battleship are tabular, having much greater depth and lateral extent than width. The width of mineralized fracture zones observed on the Battleship group did not exceed 3 feet.

Discussion. Although known workings on the Battleship do not exceed 165 feet, it can be expected that the veins continue considerably below that depth. On the adjacent 85 claim, similar vein structures were mined below 2,000 feet.[19] It should be noted that the known outcrop length of the shear zones on the Battleship claim proper are much less than on the 85, and do not necessarily extend to the same depth, although still probably greater than 500 feet. The two mineralized shears on the Lookout claim probably extend to at least 2,000 feet in depth, perhaps further. However, it should be noted that the shears are not necessarily mineralized at depth and probably do not widen.

From the observed geology 3 areas warrant further study. The first point of concentration for further exploration on the Battleship group should be on the Battleship claim. Two parallel shear zones (see geologic map, fig. 9) on the Battleship claim have been the major producers of the group. In addition, a small

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[19] Lasky, 1938, op. cit. p. 44.

TABLE 3

Sample	Mineralogy	Cu(%)	Pb(%)	Zn(%)	Ag (oz/ tn)	Au (oz/ tn)
Batt #1[a]	Q,Py,Mal,Cpy,Lim,Jar,Ser.	1.90	0.84	0.15	5.70	0.07
Batt #2[b]	Q,Mal,Cpy,Lim	0.73	0.18	0.06	1.75	0.01
Batt #3[c]	Q,Py,Cpy,Cov,Gl,Sp,Tm	1.93	2.25	1.14	1.64	t
Batt #4[d]	Q,Py,Cpy,Gl,Sp,Cth,Ser	1.02	1.16	0.58	2.18	0.04
Batt #5[e]	Q,Py,Cpy,Mal,Clr,Cth	7.19	0.32	0.18	10.12	0.04
Batt #6[f]	Q,Py,Gl,Ch	1.20	0.87	0.11	8.4	0.02
Batt #7[g]	Q,Gl,Py,Ch	0.09	1.71	0.10	1.0	0.08

Cal = calcite; Clr = chlorite; Cov = Covellite;

Cpy = Chalcopyrite; Cth = Chalcanthite;

Gl = Galena; Jar = Jarosite; Lim = Limonite

Mal = Malachite; Py = Pyrite; Q = Quartz;

Ser = Sericite; Sp = Sphalerite; Tm = Tourmaline

a. Vein material from high-grade dump, Battleship claim near "tunnel shaft" (#7).

b. Average of four samples across 12' vein on Schley claim just east of Lookout. Structure thins and continues on to Lookout claim (Batt #7)

c. Vein material from dump near shaft "Lower Shaft" (#1), Battleship claim.

d. From shear zone ∿2' wide in short adit on Battleship claim.

e. From ∿4" of vein material SE of "tunnel shaft" (#7), Battleship claim.

f. Channel sample across 1.5' of shear zone from cut on side line of Lookout claim.

g. Channel sample across 2.0' of shear zone (Discovery point #1 on Lookout claim).

shear explored by the tunnel 66 feet N 22° W (#3 on plat, Appendix 1) of the tunnel shaft (#7) may warrant further exploration.

For ease of discussion, the shears will be named as follows: Tunnel shear = shear along which tunnel (#3) was driven, shaft shear = shear along which tunnel shaft (#7) was sunk, and southern shear = shear mapped by Thorman and Drewes (see fig. 9) southeast of the tunnel shaft.

The tunnel shear is small (less than 2'), but may be of importance if it should intersect either the shaft shear or the southeast shear at depth. All three shears strike roughly N 70° E, and are within 175' on the surface. The dip of the tunnel shear was measured at 80° to the south at the end of the tunnel. The shaft and southern shears are vertical[20]. If the tunnel shear continues to dip at 80° to the south, it would intersect the shaft shear at a depth of approximately 375 feet (fig. 10). This intersection could be an area of thicker deposits of ore minerals. It should be remembered that these shears do not necessarily intersect (or even extend that far), as it is impossible to say what attitude the shears have at depth; however, it would be a good target area of a drilling program. It is also possible that the southern and shaft shears, or all three shears intersect at depth. Again, drilling is the only method of determining this.

The northeast trending shear zone on the Lookout claim (see fig. 9) is the second area for further exploration. The shear shows fair silver values (table 2, Batt. #6), but doesn't appear very extensive. Further sampling is needed along this shear.

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[20] Thorman and Drewes, op. cit.

A possible area of concentration would be where this shear intersects the large east-west fault shear, which crosses the entire Lookout claim. A sample (Batt #7) from this shear was too low grade to be economic, but an intersection of the two shears at depth could provide a mineable orebody. Thorman and Drewes do not show an intersection at the surface, nor was one observed by the authors.

The third area for exploration is along the Cretaceous andesite - Tertiary granodiorite contact. This contact nearly surrounds the base of Lookout Hill. Ore has been mined from near this contact in the 85 and Anita mines in the district.[21] The area of the contact on the northern slope of Lookout Hill nearest the east-west fault/shear zone is most likely to yield good results.

ECONOMICS

Samples 1 and 3 are representative of vein material from the Battleship workings. The assays compare favorably with similar samples taken by a U.S. Bureau of Mines engineer during the early 1940's. The average of the two NMBM samples assayed:

Copper (Cu)	1.92%
Lead (Pb)	1.55%
Silver (Ag)	3.67 oz/ton
Gold (Au)	0.035 oz/ton

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[21] Lasky, op. cit., plates 16 and 21

Average of thirteen USBM samples assayed:

Cu - 1.6%
Pb - (not determined)
Ag - 1.96 oz/ton
Au - 0.06 oz/ton

The weighted average of these 15 samples is Cu - 1.64 percent; Ag - 2.19 ounces per ton, and Au - 0.057 ounces per ton. Lead will probably average about one percent (the average value of the seven New Mexico Bureau of Mines and Mineral Resources samples is 1.05%). The value of this material[22] is as follows:

Cu:	32.8 lb/ton x $.89238/lb =	$29.27
Pb:	≈20 lb/ton x $.38966/lb =	7.79
Ag:	2.19 oz/ton x $15.65/oz =	34.27
Au:	0.057oz/ton x $594.814/oz=	33.90
	Total Value per ton	$105.23

The above samples and calculations indicate that ores likely to be found in the Battleship mine will be too low grade to ship directly to a smelter (custom smelter charges presently amount to ≈ $150.00/ton). To be made economic, the ore would have to be concentrated, probably by means of froth flotation. But it is unlikely that sufficient tonnage will be found on the Battleship group to finance construction of a suitable mill. Thus the Battleship group by itself appears to have little present value. The economic picture could

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[22] Metals Week quotations, E & MJ, Vol. 182, No. 1, Jan. 1981

change rapidly however with the establishment of a nearby custom milling operation. Three mills are presently standing idle in the area and are suitable for such an enterprise: Asarco's and Barite of America's two mills just north of Deming and Federal Resources mill nearby at the Bonney mine.[23] Startup of one of these mills, especially the Federal Resources facility could allow the Battleship to produce at a profit. Because the present mine owner is not in a position to rehabilitate and operate the mine, the authors recommend leasing the properties if possible to a reputable mining contractor.

CONCLUSION

The Battleship Group has been a producer of small amounts of siliceous copper - lead - silver ores in the past. Mineable amounts of similar ore doubtless exist near and below the older workings. Additionally three areas as discussed in the geology section present favorable targets for exploration. The services of a mining contractor and the establishment of a nearby custom milling operation will be necessary to put the mine on a paying basis.

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[23] A fourth mill is located at Hanover but is probably too distant to consider.

APPENDIX 1

Sample Descriptions

Batt #1. Vein material from high-grade dump on Battleship claim, just east of "Tunnel Shaft" (#7 on List of Improvements, MS 1592). The material from the dump is mostly quartz vein material with pyrite, limonite, malachite and chalcopyrite identified by visual examination. Many of the samples have a yellow-brown coating which appears to be jarosite. In addition, sericite was detected by x-ray diffraction.

Batt #2. Sample taken at four points across 12-foot quartz vein on Schley claim, just east of the Lookout claim. The vein strikes N 85° E and dips 72° north. The mineralogy of all four samples is similar: quartz, malachite, chalcopyrite and limonite. The location and assay results of the four samples are:

	Cu(%)	Pb(%)	Zn(%)	Ag oz/ton	Au oz/ton
Batt #2a 5" from footwall	1.40	0.84	0.09	4.30	0.02
Batt #2b 3' from footwall	0.11	0.31	0.06	0.10	0.02
Batt #2c 5' from footwall	1.17	0.15	0.07	2.00	t
Batt #2d 8' from footwall	0.26	0.10	0.03	0.60	t
Total width: 12' Ave.	0.73	0.18	0.06	1.75	0.01

Batt #3. Vein material from dump of "Lower shaft" (#1 on List of Improvements, MS 1592). Quartz, pyrite, chalcopyrite, galena and sphalerite were detected by visual examination. The chalcopyrite had a coating of covellite. X-ray diffraction revealed the presence of chlorite and a small amount of tourmaline.

Batt #4. Vein material from ∿2 feet of shear zone taken at the end of the short tunnel on the Battleship claim. (#3 on List of Improvements, MS 1592). This sample showed considerable alteration from meteonic waters. Quartz, pyrite, chalcopyrite, galena, and sphalerite were the primary minerals visually identified. In addition, considerable chalcanthite was present along fractures in the rock. Sericite was identified by x-ray diffraction.

Batt #5. About 4" of vein material from a cut 50' S 70° W of the Tunnel Shaft (#7). This is the same structure on which the shaft was sunk. The vein material is dominately quartz with pyrite, chalcopyrite, and malachite. Chlorite and a very small amount of chalcanthite were detected by x-ray diffraction.

Batt #6. Channel sample across 1.5' of shear zone from cut on north side line of Lookout claim. Contained quartz, pyrite, galena and chlorite.

Batt #7. Channel sample across 2.0' of shear zone on Lookout claim. (Discovery point #1 on Lookout claim, MS 1592). This is the extension of the vein on which sample #2 was taken. Contained quartz, galena, pyrite, and chlorite. The sulfides from this sample were very fine-grained (∿0.05").