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January 15, 1963

Copper Kettle Prospect  
Churchill County, Nevada

### FINAL REPORT

#### Summary

The Copper Kettle group of 12 unpatented lode claims and the Cobre and Cupre groups, consisting of 60 lode claims and 6 placer claims, cover an area of about 1750 acres, within which geological, geochemical, and geophysical data indicated the possibility of a large, low-grade copper deposit.

This prospect was initially examined by Congdon and Carey, Ltd. in November, 1961 and a lease and option was obtained from Mr. E. J. Bottomley for his Copper Kettle group shortly thereafter. Extensive geochemical sampling, ground magnetic surveying, and claim staking were done in the area during the spring and early summer of 1962. Prospect drilling was begun on the property on July 9th, and completed on November 1, 1962.

The drilling results indicated that there is insufficient mineralization in the area to warrant further exploration.

#### Location and Geography

The claims are located in Sections 16, 20, 21, 22, 27, 28 and 29, T 24 N, R 34 E, Churchill County, Nevada. The claim group lies on the east flank of the Buena Vista iron district and on the west side of the Stillwater Range.

The prospect area is about 32 road miles south and east of Lovelock, Nevada and is easily accessible throughout most of the year. The topography is not too rugged, the maximum relief being about 600 feet within the claim group. Some moderately rugged terrain is produced by some small canyons cutting through the area, but most portions can be reached by means of a four-wheel drive vehicle. The only vegetation is low sagebrush.

#### Ownership and History

The outcrops in Copper Kettle Canyon were discovered in 1908. Several carloads of high grade copper ore were hand sorted and shipped from shallow workings in 1917. The early claims were abandoned, and in 1941, Mr. E. J. Bottomley, of Lovelock, covered the eastern portion of the mineralized area with lode claims. He also located a small magnetic ore-body 1,000 feet south of this claim group.

During the mid-1950's, the claims were leased to Gabbs Exploration Company, who drilled three shallow holes and one 700 foot hole in search of a supposed intersection of some copper-limonite showings and a fault. Apparently no orebody was found, as no further work was done on the property. A few small pieces of core recovered near the deepest hole showed considerable pyrite in altered volcanics.

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Congdon and Carey optioned the Copper Kettle group late in 1961. Since the most extensive copper showings, coincident with favorable geological, geochemical, and geophysical data, occur to the north of the original claims, 60 new lode claims and 6 placer claims were staked in the late winter and early spring of 1962.

### General Geology

In the Buena Vista area, the Leach formation, comprised mainly of andesites, was invaded in Jurassic time by dioritic intrusives. In Cretaceous or early Tertiary time the area was folded and faulted and then altered and mineralized. Although the sources of the mineralizing solutions are not known, it is possible that the diorites were, in turn, intruded by granites or quartz monzonites during the period of folding and these bodies were the ultimate source of the mineralization. This is the normal sequence of events and rock relationships in Western Nevada. Small slivers of quartz monzonite are exposed along the Basin and Range block fault which separates the Buena Vista area from the Stillwater Range, and exposures of quartz monzonite within the Stillwater Range show this rock to be definitely related to magnetic (iron) mineralization and to small copper and nickel occurrences.

### Geology of the Prospect

The geology of the area was mapped by D. W. Fieldman, Wm. Lundby, and P. R. Donovan. The predominant rock type is a thick series of andesite flows, tuffs, and breccias of late Paleozoic or early Mesozoic age, trending northwesterly and dipping northeasterly rather steeply. This formation (Leach?) is intensely altered in the claim area, with the development of striking masses of epidote, garnet, and limonite, elongated along the bedding planes. Copper, generally oxidized, although minor chalcopyrite can be found, is present throughout the area, but is most prominent in the most intensely altered rock.

The most significant structural feature is a northeast trending fault having a low dip ( $30^{\circ}$  to  $40^{\circ}$ ) to the southeast. It is evident for at least a mile beyond the southern boundary of the claims and is undoubtedly continuous to the northeast, although in the easternmost portion of the claims it is obscured by rhyolitic welded tuffs. This fault is locally important because it cuts off the geochemical anomaly abruptly and it changes the strike of the andesites in the upper block enough to make it appear that there is an anticlinal nose. Also, it apparently served as a channel for solutions rich in iron and containing traces of copper, since the upper block has been severely altered and abundant pyrite and minor chalcopyrite have been added, as evidenced by drilling.



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### Geochemistry and Geophysics

In the early stages of development, geochemical sampling (Fig. 1) and a ground magnetic survey (Fig. 2) were the chief prospecting aids used. In each case the results were encouraging.

The technique used for the taking of geochemical samples was simple. Where rock outcrops were found in place, several rock chips were taken over an area of about twenty square feet of surface per sample. Where no outcrops were present, soil samples were taken from a depth of about eighteen inches. A total of 263 samples was taken and the results plotted; an anomalous area approximately 3,500 feet in diameter was found immediately north of the 12 original C.K. claims, this area generally having copper values in excess of 100 parts per million, or about 10 to 40 times as great as the normal copper content of the surrounding rock.

The ground magnetic survey indicated some magnetic highs and the possibility of magnetite (iron) accumulations. This was very favorable, especially because of the known association of copper with iron in the district.

### Electrical Methods

In May, C. E. Melbye and Associates conducted turam and self-potential surveys, the results of which have been reported in detail by Mr. Melbye. To summarize his conclusions, the turam showed three anomalous areas in the northern portion of the prospect (Fig. 3) which overlapped the geochemical anomaly and the self-potential method indicated a large area of negative self-potential in the same general region (Fig. 4).

### Drilling

Since the surface geology, geochemical data, and geophysics were all favorable in the northern half of the claim group, an initial program consisting of four drill holes was decided on.

The site of the first hole was chosen in the portion of the claims having the highest surface copper values and the most intense alteration. Although extremely sparse sulphides were encountered (nearly entirely pyrite), below 350 feet the copper values dropped to about the same level as the background for the district. The total depth of this hole was 1549.5 feet.

The second hole was drilled to intercept the strongest turam and self-potential anomalies. Here again, minor pyrite was found, but the copper values were very low, less than 100 parts per million (0.01% Cu). Hole number two was stopped at 1498 feet.

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Drill hole number three was positioned on a magnetic high to test the possibility of a copper concentration coincident with iron concentration. The results of this drilling were also discouraging. Again very minor pyrite was found and the copper values remained very low, less than 150 parts per million. Since almost no mineralization was found, the third hole was drilled to a depth of only 940 feet.

The final hole was drilled in the fault block lying above the low-angle (thrust?) fault in the eastern part of the claims. This site was chosen with the thought that there could be a concentration of copper above the fault in the altered block of andesites. In this hole, very abundant sulphides were encountered down to the main fault, but with very little copper present. After passing through the main fault at 517.5 feet, relatively fresh andesites, similar in appearance to those seen in the first three holes and generally devoid of mineralization, were found and the drill hole was stopped at a depth of 840.1 feet.

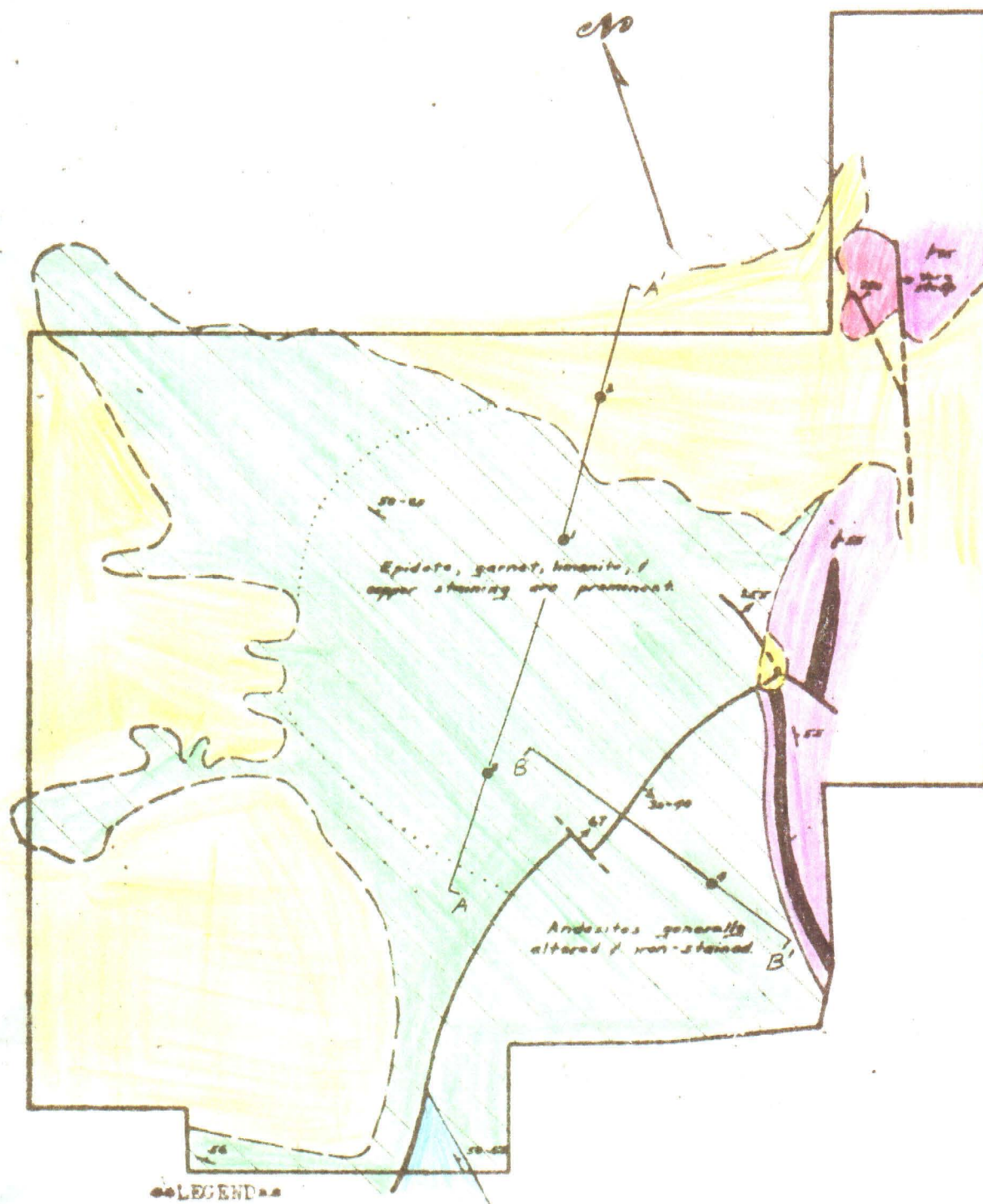
#### Conclusion

Although the surface indications and the results of the modern prospecting methods were extremely encouraging, drilling has pretty well exhausted the possibility of sufficient copper mineralization in the immediate area to be economically interesting.

There is a slight chance that there is an ore body somewhere along the thrust (?) fault found in the eastern part of the claims. If there were, it could account for the weak mineralizing solutions that passed through this fault zone, giving rise to the favorable-appearing surface features. However, the chance is slight and the exploration expense would be prohibitive. Also, any such body would probably be deeply buried by Tertiary lavas, making such a deposit uneconomical even if found.

Therefore, further expenditures on this claim group were not advisable and the lease and option on the Copper Kettle Group was dropped.



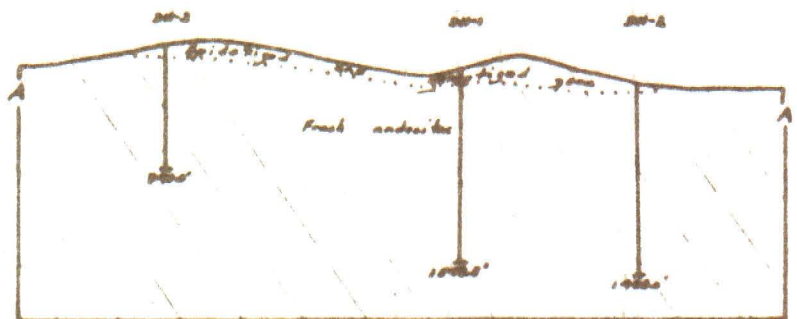


LEGEND

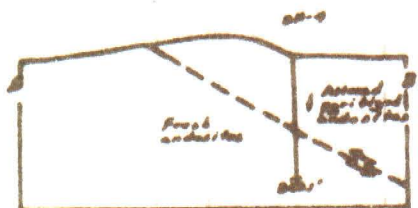
- Quaternary alluvium
- Tertiary intrusive
- Tertiary rhyolites
- Triassic (?) andesite
- Triassic (?) limestone

- Strike and dip of beds
- Faults
- Drill holes

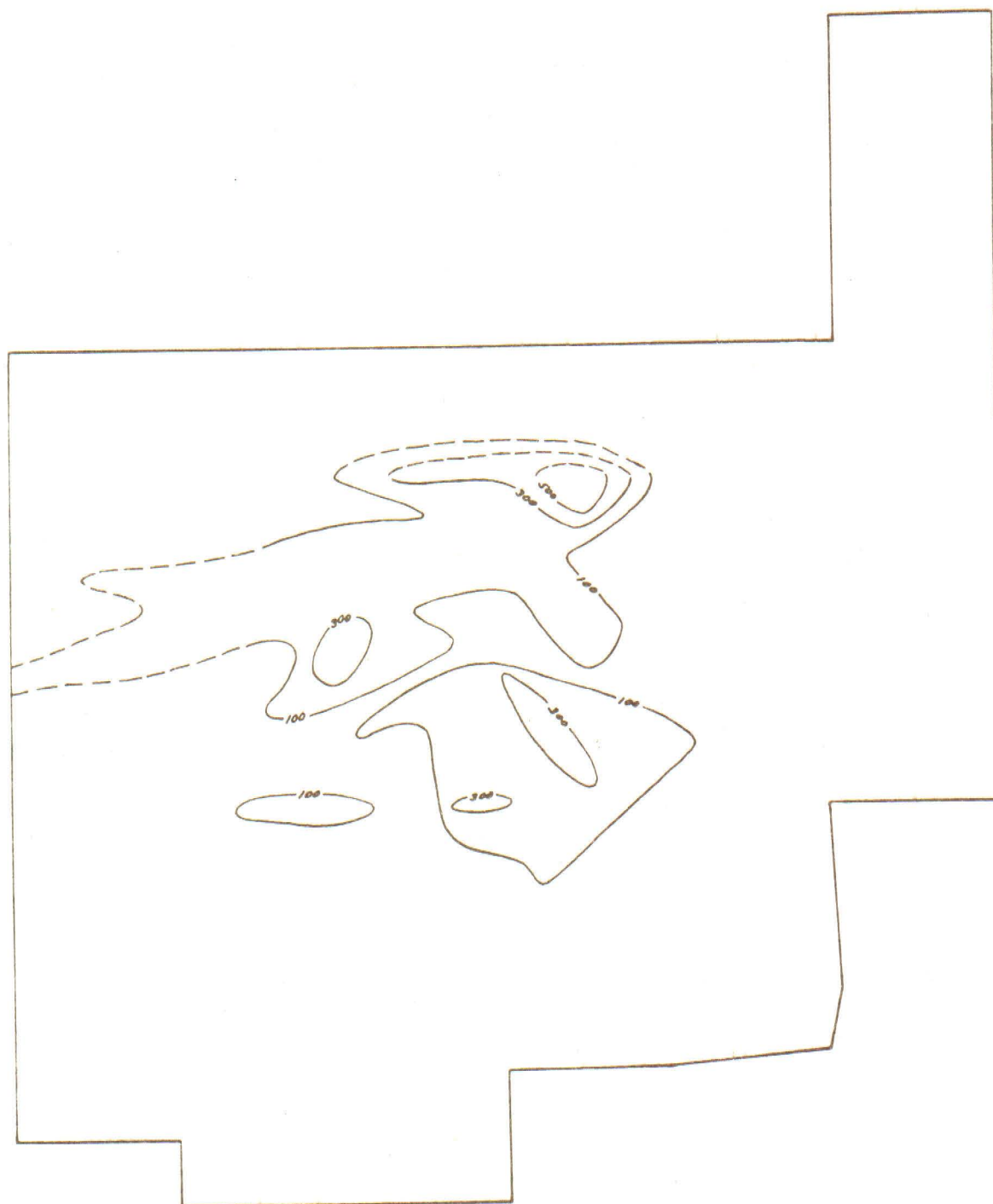
TONGAN AND CARY, LTD.  
 Geologic Map  
 Copper Kettle Prospect  
 Churchill County, Nevada  
 1" = 1600'  
 NL-JAP-PED



Geologic cross-section A-A' (looking west) through drill holes 1, 2, and 3 showing fresh andesites in all three drill holes. (Scale: 1" = 1500').



Geologic cross-section B-B' (looking northeast) through drill hole 4, showing altered and pyritised andesites above the thrust(?) fault and fresh andesites below the fault. (Scale: 1" = 1500').



— 100 — Copper content (parts per million)

Scale: 1" = 1500'

Figure 1. Geochemical survey

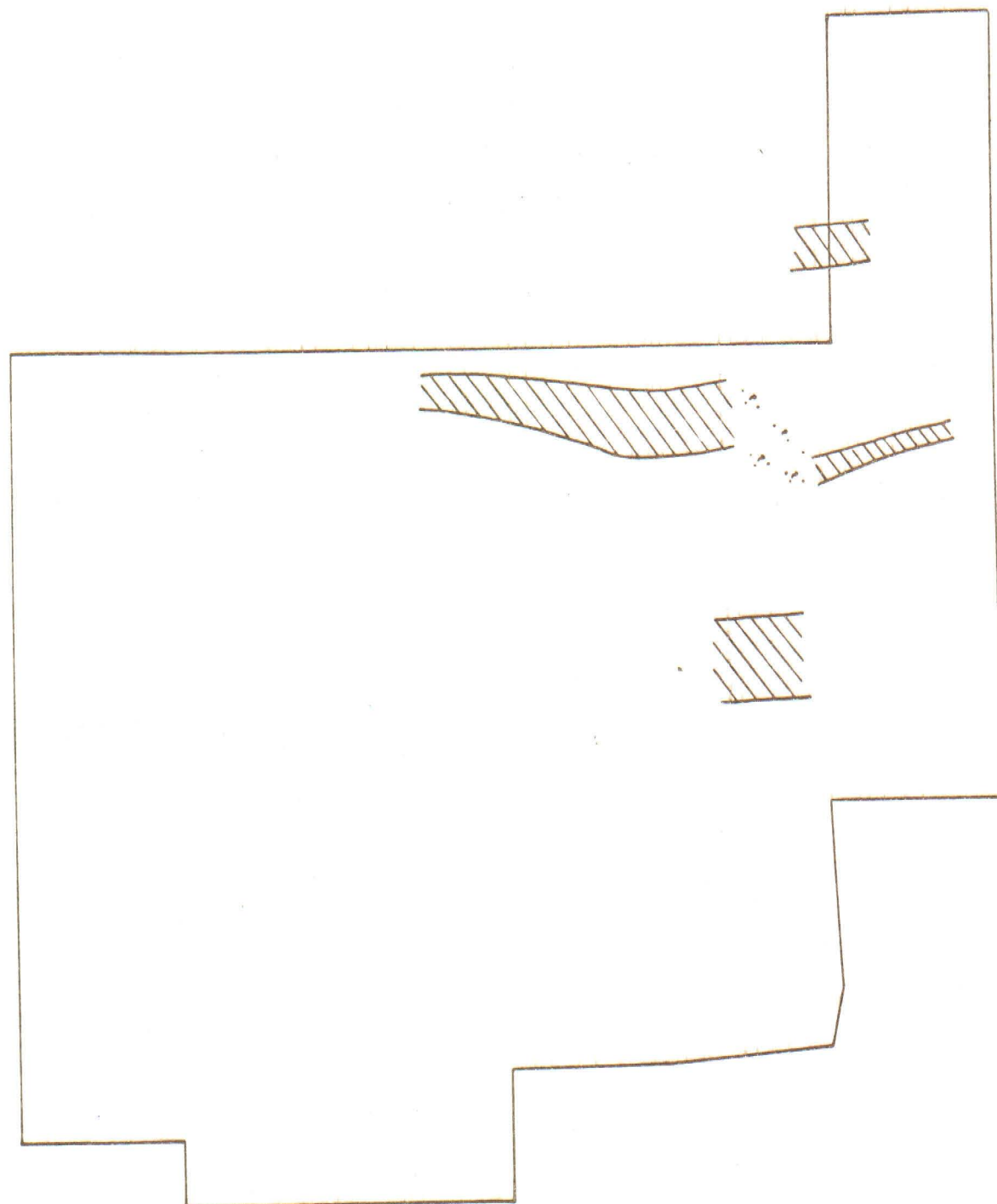


Contour interval: 200 gammas

Scale: 1" = 1500'

Figure 2. Vertical intensity ground magnetic map.

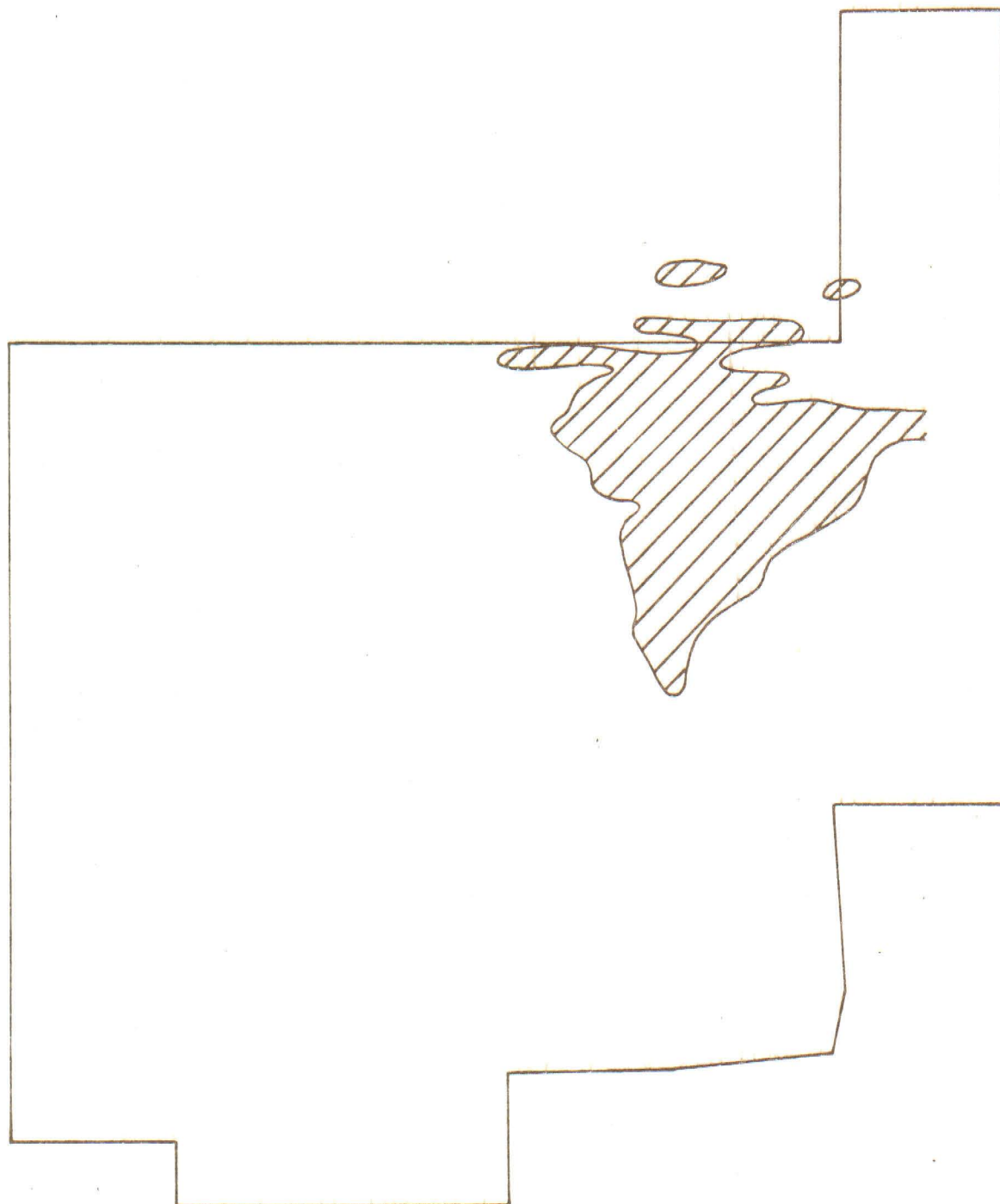




 Anomalous areas

Scale: 1" = 1500'

Figure 3. Turam survey (by C. E. Melbye).



Areas of relative negative self-potential

Scale: 1" = 1500'

Figure 4. Self-potential survey (C. E. Melbye).

**CHARLES O. PARKER & CO.**CHEMISTS • ASSAYERS • ENGINEERS  
DENVER 5, COLORADO

Folio 7857

Date Oct. 29-31, 1962.

Gaugdon & Carey,  
1037 First National Bank Bldg.,  
Denver, Colorado.**We hereby Certify,** that the samples assayed for you gave the following results:

DESCRIPTION		GOLD OUNCES PER TON	SILVER OUNCES PER TON	COPPER PER CENT (WET)	LEAD PER CENT (WET)	ZINC PER CENT	IRON PER CENT	INSOLUBLE PER CENT	VALUE PER TON
Cobre	4-1 - 438	TRACE	0.06	0.025					
	4-2 - 442-449	TRACE	0.10	0.04					
	4-3 - 442-449	TRACE	0.04	0.035					
	4-4 - 706-01	TRACE	0.08	0.025					
	4-5 - 729 <sup>2</sup> -039 <sup>5</sup>	TRACE	0.22	0.06					
Molybdenum:									
16 parts per million.									
85 parts per million.									

Gold at \_\_\_\_\_ per ounce    Copper at \_\_\_\_\_ per unit

Silver at \_\_\_\_\_ per ounce    Zinc at \_\_\_\_\_ per unit

Lead at \_\_\_\_\_ per unit

Charge \$ 30.00**CHARLES O. PARKER & CO.**  
CHEMISTS, ASSAYERS and ENGINEERS