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GEOCHEMICAL PROSPECTING ON THE GOLD-QUARTZ VEIN MCGRATH PROPERTY, FAIRBANKS DISTRICT, ALASKA

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Donald R. Stein

Territorial Department of Mines Assayer-Engineer

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INTRODUCTION

Geochemical prospecting is a tool that has been successful in many mineralized areas and is being used with success in the Fairbanks district. The gold-quartz vein on the McGrath prospect typifies many of the deposits in the district on which geochemical prospecting may be employed.

GEOGRAPHY

The McGrath property, comprised of one full claim, lies approximately nine miles north from Fairbanks along the Steese Highway. The claim begins at the top of a gently sloping hill and runs lengthwise down the western side.

GEOLOGY

Residual soil and loess constitute the soil mantle on the claim with thicknesses varying from a few feet near the top of the hill to several feet about halfway down the hill and from 23 feet thick at the north side line to 2 feet thick at the middle of the claim and to 4 feet thick near the south side line.

The claim contains only one known gold vein, of marginal value at the present time, which strikes north 80° E and dips south 60° into the enclosing Birch Creek Schist. The upper portion of the vein is well oxidized, grading into fresh sulfides at depth. The chief mineralization is Jamesonite with associated gold and silver.

Two sets of faults occur on the property. One set parallels the vein with approximately the same dip and strike. The other set strikes NW and cuts across the vein often tending to displace it. At one location underground, the strike slip of the fault displaced the vein 20 feet.

HISTORY

A shaft driven to the 80 foot level soon after the vein was discovered caved in due to poor bracing. Since then most of the prospecting has been confined to surface work and short shafts. Several trenches have been cut across the vein by bulldozers. In 1954, a bulldozer cut failed to show any sign of an extension of the vein. In the summer of 1955, geochemical methods were to be used in an attempt to locate the vein.

GEOCHEMICAL EXPLORATION

A preliminary geochemical line was laid across the known vein by drilling 15 holes at 4 foot intervals. The A, B, and C horizons were tested using the USGS geochemical method of analysis in an attempt to find out which gave the best anomaly over the vein. The anomalies from the A and B horizons were only slight variations above the background reading, but the anomaly from the C horizon

was very sharp and definite (Figure I).

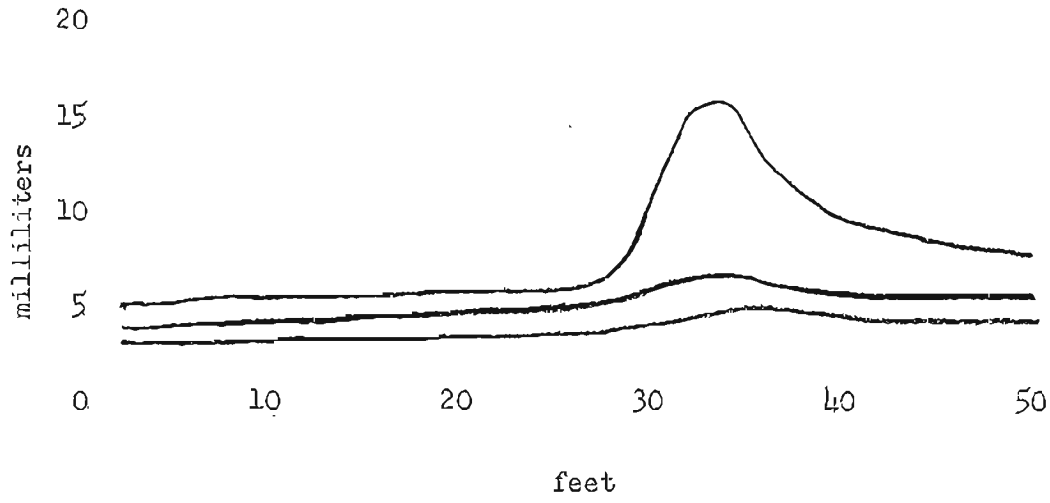

Figure I. Illustrates the Geochemical Anomalies from the A, B, & C Horizons of the Preliminary Geochemical Line Laid Across the Vein.

A geochemical exploration line was then laid out perpendicular to the strike of the vein, and far enough away from the last trenching site so that fresh, uncontaminated soil samples could be obtained along its length. Soil samples were taken from the C horizon at 20 foot intervals along the line. A representative sample was taken from the soil auger, measured into a 0.1 gram scoop, placed in a 50 ml cylinder for assay and tested immediately in the field. Total exploration time spent at each hole was approximately 10 minutes.

Holes #10 and #11 indicated a possible anomaly so soil samples were taken every four feet between holes #9 through #12 (see table #1 for analysis).

TABLE I. Assay Results of Holes 9-12 at 4' Intervals

Hole Number	Milliliters of Dz in CCl_4
9A	3
B	3
C	4
D	5
E	6
10A	8
B	17
C	18
D	16
E	12
11A	6
B	6
C	5
D	5
E	4
12A	3

A sharp and definite anomaly was produced, indicating the position of the vein. The exploration line was extended from one side of the claim to the other to detect any possible parallel veins, but none could be found within the limits of the claim. An attempt was then made to start tracing the vein the full length of the claim but cold weather and freezing ground soon brought a halt to this program.

In 1956 the prospector ran a bulldozer trench where the anomaly indicated the vein to be and that is where it was exposed.

CONCLUSIONS

Geochemical prospecting proved valuable in locating the vein quickly and economically. The absence of parallel veins on the claim was also quickly determined, and this particular problem had bothered

the prospector for a number of years. Just as geochemical prospecting was successful in telling this prospector something about the presence or absence of ore bodies, so too can it be applied to other prospects.