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PRELIMINARY COMMENTS REGARDING A SOIL-GEOCHEMISTRY ORIENTATION SURVEY GOLD HILL, VALDEZ CREEK MINING DISTRICT, HEALY A-1 QUADRANGLE, ALASKA

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PRELIMINARY COMMENTS REGARDING

A

SOIL ORIENTATION SURVEY

GOLD HILL, VALDEZ CREEK MINING DISTRICT, HEALY A-1 QUADRANGLE, ALASKA

During July of 1988, eight test pits were dug at measured intervals along a line intersecting, and perpendicular to, the estimated trace of the Yellow Horn vein at the Yellow Horn prospect located on the north flank of Gold Hill, Valdez Creek Mining District, Healy A-1 Quadrangle , Alaska. The pits were hand dug to a depth of about 2 1/2 to 3 feet. This depth was not sufficient to reach the C-horizon except at station 3. The total length of the test line is about 325 feet (slope distance) (Figure 1). Each pit was examined to determine the presence and nature of soil-profile development. These observations were recorded and a series of samples were removed from the pits. In addition, a soil grab-sample from just beneath the vegetation to a depth of 6 to 8 inches was taken adjacent to each test pit. Each identifiable horizon in each pit was sampled, however, because of funding constraints, only material from the deepest horizon in each pit was analyzed. The material from the higher soil horizons is available for processing should that become desirable in the future.

The sediments on Gold Hill above 3000 feet are residual but extensively soliflucted. Soil profile development is perceptible but very immature. It is evidenced by subtle color changes. An "A" and "B" horizon were found in all test pits. The geochemical data indicate that eluvial processes in the A-horizon have depleted that soil layer of gold and trace metals. Therefore, any soil or heavy mineral concentrate (HMC) samples should be taken from the deeper B-horizon.

Soil textures in the test pits provide evidence of overlapping solifluction lobes. This is seen in the relative proportion of matrix sediment to rock fragments in the pit walls. Soil development, as evidenced by color change, is independent of these textural changes.

Two small grab-samples, and one large sample from the lowest B-horizon exposure, were processed for each test-pit. One small grab-sample was an A-horizon sample from adjacent to the pit. The second small grab-sample was taken from the lowest exposure of the B-horizon in each pit. Each of these two small samples weighed approximately 1 kg. The bulk samples weighed approximately 4 to 6 Kg.

The grab-samples were processed by drying, sieving to -80 mesh, and pulverizing to -150 mesh. Subsequent chemical analysis consisted of Fire Assay-AAS gold analysis, and ICP-trace element analysis.

The bulk samples were dried, a 1 Kg aliquot was removed for division into 4 size-fractions, and the remainder processed to extract the -35 mesh to +230 mesh fraction HMC. The four size-fractions

obtained consisted of (-10 to -35 mesh), (-35 to +80 mesh) (-80 to +230 mesh) and (-230 mesh) material. All material grater than 230 mesh was pulverized to -150 mesh prior to analysis for gold and trace elements.

The above sampling and subsequent processing results in providing the following data for each test-pit:

A-horizon soil (-80 mesh)	Au + trace-elements
B-horizon soil (-80 mesh)	Au + trace-elements
B-horizon soil (-10 to +35 mesh)	Au + trace-elements
B-horizon soil (-35 to +80 mesh)	Au + trace-elements
B-horizon soil (-80 to +230 mesh)	Au + trace-elements
B-horizon soil (-230 mesh)	Au + trace-elements
B-horizon HMC (-35 to +230 mesh)	Au + trace-elements

Previous work in the Valdez creek area indicates that there is no correlation between trace-element base- and transition-metals and gold for rock and ore samples. Profile plots made from data generated in the present orientation study, however, show consistent correlation in B-horizon soil, between gold and many trace-elements (Figure 2a,b).

All types of soil samples, and size-fractions, provided a signal indicating the presence of the Yellow Horn vein. Because all samples and size fractions show the same relative changes in gold content along the line of test pits, it is inferred that the marked changes in gold concentration apparent in the data from pit to pit are a reflection of real changes in the soil gold content at each pit site and not random sampling and analytical noise. The data further indicate a source of gold mineralization above the Yellow Horn vein, and perhaps one below the Yellow Horn vein.

The following graphs provide additional insights relative to Gold Hill soil sample characteristics.

AuA (-10 to +35 mesh)	B-horizon soil
AuB (-35 to +80 mesh)	B-horizon soil
AuC (-80 to +230 mesh)	B-horizon soil
AuD (-230 mesh)	B-horizon soil
AuH (-35 to +230 mesh)	HMC
AuG (-80 mesh)	A-horizon soil
Au (-80 mesh)	B-horizon soil

Figure 3 shows gold concentration for the four B-horizon size fractions and the B-horizon HMC plotted on an arithmetic scale. This graph indicates the magnitude of signal enhancement afforded by the HMC sample.

Figure 4 shows the marked gold signal degradation inherent in the -80 mesh A-horizon grab sample when compared to the -80 mesh B-horizon grab sample.

Figure 5 combines the gold data for all 4 size-fractions of B-horizon soil samples, HMC gold data, and the data for the A-horizon -80 mesh grab sample. These data are plotted on a logarithmic scale to better show that although the response of the soil samples is lower than that of the HMC samples, they are (with the exception of the A-horizon data) still usable for detecting Yellow Horn-type of mineralization. Some measure of preference with regard to the effectiveness of the various sample media can be deduced from considering the peak-to-background ratio defined as the ratio between the average gold concentration of the sample from test pit 3 divided by the average gold concentration of similar samples from test pits 4 and 5. The sample types providing the higher ratio would presumably be more reliable in detecting mineralization. Approximate ratios obtained by interpolating gold concentration values from graphs 4 and 5 are as follows.

AuA	(-10 to +35 mesh)	B-horizon soil	12.4
AuB	(-35 to +80 mesh)	B-horizon soil	5.3
AuC	(-80 to +230 mesh)	B-horizon soil	26.0
AuD	(-230 mesh)	B-horizon soil	8.7
AuH	(-35 to +230 mesh)	HMC	69.0
AuG	(-80 mesh)	A-horizon soil	1.6
Au	(180 mesh)	B-horizon soil	9.5

The strongest signal is given by the HMC samples, but only the A-horizon -80 mesh sample is really a poor choice.

CONCLUSIONS

A 1 kg, -80 mesh B-horizon soil sample should effectively detect gold mineralization of the Yellow Horn type on Gold Hill. Although this sample is not the most sensitive to mineralization, its sensitivity is adequate. Collecting an processing carefully taken B-horizon samples is significantly faster and cheaper than collecting and processing either HMC or -80 +230 mesh soil samples. The cost savings in sample collection and processing would allow a close grid spacing to be used in the routine soil survey. The increase in sample numbers will, at least in part, offset the loss in sample sensitivity, and the closer grid spacing will improve the probability of detecting narrow zones of gold mineralization.

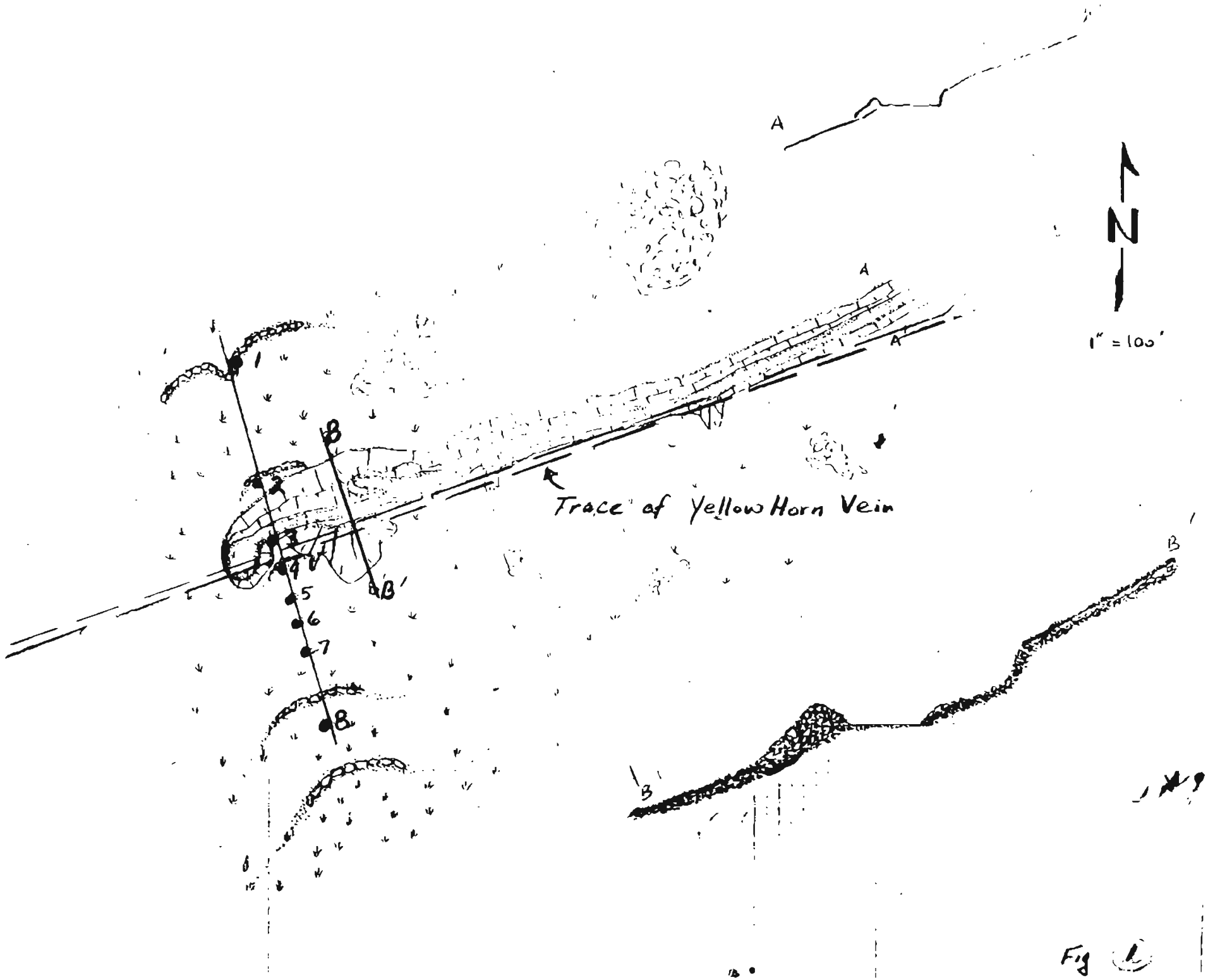
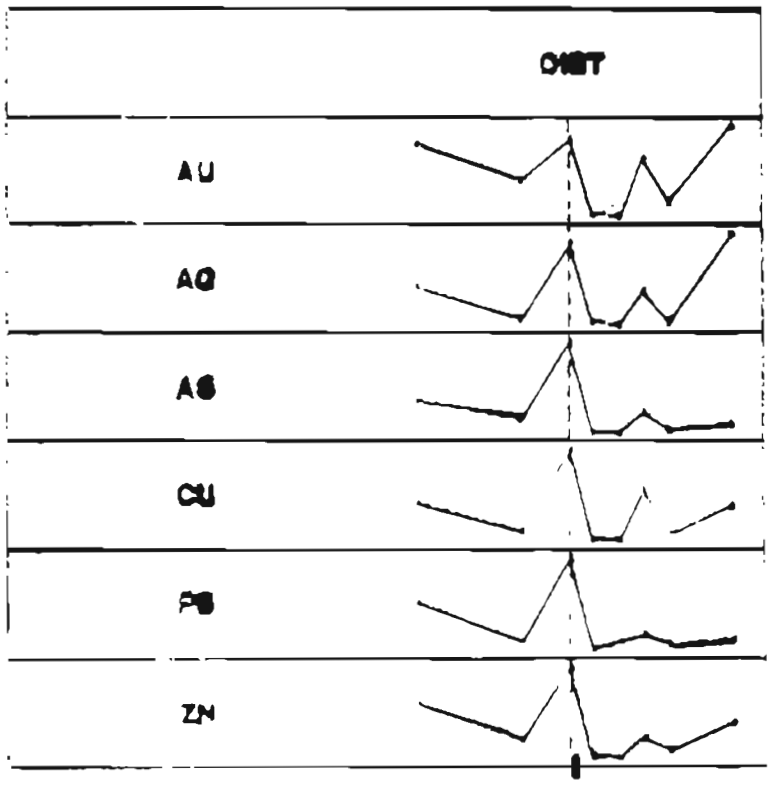
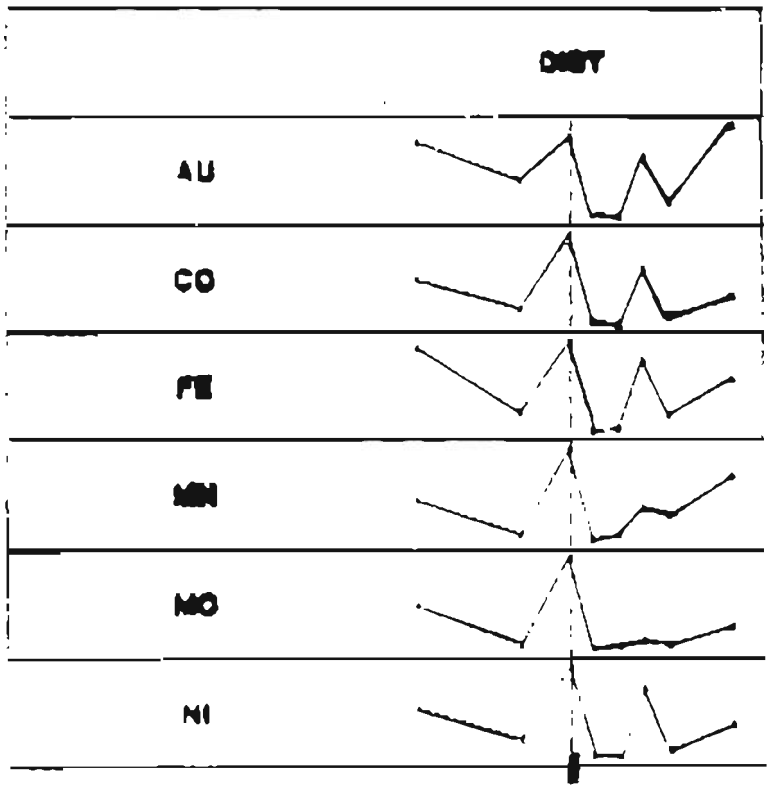


Fig 1

GOLD & PATHFINDER ELEMENTS



GOLD & BASE METALS



Gold in Soil Fractions

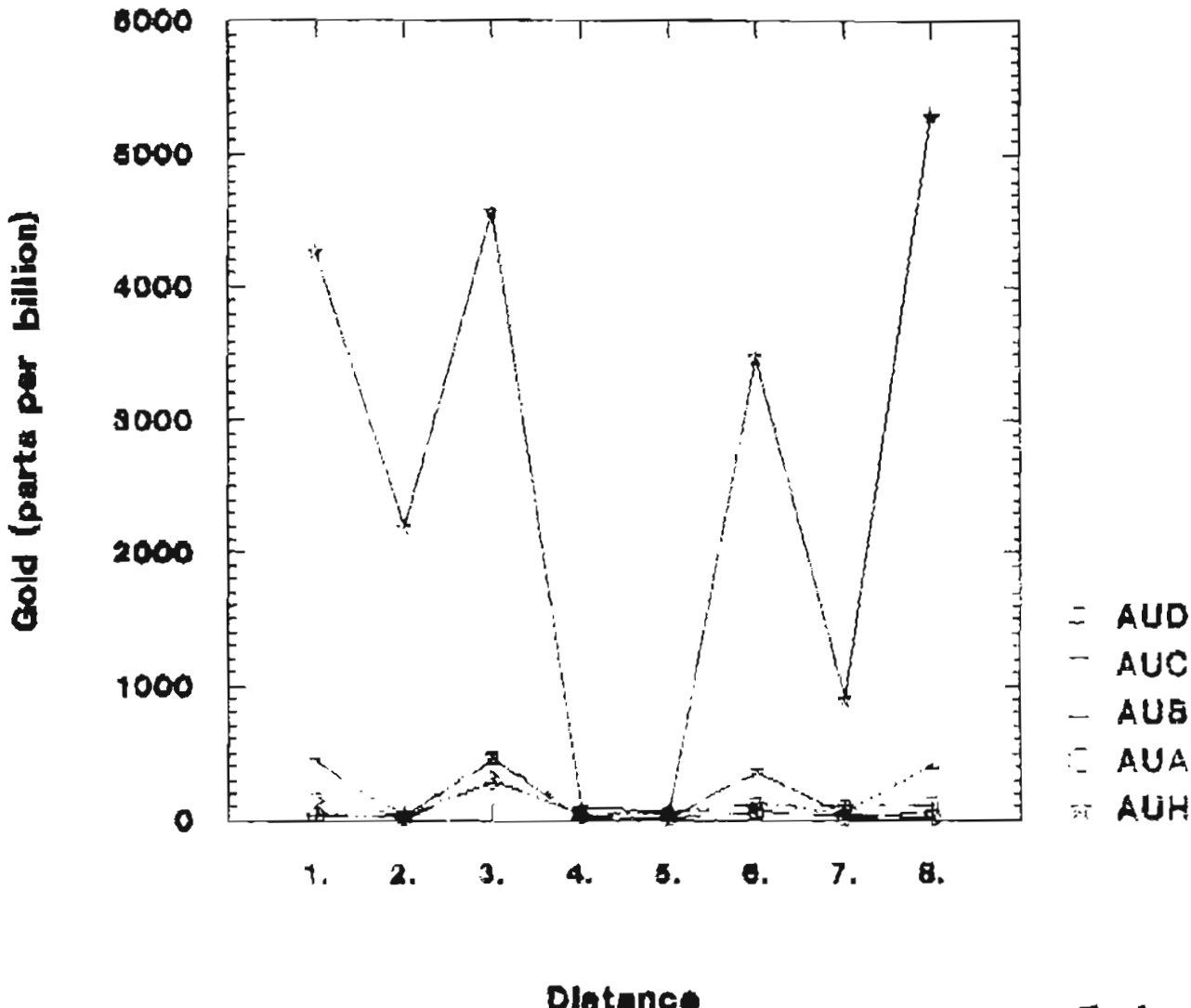


Fig 3

Gold in A- & B-Horizon Soil Samples

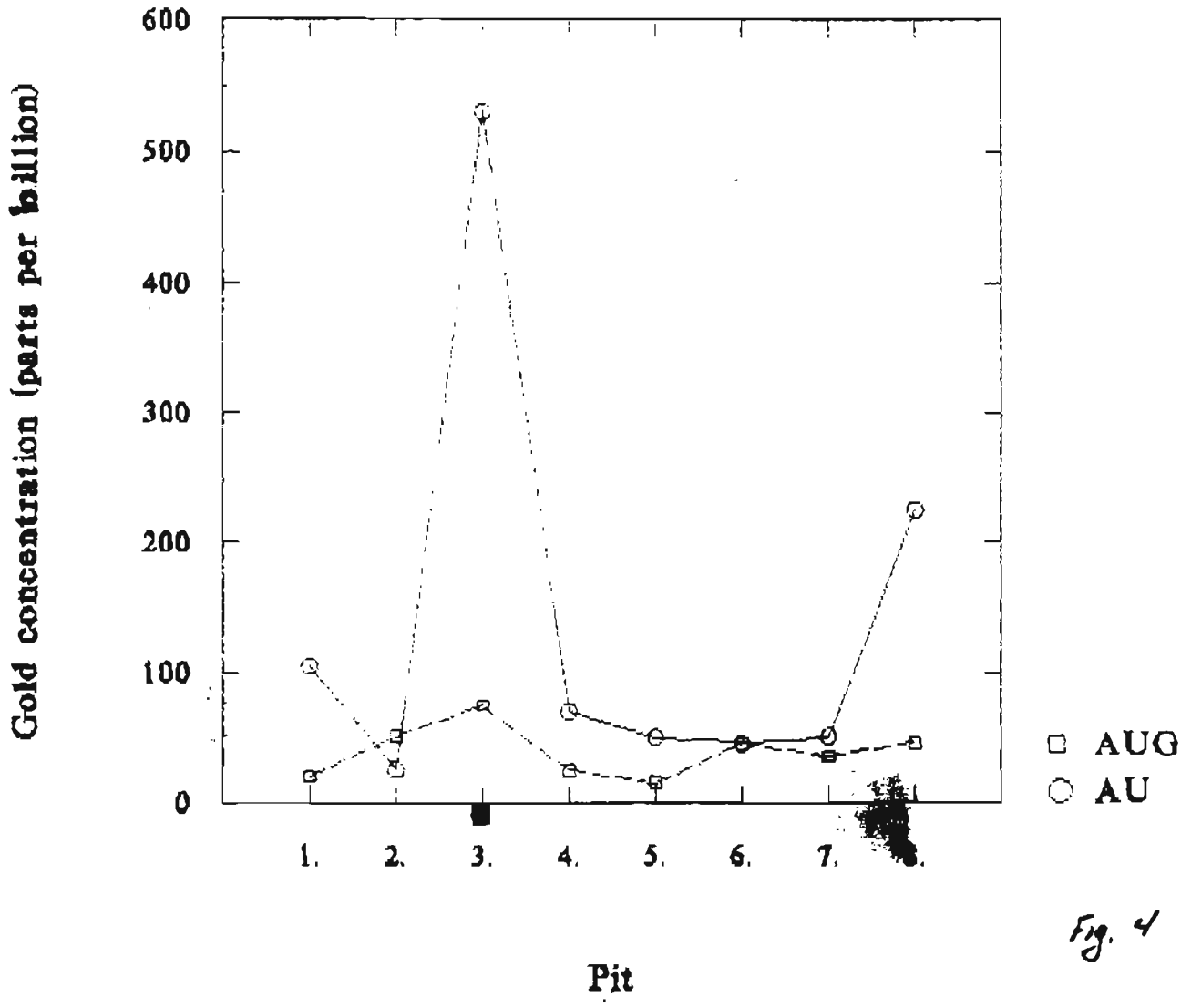


Fig. 4

Gold in Soil Fractions

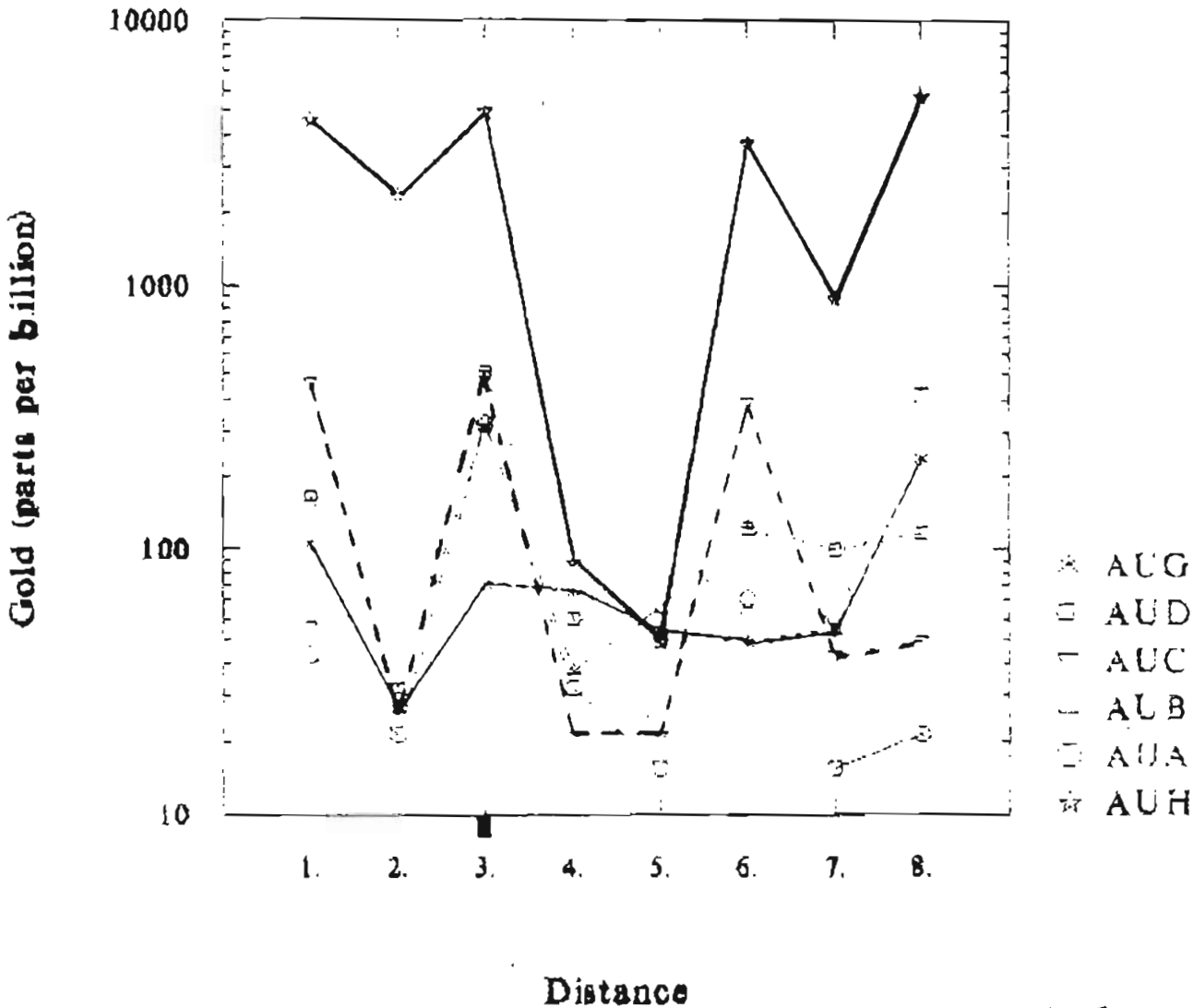


Fig 5