

# Vital Resources Limited

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## VITAL RESOURCES LIMITED

### SUMMARY

There is a good possibility that the SOUP deposit wholly owned by Vital contains hundreds of millions of tons of gold-copper ore grading \$20 per ton, 80% of the value being in gold.

The mineralization could be mined by open pit methods and the gold is recoverable in the copper concentrate.

Total operating costs could be \$5 Canadian (1983).

Cost of a drill test would be about \$250,000.

An additional adjacent property held by Vital has been shown to contain economic mineralization, and an additional \$250,000 is requested to test and hold this property, and for other exploration purposes.

### HISTORY

Vital is a private B. C. Company, incorporated as Vital Mines Ltd., later changed to Vital Resources Ltd. It acquired oil, coal, silver, gold and base metal interests. In 1980, a group, including the principals, provided \$500,000 @ 62.50 cents per present share to carry out work and acquire properties. Present capitalization is 10,000,000 shares of which 2,400,000 are issued.

Principals are well-known geologists, C. J. Sullivan and Terence Rodgers. From 1954-71 Sullivan directed exploration for Kennco, which resulted in many discoveries including Equity Silver, B. C. Molybdenum, Stikine Copper, Toodoggone gold-silver, Berg copper-molybdenum, etc. Sullivan and Rodgers, with a Japanese group, discovered the Kutcho Creek copper-zinc deposit

Vital controls the following properties:

### OIL

At present, Vital owns oil prospecting concessions S.W. of Houston, B. C. It discovered oil-bearing rocks, later investigated by Esso, which thought that the oil was derived from oil shale. No further work is envisaged at present.

### HOUSTON SILVER-GOLD

Vital owns mineral claims (RED et al) about 28 miles S.W. of Houston, B. C. on which there are impressive geological, geochemical and geophysical signs of lead-zinc-silver mineralization. Ore found on the property contains 30 oz. silver & 0.45 oz. gold/per ton as well as 25% lead-zinc. This material

would be highly profitable. The property is under investigation by Noranda (Mattagami) which plans further drilling in 1983. While this is proceeding, no further work is planned by Vital.

Total expenditure on this property to date by Vital, Noranda and others is estimated at approximately \$1 million.

The prospect is considered to be valuable, with geology not unlike that at Equity. The source of the ore is probably covered by gravels. Several significant geophysical indications remain to be drilled.

#### AIR SURVEYS

Vital owns about \$400,000 worth of air-borne geophysical data, in which there are important signs of major mineralization, some very favourably situated for exploration. We plan to investigate these, as funds and metal markets permit.

#### KLIYUL GOLD-COPPER AREA (Between Aiken & Johannsen Lakes, B.C.)

Vital has been interested in this region for the past 10 years, and has spent over \$1 million in regional and detailed investigations. Past exploration was largely for porphyry copper, but in recent years the value of gold relative to copper has increased by about 10 - 15. This, combined with the discovery of Vital of unusual quantities of gold, has led to the conclusion that this district may be primarily a source of open pit gold. The gold is associated with magnetite, pyrite and chalcopyrite.

Vital controls two claim groups, the KLI and the SOUP, each with similar geology and mineralization.

#### KLI CLAIMS

These claims were staked in the early 60's by Kennco for porphyry copper. In the early 70's Sullivan and Rodgers, along with Sumitomo, optioned the properties and found mineralization grading 0.06 oz. gold and 0.5% copper. Subsequently, Vital obtained the Sumitomo interest and in 1981 spent \$200,00 on drilling and other work.

The testing was in a small magnetic area, now thought to be satellite to a larger magnetic zone to the north, staked by Vital in 1982.

The limited drilling discovered magnetite-chalcopyrite-gold mineralization and indicated about 500,000 tons grading 0.06 oz/ton Au, 0.46% Cu and 0.2 oz/ton Ag, or 2,500,000 tons grading 0.03 oz Au, 0.3% Cu and 0.1 oz Ag.

Metallurgical work on cores carried out by the Ontario Research Foundation and by the University of Toronto indicated that the gold concentrates readily in the chalcopyrite flotation concentrate which can be sold on good terms. Even if further work shows that some gold remains in the pyrite, this can be

roasted and leached at relatively low cost per ton of ore.

Recoveries for gold and copper are projected by competent metallurgists at 90%.

The KLI claims are presently owned 55% by Vital and 45% by Kennecott Copper. Vital can expand its interest to 80% by a further expenditure of about \$1 million.

Limited geochemical and magnetic investigation of the new claims staked in 1982 is proposed for 1983, the main attention being focused on the impressive SOUP claims.

### SOUP CLAIMS

These claims commence about 6 km S.W. of the KLI claims, and are wholly owned by Vital. The geology is a continuation or repetition of that found at KLI and the deposits are similar. Large magnetic oxidized sulphide zones (gossans) are present, but outcrop is obscured by soil and rock scree.

The mineralized zones are believed to extend throughout the length of the claims (8,000 ft.) and the width of the zone could be up to 1,000 or more feet. Gold and copper are present in bands of rock containing up to 30% magnetite, but geochemistry, magnetics and rock sampling indicate that these metals are present also in other rock units containing minute fractures with magnetite, chalcopyrite, gold etc. Such vein systems, known as stockworks, have formed many large ore deposits.

### Soil Sampling

As shown on the accompanying plans, soil sampling results are very impressive. For example, the accompanying section along line 40 and 50 S shows that, across a width of about 450 meters, samples taken every 25 meters averaged about 2000 ppm copper and 1.5 gms/ton gold. The value of these metals is about \$30 per ton at present prices.

### Magnetics

Magnetics carried out by Noranda on SOUP 1, 2, 3 and 4 claims show that though higher readings occur over some mapped magnetite bands, previously unknown highly magnetic zones also exist, while a relatively high magnetite zone extends for 500 meters north of the baseline. This is also the area of high geochemistry. Whereas on the KLI claims the magnetic band drilled was 8,000 to 10,000 / above immediate background, on the SOUP the known high magnetite bands are only 2 - 3,000 / above the surrounding areas, showing that these also probably contain magnetite and other mineralization.

### Rock Sampling

This accompanying map shows rock sampling results. Owing to the difficult terrain and to scarcity of outcrop, only 17 spot samples were taken within the area of interest on claims 1, 2, 3, 4 & 11. However, of these, 8 contained metals worth plus \$20 per ton, 3 showed significant copper and 6 were negative.

This sampling is quite inadequate for a proper test, but the results are considered encouraging.

### Economics

In thinking of gold deposits such as those in the Kliyul area, it is important to consider nett smelter return. Smelters pay for 95-98% of the gold in a copper concentrate, whereas freight, smelting, refining and realization of copper may cost 35-45¢ per lb. A rough copper concentrate from Kliyul (3.9% Cu) contained 1.47 oz gold/ton. A cleaned copper concentrate (20+% Cu) could therefore be expected to contain plus 5 oz gold per ton. This means that the producer could be paid for 98% of the value of the gold. At 90¢ per lb for copper, however, the concentrate producer would probably received about 50¢ per lb.

Thus, a miner recovering 10 lbs of copper per ton (0.5%) with copper at 90¢ might receive about \$5 per ton from the smelter, whereas a gold-copper producer recovering 1 gm gold per ton (about 0.03 oz) and 6 lbs of copper per ton (0.3% Cu) in a 5 oz gold per ton concentrate might expect to receive:

Gold at \$600 Cndn	=	\$20 x 98%	=	\$19.80
Copper at 90¢ Cndn	=	6 x 50¢ net	=	<u>3.00</u>
				<u>\$22.80 per ton</u>

Put another way, Kliyul-type ore (0.3% Cu, 0.03 oz Au) is equivalent in value to about 2% copper ore.

For comparison Lornex revenue per ton in 1981 was \$6.60, 20% being from molybdenum, now not so saleable. Operating costs were \$3.59 per ton. Other operating properties had lesser revenue per ton.

Using current Brenda (\$4.50), Lornex (\$3.60) and other costs, it is considered at this stage that large-scale (30 to 50,000 t.p.d.) mining and milling in this area could be carried out for \$5 (1983) per ton. As shown on the section, stripping ratios for major ore widths could be quite modest, and our mill tests indicate relatively easy concentration of the gold and copper at moderate grinding. Therefore, the following economics

Economics (Cont'd)

are possible, using 1983 prices, costs etc.:

Throughput - 15,000,000 t.p.y.

Revenue @ \$20/ton	-	\$300,000,000	
Operating cost		<u>75,000,000</u>	
Operating profit		<u>\$225,000,000</u>	
Capital cost		<u>\$350,000,000</u>	? C.I.!

(These numbers are shown to illustrate the type of prize which could be present.)

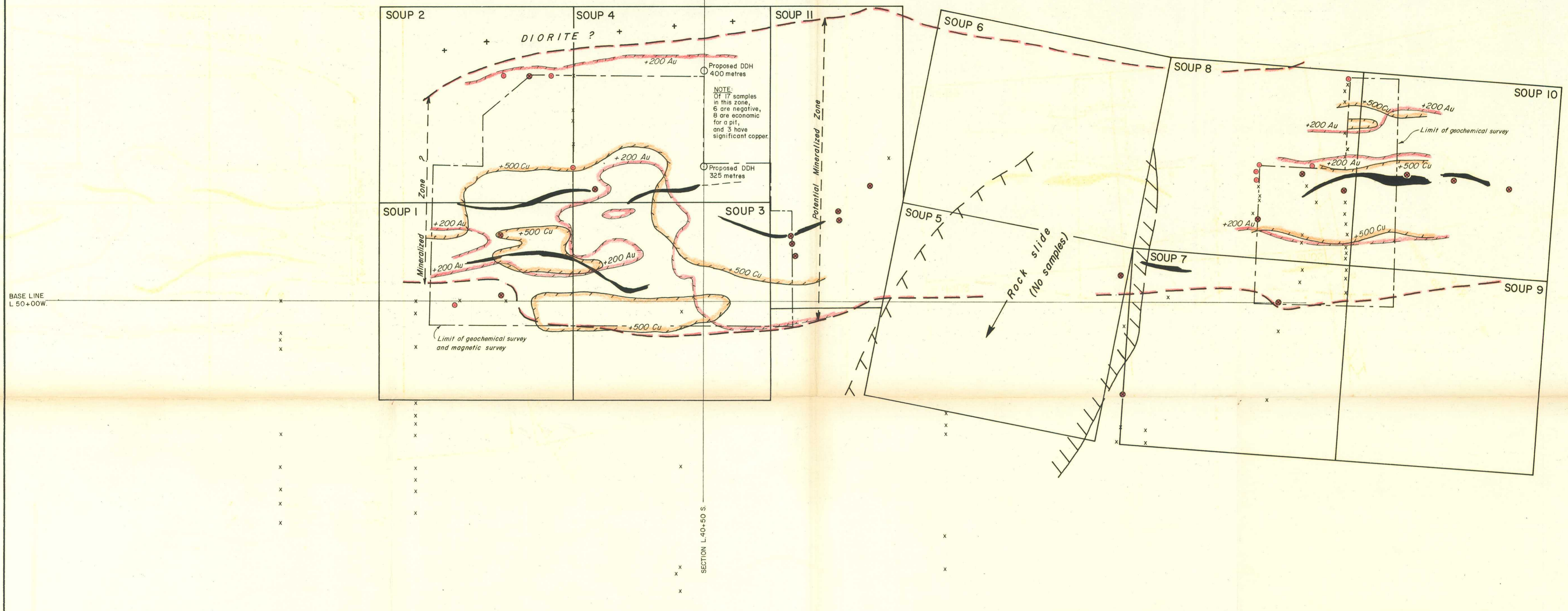
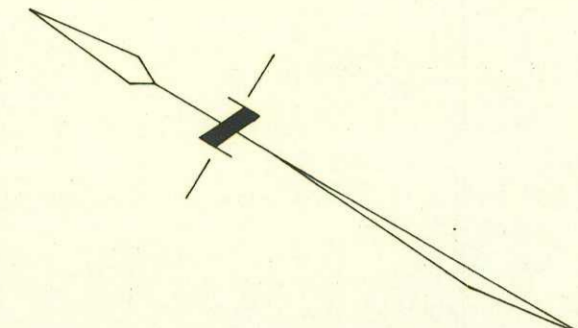
Proposed Program

The program envisaged is essentially to drill, as shown on Section 40 + 505. This would consist of about 725 meters or 2,400 ft. of diamond drilling, with core analysis, etc. At an estimated cost of \$250,000 this is considered an excellent venture in relation to the prize outlined above.

Toronto, Canada  
January, 1983

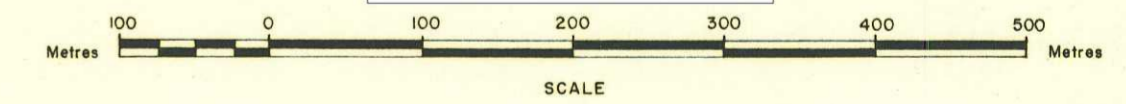
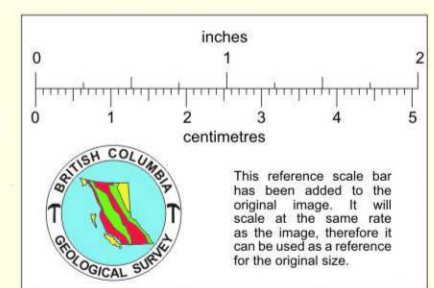
*C. J. Sullivan*  
C. J. Sullivan  
President.





SECTION L 40+50 S

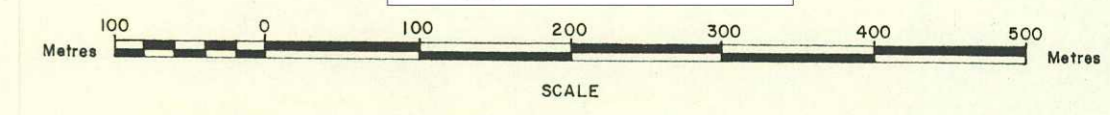
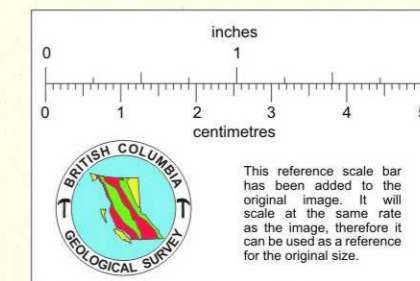
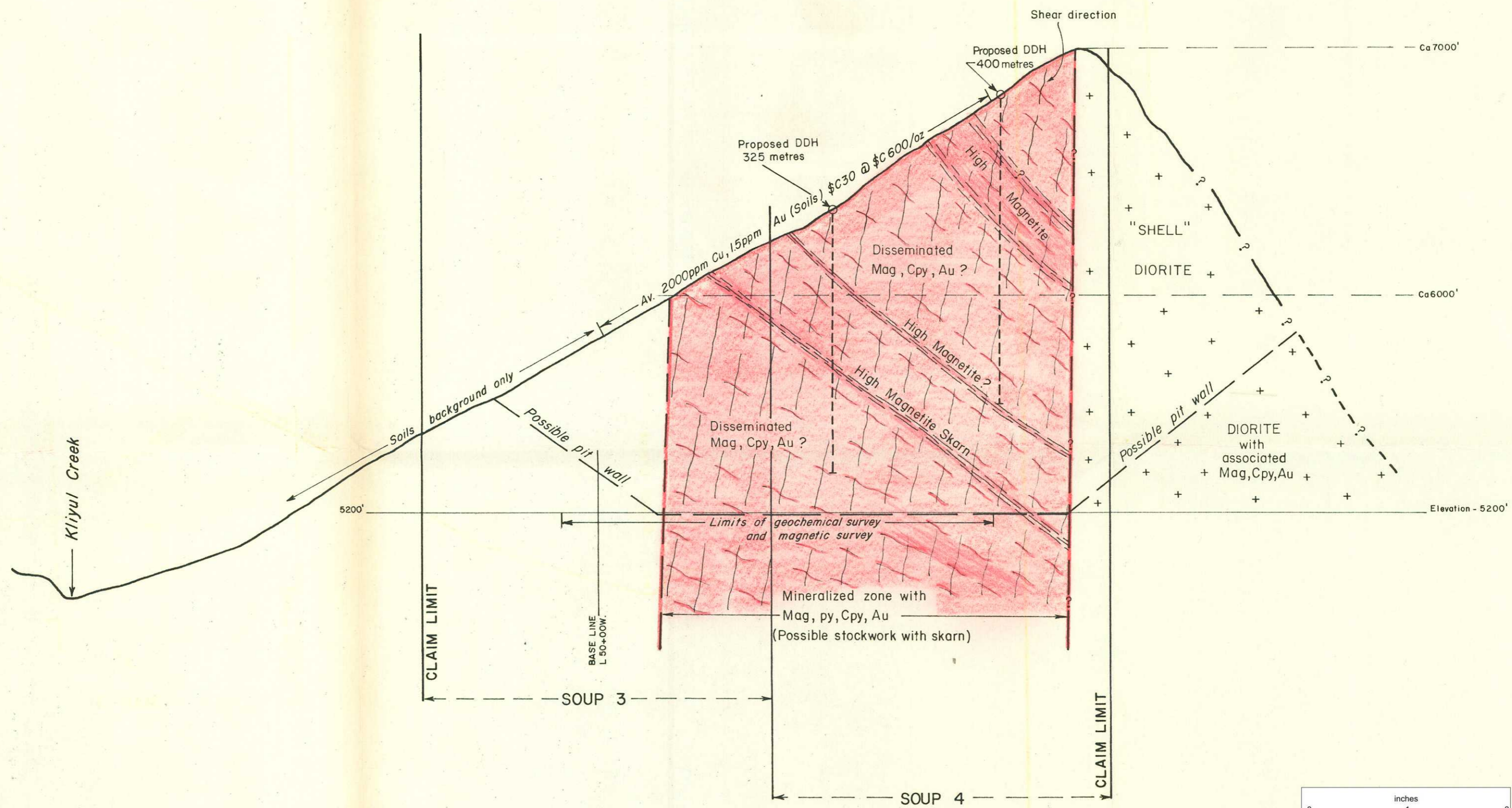
BASE LINE  
L 50+00W



- LEGEND**
- Plus \$20 Au-Cu @ \$600/oz. + 90c/lb. Cu
  - Significant Copper (0.3 to +1.0%)
  - x Essentially barren
  - +500 Cu Copper in ppm
  - +200 Au Gold in ppb

**VITAL RESOURCES LTD.**  
**SOUP CLAIMS**  
**KLIYUL AREA, B.C.**  
**ROCK SAMPLING (NORANDA et al)**  
 Scale: 1:5000





Drill test recommended — 725 metres (2400 feet)

**VITAL RESOURCES LTD.**  
**SOUP CLAIMS**  
**KLIYUL AREA, B.C.**  
**SECTION LINE 40+ 50 S.**  
 Scale: 1:5000



DIORITE AND GOLD - SOUP CLAIMS

Apart from the gold and copper associated with magnetite skarn zones, mineralization may also exist in dioritic sills - a possibility which has been neglected.

One sample taken by B.P. Minerals, apparently in a dioritic footwall sill, assayed 0.95 oz Au/ton over 3 meters (Soup claim 1).

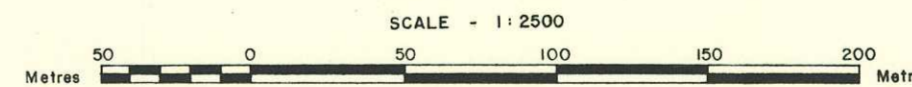
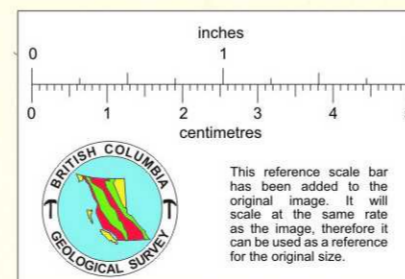
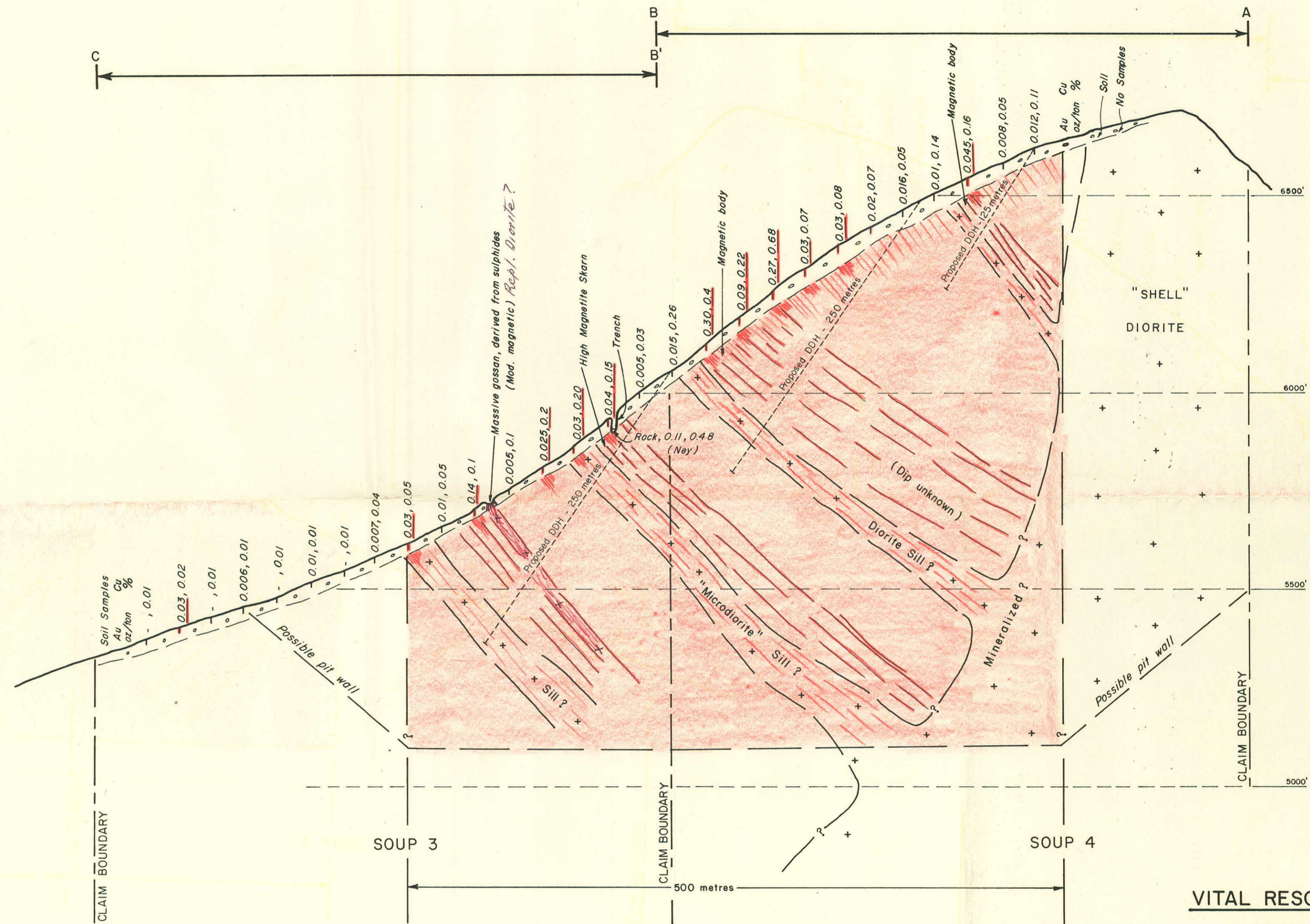
Limonite-rich gossan, apparently in situ, which I examined immediately east of the baseline at 4225 S. appeared to be replacing basic igneous rock. It was only moderately magnetic. Adjacent soil samples contained 1.8 to 4.5 gms gold per ton and 1000 to 1500 ppm copper. The Shell Diorite, which extends on to the Soup claims, is known to be associated with magnetite-copper-gold mineralization (G.S.C. Memo. 274, pp 212-217, 1954).

On another property in this district, 0.2 to 0.3 oz gold per ton over widths of 30 to 40 ft. has been obtained in sheared diorite sills (Ibid, pp. 217-218).

There is a world-wide association between diorite and gold, e.g. Bougainville.

*C. J. Sullivan*  
 C.J. Sullivan

March 1, 1983



*Note: one sample of*

**VITAL RESOURCES LTD.**  
**SOUP CLAIMS**  
**KLIYUL AREA, B.C.**

Composite Section A - B - B' - C, showing soil sampling results in oz/metric ton gold, and percentage copper, plus possible drill holes.  
 Subsurface geology is unknown, though diorite sills have been noted in the footwall of magnetite skarn zones carrying copper and gold. Some sills are mineralized.  
 A recovered grade of 0.03 oz/ton gold, plus 0.3% copper and 0.1 oz silver would have a net smelter return of \$20 to \$24 per ton at current metal prices. Rock grades can be determined only by careful sampling. The soils are unusually rich in metal (uncut average, 0.05 oz/ton Au, 0.15% Cu)  
 Drill test suggested - 625 metres (about 2000 feet)

C.J. Sullivan  
 February, 1983