



Seventy-two soil samples were collected on a grid in the immediate area of the old workings and analyzed for copper, lead, zinc, silver and arsenic by atomic absorption and for gold by neutron activation. Base metal and silver values are uniformly low; only two samples were anomalous in arsenic (above background of 15 ppm); fifteen samples were anomalous in gold (background 10 ppb) with five greater than 100 ppb Au. Higher values are confined to areas near the old shafts and adits. Soil geochemistry is however of limited use in this area due to the hydraulic placer mining methods.

Blocks of vein quartz containing trace pyrite as cubes and grains (less than 2 cm diam.) were found near the old shaft (veins up to 1 m thick). Some visible gold (associated with pyrite) was found in discordant vein material in the chute into the ore bin at the old mill.

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Assessment Report

on

Klot 1-8 Claims

Dawson Mining District

NTS 1150/14 and 116B/3

091563

by

J.K. Mortensen, Ph.D.

Archer, Cathro & Associates (1981) Limited

June 13, 1984

This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representation for amount

of \$ 3,731.73

*D. A. Emmond*

*for* Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

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## Introduction

The Klot 1-8 claims were staked in June, 1983 by Archer, Cathro & Associates (1981) Limited on behalf of Dawson Eldorado Gold Explorations Ltd. Geological sampling of the property was carried out during 1983.

## Location, Access and Vegetation

The property is located on Bear Creek and covers much of lower Discovery Pup, which is a west tributary into the left limit of Bear Creek (Figure 1). A two-wheel drive road up Bear Creek crosses the eastern half of the property.

Virtually the entire Klondike District, with the exception of the summit of King Solomon Dome, lies below treeline. Vegetation on south- and southwest-facing slopes consists of stands of aspen or mixed aspen and birch, with varying amounts of underbrush, which generally becomes denser at higher elevations. Permafrost is commonly absent on south-facing slopes, but is much more widespread on north-facing slopes. Such north-facing slopes are characterized by scattered scrub spruce or mixed spruce and aspen, with varying amounts of underbrush. The ground is commonly covered by very thick moss, which passes downward into frozen peat-like material and then into frozen soil.

## History and Previous Work

The property was first staked as Ophir, etc claims (597) in June, 1901, Gordon claims (6981) in May, 1904, Virgin claims (10862) in May, 1908 and Jean claims (11141) in August, 1909 by J. Whitelaw, who completed two adits (40 ft and 10 ft), a 20 ft shaft, a 40 ft long open cut and a number of trenches in 1902-07. A two-stamp, 4 ton/day mill was installed during 1913 by Klondike Gold Quartz Mines Ltd., which sank a second shaft to 35 ft, extended one of

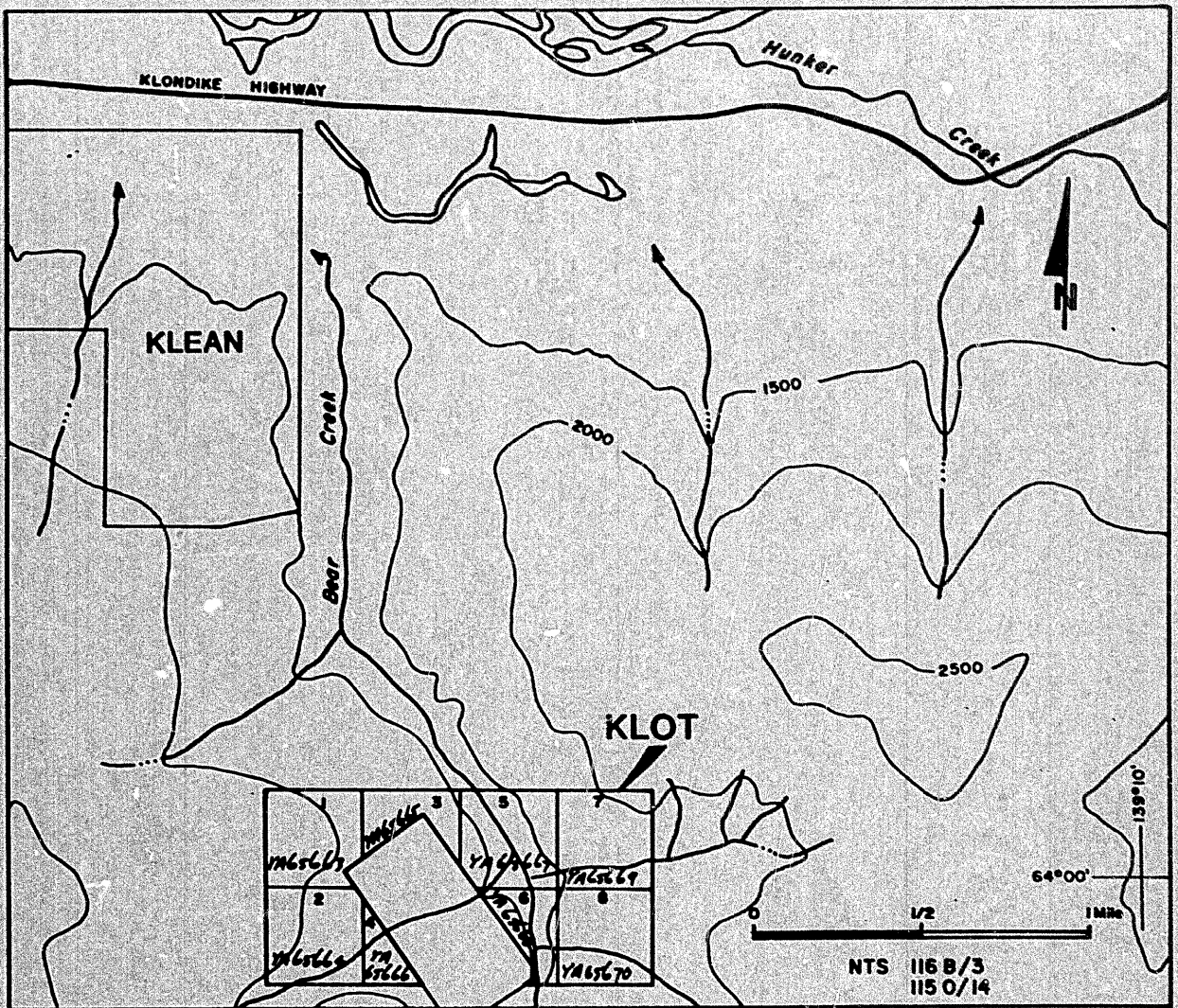


Figure 1  
 ARCHER, CATHRC & ASSOCIATES (1981) LIMITED  
**LOCATION MAP**  
**KLOT CLAIMS**  
 KLONDIKE PROJECT

the adits to 290 ft and is rumoured to have recovered about \$5,000 in gold. The property was purchased in 1914 by Bear Creek Mining Co. Ltd., which added a few claims and surveyed and leased several in 1915. The property later reverted again to Klondike Gold Quartz which reorganized in 1934 and attempted unsuccessfully to install a larger mill.

The target was restaked as Hun claims (Y65318) in May, 1972 by R.G. Hilker for Sullivan and Rogers, who conducted mapping and geochemical sampling later in the year and trenching in 1973; as GOS claims (YA5138) in July, 1976 by F. Burkhard; and, as Lode claims (YA49691) in May, 1980 by F. Merryth. All of the old workings on the property area are now covered by the GOS and Klot claims.

### Regional Geology

The Klondike District lies within the unglaciated portion of the Northern Cordillera, and experienced strong surface weathering during the early and mid-Tertiary. As a result, bedrock exposure is extremely limited (considerably less than one percent), and surface weathering locally extends to depths of 80 m or more. The scarcity of outcrop necessitates a regional approach to understanding the geology of individual properties (many properties in the Klondike have only one or two outcrops on them). In the following report, the property geology is discussed and interpreted in the light of regional mapping carried out by the writer during the 1983 field season. The bedrock geology of the property and adjacent areas is based on data collected from available bedrock and subcrop (which is usually confined to road cuts, placer workings, and ridge crests), as well as the distribution of various lithologies as rock chips in the overburden. Since solifluction and downslope creep are

the only processes operating to transport the rock chips, the latter technique can be used (with caution) to approximately locate lithological contacts in overburden-covered areas.

The Klondike District is underlain by a series of thrust sheets that are separated by regional-scale thrust faults. Discontinuous lenses of altered ultrabasic rocks occur along the thrust faults. The rock units that make up the various thrust sheets are described briefly in Table I.

An early pre-thrusting, metamorphic foliation that parallels compositional layering is pervasive in all rock units except the ultrabasic rocks and the younger intrusions and volcanic rocks (units KTqfp, KTVs and Mzd). The thrust faults are deformed by at least three younger phases of deformation. The second phase event ( $F_2$ ) produced west- to northwest-trending folds that are developed to varying degrees throughout the district. The third phase ( $F_3$ ) includes northwest-trending folds and is only recognized in the northeastern portion of the district. Late, small-scale warping ( $F_4$ ) is noted locally. Little evidence was seen for large-scale steep faulting in the area, although abundant topographic linears suggest that small-scale steep faults may be common.

Two distinct generations of quartz veins are recognized regionally in the Klondike District. The most abundant is an early generation of metamorphic quartz veins (referred to as "foliaform quartz") that comprise narrow lenses and pods parallel to the  $F_1$  foliation. Minor amounts of ferroan carbonate, pyrite and white to pale pink feldspar occur locally in the foliaform quartz. A younger set of quartz veins (referred to as "discordant quartz") form tabular veins that crosscut compositional layering in the schists as well as the  $F_1$  and  $F_2$  foliations. These veins reach 2.5 m in thickness in parts of the Klondike District. Pyrite is commonly present, usually as narrow selvages. Other sulphides,

TABLE ILITHOLOGIC UNITS IN THE KLONDIKE DISTRICT

<u>Unit</u>	<u>Map Symbol</u>	<u>Description</u>
15	KTqfp	- unfoliated quartz-feldspar porphyry
14	KTvs	- interbedded immature clastic rocks and intermediate to mafic volcanic rocks
13	Mzd	- unfoliated hornblende diorite and quartz diorite
12a	Pzub	- variably altered ultrabasic rocks (serpentinite, talc-carbonate rock, and silica-carbonate rock)
12b	Pzgr	- massive to weakly foliated greenschist
11	Pzm	- schistose impure marble
10	Pzmq	- muscovitic quartzite
9	Pzqs	- carbonaceous quartz-muscovite phyllite and schist (locally includes minor 6 undifferentiated)
8	Pzmcq	- fine-grained muscovitic and chloritic quartzite
7	Pzqms	- tan to rusty weathering quartz-muscovite, muscovite-quartz, and muscovite schist
6	Pzcs	- chlorite and chlorite-quartz-muscovite schist (includes minor amphibolite)
5	Pzqe	- "quartz-eye schist" (quartz-muscovite schist with abundant clear to bluish quartz [ $\pm$ feldspar] augen)
4	Pzqd	- weakly to moderately foliated, medium-grained, quartz dioritic orthogneiss
3	Pzmg	- weakly to strongly foliated metagabbro
2	Pzmd	- weakly to strongly foliated metadiorite
1	Pzog	- strongly foliated granitic to quartz monzonitic orthogneiss

notably galena, sphalerite, tetrahedrite, stibnite, chalcopyrite and arsenopyrite, and free gold occur in trace <sup>amounts</sup> elements in the discordant veins. Manganese staining is common on weathered samples of vein material. Sampling of veins from throughout the Klondike has shown that gold is confined almost exclusively to the discordant veins.

### Property Geology

The Klot claims are underlain entirely by moderately to strongly foliated, blocky to platy weathering quartz-eye schist of Unit 5. In this area the quartz-eye schists consist of fine-grained, quartz-muscovite ( $\pm$  feldspar,  $\pm$  chlorite) schist with less than one to as much as ten percent by volume of clear to slightly bluish, rounded quartz augen. The augen range in size from 0.1 to 0.5 cm in diameter. The schist varies considerably in colour, including pale to medium green, buff and pinkish-brown. It often shows a thin banding or striping on a scale of 1 to 30 cm defined by both variations in colour and grain size.

The colour variations reflect minor differences in mineral properties.

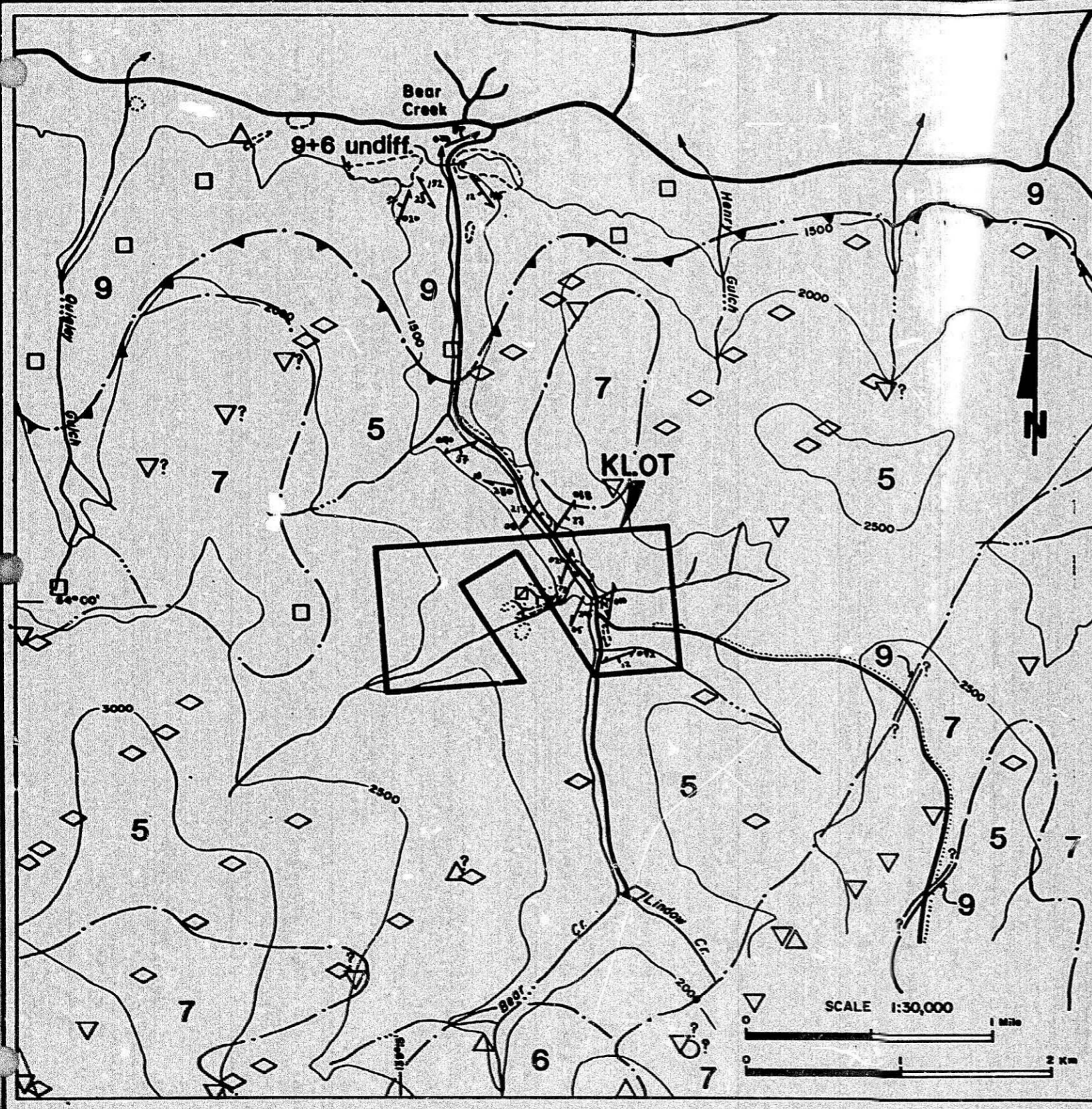
Lack of outcrop on the property precludes a detailed structural analysis.

$S_1$ , which parallels the aforementioned colour banding in the schists, is shallowly dipping in this area. A south-trending, easterly-verging mesoscopic second (or third) phase minor fold is present in one outcrop along the Bear Creek road.

Foliaform quartz, locally containing up to 50% by volume white to pinkish feldspar, is common on the property and occurs in lenses up to 15 cm in thickness.

### Mineralization

The old workings on the property are either completely caved or have been



### LEGEND

	thrust fault (defined, inferred)
	lithological contact (defined, inferred)
	outcrop and disrupted outcrop
	subcrop and local float in overburden
	lithological identification of rock chips in soil (Units 3, 5, 6, 7, 8, 9, 15 respectively)
	trench or hand pit
	edit
	shaft
	F <sub>1</sub> foliation, parallels compositional layering (strike, dip)
	F <sub>2</sub> foliation (strike, dip)
	F <sub>2</sub> crenulation lineation (trend, plunge)
	soil sample location (As content in ppm by ICP, Au content in ppb, NAA)
	silt sample location ( " " " )
	geochemical sample of fines in waste dumps ( " " " )

Figure 2  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**BEDROCK GEOLOGY**  
 KLOT PROPERTY AND VICINITY  
 KLONDIKE DISTRICT, YUKON  
 KLONDIKE PROJECT

covered by placer tailings. The workings were visited briefly by MacLean (1914, pp 42-44) and Bostock (1935, pp5-7) and the results of these examinations are summarized below.

During MacLean's visit in 1912, the workings consisted of a shaft 20 ft deep near the Discovery post on Bear Creek, a trench immediately southeast of the shaft, and a short (10 ft) adit. MacLean stated that in the shaft "the first 8 ft contained but little quartz, with increasing depth stringers and bunches were encountered, and, for the last 10 ft the excavation is largely in quartz ... A sample taken clear across the bottom ( 4 ft wide) panned good colours of gold". Two samples of quartz vein from the trench yielded gold colours by panning. In the adit, veins and stringers of quartz were observed and these comprised up to 25% of the rock at the face. Four samples were taken from the adit by MacLean and all showed good colours in the pan. Gold content of samples collected from the property varied considerably, but two samples from the adit were reported by MacLean to have assayed 0.8 and 0.9 oz/ton Au.

Bostock examined the property during the period that Klondike Gold Quartz Mines was developing it. Workings on the property at that time are shown on Figure 3. As a result of his examination, Bostock stated:

"In the sides of shaft No. 1 the northern of the two shafts, three quartz veins are visible. They are 4 to 14 inches wide, strike between 118 and 130 degrees and dip northeast at angles of 50 to 70 degrees. Shaft No. 2 is about 70 ft south and 30 ft east of shaft No. 1. On the south side of No. 2 shaft there are two quartz veins 9 inches and 14 inches wide and 16 inches apart. They strike 130 degrees and dip northeast at angles of respectively 55 and 70 degrees. Approximately 25 feet southward along the strike two veins are exposed. These

resemble and probably are continuations of the two veins seen in No. 2 shaft. The quartz of the veins is dense and white. A very few crystals of pyrite are present in the quartz in places and some iron stain occurs along fractures. It is reported that specks of free gold can be found in fractures in the veins.

A large, trench-like excavation about 90 feet lower than and southeast of the shafts, and made where the veins in the shafts might be expected to occur, reveals a mass of quartz float and, in two places, quartz that may be in place. This quartz holds a little pyrite.

No. 1 adit is approximately 110 feet lower than, and 325 feet south from, No. 2 shaft. The adit is 30 feet long and runs northwest directly into the hill. At its inner end a group of small veins, of quartz like that of the other veins described, occur. The veins are 1 to 4 inches wide, occur across a width of 45 inches, strike 125 degrees, and dip northeast at an angle of 55 degrees.

The entry of No. 2 adit is approximately 600 feet southeast of No. 2 shaft and at an elevation of about 1,720 feet. From the portal the adit runs directly into the hill. It follows a course of 328 degrees for approximately 200 feet and at the end of this distance bends to the northeast and continues along this course for nearly 90 feet. This adit, like the other workings is in green schists. It cuts across a number of small, corrugated veins and lenses of quartz that tend to follow the planes of schistosity in the schists. In a few places large cubes of pyrite occur in the veins and in the schists. No veins in No. 2 adit were noted to cut across the schists in the direction followed by the veins in the shafts."

Klondike Gold Quartz Mines, which did further development on the property after Bostock's examination, presented the following Au assay data in a company

prospectus prepared in late 1934 or early 1935:

- Shaft No. 1 - grab (?) samples taken at 2 ft intervals from surface to a depth of 40 ft; total of 24 samples, range 0.11 - 7.59 oz/ton, average 0.89 oz/ton
- Shaft No. 2 - grab (?) samples taken at 2 ft intervals from surface to a depth of 28 ft; total of 10 samples, range 0.21 - 2.21 oz/ton, average 0.77 oz/ton
- No. 1 Adit - grab (?) samples taken at roughly 10 ft intervals from 25 ft from portal to 60 ft; total of 5 samples, range 0.61 - 1.31 oz/ton, average 0.95 oz/ton
- No. 2 Adit - channel samples taken at 10 ft intervals over 140 ft interval from 70 ft from portal to 210 ft from portal; total of 15 samples, range 0.61 - 2.92 oz/ton, average 1.07 oz/ton
- channel samples at 5 ft intervals over 70 ft interval along crosscut beginning at 210 ft from portal; total of 15 samples, range 0.61 - 5.42 oz/ton, average 1.19 oz/ton

As stated above, the workings on the property are presently inaccessible and it is therefore impossible to verify these rather impressive assay results. In view of Bostock's description of the workings, however, the validity of these assays is somewhat questionable.

In summary, gold-bearing, discordant, slightly pyritic, quartz veins occur at several localities on the property. Galena is locally present in trace amounts. The veins strike northwesterly, dip moderately to steeply to the northeast and range from 1 to 16" in thickness.

Blocks of vein quartz, which are apparently locally derived and contain trace amounts of pyrite as cubes and grain aggregates to 2 cm in diameter,

were observed by the writer near shaft No. 2. Some of these blocks are from discordant veins as much as 1 m in thickness, suggesting the presence of relatively large veins in the immediate vicinity. The significance, if any, of the assay results quoted by Klondike Gold Quartz Mines remains uncertain. Gold is definitely present in at least micro amounts in some of the vein material at the mouth of Discovery Pup (as noted by MacLean), and visible gold (associated with pyrite) has been found by the writer in discordant vein material in the chute into the ore bin at the old mill. Bostock's description of the wallrock in the No. 2 adit, however, suggests that all of the quartz present there is foliaform, and thus is unlikely to contain gold. The waste dump of the No. 2 adit has been removed during placer mining, and cannot therefore be sampled.

### Geochemical Surveys

A total of 72 soil samples was collected on a chain and compass grid in the immediate area of the old workings, and analyzed for Cu, Pb, Zn, Ag and As by atomic absorption and Au by neutron activation (Figure 4). Values of base metals and Ag are uniformly low in the soils, as is typical in the Klondike District. Only two of the samples were anomalous for As (calculated background for As in the soils in the area is 15 ppm); both of these samples included fines from the waste material at the portal of No. 2 adit. Fifteen samples were anomalous for Au (calculated background is 10 ppb), with five samples containing greater than 100 ppb Au. The higher values are generally confined to the area of No. 1 and No. 2 shafts and No. 2 adit, with other lower values scattered across the southwestern portion of the grid.

Interpretation of the geochemical results is complicated by the fact that the bench immediately above the old workings is overlain by White Channel

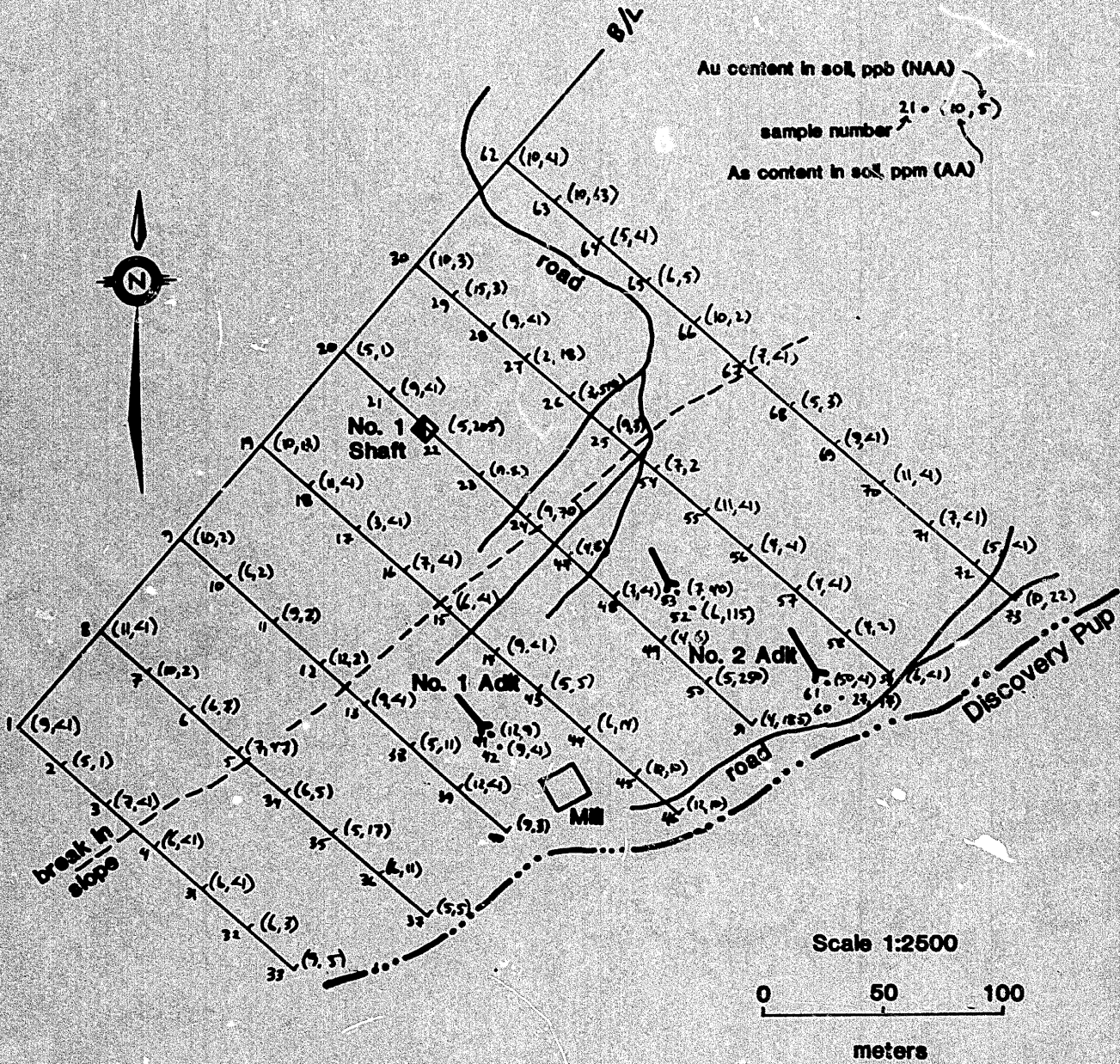


Figure 4. Soil geochemistry on part of Klot and GOS claims.

Gravels that have been placer mined using hydraulic methods. It is therefore uncertain whether the gold in the soils was derived from underlying bedrock or from sheetwash of placer tailings down the slope.


### Summary and Conclusions

The immediate area of the Klot claims is underlain by a banded variant of quartz-eye schist. Gold-bearing discordant quartz veins occur on the Klot and adjacent GOS claims over an area of at least 500 x 300 m. Where attitudes have been measured, the veins strike northwesterly and dip moderately to steeply to the northeast. The veins contain minor amounts of pyrite and galena, and the gold is at least locally associated with pyrite.

Soil geochemistry will be of limited use in further exploration because of the placer mining that has been carried out over much of the property. Future work on the claims would require extensive bulldozer trenching, and re-opening of the adits to facilitate detailed bedrock mapping, lithochemical sampling and sampling of vein structures for assay. Results obtained to date do not appear to warrant such a program.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

A handwritten signature in dark ink, appearing to read 'J.K. Mortensen' with a stylized flourish underneath.

J.K. Mortensen, Ph.D.

/mjm

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## APPENDIX I

### CERTIFICATE

I, James K. Mortensen, with residential address in Vancouver, British Columbia, do hereby declare

1. I am a geologist in the employ of Archer, Cathro & Associates (1981) Limited, 1016-510 West Hastings Street, Vancouver, B.C. V6B 1L8.
2. I am a graduate in geological engineering of the University of British Columbia (B.A.Sc., 1977, M.A.Sc., 1979) and graduate in geology of The University of California, Santa Barbara (PhD., 1983).
3. I am a member of the Geological Association of Canada and the Geological Society of America.
4. I am a registered Engineer-in-Training in the Association of Professional Engineers of British Columbia.
5. I have practised my profession as a geologist for the past eleven years.
6. I have supervised the work described in this report.

Respectfully submitted,



J.K. Mortensen, PhD.

/mc

## APPENDIX II

### REFERENCES

Bostock, H.S., Mining Industry of Yukon, 1934, Geological Survey of Canada  
Memoir 178, 10 p

MacLean, T.A., 1914, Lode Mining in Yukon, Mines Branch Publication 222,  
205 p

Northern Cordillera Mineral Inventory, NTS 1150 and 116B, Occurrence 7, Archer,  
Cathro & Associates (1981) Limited, private publication

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## APPENDIX III

April 17, 1984

Mining Recorder,  
Dawson Mining District,  
Box 249,  
Dawson, Y.T.  
Y0B 1G0

Dear Sir:

Re: Application of Regional Mapping Costs in  
Klondike District to Property Assessment

Part of the assessment work for 1983-84 filed on quartz claims in the Klondike area held by Dawson Eldorado Gold Explorations Ltd. or jointly by Dawson Eldorado and Archer, Cathro & Associates (1981) Limited consists of geological mapping outside of the individual properties for which the work was filed. We believe that this is justified because of the extreme scarcity of outcrop in the area and the lack of a detailed geological map of the Klondike which makes it impossible to interpret the geology of a particular property based solely on the very few bedrock exposures within the claim boundaries. In order to understand the bedrock geology of a claim group, it is therefore necessary to carry out more reconnaissance scale mapping in the general area of the property and extrapolate the regional geology onto the property.

Yours truly,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

/mc

J.K. Mortensen.