

# ARCHER, CATHRO

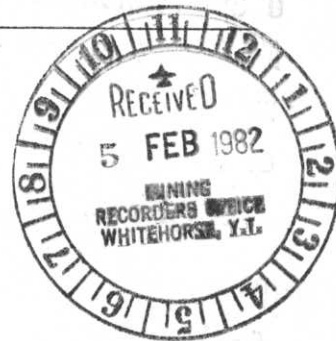
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NAT JOINT VENTURE

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

NUCLEUS 1-50 CLAIMS

(YA51189-YA51222, YA60256-YA60271)

Claim Sheet 115I/6

Latitude 62°20'N; Longitude 137°20'W

Report by

A.R. Archer, B.A.Sc., P.Eng.

Work done from 29 May, 1981 to 12 June, 1981

090973

This report has been examined by  
the Geological Exploration Dept  
under Section 5014 - Silver Quartz  
Mining Act and the results  
reported in the report amount  
of \$ 9300 -

*P. Lawson*

*for* Regional Director of Exploration and  
Geology, Commissioner  
of Yukon Territory.

650000

From: Mining Recorder at Whitehorse

File No. \_\_\_\_\_

To: Supervising Mining Recorder - Whitehorse, Y.T.



FOR ACTION:

\_\_\_\_\_ New Application for Lease to Prospect: Name \_\_\_\_\_

\_\_\_\_\_ Renewal Appl'n Lease to Prospect: Name \_\_\_\_\_ No. \_\_\_\_\_

\_\_\_\_\_ Affidavit of Expenditure on Placer Lease: Name \_\_\_\_\_ No. \_\_\_\_\_

\_\_\_\_\_ Assignment of Prospecting Lease No. \_\_\_\_\_

\_\_\_\_\_ From \_\_\_\_\_ To \_\_\_\_\_

\_\_\_\_\_ Grouping Appl'n under Sec. 52(2) Yukon Placer Mining Act: Owner \_\_\_\_\_

\_\_\_\_\_ Diamond Drill Logs: \_\_\_\_\_

\_\_\_\_\_ Owner: \_\_\_\_\_ Claim Sheet No. 115 I-6

Quartz Assessment Report \_\_\_\_\_

Claims: Nucleus 1-50 Claim Sheet No. \_\_\_\_\_

Type of Report: Geological, Geochemical, Geophysical

Submitted By: Creech, Castro

Claims work performed on: Nucleus 28, 42, 47-50, 37-38

\$ Req. for renewal application: ~~400~~ 9300.00

Signature W. S. [unclear] for M.R.  
Date 8 Feb 82

Reply action

Date Ref



Signature \_\_\_\_\_

Date \_\_\_\_\_

090973

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## NUCLEUS PROPERTY

### Introduction

In 1980 NAT Joint Venture (Chevron Canada Limited and Armco Mineral Exploration Ltd.) staked thirty-four Nucleus claims to cover gold and arsenic anomalies resulting from reanalysis of previous sample splits and follow up traverses done during the 1980 field season. Further development in 1980 consisted of reconnaissance soil sampling and limited geological mapping.

Early in the 1981 field season, sixteen more claims were added to the northeast corner of the claim block, where 1980 sampling had produced anomalous geochemical results, on ground formerly occupied by Cash claims that lapsed in November, 1980. Property work in 1981 included detailed geological mapping, line cutting, grid soil sampling, and a magnetometer survey. Data compilation and report preparation was done by geologist L. Lindinger during the period September to December, 1981. Results of the geochemistry are shown at 1:5,000 scale as Figures N20A through N20C, and geology and magnetics are shown at the same scale as Figures N20D and N20E respectively. The names of the Nat personnel involved in collection of the data, periods of employment and addresses are listed in Appendix I.

### Property, Location and Access

The Nucleus property consists of fifty contiguous mineral claims recorded in the names of Archer, Cathro & Associates Limited (Nucleus 1-34) and Archer, Cathro & Associates (1981) Limited (Nucleus 35-50) recorded in the Whitehorse Mining District as follows:

<u>Claim Name</u>	<u>Record Numbers</u>	<u>Expiry Date</u>
Nucleus 1-34	YA51189-YA51222	19 February, 1982
Nucleus 35-50	YA60256-YA60271	1 June, 1982

The claims are located at latitude 62°20'N and longitude 137°20'W on NTS claim sheet 115I/6, about 63 km northwest of Carmacks. Access in 1981 was by helicopter from a camp on the Freegold secondary road at the junction of Bow Creek, some 9 km to the southeast, or by a bulldozer trail 1 km north of the claims originating 3 km east at the western terminus of the Freegold road.

#### Previous Work

The Nucleus 1 to 34 claims were staked in 1980 on a window of available ground surrounded by the Yukon Revenue property on the east and by three blocks of Cash 1 to 48 claims on the other sides. Much of the previous exploration in this area has been conducted on the Yukon Revenue property, mostly directed toward a low grade copper-molybdenum porphyry deposit with minor values in tungsten, gold and silver. Although placer miner P.F. Guder discovered gold-quartz float in the vicinity as early as 1934, he did not stake claims until 1953, when he explored a copper showing assaying 15% Cu and 0.5 oz/ton Au over 5 m with adit and shallow shaft. His property was optioned by Conwest, which conducted an EM survey in 1954; by Teck ECL, which drilled 5 holes (427 m) in 1955; by Cominco in 1959; by Meridian Syndicate, which drilled 3 holes (165 m) and conducted a geochemical survey in 1964; and by General Enterprises in 1967. Most of the drilling tested discontinuous lenses of chalcopyrite and pyrite in a strongly altered (propylitic and argillic) breccia zone. A new company, Yukon Revenue ML, was formed by General Enterprises in 1968, which developed the property during 1967 to 1969 with road building, bulldozer trenching, geochemical sampling, an IP survey and 10 drill holes (1276 m), and during 1974 and

1978 with additional bulldozer trenching. The best precious-metal zone in these trenches assayed 0.4 oz/ton Au, 2.0 oz/ton Ag and 0.28% W<sub>2</sub>O<sub>3</sub> across 3.3 m.

The Yukon Revenue property was optioned by Kaiser Resources Limited in 1970, which cut a widely-spaced grid of bulldozer trails and trenches and drilled 25 percussion holes (2245 m) and 13 diamond drill holes (1851 m) on copper-molybdenum geochemical anomalies over weakly-altered breccia. Parts of this bulldozer grid plus 7 of the percussion and 7 of the diamond drill holes were done on ground now staked as the Nucleus claims and the Kaiser data has been incorporated into this report.

The Cash claims had been staked in 1979 by Whitehorse individuals on ground previously held as the Com claims (Cominco, 1969), the Roy and Tye claims (Eagle Bay ML, 1970) and the Roc claims (Klotassin JV, 1974). Cominco and KJV conducted geochemical soil surveys near the north-western corner of the Nucleus claims, but only weak copper and molybdenum anomalies were outlined. Minor fluorite and rare scheelite were also found in float.

Exploration for magnetite-gold skarns in Tertiary porphyry and rhyolite on the north side of Big Creek (Car claims) was conducted by a joint venture between Western ML, Belmoral ML and Cream Silver ML in 1969, but only two copper soil anomalies were obtained.

### Physiography and Glaciation

The property lies within the Yukon Plateau, an older, rejuvenated erosion surface in which major creeks now follow broad, steep-walled valleys. Smaller tributaries form deep, narrow valleys separated by long ridges of uniform elevation. Rock exposure is limited to creek cuts and hill summits. Kaiser's bulldozer grid intermittently exposes bedrock and assists in mapping. Overburden is relatively thin

varying in thickness up to 15 m. Volcanic ash is moderately thin (25 to 50 cm) and patchy, except where accumulations up to several metres thick are found in the vicinity of Big Creek. Permafrost hinders sampling on north-facing slopes, and the entire property is lightly treed.

Pleistocene glaciation did not cover the property, although the last ice-cap advance terminated less than 50 km to the south. Outwash detritus has filled several of the larger creek valleys, including parts of Big Creek, and local alpine glaciation probably existed on higher mountains to the north and west. Surface weathering is strong and probably extends to a depth of 100 m or more.

#### Geology and Mineralization

The Nucleus property lies on the southern margin of the Big Creek lineament, a strong, northwesterly-trending topographic and aeromagnetic lineament following Big Creek, which is postulated to be a major fault subparallel and possibly related to the Teslin Lineament. It can be traced from Carmacks through Big Creek and Hayes Creek to the Yukon River, and is related to most of the mineralized porphyries in the Dawson Range, possibly directly as a channel of mineralizing fluids or indirectly as a zone of crustal weakness that allowed porphyry systems (and volcanic centres) to develop along it. Notable porphyry or mineral deposits in close spatial proximity to the lineament include: Mt. Freegold, Yukon Revenue, Klazan, Cash, Lilypad, Tad, Mt. Cockfield and Casino. All of these contain gold and silver values, either in a porphyry setting or as peripheral gold-quartz and gold-silver-carbonate veining. In some cases, the precious-metal veining is the most economic feature of the porphyry system.

In the Big Creek area around Nucleus, a system of subsidiary southwest-trending faults, reflected by creek topography, is related to the major lineament described above.

The oldest rocks in the area are rusty weathering pendants of the Yukon Metamorphic Complex, of Proterozoic to Mississippian age (PPsn), including brown to grey weathering, mesocratic brown, well-foliated, fissile micaceous quartzite and schist, with dark grey, medium-grained, strongly-banded biotite schist-gneiss, interbedded with minor pyritiferous amphibole feldspar gneiss. These rocks underlie about half of the property, and form the local height-of-land. Towards Big Creek, the Yukon Group has been altered to a paler yellow, leached, finer-grained, siliceous and more competent rock (PPsna), with feldspars altered to clay, and ubiquitous, tiny, dark grey quartz stringers and veinlets. This alteration is often mistaken for altered Tertiary volcanic flow rocks.

In the vicinity of the property, a Mesozoic orogeny has produced granitic bodies of various sizes with compositions ranging from hornblende syenite through monzonite to granodiorite and quartz monzonite. A tongue of grey, medium-grained, porphyritic hornblende K-feldspar syenite (My) outcrops near the southeast corner of the claims.

The Mesozoic orogeny was followed by late Cretaceous to early Eocene volcanism, with an associated subvolcanic feldspar porphyry phase, whose rocks form an east-trending belt that covers approximately half the claims. These rocks include a dark green, fine- to medium-grained rhyolite porphyry with up to 5% quartz phenocrysts to 1 mm and altered feldspar phenocrysts to 8 mm (KTfp), and pale yellow and green, aphanitic to sugary, sometimes drusy and fractured, siliceous dykes and sills of aplite and felsite (KTap). The brecciated feldspar porphyry is prominently propylitically altered, with local argillic alteration (feldspar to kaolin) giving the rock a white colour. The aplite dykes have been strongly altered to the advanced argillic grade.

Late-stage quartz flooding cuts all of these units, with resultant alteration and brecciation that obscures contacts. In the areas where brecciation is most intense, original rock fabric and textures have been destroyed by advanced argillic to silicic alteration, resulting in a beige, fine-grained, slightly porphyritic rock. Fragments of Yukon Group schist-gneiss have been loosely cemented by frothy to crackly, banded felsite. Two types of brecciation have been distinguished on the property, a widespread unit characterized by leucocratic, weakly to strongly fractured, vuggy to scoriaceous, sugary aplite containing strongly altered, angular aplite and porphyry fragments (Tbr1), and a much smaller occurrence on the west side of the central hill that consists of a scoriaceous, limy, strongly altered, aplitic matrix containing more mesocratic, weakly to moderately altered schist fragments (Tbr2).

Mineralization is restricted to traces of very fine-grained pyrite with associated jarosite, although malachite, galena and sphalerite have been reported in previous work on an eastern tributary of Mechanic Creek (unverified by NAT). A few specimens of fist-sized magnetite were found at one location. Core from three of the seven 1970 Kaiser diamond drill holes was examined by NAT in 1981. The location of the drill hole collars are shown on Figure N20D. A cursory examination of holes D70-6 and D70-7 was made early in the season, and holes D70-5 and D70-6 were relogged and resampled by M.P. Phillips at the end of the season as reported in Appendix II and on Figures N20F and N20G illustrated in Pocket G. Hole D70-6 cut mostly quartz with a minor granitic phase (and some gneiss from 100 to 120 m), which exhibits moderate to strong alteration (argillic to phyllic with silicification). Mineralization seen in the core includes pervasive calcite, pyrite, pyrrhotite and chalcopyrite as veinlets and disseminations, and traces of malachite and azurite,

especially at shallower depths. Hole D70-7, at Big Creek, appears to cut entirely Yukon Group schist, with minor fault breccia healed by aplite. Argillic and quartz-carbonate alteration are accompanied by traces of pyrite and chalcopyrite.

### Geophysics

Concurrent with the soil sampling program, a magnetometer survey was performed on the claims within a 1400 m by 1800 m area, centred on the hillside west of Mechanic Creek. A total of 1050 readings were taken at 25 m stations on lines spaced on average of 120 m apart using a Scintrex MF-2 fluxgate magnetometer. Diurnal drift was corrected by closing loops to an established baseline. Results of the survey are shown as Figure N20E.

A regional, background trend is shown by the magnetometer readings, which increase about 200 gammas towards Big Creek. Local steep gradients occur near the northwestern margin of the survey (300 gammas relief) and in several locations near the southern end of the baseline (up to 1000 gammas relief). The latter gradients are probably due to the presence of magnetic syenite (My) in this area, thus reflecting the syenite-metasediment contact.

### Geochemistry

Gold samples were analyzed at Chemex Labs Ltd., North Vancouver, B.C. The analytical techniques used are described in Appendix III. Reconnaissance soil sampling in a geochemically anomalous area of Big Creek in the early part of the 1980 field season returned gold values of 760, 550 ppb and

lower with associated arsenic anomalies of more than 500, 230 ppm and lower from the area eventually staked as the Nucleus claims. Later during the 1980 field season, golds to 1824 ppb in rock and 745 ppb in soil were returned from more closely-spaced reconnaissance soil sampling (Figure N9, 1980).

Property work began with cutting a 2900 m baseline striking perpendicular to the existing 1970 Kaiser bulldozer lines (azimuth of baseline=008°). A total of 376 soil samples were taken at 50 m intervals on these lines and from existing ripper trenches on them within a 2000 m by 1350 m area on the hillside just west of Mechanic Creek (see Figures N20A to C). Extensive permafrost and frozen ash hindered the sampling.

All samples were analyzed for gold, silver and arsenic. Of these, arsenic shows the widest anomalous response, with a large area (1500 m by 800 m) returning values greater than 250 ppm, including five samples greater than 500 ppm and two others greater than 1000 ppm (see Figure N20C).

Gold response is not as consistently anomalous as that for arsenic, but the geochemical pattern suggests several specific centres of locally strong response within a 1200 m by 700 m area of threshold values (50 ppb or greater) as shown on Figure N20A. Gold values of 3284, 2687 and 1559 ppb have been returned for samples in three widely-separated locations, with patches up to 300 m across surrounding these sites and elsewhere returning values in excess of 100 ppb.

Silver response is erratic, with isolated anomalous peaks returning values of 52.0, 8.9, 3.2 ppm and less. All silver anomalies are directly correlatable with strong gold anomalies.

The gold and arsenic anomalies do not coincide, but appear to be displaced with respect to each other, the gold response being stronger near Mechanic Creek and arsenic stronger on higher elevations on the hillside to the west. It is noteworthy that foreign glaciofluvial till has accumulated to considerable thicknesses (up to 20 m) in the bottoms of the Mechanic and Big Creek valleys, and the best gold response is at least partly underlain by this alluvial material, whereas arsenic response is

chiefly over the relatively thin "native" overburden (ie. eluvial material). The approximate alluvium boundary has been drawn on the geochemical maps (Figures N20A to N20C for reference.

Gold values of 1980, 1320, 750 ppb and less have been returned from altered rock samples in diamond drill core (holes D70-6 and D70-7). Gold analysis of core samples from M.P. Phillips' re-logging of holes D70-5 and D70-6 are tabulated on Figures N20F and N20G and discussed in Appendix II. Arsenic values are promising, with 16 of the 117 samples returning values greater than 100 ppm and two samples exceeding 1000 ppm. Only one silver anomaly (12.3 ppm) was returned from this core.

### Discussion

The gold and arsenic anomalies are underlain by quartz-flooded, altered and brecciated rocks which are probably the source of the precious metal mineralization.

Interpretation of the geochemical patterns suggests that the offset of gold (downhill) from arsenic reflects gravity-concentration and solifluction, with the arsenic anomalies closer to the true source and the gold anomalies transported. There appear to be specific centres of anomalous gold response defined within the area covered by the soil grid, but statistical analysis (comparison of bedrock versus soil sampling) indicates that the pattern is blurred because samples were too shallow or too widely-spaced.

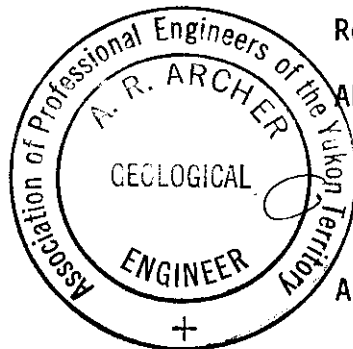
Results obtained by resampling of Kaiser diamond drill core are encouraging in that the gold backgrounds in D70-6 are much higher than those in D70-5 probably reflecting increasing gold content in the direction of the zone of

intense brecciation. Although neither hole was drilled within the main gold-arsenic soil anomaly, both returned interesting values including 3582 ppb Au over 1.3 m in D70-5 and 517 ppb Au over 6.0 m in D70-6. There is little direct correlation of gold content to lithology, alteration or other metals except for a general relationship with quartz veins associated with porphyry dykes and breccia zones.

Resampling in the limited area outlined by the best gold and arsenic response is recommended, with deeper pits and closer spacing. This will provide more reliable geochemical information, and a more detailed geological map could be prepared using rock chips from sample pits. The permafrost problem can be partially alleviated by sampling late in the field season (August or September) and/or by scraping vegetation from proposed sample sites early in the season to allow deeper thawing. Test pits should also be dug over favourable geology (ie. altered Yukon Group and breccia) where it appears to extend west of the claims in more vegetated areas. Sampling in the Big Creek valley itself is not recommended due to the thickness of glaciofluvial debris.

A fraction of unstaked ground less than two claims in size exists between the Nucleus and Revenue properties and should be staked. Further reconnaissance soil sampling in this area and in the northeast portion of the property (east of Mechanic Creek) should be done. The remaining core from Kaiser's 1970 drilling (holes D70-9 through D70-12) should be re-logged and sampled. At least 100 mandays of work is recommended for the Nucleus property for 1982.

Respectfully submitted,



ARCHER, CATHRO & ASSOCIATES (1981) LIMITED,

A handwritten signature in black ink, appearing to read "A. R. Archer".

A.R. Archer, B.A.Sc., P.Eng.

APPENDIX I

PERSONNEL

<u>Name</u>	<u>Address</u>	<u>Work Period on Property</u>
E. Onasick	3-2859 W. Broadway Ave., Vancouver, B.C.	29 May, 1981
H. Oiyé	107 - 1730 Chesterfield St., Vancouver, B.C.	29 May, 1981
J. Robertson	2421 Royal Ave., Saskatoon, Sask.	29 May - 6 June, 1981
L. Lindinger	5 - 1940 Arbutus St., Vancouver, B.C.	29 May - 9 June, 1981
B. Jenkins	General Delivery, Shoal Lake, Man.	29 May - 9 June, 1981
F. Schuerheck	1010 Curry Ave., Windsor, Ont.	29 May - 4 June, 1981
B. Goldbeck	2034 Townline Rd., Abbotsford, B.C.	29 May - 12 June, 1981
M. Trudzik	Box 93, Mayerthorpe, Alta.	6 - 9 June, 1981

APPENDIX II

KAISER DRILL HOLES 5 AND 6  
NUCLEUS PROPERTY

Introduction

Diamond drill hole core from holes DDH 70-5 and DDH 70-6 (Kaiser, 1970) on the NAT Joint Venture Nucleus property was relogged and sampled by M.P. Phillips in October, 1981. Samples were geochemically analyzed by Chemex Labs in North Vancouver for gold, silver, arsenic and lead. Results of this analysis, along with the geological descriptions and Kaiser's geochemical results for copper and molybdenum, are shown on two cross-sections (Figures N20F and N20G in Pocket 7) while the collar locations are shown on Figure N20D in Pocket 5.

Hole DDH 70-5 (attitude: vertical, depth: 184.8 m [606 ft])

Figure N20F is a cross-section illustrating rock types, alteration zonation, and geochemical results, accompanied by geological notes referring to specific sections of interests. The hole cuts quartz monzonite except for an aplitic, quartz-feldspar porphyry from 19.5 m (80 ft) to 31.1 m (102 ft) and a felsite and quartz-monzonite breccia zone from 61.9 m (203.2 ft) to 63.3 m (207.6 ft). An 18.3 m (60 ft) wide, weakly brecciated zone occurs within the quartz monzonite from 91.8 m (301 ft) to 110.0 m (361 ft); and two similar zones, each less than one ft (0.30 m) wide, occur near the bottom of the hole. Pervasive propylitic grading to montmorillinitic alteration has resulted in chlorite and calcite replacing mafic minerals and plagioclase feldspar in the quartz monzonite throughout the hole; while argillic alteration, characterized by kaolinization of K-feldspars, occurs around the quartz-feldspar porphyry dyke and within the breccia zones.

A pronounced supergene cap extends down to 37.8 m (124 ft) and gradually gives way to hypogene mineralization by 48.8 m (160 ft).

Although quartz veining is generally poorly developed, a number of narrow, stockwork zones are found throughout the hole. Both white and grey varieties are present but the former is more abundant and widespread. The white quartz was probably deposited from late fluids derived from the quartz monzonite or from ground waters, whereas the grey variety appears to have been introduced by the intruding porphyry dykes. Dark green quartz-sericite veinlets, similar to those associated with significant gold values at Mt. Freegold, are rare.

Pyrite occurs as minor disseminations throughout the hole and less frequently in quartz veins, sometimes accompanied by chalcopyrite and white to cream calcite. The strongest mineralization occurs in a 1.3 m (4.4 ft) section of breccia at 61.9 m (203.2 ft) the upper 0.9 m of which exhibits 1-2% pyrite while the lower 0.4 m portion contains 20% pyrite with 5% chalcopyrite. Other mineralization includes chalcocite occasionally appearing as tarnish on pyrite, gypsum coating fractures from 16.8 m (55 ft) to 24.4 m (80 ft), traces of purple fluorite in a quartz-calcite vein at 132.6 m (435 ft), and traces of hematite in some quartz veins.

Gold response is erratic and does not correlate with rock type, alteration, or other metals (except possibly lead?). The best intersections were 3582 ppb Au from the 1.3 m sulphide-rich breccia zone mentioned above, 978 ppb Au from a 3 m quartz-monzonite section (112.8 m [370 ft] to 115.9 m [380 ft]), and 252 ppb Au from a 1.8 m wide shear zone (125.0 m [410 ft] to 126.0 m [416 ft]). All other gold values were less than 137 ppb and most were less than 20 ppb.

The only gold anomaly which coincides with anomalies for other metals is the 1.3 m breccia zone which returned 12.3 ppm Ag, 620 ppm lead and greater than 1000 ppm As.

Hole DDH 70-6 (attitude: vertical, depth: 153.4 m [503 ft])

Figure N20G is a geological cross-section of the hole accompanied by the geochemical results and shows that the upper 91.4 m (300 ft) were in quartz monzonite while the lower 61.9 m (203 ft) intersected a large raft of Yukon Group metasediments. A few narrow, Cretaceous-Tertiary porphyry dykes cut both these units.

Hypogene alteration is predominantly propylitic to montmorillonitic however narrow sections of kaolinitic alteration are developed adjacent to quartz veins and porphyry dykes. Supergene argillic alteration over prints the hypogene alteration in the upper portion of the hole.

Randomly distributed quartz veinlets up to 1 cm wide occupy up to 1% of the rock, and are best developed in the intrusive rocks. Dark green quartz-sericite veining is rare.

Pyrite comprises up to 1% of some quartz veinlets and is less common as disseminated grains replacing mafic minerals in the groundmass of intrusives. Chalcopyrite often accompanies the pyrite in veinlets cutting quartz monzonite. The best mineralization occurs in a 0.15 m band of quartz-feldspar flooded meta-sediment at 124.2 m (407.5 ft) which contains 30% pyrite and a trace of chalcopyrite.

Gold content in this hole is uniformly higher than hole 70-5, averaging around 50 ppb and reaching up to 339 ppb and 696 ppb over two consecutive 3m sections. Arsenic in excess of 100 ppm (maximum 600 ppm) was returned from

7 samples, representing a total of 18.9 m (62 ft). Silver and lead are not anomalous. Again, there does not seem to be any correlation between gold and any other metal (particularly not arsenic, as would normally be expected). Higher values are not underlain by any specific lithology, nor does alteration explain the anomalies.

### Discussion

Although the two holes described here do not outline any mineable grades in gold or silver, the results are encouraging as they suggest that: (1) gold is concentrated in quartz veins associated with porphyry dykes; and, (2) there is a crude zonation of gold value with a general increase in the gold background as one moves toward a zone of intense brecciation which is cut by numerous porphyry dykes and coincides with the gold-arsenic soil anomalies. There is little direct correlation between gold and other metals, however, it is significant that anomalous silver values are confined to gold-rich sections and that arsenic values are weakly to strongly anomalous throughout most of the core.

Future work should include logging and sampling of other Kaiser diamond drill core and careful examination of the results to explore for possible correlation of gold content to lithology, alteration, mineralization, brecciation and quartz vein abundance and type.

APPENDIX III

## TECHNIQUES OF GEOCHEMICAL ANALYSIS

Analysis techniques used in 1981 included geochemical and fire assay methods, the latter used mainly for rock specimens with visible mineralization. After screening to -35 mesh and pulverizing to -80 mesh for silts and soils, or crushing and screening to -80 mesh for rocks, samples were analyzed for gold by the "combo" method, silver and lead by nitric-perchloric extraction followed by Atomic Absorption, and arsenic by the hydride vapour technique. The combo method for gold is concentration by fire assay followed by measurement with either Neutron Activation Analysis (1 ppb detection) or Atomic Absorption (5 ppb detection). Most of NAT's 1981 analysis used the more sensitive detection limit.

**ARCHER, CATIRO**  
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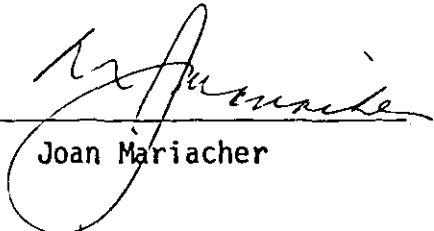
STANDARD BUILDING, VANCOUVER, B.C. 688-2568

1016 STANDARD BUILDING  
510 WEST HASTINGS STREET  
VANCOUVER, B.C.  
V6B 1L8

AFFIDAVIT

I, Joan Mariacher, of Vancouver, B.C. make oath and say:

That to the best of my knowledge the attached Statement of Expenditures for exploration work on the Nucleus 35 - 50 mineral claims on Claim Sheet 1151/5 is accurate.

  
Joan Mariacher

Sworn before me at Vancouver, B.C.  
this 7 day of  
January, 198 2

  
Notary, Yukon Territory

09097 R

total \$ 12284  
signed for \$ 9300

Statement of Expenditures  
Geochemical Sampling and Geological Mapping  
Nucleus 35 - 50 Claims

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Expenses

Chemex Labs Ltd. analyse 524 samples for  
Au, Ag, Pb, As at \$10.40 each

\$5,450.00

**ARCHER, CATHRO**  
AND ASSOCIATES LTD.  
CONSULTING GEOLOGICAL ENGINEERS

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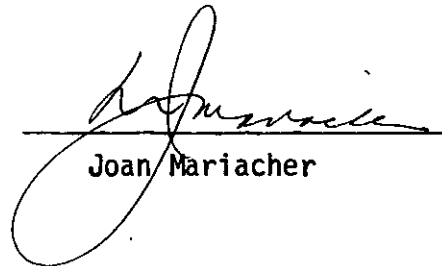


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510 WEST HASTINGS STREET  
VANCOUVER, B.C.  
V6B 1L8

AFFIDAVIT

I, Joan Mariacher, of Vancouver, B.C. make oath and say:

That to the best of my knowledge the attached Statement of Expenditures for exploration work on the Nucleus 1 - 34 mineral claims on Claim Sheet 1151/5 is accurate.

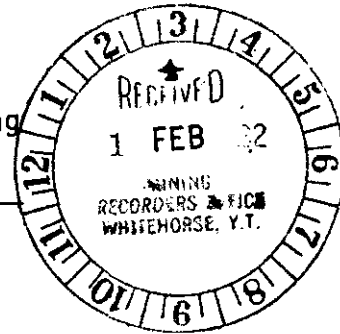
  
Joan Mariacher

Sworn before me at Vancouver, B.C.  
this 7 day of  
January, 198 2

  
Notary, Yukon Territory

090973

Statement of Expenditures  
 Data Compilation and Core Logging  
 Nucleus 1 - 34 Claims  
 January 6, 1982



Management

Archer, Cathro & Associates (1981) Limited \$ 350.00

Labour

E. Onasick - 4 days supervision and report preparation October-December 1981 at \$220/day	\$ 880.00	
L. Lindinger - 1 month data compilation and report preparation September-December 1981	3,150.00	
M.P. Phillips - 22 hours in October-November 1981 picking up and splitting drill core at \$31.25/hr	<u>687.00</u>	4,717.00

Expenses

J-Nor Enterprises Ltd. truck rental to move core to Whitehorse core library	270.00	
Chemex Labs Ltd. analyse 117 core samples for Ag, Au, As and Pb at \$10.40 each	<u>1,497.00</u>	<u>1,767.00</u>
<b>Total</b>		<u><u>\$6,834.00</u></u>

Project - NAT JOINT VENTURE  
Date -- SEPT. 30, 1971



		Total
<b>MANAGEMENT</b>		
	Sept.	
		A 2,350.
<b>LABOUR</b>		
Supervisory		
	M.P. Phillips - prepare and file Lilypond, Nest & Wit assessment, 13 1/2 days @ \$250	3,375.00
Field		
	E. DNASICK - SEPT 1-20 AT 29.00/mo	4900.00
	H. DIVE - SEPT 1-20 AT 11.00/mo	2100.00
	L. LINDINGER - SEPT 1-3, 14-20 - 20 DAYS AT 21.00/mo + CB 356.00	1756.00
	J. ROBERTSON - SEPT 1-9 AT 16.00/mo	480.00
	B. GOLDBECK - SEPT 1-7 AT 11.00/mo	350.00
	B. JENKINS - SEPT 1-9 AT 14.00/mo	372.00
	K. WYLLIE - SEPT 1-7 AT 16.00/mo	374.00
	M. JOVANOVIC - SEPT 4-AT NSO/mo	49.00
	M. TRUDZIK - SEPT 1-2 AT 18.00/mo	360.00
	J. DUKE - SEPT 1 AT 15.00/mo + CB 104.00	215.00
	K. OPSETMOEN - SEPT 1-5 AT 18.00/mo + CB 25.00	233.00
	plus 50 %	5230.00
Casual		
	K. Wyllie - 11 1/2 hrs in Sept @ \$18/hr.	207.00
	C. CHARLTON - SEPT 1, 2, 3 - 3 DAYS AT 140/DAY	420.00
	K. HUCKMAN - SEPT 14, 15 - 2 DAYS AT 140/DAY	280.00
	P. BAXTER - SEPT 14, 15, 16 - 3 DAYS AT 140/DAY	420.00
<b>EXPENSES</b>		
Accounting Sept.		400.00
Expediting		
Room & Board in Whse JOVANOVIC-1, DNASICK-3, DIVE-3, LINDINGER-5, ROBERTSON-1, JENKINS-1, WYLLIE-2, OPSETMOEN-2, CHARLTON-2, HUCKMAN-1 total 23 days at \$35/day		805.00
Field equipment from AC stock		
Xerox copies, 7011 copies at .75/copy		503.75
Radio rental Sept 1-3 @ \$250/mo		25.00
Rental AC truck at \$ /mo. plus ( to ) kms at /km		
Petty cash 2,80 C2 + 12.00 D3 + 17.60 D1 + 6,21 C2		38.61
Telephone 1,30 +		1.30
Blueprinting, 57 sq. ft. Ozalid at 30 c/ft plus 4,0 sq. ft. Dilar at \$2.50 /ft.		25.30
Drafting, 7.2 hrs. at \$18 /hr		126.00
Use of AC computer for 7 1/2 hrs to enter all 1971 survey data for Lilypond ch. Monte Carlo, crew claims		50.00
M. Trudzik, travel		530.00
Wilson Office		5.70
Wilson Office		16.50
Change Logs		12.00
Whse. Station		23.93
Northern Outdoors		16.90
Whitehorse ESSO		19.75
Yukon Salvage, fuel cost		92.00
Shoppers Drug		18.00
Can. Freightways		62.05
Rec. General, maps		36.10
Rec. General, file cases, Lilypond 33-100, Nest 7-14		1910.00
W. Park, diesel (Aug bill)		352.00
<b>Credit</b>		
advance to AC on Oct 2/81		20,000.00
<b>Total</b>		576689

5069.79  
75766.89

Project -  
Date --

NAT JOINT VENTURE  
Oct. 31, 1981

		Total
<b>MANAGEMENT</b>		
	Oct.	
		A 2,250.00
<b>LABOUR</b>		
Supervisory		
	M.P. Phillips - total 3 days prep work and file assessment @ 250	B 750.00
Field		
	F. Onasick, Oct 1-31 @ 2900	2900.00
	H. Ouge - Oct 1-31 @ 2100	2100.00
	L. Lindberg - Oct 1-31 @ 2100.	2100.00
		<u>7100.00</u>
Casual		
	H. Wylie - 1 hr drafting plus 50%	18.00
		3550.00
<b>EXPENSES</b>		
Accounting Oct.		400.00 C3
Drafting, 1/2 hrs at \$18 /hr		9.00 C1
Xerox copies, 312 copies at 25¢/copy		78.00 C1
Petty cash 31.35 C2, 20.35 C2		51.70 CV
Telephone		
	Brown Lumber	6.93 D1
	use of AC computer for fuel sample assay & on word processor	150.00 CV
	Recreation General, Vermont - Lilypond - Nit assessment	10,456.25 F
	" " " " file claim transfer	332.00 F
	C.P. Air	91.59 D3
	Northern Metallic	22.51 D1
	Chlorine fuel	19.90 D3
	Ford Fuel	8.43 DV
	Taylor Chlor	12.00 D4
	Remed Ent	17.23 D1
	Norwich	16.35 CV
	T-Shirt City	112.78 D1
		<u>11,784.00</u>
		25,452.00
<b>Cost</b>		
	Sub-let 14.5 hrs of X/VW time to Chemin MSVY Project at \$350/hr plus \$33.09 TMTA fuel charge	B1 5108.09 (5108.00)
<b>Total</b>		20,344.00

# In Account With

Project - NAT JOINT VENTURE

Date -- NOVEMBER 30, 1981

		Total
<b>MANAGEMENT</b>		
<i>Frederick</i>	2250.00	2250.00
<b>LABOUR</b>		
Supervisory M.P. PHILLIPS - 54 HRS AT 31.25/HK - CORE LOGGING + MAPPING		1687.50
Field E. DNASICK - NOVEMBER 1-30 AT 2900/MO	2900.00	
H. OIYE - NOVEMBER 1-30 AT 2100/MO	2100.00	
L. LINDINGER - 3/4 NOVEMBER AT 2100/MO	NN.00	
J. DUKE - NOVEMBER 9-17 AT 100/DAY	800.00	7375.00
Casual	PLUS 50 %	3687.50
<b>EXPENSES</b>		
Accounting <i>November</i>	400.00	
Drafting, 48 hrs. at 18 /hr.	864.00	
Xerox copies, 222 copies at 25¢ /copy	55.50	
Petty cash 8.50 + 1.52	10.02	
Telephone		
<i>Shopper Drug</i>	1.59	
<i>Howe's Office Supply</i>	2.45	
<i>Williams &amp; Sonnet</i>	10.92	
<i>Vandal</i>	2.45	
M. Phillips expense etc <sup>2.89 CV</sup> 3.80 CV 26.72 CV	33.41	
M. Phillips expense etc CV	6.87	
computer pages printed, 214 @ 50¢ ea	107.00	
		1494.21
		16,474.4
<b>CREDIT</b>		
<i>ICE Condition Program - Return</i>	2.30	2.30
<b>Total</b>		16,471.91



# CHEMEX LABS LTD.

212 BROOKSBANK AVE.  
NORTH VANCOUVER, B.C.  
CANADA V7J 2C1  
TELEPHONE: (604)984-0221  
TELEX: 043-52597

• ANALYTICAL CHEMISTS • GEOCHEMISTS • REGISTERED ASSAYERS

\*\*\* INVOICE \*\*\*

To : ARCHER, CATHRO & ASSOCIATES (1981) LTD.  
1016 - 510 W. HASTINGS ST.,  
VANCOUVER, B.C.  
V6B 1L8

Invoice # : I8115259  
Date : 11-DEC-81  
P.O. # : NONE  
Project NAT JOINT VENTU

Invoice for analytical work reported on certificate(s) A8115259-001 to -003

Quantity	Analysed for code description	unit price	amount
117	004 - Pb ppm		
	006 - Ag ppm		
	013 - AS ppm		
	101 - Au NAA ppb	11.50	1345.50

Sample preparation and other charges :

117	205 - Rock geochem - RING	2.00	234.00
1170	251 - Overweight sample charge	0.25	292.50

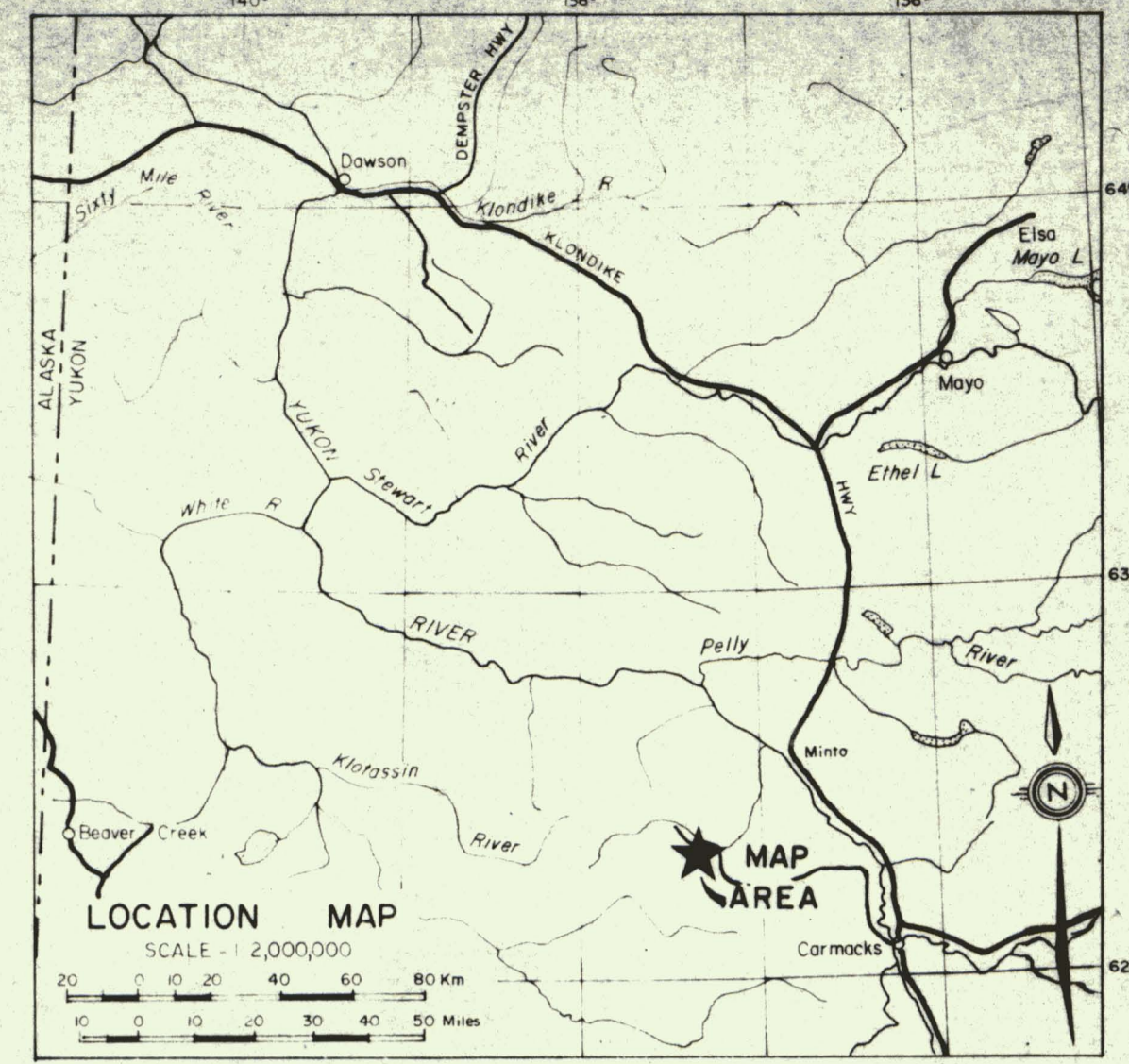
TOTAL \$ 1872.00  
Discount (20 %) \$ 374.40

Please pay this amount ----> \$ 1497.60  
=====

TERMS -- NET 30 DAYS  
2.0 % per month (24 % per annum) charged on overdue accounts

*John ... 1/21  
# 575*





- LEGEND**
- GEOCHEMICAL ANALYSES ppb Au**
- Soil
  - Rock
  - X Silt
  - H Ripper Trench Soil
  - T Trace
- NUCLEUS CLAIM BOUNDARY
- YUKON REVENUE CLAIM BOUNDARY
- / — GEOCHEMICAL CONTOUR ppb Au  
(teeth toward lower values)
- - - GLACIOFLUVIAL OVERBURDEN (in direction of hatch mark)
- ⊙ DIAMOND DRILL HOLE (KAISER 1970)
- △ 3622 TOPOGRAPHICAL ELEVATION

FIGURE N20A  
 ARCHER, CATTHRO & ASSOCIATES (1981) LTD.

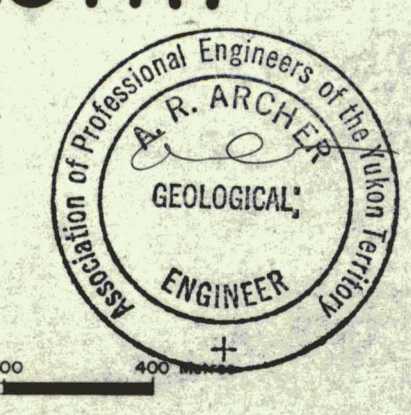
**Au GEOCHEMISTRY**

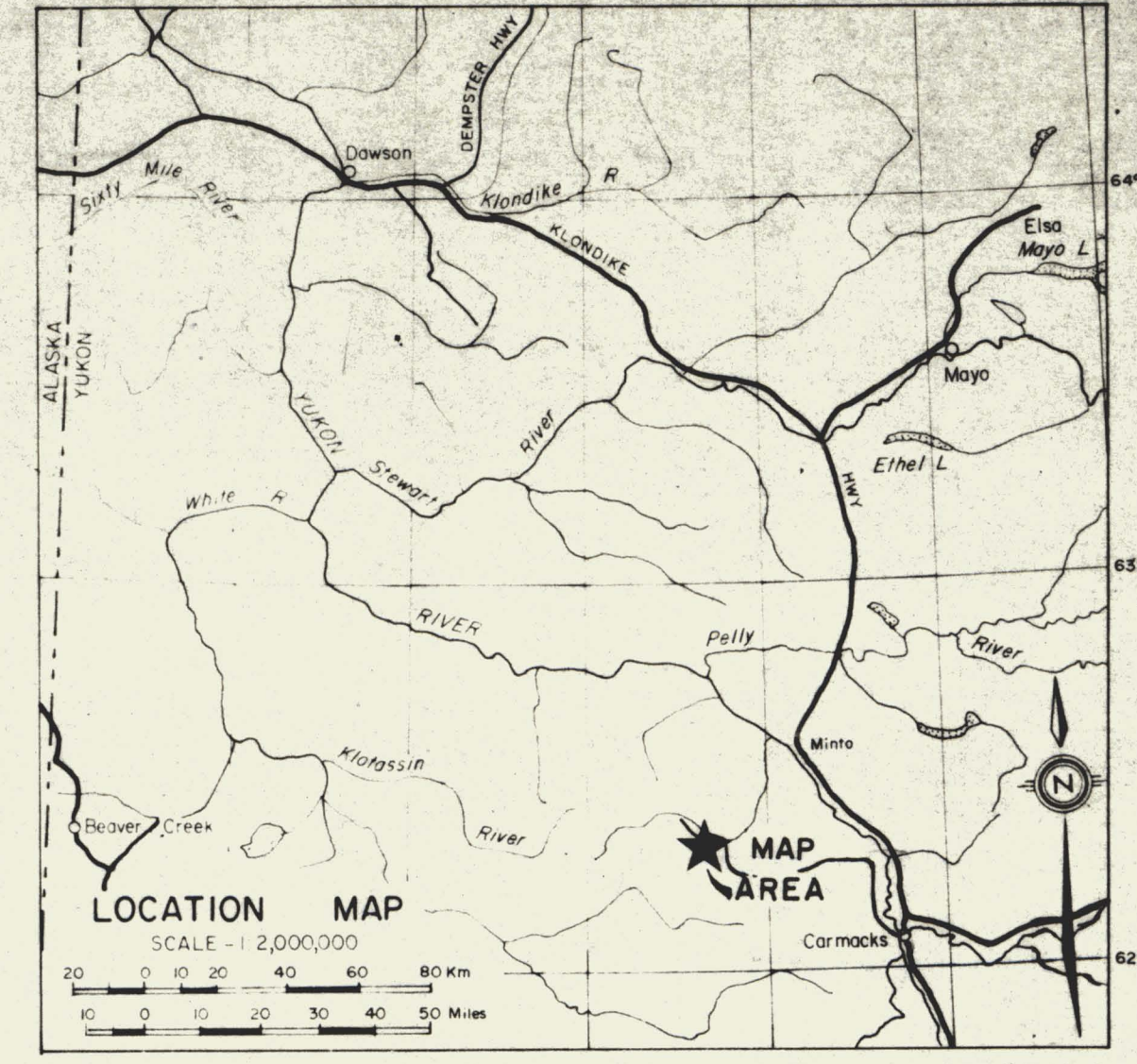
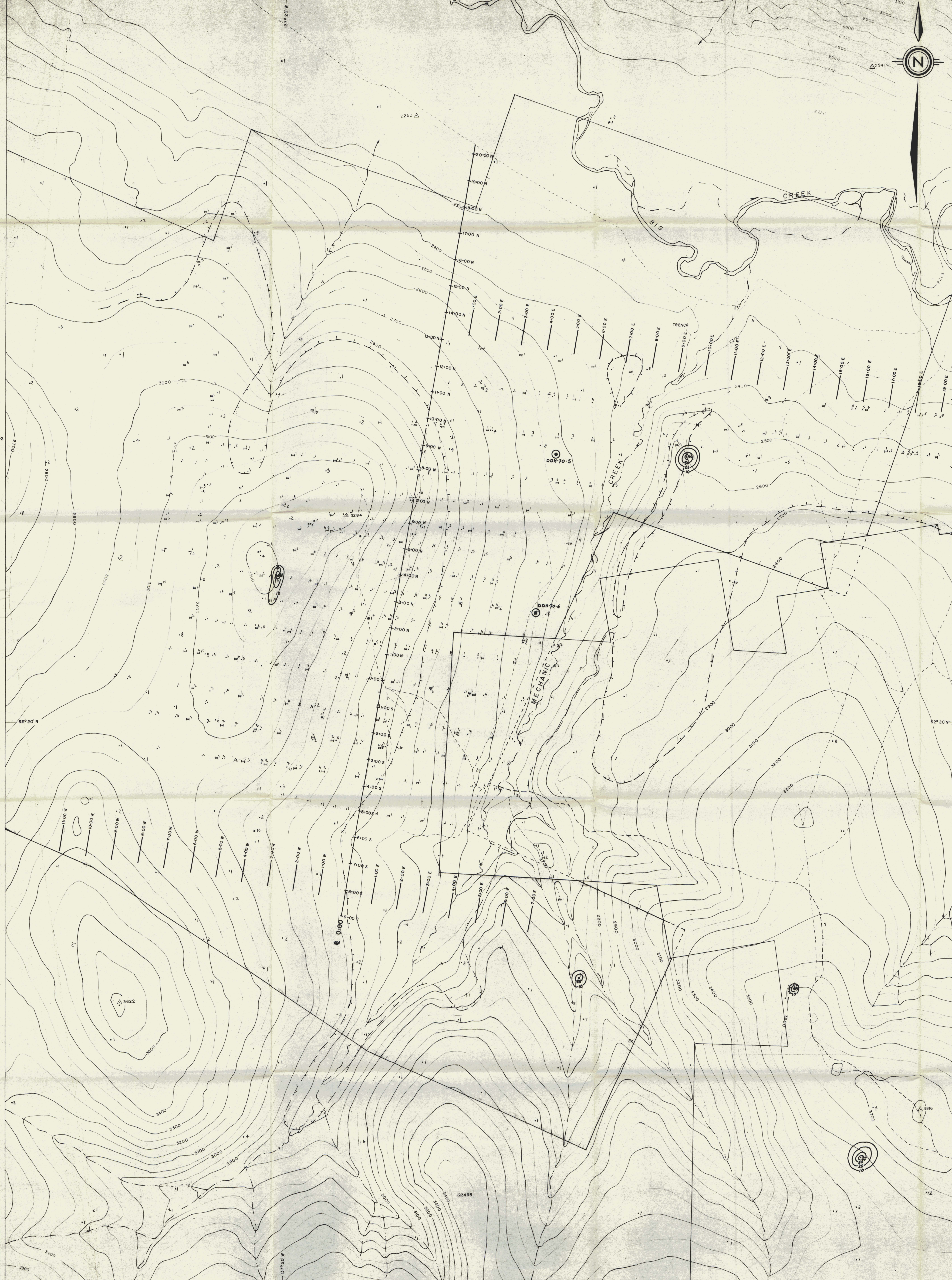
NUCLEUS DETAIL  
 NAT JOINT VENTURE

SCALE 1:5000

100 50 0 50 100 200 300 400 METERS

100 50 0 50 100 200 300 400 METERS





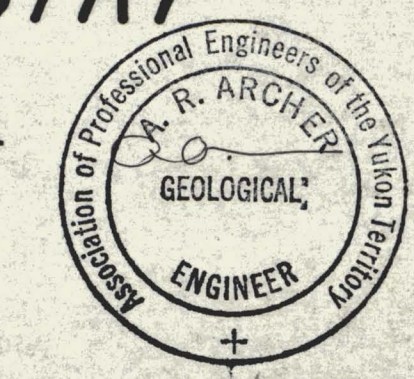
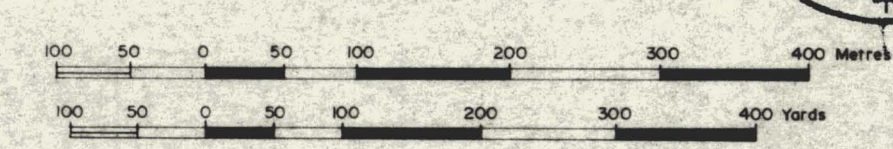
- LEGEND**
- GEOCHEMICAL ANALYSES ppm x 10 Ag**
- Soil
  - Rock
  - x Silt
  - ⊥ Ripper Trench Soil
- NUCLEUS CLAIM BOUNDARY
- YUKON REVENUE CLAIM BOUNDARY
- 10 — GEOCHEMICAL CONTOUR ppm x 10 Ag
- - - GLACIOFLUVIAL OVERBURDEN (in direction of hatch mark)
- ⊙ DIAMOND DRILL HOLE (KAISER 1970)
- △ 3622 TOPOGRAPHIC ELEVATION

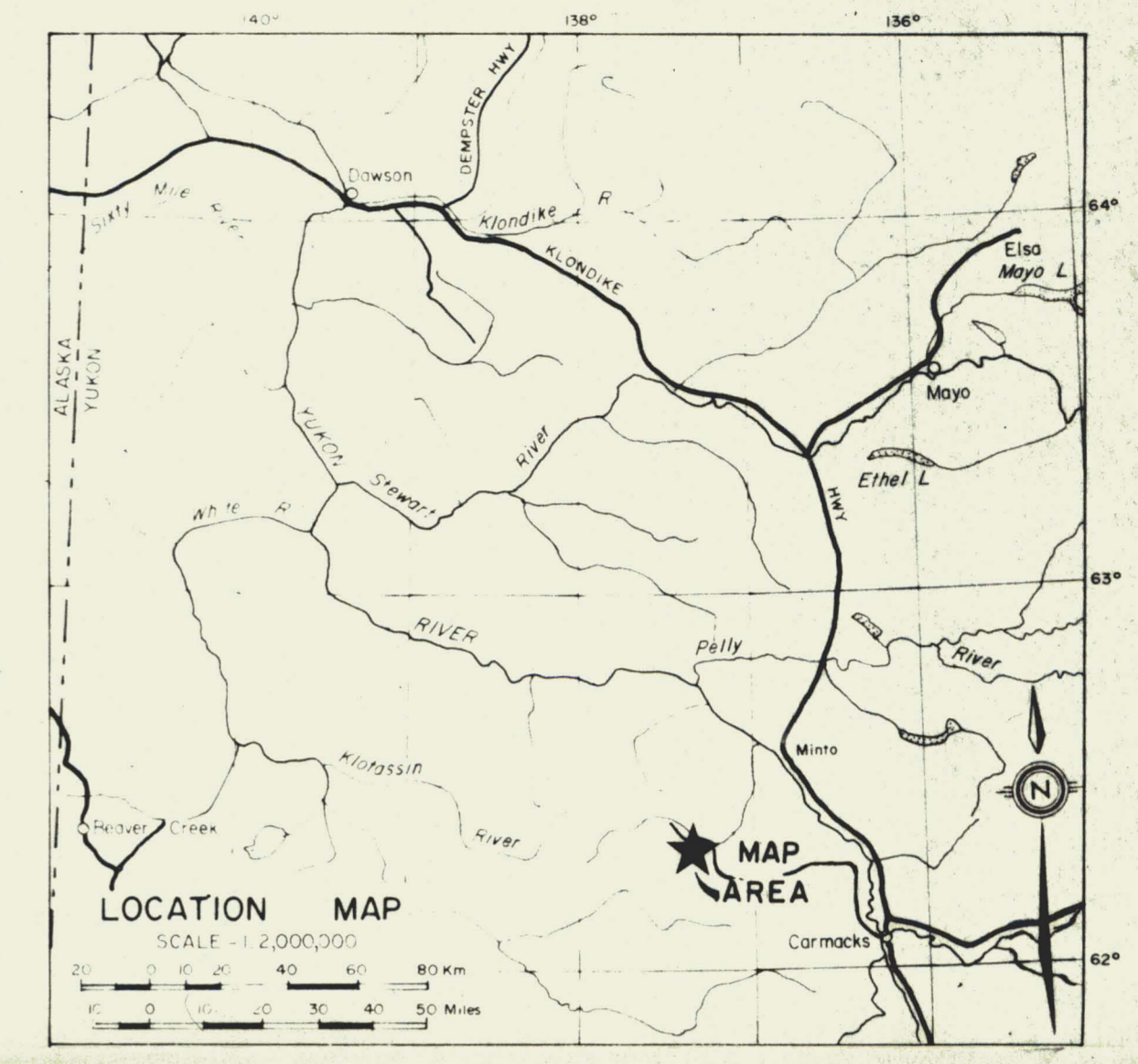
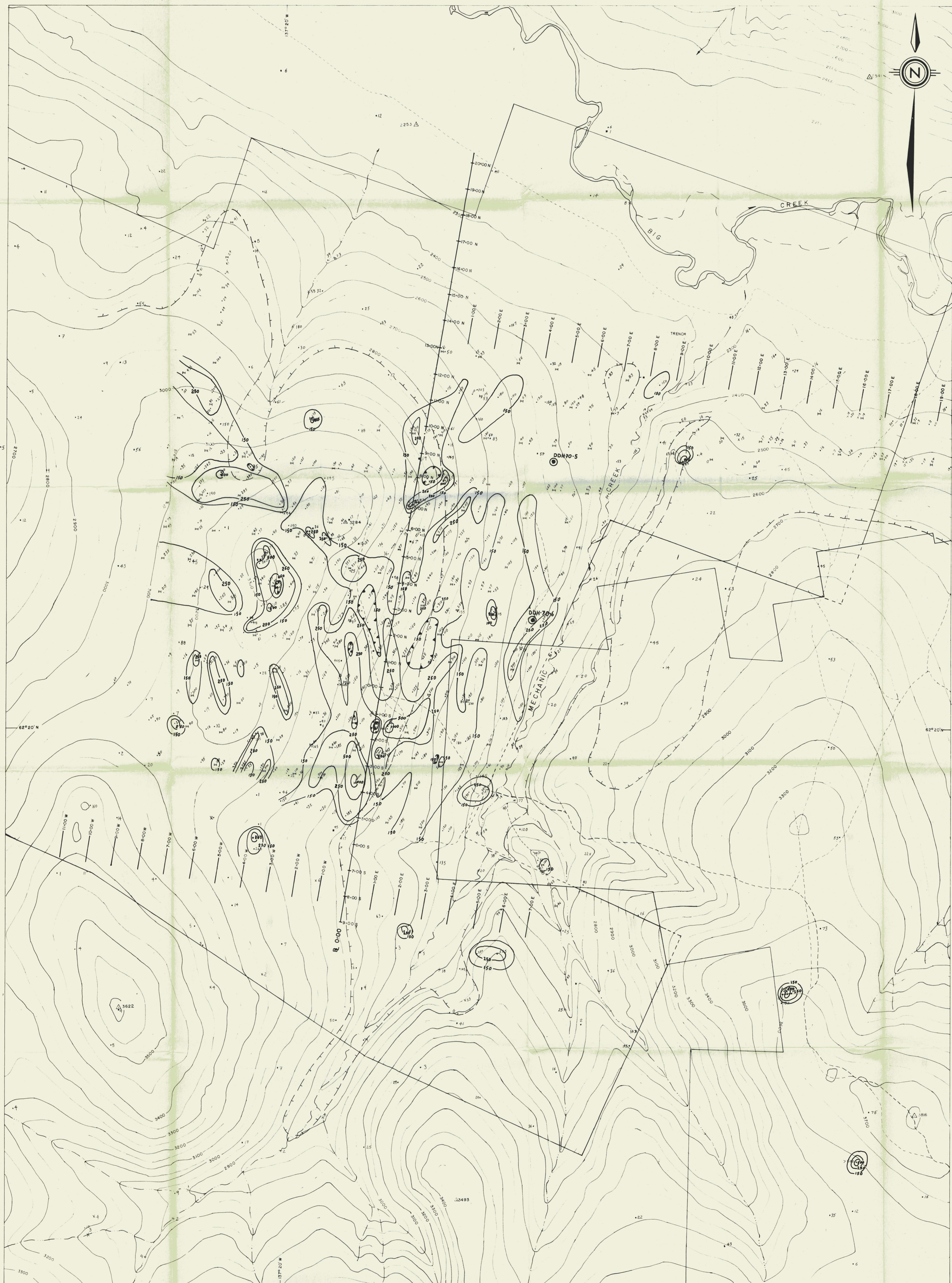
FIGURE N20B  
ARCHER, CATHRO & ASSOCIATES (1981) LTD.

**Ag GEOCHEMISTRY**

NUCLEUS DETAIL  
NAT JOINT VENTURE

SCALE 1:6000





- LEGEND**
- GEOCHEMICAL ANALYSES ppm As**
- Soil
  - Rock
  - Silt
  - Weger Trench Soil
- NUCLEUS CLAIM BOUNDARY
- YUKON REVENUE CLAIM BOUNDARY
- GEOCHEMICAL CONTOUR ppm As (teeth toward lower values)
- GLACIOFLUVIAL OVERBURDEN (in direction of hatch mark)
- ⊙ DIAMOND DRILL HOLE (KAISER 1970)
- △ TOPOGRAPHIC ELEVATION

FIGURE N20C  
 ARCHER, CAIRO & ASSOCIATES (1981) LTD.

**As GEOCHEMISTRY**

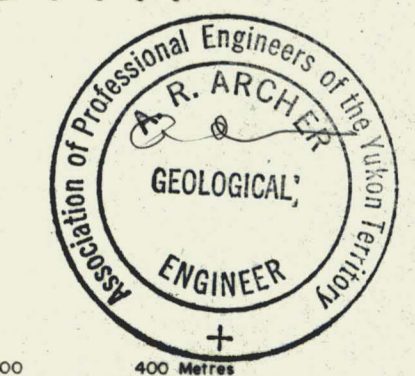
NUCLEUS DETAIL  
 NAT JOINT VENTURE

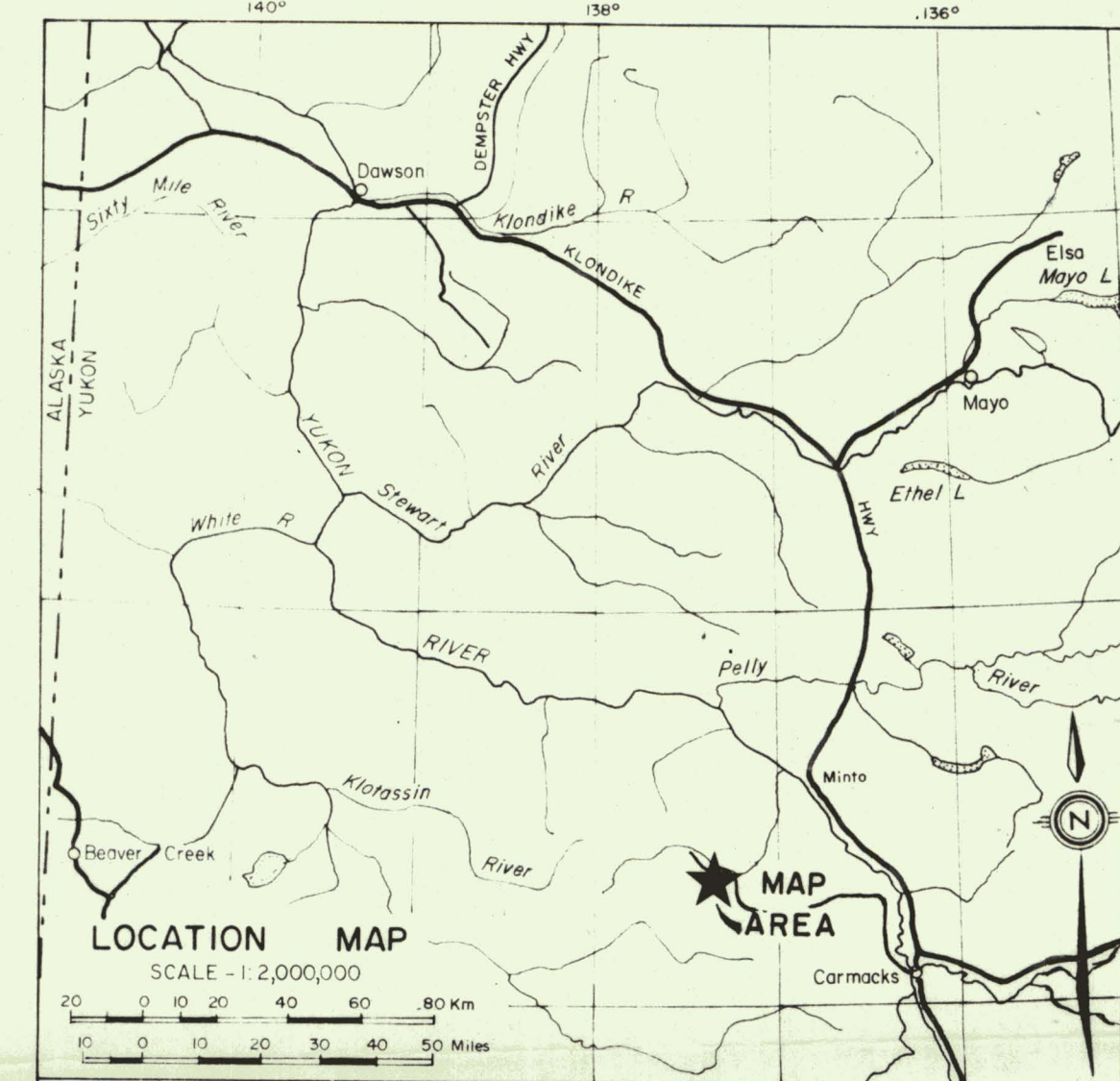
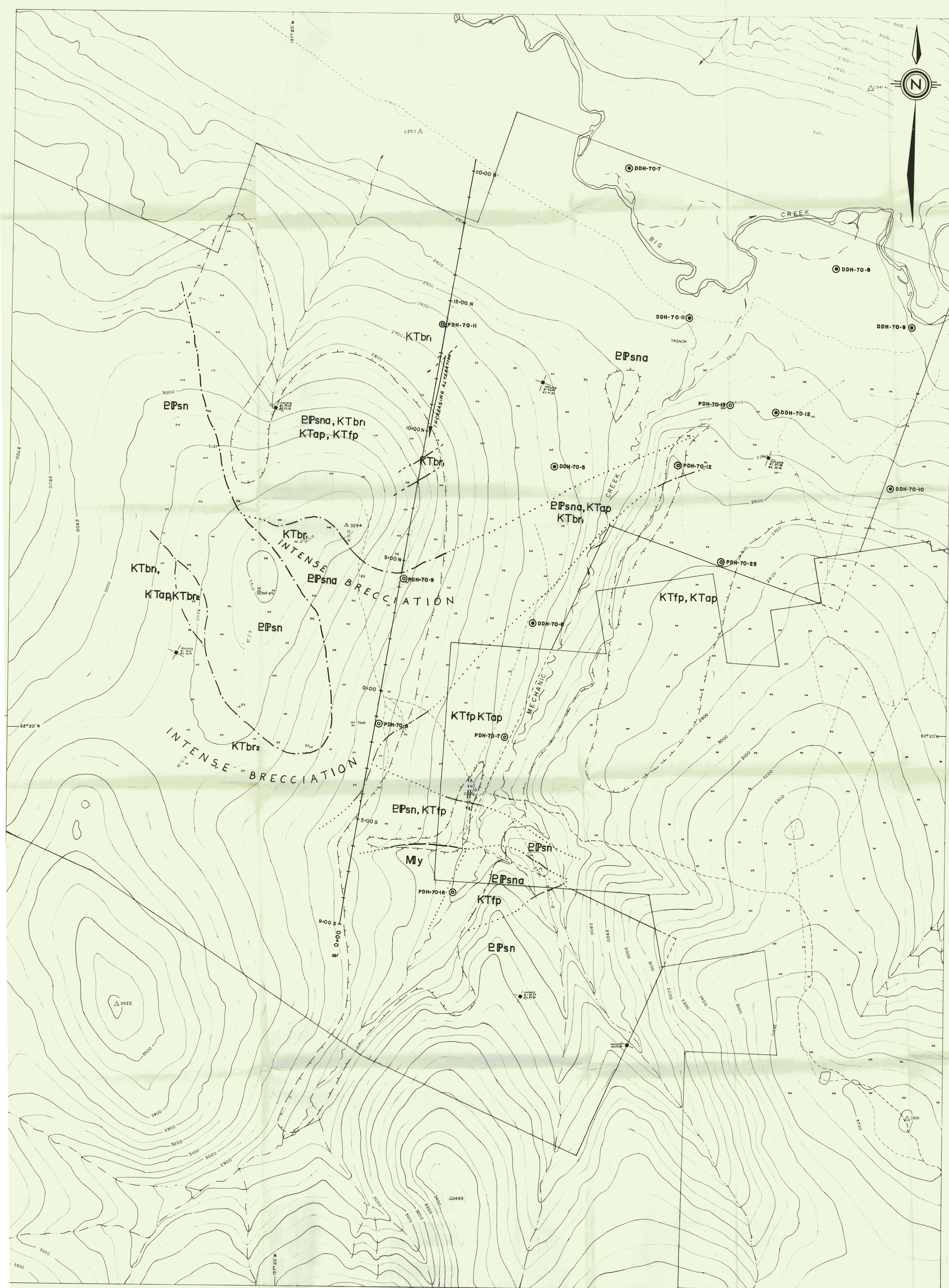
SCALE 1:6000

0 50 100 150 200 250 300 350 400 METERS

0 50 100 150 200 250 300 350 400 FEET

09C973





**LEGEND**

- QUATERNARY**  
**Q** ALLUVIAL - unconsolidated glacial till, glacioluvial and reworked material.
- CRETACEOUS TO TERTIARY**  
**KTbr** BRECCIA - tectonic, weakly to strongly fractured, angular, highly altered apitic and primary fragments in a pale, suggy to scoriaceous, apitic and suggy crystal matrix.  
**KTbr<sub>1</sub>** BRECCIA - tectonic with strongly fractured, weakly to moderately altered apitic fragments in a scoriaceous, fine, highly altered apitic matrix.  
**KTap** APHITE - light yellow to pale green, anhedral to suggy, massive, homogeneous to laminar (poor), may be moderately drusy and fractured, with small, clear to brownish blue quartz eyes and up to 2 mm quartz stringers, some spars, siltite, and matrix in breccia.  
**KTfp** FELDSPAR PORPHYRY - dark green when fresh, to almost white when altered, with 3 to 8 mm subhedral to euhedral kaolinitized feldspar phenocrysts elongated in a fine to medium grained groundmass.  
**TRIASSIC (?)**  
**My** MICAITE - grey, medium grained rock containing large orthoclase phenocrysts with minor plagioclase, biotite, quartz and amphibole, phyllosilicates to often altered with fresh-looking secondary (?) biotite present.
- PROTEROZOIC and/or PALEOZOIC**  
**EPsna** ALTERED SCHIST GNEISS - tectonic, beige to yellow brown, mottled, fine grained, matrix to weakly foliated, quartz eyes with feldspar porphyroblasts relatively common, often altered to clay; fine quartz veins and stringers ubiquitous.  
**EPsn** SCHIST-GNEISS - brown to grey weathering, grey to yellow micaceous quartzite, quartz feldspar mica schist-quartzite, and minor gneissitic amphibole feldspar gneiss.

**SYMBOLS**

- 3000 LANTERN (1111)
- TREIL
- BALLOON TRENCH (KAISER 1970)
- RIPPER TRENCH (KAISER 1970)
- GLACIOLUVIAL OVERBANK (in direction of hatch marks)
- DIAMOND DRILL HOLE (KAISER 1970)
- PERCUSSION DRILL HOLE (KAISER 1970)
- MINAN CLAIM POST LOCATION
- GEOLOGICAL CONTACT: DEFINED, GADGIONAL, ASSUMED
- TRAIL CUT BASELINE
- PF M T
- PHYTE, MICAITE OCCURRENCE
- △ 3622 TOPOGRAPHICAL ELEVATION
- NUCLEUS CLAIM BOUNDARY
- YUKON REVENUE CLAIM BOUNDARY

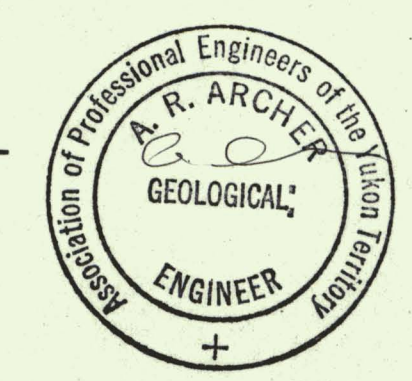
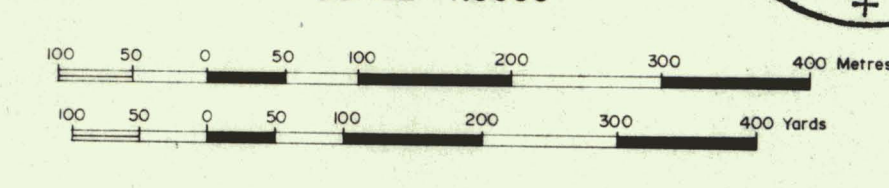
SOURCES: ARCHER, CATRO MAPPING (1980-81), GSC MAPPING, KAISER RESOURCES ASSESSMENT (1970)

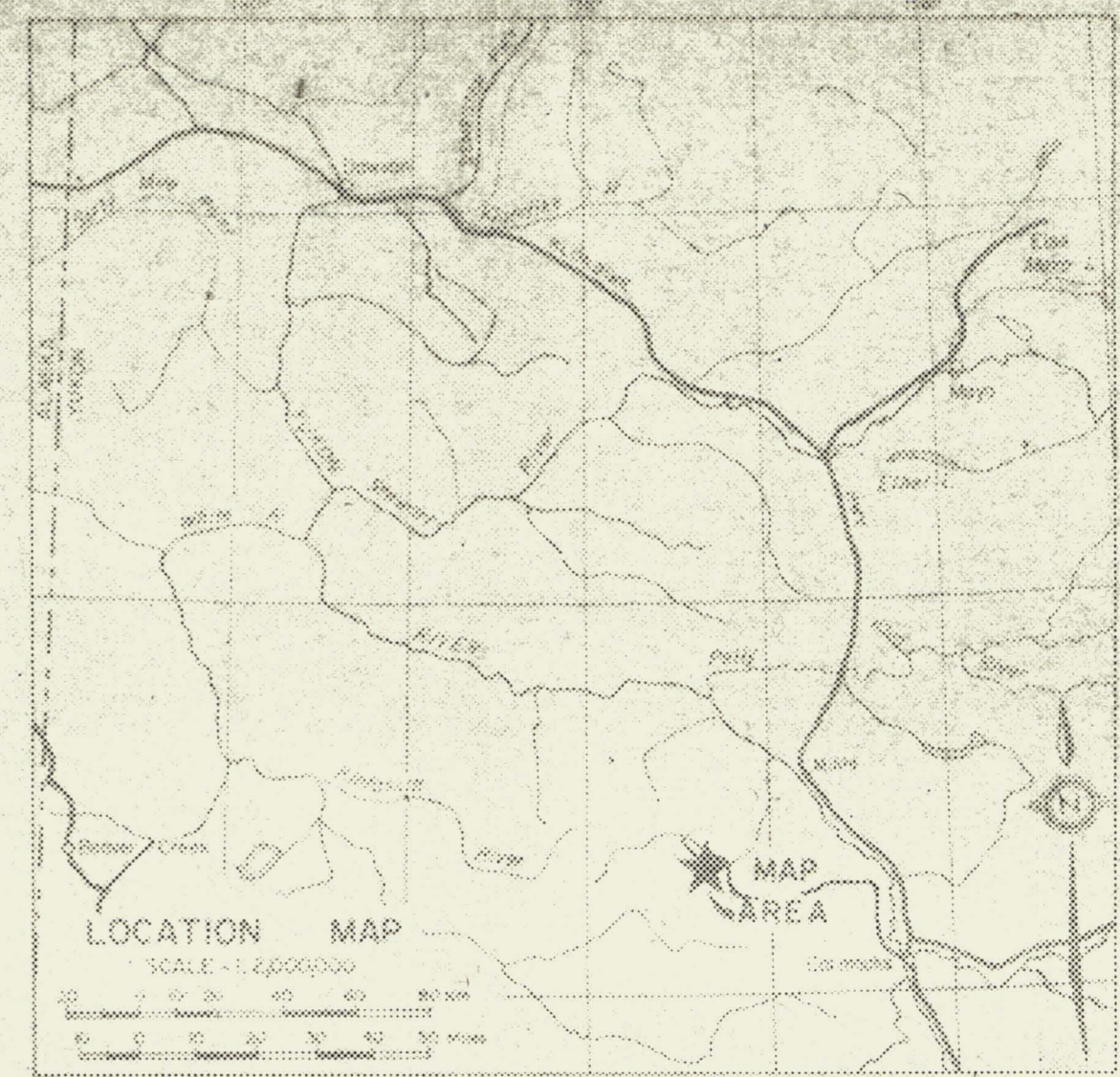
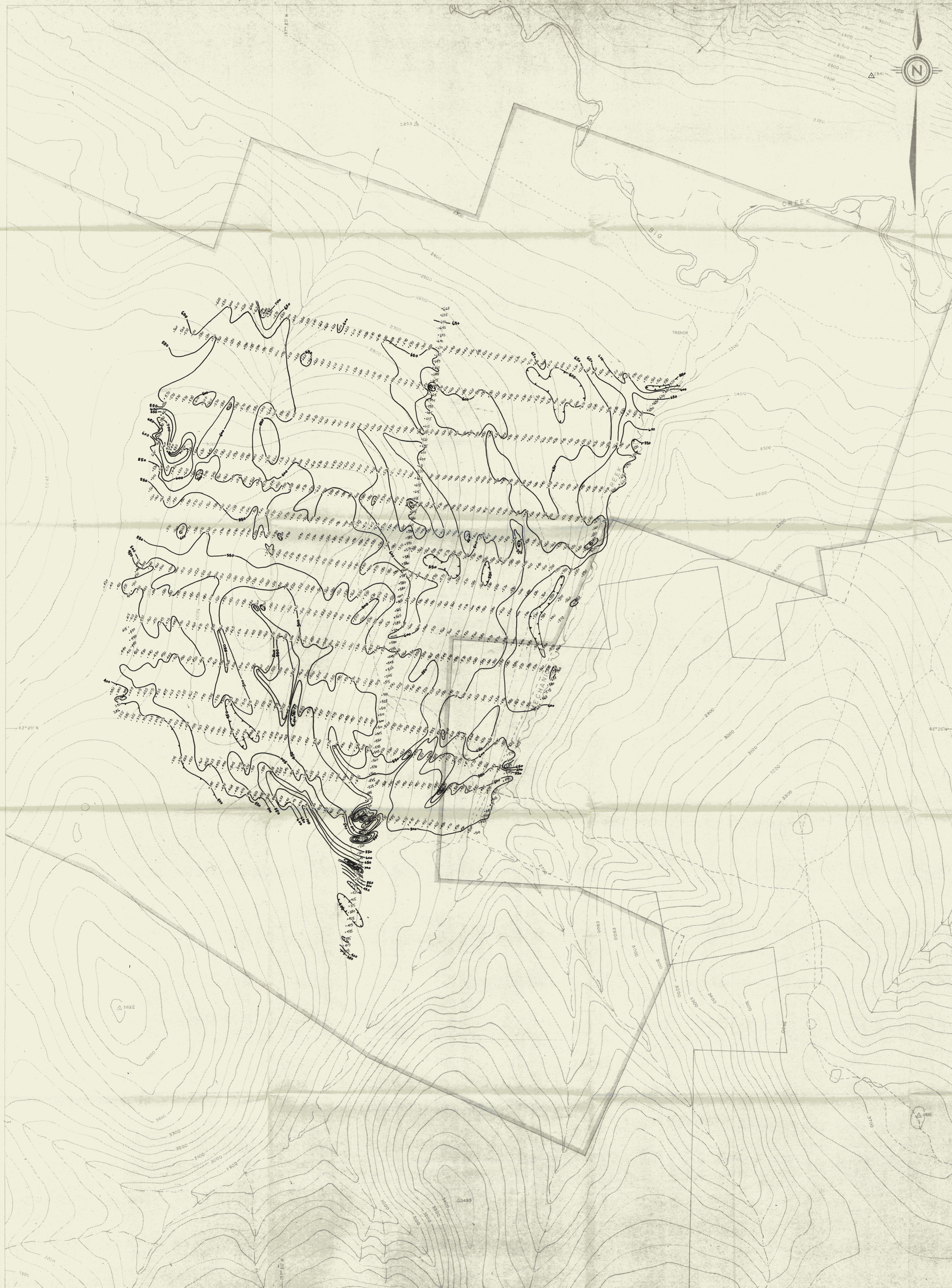
FIGURE N20D  
 ARCHER, CATRO & ASSOCIATES (1981) LTD.

**GEOLOGY**

NUCLEUS DETAIL  
 NAT JOINT VENTURE

SCALE 1:5000





**LEGEND**


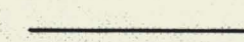
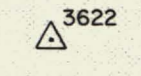


-  NUCLEUS CLAIM BOUNDARY
-  YUKON REVENUE CLAIM BOUNDARY
-  TOPOGRAPHICAL ELEVATION
-  SAMPLE POINT AND VALUE (Ø)
-  MAGNETIC CONTOURS:  
CONTOUR INTERVAL - 50 G  
TEETH POINT TO MAGNETIC LOW
- BACKGROUND CONTOURS REPRESENT TOPOGRAPHY (50' INTERVAL)

FIGURE N20E  
 ARCHER, GATHRO & ASSOCIATES LTD  
**MAGNETIC SURVEY**

NUCLEUS DETAIL  
 NAT JOINT VENTURE

SCALE 1:50000

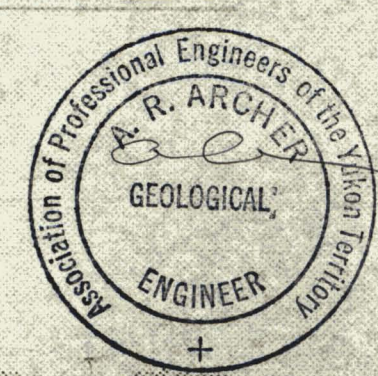
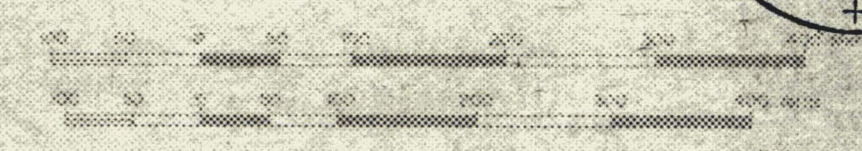
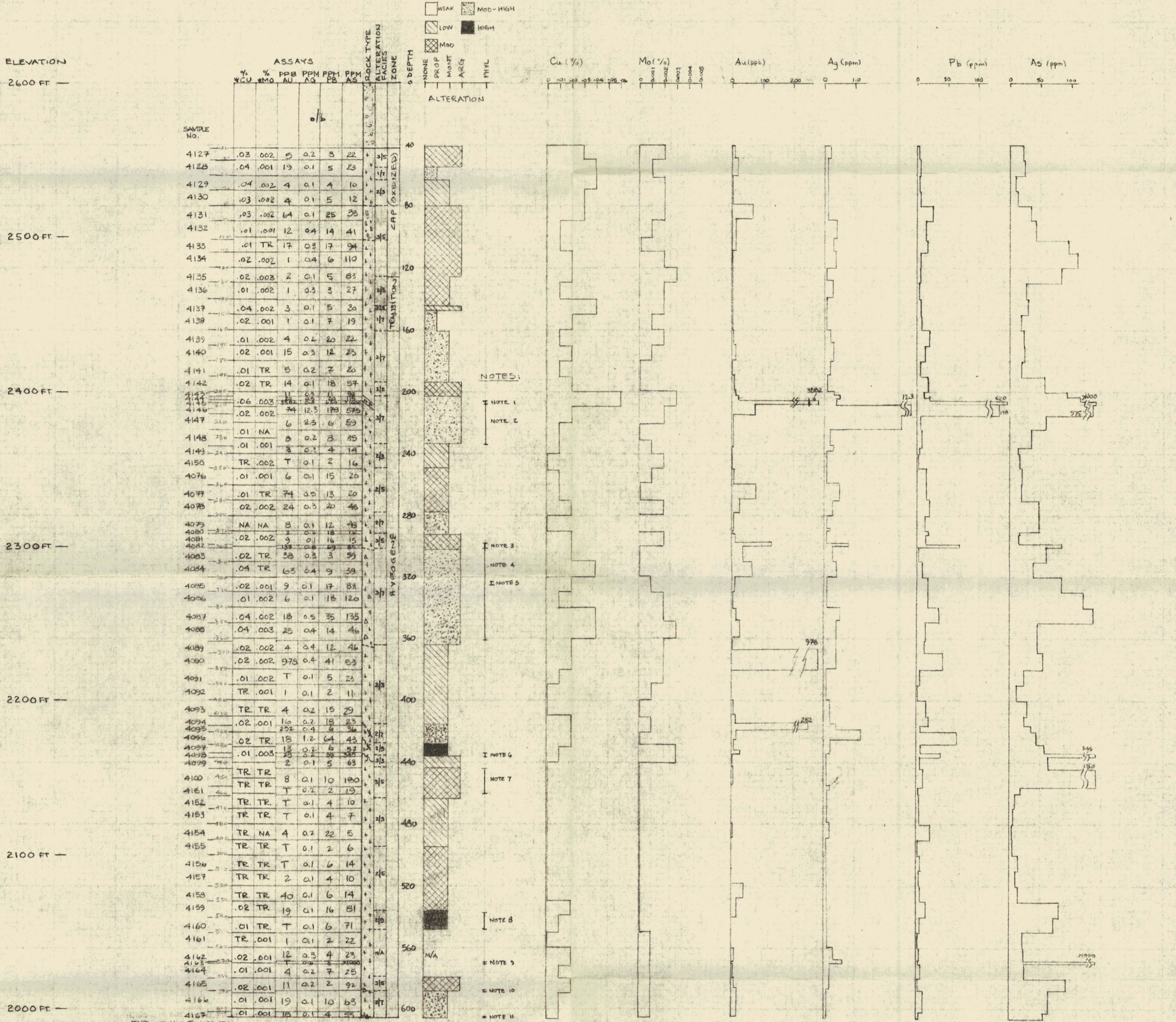


FIGURE 1  
NUCLEUS CLAIMS  
KAISER 1970/  
HOLE D70-5-90°  
V SCALE 1:480



- END OF HOLE 606 FT.
- NOTES: 1 (203.2'-207.6) FELSITE AND QUARTZ MONZONITE BRECCIA - ROUNDED TO ANGULAR, UP TO 0.1 FT FRAGMENTS IN A GLASSY MATRIX; 1-2% PYRITE TO 206.2 FT, 20% PYRITE + 5% CHALCOPYRITE TO 206.6 FT  
2 (207.0'-234.0) WHITE QUARTZ VEINING TO 0.1 FT (AVERAGE 0.05 FT); WEAK DISSEMINATED SULPHIDES + LIMONITE; RARE PYRITE + CHALCOPYRITE VEINLETS  
3 (298.8'-301.0) QUARTZ VEINING, BRECCIATED GREY AND WEAKLY BRECCIATED STRONG WHITE  
4 (301.0'-361.4) BRECCIATED OR CRACKLED QUARTZ MONZONITE; MINOR FELSITE FRAGMENTS + WHITE-GREY QUARTZ VEINING, SOMETIMES BRECCIATED; CHALCOPYRITE VEININGS ± QUARTZ, ~1% PYRITE, CHALCO TAKEN  
5 (323.0'-325.4) STRONG WHITE AND FAIR GREY QUARTZ VEINING, MINOR ~1% PYRITE; BLACK MINERAL - CHALCO  
6 (434.0' - 436.7) CREAM & WHITE CALCITE ± 10-20% GREY & WHITE QUARTZ; TRACE PURPLE FLUORITE; WEAK TO FAIR CHALCOPYRITE, PYRITE VEINING  
7 (444.0' - 461.0) FAIR WHITE & GREY QUARTZ, MINOR QUARTZ-SERICITE VEINING, OFTEN WITH PYRITE-CHALCOPYRITE VEINING  
8 (537.0' - 548.0) CALCITE VEINLETS OFTEN WITH CHALCOPYRITE, PYRITE AND HEMATITE MINERALIZATION; SILICA ENVELOPE AROUND CALCITE VEINLETS  
9 (569.4' - 570.8) SILICEOUS ENVELOPE AROUND PYRITE AND CALCITE VEINLETS; 2% CHALCOPYRITE  
10 (588.0' - 589.0) BRECCIA FRAGMENTS IN GLASSY DARK GREY MATRIX  
11 (605.7' - 606.0) BRECCIA WITH 'CHERTY' GREY QUARTZ MATRIX

FOR GEOLOGICAL LEGEND, SEE CHART FOR HOLE D70-6

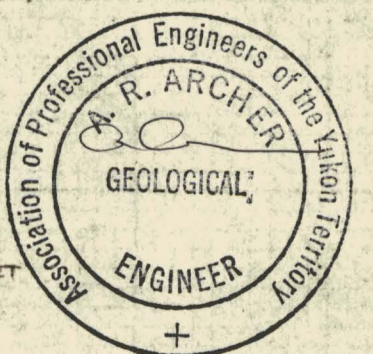
FIGURE 120F  
ARCHER, CATHRO & ASSOCIATES (1981) LTD  
HOLE D70-5 GEOCHEMISTRY

NUCLEUS PROPERTY  
NAT JOINT VENTURE  
VERTICAL SCALE 1:480

0 20 40 60 80 100 120 FEET

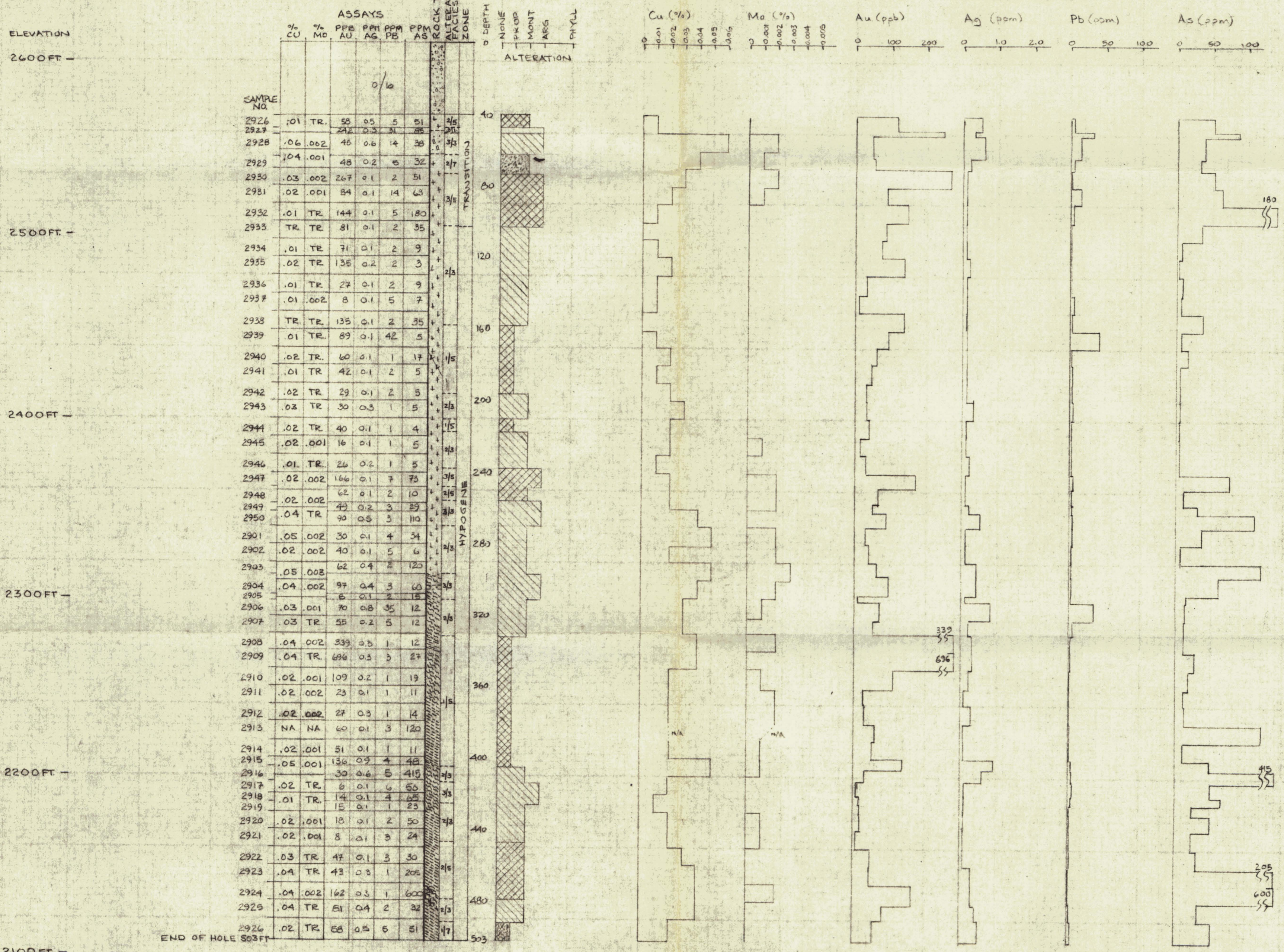
090973

TO ACCOMPANY REPORT BY A.R. ARCHER DATED JANUARY 1982



NUCLEUS CLAIMS  
KAISER 1970  
HOLE D70-6-90

WEAK Mod  
LOW Mod-HIGH



GEOLOGICAL LEGEND

- RECENT
  - GLACIAL TILL & WEATHERED BEDROCK
  - UPPER CRETACEOUS & TERTIARY (50-70 MA)
    - QUARTZ-FELDSPAR PORPHYRY - FINE-GRAINED QUARTZ & FELDSPAR PHENOCRYSTS IN A MICROCRYSTALLINE MATRIX
    - ANDESITE - DARK GREEN APHANTIC, RARE QUARTZ, FELDSPAR PHENOCRYSTS
    - QUARTZ MONZONITE - MEDIUM GREEN, EQUIGRANULAR - RARELY GNEISSIC TEXTURE, UP TO 15% BIOTITE AND HORNBLende
- PALEOZOIC? (UPPER DEVONIAN & MISSISSIPPIAN)
  - YUKON CRYSTALLINE TERRANE (ALLOCHTHONOUS)
    - SCHIST/GNEISS UNIT
      - QUARTZITE - SCHISTOSE, VARIABLE AMOUNTS OF CHLORITE, BIOTITE AND FELDSPAR, GRADES INTO GNEISS BELOW
      - GNEISS - QUARTZ, FELDSPAR
- △ BRECCIATED
- \* ASSAY RESULTS FROM KAISER 1970 DRILL LOGS

FIGURE N209

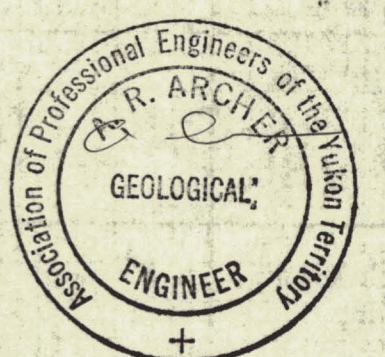
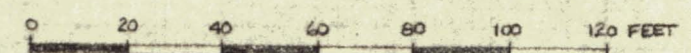
ARCHER, CATRO & ASSOCIATES (1981) LTD.

HOLE D70-6 GEOCHEMISTRY

NUCLEUS PROPERTY

NAT JOINT VENTURE

VERTICAL SCALE 1:480



040413