

# ARCHER, CATHRO

& ASSOCIATES (1981) LIMITED

CONSULTING GEOLOGICAL ENGINEERS

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091810

GEOLOGICAL AND GEOCHEMICAL REPORT

on the

MALONEY PROPERTY

(ALO 1-50 Claims)

located at

Latitude 62°01'N; Longitude 137°54'N

on

NTS Mapsheets 115I/4 & 115H/13

091810

W. Douglas Eaton, B.A., B.Sc.

Work done between August 12 and 20, 1985



This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representation work in the amount  
of \$ 13,750.

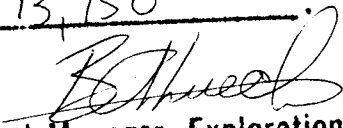
  
Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

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M5	Silver Geochemistry	B
M6	Arsenic Geochemistry	B
M7	Lead Geochemistry	C
M8	Zinc Geochemistry	C
M9	Copper Geochemistry	C

### INTRODUCTION

The Maloney property was staked by Freegold Venture (FV) in June, 1985 to cover a recently lapsed porphyry copper deposit called the Pot occurrence. Reconnaissance soil sampling peripheral to the occurrence by Nat Joint Venture (Nat) in 1981 had returned a few anomalous gold values. Exploration in 1985 consisted of prospecting and wide spaced grid soil chemistry under supervision of the author. Appendix I contains the author's Statement of Qualifications, while Appendix II is a list of personnel who worked on the property.

### PROPERTY, LOCATION AND ACCESS

The property consists of 50 contiguous mineral claims as shown on Figure M1 on the following page. The claims are recorded in the name of Archer, Cathro & Associates (1981) Limited in the Whitehorse Mining District as listed below.

<u>Claim Name</u>	<u>Grant Number</u>	<u>Expiry Date</u>
ALO 1-50	YA87228-YA87277	June 19, 1986

The claim block is centred at latitude 62°01'N and longitude 137°54'W along the boundary between NTS map sheets 115I/4 and 115H/13, some 82 km west of Carmacks. Access in 1985 was by helicopter operating from a base in Carmacks and the work was done from a flycamp on the property. The nearest road access is the Mount Nansen Road, 37 km to the east. An old bulldozer trail between the Mount Nansen mine and the north end of Aishihik Lake bisects the property.

137°55'

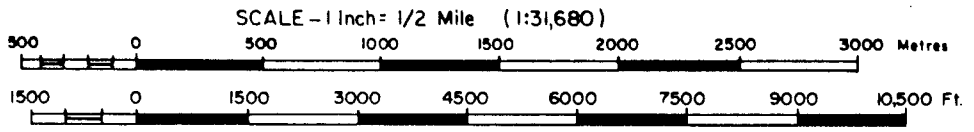
1	3	5	7	9	11	13	15
2	4	6	8	10	12	14	16
17	19	21	23	25	27	29	31
50	18	20	22	24	26	28	30
49	33	35	37	39	41	43	45
34	36	38	40	42	44	46	48

ALO Claims



62°00'

FIGURE M1  
 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
 CLAIM MAP  
 MALONEY PROPERTY  
 FREEGOLD VENTURE  
*WPJ*



#### PREVIOUS WORK

The Pot occurrence was first staked in 1969 by Amax, which conducted grid soil sampling, hand pitting, magnetometer and IP surveys and drilled 4 packsack holes totalling 75 m in 1970. In 1976, a joint venture involving Brascan and Scurry Rainbow optioned the property and drilled 6 diamond drill holes totalling 740 m. The work outlined a small low grade porphyry copper deposit. The Pot claims were allowed to lapse in 1981.

#### PHYSIOGRAPHY AND GEOMORPHOLOGY

The property covers two west-flowing tributaries of Maloney Creek and the adjacent ridges. The valley bottoms are at about 1000 m and are broad and swampy, while the ridges crest at 1280 m and exhibit gentle slopes with rounded tops. North-facing slopes and valley bottoms are permanently frozen and are vegetated with deep moss, buckbrush and stunted black spruce, compared to south-facing slopes which are relatively dry and feature alder, birch and larger spruce trees. Soil profiles range from C horizon on ridge tops, to well developed A, B and C horizons on south-facing slopes, to a thick layer (often in excess of 1 m) of frozen organics over a soliflucted mixture of A and B horizon on valley bottoms. The thickness of the ash layer varies from nonexistent on ridges to 20 cm or more at some locations on valley bottoms. Outcrop and talus are restricted to ridge tops.

## GEOLOGY

### General

Figure M2 in the pocket illustrates the property geology and is modified after a map presented in an Amax assessment report (Godfrey, 1970) which described results of a comprehensive program of outcrop and soil rock fragment mapping. The Amax baselines were located relative to the 1985 FV grid so that previous work could be utilized, thus saving a considerable amount of time.

The geology is complex and consists of Paleozoic or earlier Pelly Gneiss metamorphic rocks which are overlain by Cretaceous intermediate to acid flows and intruded by a variety of related, plutonic and subvolcanic feeder dykes and plugs. Exposure is poor and little is known about the contact and/or age relationships between units.

### Lithology

The following rock descriptions are simplifications of those given in the Amax report. The Amax unit numbers have been retained to conform with the map but they have been regrouped into four categories to better reflect apparent affinities. The categories are Pelly Gneiss, mafic intrusions, volcanics and felsic intrusions, in approximate order of formation from oldest to youngest.

Pelly Gneiss (Unit 1) is comprised of crystalline rocks of sedimentary and intrusive origins, which include schists and gneisses (1A), cherts (1B), limestones (1C) and skarns (1D). This unit is the predominant rock type and occurs throughout the property.

Mafic Intrusions (Units 2, 3 & 5) includes a 600 by 1500 m quartz diorite plug at the centre of the property (Unit 5), several small biotite-hornblende porphyry dykes or plugs directly south of the large plug (Unit 3), and a poorly defined diorite to quartz diorite body in the extreme southwest corner of the property (Unit 2). These intrusions were probably feeders to the younger, largely eroded Mount Nansen Group volcanics and are distinguished from later intrusions by an abundance of biotite and/or hornblende which characteristically comprise 20 to 30% of the rock.

Volcanics (Units 4 & 9) are confined to the western half of the property and are probably remnants of more extensive flows which have been eroded. Unit 4 consists of fine-grained dark green andesites which are either volcanic flows or subvolcanic ring dykes surrounding the quartz diorite intrusions. Unit 9 is comprised of orange weathering fine-grained rhyolites.

Felsic Intrusions (Units 6, 7, 8, 10 & 11) form numerous dykes and plugs, most of which are located in the eastern two-thirds of the property. Major lithologies include quartz porphyry (Unit 6), quartz porphyry breccia (Unit 7), quartz-feldspar porphyry (Unit 8) and coarse-grained quartz-feldspar porphyry (Unit 11). The largest body belonging to this group is an irregularly shaped 600 by 300 m quartz porphyry breccia zone located immediately east of the large quartz diorite plug (Unit 5). Unit 10 consists of widely scattered basic to acidic aphanitic dykes which could not be assigned to any other unit.

#### Alteration

A variety of alterations have been recognized and affect four rock types: quartz diorite (Unit 5), quartz porphyry (Unit 6), quartz porphyry breccia (Unit 7) and the adjacent Pelly Gneiss (Unit 1) wallrocks.

Silicification is locally intense and pervasive within all three intrusive units, particularly along contacts. Quartz veining is best developed in the southern half of the quartz diorite where veins ranging from 2 mm to several cm in width form a stockwork exhibiting 200 to 400 veins per square metre. Some of these veins are surrounded by narrow secondary potassium feldspar alteration envelopes. Hairline quartz veinlets are scattered throughout the quartz porphyry breccia but are absent in the quartz porphyry. Silica flooding is common along foliation planes in the Pelly Gneiss adjacent to the intrusives but nowhere reaches a density exceeding ten veinlets per linear metre.

Intense kaolinization and/or sericitization of feldspar occurs throughout the quartz porphyry and quartz porphyry breccia, and locally within the southern portion of the quartz diorite. Bleaching due to sericitization of mafics and feldspars is common in Pelly Gneiss rocks within a 100 m halo surrounding the quartz porphyry breccia.

### Structure

The dominant structural feature on the property is a series of north-to northwest trending topographic linears which are probably fault zones. Many of the felsic intrusions parallel this trend. Due to the lack of exposure the exact nature and extent of these structures could not be determined.

### MINERALIZATION

Mineralization is closely associated with alteration and is confined to the quartz diorite (Unit 5), quartz porphyry (Unit 6), quartz porphyry breccia (Unit 7) and adjacent Pelly Gneiss (Unit 1).

The apparent centre of the porphyry copper system occurs within the stockwork zone along the southern edge of the quartz diorite. Minerals present include pyrite, chalcopyrite, molybdenite, arsenopyrite, jarosite, azurite, malachite and hematite. Six 1976 diamond drill holes tested the target and returned numerous 3 m intersections in the range of 1000 to 2000 ppm Cu, 1.0 to 3.0 ppm Ag, and 100 to 250 ppb Au. Copper and gold values show a fairly high correlation. None of the holes cut known or suspected fault zones. Sulphides are rare at surface and the rocks are almost totally oxidized to a depth of about 60 m. Pyrite (up to 10%) and fluorite (up to 0.1%) are found throughout the quartz diorite plug, while traces of scheelite and tourmaline occur within it adjacent to the copper mineralization. Magnetite is most abundant north of the copper zone while pyrite is more prevalent to the south.

The quartz porphyry and quartz porphyry breccia units both exhibit abundant pitting and limonite, most of which appears to be after pyrite. Traces of molybdenum occur as disseminations and in hairline fractures within the quartz porphyry breccia.

Mineralization in the Pelly Gneiss is restricted to pyrite with minor chalcopyrite and/or molybdenite in quartz veins cutting schists adjacent to the quartz diorite, and traces of disseminated chalcopyrite and pyrite in skarns.

## GEOCHEMISTRY

### General

The 1985 soil samples consisted of B or C horizon material routinely taken at 100 m intervals along compass and topofil controlled lines spaced 200 m apart. Sample density was increased to 50 m intervals on lines 100 m apart in areas exhibiting altered rocks. Survey control was provided by three east-west trending baselines that more or less coincide with the claim lines. The baselines are marked by 1 m lath pickets every 100 m, while the sample sites are located by 0.5 m lath pickets bearing aluminum tags inscribed with the sample number and grid coordinates.

All 669 samples were sent to Chemex Labs in North Vancouver where they were screened to -35 mesh, crushed and analyzed for gold using a fire assay preparation and neutron activation analysis. Two hundred and three of the samples were submitted for 30 element ICP analysis in November.

### Results

Figure M3 in the pocket illustrates results of 1985 FV gold soil geochemistry, while Figures M5 to 9 inclusive show silver, arsenic, lead, zinc and copper results, respectively.

Anomalous gold values are somewhat erratic but show good contrast with the surrounding background values, which average less than 10 ppb. Two areas of anomalous results were identified.

The larger target consists of several clusters of anomalous gold values scattered over a 2400 by 800 m west-northwesterly trending area that extends off the property to the east. The highest values (100 to 1270 ppb Au) occur peripheral to copper soil anomalies but are not supported by arsenic, silver, lead or zinc. Old drill holes that tested the copper anomalies produced several intersections grading 100 to 250 ppb Au over 3 m widths but soil gold values surrounding the holes are generally low, ranging from 3 to 56 ppb. Gold values within this target are erratic and this is probably due in part to the wide sample spacing and the fact that many of the samples were taken from the heavily frozen north-facing slopes. The highest gold values largely coincide with the alteration zone surrounding the quartz diorite and quartz porphyry breccia zone. Three rock samples were taken east of the property along the anomalous trend; and one, a specimen of altered Pelly Gneiss, returned 1330 ppb Au.

The second target is approximately 200 m in diameter and lies along a ridge crest on the southern edge of the claim block. It is underlain by Pelly Gneiss metamorphic rocks and is open to the south. The target is centered on two strongly anomalous values (177 and 532 ppb Au) and exhibits moderate to strong silver, arsenic, lead, zinc and copper values. Maximum values for the pathfinder metals were 8.6 ppm Ag, 2162 ppm Pb, 5170 ppm Zn and 132 ppm Cu.

Although the larger of the two geochemical targets is oriented parallel to one of the two major structural trends on the property, there is no direct relationship between anomalous values and specific linears.

DISCUSSION AND CONCLUSIONS

The geological environment and mineralization on this property are similar to those at other gold prospects in the Dawson Range. Three features are of specific interest. First, the subvolcanic, altered and locally brecciated porphyry intrusions are significant as rocks of this type host bulk tonnage gold mineralization at the Nucleus, Nitro, Revenue and Antoniuk properties. Second, the presence of north to west-northwesterly trending linear structures is encouraging as structures with this trend host most epithermal vein mineralization in the district. Finally, the rocks are deeply oxidized offering potential for cyanide extraction of the gold should a deposit be outlined.

Gold geochemistry is patchy but has outlined two large areas of interest, one apparently associated with a weak porphyry copper system and the other with a vein fault based on their metal signatures. The discontinuous nature of the anomalies is probably due in part to the wide sample spacing and difficult terrane from which many of the samples were taken. Both geochemical anomalies extend off the claim block.

Based on available geological and geochemical data, the property has potential for hosting either bulk tonnage or higher grade structurally controlled deposits. The 1985 sampling was not specifically designed to outline structural targets and was too wide spaced to serve this purpose.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED



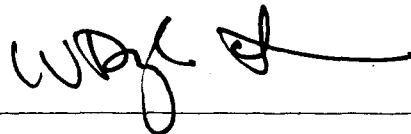
APPENDIX I

Author's Statement of Qualifications

STATEMENT OF QUALIFICATIONS

I, W. Douglas Eaton, geologist, with business addresses in Whitehorse, Yukon Territory and Vancouver, British Columbia, and residential address in Burnaby, British Columbia, do hereby declare:

1. I graduated from the University of British Columbia in 1980 with a B.Sc.
2. From 1971 to the present, I have been actively engaged in mineral exploration in British Columbia and Yukon Territory and on June 1, 1981, became a partner in Archer, Cathro & Associates (1981) Limited.
3. I have personally participated in or supervised the field work reported herein and have interpreted all data resulting from this work.



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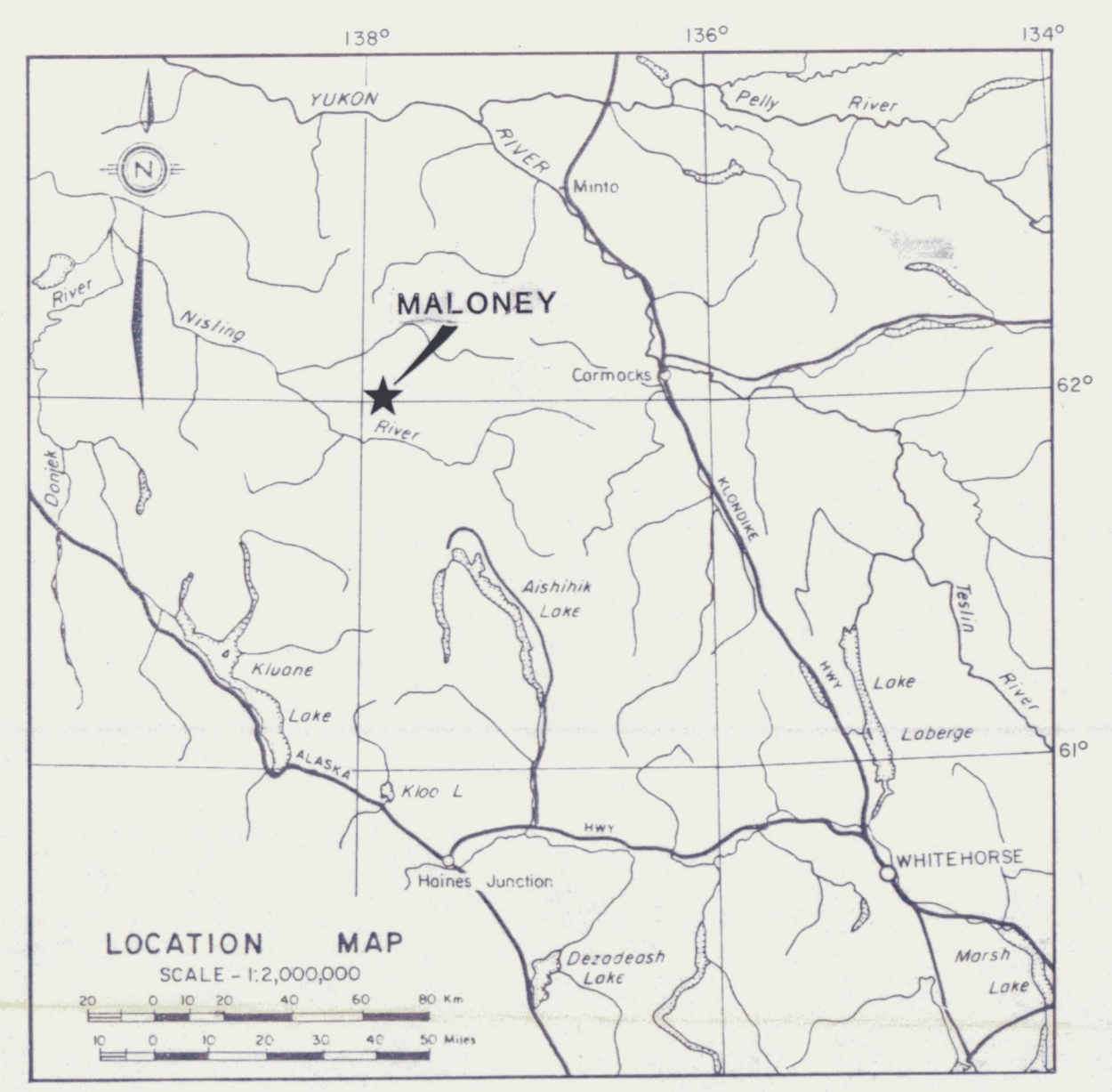
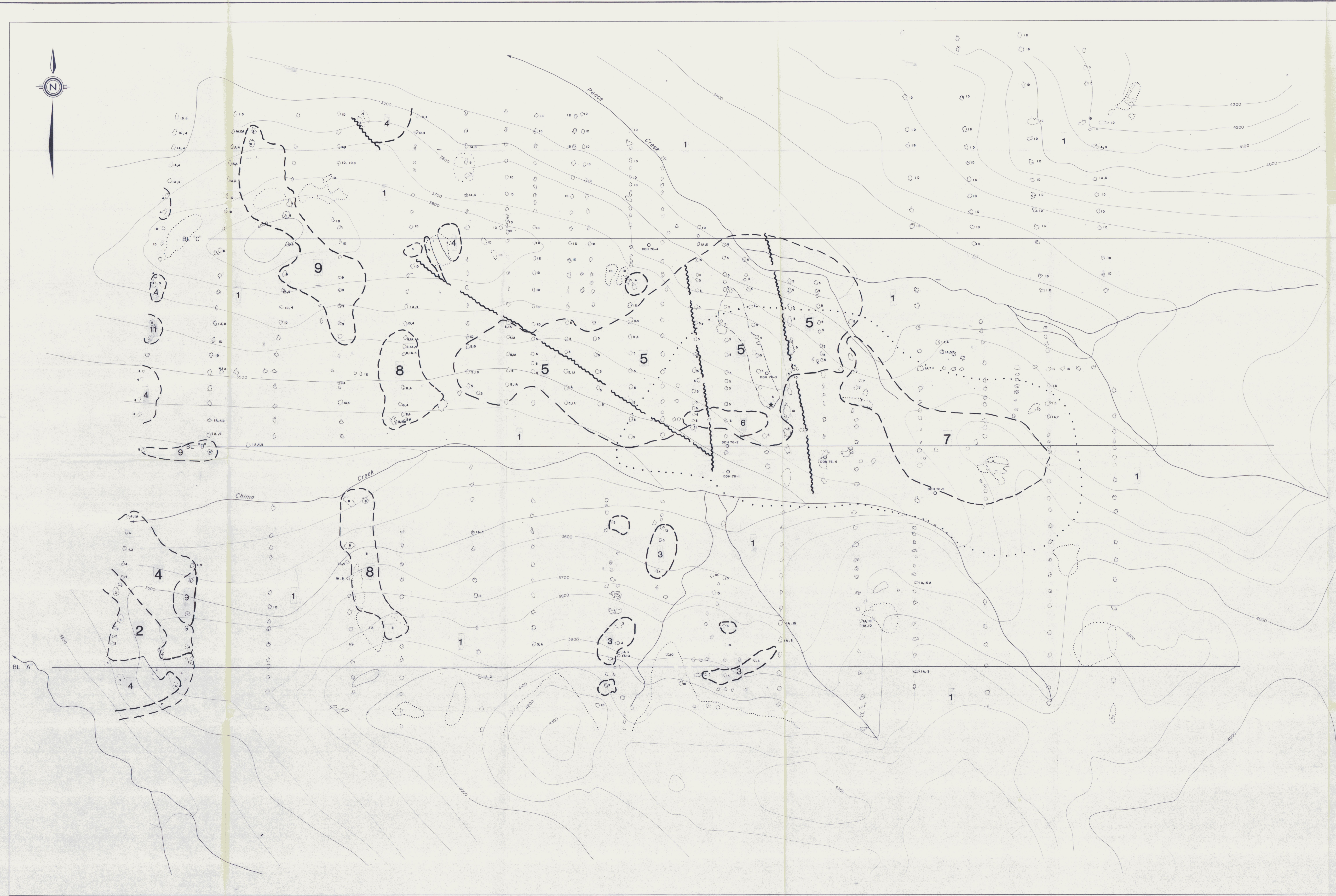
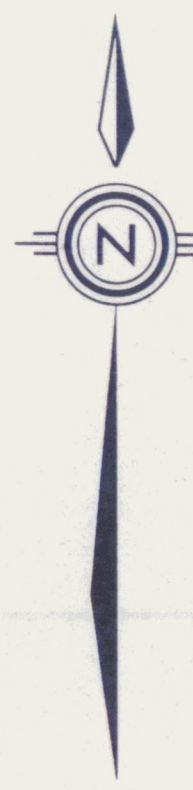
W. Douglas Eaton, B.A., B.Sc.

APPENDIX II  
List of Personnel

LIST OF PERSONNEL - MALONEY PROPERTY

DATES WORKED: August 12 - August 20, 1985

<u>NAME</u>	<u>ADDRESS</u>	<u>POSITION</u>
K. Sax	Box 555, Sedgewick, Alberta	Crew Chief
M. Neary	133 West 20th Avenue, Vancouver, B.C.	Student
J. Olsson	109 Waddington Drive, Kamloops, B.C.	Student



**CRETACEOUS FELSIC INTRUSIONS**

- 11 Coarse grained quartz feldspar porphyry
- 10 Undifferentiated aphanitic dykes
- 8 Quartz feldspar porphyry
- 7 Quartz porphyry breccia
- 6 Quartz porphyry

**CRETACEOUS VOLCANIC ROCKS**

- 9 Rhyolite
- 4 Andesite

**CRETACEOUS MAFIC INTRUSIONS**

- 5 Quartz diorite
- 3 Biotite hornblende porphyry
- 2 Diorite with lesser quartz diorite

**PALEOZOIC OR OLDER**

- 1 Undifferentiated metamorphic rocks
- 1A schist & gneiss
- 1B chert
- 1C limestone
- 1D skarn

- Approximate geological contact
- - - - - Fault
- ..... Approximate limit of intense silicification argillization and/or sericitization
- o o o o Approximate limit of rock soil fragments talus and/or outcrop

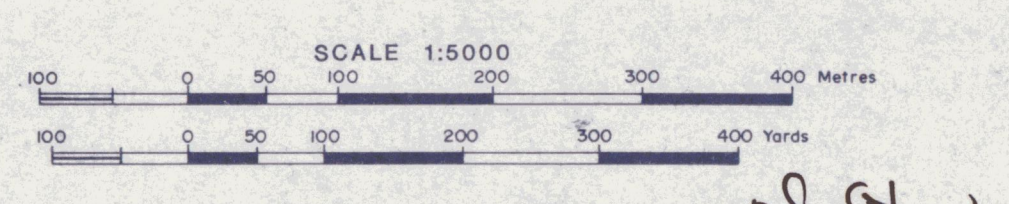
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FIGURE M2

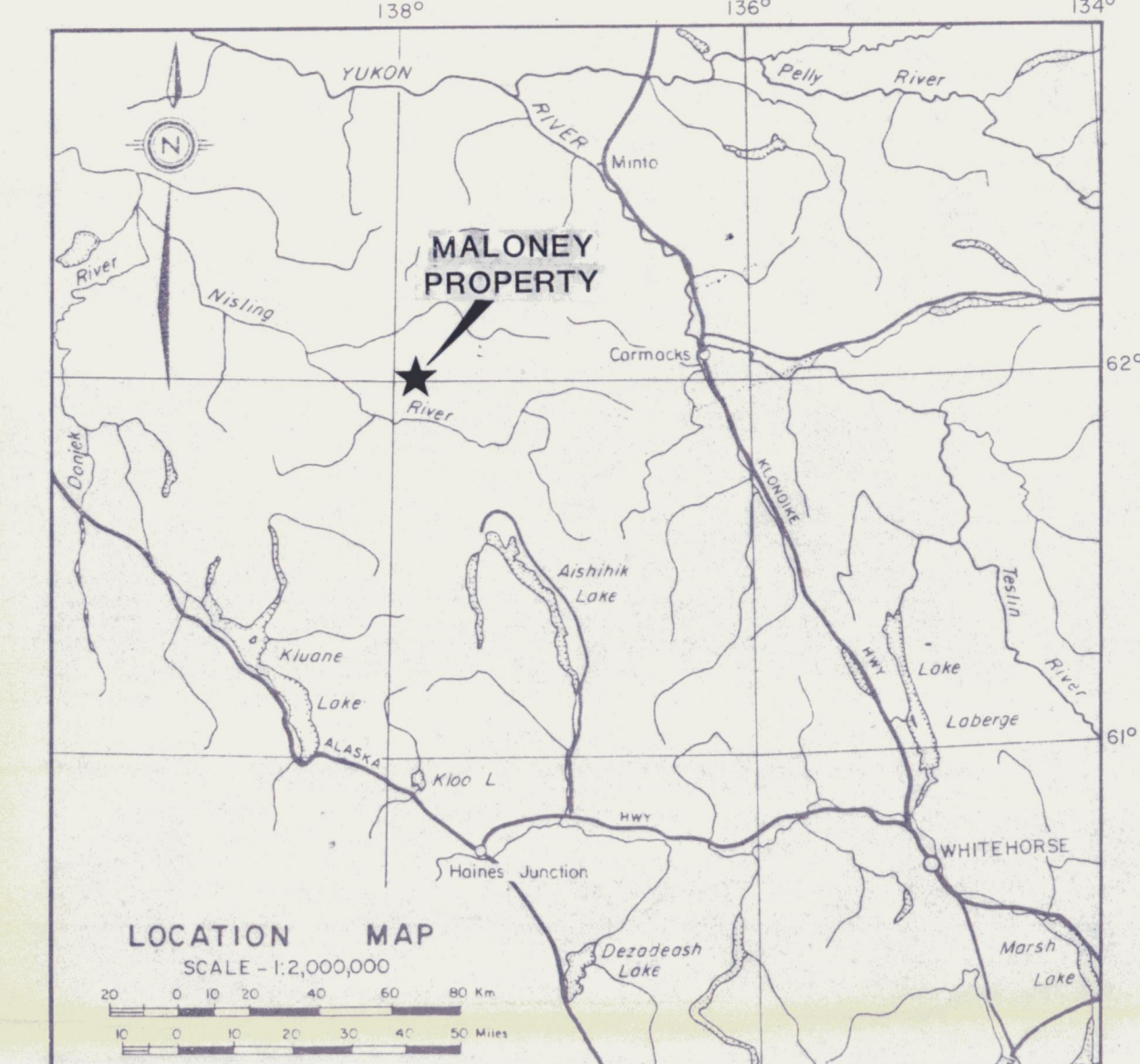
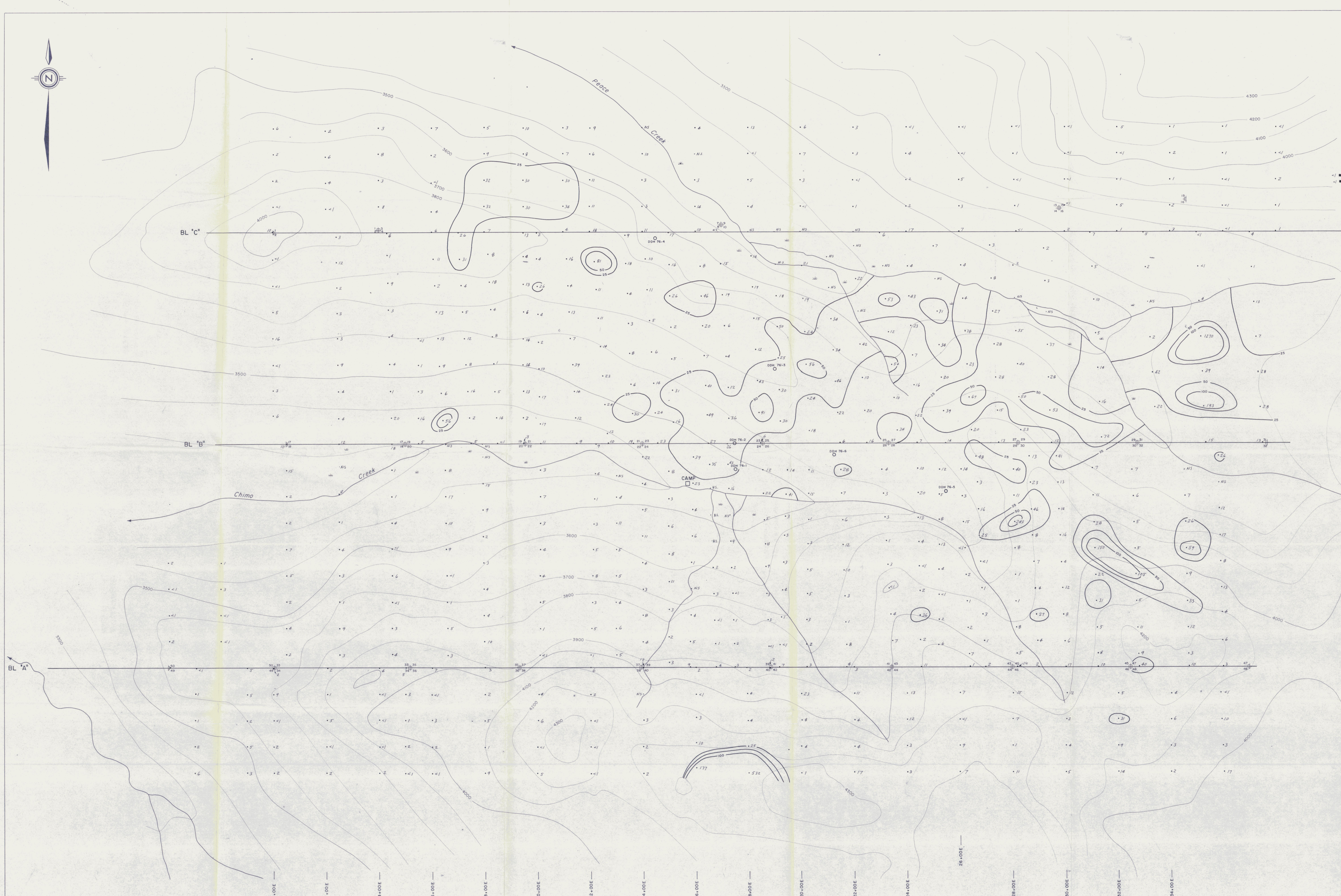
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**GEOLOGY**

MALONEY PROPERTY  
FREEGOLD VENTURE

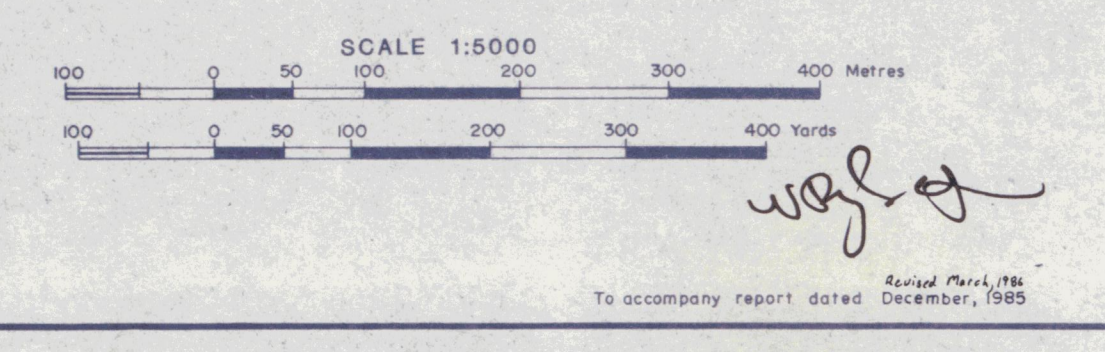


wjg  
Printed Plans, 1981  
To accompany report dated December, 1980



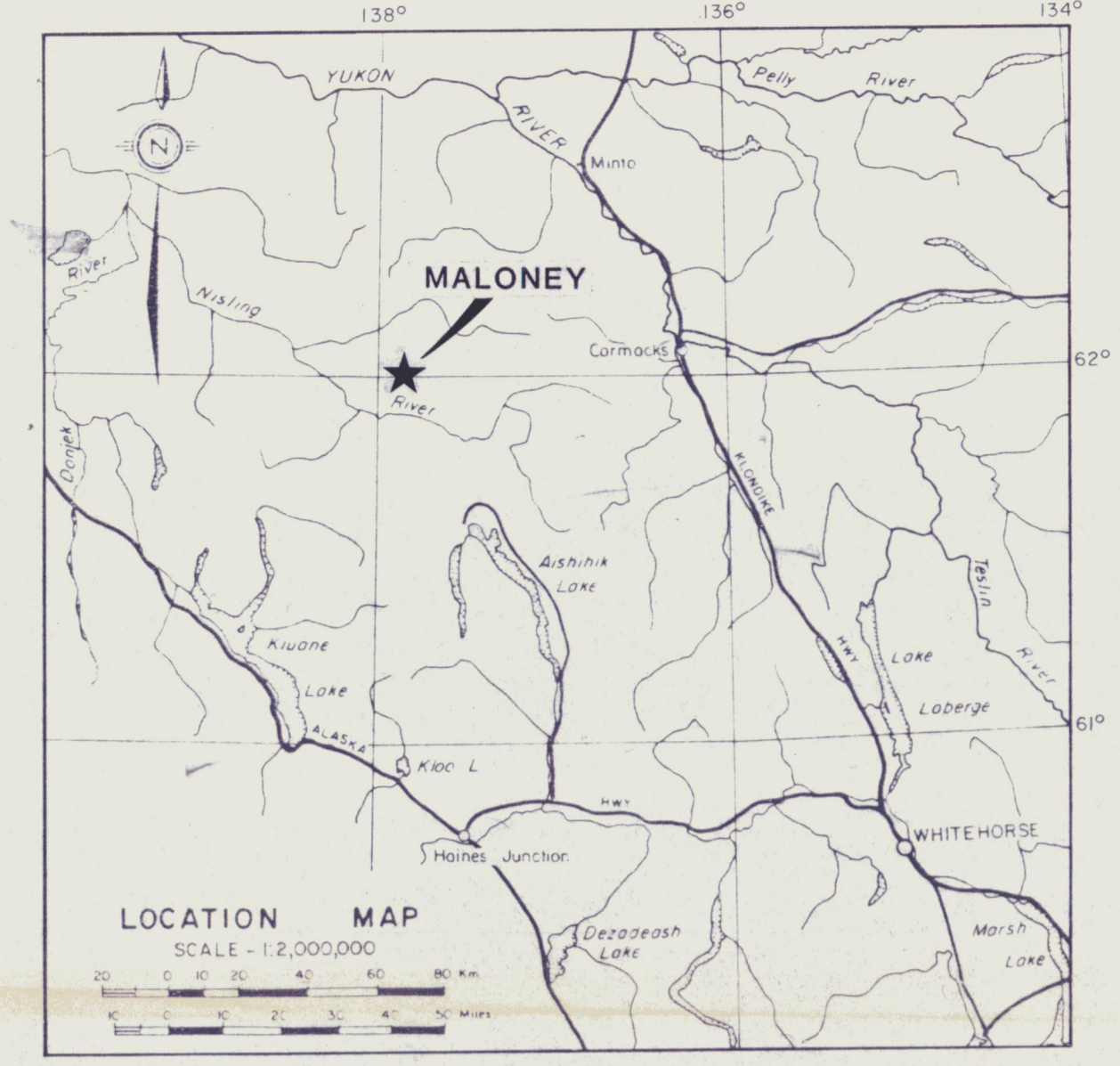
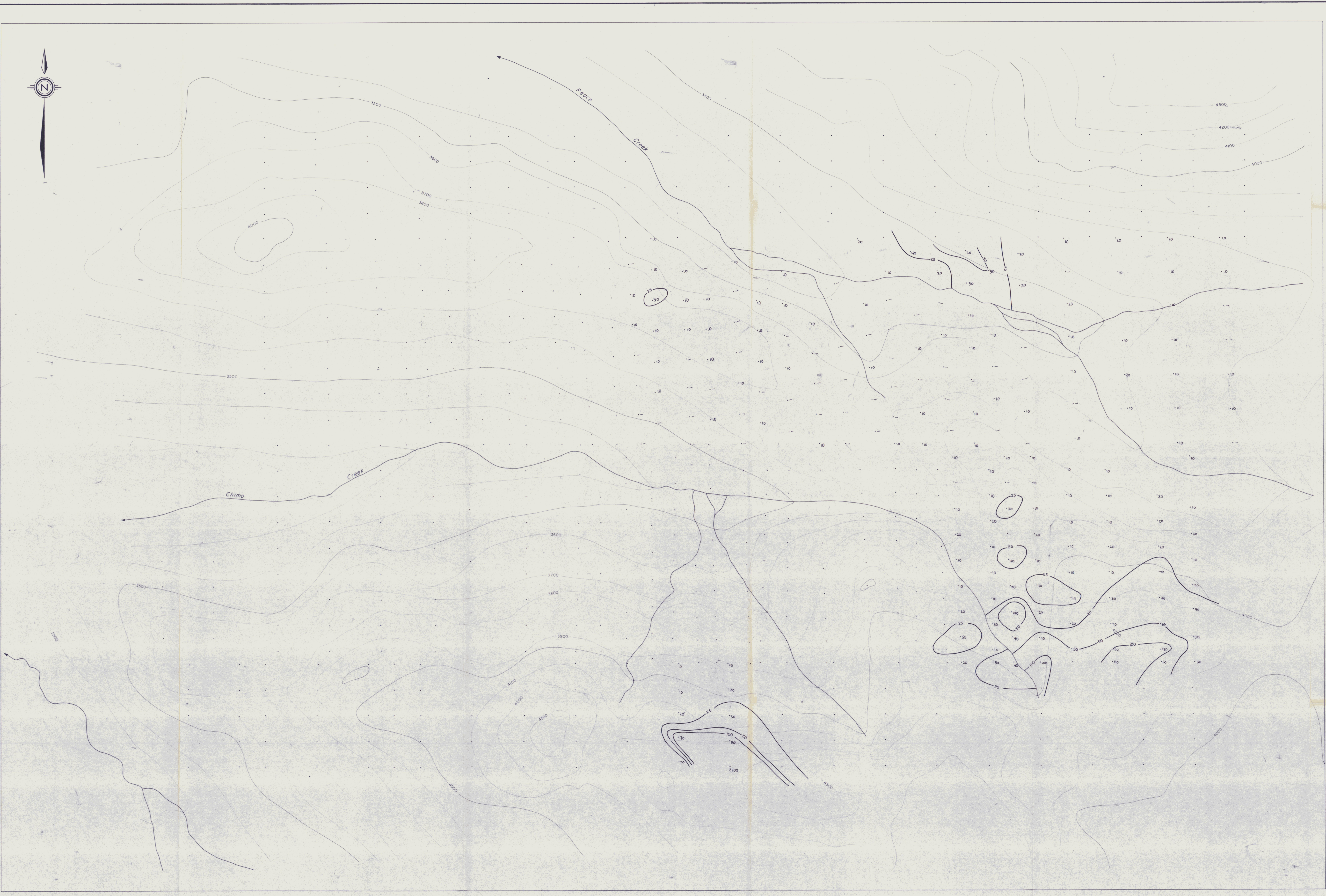
- LEGEND**
- 55 soil sample location with gold value in ppb
  - 66 rock sample location with gold value in ppb
  - ▭ swamp
  - claim post location
  - DDH 76-x diamond drill hole

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Figure M3  
ARCHER, CATIRO & ASSOCIATES (1981) LIMITED  
**GOLD GEOCHEMISTRY**  
MALONEY PROPERTY  
FREEGOLD VENTURE



To accompany report dated October, 1981





**LEGEND**

• Soil sample location with arsenic in ppm

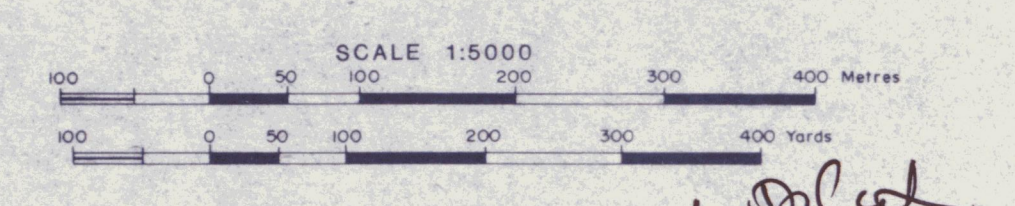
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**FIGURE M6**

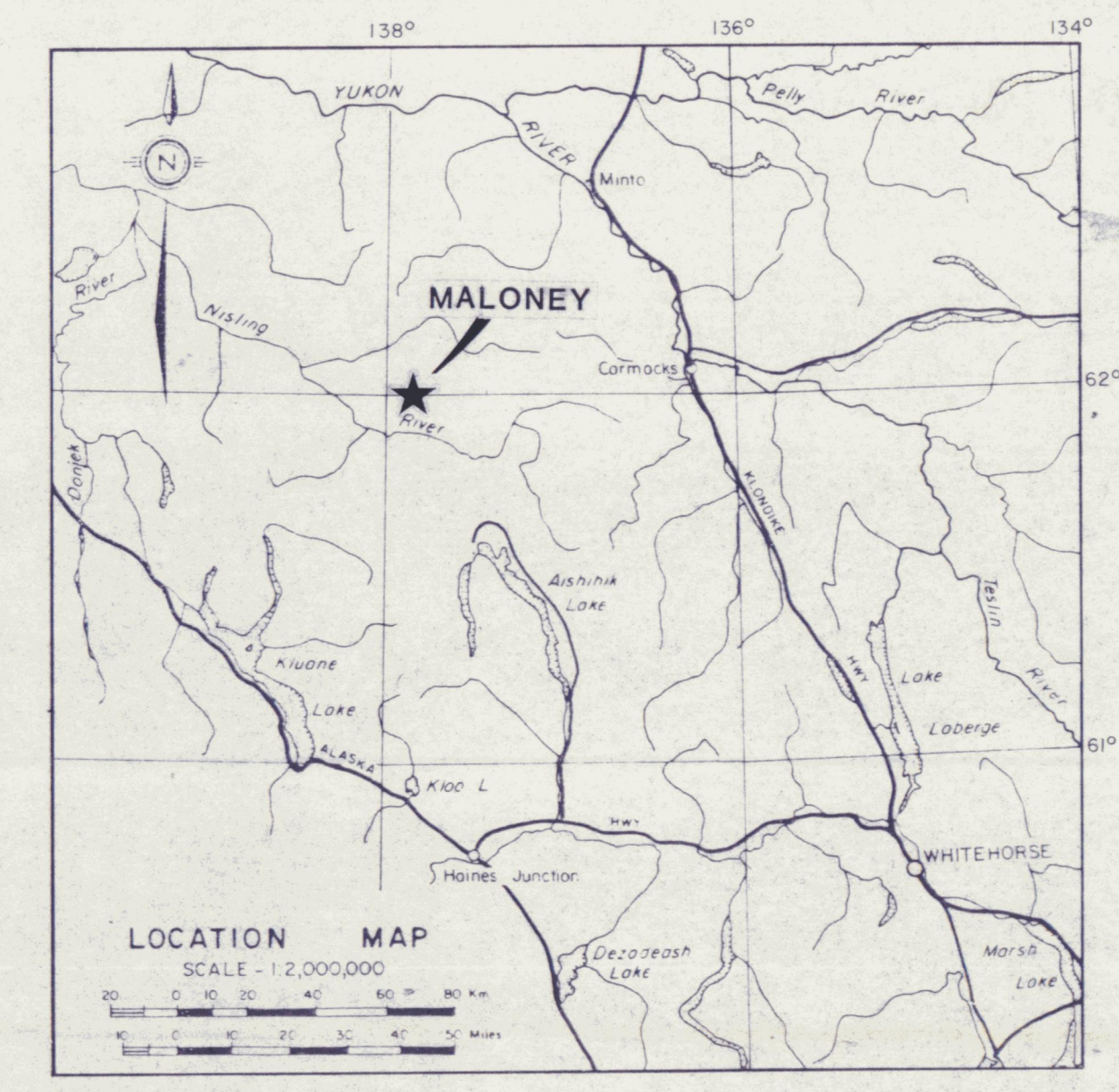
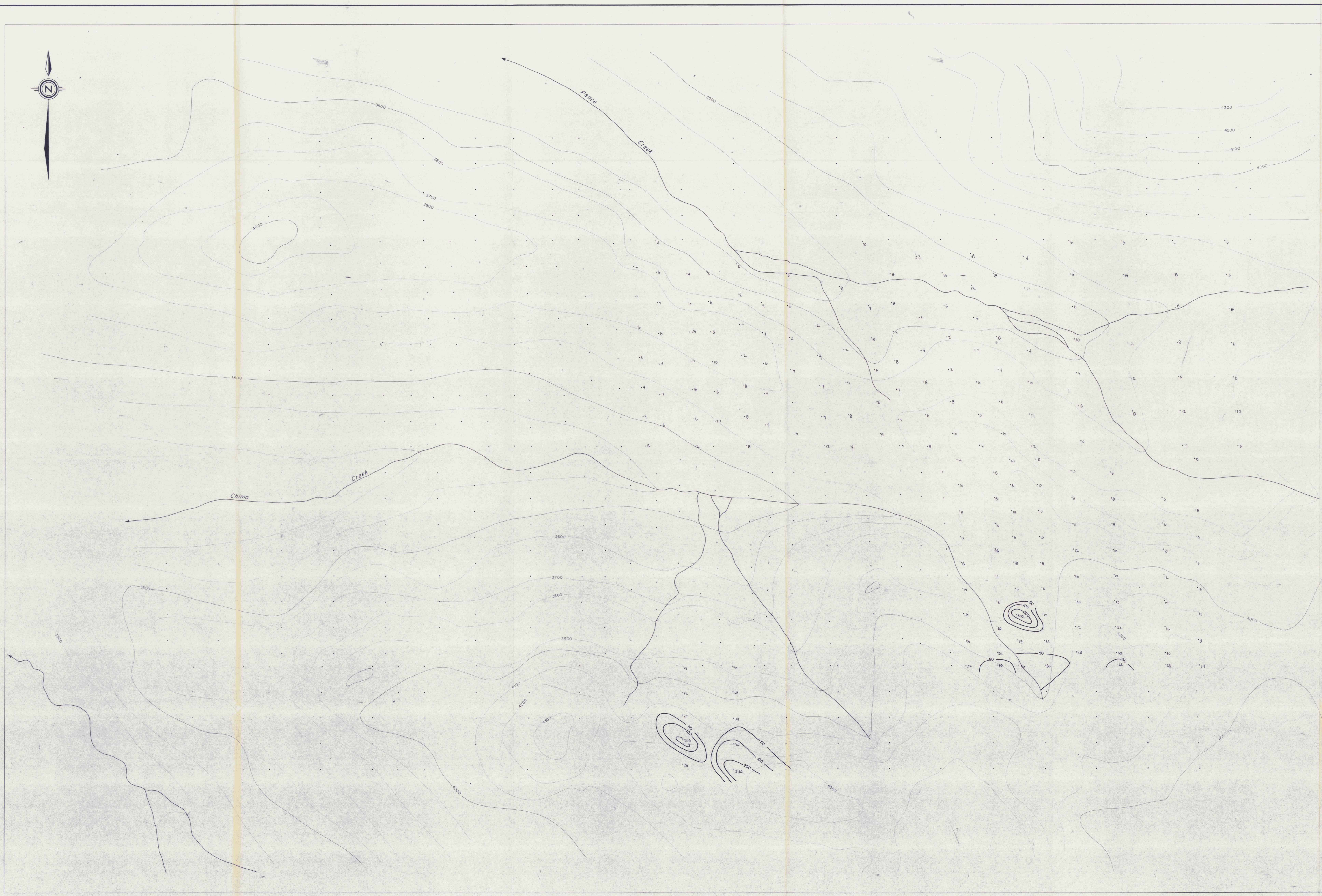
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**ARSENIC GEOCHEMISTRY**

MALONEY PROPERTY  
FREEGOLD VENTURE



*W.P. Cathro*  
To accompany Report ARS/Maloney, 1986



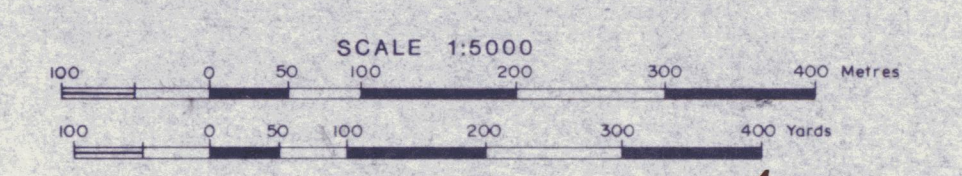
**LEGEND**

• 46 Soil sample location with lead in ppm

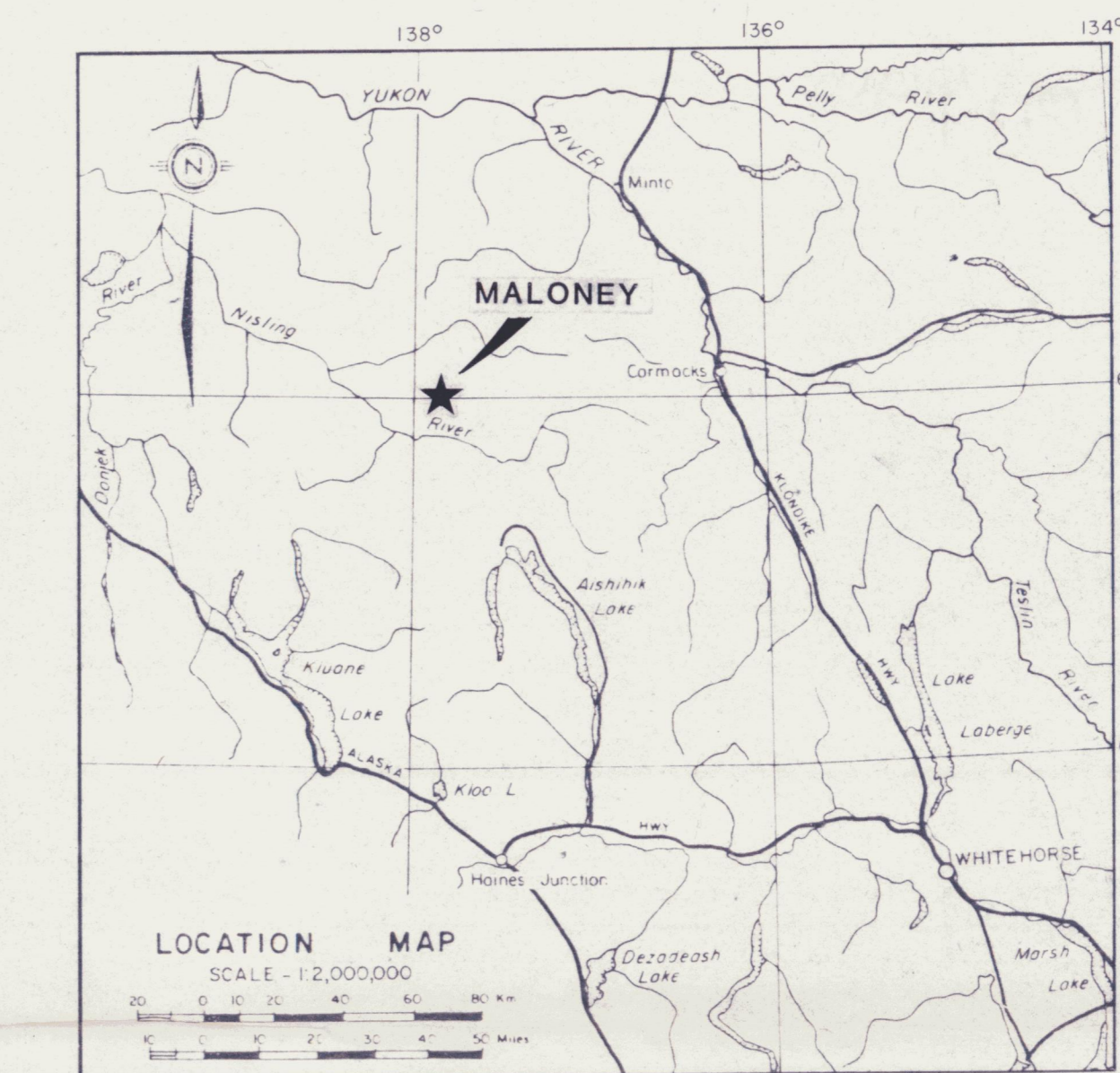
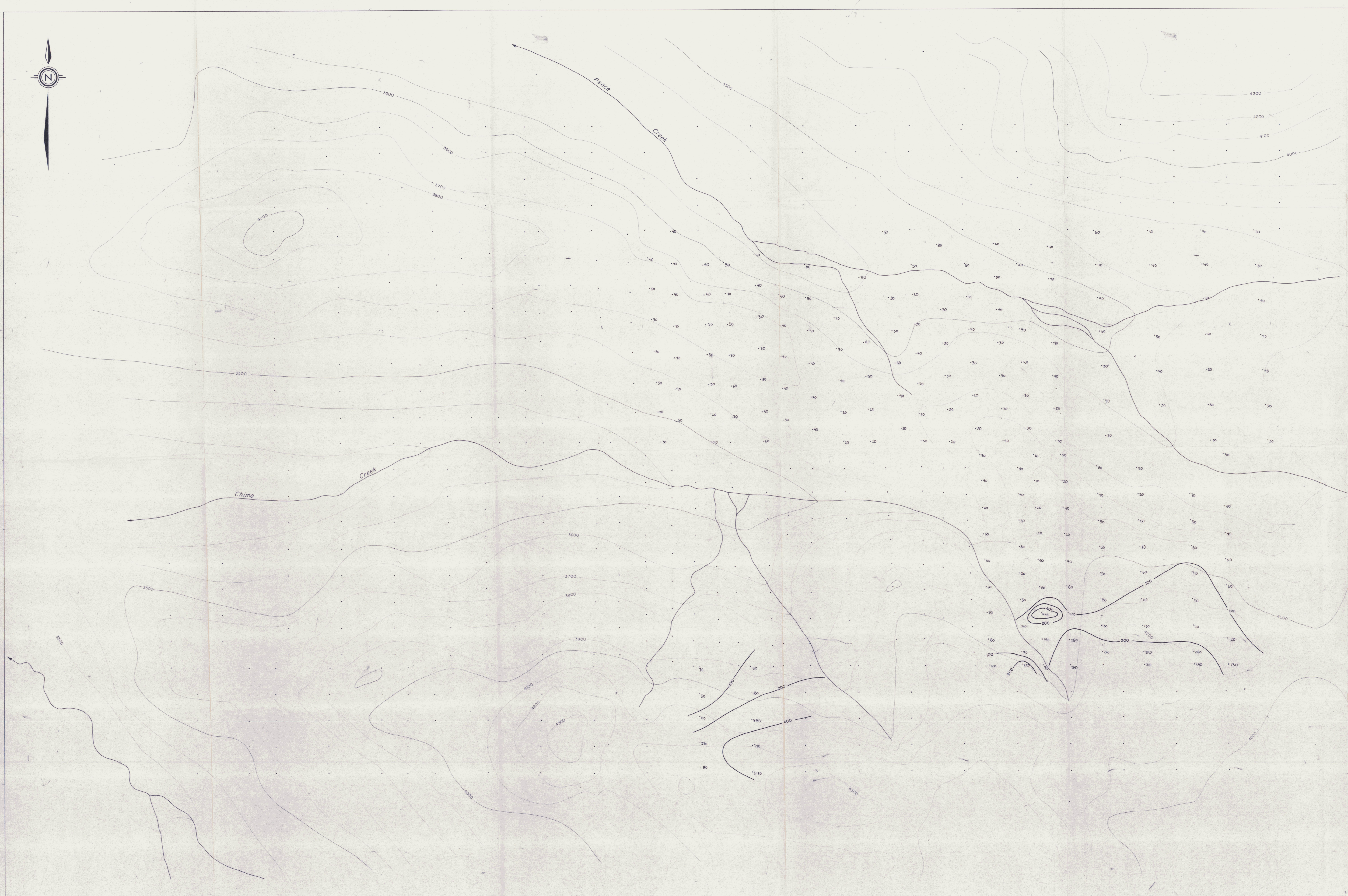
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**FIGURE M7**  
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
**LEAD GEOCHEMISTRY**

MALONEY PROPERTY  
FREEGOLD VENTURE



*W. J. C.*  
To accompany 1007 Maloney Map, 1980



**LEGEND**

\*980 Soil sample location with zinc in ppm

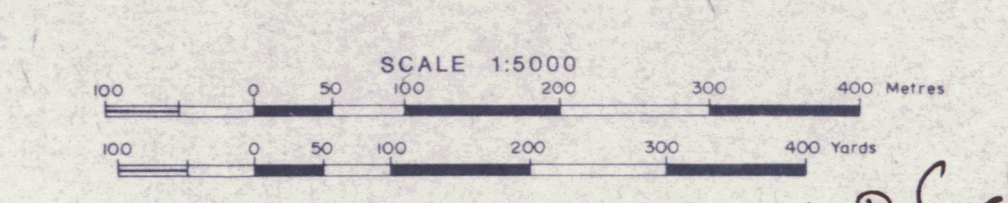
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FIGURE M8

ARCHER, CATRO & ASSOCIATES (1981) LIMITED

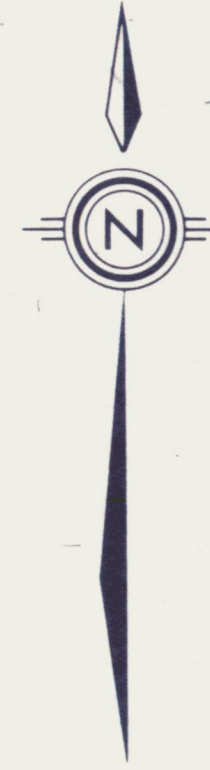
**ZINC GEOCHEMISTRY**

MALONEY PROPERTY  
FREEGOLD VENTURE



*W.C.*

To accompany report dated March, 1986



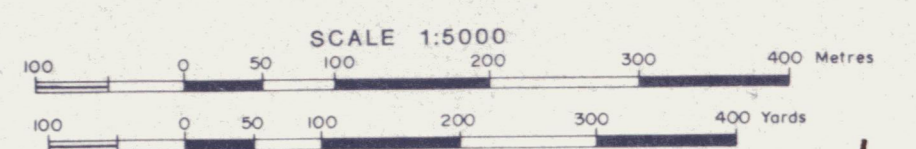
**LEGEND**

\*245 Soil sample location with copper in ppm

**091810**  
**FIGURE M9**

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**COPPER GEOCHEMISTRY**  
MALONEY PROPERTY  
FREEGOLD VENTURE



*wjfa*

To accompany report dated March, 1982