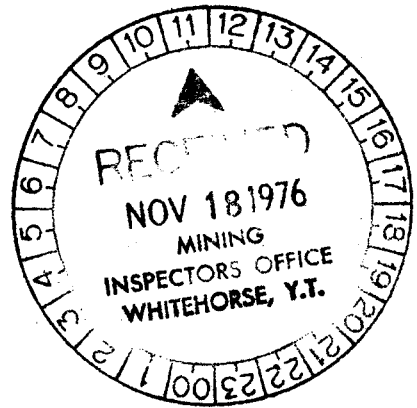


GEOLOGICAL AND GEOCHEMICAL
Report On The
A and B CLAIM GROUPS
TAY MOUNTAIN AREA
WHITEHORSE MINING DIVISION
YUKON



Lat. 62° 10'
Long. 134° 05'
NTS 105 L 9

FOR

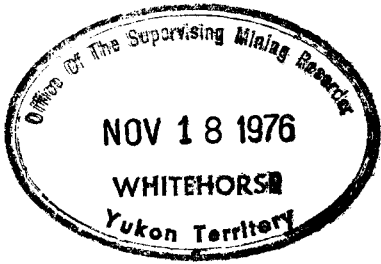


SWIM LAKE MINES LTD. (N.P.L.)

BY

STANLEY B. REAMSBOTTOM Ph. D
CANADIAN NATURAL RESOURCES LIMITED

070 57



This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of \$ 2300⁰⁰

A handwritten signature in cursive script, appearing to read "W. Sinclair".

~~Resident Geologist or
Resident Mining Engineer~~

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

A handwritten signature in cursive script, appearing to read "B.R. Baxter".

B.R. BAXTER
~~Supervising Mining Recorder~~

Commissioner of Yukon Territory

TABLE OF CONTENTS

	Page
INTRODUCTION	1
GEOGRAPHY	2
Location	2
Access	2
Topography	2
Climate	2
Water	3
CLAIMS	3
GEOLOGY	4
Regional	4
Property	4
STRUCTURE	6
GEOCHEMISTRY	8
Treatment of data	8
Discussion of results	8
SUMMARY AND CONCLUSIONS	9
RECOMMENDATIONS	10
Estimated Costs	11
LIST OF EXPENDITURES	12
REFERENCES	13

LIST OF FIGURES

<u>FIG.</u>		<u>PAGE</u>
1	LOCATION MAP A-B CLAIMS	14
2	A-B CLAIM GROUPS	in pocket
3	GEOLOGY OF TAY MOUNTAIN AREA	15
4	CROSS SECTION A-A ¹	16
5	F ₁ SMALL-SCALE FOLDS	17
6	F ₁ , F ₂ , F ₃ , FOLD ELEMENTS IN ONE OUTCROP OF BLACK, ³ QUARTZ GRAPHITIC PHYLLITE	18
7	CUMULATIVE, PROBABILITY PLOT FOR <u>Pb</u>	19
8	CUMULATIVE, PROBABILITY PLOT FOR <u>Zn</u>	20

INTRODUCTION

In 1976 Canadian Natural Resources Limited entered into an agreement with Swim Lake Mines Ltd. whereby the former could earn a 50 per cent interest in the A - B claim groups, Tay Mountain, Yukon by expenditure of \$75,000 before January, 1978. By the same agreement an additional 25 per cent interest could be earned by expenditure of a further \$75,000 before January, 1980.

This report presents the results of a preliminary examination of the A and B Claim groups carried out by the author between August 25, 1976 and September 1, 1976.

GEOGRAPHYLocation:

The property is located in the Anvil Range in Central Yukon. The community of Faro is located 30 miles to the southeast and Whitehorse, the main supply centre for the area, is located 135 air miles to the southwest. (Fig. 1)

Access:

It is 230 miles from Whitehorse to Faro by a good all weather gravel road. From Faro the A - B claims can be reached by helicopter.

Topography:

The property covers the headwaters of Fishhook Creek on the western flank of Tay Mountain. Elevation ranges from 4,500 feet to 7,000 feet with more than one half of the claim group above timber-line. Headward erosion by the north and especially the south tributaries of Fishhook Creek has created deeply incised creek valleys.

Climate:

Rainfall varies from 15 to 20 inches per year and winter-compacted snow depth ranges from 3 to 6 feet at higher elevations. The area would be free from snow from May to October. The climate would be almost identical to that found at Faro where Cyprus-Anvil Mining Corporation operates an open pit mine year round.

Water:

There is ample water on the property for diamond drilling requirements provided the drilling is completed before August, when runoff in the upper reaches of Fishhook Creek, near an interesting drill-target, falls off drastically.

CLAIMS

There is a total of 48 contiguous claims in two blocks.

(Fig 2, in pocket)

<u>Name</u>	<u>Record Number</u>	<u>Expiry Date</u>
A 1 to 32	Y98930 to Y98961	June 27, 1977
B 1 to 16	YA3980 to YA3995	Nov. 17, 1976

The claims are recorded with the Whitehorse Mining Recorder, Whitehorse, Yukon.

GEOLOGYRegional:

The Anvil Range is underlain by Anvil Batholith, a mesozonal and epizonal complex of granodiorite and quartz monzonite porphyry. Flanking the batholith to north and south are thick sequences of metamorphic phyllites, calc-silicates and metavolcanics of Hadrynian or Cambro-Ordovician age. (Tempelman-Kluit, 1972)

Faro, Vangorda, Swim and Grum are known zinc-lead deposits within the latter sequence of metamorphic rocks. These deposits range in size from the 5 million tons of Swim to the 63 million tons of Faro. The deposits average 10 per cent combined zinc and lead with 1 to 2 ounces of silver per ton.

Property:

The claim area is underlain by a recumbently-folded and hence structurally repeated sequence of black, graphitic phyllite; grey-green quartz-muscovite; chlorite \pm biotite \pm andalusite schist; green speckled amphibolite and associated meta-tuff, and black and white limestone and calc-silicate. (Fig 3 and Geology map in pocket)

As shown in Fig 3 the units have been traced north and east onto the summit-ridge of Tay Mountain. This sequence has been intruded by medium-grained pink granite and fine-grained epigranite on Tay Mountain. The northerly-trending granite contact south of Tay Mountain appears to dip shallowly to the west below the metamorphic rocks. Isograds defined by incoming of cordierite and

andalusite in Units 1 and 2 and development of garnet, idocrase, diopside, tremolite[†] wollastonite in Unit 5 are sub-parallel to the northerly-trending granite contact (Fig 3).

Rocks were mapped in detail within the claim-group and the results presented in the Geology Map (in pocket). A brief description of the units follows.

UNIT 1

Several horizons (or possibly a structurally repeated single horizon) of fine-grained, black locally rusty-weathering, graphitic phyllite underly the claim-block and summit-ridge of Tay Mountain. Within the Tay Mountain thermal-aureole incipient development of small (1-3mm) cordierite crystals give this unit the characteristic appearance of a "spotted hornfels" or schist. (Fig 3)

UNIT 2

This unit is composed of grey-green, quartzose or 'psammitic', muscovite-chlorite schist with local development of biotite and/or andalusite? as the contact with the batholith is approached. In the core of the recumbent F_1 isocline, Unit 2 is closely associated with amphibolitic rocks. (3)

UNIT 3

Unit 3 is composed of interlayered, dark-green, fine to medium-grained, speckled amphibolite and fine-grained laminated quartz-chlorite-biotite schist. These rocks may be metamorphosed volcanics or tuffs. Locally they are rich (3-5%) in fine-grained pyrrhotite which on weathering gives the rock a rusty appearance.

UNIT 4

Two grey medium-grained dacite porphyry dykes were noted on Fishhook Creek. They are 4 to 6 feet wide and trend N 20 E.

UNIT 5

Within the black graphitic phyllites, horizons of sooty-black crystalline limestone and pale-grey to white impure limestone act as additional marker horizons. Limestones in the valley of the north-arm of Fishhook Creek are completely recrystallized but have no "Skarn" minerals. Those on Tay mountain summit-ridge however, have a varied mineralogy which includes: red-orange grossular garnet; red-brown idocrase or vesuvianite; green diopside; white radiating sheaves of tremolite, and possibly wollastonite. These impure limestones have been completely recrystallized within the Tay Mountain thermal aureole.

STRUCTURE:

The rock-sequence has been folded into recumbent isoclines with axes which trend N 10 to 50 E. (Figs. 3, 4; map in Pocket) Small-scale recumbent F_1 isoclines are best preserved in Units 1 and 3. In Unit 1 they develop a penetrative strain-slip cleavage but in the more competent Unit 3 they are defined by isoclinally folded compositional layering (Fig 5) Second and third-phase folds are homoaxial, northwest-trending, and are represented by similar-style open folds (F2) and open-monoclinial warps (F3) with a widely-spaced subvertical, fanned, fracture-cleavage (Fig 6).

Planar and linear elements associated with the three folding-events have been plotted in the accompanying geology map. (In pocket)

In summary, the rocks have been folded into north to northeasterly-trending recumbent isoclines which have been refolded about northwest to west-northwest fold axes. Later folds are more open in style and of shallow amplitude so that the rocks still have the appearance of an orderly sequence of flat-lying units which have been little-modified by folding.

GEOCHEMISTRY

A total of 165 soil and 8 silt samples were collected from the property. Samples were located on a 400 X 800 foot grid. The B - soil horizon is not well developed on the property, and samples were taken from a depth of 1 to 1.5 feet and below the black-muck or white volcanic ash horizons. They were analysed for lead and zinc (Hot extraction HClO_4) by Barringer Research Limited, Whitehorse.

Treatment of Data

The 165 analyses for lead and zinc in soils from the property were cumulated and plotted on probability paper after the manner of Tennant and White (1959). The results for lead and zinc analyses are shown in Figs. 7 & 8.

The resulting curves show that the data fall into 2, possibly 3, distinct distributions; one representative of background, the other(s) anomalous values. From the curves the following background, threshold-anomalous, and anomalous values for lead and zinc were chosen at 30; 40; 50 and 100; 200; 350 respectively. Data were contoured and presented in the geochemistry maps in pocket.

Discussion of results

Zinc:

An east-west trending anomalous zone parallels the south-arm of

Fishhook Creek from about L8W;8S to L64W;8S. Within this zone highs occur at the following locations; L24W ;12S: L40W, 2N and 20S: L48W, 8S.

This anomalous zone is partially co-incident with units of black graphitic phyllite.

Lead:

An almost coincident anomalous zone of lead geochemistry also parallels the south-arm of Fishhook Creek. Individual highs are located at L16W, 2N; L24W, 4 and 12S.

SUMMARY AND CONCLUSIONS

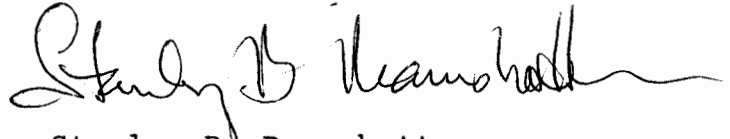
In summary a zone of anomalous lead and zinc geochemistry parallels the south-arm of Fishhook Creek. Anomalous values may, in part, be attributable to underlying graphitic phyllite units. However, a previous gravity survey of the property defined a 2.1 mgal residual anomaly on L0E,7S. (Galeski, 1975) The geochemical anomaly appears to emanate from the residual gravity high thus making it an intriguing potential drill-target. Further, massive sulphides could be concentrated at depth about the nose of the northerly-trending F1 isocline, as postulated in Fig. 4. Depth to causative mass of the gravity anomaly is 540 feet (Galeski 1975) so that such a deeply buried sulphide body may not have a particularly intense geochemical expression.

The combination of structural geology, geochemistry and gravity surveys indicate that Gravity anomaly A on L0E, 7S is the best drill-target on the property.

RECOMMENDATIONS

It is recommended that Gravity anomaly A on L0E, 7S should be tested to a depth of 800 feet. If it is desirable to keep costs to a minimum an additional joint-venture partner may be sought.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Stanley B. Reamsbottom", with a long horizontal flourish extending to the right.

Stanley B. Reamsbottom

Estimated Costs:

Diamond drilling

1000 feet of BQ wireline at \$18.00/per foot \$18,000.00

Helicopter support 60 hrs. at \$350.00/per hour 21,000.00

Overhead and contingencies 6,000.00

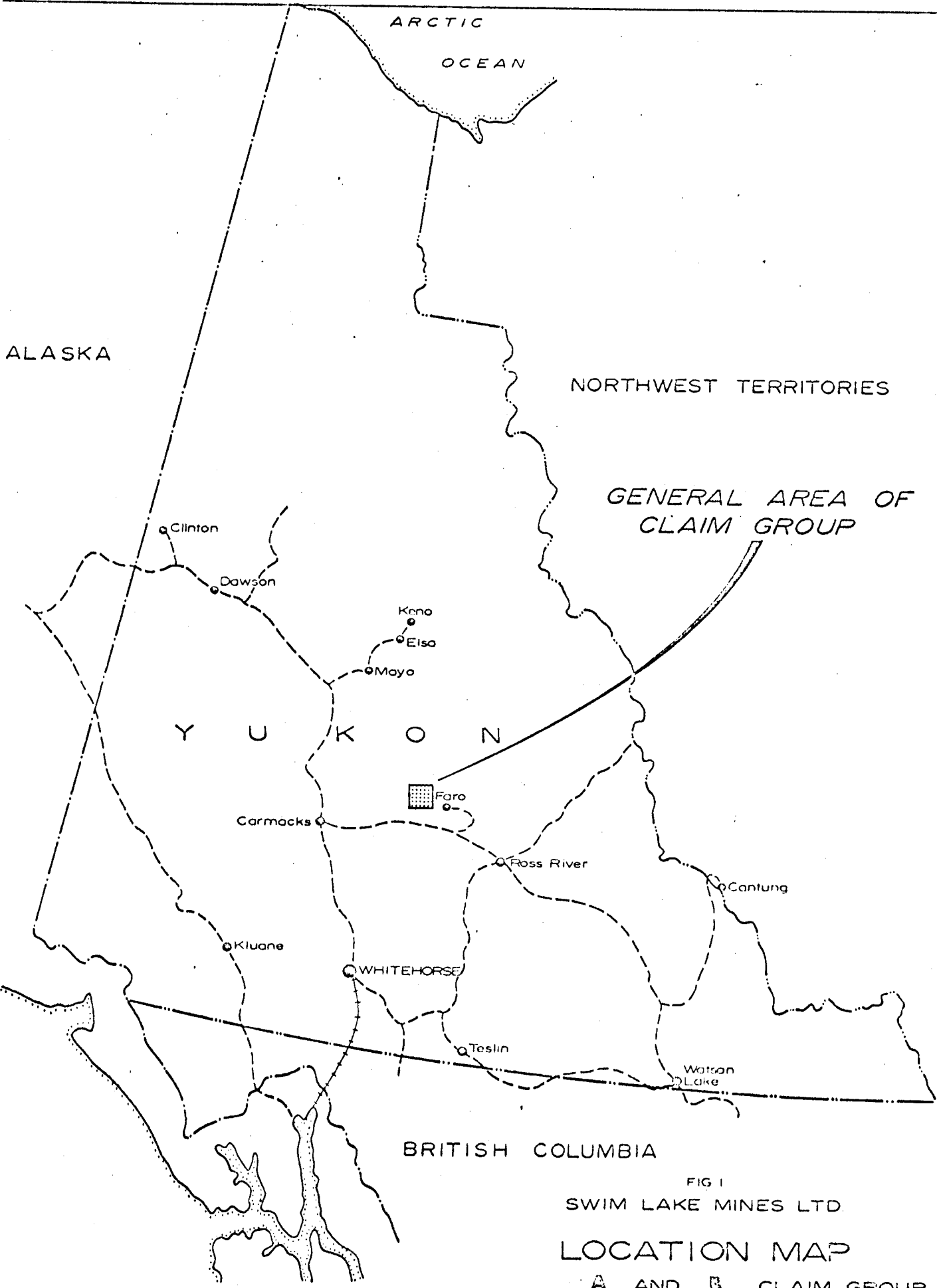
Total \$45,000.00

REFERENCES

Galeski R.B. and "J.R., 1975". Tay Mountain Area, Yukon,
Gravity interpretations for Swim Lake Mines Ltd."

Tempelman- Kluit D.J. 1972 " Geology and origin of the Faro,
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Yukon Territory" G.S.C. Bulletin 208.

Tennant C.B. and White M.L. 1959, Econ. Geol., Vol. 54.
" Study of distribution of some geochemical data."



GENERAL AREA OF CLAIM GROUP

FIG 1

SWIM LAKE MINES LTD

LOCATION MAP

A AND B CLAIM GROUP

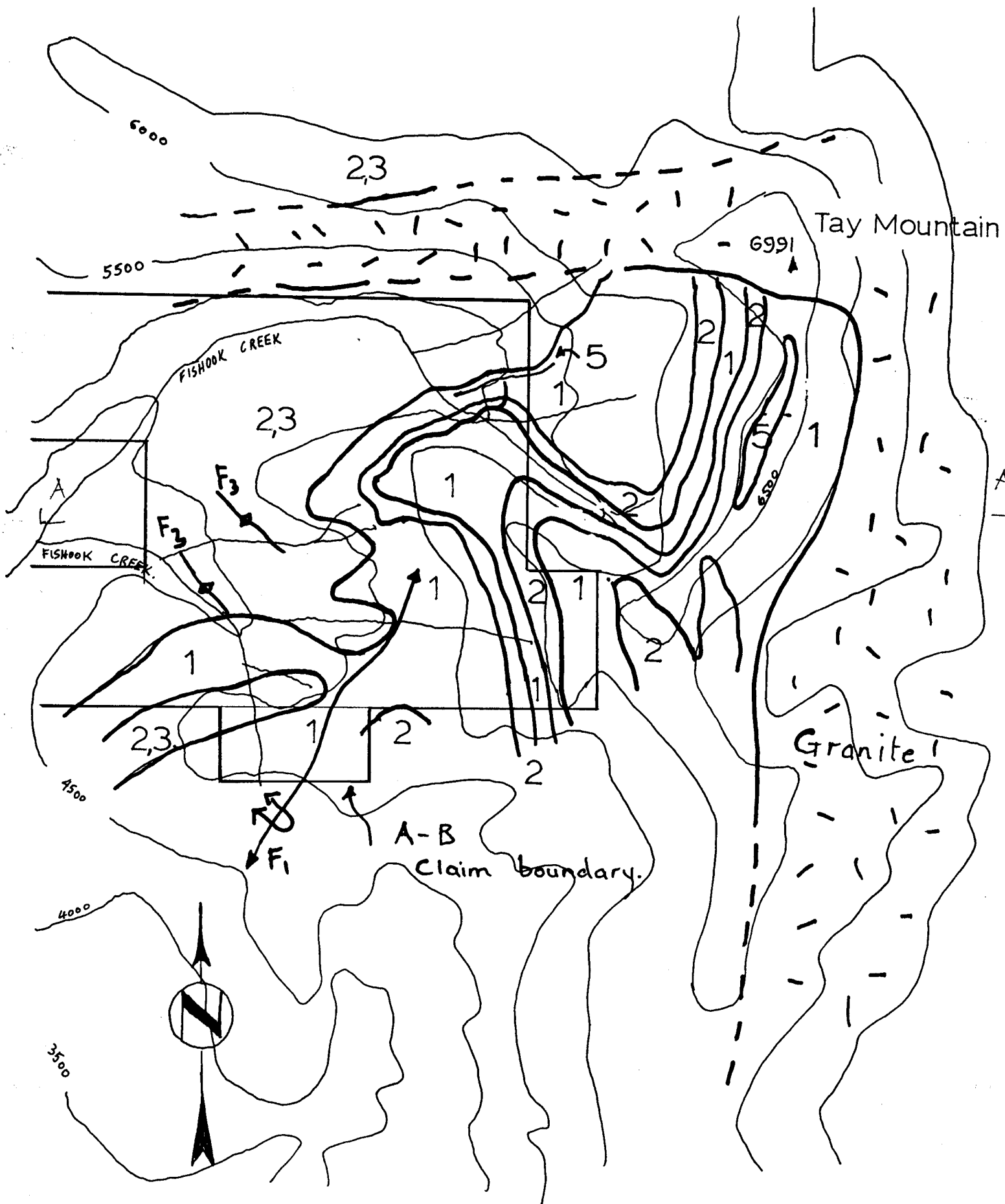


Fig 3

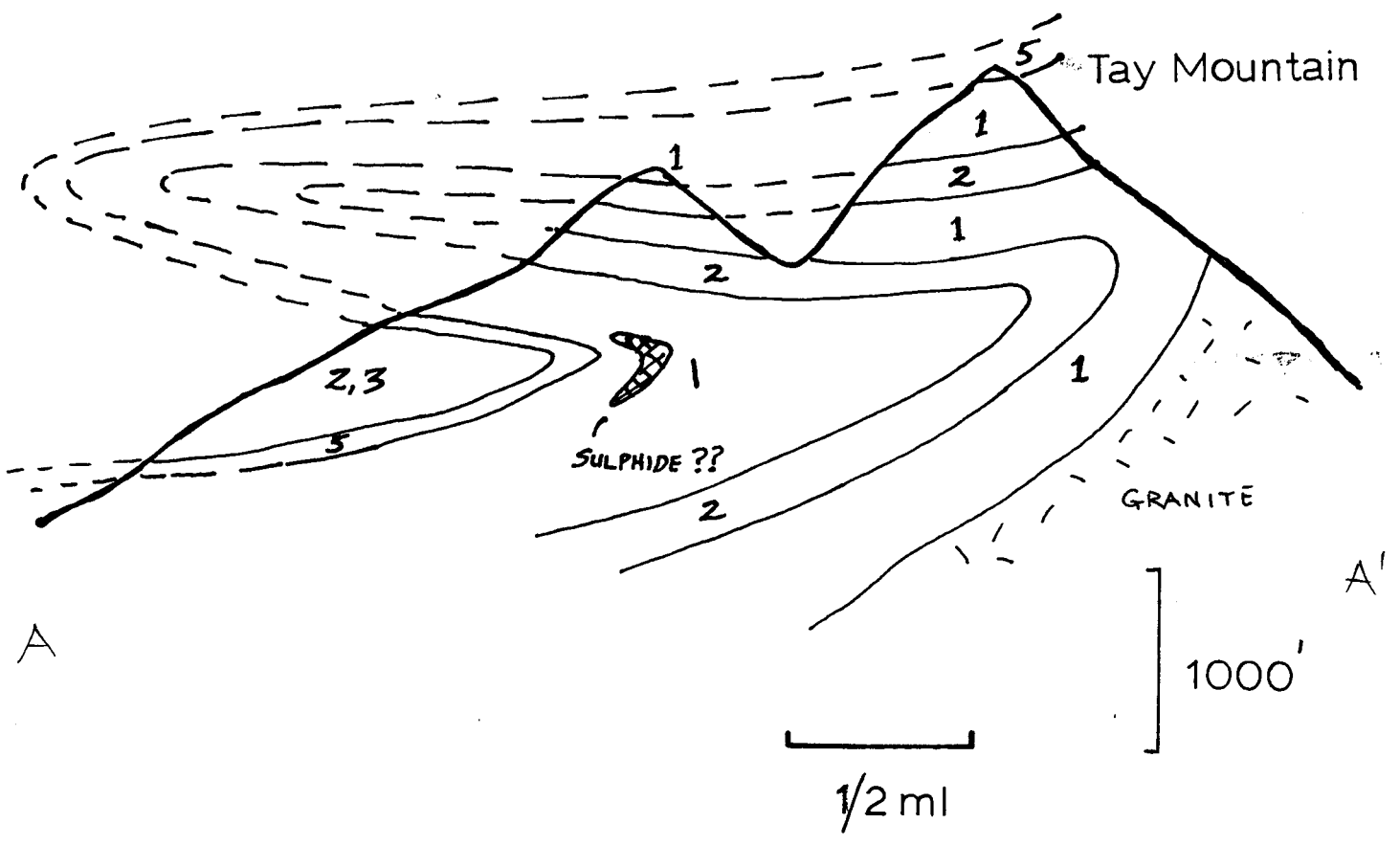
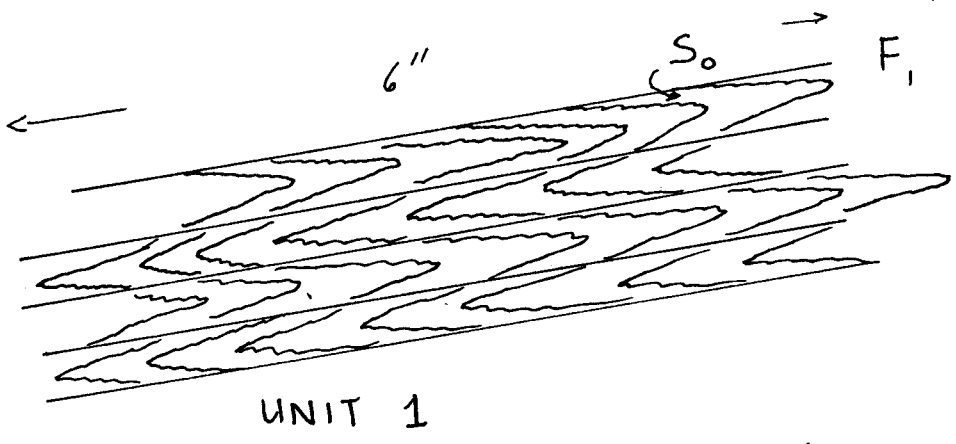
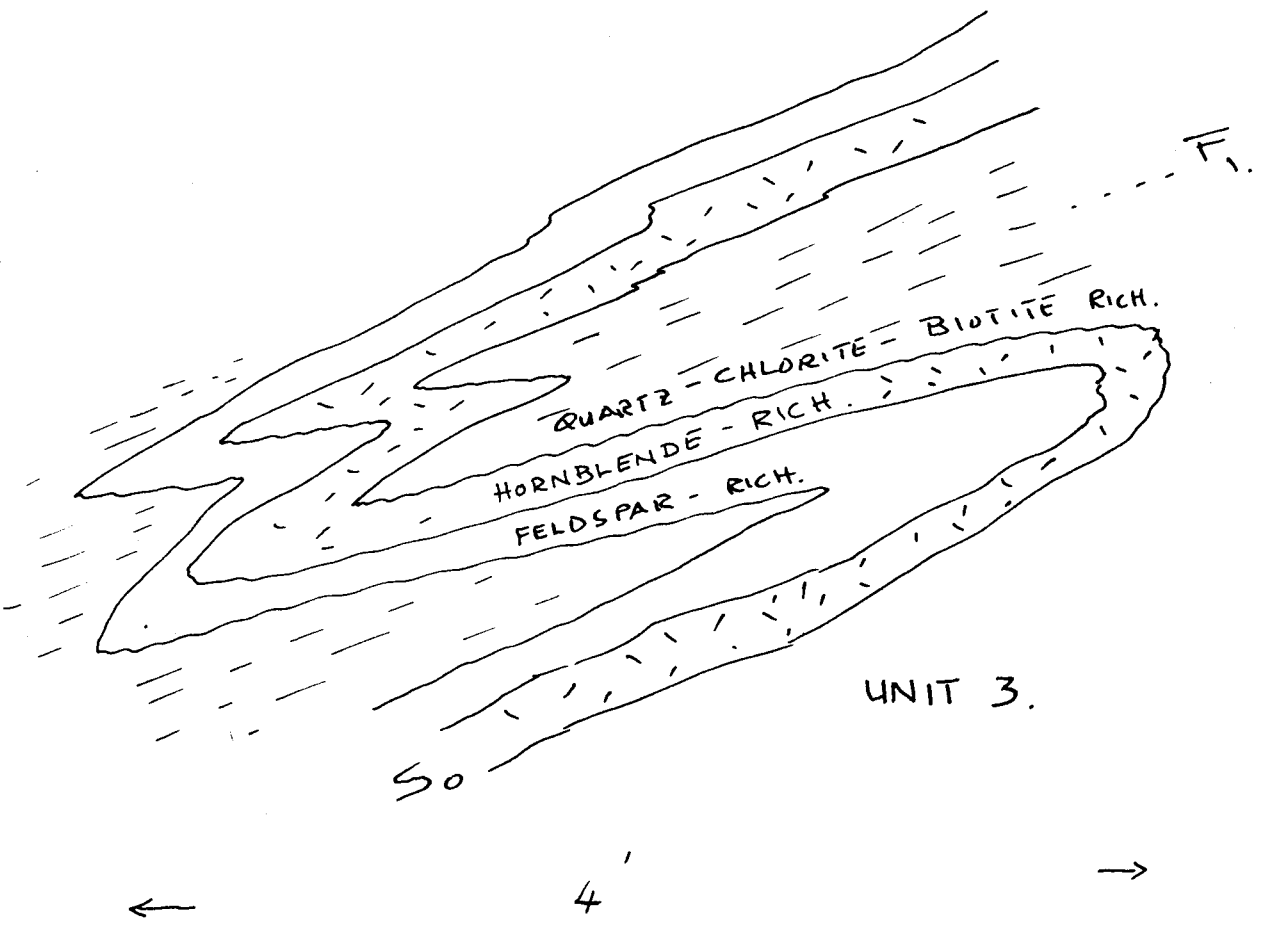


Fig 4

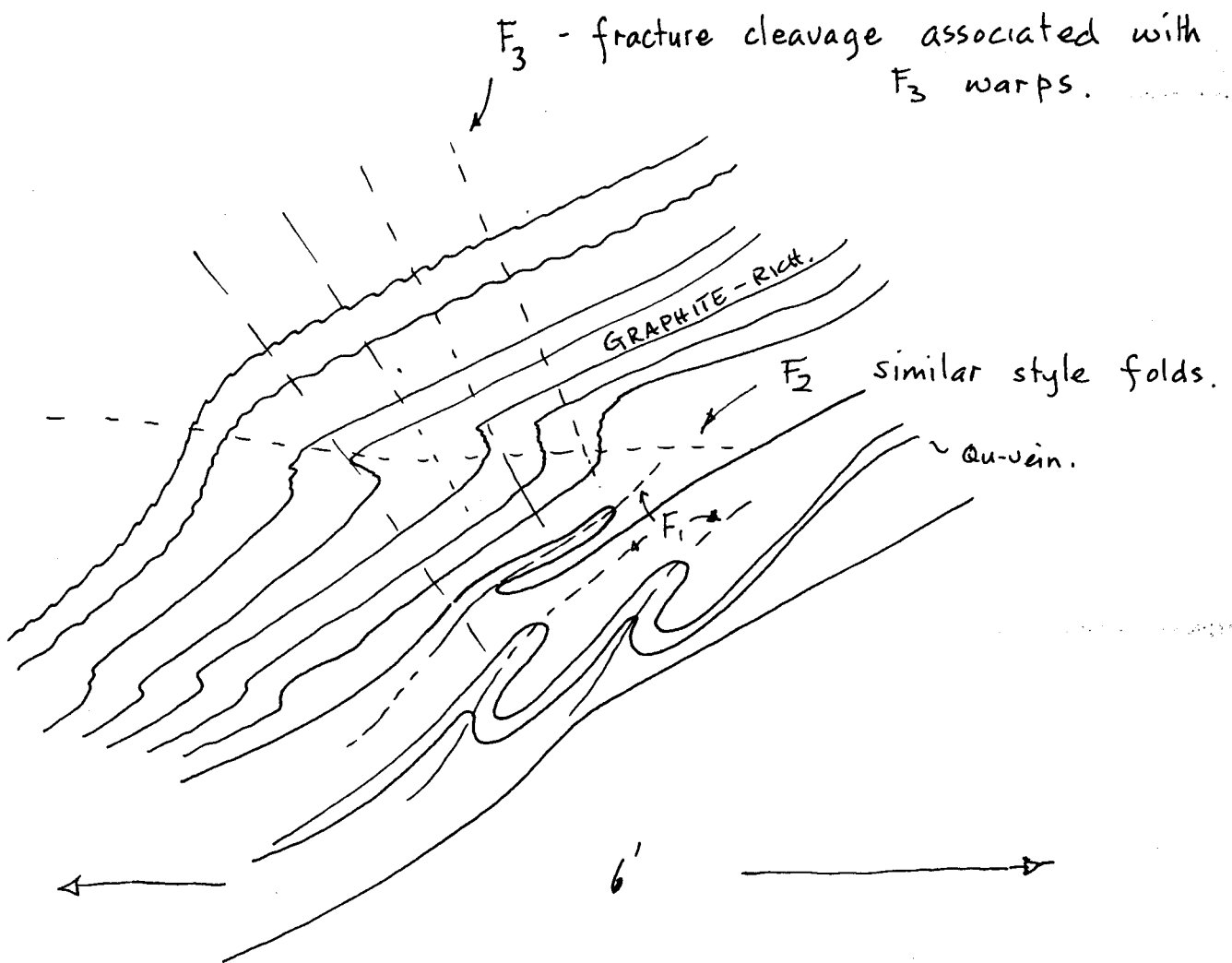


UNIT 1



UNIT 3.

Fig 5



F_1 , F_2 and F_3 fold elements in one outcrop of black, quartz graphitic phyllite.

Fig 6

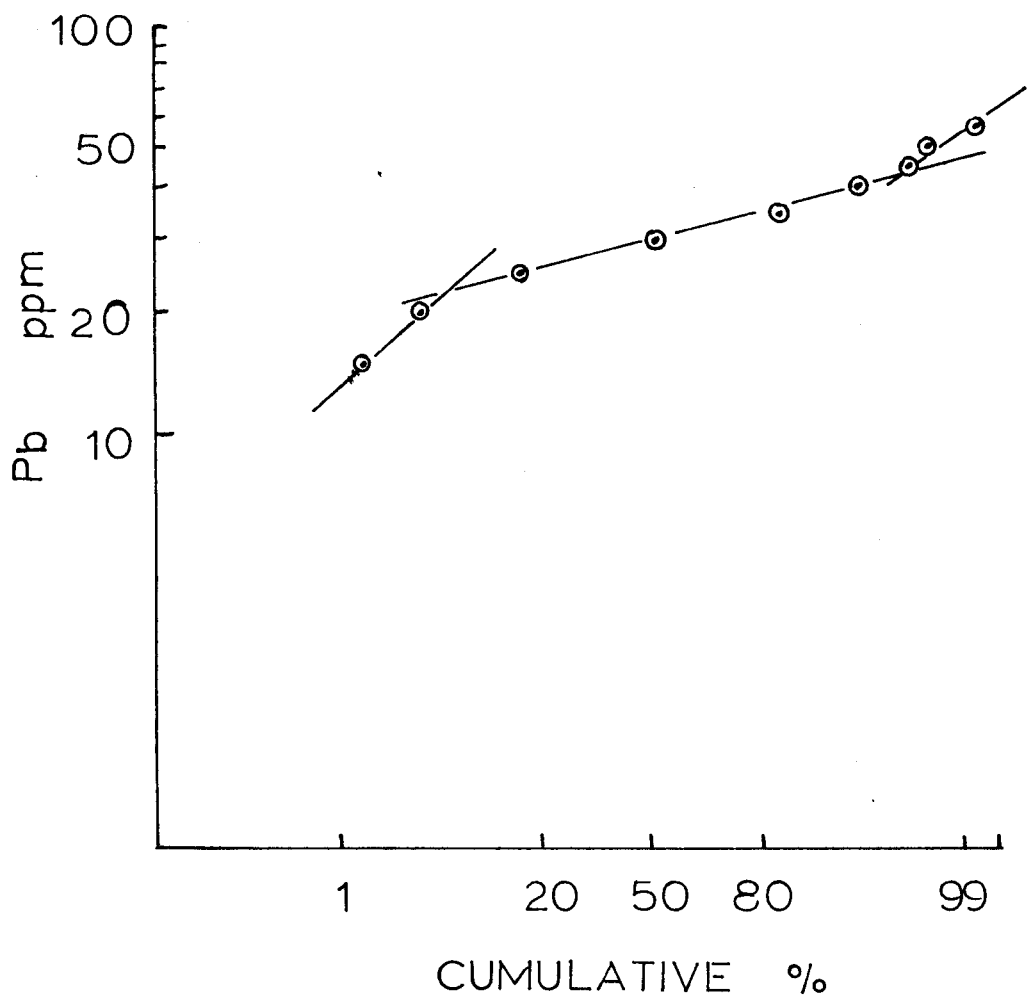


Fig 7

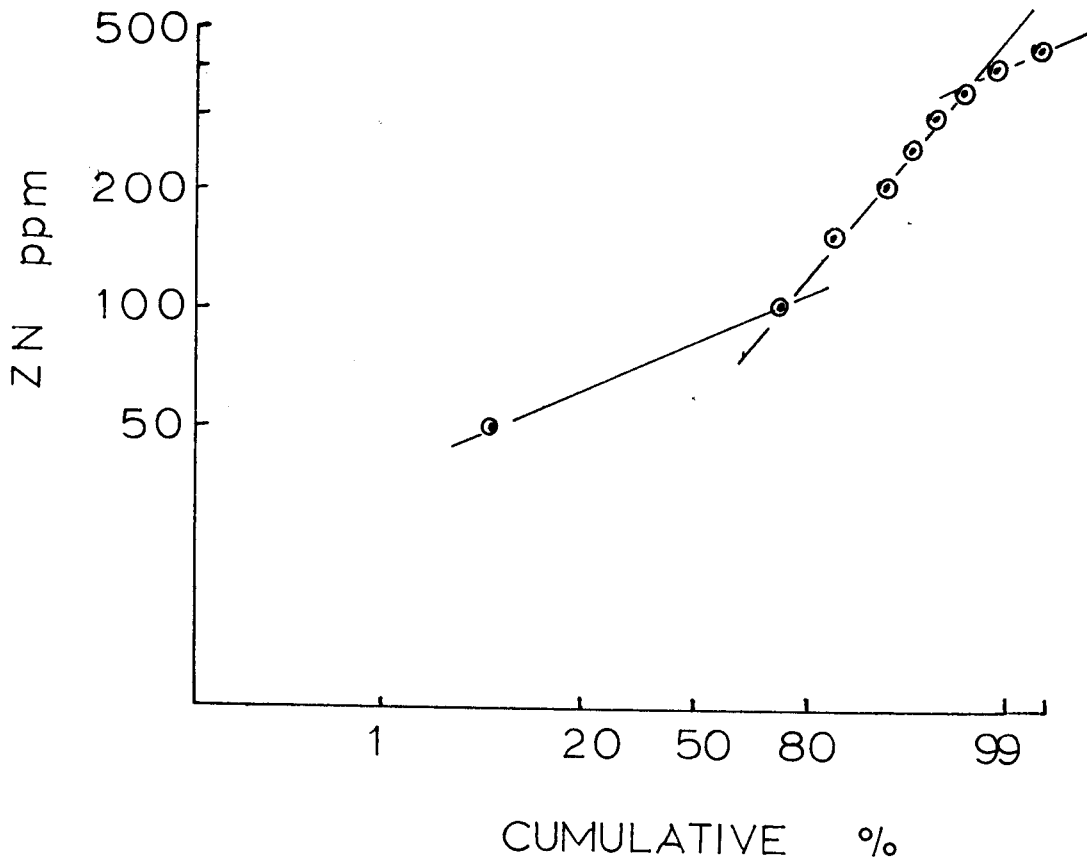
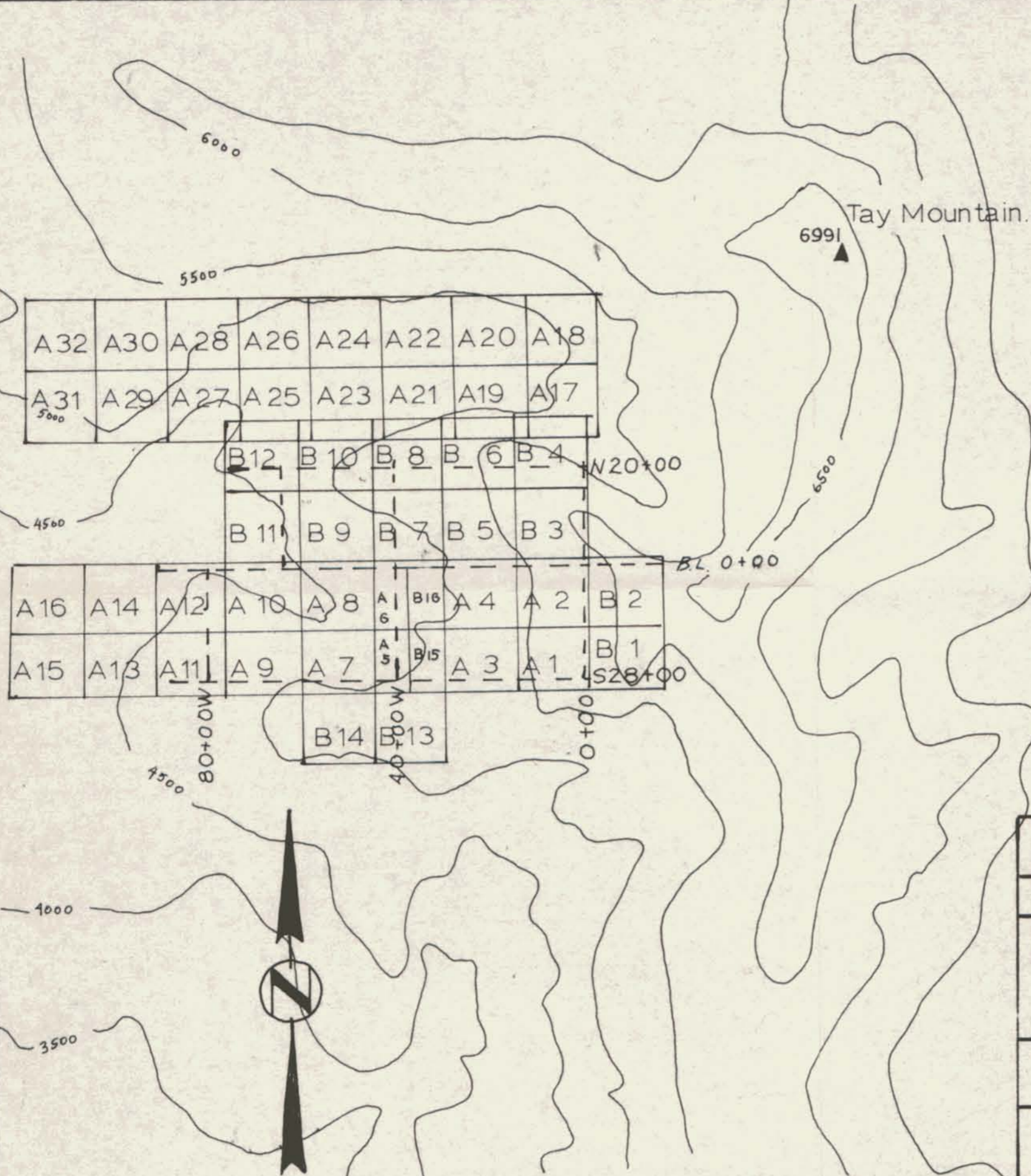
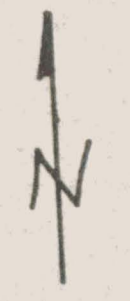


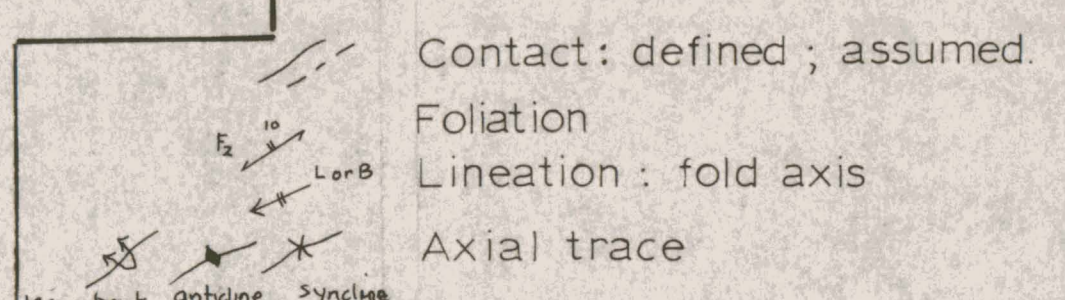
Fig 8



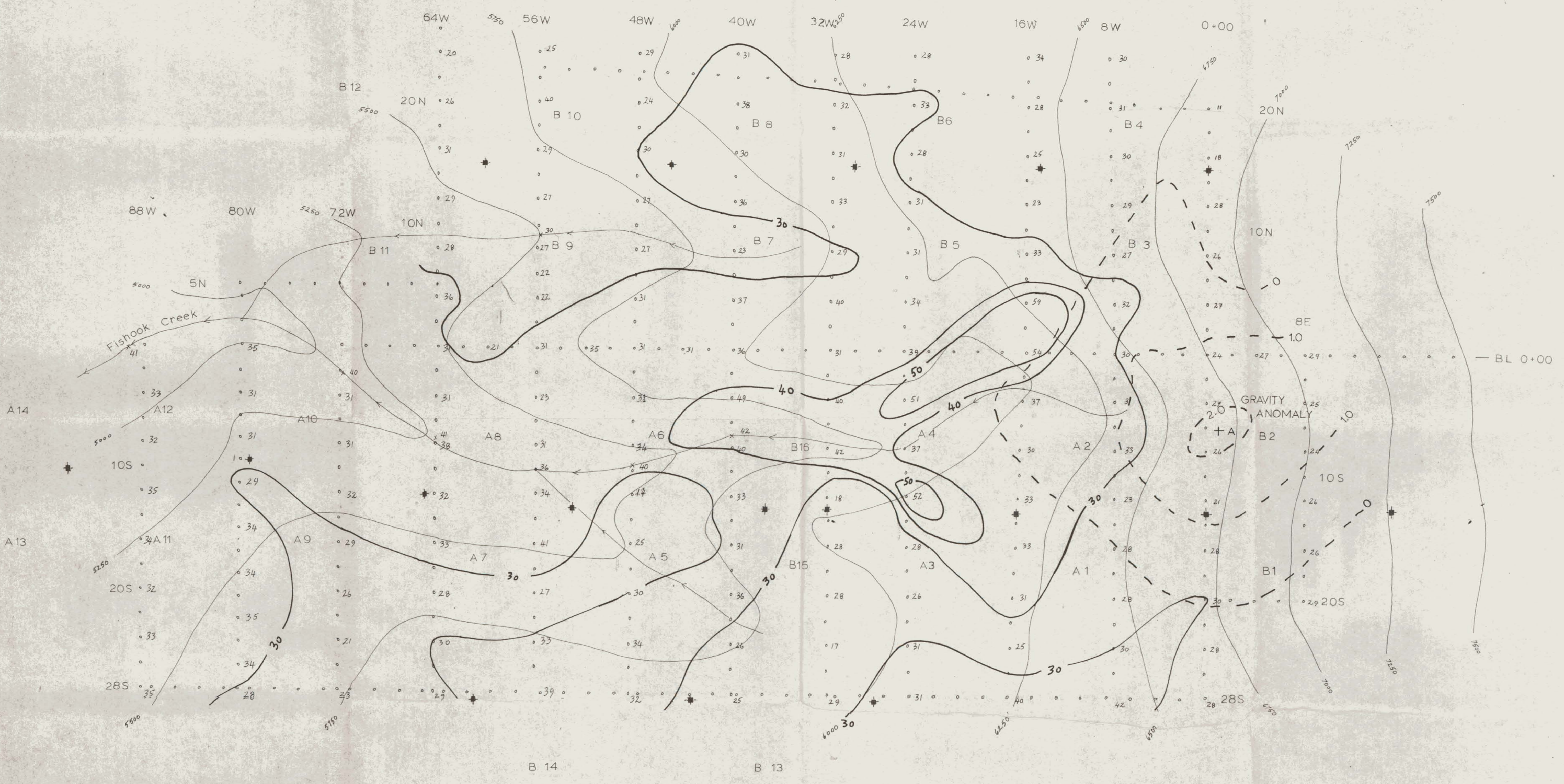
SWIM LAKE MINES LTD.	
TAY MOUNTAIN	
A 1-32 and B 1-16	
GRID LOCATION	
Scale 1=1/2 ml.	N.T.S. 105 L9
CANADIAN NATURAL RESOURCES LTD.	



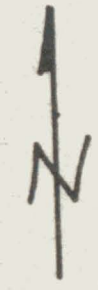
LEGEND	
5	Black limestone.
4	Dacite dyke.
3	Amphibolite
2	Qu muscovite biotite schist.
1	Black graphitic phyllite.



SWIM LAKE MINES LTD	
TAY MOUNTAIN GROUP	
GEOLOGY	
Scale 1"=400'	S.B. Reamsbottom, Ph.D.
CANADIAN NATURAL RESOURCES LTD.	



SWIM LAKE MINES LTD	
TAY MOUNTAIN GROUP	
GEOCHEMISTRY : LEAD	
• 30 ppm	S.B. Reamsbottom, PhD.
Scale 1" = 400'	CANADIAN NATURAL RESOURCES LTD.



SWIM LAKE MINES LTD	
TAY MOUNTAIN GROUP	
GEOCHEMISTRY : ZINC.	
• 90 ppm.	S.B. Reamsbottom. PhD
Scale 1"= 400'	
CANADIAN NATURAL RESOURCES LTD.	