EXPLORATION REPORT

HOHO-BRAM AND LORNA, ROTO, GRAN, JEAN, ARO MINERAL CLAIM GROUPS

TINTINA - ANVIL PROJECT

1971

N.T.S. 105-K 5

To accompany submission for

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DYNASTY EXPLORATIONS LIMITED

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EXPLORATION REPORT
HOHO-BRAM AND LORNA, ROTO, GRAN, JEAN, ARO MINERAL CLAIM GROUPS
TINTINA - ANVIL PROJECT

INTRODUCTION

In 1964 Dynasty Explorations initiated the first comprehensive regional mineral exploration program in the Anvil area utilizing saturation geologic, geochemical and geophysical methods.

During 1964 and 1965 exploration was carried out over an area of approximately 250 square miles, located in the Anvil-Vangorda Creek area of east-central Yukon, 125 miles northwest of Whitehorse. The Vangorda deposit, a massive lead-zinc sulphide body discovered in 1953, was centred in the area proposed for exploration, a northwest trending belt located between the southwestern flank of the Anvil Range and Pelly River. To effectively explore this area, a combination of geophysical and geochemical methods were essential due to extensive overburden cover varying in depth from a few feet to over 300 feet.

After a total of 12 months of field work involving an expenditure of approximately $450,000, massive sulphides of the Faro orebody were discovered, this orebody was put into production by Anvil Mining Corporation in early 1970.

With the Anvil Mine now in production, further mineral exploration is required to develop overall district reserves sufficient for a possible smelter. Based on the distribution of known near-surface replacement-type lead-zinc ore deposits and the high probability of existence of additional such deposits at

depth, or under overburden areas, intensive exploration of the Anvil area is well warranted. Continued exploration over the last two years has been based on an improved knowledge of the district gained from a re-evaluation of earlier exploration data, current exploration results available from Anvil Mining Corporation and development of better exploration techniques.

Exploration has been concentrated almost entirely on the southwest linear schist belt parallel to the Tintina Trench, in which all the known massive sulphide bodies have been found to date.

During 1971 Dynasty Explorations participated in the financing, management and operation of an ambitious 500,000 dollar exploration program on the mineral claims currently held by Anvil Mining Corporation. Participation in such a program greatly broadened our knowledge of the Anvil area and aided in developing new exploration techniques for other areas within the Anvil Range. Some of the studies carried out on Anvil claims involved the following:

(1) Detailed structural and petrographic studies of the Faro orebodies to determine ore controls, oregenesis and exploration parameters applicable to the immediate vicinity of known orebodies and other areas.

(2) Checking, correlating and extending geochemical data over the area of non-fluvial overburden west of Blind Creek to explore present unknown areas and to determine metal ratio and other element factors over the Faro orebodies.

(3) Geochemical orientation studies involving overburden and rock geochemical sampling using available diamond drill hole

material to determine presence or otherwise of a recognizable geochemical aureole around the Faro ore-bodies and any other useful geochemical exploration parameters.

(4) Completion of an overburden and bedrock sampling rotary drill program in areas of known and extrapolated favourable geology to investigate both known geochemical and geo-physical targets and areas of deep overburden where conventional surface exploration methods are of little value. Geochemical parameters established in (2) and (3) were used to evaluate geochemical assays of overburden and bedrock samples obtained from the rotary drill program. Partial completion of an overall geological map was based on known outcrop and borehole bedrock sampling data.

(5) Provision of follow-up gravity and/or other geophysical methods in geochemically anomalous areas indicated by rotary drilling, particularly where overburden depths are known.

Approximately $100,000 was spent in 1970 and $145,000 in 1971 on Dynasty's interests in the area which have mainly involved property acquisition and ground follow-up exploration. Dynasty holds two major groups of claims within the Anvil Range:

East Sector (Hoho-Bram Claims - 48 claims
West Sector (Roto, Jean, Gran, Lorna, Aro Claims - 207 claims

All claims have received considerable exploration, involving geologic mapping, magnetic and electromagnetic surveys, gravity survey coverage and soil and silt sampling.

Other related exploration carried out by Dynasty in the Anvil region has involved emphasis on research of areas of known sulphide occurrences to establish parameters for further exploration. This work has involved:

Geology - detailed structural, metamorphic and geochemical analysis of Faro and Vangorda massive sulphide deposits,

- compilation of all available geologic data for Anvil area,
- logging of all known diamond drill hole cores within Anvil area,
- preparation of regional geologic map, scale 1:50,000,
- preparation of detailed regional geology to scale 1:1320.

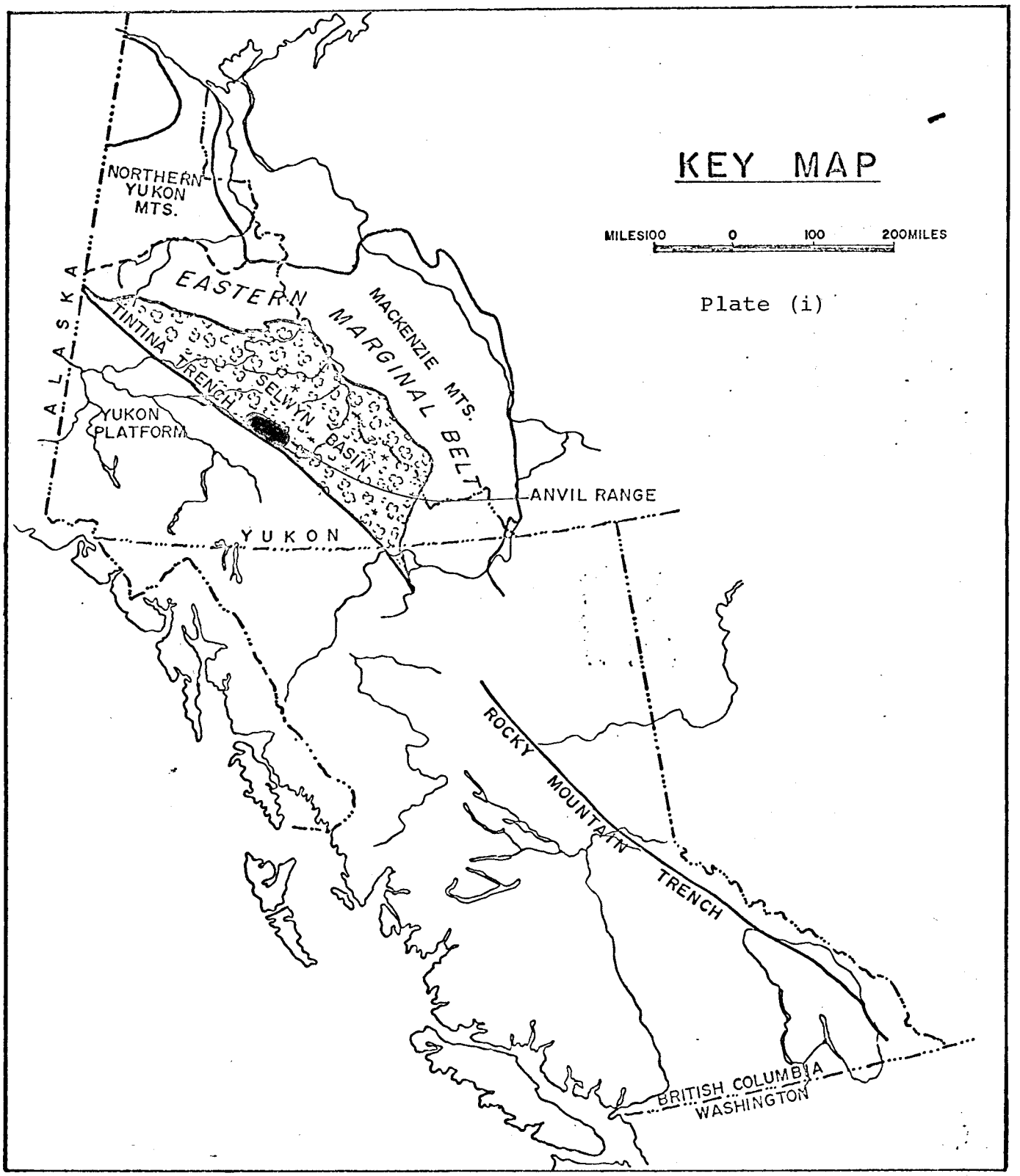
Geochemical - compilation of all available soil sampling data - Anvil area,

- research and orientation studies directed towards lakeshore silt sampling and stream sediment sampling and completion of lakeshore and stream sediment sampling as well as soil sampling of selected local areas.
- orientation studies to determine and identify geochemical characteristics of phyllite host as well as geochemical characteristics of soil horizons overlying phyllite,

Geophysical - compilation of all available geophysical information from past surveys carried out within Anvil area,

- review and re-interpretation of airborne geophysical data including:
  - G.S.C. aeromagnetic maps
  - Lockwood Survey low level aeromagnetic
  - Lockwood Survey H.E.M. survey
- attempted Turair survey
- extensive ground electromagnetic (C.E.M.) surveys

The recent exploration activities of Dynasty Explorations within the Anvil area represent the first thorough and detailed major attempt by any company to discover new base metal reserves in that district. Based on the information contained within this report, a continuation of this exploration program is highly warranted.


KEY MAP
MILES100 0 100 200MILES
Plate (i)
NORTHERN YUKON MTS.
ALASKA
EASTERN MARGINAL BELT
MACKENZIE MTS.
TINTINA TRENCH
SELWYN BASIN
YUKON PLATFORM
ANVIL RANGE
YUKON
ROCKY MOUNTAIN TRENCH
BRITISH COLUMBIA
WASHINGTON

REGIONAL GEOLOGY

The Anvil Range, located in the eastern portion of the Selwyn Basin, northeast of the Tintina Trench, consists of a 20-mile wide by 50-mile long belt of Proterozoic and Paleozoic strata. This succession of strata, dominated by Cambrian to Eocambrian quartz mica and phyllite, forms the Anvil Arch, a northwest-trending asymmetric antiform with an elongate intrusive, the Anvil Batholith, in the core. In the southeast portion of the district, the amplitude of the Anvil Arch diminishes resulting in a shallow broad basin. A simplified geologic section consists of quartz mica schist and calc-silicates overlain by phyllite which, in turn, is unconformably overlain by late Paleozoic volcanics and sediments. Structurally, this area has had a complex history of at least five deformations during regional metamorphism. Major faults are oriented in a northwest direction parallel to the Tintina Trench, as well as northeast. The Tintina Fault system, at least 600 miles long, is a zone of major transcurrent faulting on which about 250 miles of right lateral displacement has been postulated (Templeman-Kluit).

The major massive sulphide deposits occur at the same stratigraphic level within the phyllite unit. Increasing metamorphic grade paralleled by an increase in sulphide grain size, increasing pyrrhotite content with metamorphism and elongation of deposits paralleling deformational fabrics, indicate that the sulphides were affected during regional metamorphism. The pre-metamorphic emplacement, coupled with similar average metal content, uniform lead-zinc ratios, and similar textures and mineralogy, and some stratigraphic control, may indicate a syngenetic origin.

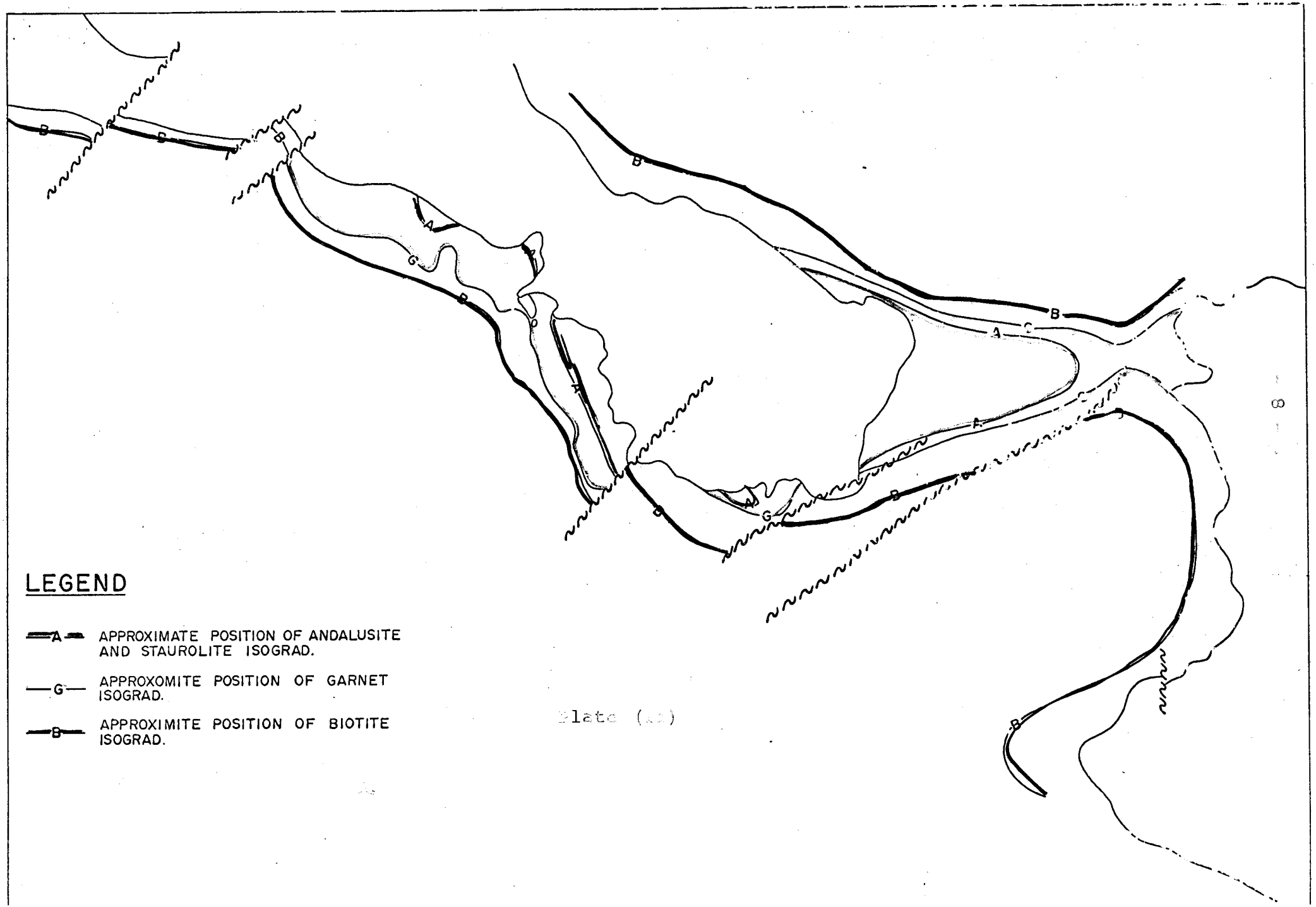
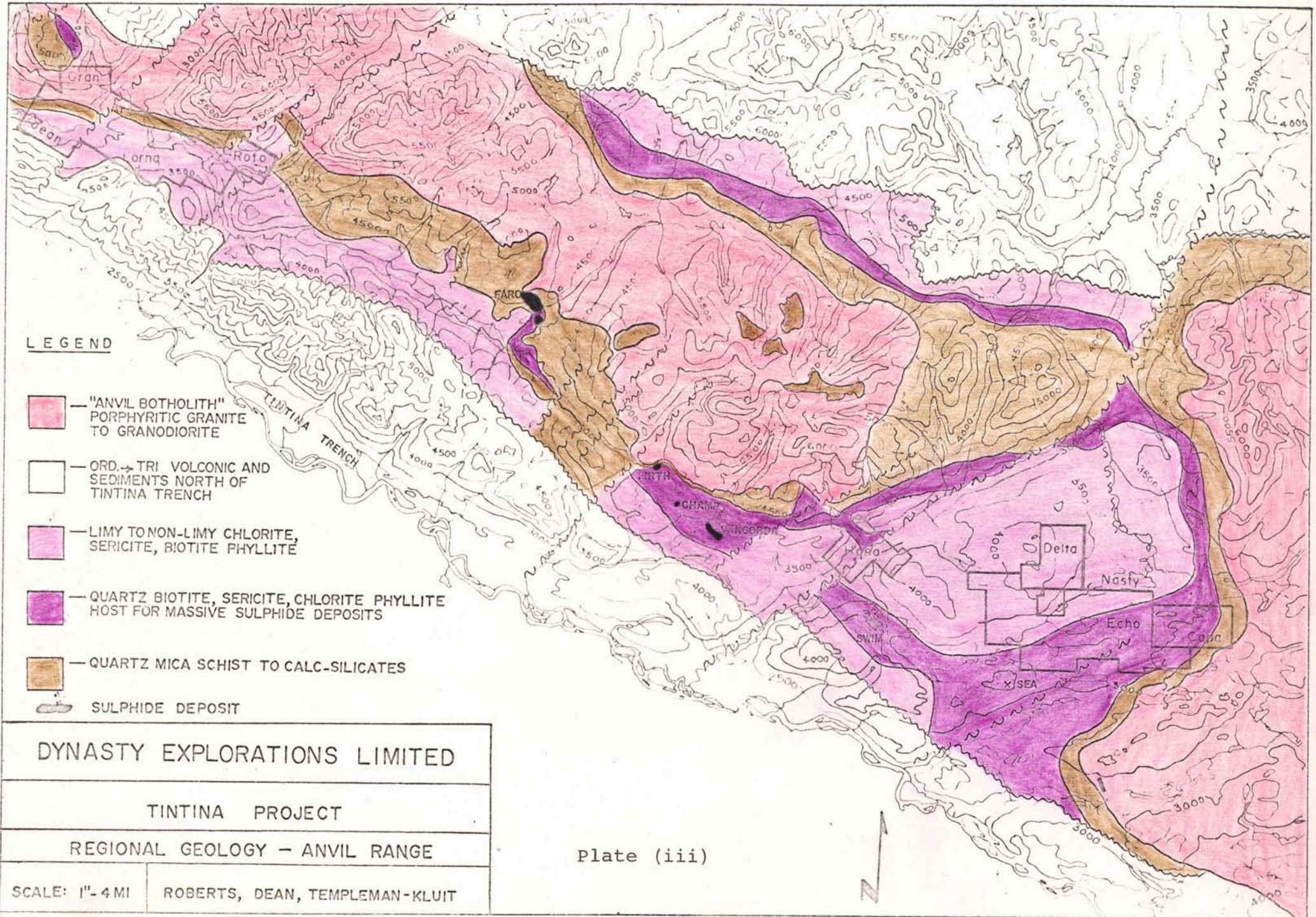

LEGEND
A APPROXIMATE POSITION OF ANDALUSITE AND STAUROLITE ISOGRAD.
G APPROXOMITE POSITION OF GARNET ISOGRAD.
B APPROXIMITE POSITION OF BIOTITE ISOGRAD.

Plate (x)



DYNASTY EXPLORATIONS LIMITED

TINTINA PROJECT

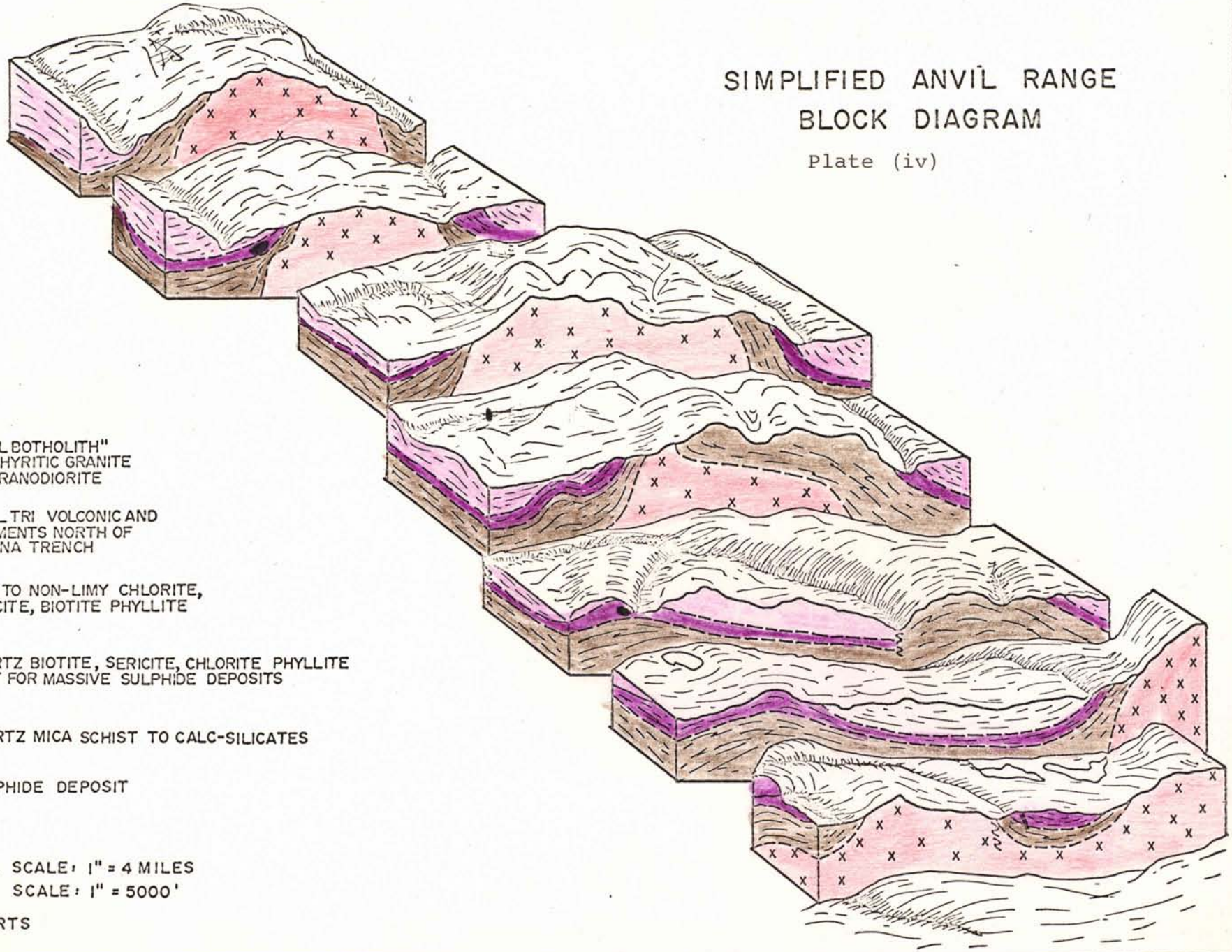
REGIONAL GEOLOGY – ANVIL RANGE

SCALE: 1"-4 MI | ROBERTS, DEAN, TEMPLEMAN-KLUIT

Plate (iii)

SIMPLIFIED ANVIL RANGE BLOCK DIAGRAM

Plate (iv)



LEGEND

- "ANVIL BOTHOLITH" PORPHYRITIC GRANITE TO GRANODIORITE
- ORD._TRI VOLCONIC AND SEDIMENTS NORTH OF TINTINA TRENCH
- LIMY TO NON-LIMY CHLORITE, SERICITE, BIOTITE PHYLLITE
- QUARTZ BIOTITE, SERICITE, CHLORITE PHYLLITE HOST FOR MASSIVE SULPHIDE DEPOSITS
- QUARTZ MICA SCHIST TO CALC-SILICATES
- SULPHIDE DEPOSIT

HORIZONTAL SCALE: 1" = 4 MILES
VERTICAL SCALE: 1" = 5000'

W. J. ROBERTS

TABLE OF GEOLOGIC FORMATIONS

AGE	PROBABLE THICKNESS		
TERTIARY		14b	14b – FINELY LAMINATED, LIGHT GREY, RHYOLITIC TUFF. (913)
		14a	14a – APHANITIC, LIGHT GREENISH TO REDDISH QUARTZ FELDSPAR PORPHYRY. (926)
CRETACEOUS TO TERTIARY		13	13 — SAUSSURITIZED PORPHYRITIC HORNBLENDE DIORITE. (942)
	INTRUSIVE	12	12 — WEATHERING RUSTY BROWN, MEDIUM GRAINED, DARK GREEN-GREY, EQUIGRANDULAR ALTERED PYROXENITE AND HORNBLENDE DIORITE. (928)
CRETACEOUS	INTRUSIVE	11	ANVIL BATHOLITH 11 — MEDIUM GREY, EQUIBRANULAR BUT LOCALLY PORPHYRITIC AND FOLIATED, HYPIDIOMORPHIC, MEDIUM GRAINED QUARTZ MONZONITE BUT RANGES FROM BIOTITE QUARTZ MONZONITE TO BIOTITE GRANODIORITE. (929)
TRIASSIC	300'	10a	10a – THIN BEDDED, PLATY, MEDIUM GREY CALCAREOUS SLATE, WITH LOCALLY INTERBEDDED FINE GRAINED ARGILLACEOUS LIMESTONE.
TRIASSIC	2000'	10	10 — BROWN-WEATHERING CONGLOMERATE WITH QUARTZITE, SCHIST GRANITE GNEISS, BASALT, CHERT AND LIMESTONE PEBBLES. (944)
U. PERMIAN TO TRIASSIC		9	9 — DARK GREEN TO BLACK SERPENTINITE AND RELATED PERIDOTITE. (907)
U. PERMIAN		8c	ANVIL RANGE GROUP 8c — ORIGINALLY LIGHT GREY CRINOIDAL OR BIOCLASTIC LIMESTONE, NOW RECRSTALLIZED. WEATHERS BUFF, CONTAINS MINOR QUARTZ, ESSENTIALLY A SPARITE. (906)
PERMIAN	1500'	8b	8b — MEDIUM TO DARK GREEN, MASSIVE, BASALTIC VARIETIES INCLUDING TUFFS, MASSIVE AMYGDALOIDAL FLOWS, PILLOWS AND PYROCLASTIC TYPES. (908)
L. PERMIAN	2000'	8a	8a — PALE GREEN, GREENISH BROWN, LIGHT GREY MASSIVE TO THIN BEDDED ARGILLACEOUS AND TUFFACEOUS CHERT, WEATHERS OFF-WHITE. LOCALLY BRICK RED DUE TO HEMATITE (JASPER), LOCALLY BRECCIATED. (925)
U. DEVONIAN TO MISSISSIPPIAN		7	7 — DARK GREY TO BLACK, MASSIVE TO THICK BEDDED, GRAPHITIC CHERT, ASSOCIATED DARK GREY GRAPHITIC CHERTY ARGILLITE AND ARGILLACEOUS SILTSTONE, MINOR ARGILLACEOUS LIMESTONE, GREYWACKE AND CHERT PEBBLE CONGLOMERATE. (918)
M. DEVONIAN	100'	6	6 — THIN BEDDED, PLATY, BLACK, CARBONACEOUS FETID CRINOIDAL LIMESTONE TO MASSIVE BUFF WEATHERING GREY BIOCLASTIC DOLOMITE. (905)
SIL. DEVONION	50'	5	5 — MASSIVE MED. TO LIGHT GREY, MED-COARSE GRAINED ORTHOQUARTZITE. (927)
ORDOVICIAN SILURIAN	400'	4	4 – GRAPTOLITIC BLACK CARBONACEOUS SLATE, BLACK SILTY SHALE, ARGILLITE, MINOR BLACK CHERT BANDS, MINOR PYRITE. (949)
MIDDLE UPPER CAMBRIAN ?	4000'+	3d	3d — "GREENSTONE" - DARK TO PALE GREEN FOLIATED TO MASSIVE AMPHIBOLITE, CHLORITIC TUFF, AND ANDESITE. (911)
		3c	3c — THINLY LAMINATED SILTY LIMESTONE, ALTENATING LAMINAE OF PHYLLITE AND SILTY FINE GRAINED GREY LIMESTONE. (920)
		3b	3b — SILVERY GREY WEATHERING, GREY TO BLACK FOLIATED SERICITE CHLORITE, BIOTITE, GRAPHITE PHYLLITE. CAN CONTAIN LARGE GREENSTONE LENSES. (934)
		3a	3a — LIGHT TO DARK GREY, BLACK QUARTZ SERICITE, BIOTITE, CHLORITE, PHYLLITE. ALSO INCLUDES QUARTZ GRAPHITE PHYLLITE (3ag) AND QUARTZITE (3aq). GENERALLY CONTAINS SMALL GREENSTONE LENSES. (931)
LOWER CAMBRIAN ?	2000'+	2e	2e — DARK GREEN MASSIVE AMPHIBOLITE OCCURING AS LENSES THROUGHOUT UNIT 2. (921)
		2d	2d — TAN WEATHERING MEDIUM GRAINED QUARTZ BIOTITE SERICITE (MUSCOVITE) SCHIST WITH ANDALUSITE, GARNETS, AND STAUROLITE. (941)
		2c	2c — MASSIVE WHITE TO CREAMY CRYSTALLINE LIMESTONE TO MARBLE. (903)
		2b	2b — WHITEISH WEATHERING, BANDED PALE TO DARK GREEN, PURPLISH BROWN BANDED CALC-SILICATES WITH PHYLLITIC AND SCHISTOSE PARTINGS. (916)
		2a	2a — BROWN WEATHERING, MEDIUM TO COARSE GRAINED QUARTZ BIOTITE SCHIST WITH MINOR MUSCOVITE, ANDALUSITE, GARNET, AND STAUROLITE PORPHYROBLASTS COMMON. (947)
PROTEROZOIC		1	" GRID UNIT " 1 — GREY WEATHERING MEDIUM - DARK GREY, MUSCOVITE METAQUARTZITE LOCALLY COLOUR BANDED, MINOR CHLORITE, TOURMALINE AND CARBONATE. INTERFOLIATED BLACK GRAPHITIC QUARTZITE COMMON. (946)

GEOLOGY

During 1971 Dynasty undertook a large program of data compilation, regional mapping and property acquisition in the Anvil Range. All previous geochemical, geological, geophysical and diamond drilling results from both Dynasty's and Anvil's previous exploration programs were compiled on 1:1320 scale to serve as base maps for further detailed exploration. Work by Dirk Templeman-Kluit of the G.S.C. provided a good regional geological base. Geological mapping was initiated around the Faro deposits, followed by regional mapping of the south limb of the Anvil Arch, the Vangorda deposit and the Swim Lakes area. The purpose of continued detailed mapping was to determine which stratigraphic levels, if any, of the phyllite were host to major sulphide deposits and which structures, if any, might control ore deposition. These guides were then used to evaluate further potential areas in the Anvil area. Several claim groups were then staked over geophysical targets in areas of favourable geology.

The stratigraphic sequence, assumed ages, and probable thicknesses of geologic units are taken from previous work by Dirk Templeman-Kluit[1]. Unit 2, the schists, and Unit 3, the phyllites, were mapped and subdivided in detail during the 1971 exploration season. The exploration department of Anvil Mining Corporation also assisted in determining the stratigraphic sequence from current work in progress around the Faro orebodies. Unit 1 and Units 4 to 10 are not discussed in detail but general rock types may be noted in the "Table of Geologic Formations" on the following page.

Unit 2, made up of quartz biotite schist, calc-silicates, recrystallized limestone, quartz biotite sericite schist and amphibolite lenses, occurs in the core of the Anvil Arch and

[1] Personal communication

borders the southeastern batholith contact. No evidence of bedding was observed in this unit but since it is more highly metamorphosed and stratigraphically lower, it is probably older than the phyllites. Distinct lithologies have been mapped as separate units, however, in many outlying areas all units occur but only the dominant one has been noted. Stratigraphic thickness likely exceeds 2000 feet although it is highly obscured by numerous folds. Grades of metamorphism appear highly variable including varying assemblages of biotite, muscovite, garnet, andalusite and staurolite. These mineral assemblages are characteristic of the green schist and almandine amphibolite facies of regional metamorphism (Templeman-Kluit). A simple stratigraphic section includes a thick sequence of quartz biotite schist (2a) becoming more muscovite-rich near the top (2d) with an included band of calc-silicates (2b) in the upper portion. Lenses of re-crystallized limestone (2c) are common throughout the calc-silicates. Amphibolite (2e) occurs as lenses of variable thickness throughout Unit 2. This portion of the section probably represents an originally impure sandstone or arkose containing a band of silty limestone. The amphibolite probably has a volcanic origin. Detailed descriptions of individual units follows:

Unit 2a - consists of medium to coarse grained quartz biotite schist with variable porphyroblasts of garnet, andalusite and staurolite. Muscovite is very minor and generally absent. Average hand specimens contain 50-80% anhedral quartz, 20-30% biotite, and less than 10% garnet, andalusite and staurolite. Flakes and books of biotite are dark brown, rarely black, and occur in two prominent orientations. Biotite flakes up to 5 mm. form and outline the major foliation, S_2. In areas where later deformations are prominent fine grained biotite forms S_3 and S_4 and possibly axial plane cleavage of associated folds.

Subhedral to euhedral red iron rich almandite garnets occur throughout this unit. They generally range between 1 mm. and 1 cm. in size. Euhedral andalusite and staurolite crystals generally less than 5 mm. occur along specific S_2 planes with their two longest dimensions parallel to S_2 surfaces.

Distribution of Unit 2a is limited to the central portion of the southern limb of the Anvil Arch. Occurring along the margin of the Anvil Batholith throughout most of the Faro grid area it is terminated in the southeast by a northeast-trending fault at the junction of the Anvil and Vangorda roads. A thickness of over 1500 feet was measured locally but may be erroneous due to multiple folding.

Unit 2b - consists of pale green to white and dark brown to purple banded calc-silicates. Individual bands vary from 2 mm. to 2 cm. and contain schistose or phyllitic partings. The banded skarn consists of alternating bands of pale green quartz, calcite, diopside and grossularite with purplish brown quartz, biotite and amphiboles. Contact metamorphism, adjacent to the Anvil Batholith, has formed clusters of actinolite and tremolite, anhedral andradite and pinkish zoisite(?). Individual laminae or bands are generally discontinuous and parallel the S_2 foliation. Sketch C on page 30[1] shows the typical nature of this rock type. Lenses of greyish weathering, white crystalline marble, Unit 2c, occur throughout the calc-silicates but are prominent in the upper portions of this unit. Lenses vary between 12 and 100 feet thick, and generally conform to the S_2 foliation. Minor constituents of the marble include fine grained subhedral andradite, sparse disseminated

[1] Plate (vii) - Deformation D_2

anhedral diopside and aphanitic graphite. Minor graphite occurs in fine stringers paralleling the S_2 foliation. Two major marble lenses of over 100 feet thick occur northeast of Damsite Lake and north of the old Beta claim group on the northwest side of Blind Creek. The greatest extent of the calc-silicates is distributed northwest of the Faro grid diminishing southeast towards Vangorda. Unit 2b is terminated by a northeast-trending fault at the junction of the Anvil and Vangorda roads. Calc-silicates also occur northeast of the Vangorda deposit and on the north limb of the Anvil Arch. In most instances these rocks form the batholith contact or are in proximity to it. Note the accompanying 1 inch = 1 mile Regional Geology Map for distribution of this unit. The thickness of the calc-silicates varies considerably, possibly due to a facies change during sedimentation or different orientations of original bedding and the intense D_2 deformation. A thickness of over 1800 feet was measured on the Joe and Fair claims northwest of the Faro deposits. Complex folding and possible napping has probably increased the true stratigraphic thickness.

Unit 2d - consists of a coarse to medium grained quartz biotite garnet sericite schist. Compositionally, its only difference from Unit 2a is the sericite content which varies between 10 and 40 percent of the rock unit. Texturally, the two schistose units are similar with major biotite growth paralleling the S_2 foliation. Unit 2d also contains coarse grained garnet, andalusite, staurolite and possible chloritoid porphyroblasts. Garnets are generally subhedral to euhedral, 1 mm. to 1 cm. in size, and of the iron rich andradite variety.

In many drill holes on the Faro claims garnets are found replaced by chlorite, possibly due to retrograde metamorphism post-dating the D_2 deformation in which they were formed. Elongate prismatic andalusite porphyroblasts up to 6 inches in length occur in preferential S_2 planes. Greatest concentrations of andalusite occur near the Anvil Batholith. Subhedral to euhedral tan-brown staurolite up to 1 cm. in size also occurs along preferential S_2 planes rich in biotite and andalusite. Elongate metacrysts of green chloritoid (hand specimen identification only) with "rooster tails" up to 1 inch long occur in quartz biotite sericite schist in a belt underlying the Faro grid and extending to Damsite Lake. Quartz biotite sericite schist occurs adjacent to intrusives and although it was mapped as Unit 2, it may possibly represent, in certain areas, contact effect of the intrusives on originally phyllitic material of Unit 3. Unit 2 is thought to represent the upper portion of the general schist interval and includes the interval of calc-silicates. The greatest accumulation of quartz biotite sericite schist occurs northwest of Blind Creek where a thickness of over 1000 feet was measured. Complex folding and faulting likely have increased the true stratigraphic thickness. Generally this unit appears to be between 100 and 500 feet thick and grades conformably into quartzite and quartz sericite, biotite, chlorite phyllite. Included lenses of white crystalline marble are probably related genetically to calc-silicates in other areas.

Unit 2e - is a dark green amphibolite and occurs as lenses generally less than 100 feet thick. No chemical analysis or petrological work was done on this rock type but in hand specimen it appears to contain mostly fine

grained actinolite. Some lenses are definitely conformable to the major foliation S_2 while others show discordant relationships. The borders are generally well foliated but the lenses tend to be more massive near the core. Maximum length is generally parallel to the strike of S_2.

The phyllites, Unit 3, are subdivided into 3 major rock types, quartz rich phyllite (3a) the lower member, non-quartz rich phyllite (3b), the middle member, and limy phyllite (3c) the upper member. Greenstone (3d) occurs as lenses throughout this section. This phyllite series probably represent an original silty shale regionally metamorphosed up to a greenschist facies. The "greenstones" likely have a volcanic origin. Original bedding is present in areas of low metamorphism but in most cases is obliterated by D_2 deformation producing the well developed S_2 surfaces. Later deformations are indicated by well formed lineations and small to large scale folds. Due to easy erodability the phyllites are poorly exposed, thus limiting structural detail. Size of individual mica grains was used to differentiate fine grained schists and phyllites. Under a hand lens, no individual mica grains could be observed in the phyllite.

Unit 3a - consists of a well-foliated quartz sericite, biotite, chlorite, graphite phyllite. Colour varies according to predominance of mica and graphite content. Quartz and mica are segregated and form alternating folia generally less than 1 cm. thick. Thickness of the quartz rich folia generally is in proportion to the total amount of quartz present and often contains minor pale green chlorite. Alternating darker folia consisting of mica generally are thinner and can contain

a combination of muscovite, biotite, chlorite or graphite. Sericite rich phyllite predominates and has a silvery-grey sheen on mica rich folia parallel to S_2. Green colouration generally reflects high chlorite content, dark brown indicates biotite and black phyllite usually is graphite rich. Quartzite with phyllitic partings noted at all three major deposits is of limited extent. Hydrothermal origin of quartzite is questionable. The quartz rich phyllite, the lower member, consists of over 50% quartz in hand specimen. It appears to have a conformable contact with the underlying quartz biotite-sericite schist. Thickness is variable and thought to be less than 1000 feet. The Swim Lakes area, a region of low metamorphism, contains various degrees of D_2 deformation as shown by the geometry of original quartz rich bands noted on page 30 [1]. Metamorphism in the Anvil Area increases to the northwest as shown by the increase in biotite content. Large porphyroblasts of andalusite, up to 6 inches in length, within this unit north of the Vangorda deposit are probably the result of pyrometamorphism caused by the Anvil Batholith. Around Swim Lakes, Unit 3a is predominantly quartz graphite phyllite with minor sericite. Greenstone lenses, Unit 3d, occur within this unit as small concordant bodies generally less than 100 feet thick. Minor disseminated fine grained subhedral to euhedral magnetite occurs commonly in graphitic rich areas.

The distribution of this unit is very limited. On the southern limb of the Anvil Arch Unit 3a appears to terminate towards the northwest of the main Faro orebody. A quartz graphite phyllite lens trends southeast from the Faro No. 2 and is not found east of the storage dam. It is again noted between the Firth and Vangorda deposits,

[1] Plate (vii)

faulted down, emerging again near the Swim deposit forming a rough ring-shaped pattern in the Swim Lakes Basin. Regional mapping on the north limb of the Anvil Arch indicates a somewhat more continuous interval of quartz rich phyllite. Overall distribution may be noted on the Regional Geology Map accompanying this report.

The middle member, Unit 3b, consists of sericite, chlorite and graphite phyllite with minor quartz content. Compositionally, micas and graphite make up 50 to 80 percent of the unit, quartz and calcite comprise less than 30 percent. Individual folia of aligned micas are much thinner than those of the 'lower member'. Colouration is due to prominence of mica, i.e. sericite phyllite appears silvery-grey, chlorite phyllite is pale green and graphite phyllite is black. The major foliation S_2 is well developed and since low quartz content decreases competence, many F_2 isoclinal folds, as well as D_3 and D_4 crenulations and lineations are present. Generally this unit weathers recessively leaving many small and sparse outcrops throughout the district. For this reason many large folds probably remain undetected.

Large tabular lenses of greenstone, Unit 3d, (concordant with $S_2$0) occur throughout this unit. Foliation of the phyllite tends to wrap around the borders of the more massive lenses appearing as large pseudo-folds with the greenstone in the core.

Unit 3b has a widespread distribution, occurring on both limbs of the Anvil Arch and in the central portion of the Swim Lakes Basin. A somewhat continuous northwest-

trending belt of sericite phyllite stretches from lower Anvil Creek along the south side of Rose Creek to the Blind Creek fault. A similar northwesterly-trending belt of smaller dimensions occurs on the north limb which is also predominantly sericite phyllite. In the Swim Lakes area graphite phyllite (3bg) predominates in the lower portions grading upwards to sericite phyllite. Thicknesses of over 2000 feet were measured south of Storage Dam Lake and in Lower Anvil Creek, it is thought this is an average thickness for the unit.

Carbonate content gradually increases in the sericite phyllite towards a conformable contact with the overlying limy phyllite, Unit 3c. This unit, due to its exceptionally high calcite content and low grade of metamorphism, may also be called a silty limestone. Calcite content varies between 30 and 90 percent as pale yellow, grey and white laminae approximately 1 mm. to 2 cm. thick. Average thickness is roughly 1 cm. Alternating thinner laminae (1-5 mm. thick) consist of dull silvery-grey sericite phyllite to grey silty slate. Foliation S_2 is again predominant with later D_3 and D_4 lineations and crenulations superimposed. Although no thicknesses were measured, this uppermost unit of the phyllites likely is in excess of 1000 feet. Large greenstone lenses also occur within this unit.

Distribution of Unit 3c is limited to 4 areas, the central portion of the Swim Lakes Basin, Lower Anvil Creek, central portion of the north limb and south of the Anvil Mine.

Greenstone, Unit 3d, occurs throughout the phyllite section. Greenstone is found as small lenses in Unit 3a, in Units 3b and 3c large tabular greenstone bodies several hundred feet thick are found. It is more resistant to weathering than the enclosing phyllite and consequently forms the more prominent exposures. The greenstone is a fine grained amphibolite made up of fine grained actinolite and minor chlorite, epidote, plagioclase and calcite. Rough alignment of actinolite crystals gives the greenstone a distinct linear grain.

The greenstone bodies generally have well-foliated margins with coarser grained massive centres. Field terms such as chlorite schist or actinolite schist were used to describe the foliated variety and amphibolite for the more massive type. Colouration varies from pale green well foliated chlorite rich schist to dark green amphibolite. Locally, the greenstone includes pale green laminated, tuffaceous looking material (Templeman-Kluit)[1]. Carbonate content occurs as pinkish to creamy calcite and interstitial fillings between amphibolite grains as well as distinct fine bands parallel to the S_2 foliation. Lenses of crystalline calcite are rare and only found in the greenstone body west of the Vangorda deposit and in the greenstone bodies north of Swim Lake. The greenstone likely represents extrusive andesite and volcanic tuffs.

Chemical analysis by Templeman-Kluit indicates that the greenstones have the general composition of andesites. However, three of the four analyses are anomalously low in K_2O, being 0.4% compared to about 1-1.5% average for

[1] Personal communication

andesites. One of the samples was also anomalously high in Na_2O. This same chemical variation has been reported from the greenstone associated with the Stekenjokk ore deposits in Sweden, which are very similar to the Anvil Range ore deposits in mineralogy, age and environment[1]. Since the source of Anvil sulphides may be related to volcanism, this variation from the norm in the bulk chemical composition of the volcanic rocks may be significant. The one analysis which was not atypical was from the north limb of the Anvil Range, all known sulphide deposits occur on the south limb. Greenstones are widely distributed throughout the phyllites. The location of individual bodies may be noted on the accompanying 1:1320 Regional Geology Sheets. Relationships between volcanic activity and ore deposition within the Anvil Area will be further investigated through trace element studies.

The granitic rocks, Unit 11, form the Anvil Batholith and the batholith east of Swim Lake. The elongate, northwest-trending Anvil Batholith, with a length of over 30 miles and an average width of 5 miles, lies in the core of the Anvil Arch.

Although these rocks were not mapped in detail, two distinct rock types were noted. Much of the intrusive consists of a pale grey, medium grained, porphyritic biotite quartz monzonite. Large white euhedral phenocrysts of orthoclase often with Carlsbad twins occur up to 6 inches long. Near borders the large phenocrysts are roughly aligned parallel to the contact. Biotite generally comprises less than 10 percent of the rock volume.

There is also a foliated variety of intrusive which has similar composition but contains orthoclase up to 1 cm. in size and roughly aligned biotite. The texture resembles an augen gneiss

[1] Zachrisson, 1971.

and has been previously mapped as a member of the schist unit. Foliated varieties are common north of the Vangorda deposit, south of Mt. Mye and northwest of the Firth deposit. Porphyritic varieties are common in the Faro area. According to Templeman-Kluit the two batholiths are composed of medium grained equigranular hypidiomorphic quartz monzonite to granodiorite. Average age determinations done by the G.S.C. on biotite indicate an age of roughly 90 million years, emplacement thus being during the Cretaceous.

A border phase of coarse grained alaskite has been mapped northwest of Hoho-Bram claims. Width is at least several hundred feet; this rock also forms dykes cutting the intrusive and schists, and probably is a late phase of the intrusive.

A small dark green aphanitic plug and associated breccia, Unit 12, was mapped on the east Faro grid. Individual grains were not recognizable, however, the rock appeared to contain epidote, chlorite and possible amphiboles. This unit was not considered important in relation to known sulphide occurrences until galena and sphalerite were found in the breccia. No age relationships are known post-dating the intrusion of the lower Paleozoic schists.

Small stocks, dykes and sills of medium grained hornblende diorite were mapped as Unit 13. Three major bodies occur on the Lee Group, adjacent to the Faro No. 1 orebody, and on a rounded hill south of the Swim deposit. Smaller dykes and sills up to 10 feet thick are common on Big Indian Mountain north of the Faro No. 2 orebody. All bodies are altered to some degree with various amounts of sericite, quartz, epidote, chlorite, feldspar, biotite and chloritized hornblende. A hornblende diorite body cutting the northwest end of the Faro No. 1 deposit[1]

[1]Hesslop and Jennings, Anvil Mining Corporation, 1971.

is extremely altered to a white sericite and other clay minerals. The origin of this alteration is still unresolved. Hornblende diorite appears to cut the batholith and is presumably younger. Feldspar and quartz porphyry as well as felsite were mapped as Unit 14. The rocks generally have a pale grey to tan aphanitic ground mass with phenocrysts of quartz and feldspar up to 5 mm. in size. They occur as north-trending dykes east of the Vangorda deposit and on the Lo claims. They are thought to be of Tertiary age.

STRUCTURAL GEOLOGY

Anvil Arch

The Anvil Arch is an asymmetrical northwest-trending antiform approximately 30 miles long and 15 miles wide with an amplitude probably in excess of one mile. The major foliation S_2 dips gently to the southwest on the southern limb and moderately to the northeast on the northern limb. To the northwest, the Anvil Arch plunges gently beneath cover and terminates in a structural depression containing late Paleozoic volcanics (Templeman-Kluit). To the southeast, the Arch terminates at the Blind Creek fault where dips of schist and phyllite trend roughly perpendicular to the batholith contact. This implies more of a doming effect rather than a plunging antiform.

The Swim Lakes Basin, bounded to the west by the Blind Creek Fault and to the east by a large unnamed batholith, consists of near horizontal strata uplifted along the contact of the batholith. Broad, open, low amplitude F_4 folds give an undulating effect.

Several theories have been considered with respect to formation of the Anvil Arch. The most plausible involves formation during initial metamorphism during deformation D_2. Measured F_2 fold axes average approximately 310°, roughly parallel to the axis of the Arch.[1] The asymmetric form is also similar to F_2 isoclinal folds. D_3 and D_4 deformations do not appear large enough to produce such a major feature.

The Anvil Arch appears to be associated with D_5 deformation and emplacement of the Anvil Batholith during the Cretaceous. The Batholith is exactly in the centre of the Arch, both limbs have axes of similar attitudes and the axes of the Anvil Batholith and Anvil Arch are within 5 degrees as noted

[1] Plate (v)

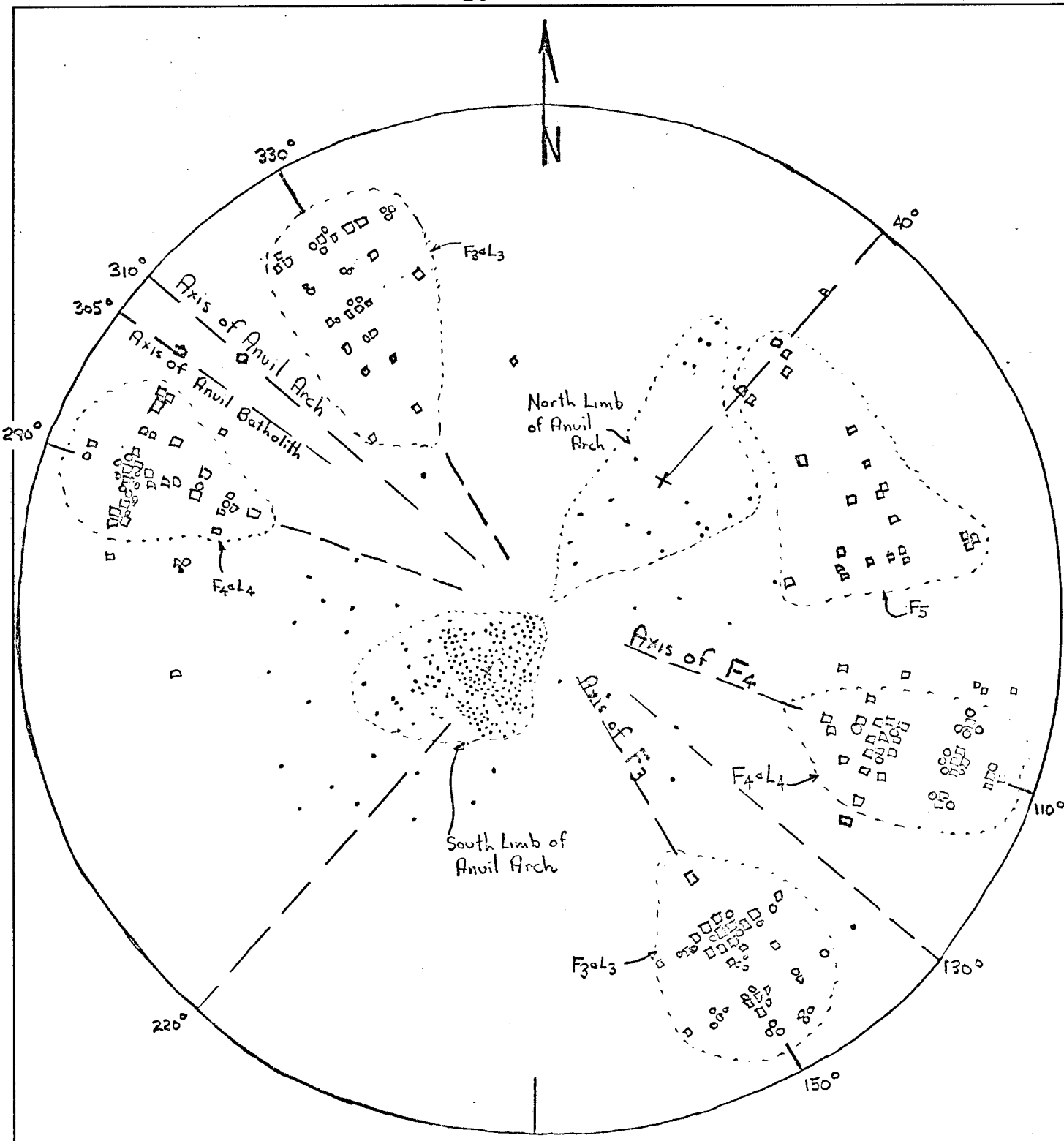


Plate (v)

LEGEND

- • —— POLES TO S_2 FOLIATION
- □ —— FOLD PROJECTIONS
- o —— LINEATION PROJECTIONS

DYNASTY EXPLORATIONS LTD.	
STEREOGRAM	
FARO TO BLIND CREEK	
W.J. ROBERTS	DECEMBER, 1971

on the Stereogram, page 26 . An area of interest is found northwest of Blind Creek where there appears to be a doming of strata around the termination of the batholith rather than evidence of a previously interpreted plunging antiform . Templeman-Kluit believes major flexing producing the Anvil Arch occurred during the Cretaceous since the Permian-Anvil Range Group has also been affected. Uplift associated with batholith emplacement is supported to a lesser extent east of Swim Lakes where S_2 foliations dip away from the intrusion. North of Blind Creek uplift has likely occurred at some later stage leaving a predominence of schist exposures. It is uncertain whether the two batholiths join at depth in the area of the Swim Lake basin.

Regional Metamorphism

Regional metamorphism of Units 2 and 3 has been separated into a minimum of 5 deformational events forming a complex pattern of planar structures, lineations, crenulations and folds. Contact metamorphism during batholith emplacement has complicated those metamorphic events and in some areas distinguishing between deformation events and contact metamorphism is difficult.

Varying mineral assemblages of quartz, muscovite, biotite, feldspar, andalusite, staurolite, garnet, diopside and actinolite comprise Unit 2 and are characteristic of the almandine-amphibolite facies of regional metamorphism. Assemblages of quartz, biotite, sericite and chlorite found in the phyllite unit are characteristic of the green schist facies. The overlay on page 8[2] shows some variations in intensity of metamorphism. The staurolite-andalusite and the garnet isograds are restricted to Unit. The biotite isograd includes all the schist as well as a portion of the quartz-rich phyllite, Unit 3a. Biotite schist bordering the intrusives in the northwest and southeast portions of the map area may have originated from either contact or regional metamorphism. The staurolite-andalusite and garnet

[2] Plate (ii)

or regional metamorphism. The staurolite-andalusite and garnet isograds occur within the core of the Anvil Arch but are not considered to be associated with the Anvil Batholith. Andalusite in phyllite found north of Vangorda was probably formed by pyrometamorphism and has not been included in the andalusite-staurolite isograd. A description of deformational events during metamorphism of Units 2 and 3 follows:

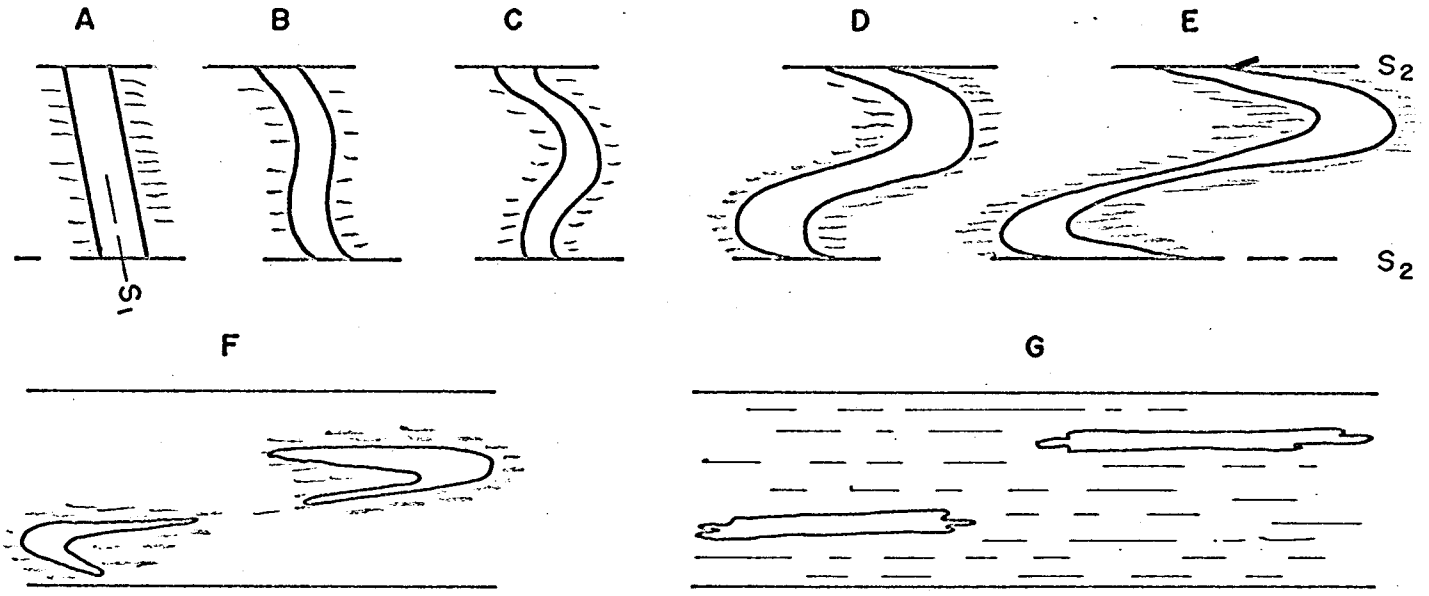
Deformation - D_1

Very little evidence remains of the geological history prior to the major deformation D_2 except for the presence of bedding found in a few localities. D_1, the first deformation, is thought to be loading under pressure thus defining the compositional layering. Individual quartz rich and calcite laminae, generally less than 5 mm. thick, occur as tight isoclinal folds in quartz and limy phyllite respectively and probably represent original bedding. No attitudes were taken of sets of "S" folds to determine original orientations as their shape is highly variable.

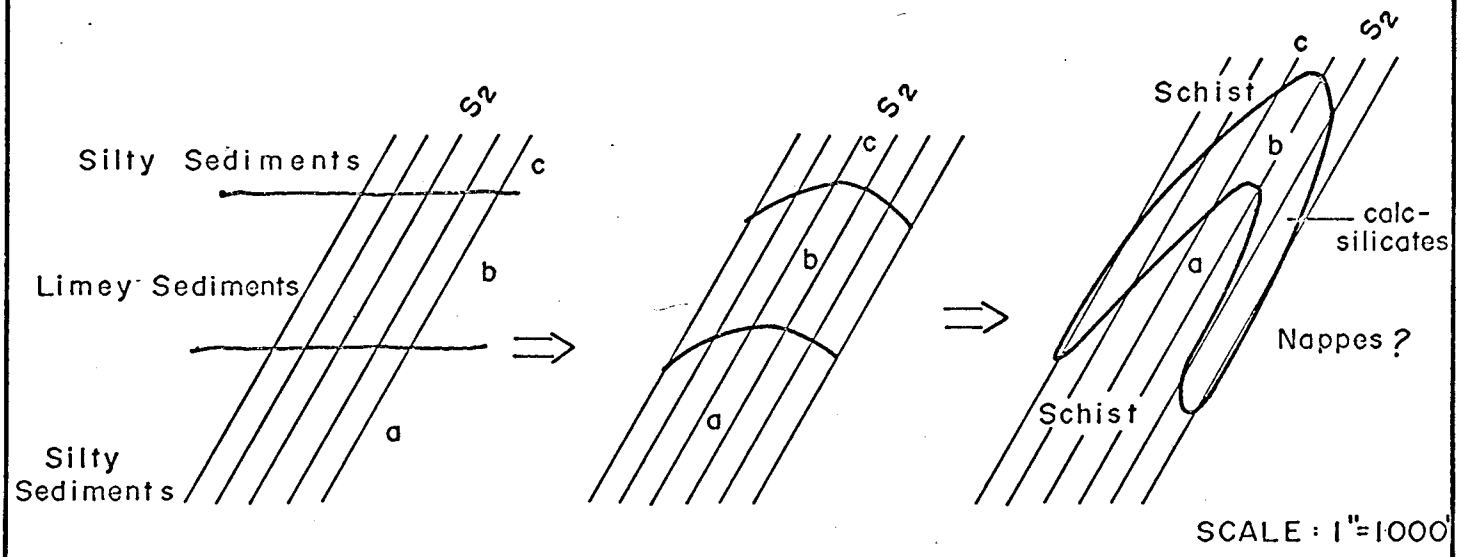
Deformation- D_2

Deformation D_2, the strongest deformation, formed the major and pervasive planar structure S_2 and accompanying F_2 isoclinal folds. The S_2 foliation is well defined by lamina of recrystallized micas aligned parallel to the major slip planes. Spacing of lamina is variable and dependent on quartz content as well as degree of metamorphism. Individual bands generally vary between $<$1 mm. to 2 cm. S_2 surfaces are not always parallel and are often found merging with one another. Laminae of muscovite and biotite generally are very thin in areas of low metamorphism and become thicker with increasing deformation.

DEFORMATION — D_2



INCREASING DEFORMATION A → G SCALE : 1" ≈ 1cm



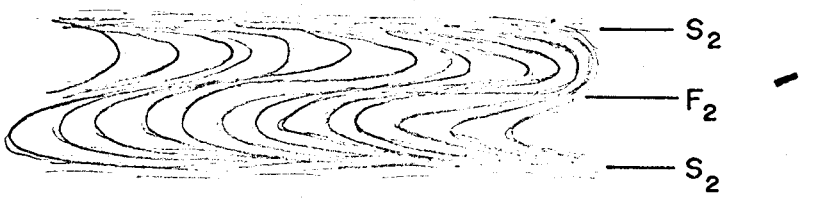
SCALE : 1"=1000'

Plate (vi)

POSSIBLE ORIGIN OF LARGE SCALE FEATURES IN HIGHER METAMORPHOSED REGIONS

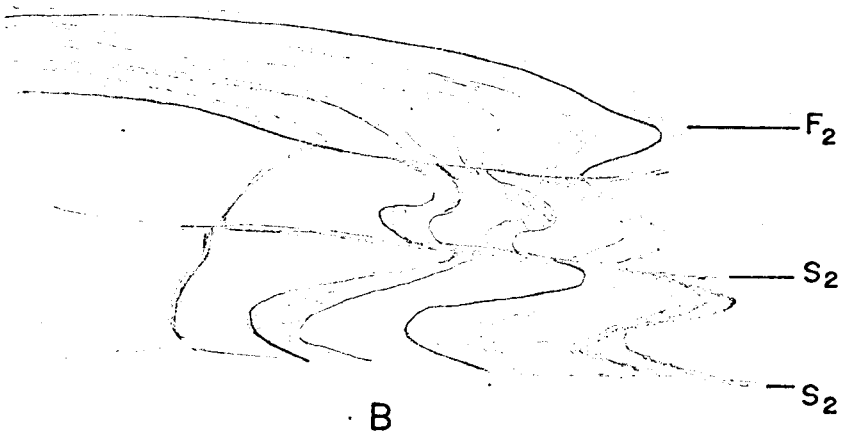
DEFORMATION — D_2

Scale
x 1



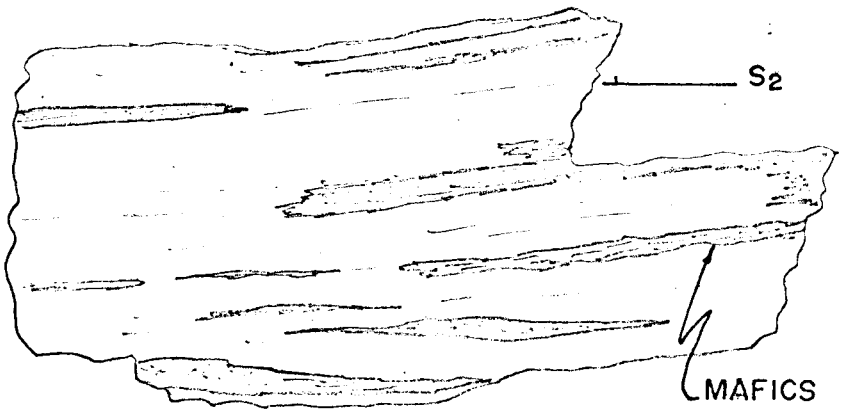
A

x 5



B

x 1.



C

Plate (vii)

The transposition of S_1 into S_2 is highly variable and dependent on grade of metamorphism. In the Swim Lakes area, a region of subdued deformation, evidence of S_1 exists. Complete transposition of S_1 into S_2 is common in higher degree metamorphism in the Faro-Vangorda area. Evidence of earlier S_1 is only evident in the slightly deformed phyllites where previous quartz or calcite has defined compositional layering. An individual lamination affected by increasing deformation is illustrated on page 29[1]. "S" shaped open folds, examples 'D' and 'E', commonly outline S_1 between S_2 surfaces in the Swim Lakes area. Sheared-out limbs and complete tranposition, examples 'F' and 'G', are common in the Vangorda-Faro region.

F_2 folds produced during deformation D_2 are commonly isoclinal and are measured in inches. Examples 'A' and 'B' on page 30[2] illustrate F_2 folds in limy phyllite and quartz rich phyllite respectively found southeast of the Vangorda deposit.

Attitudes of F_2 folds taken varied between 290 and 320 degrees plunging at low angles to the northwest. Large F_2 folds measured in tens or hundred of feet were not observed, possibly due to two reason. The sparse outcrop pattern and lack of definite marker horizons left them undetected or the strata was incompetent and all stress was absorbed by slippage with the formation of the well defined S_2 foliation.

Unit 2 contains no evidence of deformation or bedding previous to D_2. All laminae in the calc-silicates as well as aligned biotite and muscovite in the schist parallel the S_2 foliation. Individual bands and laminae

1 - Plate (vi)
2 - Plate (vii)

are generally discontinuous and lensoid, as illustrated in example 'C' on page 30.[1] Porphyroblasts of garnet, staurolite and andalusite were probably formed during this deformation. Less intense deformations post-dating D_2 have likely produced retrograde effects of chlorite after garnet.

Deformation- D_3

The D_3 deformation appears to have little effect on the phyllites and schists. Small lineations and open folds with axial traces averaging 150° (not accompanying stereogram) were produced during this deformation. Lineations were commonly observed in lower grade non-quartz rich phyllite and limy phyllite while folds with amplitudes up to 10 feet were common in the more highly deformed Unit 2. As shown in example 'D' on page 33,[2] D_3 only produced a slight wrinkling effect on the S_2 foliation.

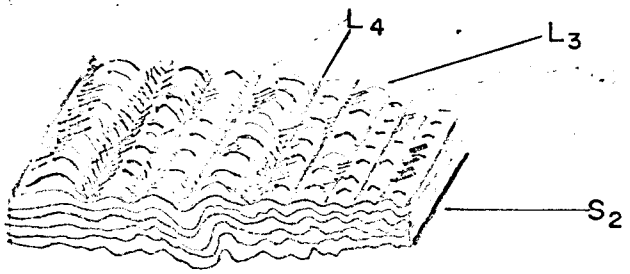
Deformation-D_4

D_4, more intense than D_3, produced larger wrinkles in S_2 and many more prominent open folds. Axes of lineations and folds averages 290 or 110 degrees. Wrinkles noted in Unit 3a near Vangorda have a maximum amplitude of 1-2 mm. and are generally less than 1 mm. F_4 folds, example 'F' on page 33,[2] have amplitudes ranging between .5 cm. and 100 feet. Larger folds are more prominent in the more highly metamorphosed schists. Interference figures with amplitudes up to 6 inches produced by F_3 and F_4 folds were found in Unit 3a on the north limb. Medium grained biotite formed during this stage occurs in the schists producing axial plane cleavage on F_4 folds.

1 - Plate (vii)
2 - Plate (viii)

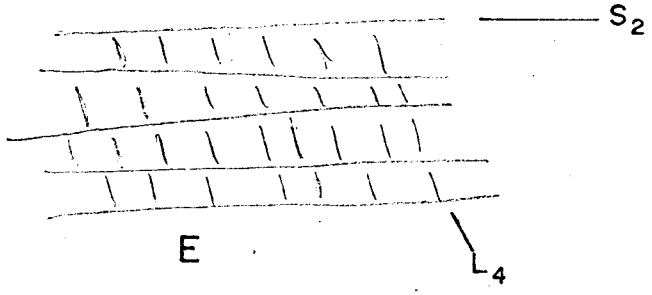
DEFORMATION – D_3 and D_4

Scale
x5



D

x3



x1

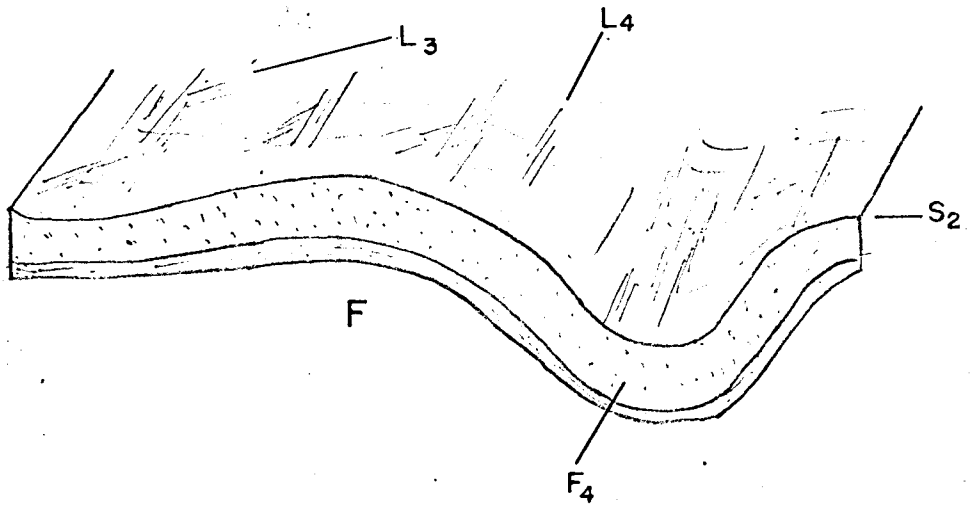


Plate (viii)

Three large F_4 folds, known as the Faro, Vangorda and Swim Anticlines, are major structures containing the Faro, Vangorda and Swim deposits respectively[1]. All appear to be open folds plunging gently to the northwest. Structural complexity around the Faro ore bodies could possibly be caused by F_4 folding of a previous F_2 nappe. Small scale structures with similar design were noted on the Faro grid. Large low amplitude F_4 folds observed in the Swim Lakes area have produced an undulating effect on the near flat-lying phyllites.

Deformation- D_5

Doming and intrusion of the Anvil Batholith during the fifth deformation has resulted in warping of the S_2 foliation and production of F_5 folds. Axes of open folds trending and plunging southwest on the south limb of the Anvil Arch and northeast on the north limb were considered in this deformation. Broad warps noted on the "Faro-Blind Creek Structural Overlay" roughly parallel the intrusive contact.

Contact Metamorphism

Obvious effects of emplacement of the Anvil Batholith on the surrounding strata is best shown where calc-silicates are in contact with the intrusive. Such notable areas include, northeast of the Vangorda deposit, and northwest of the Faro grid. The calc-silicates or banded skarns contain medium to coarse grained anhedral to subhedral garnet, diopside, tremolite and many other unidentified minerals within 500 feet of the intrusive contact. Sphalerite and minor galena found in the banded skarn adjacent to the contact on the Rich, A, and Hec claim groups probably resulted from intrusive activity.

[1] Ref. Accompany maps: 'Geology 1"1320 Sheet 2'
'Faro-Blind Creek Structural Overlay'

Effects of pyrometamorphism on high grade quartz-mica schist is minimal and has not been studied in detail. Coarse grained andalusite in quartz sericite phyllite, Unit 3a, north of Vangorda is also probably caused by pyrometamorphism. There also appears to be a considerable amount of hornfelsic phyllite caused by intrusive activity throughout the Lower Anvil Creek Area.

Faulting

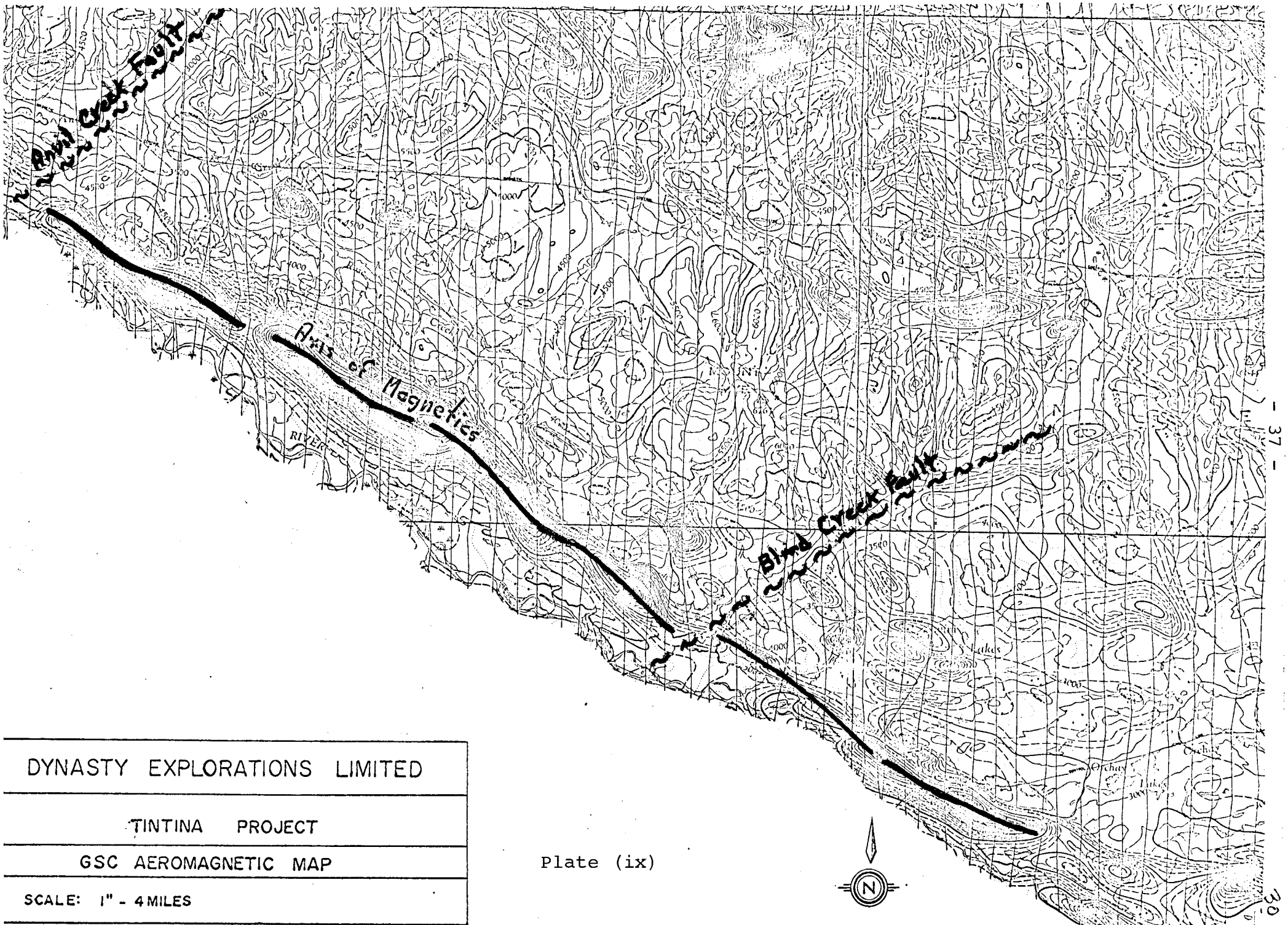
Work by Templeman-Kluit shows the Tintina Fault system as a northwest-trending network of steeply dipping, subparallel faults on which both dip-slip and strike-slip movement has occurred. As faults with northwest orientation were not observed within Units 2 and 3, no detailed studies of those systems were undertaken. Major defined and assumed faults generally trend in a northeast direction within the area mapped. Since many faults have displaced intrusive contacts, the majority are considered to be post-Cretaceous, and possibly related to late effects of batholith emplacement.

The most prominent northeast-trending linear, the Blind Creek fault, has possible left lateral movement of roughly one mile, as shown by the displacement of Unit 8b. A similar displacement of aeromagnetic anomalies may also be observed on the G.S.C. Aeromagnetic Map[1]. A fault parallel to and northwest of the Blind Creek fault appears to have primarily dip-slip movement and could be associated with a quartz-feldspar porphyry dyke, thus inferring pre-Tertiary movement.

Many other faults were recognized throughout the map area with dip-slip, left lateral and right lateral movement and generally trending northeast to north. Due to lack of sufficient outcrop and true stratigraphic thickness, displacement measurements on individual faults were not attempted. The

1 - Plate (ix)

network of faults observed in the Faro Pit indicates the probable complexity of faulting throughout the Anvil Area, much of which cannot be observed because of overburden cover. Faults do not laterally displace the Faro deposits and faulting is not considered to be an ore control.



DYNASTY EXPLORATIONS LIMITED
TINTINA PROJECT
GSC AEROMAGNETIC MAP
SCALE: 1" - 4 MILES

Plate (ix)

ECONOMIC GEOLOGY

Mineral Deposits

The Faro orebodies, owned and operated by Anvil Mining Corporation, and the Vangorda, Swim, Champ and Firth deposits, owned by Kerr Addison Mines, contain over 80 million tons of ore reserves. The three main deposits, Faro, Vangorda and Swim, occur as massive stratiform iron-zinc-lead bodies located in a northwest-trending zone within the south limb of the Anvil Arch. The general shape of the deposits is tabular, the plane in which they lie is roughly parallel to the S_2 foliation. Their long axes may coincide with F_2 folds. Each deposit is generally thicker in the centre, thinning towards the margins. All three deposits occur at the same stratigraphic level near the contact of Units 2 and 3.

The three deposits are both texturally and mineralogically similar. Primary sulphides, in order of abundance, include pyrite, pyrrhotite, sphalerite, galena and minor chalcopyrite. Tetrahedrite, bournonite and arsenopyrite have been identified as minor or trace constituents. Marcasite is the important secondary mineral; anglesite, goethite and gypsum occur sparingly. Quartz is the only important gangue mineral. In the Swim and Vangorda deposits barite occurs. Sphalerite, galena, chalcopyrite and tetrahedrite occur as inclusions in pyrite and interstitial to pyrite grains. The ores have a granular texture and average approximately 50 percent sulphides. Relative proportions of the various sulphides are remarkably constant throughout the individual deposits as well as between the deposits. Average metal content for all three deposits is about 6 percent zinc, 4 percent lead, 1 percent copper and over 1 ounce per ton of silver. The ores of all three deposits show a uniform zinc-lead ratio and low copper concentration that characterizes the conformable

massive pyritic base metal deposits in other parts of the world. Grain size of the sulphides varies within the deposits and from one deposit to another, but the average grain size at Faro is distinctly coarser than at Vangorda, which in turn is coarser than the Swim. Pyrite grains are generally coarser than those of other sulphides.

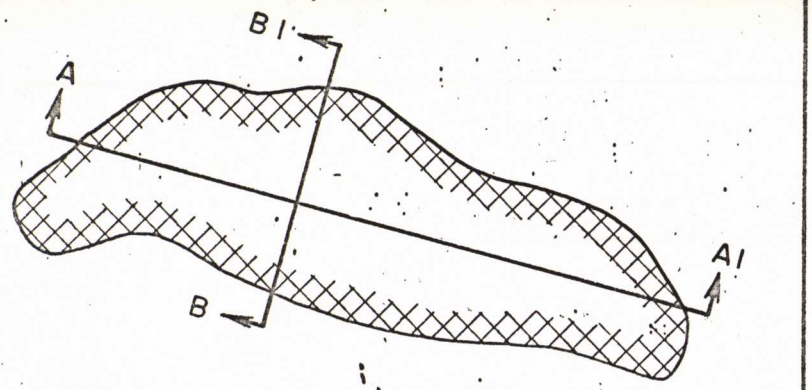
Structures in the ores are generally similar to those of the enclosing silicates. Pyrite-pyrrhotite rich and lead-zinc rich bands are parallel to the S_2 foliation and generally outline folds within the deposits.

All three major deposits contain an irregular bleached envelope, locally up to 100 feet thick, rich in silica and alumia surrounding the massive sulphides.

(1) Faro Deposit

The Faro orebodies consist of massive, banded and disseminated sulphides in two major deposits. The Faro No. 1 and 3 orebodies together form a regular and continuous southwest dipping tabular lens roughly 4800 feet long, 1200 feet wide and averaging 120 feet thick. In longitudinal section, the orebody has a basin-like shape with Faro No. 3 down faulted by approximately 150 feet. Both overburden and rock cover range between 100 and 600 feet in thickness. Proven tonnage is 58,300,000 tons grading 9.23 percent combined lead and zine with 1.2 ounces of silver per ton.

Faro No. 2 orebody, 500 feet to the south, is 1200 feet long, 1000 feet wide and up to 30 feet thick, lies under shallow overburden and is open to the southeast. Proven tonnage consists of 5,150,000 tons grading 8 percent combined lead and zinc with 1.5 ounces per ton silver.



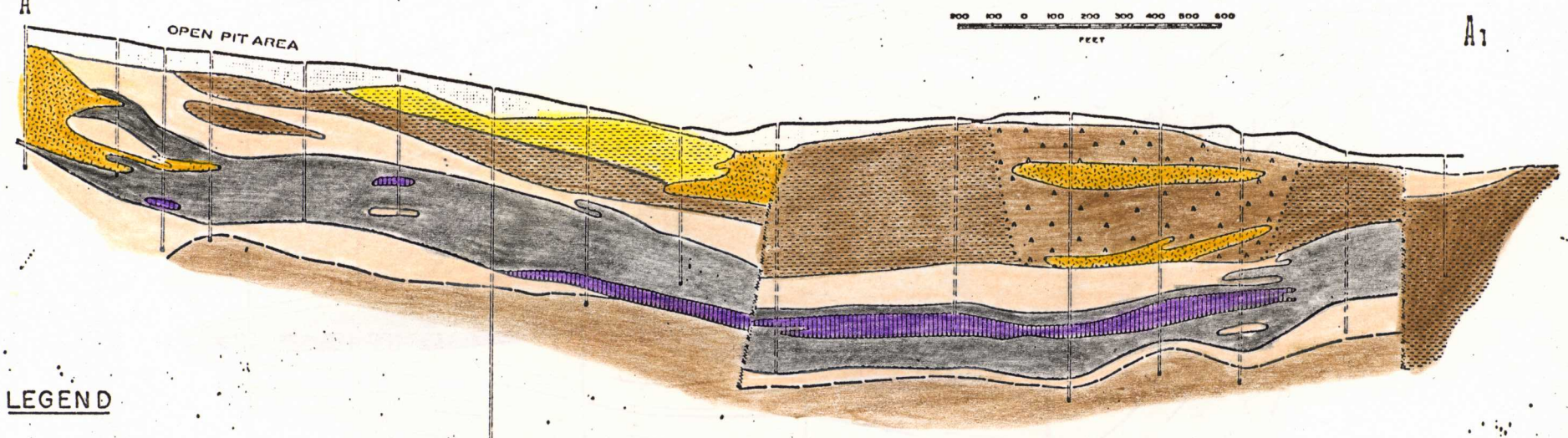
SCALE

200 100 0 100 200 300 400 500 600
FEET

A

OPEN PIT AREA

A1



LONGITUDINAL CROSS SECTION A-A1

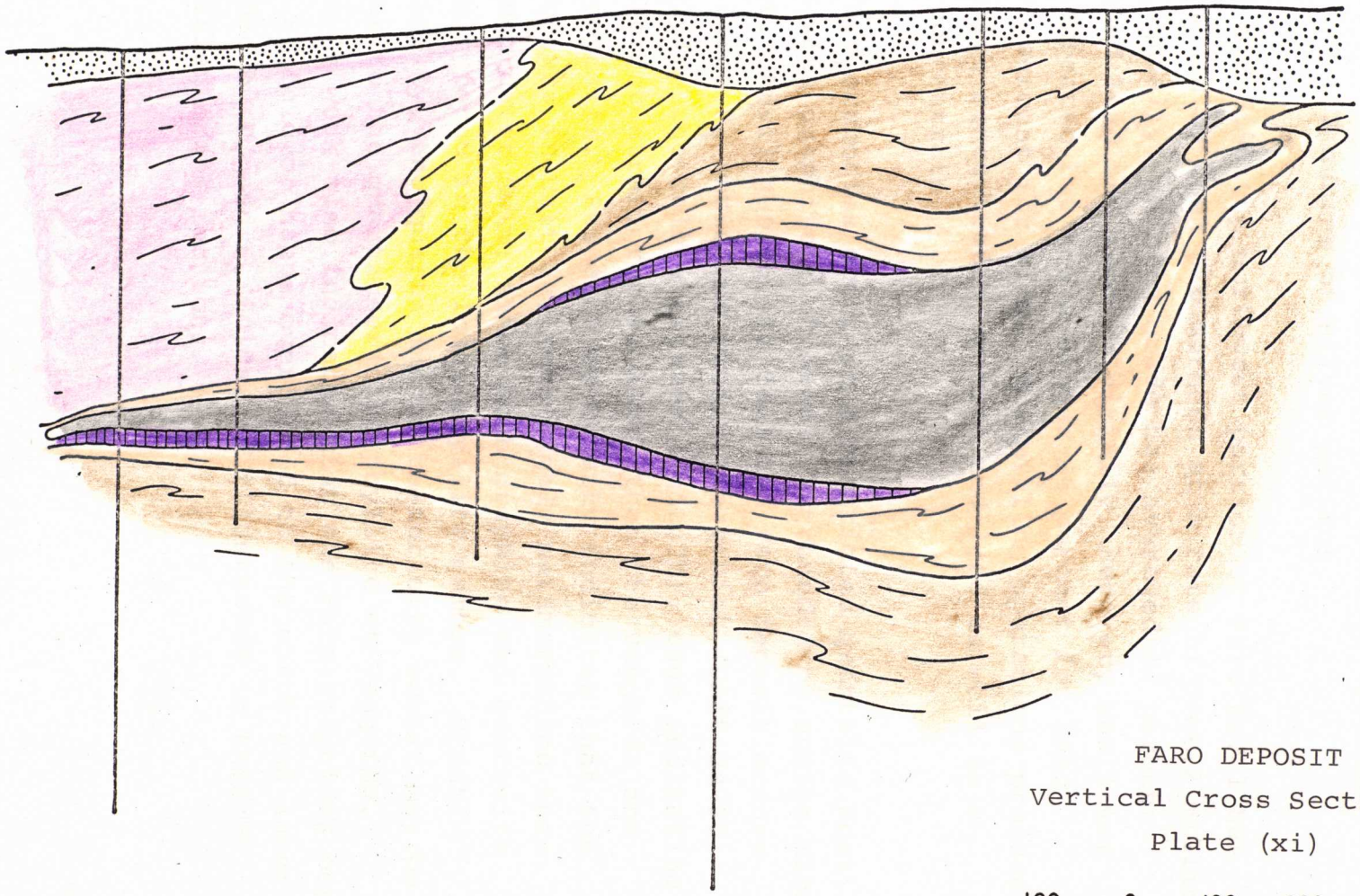
FARO DEPOSIT
Longitudinal Cross Section
Plate (x)

LEGEND

- Breccia
- Disseminated sulphides
- Massive sulphides
- Bleached zone
- Hornblende diorite
- Sericite phyllite
- Quartzite to quartz graphite phyllite
- Quartz biotite sericite schist
- Calc – silicates

W.J. Roberts

VERTICAL CROSS SECTION B - B1



FARO DEPOSIT

Vertical Cross Section

Plate (xi)

100 0 100 200 300 Feet

SCALE

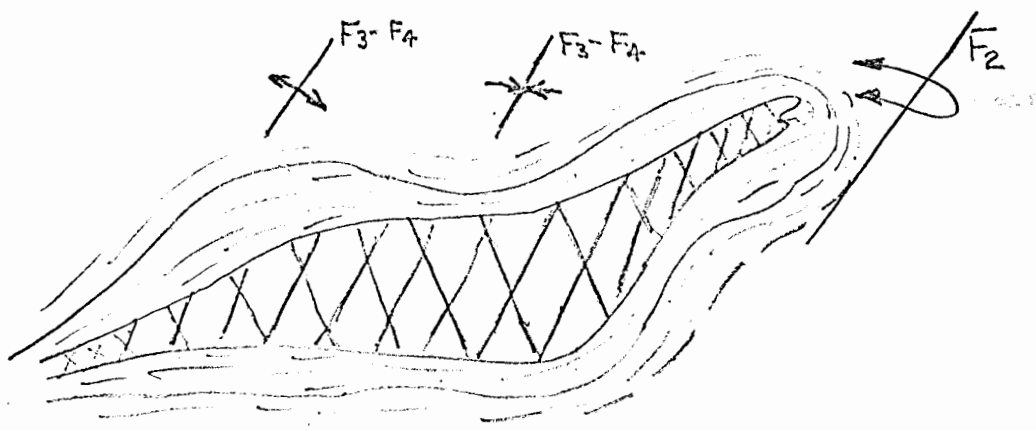
W. J. ROBERTS

In total, Anvil has outlined 63,470,000 tons of assured ore averaging 3.4 percent lead, 5.7 percent zinc and 1.2 ounces of silver per ton.

Since mid-1696 the northwest portion of Faro No. 1 has been mined by open pit methods at a rate of over 2 million tons annually. Mining grade has averaged 12 percent combined lead and zinc. Initially, recovery was lower than expected but now averages 85 percent for lead and 71 percent for zinc. The milling operations produce selective concentrates of zinc and lead as well as a bulk concentrate.

The Faro orebodies occur in a restricted quartzite host, often with graphite rich bands, surrounded by quartz mica schist. Anvil geologists feel the Faro deposit occurs in a large F_4 anticline within the schist (Unit 2a-2d) underlying the calc-silicates (Unit 2b), thus indicating a different stratigraphic level than the Vangorda and Swim deposits. Research by Dynasty indicates that the Faro occurs in Unit 3a; more highly metamorphosed than at Vangorda or Swim; since both graphite and quartzite are only found in the lower phyllite member. Stratigraphically, the quartz muscovite-sericite schist may be similar to the quartz sericite phyllite at Vangorda. Dynasty's work also indicates that the Faro sulphides occur in an F_2 fold or nappe overturned to the north and later refolded by F_3 and F_4 folds, as illustrated in this simplified cross section.

Plate (xii) - Simplified Cross Section Faro No. 1 Deposit showing role of F_2, F_3 and F_4 folds.



A creamy to white bleached quartz muscovite schist with minor garnets, ranging in thickness between 10 and 150 feet, surrounds the main orebody. A breccia occurring above the Faro No. 3 deposit consists of angular fragments of quartz muscovite-biotite schist of varying size with minor amounts of matrix. No mineralization was noted in the matrix, however, large blocks of massive banded sulphide float has been found in close proximity to the breccia. Thus, the breccia could be post-ore and related to local intrusive activity.

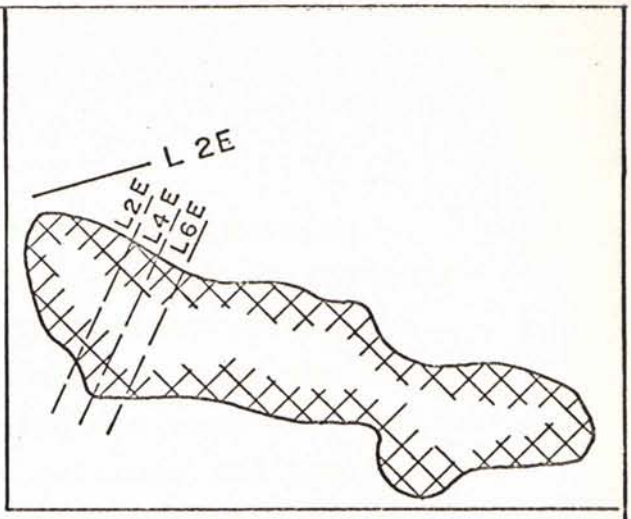
The northwest end of the main orebody has been uplifted by, and interfingers with, a large body of diorite. The diorite is highly altered with only sericite after biotite, quartz and white clay minerals remaining. Segregated bands of bronze-yellow pyrite and pyrrhotite rich material alternate with dark silvery-grey lead-zinc-pyrite bands.

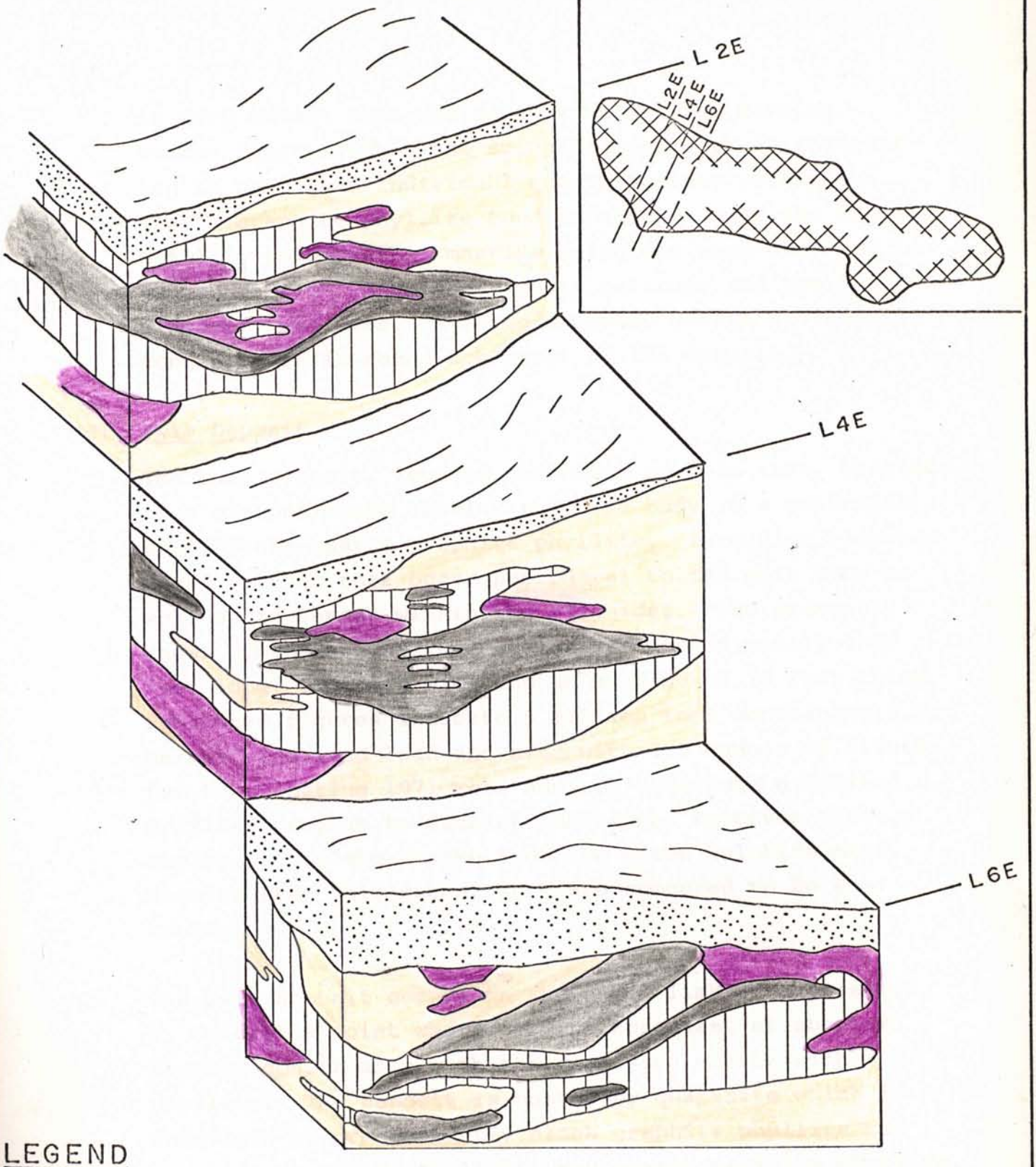
Individual bands vary between 1 cm. and 3 feet but generally average an inch in thickness and are thought to parallel the penetrative S_2 foliation. Tongues of sulphides extending into the surrounding silicates has been caused by complex folding and faulting. Veins of coarse grained galena and quartz probably represent mobilization of metals during metamorphism.

(2) Vangorda Deposit

The Vangorda deposit, located on Vangorda Creek, consists of irregular, flat-lying tabular lenses of massive sulphides. This deposit is roughly 2500 feet long, 500 feet wide and averages 70 feet thick. The sulphides form the bedrock surface over most of the deposit and are covered by 10 to 70 feet of glacial fluvial material. Published tonnage and grade figures indicate 9.4 million tons of 3 percent lead, 5 percent zinc, .3 percent copper and 1.8 ounces per ton of silver. An additional 12.6 million tons of barren sulphides also occurs within the main body. In all likelihood glaciation has removed the upper portion of this deposit. The composition and textures of the Vangorda sulphides are very similar to that of Faro. Vangorda has a finer grain size with a large pyrite to pyrrhotite ratio. Pyrite forms the largest grains and is the dominant sulphide. Sulphide banding is also evident in the Vangorda. Disseminated sulphides generally occur peripheral to the main mass with sulphide grains associated with quartz rich laminae rather than mica or graphite folia.

The Vangorda deposit occurs in a quartzite within Unit 3a, a quartz sericite graphite phyllite. An irregular halo of bleached phyllite to schist occurs peripheral to and in the sulphide body. Quartz graphite phyllite





LEGEND

- BONDED SULPHIDES
- MASSIVE SULPHIDES
- QUARTZ GRAPHITE PHYLLITE
- "BLEACHED ZONE"– QUARTZ, MUSCOVITE & DISSEMINATED SULPHIDES.

VANGORDA DEPOSIT

BLOCK DIAGRAM OF WESTERN PORTION

Plate (xiii)

SCALE: 1" = 200'

is very common near the deposit as well as forming barren lenses within the sulphide mass. It is interesting to note that individual quartz laminae within the quartz graphite phyllite tend to thicken near the deposit. Small F_4 folds within massive sulphides were observed in Vangorda Creek where the deposit outcrops and the initial discovery was made. A large cemented gossan or limonite conglomerate is found southwest of the deposit.

(3) Swim Deposit

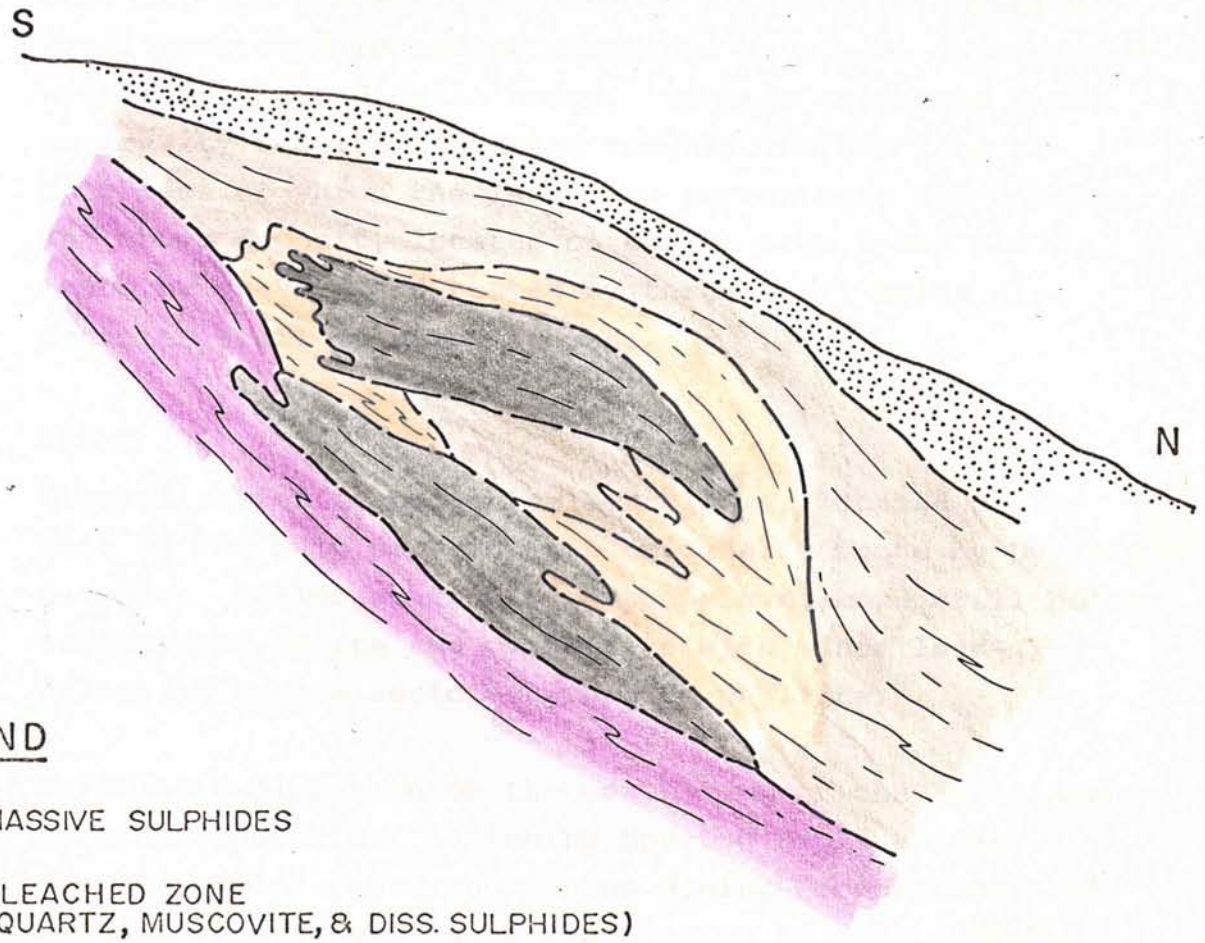
The Swim deposit, located northwest of Swim Lake, consists of a discontinuous tabular sulphide body in a quartzite host within quartz graphite phyllite. Irregular bleached areas of host rock occur peripheral to the main body as well as in lenses within the sulphides. The presently known dimensions of the deposit are approximately 1500 feet long, 500 feet wide and an average of 70 feet thick. Published figures indicate 5 million tons containing 9.5 percent combined lead and zinc with 1.5 ounces of silver per ton. During 1971 Kerr Addison undertook a limited drilling program to develop additional reserves through exploration along strike from the known sulphide mass. Results from this recent work are rumoured to be encouraging.

The Swim deposit occurs on the north limb of a presumed F_4 fold at a point where it dips northeast at about 20 degrees conformably with the enclosing quartz rich phyllite. The deposit is hosted by quartzite which is underlain by predominantly black graphite phyllite and overlain by creamy to light grey quartz sericite phyllite. Segregated bands of brass-yellow pyrrhotite to pyrite alternating with grey bands of galena and sphalerite,

SWIM DEPOSIT

SIMPLIFIED CROSS SECTION

Plate (xiv)



LEGEND

- MASSIVE SULPHIDES
- BLEACHED ZONE (QUARTZ, MUSCOVITE, & DISS. SULPHIDES)
- QUARTZ SERICITE PHYLLITE TO QUARTZITE
- QUARTZ GRAPHITE PHYLLITE

SCALE: 1" = 200'

observed in drill core, outline the F_2 foliation as well as small F_2 folds. Individual bands are generally thinner than those in the Vangorda or Faro deposits. The overall grain size of the sulphides is definitely smaller at Swim than at Vangorda.

(4) Champ and Firth Deposits

The Champ and Firth deposits occur northwest of the Vangorda deposit within the boundaries of Kerr Addison's claims. Both are located in the quartz rich phyllite, Unit 3a, and contain uneconomical tonnages of sulphides. Small scattered lenses of sulphides have been intersected with four diamond drill holes. Tonnage estimates based on gravity results indicated roughly 500,000 tons of sulphides of which the lead-zinc percentages are unknown. The Champ deposit, located on claims Grum 5 and Bix 3, found by gravity and tested by three drill holes also contains small sulphide lenses.

(5) Sea

Mineralization found on the Sea claims, located south-east of the Swim deposit, was originally found by Dynasty in 1964. Bulldozer trenching and six diamond drill holes encountered pyrite and pyrrhotite with minor lead-zinc values in quartz sericite graphite phyllite.

Detailed exploration on the north limb of the Anvil Arch by other companies, including Spartan Explorations, Mercury Explorations and Cyprus Mining Corporation, has not yet yielded any major discoveries to date. Cyprus have drilled three holes in schist and encountered mainly pyrite. On the high reaches of Mount Mye some lead-zinc mineralization has been found on Spartan's Mur group

in a zenolith within the Anvil Batholith. Zinc mineralization in banded skarns adjacent to the intrusive contact is due to pyrometamorphism and not related to the stratabound massive sulphide deposits.

Metamorphic Effects

Many characteristic features common to changes in metamorphic grade within silicates have been observed in the Anvil Range sulphide deposits, thus indicating a pre-metamorphic emplacement. Templeman-Kluit[1], through determining grain size of pyrite and other sulphides for all three deposits, has established a direct correlation between increasing grain size and increasing metamorphic grade. He has also demonstrated how the general overall shapes of the Swim, Vangorda and Faro deposits can be achieved by transposition during increasing metamorphism. Increasing pyrrhotite content with metamorphism and elongation of deposits paralleling deformational fabrics, such as found at the Faro, Vangorda and Swim deposits, indicates pre-metamorphic emplacement. Both small scale and large scale structural features within the banded sulphides appear to be of metamorphic origin. Sulphide replacement of pre-existing structures is very unlikely. Large F_3 and F_4 folds noted in the Faro Pit definitely fold the sulphides and appear to have shaped the overall sulphide mass. Large folds, noted by Anvil geologists, have displaced the original orebody contact forming irregular tongues of sulphides within the enclosing schist.

Lower grade metamorphism in the Swim Lakes area has had a subdued effect on sulphides compared to deformation at Faro. Small isoclinal F_2 folds outlined by pyrite rich bands are common in diamond drill core examined from the Swim deposit. All F_2 folds are absent in higher grade metamorphic areas.

[1] 1968 - Canadian Journal of Earch Sciences

The pale, bleached, irregular zone of quartz and sericite around all three deposits is characteristic of an alteration halo formed during hydrothermal replacement but is probably largely due to physical-chemical conditions in a sulphide environment during regional metamorphism. Vokes, 1968, indicates that some metamorphosed stratiform base metal deposits in Scandinavia also contain irregular confined bleached zones which he attributes to processes of regional metamorphism. Mobilization of metallic elements from silicate minerals may occur by metamorphically activated pore fluids or by accretion to massive bodies by process of sulphidization. Shearing along the edge of the massive bodies may have also changed the chemistry of the nearby silicates.

Stratigraphic Controls

There is a definite stratigraphic control for ore deposition in the Anvil Range. The Faro, Vangorda, Swim and other small massive pyrite-zinc-lead deposits occur within the quartz rich phyllite, Unit 3a, in the south limb of the Anvil Arch. The Vangorda, Swim, Champ and Firth deposits as well as the Sea mineralization occur conformably in quartz sericite graphite phyllite. Stratigraphically, the Faro orebodies occur near the quartz sericite biotite phyllite, Unit 3a, and quartz sericite-biotite schist, Unit 2d, contact. Increased regional metamorphism in the Faro area probably deformed Unit 3a enough to produce higher grade schist, hence making correlation more difficult.

All three major deposits are limited to a quartzite host. The extent of quartzite is very restricted to a few feet beyond the limits of the massive sulphides. The quartzite generally has up to 20 percent disseminated galena, sphalerite, chalcopyrite and pyrite along particular S_2 planes.

The quartz graphite phyllite forming barren lenses within the deposits as well as immediately surrounding the massive bodies is identical in the Faro, Vangorda and Swim drill core. Thin black laminae of graphite alternated with thicker white folia of quartz that contains up to 30 percent disseminated anhedral pyrite. These laminae parallel the S_2 foliation.

Structural Controls

Little evidence exists to support theories for structural controls for ore deposition. Although all three major deposits occur in large F_4 folds, these folds are thought to post-date ore emplacement. Since ore deposition pre-dates metamorphism all previous structural controls, if any, have so far been masked by later deformations. It is felt that the final shape of the individual deposits is largely due to structural control. The major deformation D_2 probably had the greatest effect on the overall shape of the deposits. All deposits are elongated in a northwest orientation paralleling the strike of the S_2 foliation, the major deformational fabric. The axes of the Vangorda and Faro deposits are both 320 degrees, which is parallel to some of the F_2 folds measured; roughly between F_3 and F_4 fold orientations but closer to F_3; and is approximately parallel to the axis of the Anvil Arch. Thus, the orientation and shape of the deposits has been formed by a very complex history of deformational periods rather than any singular and particular metamorphic event.

ORE GENESIS

Theories of formation of the Faro orebodies as well as the Vangorda and Swim deposits are discussed to help determine trends of mineralization and to evaluate parameters for exploration. Evidence previously summarized indicates the deposits have a pre-metamorphic emplacement and that evidence controlling ore deposition is largely obliterated by regional metamorphism. Both syngenetic and epigenetic origins are possible but the geological setting has many characteristics favouring a syngenetic origin.

The Anvil Range deposits are very similar to other syngenetic massive stratiform deposits occurring in sedimentary-volcanic sequences in other parts of the world. These deposits are generally closely genetically associated with volcanics in time and space. Both basic and acidic volcanics are found near many major conformable pyritic deposits thought to be syngenetic in origin. The host quartzite in the massive Outokumpu deposit in Finland, described by Mikkola as originally being a siliceous sinter or tuff, may be very similar to the unmetamorphosed quartzite host in the Anvil Range. Quartz sericite schist surrounding some other metamorphosed sulphide deposits was origninally thought to be rhyolite (Anderson, 1969).

The lack of visible ore trapping structures in the Anvil Range deposits is also the case for many other metamorphosed stratiform base metal deposits. Work by Stanton indicates such deposits commonly occur along elongated zones of volcanism in shelf facies on the margins of eugeosynclines. Similarily, the Faro, Vangorda, Swim, Champ and Firth deposits as well as the Sea mineralization are found to be oriented in a northeast direction although no major structure has obviously controlled such a pattern. This general area of the Anvil Range also formed the margin of a major eugeosyncline, the Selwyn Basin.

Syngenetic theories are also substantiated by the fact that all mineralization occurs at the same stratigraphic level. Unit 3a, quartz sericite, biotite graphite phyllite, is the host, all mineralization is restricted to a highly quartz rich zone. Detailed microscopic and chemical studies have shown the three major deposits to have very similar composition, mineralogy, lead-zinc ratios, granoblastic textures, banding parallel to S_2 foliations, and overall shapes. Templeman-Kluit (1968) feels this consistency favours a syngenetic origin.

Current research and exploration results favour a sedimentary-exhalative or volcanogenic theory of formation of the Anvil Range ores, if it can be hypothesized that huge quantities of metals associated with exhalation, hydrothermal solutions, or volcanic gases were introduced and rapidly precipitated directly on contact with sea water or from efforts of sulphate reducing bacteria. If sulphates were not reduced then sulphur would have to accompany the metal-bearing solutions or gases. Further support to this theory may be established by lead isotope, sulphur isotope and pyrite trace element studies. Uniform and regular lead isotope ratios from all three deposits could indicate a deep source of lead. Lead occurring for longer time periods in crustal regions, i.e. hydrothermal lead, would become radiogenically contaminated and have irregular ratios. Sulphur isotope ratios from either barite or pyrite may show sulphate origins of sulphur. A large ratio of generally 15 to 20 percent indicates marine sulphate. Anderson (1969) observed that pyrite forming in a marine environment from the reduction of sulphate contained only trace amounts of selenium and high vanadium, up to 50-100 parts per million. He states the opposite relationship of the two trace elements is present in hydrothermal pyrite.

An epigenetic theory for original ore deposition is possible but not plausible. The irregular bleached halos around the deposits probably represent metamorphosed original alteration halos and the great consistency between individual deposits and their mineralogical similarities to other stratiform base metal deposits helps favour a syngenetic theory of origin.

FAVOURABLE AREAS FOR ORE DEPOSITION

The most favourable area for discovery of additional tonnage is in the quartz rich phyllite along the linear northwest-southeast trend of all known deposits. For this reason the Echo-Capa-Group covering quartz graphite phyllite adjacent to the linear trend were recently staked and are Dynasty's best prospect for such discoveries. Quartz rich phyllite, outlined by mapping in the northern portion of the Swim Lakes area as well as the north limb of the Anvil Arch, also holds good potential for further finds of sulphide mineralization.

A possible facies change within the quartz rich phyllite northwest of Faro has eliminated this area from further exploration. A small area of quartz-graphite phyllite containing no visible sulphides occurs on the northwest side of 'Next Creek' within the boundary of the Faro claims. Quartz-graphite phyllite can be traced southeast from Faro No. 2 to 'Dam Site Lake' where either faulting, uplift or erosion, or a possible facies change, have terminated the unit. Much of this area is covered by overburden and the swampy areas of Rose Creek. A few outcrops contained up to 10 percent disseminated pyrite with traces of sphalerite. A coincident airborne-magnetic and electromagnetic anomaly within this area establishes a good exploration target for further work.

The broader belt of quartz-sericite-graphite-phyllite between the Firth and Vangorda deposits is covered by claims owned by Anvil and Kerr Addison. This area holds good potential for further discovery of sulphides. Quartzite containing disseminated pyrite, minor chalcopyrite, galena and sphalerite was found in Vangorda Creek north of the Vangorda deposit. There is a good possibility that these outcrops represent the host horizon for the Vangorda deposit, a situation confirmed

by tracing structural form lines representing a large F_4 fold which trends northward off the northwest end of the Vangorda deposit. Disseminated pyrite in quartzite also trends off the southeastern end of the Vangorda deposit and is terminated by a fault parallel to the Blind Creek fault. A large gossan area occurs over the fault where Kerr Addison has previously drilled three diamond drill holes, apparently without encountering significant mineralization. Movement on the fault appears to be mainly dip-slip with the eastern portion moving down. No accurate measurements were attempted but over 500 feet displacement has been estimated to have occurred. A deep drill hole on the east side of the fault on strike with the trend of sulphide bearing quartzite is probably a good exploration bet. The Dy, Rich and Bob claims held by Anvil appear to be highly favourable ground warranting further exploration.

The belt of mineralization containing the Swim deposit and Sea showings appear to follow S_2 form lines and trends into the southeastern portion of the Swim Lake area. Very little is known of the exploration potential between the Sea and Swim claims as at least half this area is covered by Swim Lake. Kerr Addison has tested a portion of their claims by drilling Swim Lake through the ice during the winter season. Results of this program are not known.

The quartz-graphite, sericite-biotite-phyllite occurring northeast of Blind Creek and partially covered by the Hoho-Bram Group also appears encouraging for exploration. Very little detailed geology has been obtained from this area as outcrop is scarse.

Quartz rich phyllite and quartzite occurring in the north limb of the Anvil Arch and the northern portion of the Swim Lakes Basin should be considered as a high priority area for further work. Future detailed exploration should include areas such as the old West, northeast Beta and Ace Groups where extensions of Unit 3a should be mapped by drilling for stratigraphy.

GEOPHYSICAL SURVEYS

Use of the Faro, Vangorda and Swim deposits as case histories has been of assistance in determining the most effective geophysical methods of exploration. On the assumption that other deposits of massive sulphides can be found within the same phyllitic units as the presently known occurrences, it can be assumed that they would be easily distinguishable by their conductivity, magnetic susceptibility and specific gravity. The effective use of any one geophysical technique is hampered by the presence of graphitic schists, basic intrusives and greenstone bodies as well as unknown and varying depths of overburden.

Airborne Geophysical Surveys

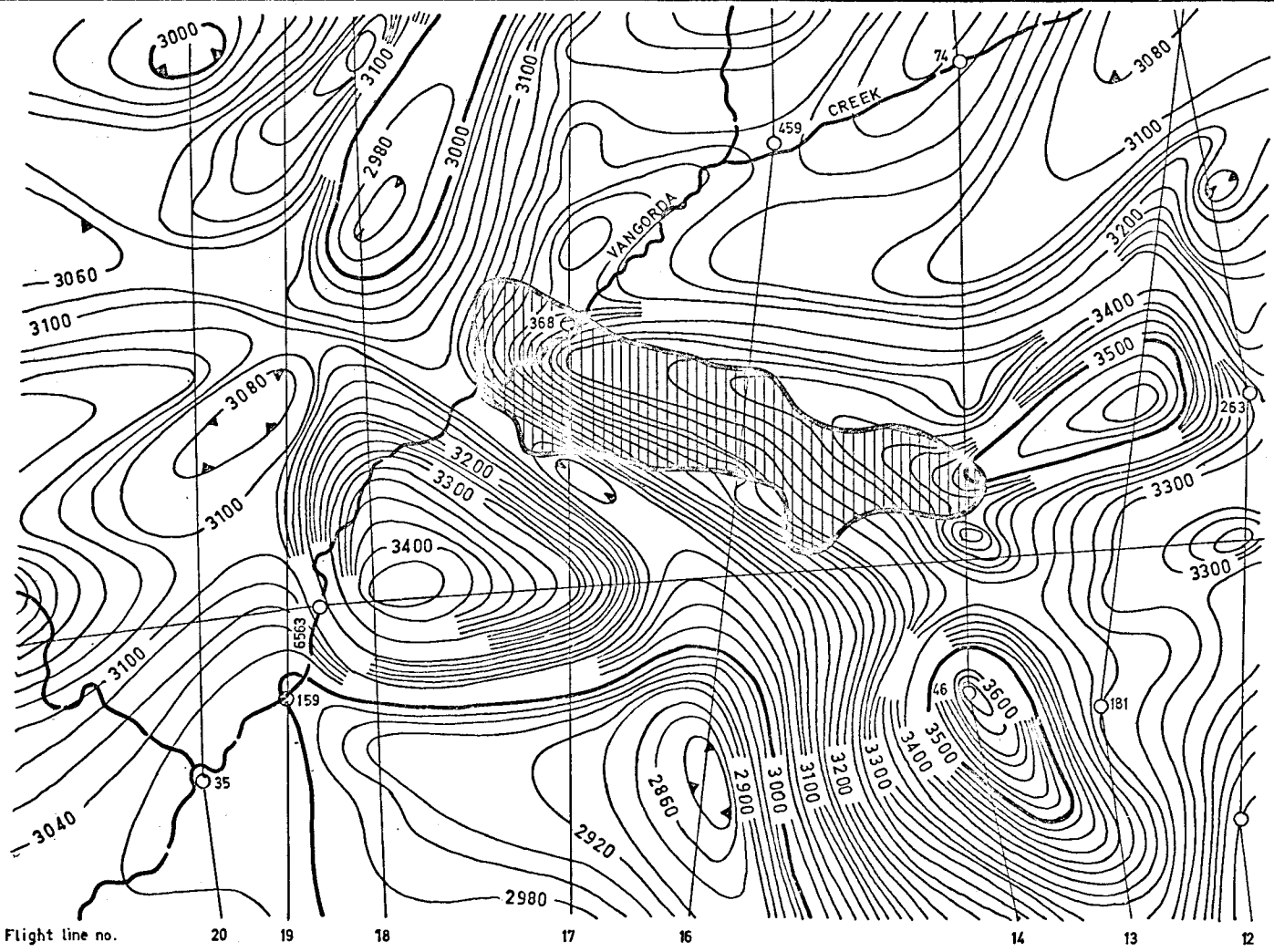
Regional aeromagnetic coverage of the Anvil area became available from the Geological Survey of Canada in 1966. Ground magnetic surveys initially carried out over the Vangorda deposit were successful in locating sulphides and generally outlining the orebody in 1953. In 1963 Kerr Addison Mines had flown an aeromagnetic survey of the Vangorda Creek-Swim Lake area utilizing a helicopter-borne ELSEC nuclear precession magnetometer. This survey led to the staking of several magnetic anomalies in the Swim Lakes area, one of which was subsequently proven to be the Swim deposit.

The favourable schist belt extends far beyond the vicinity of the known mineral occurrences. Therefore, in 1964 Dynasty decided to cover most of the potentially mineralized district, a 250 square-mile area, by a helicopter-borne aeromagnetic survey using a Gulf Mark III fluxgate magnetometer.

It was recognized that the probability of direct detection of all sulphide bodies by magnetic surveys would not be as likely

	Flight Line No.	Location	Subsurface Depth to Top of Sulphides	Height of Bird	In-Phase	In-Phase/ Out-Phase Ratio	Total Residual Magnetic Field Recorded 400 ft. above ground
Swim Deposit	16	Central region of sulphide zone	50 ft.	150 ft.	199 ppm	10	300 gammas
Vangorda Deposit	69	Massive sulphide outcrop	On surface	150 ft.	98 ppm	5.2	200 gammas
	70	Central region of sulphide zone	80 ft.	140 ft.	120 ppm	3	400 gammas
Faro No.1 Deposit	18	Northwest end of sulphide zone	100 ft.	220 ft.	19 ppm	2.1	125 gammas
Faro No.2 Deposit	23	Central region of sulphide zone	35 ft.	150 ft.	41 ppm	1.6	20 gammas

Table (iii) Airborne Magnetic-Electromagnetic Survey Responses over Massive Sulphides - Anvil Area, Yukon



LEGEND:

SULPHIDE ZONE

CONTOUR INTERVAL ---------- 20 GAMMA

MEAN TERRAIN CLEARANCE ---------- 400 FEET

FIDUCIAL POINTS ---------- O 368

FLIGHT LINES

Plate (xv)

AIRBORNE TOTAL INTENSITY
MAGNETIC SURVEY

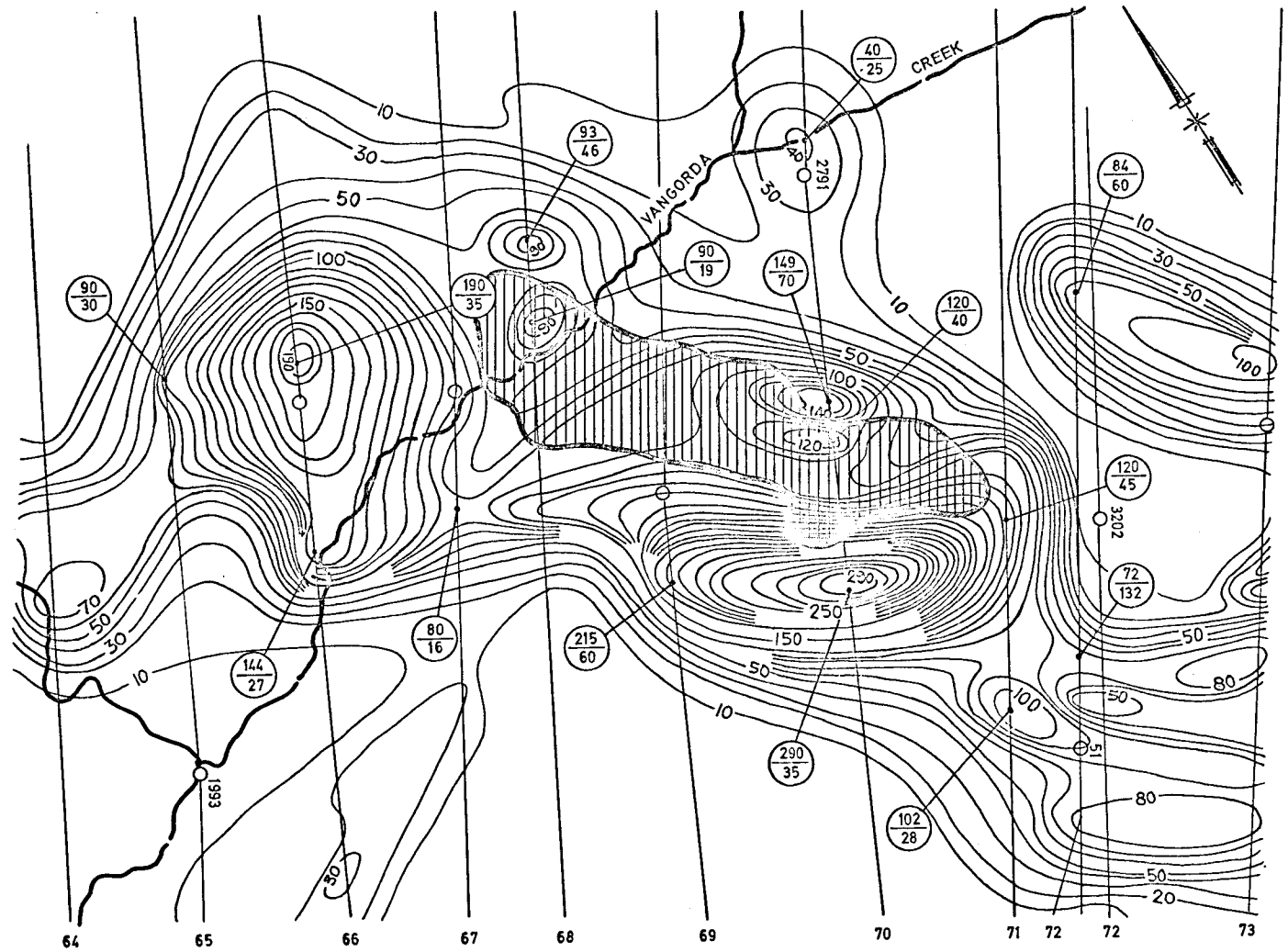
VANGORDA DEPOSIT

INSTRUMENTATION :

Helicopter borne Gulf Mark III

0 1000 2000 3000 4000
feet

p.v.



Flight line no.

LEGEND:

SULPHIDE ZONE _____

CONTOUR INTERVAL _____ 10 P.P.M.

MEAN TERRAIN CLEARANCE _____ 150 FEET

FIDUCIAL POINTS _____ O 3202

FLIGHT LINES _____

The contours represent amplitude of in phase response of the resultant field expressed in parts per million of the primary

The figures (102/28) represent amplitude in phase component / quadrature component

The frequency of the primary current is 4000 cycles per second

INSTRUMENTATION :

Helicopter borne Lockwood Mark II

Plate (xvi)

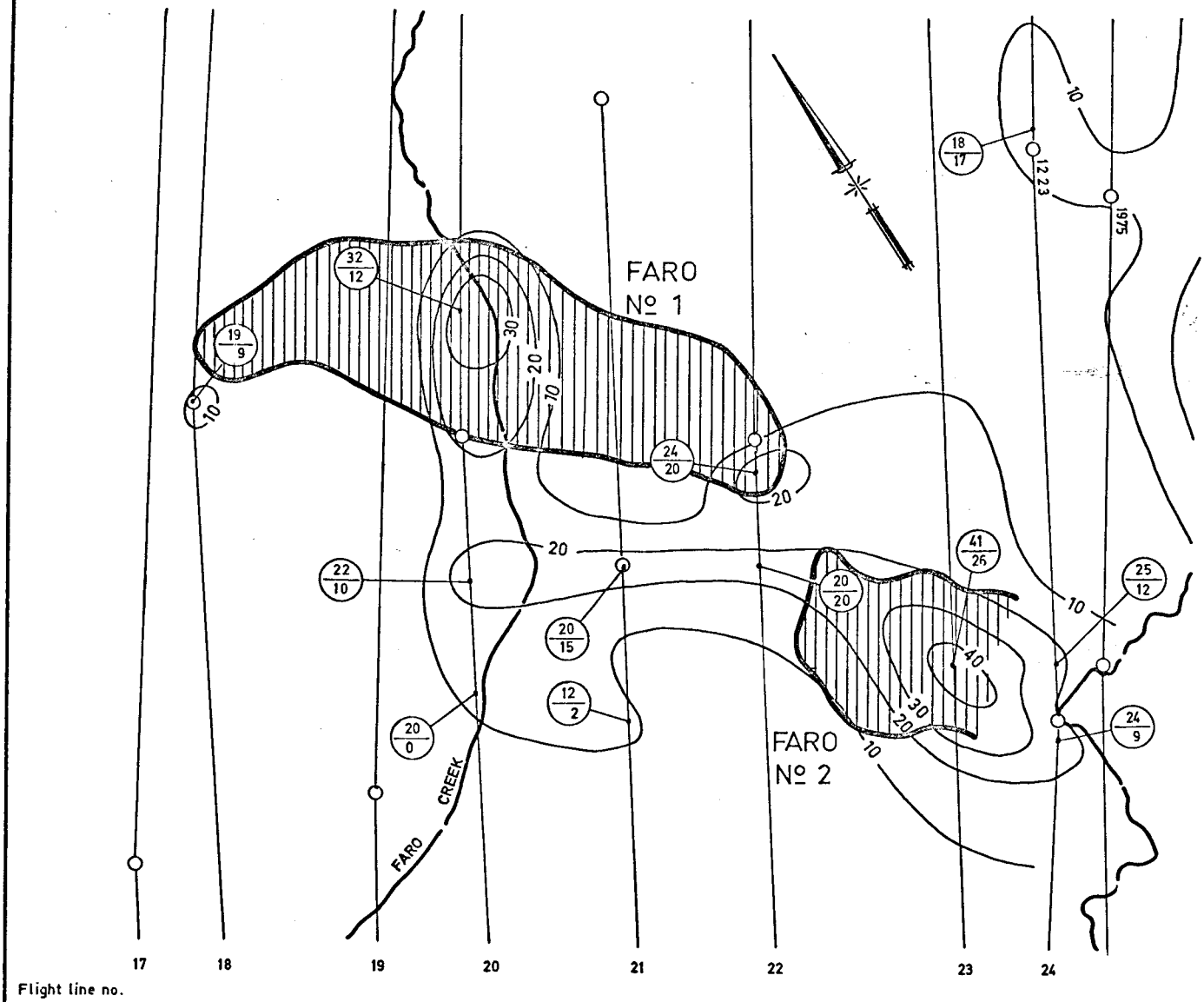
AIRBORNE ELECTROMAGNETIC SURVEY

VANGORDA DEPOSIT

0 1000 2000 3000 4000

feet

p.v.



LEGEND:

SULPHIDE ZONE _____

CONTOUR INTERVAL _____ 10 P.P.M.

MEAN TERRAIN CLEARANCE _____ 150 FEET

FIDUCIAL POINTS _____ O 1975

FLIGHT LINES _____

The contours represent amplitude of in phase response of the resultant field expressed in parts per million of the primary.

The figures $\frac{41}{26}$ represent amplitude $\frac{\text{in phase component}}{\text{quadrature component}}$

The frequency of the primary current is 4000 cycles per second

INSTRUMENTATION :

Helicopter borne Lockwood Mark II

Plate (xvii)

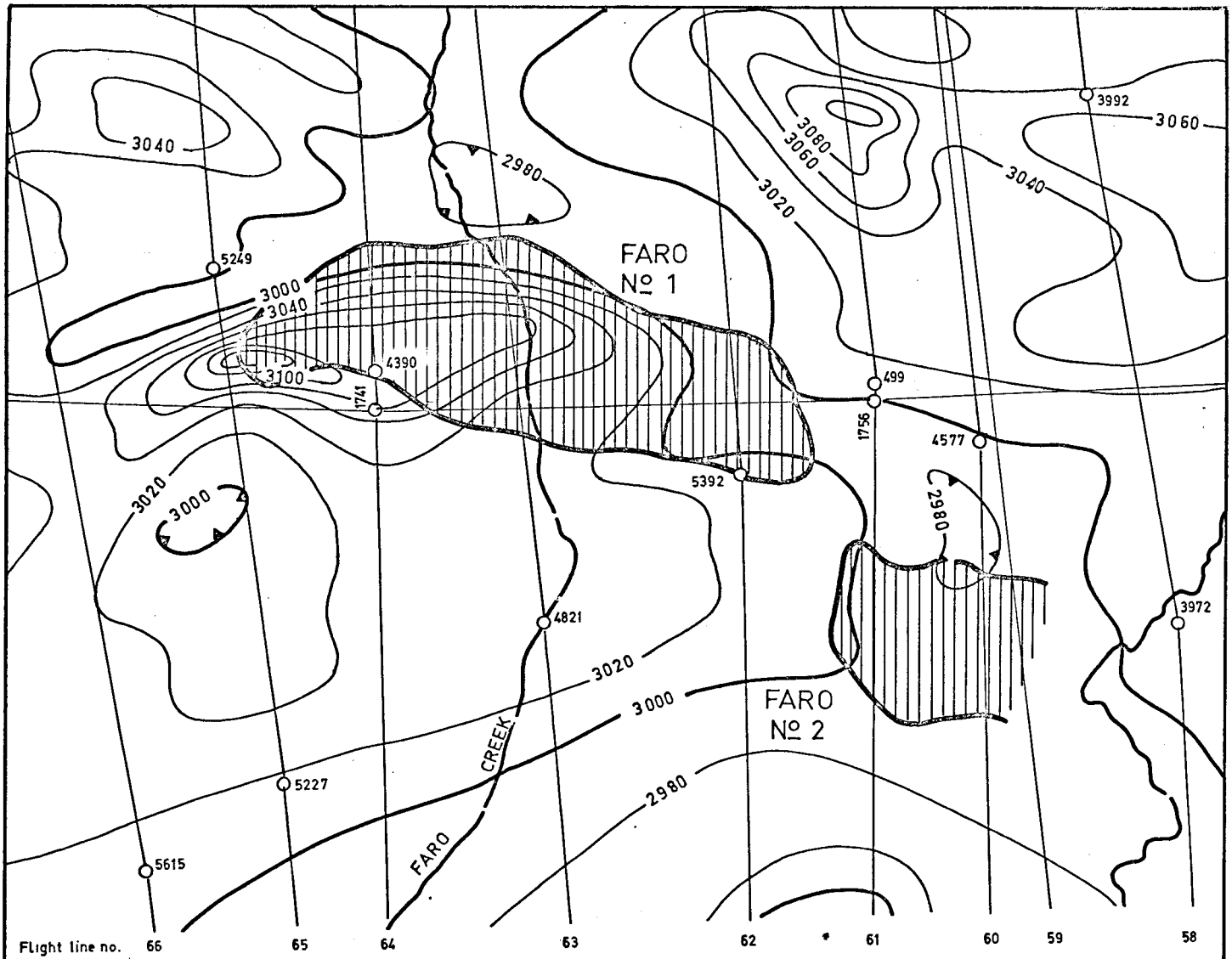
AIRBORNE ELECTROMAGNETIC SURVEY

FARO DEPOSIT

0 1000 2000 3000 4000

feet

p.v.



LEGEND

SULPHIDE ZONE

CONTOUR INTERVAL 20 GAMMA

MEAN TERRAIN CLEARANCE 400 FEET

FIDUCIAL POINTS O 499

FLIGHT LINES

Plate (xviii)

AIRBORNE MAGNETOMETER SURVEY

FARO DEPOSIT

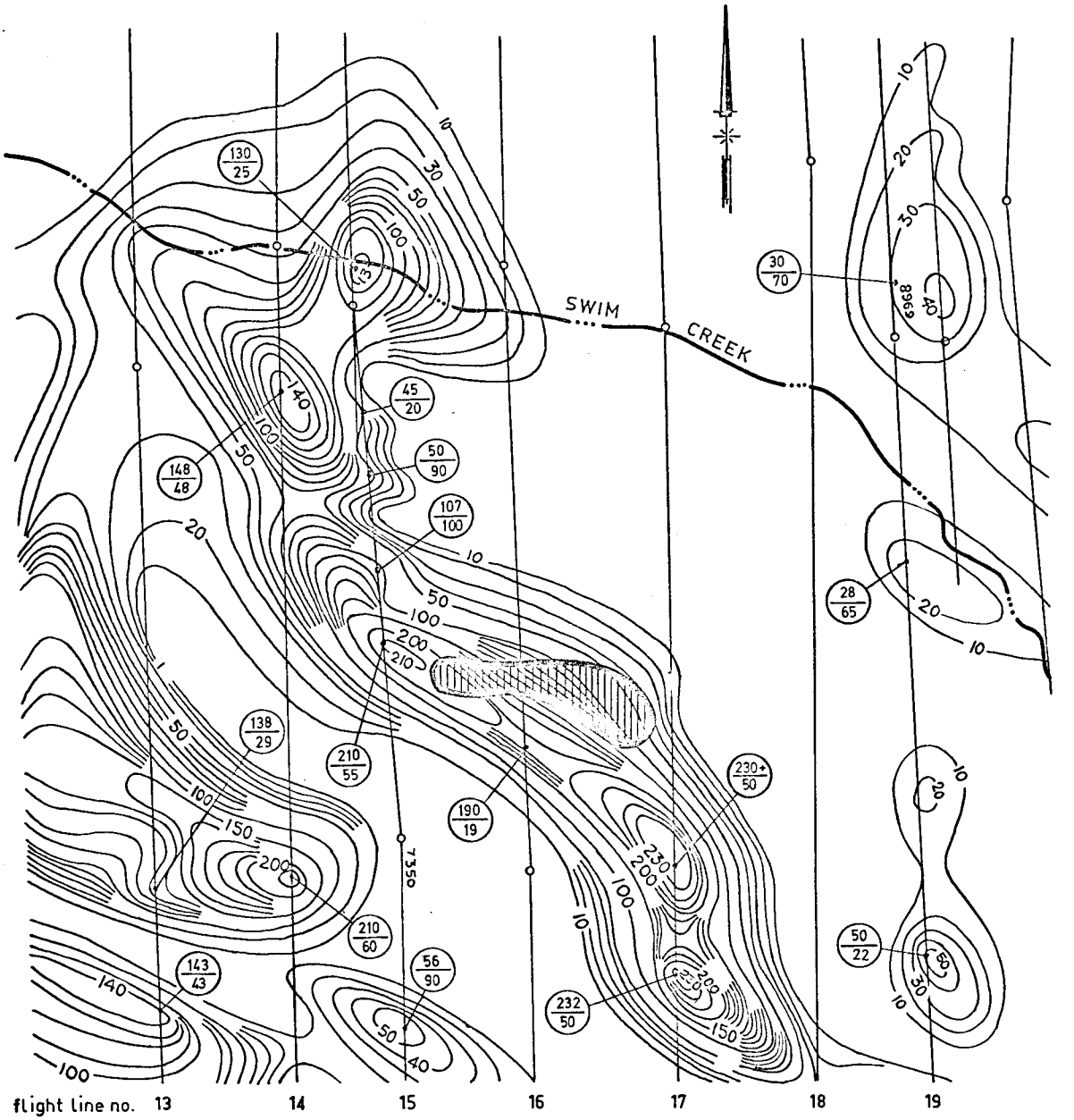
INSTRUMENTATION :

Helicopter borne Gulf Mark III

0 1000 2000 3000 4000

feet

p.v.



LEGEND:

SULPHIDE ZONE

CONTOUR INTERVAL 10 P.P.M.

MEAN TERRAIN CLEARANCE 150 FEET

FIDUCIAL POINTS o 3690

FLIGHT LINES

The contours represent amplitude of in phase response of the resultant field expressed in parts per million of the primary.

The figures (210/55) represent amplitude $\frac{\text{in phase component}}{\text{quadrature component}}$

The frequency of the primary current is 4000 cycles per second

INSTRUMENTATION :

Helicopter borne Lockwood Mark II

Plate (xix)

AIRBORNE ELECTROMAGNETIC SURVEY

SWIM DEPOSIT

0 1000 2000 3000 4000

feet

p.v.

as detection by the use of integrated magnetic-electromagnetic airborne survey methods, although the pyrrhotite content of the Vangorda and Swim deposits and sections of the Faro proved sufficient to give well defined magnetic anomalies. An airborne E.M. survey was flown in 1965, utilizing a better grasp of the geologic environment and extent of the phyllite belt, plus knowledge gained from follow-up of magnetic anomalies staked in 1964 using ground geophysical surveys. This electromagnetic survey gave good response over the Faro No. 1, Vangorda and Swim deposits although, in the case of the Swim, enclosing graphitic schists masked much of the sulphide response.

Anomalies of coincident aeromagnetic and electromagnetic response have been considered as primary targets for follow-up and have been staked. Graphitic schists are usually in close proximity to ore in the Anvil camp, therefore, gross detection of graphite belts by electromagnetic methods is useful. In the preliminary stages of exploration, the inability to distinguish between sulphide bodies and graphitic bodies has been of no serious consequence. If sulphides existed in close relation to the graphitic schists, it is hoped that other geophysical and geochemical techniques will reveal them.

Attention has been paid to isolated conductors with no magnetic coincidence on using the premise that about half of most base metal deposits have no magnetic association whereas all near-surface ones have some conductivity.

In 1971, Dynasty realized the need for a deeper penetrating A.E.M. survey to locate conductors at depths in excess of 100 feet. To accomplish this, Seigle & Associates were contracted to perform a Turair survey. The Turair method utilizes the same principals of the conventional Turam survey. A large loop, measuring up to 4 miles by 4 miles square, is laid by

helicopter and energized to create a primary field. The search coil apparatus is housed on a 'bird' and towed over the field with a helicopter. Field strength ratios and in-phase measurements are taken.

The Turair survey encountered numerous problems and could not be completed effectively and at a reasonable cost. It was, therefore, abandoned in favour of deep penetrating ground operated surveys.

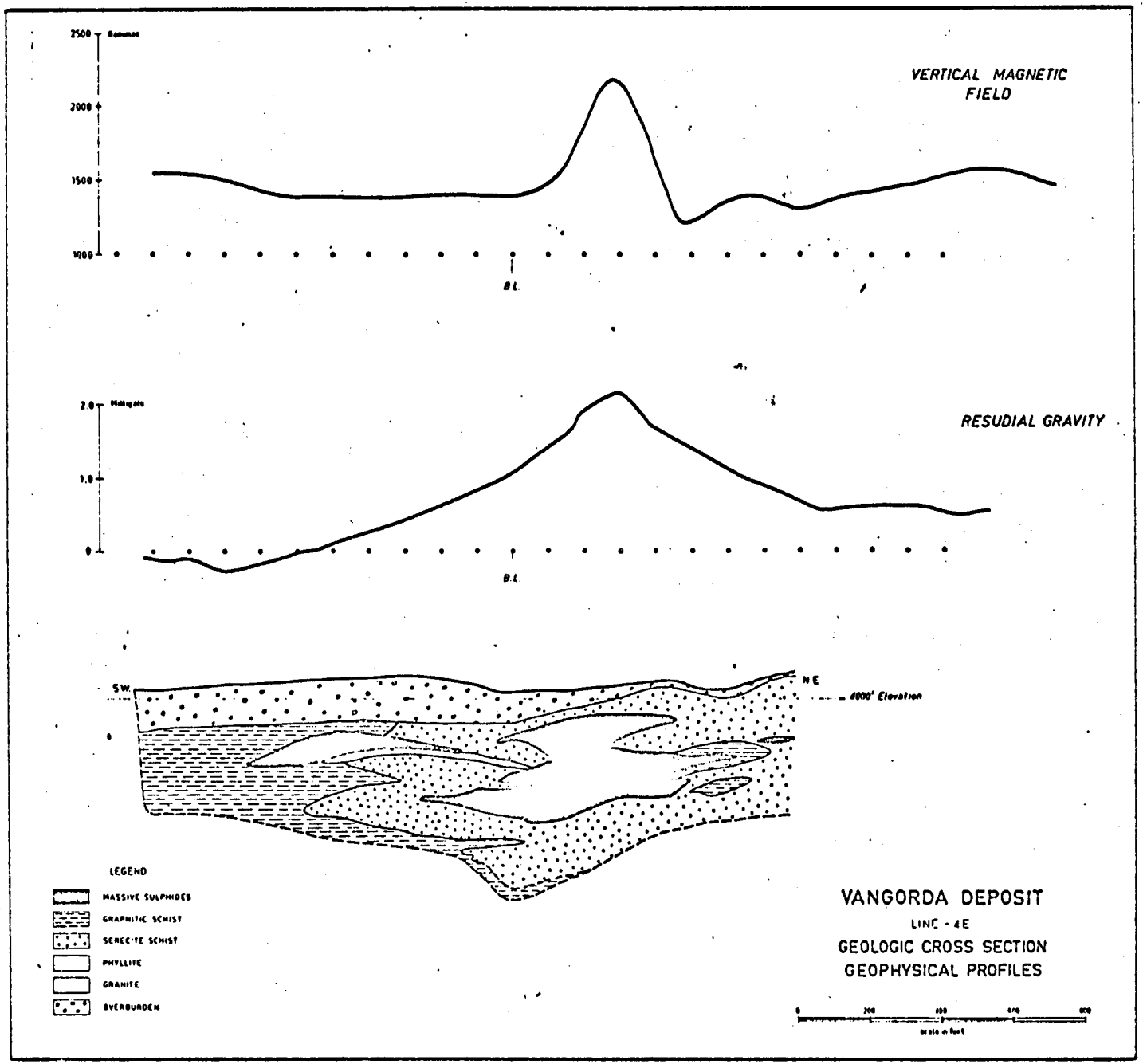
Ground Geophysical Surveys

Since 1964, Dynasty Explorations has both completed and been indirectly involved in over 700 line miles of ground geophysical surveys in the Anvil Area:

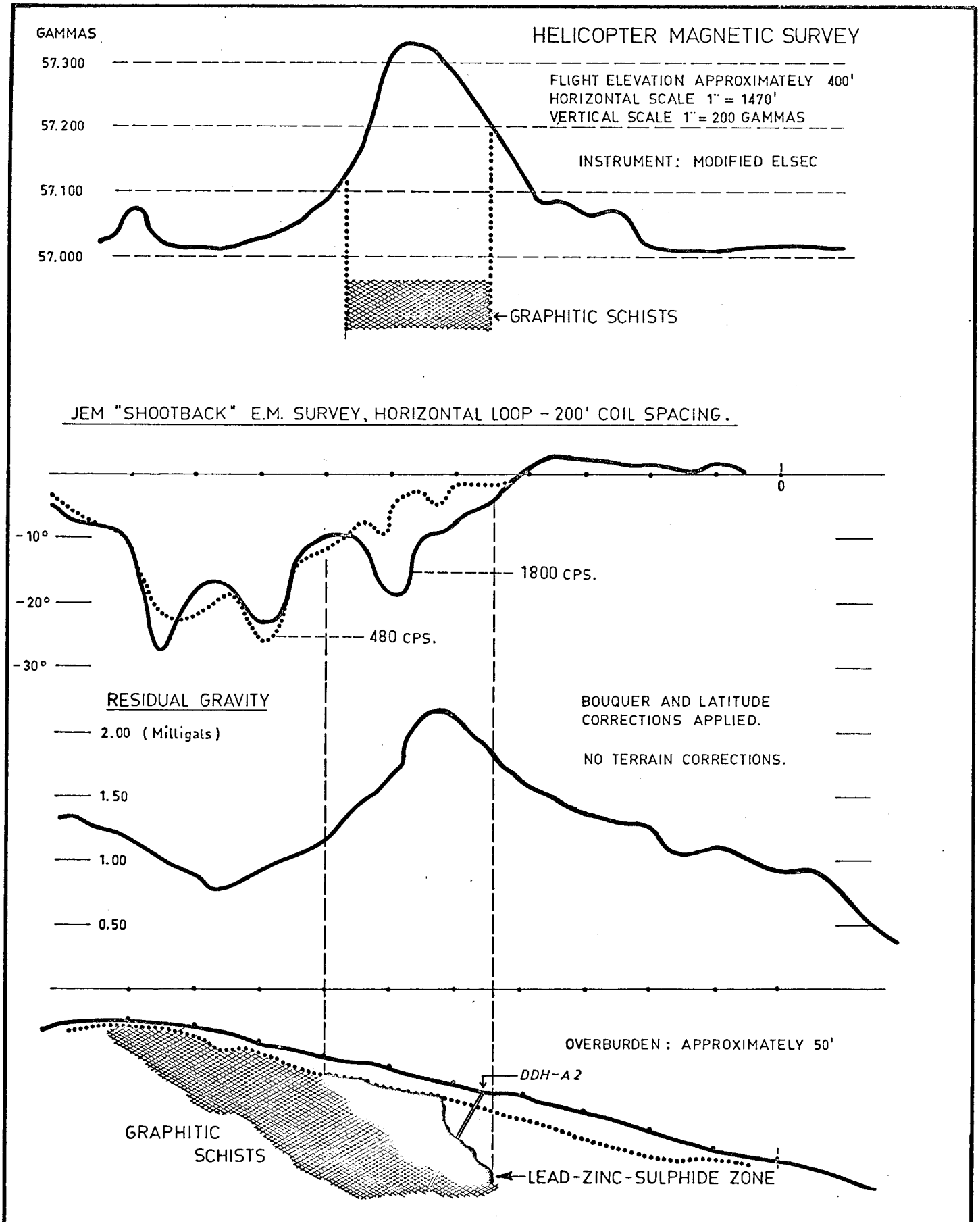
Ground Magnetometer Survey		- 300 miles
Electromagnetic Surveys	JEM	- 150 line miles
	CEM	- 124 line miles
	ABEM	- 4 line miles
Resistivity Surveys (experimental)		- 3 line miles
Gravity Surveys		- 110 line miles
Seismic Surveys (experimental)		- 10 line miles
I.P. Surveys (experimental)		- 10 line miles
		711 line miles

Magnetic Surveys

Selection of magnetic anomalies for further exploration has been of a qualitative nature so that isolated anomalies of possible merit can be studied in detail. Magnetic susceptibilities, theoretical causative structure configurations and depths are calculated by rule of thumb methods. No magnetic anomaly has been drilled without additional confirmation provided by either supporting geochemical, electromagnetic or gravimetric evidence.



Cross section of Vangorda Deposit, showing magnetic and gravity profiles
Plate (xx)



SWIM LAKE DEPOSIT

Plate (xxi)

YUKON TERRITORY

400 0 400 800 1600

scale in feet

P.V.

Recently more emphasis has been placed on magnetic interpretations as an aid to geologic interpretations in overburden covered areas. The spatial relationship between rocks of volcanic origin and sulphides is thought to be of possible significance, therefore, location of greenstone bodies by their magnetic properties is important.

Gravimetric Surveys

Gravity surveys have been used as a tool in the search for massive sulphides on the assumption that any single or mass of a minimum 50 percent sulphides would have a minimum density of about 3.5 gm/cc giving a density contrast of at least 1.0, assuming the density of the Anvil area host rocks to average 2.6 gm/cc.

Gravity surveys were initially planned to provide back-up for screening of magnetic anomalies. Because of the obvious 2.02 milligal anomaly over the Vangorda deposit, a 1.8 milligal gravity anomaly over the Swim deposit and a 2.8 milligal anomaly over the Faro deposit, gravimetric surveys have been used as a primary exploration tool in the past.

It has recently been found that much of the Bouguer data has been largely over-corrected due to unknown overburden conditions, thus making it difficult to provide realistic interpretations without obtaining additional information concerning overburden depths which can only be obtained by experimental drilling or another geophysical method. Several methods of determining overburden thickness have been attempted. Resistivity surveys were used for profiling the bedrock surface. The method was generally effective but found to be slow and expensive. A simple hammer seismic unit has also been tried, however, trial surveys proved that sub-surface permafrist conditions could not

be easily differentiated from bedrock topography. Gravity surveys have now been mainly reserved as a tool to be used as follow-up after indications of sulphide mineralization have been obtained from drilling of magnetic, electromagnetic and geochemical anomalies.

Electromagnetic Surveys

The decision to use electromagnetic surveys was based mainly upon the impracticability of using gravity as a primary tool, as well as realization that location of graphitic zones could be important. Electrical response from the Vangorda, Swim and Faro No. 1 deposits is excellent, therefore the high conductivity of sulphides appears to be the most readily exploited of the characteristic physical properties. Initially targets within several hundred feet of surface were being sought, their detection presented no problem for conventional ground E.M. equipment although instrumentation was required that would allow rapid and economic survey coverage in rough terrain. For these reasons, a Crone J.E.M. unit was found most practical for the ground E.M. survey work. The Crone unit utilized the 'shootback method' where each of two coils is used to transmit and receive in sequence. The effective depth penetration is 300 feet for detection of a flat-lying conductor with no allowance for skin effect and 100 feet for a vertical conductor. Operational frequencies of 1800 to 480 cps were used.

During the past year a Crone C.E.M. unit has been used in place of the J.E.M., this instrument has been designed to be used with the new horizontal shootback E.M. method as well as vertical loop and horizontal loop methods. Coil separations of up to 600 feet can be used with standard operational frequencies of 390, 1830 and 5010 Hz. Field strength ratios and resultant dip angles are measured. This unit has proven to be extremely effective as a deep-penetrating E.M. instrument.

In order to aid in mapping of the phyllite belt and overall geologic interpretation of the south limb of the Anvil Range, extensive C.E.M. surveys were carried out in the Swim Lakes area. Tests carried out over massive sulphide of depths up to 450 feet below surface were positive.

Geophysical characteristics of Known Sulphide Deposits

A table of sulphide abundances given below includes figures for the Faro as well as Swim and Vangorda deposits. The sulphide content of the Faro deposits average 61 percent overall. Specific gravity for the sulphide mass as derived from an average density factor of 8.5 cubic feet per ton is 3.77. Massive sulphides from the Vangorda deposit are reported by Chisholm (1957) to have measured densities of 4.23 to 4.62 gm/cc. An average density of 4.0 gm/cc has been reported for the sulphides of the Swim deposit. The schist/phyllite country rock in the Anvil area has average density ranging from 2.75 to 2.80 gm/cc. No conductivity or susceptibility measurements of sulphides or country rock are known to have been taken in the Anvil area.

Sulphide abundances	Faro Deposit	Vangorda Deposit	Vangorda Deposit *	Swim Deposit
Pyrite	35%	35%	35%	35%
Sphalerite	10%	10%	25%	10%
Galena	5%	5%	15%	5%
Pyrrhotite	10%	5-10%	10%	5%
Chalcopyrite	1%	1%	6%	1%
Gangue Minerals	39%	40%	9%	44%

Table (ii) Sulphide Abundances: Faro, Vangorda and Swim Deposits, Yukon (after Templeman-Kluit, 1970, * after Chisholm, 1957)

Deposit	Sulphides: Depth to Top	Sulphides: Thickness	Magnetic Response: Vertical Field	Conductive Response: Crone J.E.M. 200' C.S.: 1800 cps Res.Dip	480 cps Res.Dip	Ratio	Gravity Response
Faro No.1	130 ft.	150 ft.	700 gammas	-2°	-18°	-	1.0 mg.
No.3	350 ft.	320 ft.	300 gammas	-4°	- 1°	-	2.8 mg.
No.2	35 ft.	80 ft.	150 gammas 'spot high'	-30°	- 4°	0.3	0.7 mg.
Vangorda 22 M.tons	100 ft.	200 ft.	1200 gammas				2.0 mg.
Champ .5 M.tons	Approx. 30 ft.	70 ft.	250 gammas				0.4 mg.
Firth .5 M.tons	Approx. 20 ft.	20 ft.	400 gammas				0.3 mg.
Swim Est. 20 M. tons	50 ft.	300 ft.	-	-27°	-22°	1.0	1.2 mg.

Table (iv) Ground Geophysical Survey Response Magnetic, Electromagnetic, Gravity, over known sulphide deposits, Anvil Area.

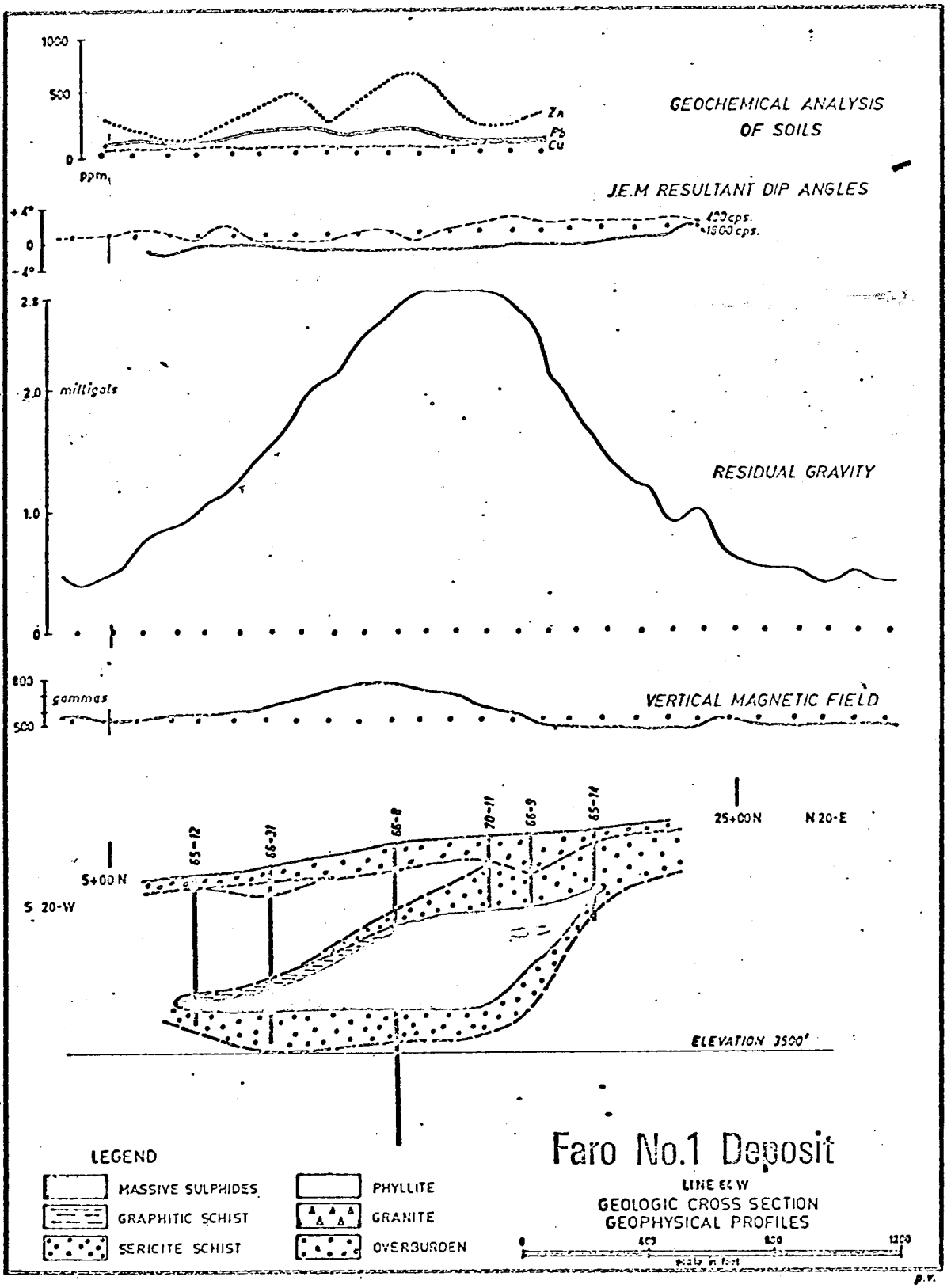


Plate (xxii)

Faro Deposit Geologic Cross Sections
and Geophysical Profiles - Line 64W

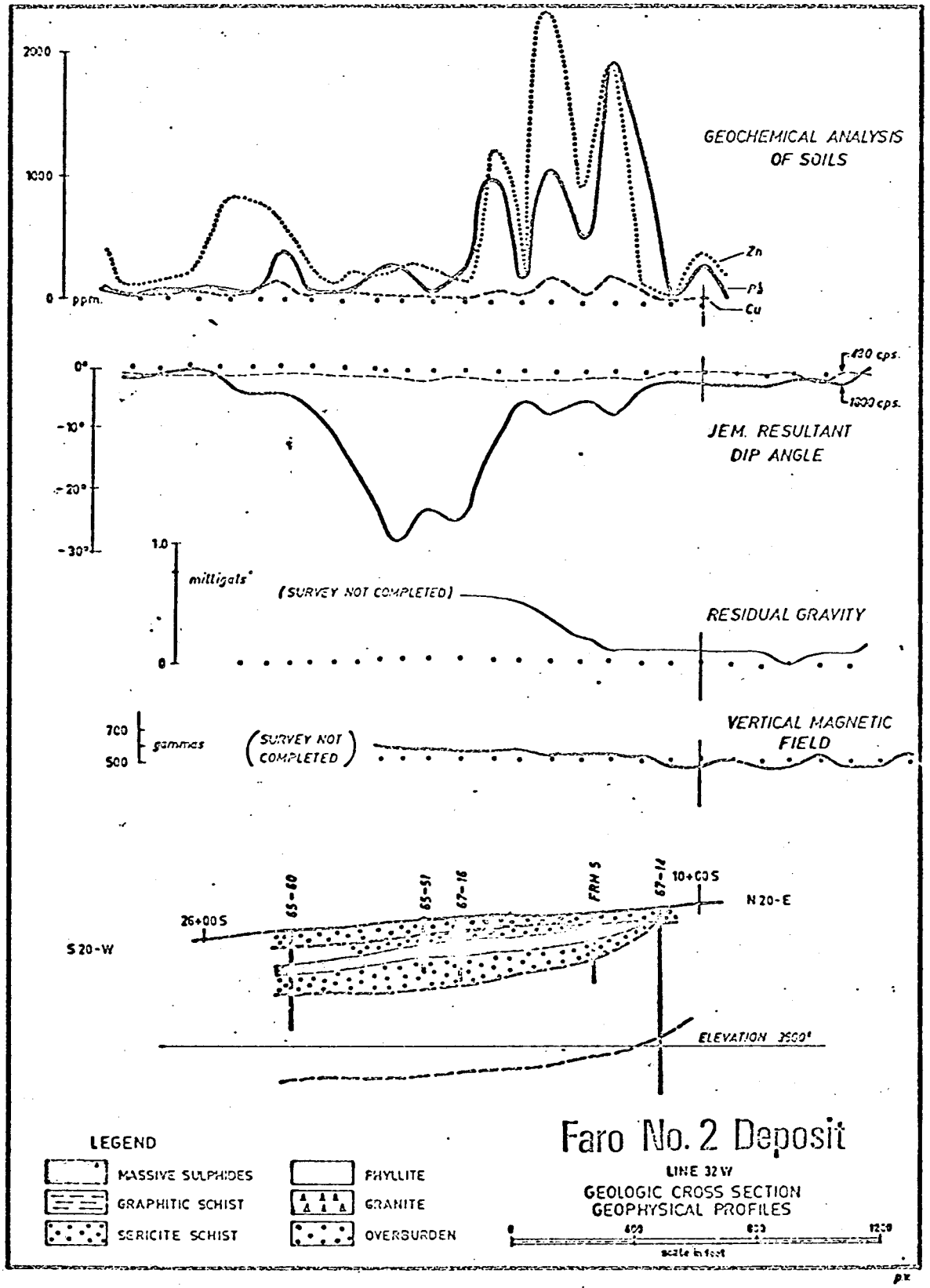


Plate (xxiii)
Faro Deposit Geologic Cross Sections and Geophysical Profiles - Line 32W

The geophysical approach to exploration in the Anvil area is considered the best method for location of massive sulphides. Dynasty's experience with a variety of geophysical techniques in this area has been continually modified and improved upon during the course of exploration carried out over the last 8 years. Anomaly testing by drilling has continually provided new geologic information which, in turn, has aided greatly in modification of the geophysical approach.

Summaries of geophysical anomalies on Dynasty's present claim holdings are outlined within the following sections of this report dealing with the exploration potential of these properties.

GEOCHEMISTRY

To date geochemical surveys within the Anvil Area have largely involved collection and analysis of soil and silt samples for base metal elements.

During 1971, Anvil Mining Corporation initiated an orientation survey around the Faro deposits to assess the usefulness of primary dispersion (bedrock) geochemistry in mineral exploration. The purpose of this program was to:

1. To establish the magnitude of the wall rock anomaly at the Faro deposit, and determine if this was significantly larger than the ore deposit itself, and consequently a significantly better drilling target.

2. To determine if, away from the deposit, a "marker horizon" to which the ore related could be identified geochemically. That is, if it was possible to determine geochemically, in an otherwise barren hole, if the drill had passed through the horizon favourable for mineralization and, if so, at what depth. This condition can probably only exist if the origin of the deposit is stratigraphically controlled.

3. To determine if sampling of fractured material for mercury could detect an ore deposit where it is blind.

A suite of sulphide samples and 10 wallrock samples were analyzed spectrographically in order to determine which elements, besides lead and zinc, are anomalous in the ore and may serve as a useful pathfinder. Spectrographic analysis was carried out for 23 elements at Queen's University. Two duplicate samples were included for analytical control.

On the basis of the spectrographic analysis, all rock samples were analyzed for copper, lead and zinc; the attack used was concentrated perchloric acid with a four hour digestion and determination was by atomic absorption. On the basis of the known strong association of cadmium with sphalerite and mercury with sulphides, a selected number of samples were also analyzed for mercury and cadmium. For cadmium the perchloric acid sample attack and atomic absortpion were used. Analyses for mercury were made using the Barringer mercury spectrometer.

TABLE (v)

FARO AREA, WALLROCK SAMPLES
BACKGROUND, THRESHOLD AND ANOMALOUS LEVELS
FOR Cu, Pb, Zn, AND PRELIMINARY LEVELS FOR Hg, & Cd

				Provisional	
Anomalous Levels	Zn ppm	Cu ppm	Pb ppm	Hg ppb	Cd ppm
Background	0-1000	0-80	0-300	0-300	0-3
Threshold	1000	80	300	300	3
Third Order Anomalous	1001-2000	81-160	301-600	301-600	4-6
Second Order Anomalous	2001-4000	161-320	601-1200	601-1200	7-9
First Order Anomalous	>4000	>320	>1200	>1200	>9

1. Spectrographic analysis of 22 sulphide and wallrock samples showed only copper, lead, zinc and possibly cadmium to be significantly higher in sulphides in the wall rock and show an even poorly recognizable wall rock dispersion.

2. Lead and zinc in the wall rocks of the mine area are both rather higher than the average for rocks of this type remote from mineralization. Both elements show detectable but erratic wall rock anomalies. The exact extent of the

aureole cannot be estimated at this time because insufficient samples have been collected remote from the deposit, i.e. at distances greater than 400-500 feet. The present data do indicate, however, that lead in particular may form an irregular aureole using a threshold of 160 ppm, 200-400 feet wide about the deposit. Zinc is more erratic and less predictable. Both lead and zinc show first order anomalous values remote from ineralization and consequently their dispersion cannot be relied on for detailed interpretation although they may prove useful in indicating the general presence of the ore environment.

3. Copper shows a more restricted but more uniform wall rock dispersion. No first order copper values were found remote from mineralization. The copper dispersion is an average of 50 feet but varies between 9 and greater than 100 feet.

4. Cadmium shows a very restricted but very specific aureole.

5. Mercury shows the most regular wall rock aureole of all the elements tested, with a generally regular fall-off in concentration away from the orebody, up to a maximum distance of 170 feet.

   The interpretation of the distribution of mercury in fractured material is ambiguous at this time.

Based on the initial findings of this orientation survey, additional geochemical studies were undertaken to aid in determining further exploration parameters.

1. The use of mercury, cadmium and copper was investigated in the secondary environment as a prospecting guide. Initial results show analysis of soils for mercury to be

less than meaningful because of the high organic content of easily sampled soil horizons in the Anvil area. Cadmium content of overburden over known sulphides was also found to be a poor exploration guide. The presence of copper, lead and zinc in soils still remains the best geochemical tool for indicating underlying sulphides.

2. A graduate student of the Department of Geology at the University of British Columbia has attempted to use geochemical characteristics of the secondary environment to aid in mapping the phyllite host where masked by overburden. Results of this study are not complete, however, preliminary findings are encouraging.

   Initial results from this research indicate that the high values of titanium, vanadium, chromium and nickel common to greenstones are abnormally low in the massive sulphides at Faro. One drill hole through Faro No. 1 was analyzed for 16 elements to determine trace element concentrations in the halo. Very restricted and narrow geochemical halos of copper, lead, zinc and possibly silver and barium occur adjacent to the main sulphide mass. So far, no trace elements were found to be anomalous in the quartz rich phyllite.

3. During 1971, Dynasty spent considerable time researching the geochemical characteristics of the phyllite section through analysis of core and cuttings from previously drilled holes throughout the Anvil area. Rock geochemical analyses was carried out to establish background values for different rock units which would aid in logging future rotary drill holes in the area. Samples were taken of every 10 foot interval for seven drill holes in the Swim Lakes area.

The results of this work were found to be useful in that the three members of the phyllite unit analyzed were found to have distinctly different geochemical backgrounds for copper, lead and zinc. The following table summarizes the background geochemical data obtained from two rotary holes drilled in 1965.

Rock type	Mean Values Cu	Pb	Zn
Non-graphitic (Unit 3b)	40 ppm	25 ppm	75 ppm
Graphitic lenses in (Unit 3b)	60	45	175
Graphitic,Qtzose (Unit 3a)	120	30	300

The data from diamond drill holes drilled on the Sea claims was not used in producing this table as those holes intersected mineralized zones, however, the analyses from unmineralized portions of the holes fit well with the data given for the "3a" rock type in the table. Geochemical data for greenstones is variable but tends to be high in copper, around 100 ppm, and about average in lead and zinc, around 30 and 100 ppm, respectively. The change in background geochemical values is very sharp at the contact between Unit 3b and 3a, even though there is not a significant change in the visual appearance of drill cuttings and some core samples.

Drill logs and geochemical profiles appear as Tables (vi) to (xii)

4. The presence of permafrost and deep transported overburden throughout much of the Anvil Range makes the value of geochemical surveys and their subsequent interpretations dubious. Although geochemical response over the Faro, Vangorda and Swim deposits does reflect underlying sulphides masked by

DRILL LOG

Qtzte.-qtz. ser schist (pyrr.Cu-massive) to bands in qtz. < ½" $S_2 \sim 90^o$

Pale green-grey qtz. chl. ser. phy. qtz. < ½" uneven 60-90° / axis - diss. pyrr + Cu.

Qtzite - massive pyrr & Cu. up to 4"

Pale green grey qtz. chl. ser. phy. py & Cu. in qtz. bands < ¼", ... Core Missing

Some intervals of qtz. phy. < 5'. Qtzite. with chl. & Ser. phyllitic partings. Est.> 80% qtz. S_2 70-90°/axis. Massive Pyrr. < 6" after qtz. pyrr. & Py. disseminated and in later fractures - Est. .51% Cu.

Massive pyrr. py. Cu. & Qtz.

Grey-green qtz. ser. chl. phy. often brecciated and fractured. qtz. chl. vs qtz.ser

GEOCHEMICAL PROFILES

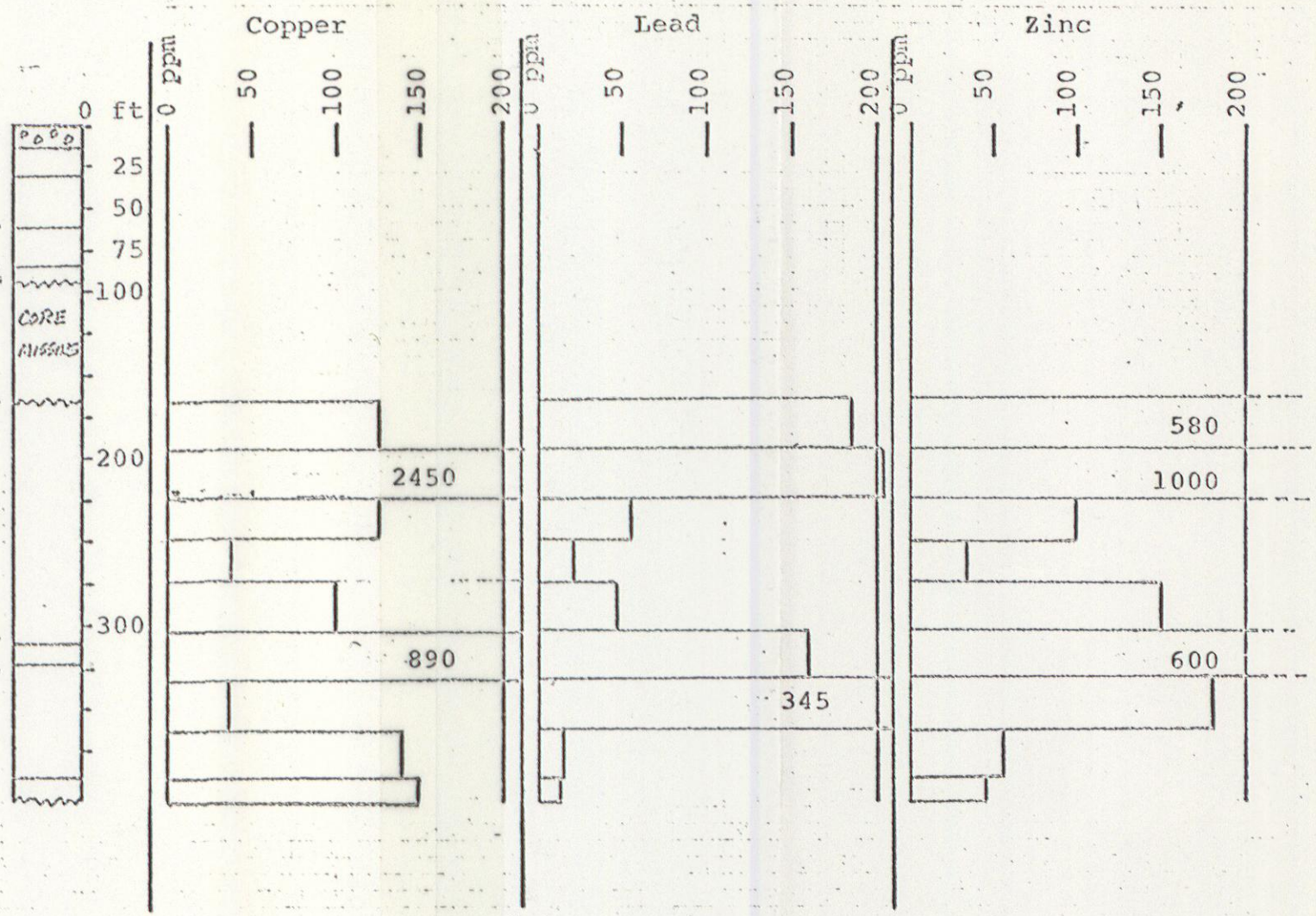


Table (vi)

GEOLOGY BY: W. Roberts

Geochemical Analysis: Barringer REsearch Limited using $HClO_4$ extraction

August, 1971

DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR DDH 1964 S-3
SEA CLAIMS (Anvil Mining Corporation) 105-k-2

DRILL LOG

GEOCHEM PROFILES

Grey ser. phy, some qtz. rich intervals, pyrr. & py. tr. of Cu ass. with ~¼" qtz. bands. S_2 ~ 45°/axis - regular.

Blk. grap. phy. low qtz. S_2 - 45°/axis

Banded qtz. grap. phy bands ~ 1 mm often over ½" locally for 4'. S_2 ~ 45°/axis Pyrr. & Py occurs with wider qtz. bands - sor chl. occurs with qtz.

Banded qtz. chl. ser. phy. S_2 60°/axis - similar to Calc-silicate - qtz. rich material bordering greenstone.

Pale green actinolitic tuff
S_2 60°/axis

Banded qtz. rich material & chl. part of greenstone

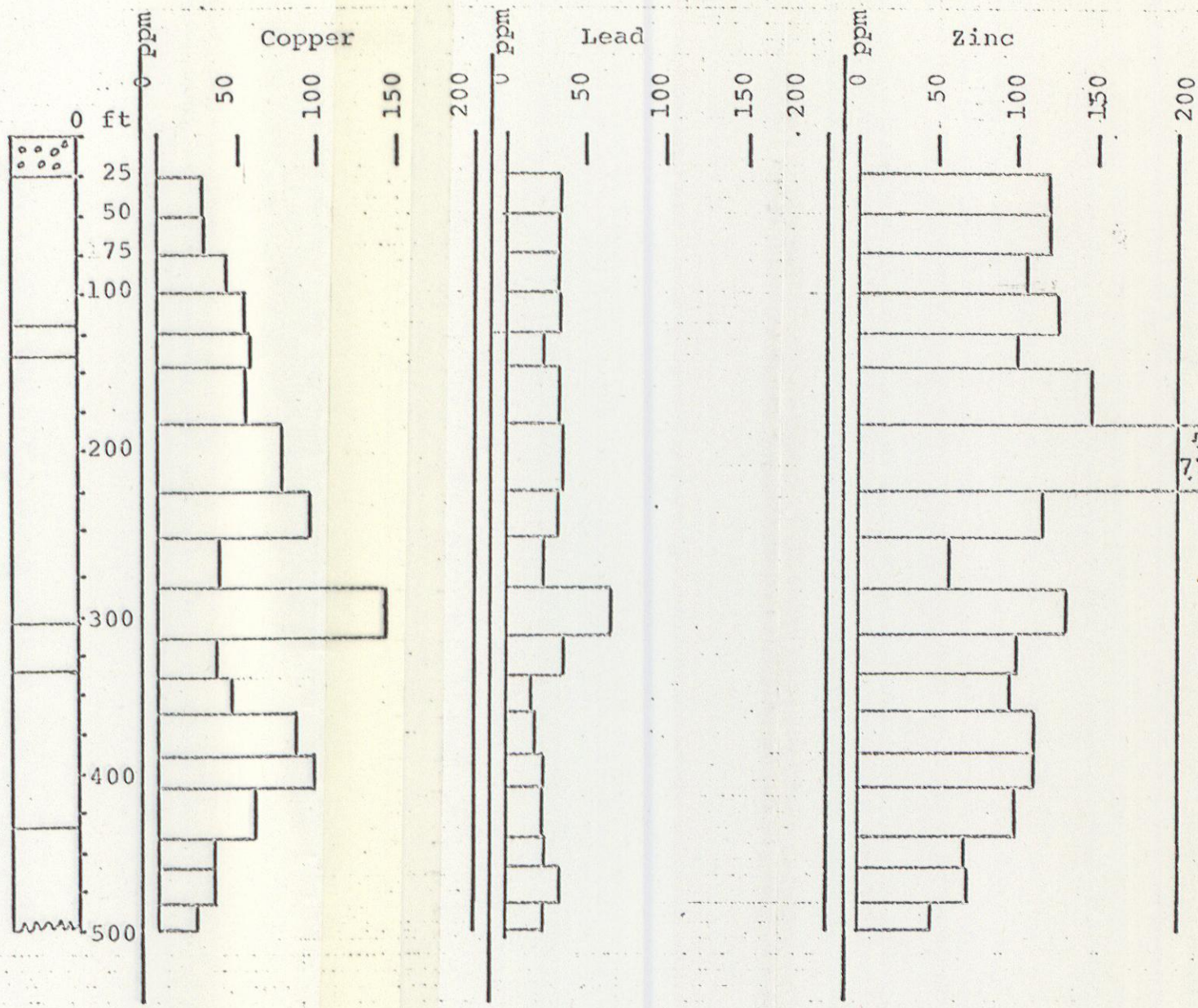


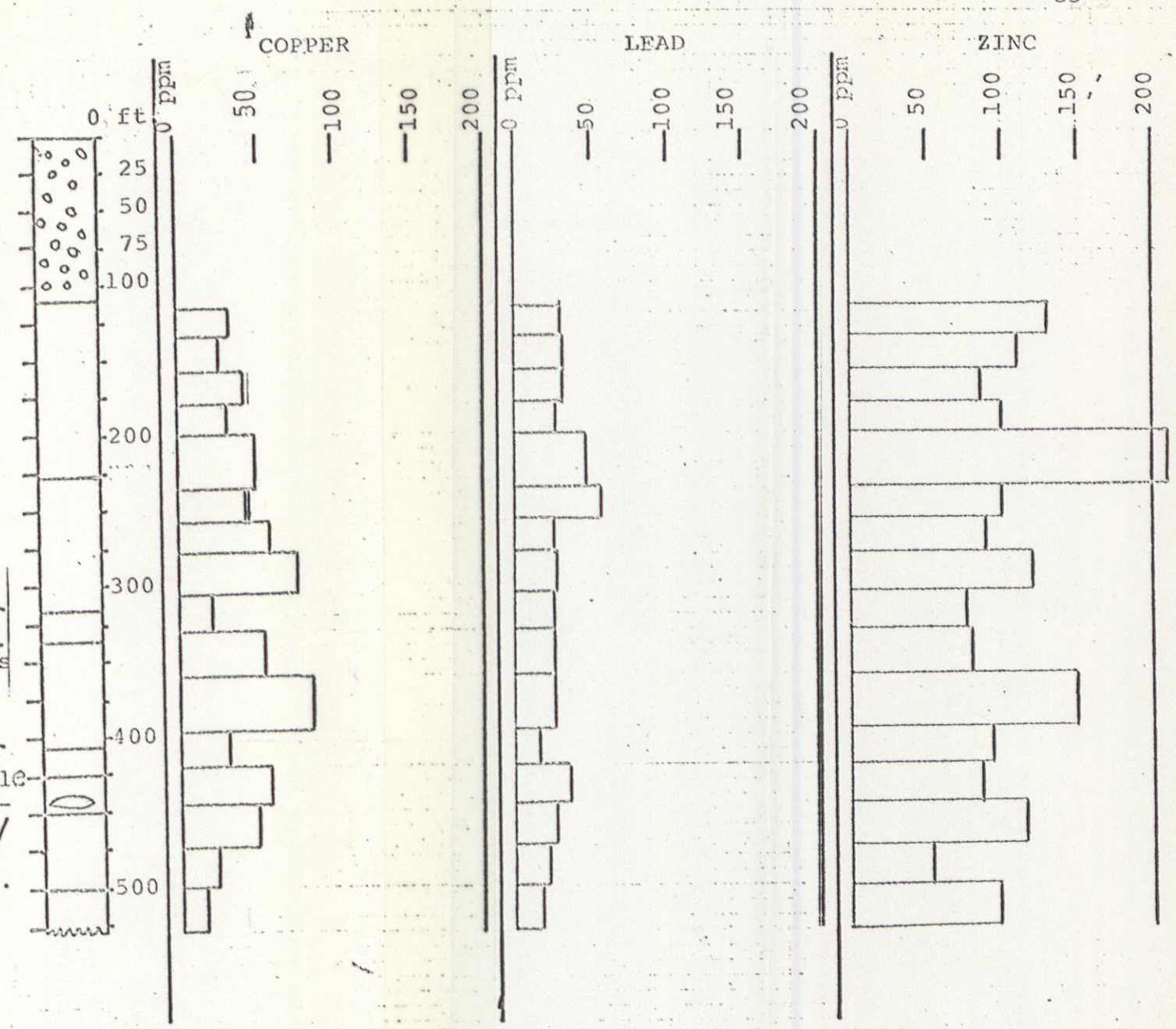
Table (vii)

DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR DDH 1966 S-1
SEA CLAIMS (Anvil Mining Corp.) 105-K-2

Geology By: W. Roberts

Geochemical Analysis: Barringer REsearch Limited using $HClO_4$ q extraction

August, 1971



Dark grey qtz. chl. ser. phyllite S_2 80-90o/axis less than 6" chl.qtz. greenstone lenses.

Black graphitic phyllite qtz. rich banding < ¼". S_2 60-90°/axis. Bull qtz. < 3' - some pyr & pyrr.; 280-400 higher in pyrite and pyrrhotite S_1 contorted

Chl.-ser. qtzite. S_2 ~ 80-90°/axis S_2 folds predom < 1"

Black-dark grey graphitic phy.+ qtz. intervals of qtz. rich material ~50% of section. S_2 -60-70°/axis

Grey-black qtz. chl.ser. graph. phyl. S_2 ~ 70°/axis. Bands < ¼" alternating. No visible mineralization.

Blk.+ white qtz. graph. phy.laminae < ¼" wide S_2 70-90°/axis est. < .5% py. + pyrr. in qtz.

Grey-pale grey qtz. chl. ser. phy, → qtz. volc.

Light-pale grey andesite tuff with calcite.

Table (viii)

DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR DDH 1966 S-2
SEA CLAIMS (Anvil Mining Corp.)
105-K-2

GEOLOGY BY: W. Roberts

Geochemical Analysis: Barringer REsearch Limited using $BCl0_4$ extraction

August, 1971

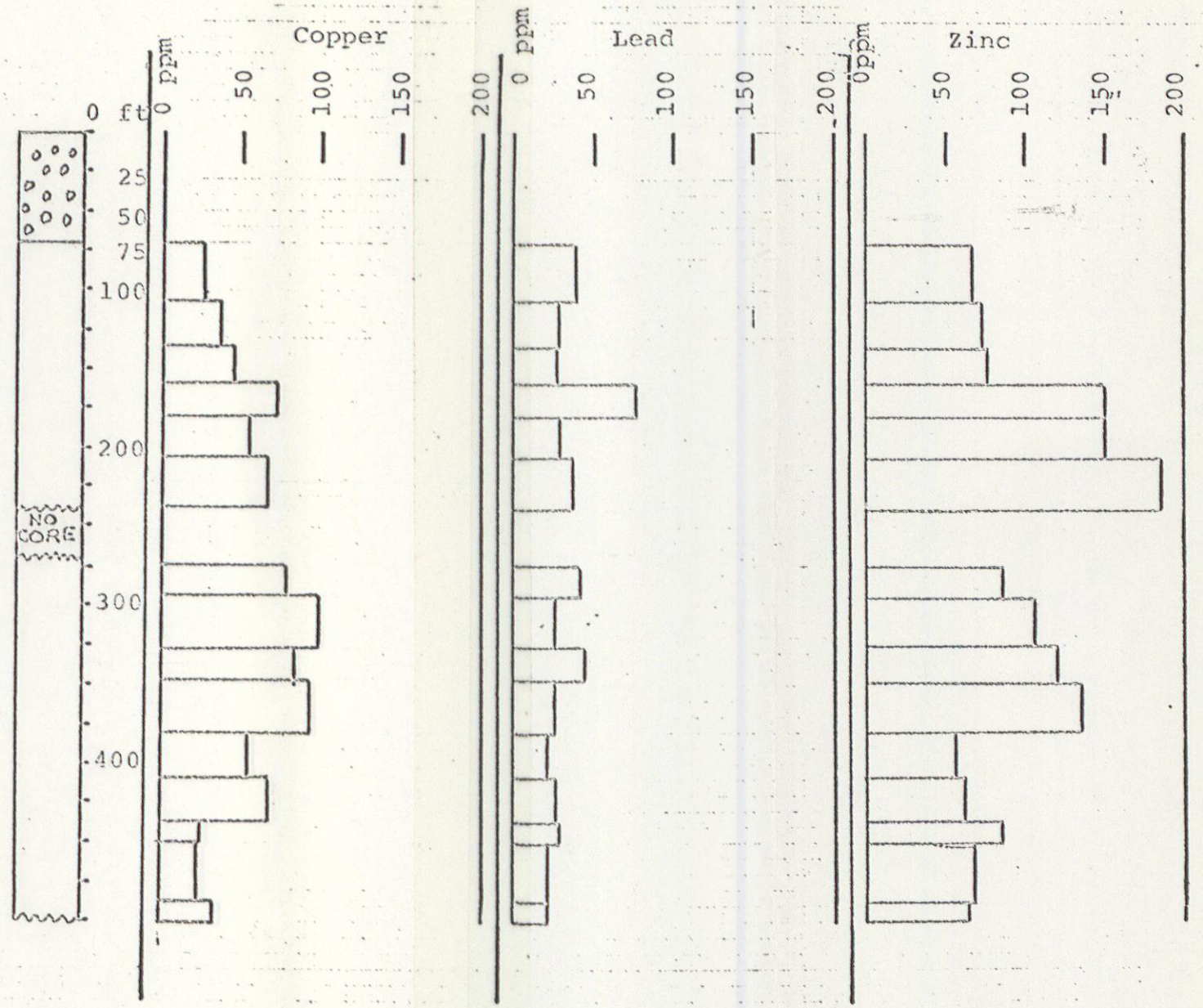
DRILL LOG

Blk.-grey qtz. graph. phy. qtzite. - intervals < 1' of qtzite. with graph. phy. partings S_2~ 45°/ axis regular S_1 - highly folded, observed only in qtzite. Minor py. & pyrr in qtz. banding < 1/8"

Core Missing

Pale green andesitic tuff
- often banded < ½" with qtz. rich material
S_2 45°/axis no visible S_1

GEOCHEM PROFILES



GEOLOGY By: W. Roberts

Geochemical Analysis: Barringer Research Limited using $HClO_4$ extraction

August, 1971

Table (ix)

DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR DDH 1966 S-3
SEA CLAIMS (Anvil Mining Corp.) 105-K-2

DRILL LOG

Pale green grey qtz. chl. ser. phy. S_2 80-90° axis contorted due to S_1 60°/axis

Qtz. ser. phy. minor chl.-qtzte S_2 70-90°/axi

White qtzite & ser. partings - visible pyrr. py. Cu with white g.s. schist qtz. veins < 1' with chl.

Pale green-grey qtz. chl. ser. phyllite. Probably partially volcanic. S_2 60-70°/axis Some bands less than ¼" of pyrr. & py.

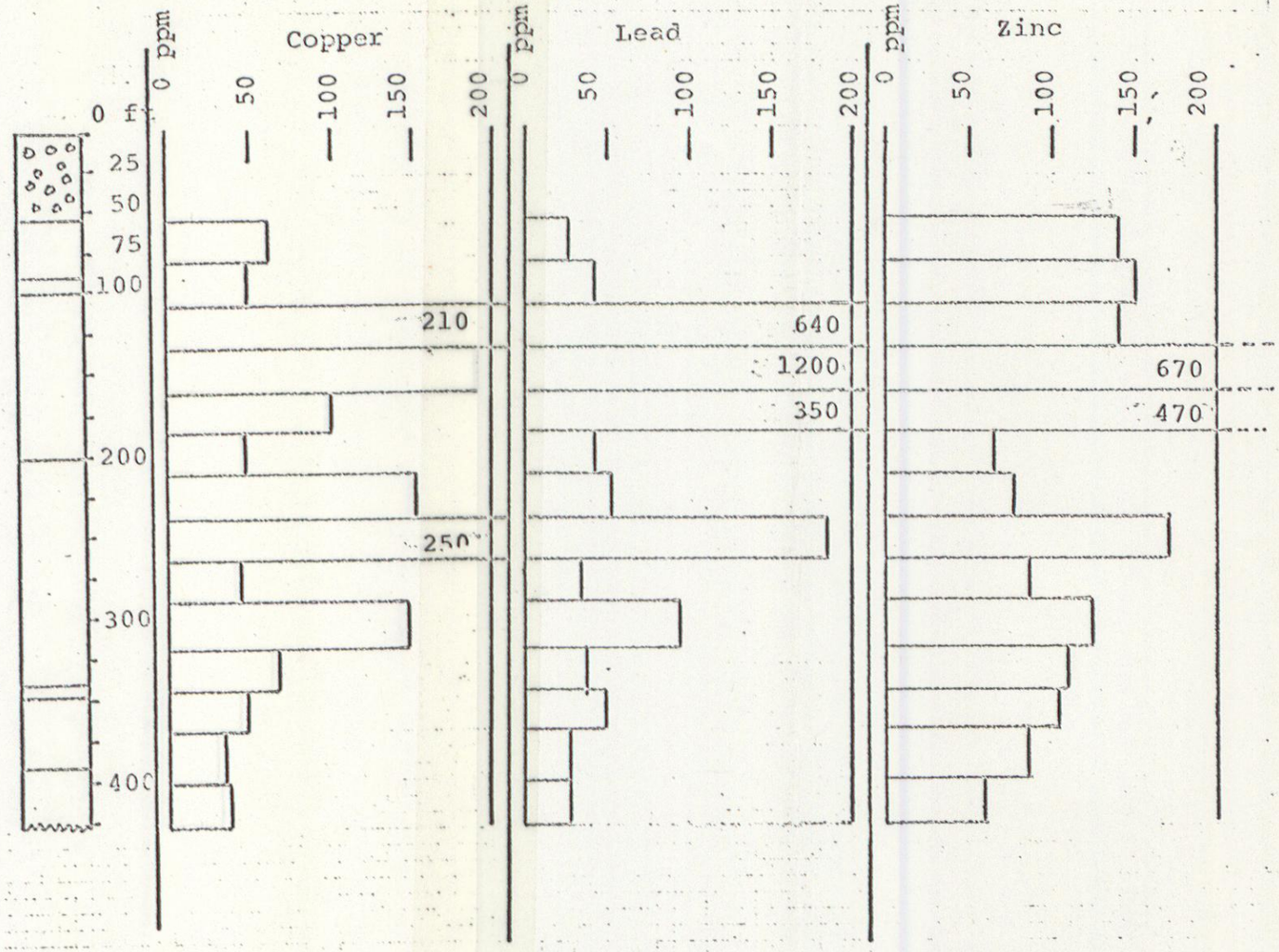
S_2 45°/axis

White qtz. ser. phyllitic schist

Pale green-grey g.s. ch. phy. S_2 ~ 45°/axis good looking Rx qtz < ¼"

Pale greenish grey qtz. ch. ser. ph. - S_2 ~ 60-80°/axis - diss.qtz. bands > 1/8' bull qtz. < 4", with chl - minor pyrr in qtz.

GEOCHEMICAL PROFILES



Geology By: W. Roberts

Geochemical Analysis: Barringer REsearch Limited using $HClO_4$ Analysis

August, 1971

Table (x)

DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR DDH 1966 S-4
SEA CLAIMS (Anvil Mining Corp.) 105-K-2

DRILL LOG

Dark sericite schist - bedrock to bottom of hole

Very minor galena in approx. 1% sulphides

Minor galena in approx. 2% sulphides

GEOCHEMICAL PROFILES

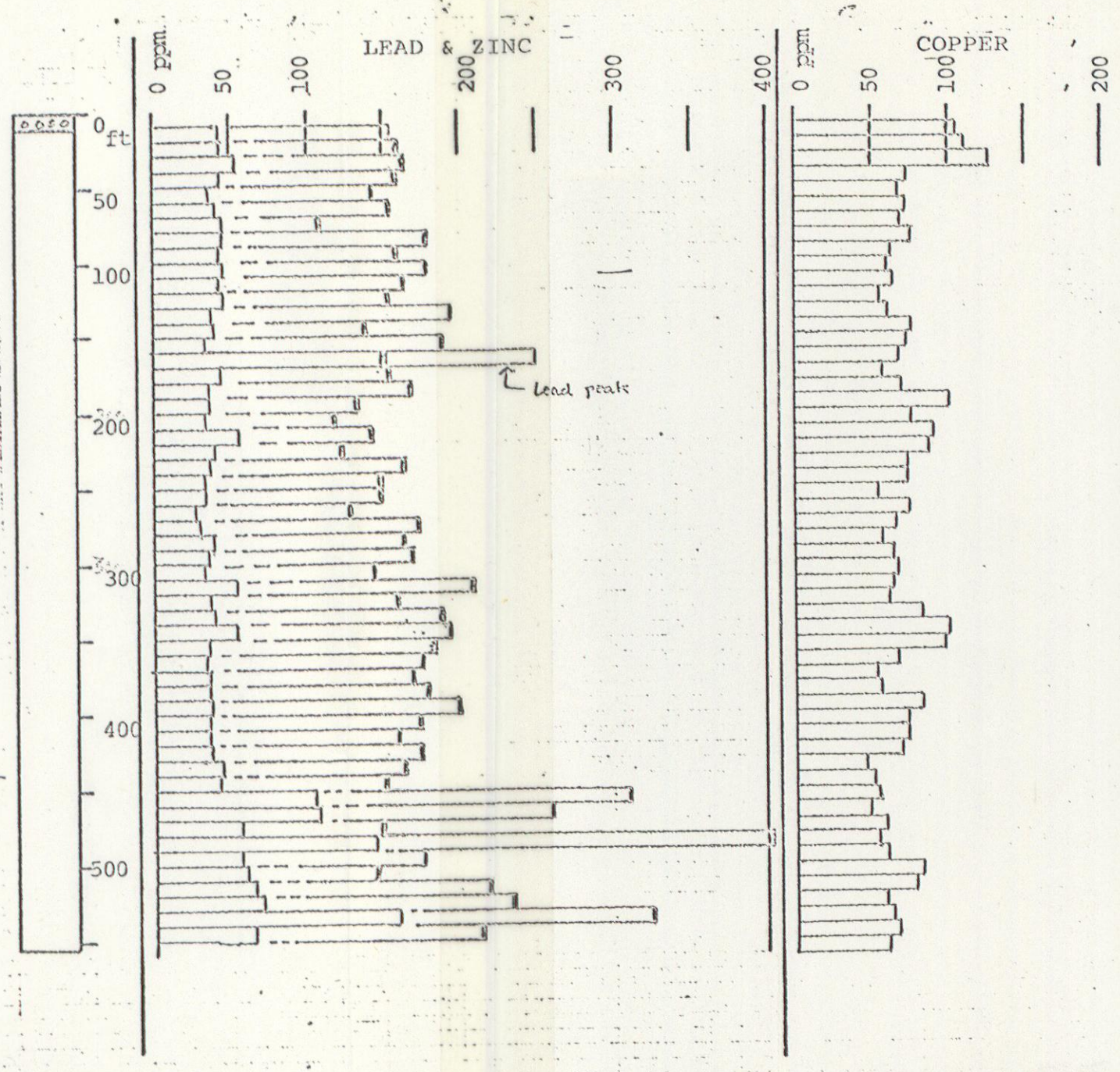


Table (xi)
DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR CUB ROTARY HOLE #2
CAPA CLAIMS (DYNASTY) 105-K-2

T (xi)

Geology By: J.F. Fairley 1965
Geochemical Analysis By: Barringer Research Limited using $HClO_4$ Extraction

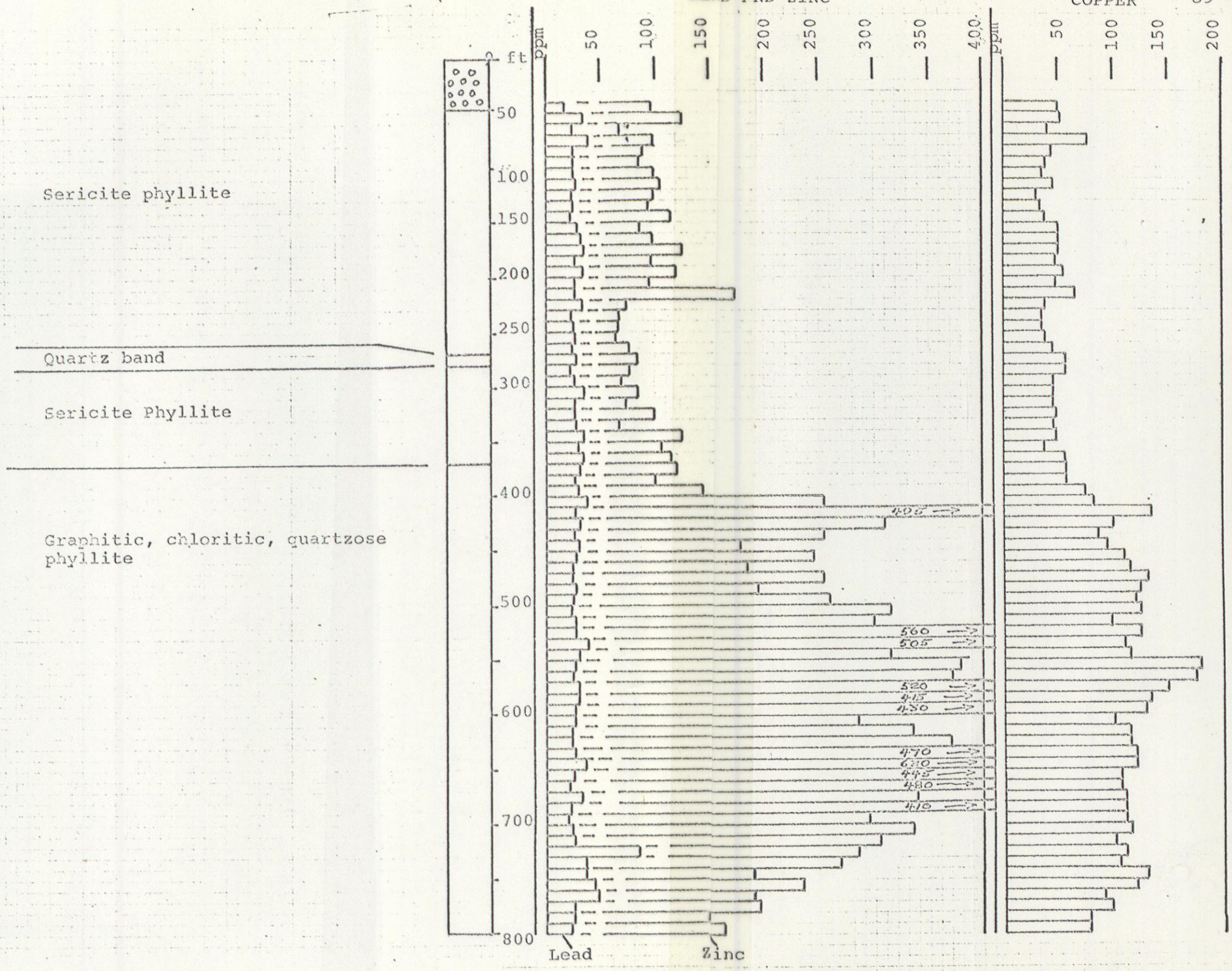


Table (xii)

Geology By: J.F. Fairley 1965
Geochemical Analysis : Barringer REsearch Ltd., using $HClO_4$ Extraction

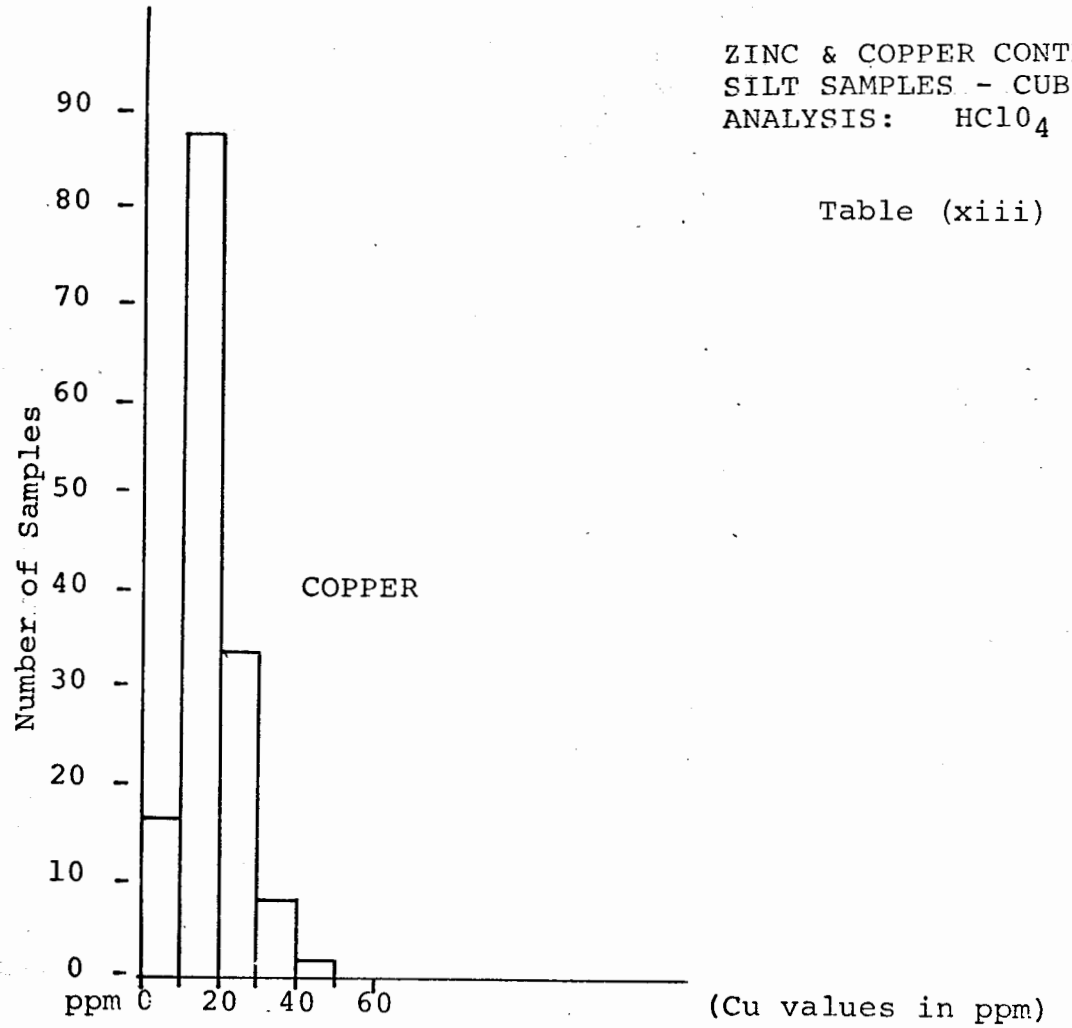
DYNASTY EXPLORATIONS LIMITED
DRILL LOG FOR NASTY ROTARY HOLE #3
ECHO CLAIMS (Dynasty) 105-k-2

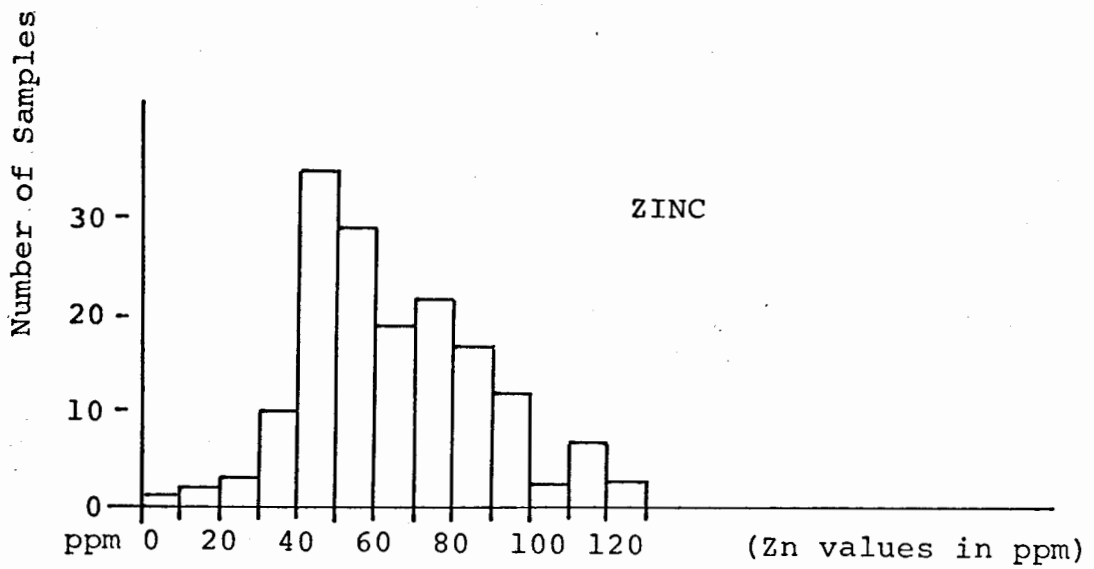
overburden of up to 100 feet in depth, not enough is known of the characteristics of the soils, alluvium and residual matter to carry out geochemical interpretations of areas of deeper overburden.

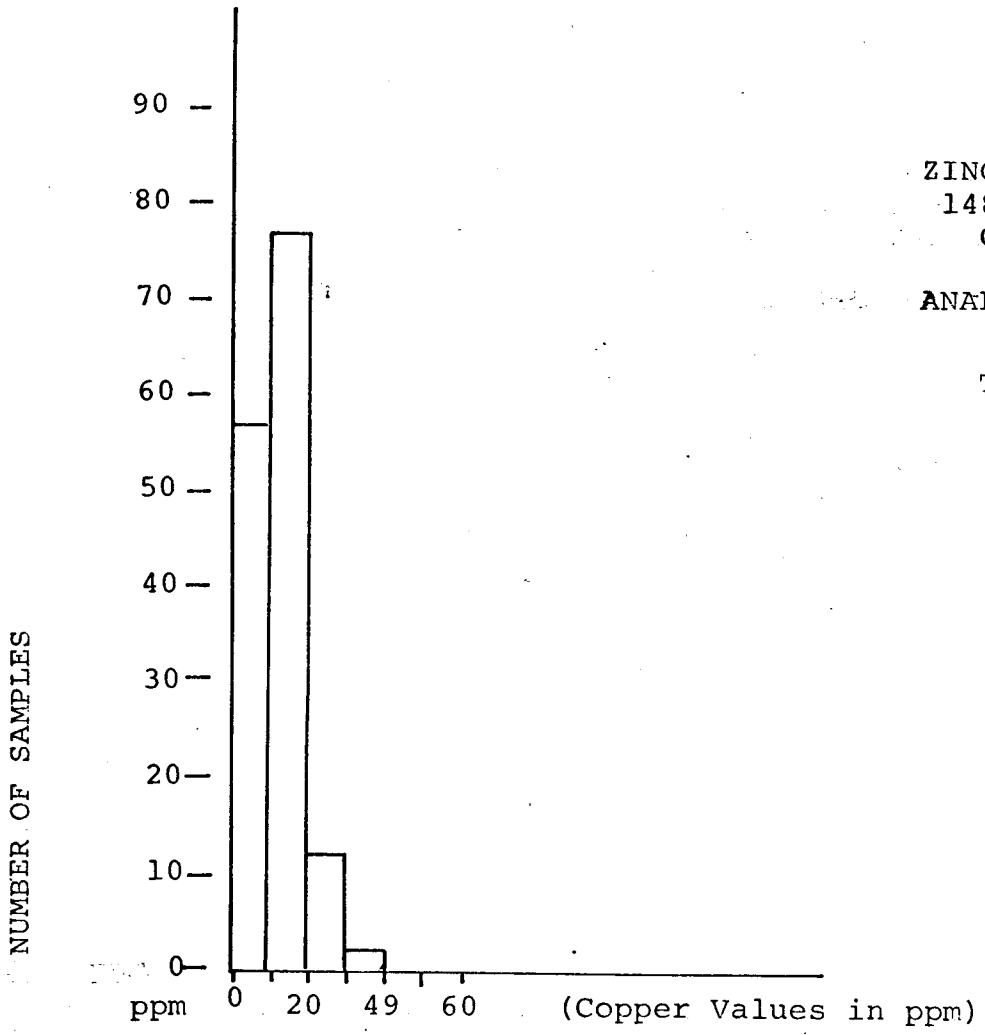
For these reasons, silt sampling of side-hill seeps, drainages and lakeshore silts has been attempted. Samples of lakeside silts, non-organic matter, taken from lake bottoms under about six inches of water can give useful geochem results. Samples are from a relatively uniform environment and represent water table emergence from large areas of adjacent hillside. Lakes and drainage are well placed over an area of exploration interest held by Dynasty. Several of the lakes and drainages give good cross sections of the phyllite, hornfels and intrusive units. Sampling of Swim Lake provides an interesting case history. The main drainage off the Swim orebody is into Swim Creek rather than into Swim Lake but nevertheless some anomalous samples do occur at the southwest corner of Swim Lake. Similarly, the main drainage from the Sea mineral showings is to the south, yet here as well some anomalous samples occur. These results indicate that lake bottom silt sampling may be a reliable geochemical method in the Anvil Range. Histograms relative to the abovementioned studies are shown as Tables (xiii) to (xxi).

ZINC & COPPER CONTENT OF 148
SILT SAMPLES - CUB LAKE AREA
ANALYSIS: $HClO_4$ (Total Extraction)

Table (xiii)



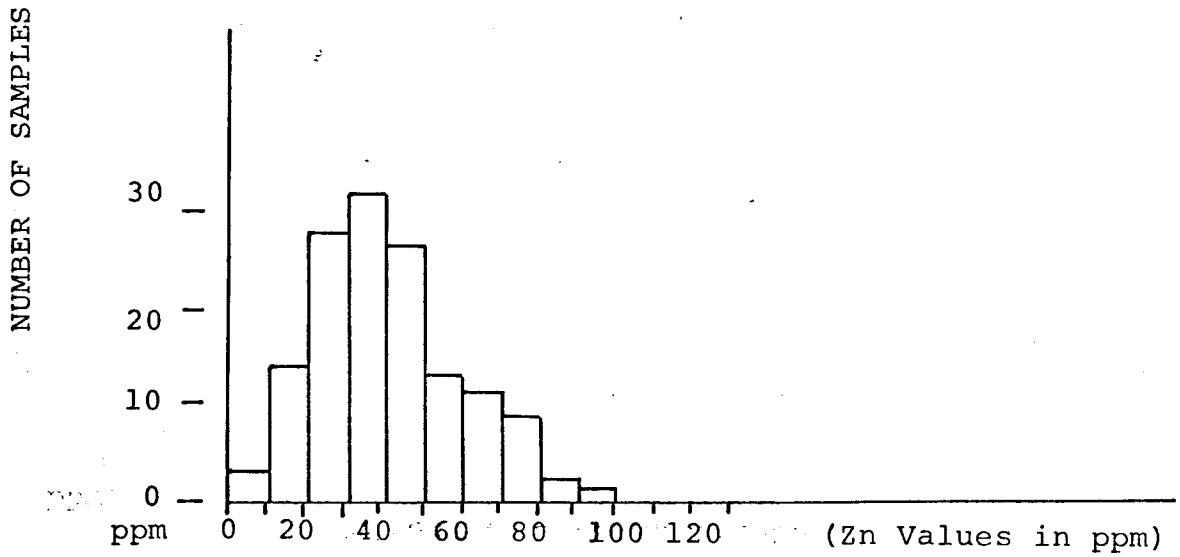




ZINC & COPPER CONTENT OF
148 SILT SAMPLES
CUB LAKE AREA

ANALYSIS: HCl (Partial Extractio

Table (xiv)



DYNASTY EXPLORATIONS LIMITED

SWIM LAKES AREA

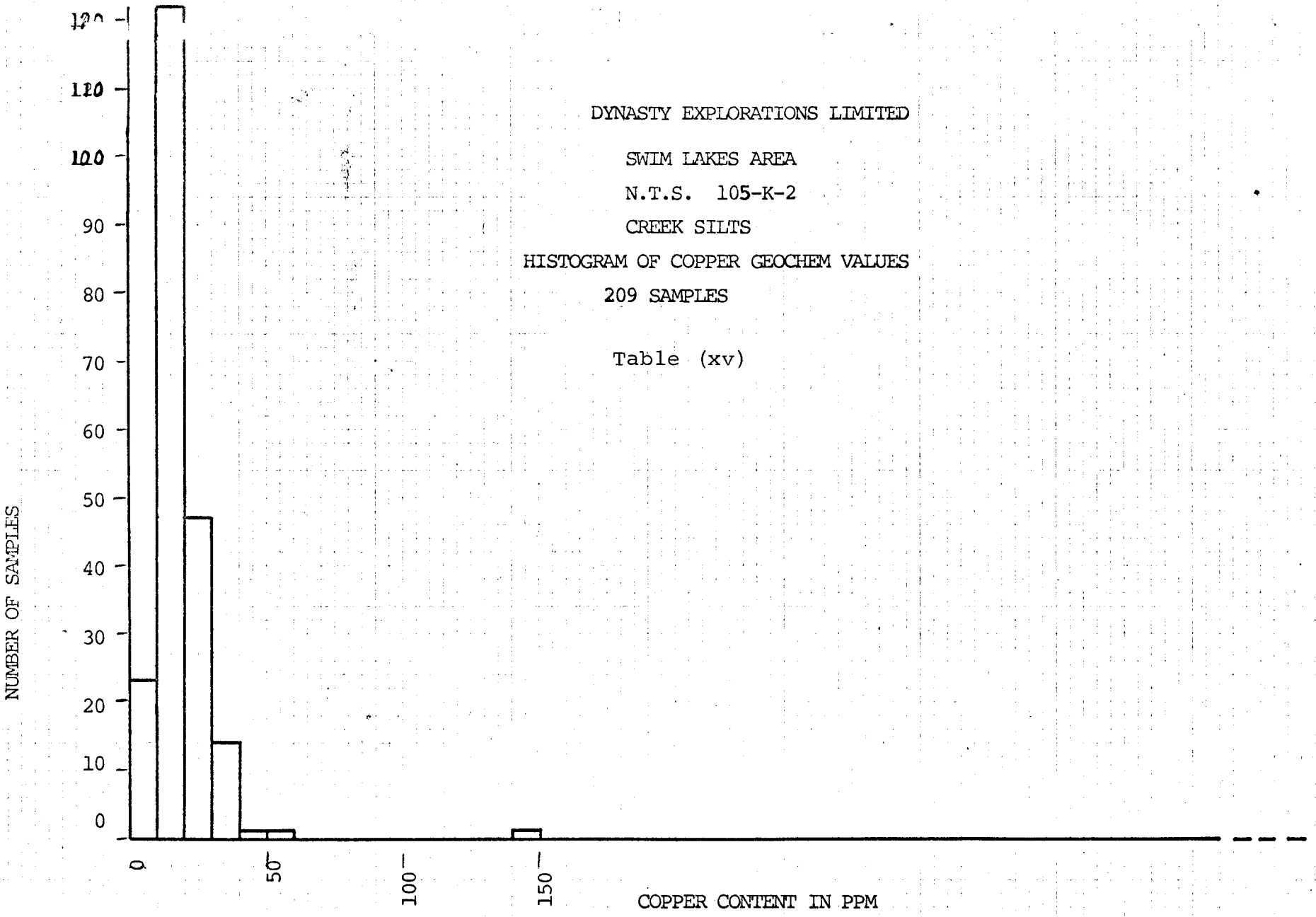
N.T.S. 105-K-2

CREEK SILTS

HISTOGRAM OF COPPER GEOCHEM VALUES

209 SAMPLES

Table (xv)



DYNASTY EXPLORATIONS LIMITED

SWIM LAKES AREA

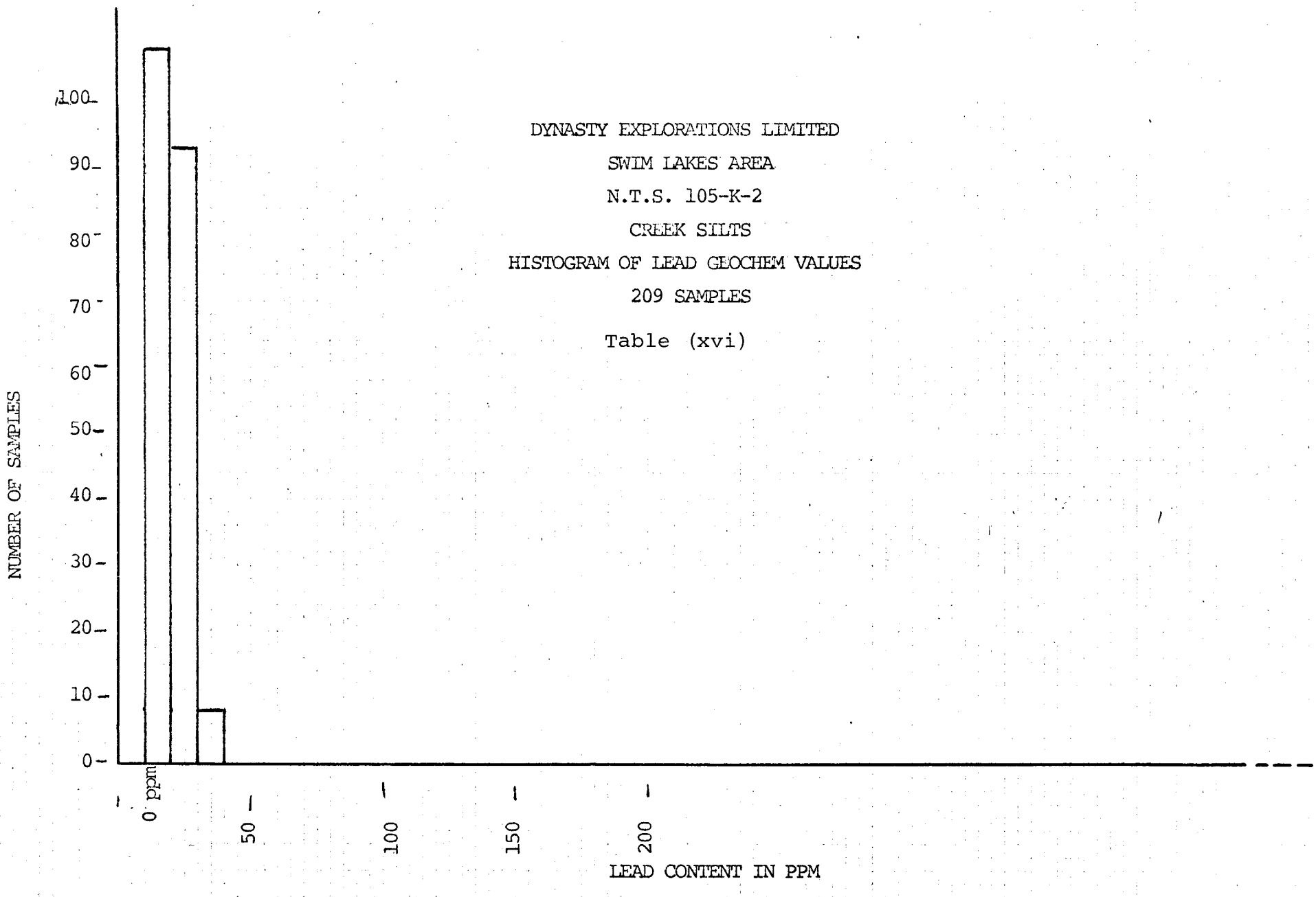
N.T.S. 105-K-2

CREEK SILTS

HISTOGRAM OF LEAD GEOCHEM VALUES

209 SAMPLES

Table (xvi)



DYNASTY EXPLORATIONS LIMITED

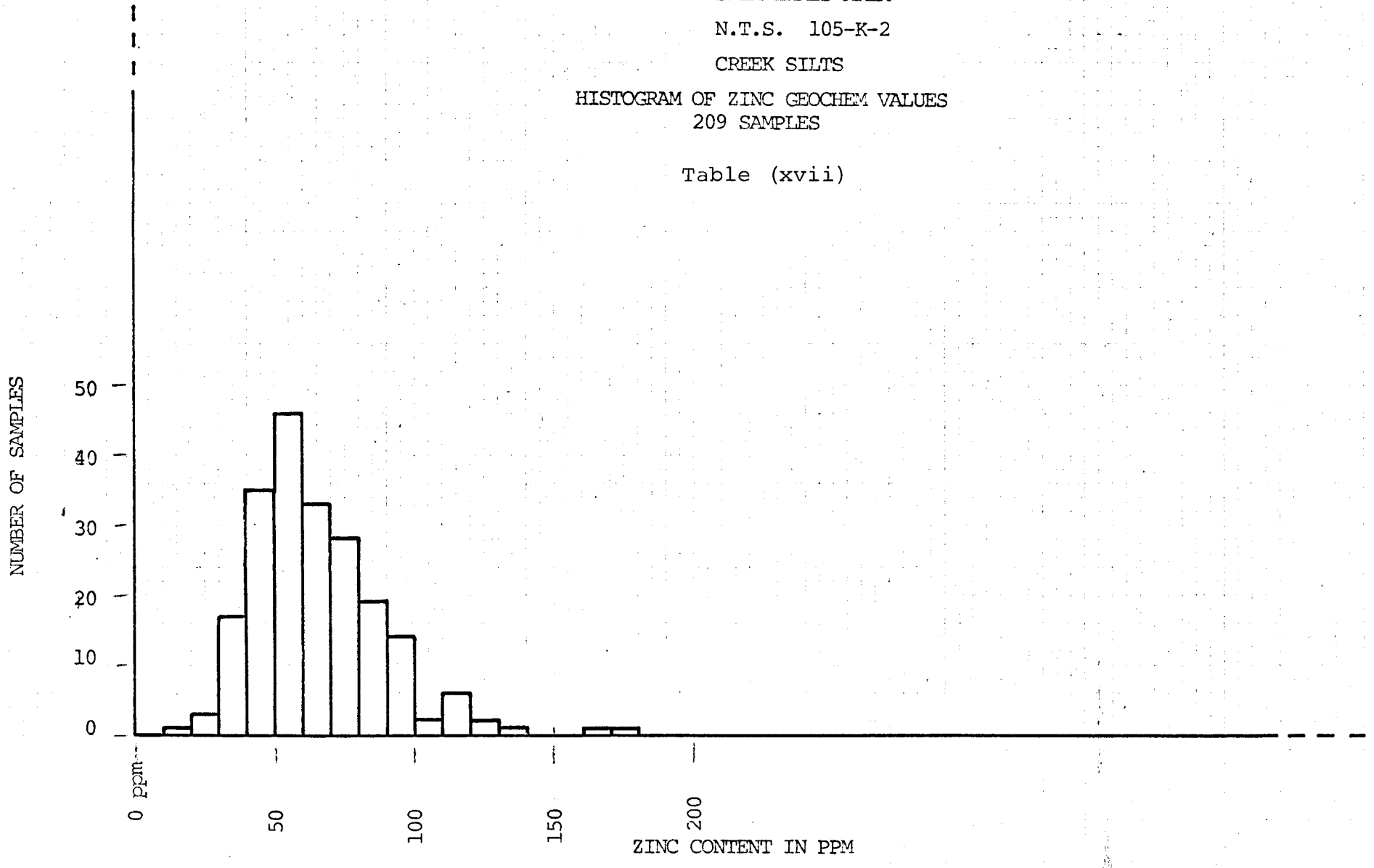
SWIM LAKES AREA

N.T.S. 105-K-2

CREEK SILTS

HISTOGRAM OF ZINC GEOCHEM VALUES
209 SAMPLES

Table (xvii)



DYNASTY EXPLORATIONS LIMITED

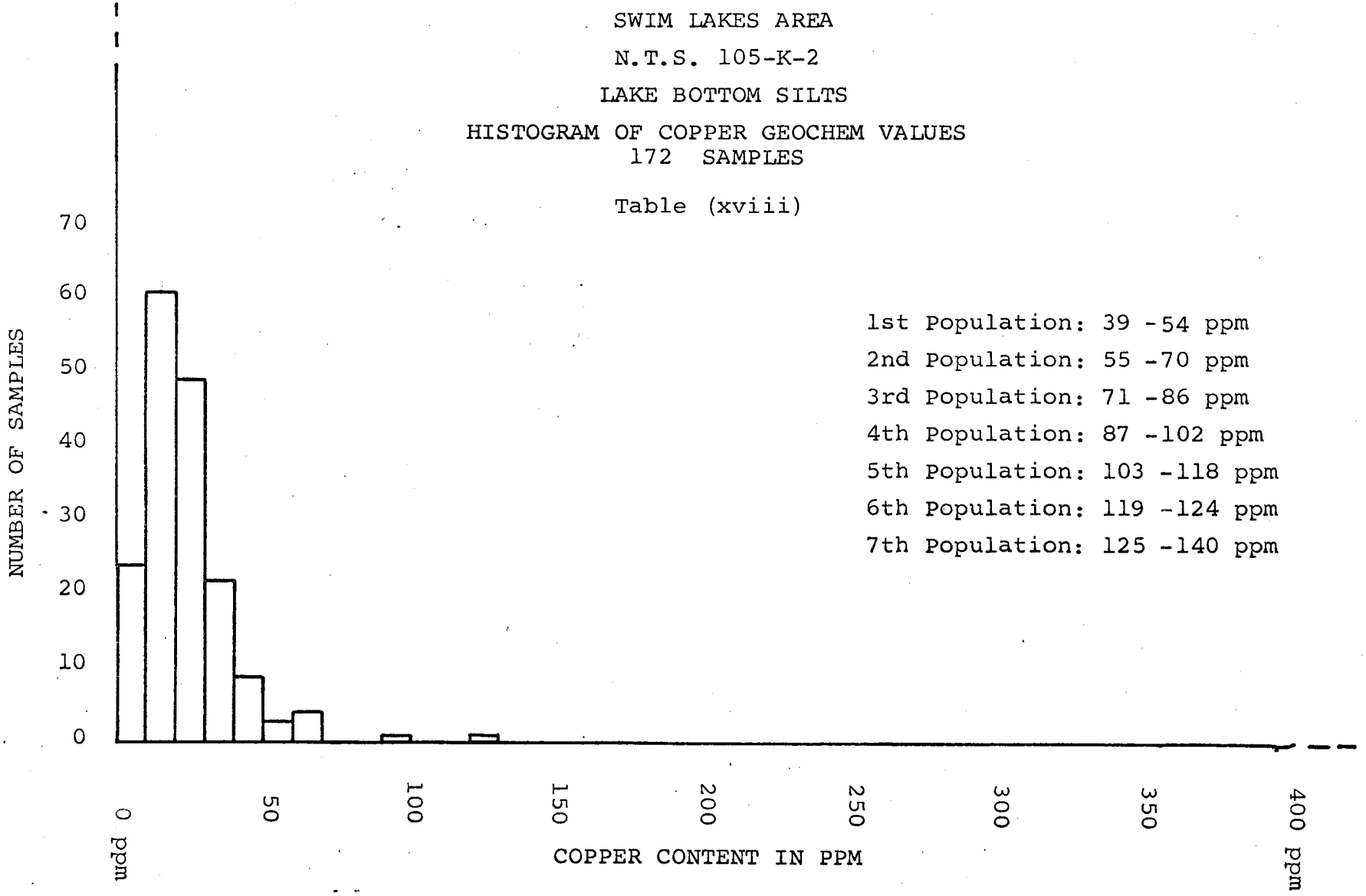
SWIM LAKES AREA

N.T.S. 105-K-2

LAKE BOTTOM SILTS

HISTOGRAM OF COPPER GEOCHEM VALUES
172 SAMPLES

Table (xviii)



1st Population: 39 -54 ppm
2nd Population: 55 -70 ppm
3rd Population: 71 -86 ppm
4th Population: 87 -102 ppm
5th Population: 103 -118 ppm
6th Population: 119 -124 ppm
7th Population: 125 -140 ppm

DYNASTY EXPLORATIONS LIMITED

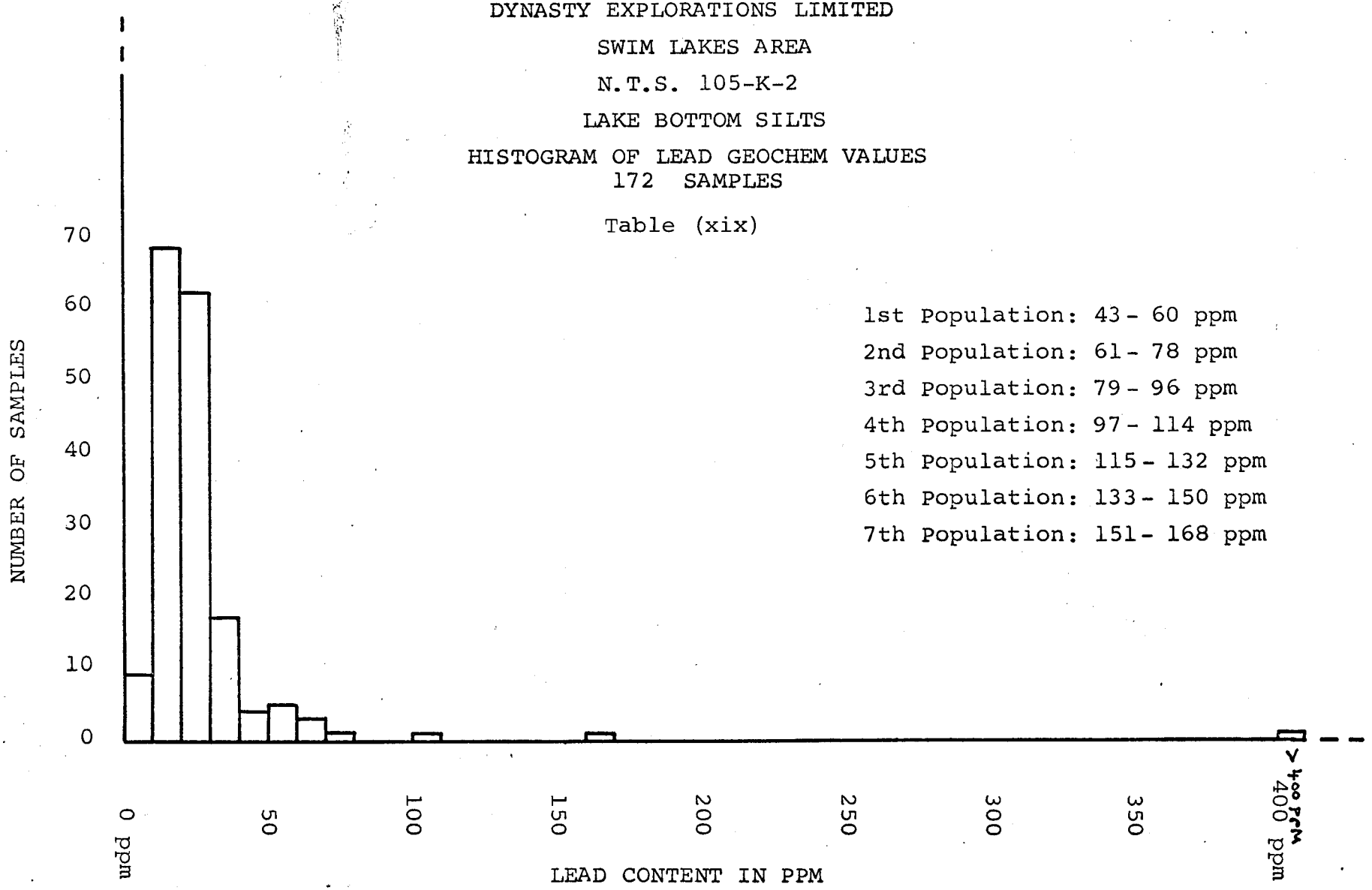
SWIM LAKES AREA

N.T.S. 105-K-2

LAKE BOTTOM SILTS

HISTOGRAM OF LEAD GEOCHEM VALUES
172 SAMPLES

Table (xix)



1st Population: 43 - 60 ppm
2nd Population: 61 - 78 ppm
3rd Population: 79 - 96 ppm
4th Population: 97 - 114 ppm
5th Population: 115 - 132 ppm
6th Population: 133 - 150 ppm
7th Population: 151 - 168 ppm

DYNASTY EXPLORATIONS LIMITED

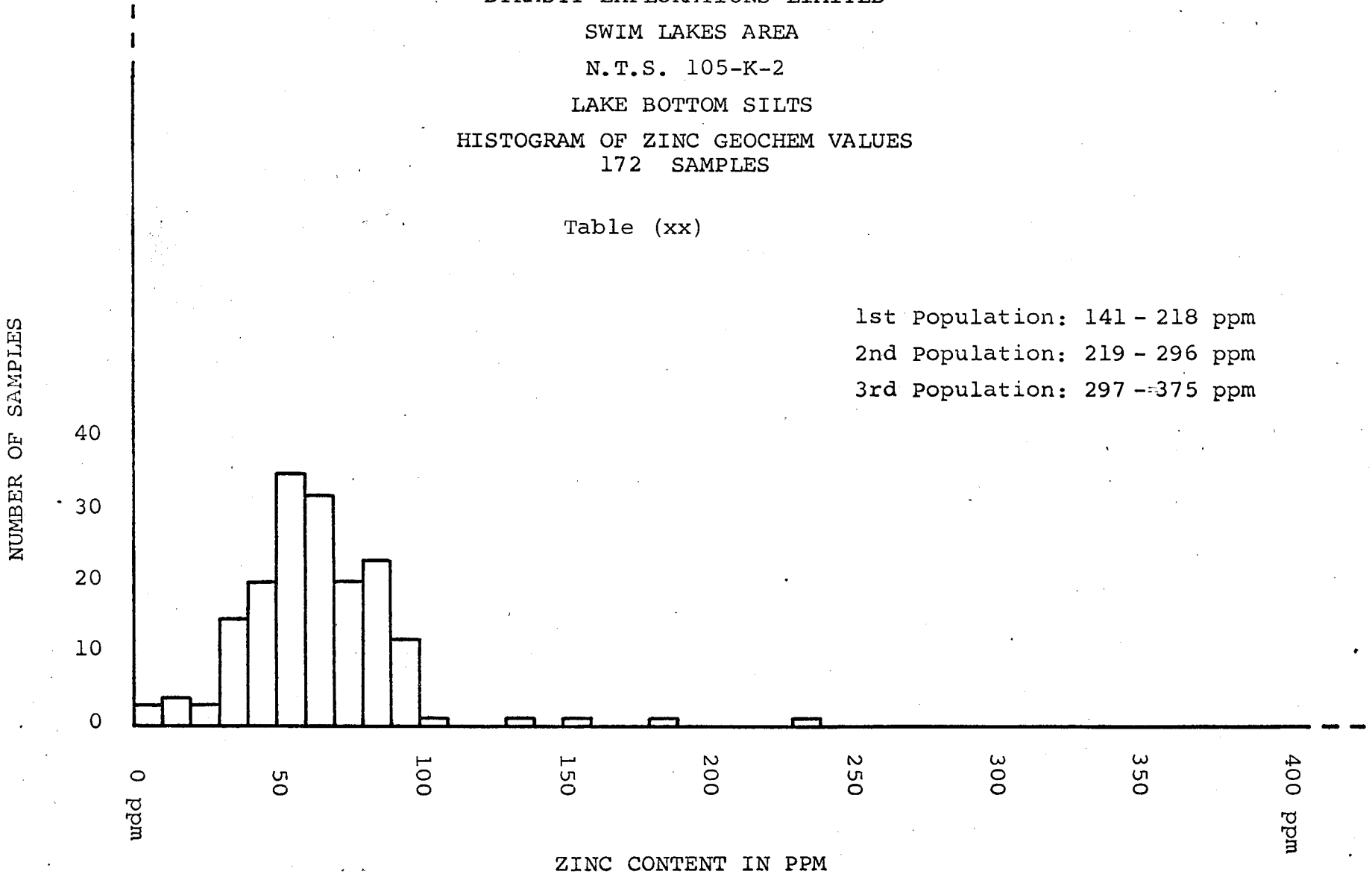
SWIM LAKES AREA

N.T.S. 105-K-2

LAKE BOTTOM SILTS

HISTOGRAM OF ZINC GEOCHEM VALUES
172 SAMPLES

Table (xx)



PROPERTY ACQUISITION AND EXPLORATION POTENTIAL OF DYNASTY CLAIMS

Property acquisition has been based on locating of airborne geophysical targets within areas of favourable phyllite as defined by the regional mapping program. Follow-up exploration of the properties has been mainly through geophysical surveys for delineation of drill targets. Detailed geologic mapping to a scale of 1:1320 has also been done over the properities and surrounding area.

Dynasty holds two major groups of claims within the Anvil area:

East Sector (Hoho-Bram Claims) - 48 claims
West Sector (Roto, Jean, Gran, Lorna, Aro Claims) -207 claims

EAST SECTOR

This area is thought to be the most promising for new discoveries of lead-zinc sulphides. Geologic mapping of the region has indicated the presence of rock units similar to those which contain the Anvil, Vangorda and Swim deposits. The next phase of exploration will involve detailed deep drilling of E.M. conductors and favourable stratigraphy. A budget of $250,000 will be required for this program.

General

Exploration work carried out in 1971 throughout the Hoho-Bram claims and eastern sector is summarized below.

Geology
- Completion of regional mapping to scale 1:1320 for claim group area plus surrounding district including Swim Lakes and Blind Creek.
- Logging of all previously drilled diamond drill holes and rotary boreholes on existing claim groups and surrounding area.

Prospecting - Locating of minor sulphide occurrences, gossans and rust seepages.

Geophysical Surveys - Compilation and interpretation of geophysical data from previous geophysical surveys carried out between 1965 and 1968.

- Completion of ground electromagnetic (C.E.M.) surveys and 'fill-in' ground magnetic surveys in place of originally proposed airborne Turair survey.

Geochemical Surveys - Recce. contour soil sampling.

- Stream sediment sampling.
- Lakeshore bottom research silt sampling.
- Rock geochem sampling of outcrops and all available diamond drill core and rotary drill cuttings.

Geology of the East Sector

Quartz rich phyllite has been mapped on strike with the Swim deposit and the Sea Group showings. This area covers numerous geophysical anomalies outlined by both ground and airborne surveys and was studied in detail to provide further information and exploration guides to the Anvil area as a whole.

Outcrop is sparse throughout most of the Swim Lakes area covered by the claims, however, interpretations of bedrock geology have been obtained by projection of known geologic contacts and information gathered from re-logging rotary holes drilled by Dynasty in 1965. Geophysical C.E.M. surveys and photo-interpretation also aided in mapping the area of phyllite on strike from the Hoho-Bram claims.

Most of the Swim Lake and Cub Lake area is underlain by the quartz rich lower member of the phyllite unit. The attitudes of graphite rich beds within Units 3a and 3b show up well on the electromagnetic surveys; the location and relative strike slip movement of some faults, as well as the position of other structures on the claims, have been postulated on the basis of electromagnetic survey information. The eastern part of the recently staked Echo claims, north of Moose Lake, is on strike with the quartz rich phyllite band that encloses the copper-zinc mineral showings on the Sea claims, southeast of Swim Lake.

In the course of mapping the Swim Lakes area, all previous drill hole logs were evaluated and, in most cases, chip samples and core were re-logged. Geochemical samples were taken for each 10 foot interval on two of the rotary drill holes on the property and for each 25 foot interval on five of the drill holes on the Sea claims, several miles east of the Hoho-Bram property. Drill logs and geochemical profiles are presented as Tables (vi) to (xii).

Geophysics of the East Sector

Previous geophysical work carried out between 1964 and 1968 throughout the East Sector then covered by the Nasty and Cub claims included A.E.M. and aeromagnetic surveys, ground J.E.M. surveys, ground magnetic surveys and gravity surveys. Subsequent to recent compilation of these results, two main deficiencies were discovered. The original surveys were laid out without a proper understanding of the geology of the region and, as a result, much potentially favourable ground was never covered by any ground geophysical survey. Secondly, the instruments used for both the A.E.M. and the ground E.M. were of limited depth penetration, less than 200 feet for both survey methods. However, of the numerous anomalies that were

discovered through previous geophysical surveys, only four have ever been investigated with drill holes. To obtain a more complete geophysical picture and to fully map the extent of the phyllite units, Dynasty, in 1971, completed ground magnetic and C.E.M. surveys over all parts of the area east of the Hoho-Bram claims and north of Swim Lakes that had not been covered previously either by air or ground magnetic surveys. Recent geophysical surveys, coupled with new interpretations of previous geophysical results, confirmed the presence of phyllite and the significance of that unit as a host to sulphides through locating of significant anomalies and major structures that require drill testing.

Electromagnetic (C.E.M.) Survey

The Crone C.E.M. instrument is an improved version of the reliable and well known Crone J.E.M. instrument. It consists of two coils which can be utilized in a variety of configurations. For the survey, the "horizontal shootback" method was used, with the coils transmitting and receiving in a horizontal position. The depth penetration capability of the C.E.M., as with the J.E.M., is a function of the coil separation. Under conditions of low background noise, the C.E.M. is capable of detecting conductors at 600 foot depths with a coil separation of 800 feet. Under the high noise conditions that prevailed during the course of the survey, the maximum possible coil separation was 500 feet, which resulted in a depth penetration of just under 500 feet. In a trail run over the Faro orebody, the C.E.M. clearly detected sulphides at a depth in excess of 400 feet.

The C.E.M. survey detected numerous conductive anomalies east of the Hoho-Bram claims. Most of these anomalies

are very long, narrow, formational-looking conductors which can be correlated with graphite-bearing lenses in Units 3a and 3b. This information adds additional economic potential to the region since both the Vangorda and the Swim ore deposits are located within similar large E.M. conductors reflecting graphitic horizons. The axis of most of these conductors tends to conform with the strike of the S_2 foliation of the underlying phyllite bedrock. Most of these conductors showed up on the A.E.M. survey as well.

Geochemistry of the East Sector

Geochemical work in the Swim Lake area included soil sample surveys, stream silt sampling, lake bottom silt sampling and rock geochemical sampling of diamond drill core and rotary drill chip samples. Much of the geochemical work was experimental in nature and was intended to evaluate the effectiveness of various geochemical methods in the Anvil Range.

(a) Soil Sampling Surveys

No good, extensive geochemical anomalies were discovered by recent soil sampling work or by previous surveys. All anomalies indicated on the "Geochem Interpretation" maps are either very weak or very spotty, involving at most a few samples. The highest value encountered on any survey was a 1300 ppm Zn. that occurred on the former Nasty claims.

(b) Silt Sampling Surveys

Four areas with anomalous values were discovered within the Swim Lake area:

(1) Two anomalous lake samples at the southwest end of Moose Lake occur in close proximity to a coincident

ground magnetic and C.E.M. anomaly. This combined geochem-geophysical anomaly is on strike with the copper-zinc mineralization on the Sea claims one mile to the west. This should be regarded as a very high priority area for drill testing.

A single stream silt, anomalous in copper, which occurs near the end of Moose Lake is downslope from some mineralized shear zones on the Sea claims and probably is related to those.

(2) A single sample on the north shore of a small lake east of Echo Lake is anomalous in zinc. It is near a gravity anomaly which is coincident in part with a long C.E.M. conductor. This area also warrants testing with at least one drill hole

(3) Two stream silt samples at the east end of Moose Lake are anomalous for lead and zinc. The stream from which these samples were taken drains a swampy area which contains a weak magnetic anomaly. The samples are on strike with a long C.E.M. anomaly that lies a few hundred feet to the west.

(4) Two samples on the south shore of Cub Lake were anomalous in copper. These are close to an old camp location and could possibly be the result of contamination from garbage or other junk left at the site from previous years. They do not coincide well with any geophysical anomalies, however, they are on strike with a long C.E.M. conductor which lies to the southwest.

Hoho-Bram Mineral Claims

The Hoho-Bram claim group straddles Blind Creek approximately seven miles upstream from its confluence with the Pelly River. Access to the property can be made by helicopter from the town of Faro, about ten miles southwest of the claims or by means of a four and one-half mile long road suitable only for tracked vehicles which leaves the Vangorda-Blind Creek road about three miles east of Vangorda cabin.

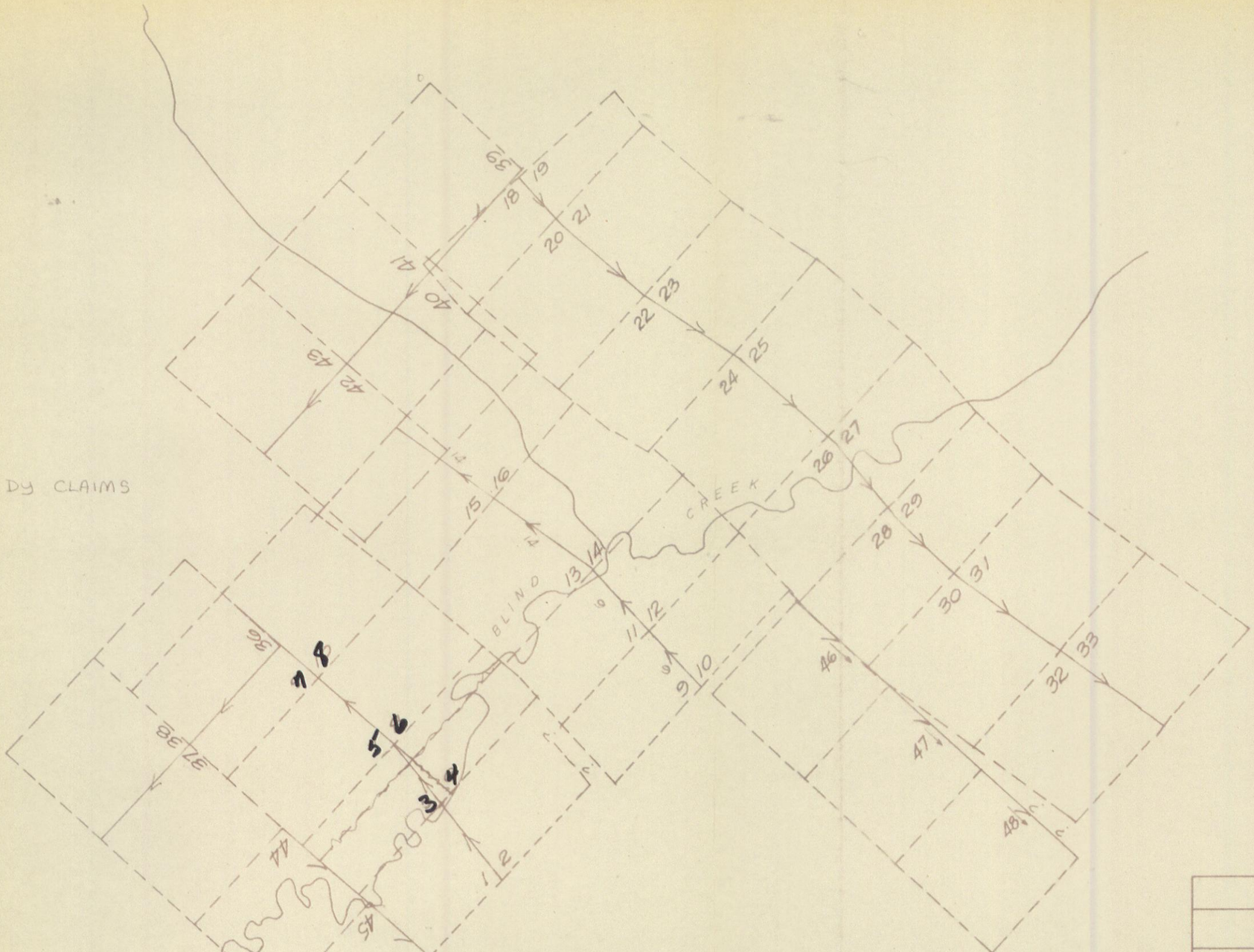
The claims were staked to cover two A.E.M. anomalies outlined during a helicopter-borne geophysical survey flown for Dynasty Explorations by Lockwood Survey Corporation in 1965. The conductor of priority interest on the northwest side of Blind Creek was formerly covered by the DY claims held by Anvil Mining Corporation. The second anomaly found on the southeast side of Blind Creek has not apparently been previously staked.

No reports of previous work have been recorded or filed on claims formerly staked in the area of the conductive zones, however, a picket line grid was found cut over much of the western anomaly. Evidence of a soil sampling survey was found on this original grid. A gravity survey carried out over most of the DY claims by Anvil Mining Corporation did not extend as far east as the conductors found on the Hoho-Bram claims.

Claim Location

The original 35 claims were staked by Harman and Associates, contract stakers.

Hoho	1-8	Y60357-Y60364
Bram	9-16	Y60384-Y60391
Hoho	17-24	Y60365-Y60372
Hoho	33-35	Y60381-Y60383



DYNASTY EXPLORATIONS LIMITED
TINTINA-ANVIL PROJECT
BRAM - HO, HO MINERAL CLAIMS 105 K-2
CLAIMS LOCATION MAP
DATE: NOV, 1971 SCALE: 1" 1320'

Incorrect locating of the original claims necessitated the staking of 13 more claims during the month of June to cover the A.E.M. anomalies as well as a fraction left between the Hoho-Bram claims and the DY claims. These new claims are:

Hoho	36-43	Y60908-Y60915
Hoho	44-48	Y60916-Y60920

As a result of this new staking, claims 17, 34 and 35 of the original Hoho claim group are superfluous and can be dropped.

The Bram and Hoho claims are located on Blind Creek, approximately seven miles from its confluence with the Pelly River. The property adjoins Anvil Mining Corporations' DY Group to the southwest and Kerr Addison's Swim Group to the southeast.

The Bram and Hoho claims are accessible via a 4½ mile 'cat-road' which leaves the Vangorda Road about 3 miles east of Vangorda Creek. A bombardier has been used for transportation to the property, however, with a minimal amount of ditching and bridging, the 'cat-road' could be made passable for 4-wheel drive vehicles. Alternative access is by helicopter.

Exploration History

The Hoho-Bram claims were originally part of the northeast sector of the DY mineral claims staked in 1964. The area was subsequently re-staked as the Luk Group in 1966 and was again re-staked by Dynasty in 1971 as the Hoho-Bram Group.

Previous exploration of the property involved only aero-magnetic and A.E.M. survey work by Dynasty in 1964 and 1965.

Exploration done by Dynasty during 1971 consisted of:

Geology - Logging of core from 3 diamond drill holes located approximately 3 miles northwest of the Hoho-Bram claims.

- Detailed geologic mapping of the property and surrounding area at scale 1:1320.

- Geologic mapping of grid area on property at scale 1:400.

Prospecting - Locating of minor sulphide occurrences, including:

(1) minor pyrite pyrrhotite, chalcopyrite, sphalerite and galena in quartz veins,

(2) Pyrrhotite and chalcopyrite in greenstone lenses.

Geochemical Sampling - 225 samples collected over grid lines in proximity to A.E.M. anomalies,

- 200 samples collected on a 'recce-grid' extending over airborne geophysical anomalies extending west and north of the gridded area,

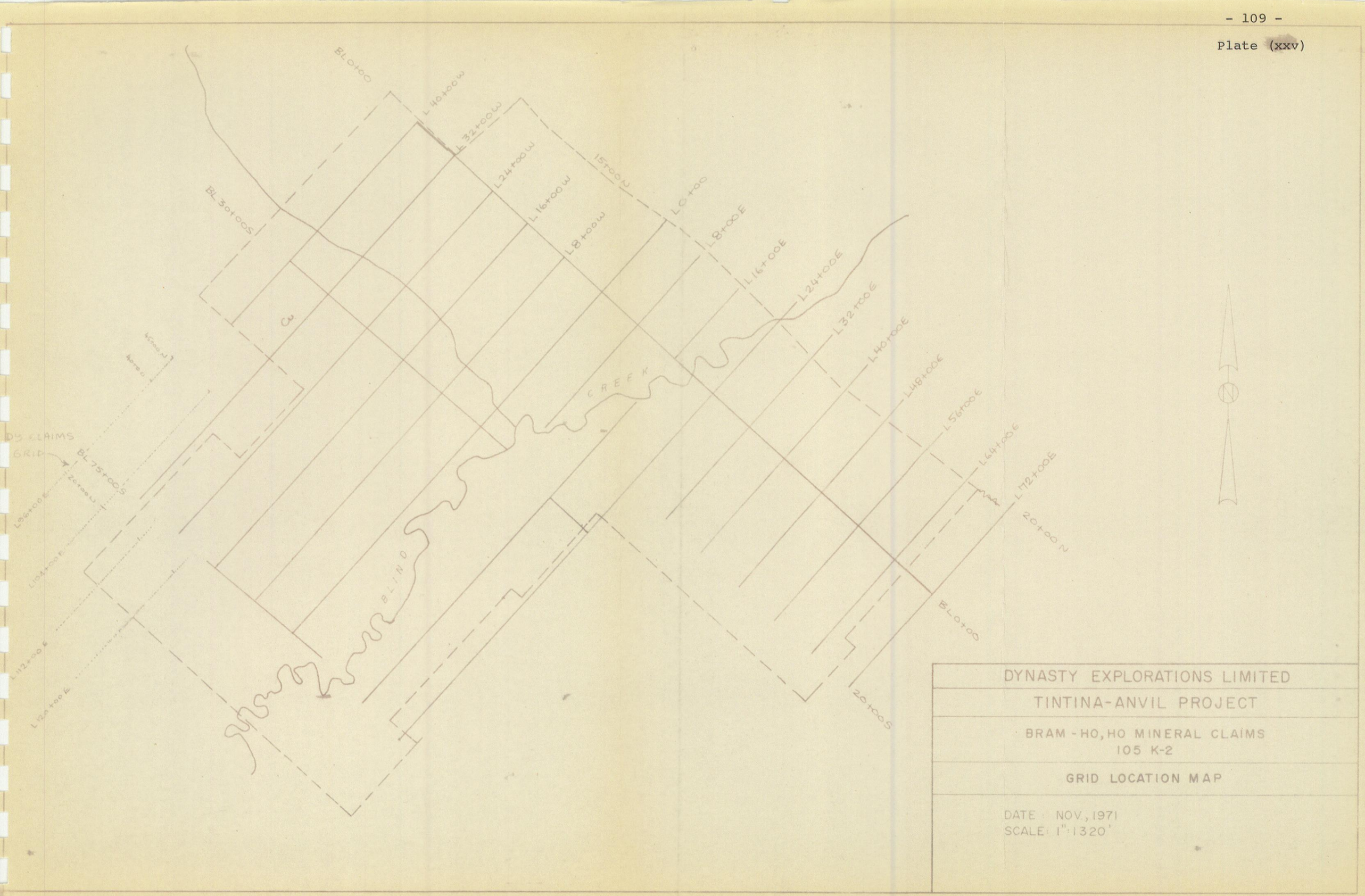
- Rock geochemical studies of outcrop and drill core from surrounding area.

Geophysics - Interpretation of airborne mag and E.M. data,

- Deep penetrating C.E.M. horizontal loop survey over entire claim group,

- Examination of gravity survey results over portions of Hoho-Bram claims from previous surveys on DY claims.

Plate (xxv)



DYNASTY EXPLORATIONS LIMITED
TINTINA-ANVIL PROJECT
BRAM - HO, HO MINERAL CLAIMS 105 K-2
GRID LOCATION MAP
DATE : NOV, 1971 SCALE: 1" = 1320'

Geology

The Anvil Batholith outcrops about 1½ miles northwest of the claim group. Adjacent to the intrusive contact is found a coarse grained muscovite-rich alaskite which grades into biotite granodiorite further into the batholith. Sericite-biotite schist and some skarn occur against the granite contact, these units underlie a dark grey quartz phyllite. The relationship between these two rock units is obscured by the presence of several major northeast trending faults as well as lack of outcrop. About four miles to the north of the claim group the batholith is bordered by a wide belt of high-grade garnet-biotite gneiss. This rock type probably underlies the sericite-biotite schist and the phyllite unit but again the contacts are faulted and the exact stratigraphic relationship is uncertain. The phyllite unit changes abruptly from a sericite-quartz phyllite to a biotite-garnet quartz schist. The change in matamorphic grade is well defined and indications are that the phyllites and biotite-garnet schists are probably in fault contact. Differences in metamorphic grade are probably unrelated to the Anvil Batholith, both phyllites and biotite-garnet schists contact granite.

The foliation on both sides of Blind Creek tends to dip at low angles into the Blind Creek valley. A prominent topographic rise north of Swim Lakes and east of the Hoho-Bram claims may be due to uplifting by an underlying granitic intrusion.

Geologic mapping of the claim group was hampered by a lack of outcrop, as well as thick brush which made the few outcrops present difficult to find. No outcrop exists in the immediate vicinity of either anomaly. On the claim group itself a sequence of phyllitic rocks are exposed.

The lowest, stratigraphically, are dark grey, very quartz-rich phyllites which outcrop along the lowest part of the Blind Creek valley. This rock type grades upward in the section through a pale grey to pale greenish sericite-chlorite phyllite which in turn grades into a limy, carbonate-phyllite at the top of the section. Throughout the middle and upper sections of the phyllite unit there are many greenstone lenses up to a few tens of feet in thickness. These vary from massive, unfoliated amphibolite near their cores to well-foliated chlorite schists near the margins. These lenses frequently contain pyrrhotite and pyrite, and occasionally contain sparse chalcopyrite in quartz veins. In some greenstones close to the claim group abundant euhedral pyrite crystals up to one-half inch in size were found. No outcrop has been found in the vicinity of geophysical anomalies. Both anomalies occur over phyllites that are high in the section and are probably within a few hundred feet, stratigraphically, of the limy upper phyllite member. Greenstone lenses containing pyrrhotite occur abundantly within 1000 ft. of the anomaly on the northwest side of Blind Creek. These lenses do not seem to be directly associated with E.M. or aeromagnetic anomalies.

Linecutting

A picket line grid with cross lines at 800 foot intervals and stations of 100 foot spacing was cut over the entire claim group. The base line is oriented at 315^{o} and coincides with the northernmost claim line, the point of origin (Line 0, Station 0)being at claim posts for Hoho claim numbers 23, 24, 25 and 26. A total of 107,000 feet of line was cut. Good linecutting was severely hampered by heavy brush cover over much of the property. A crew of four locally hired natives was used for linecutting.

Geochemical Survey

Soil samples were collected at 200 foot intervals along selected lines in the vicinity of the C.E.M. anomalies. An approximately total of 420 samples were collected and sent to the Barringer Research Laboratory in Whitehorse for copper, lead and zinc determinations. $HClO_4$ extraction was used for soils; .5 N HCl extraction was used for silts. Inspection of the resulting data shows background values for copper and lead within the claim group area being in the order of 20 to 25 ppm. For zinc, the background appears to be about 60 to 70 ppm.

Copper

Copper values range from 15 to 140 ppm, anomalous values are considered to be in excess of a threshold of 50 ppm, median values range from 25-30 ppm.

Seven small areas of anomalous copper, each area including between 2 and 5 stations, occur on the grid. A few 'spot highs' in excess of 50 ppm were also found.

Lead

With the exception of Cu anomaly No. 3 on the Recon. Grid, anomalous copper values do not coincide with anomalous lead-zinc values. Lead and zinc geochemistry is certainly less widespread than copper. Lead values range from 15 ppm to a high of 360 ppm, average values of lead in soils are in the order of 30 ppm, threshold has been estimated at 50 ppm.

Only one significant lead anomaly in soils was outlined on the northwest border of the claim group on the recon. grid. Two recce soil samples taken 400 feet apart along a sidehill contour gave values of 360 and 120 ppm.

Cu. Geochem Anomalies

	Location		Coincident Features
No. 1	Hoho-Bram grid 32W, 33S	3 anomalous stations highest value 76 ppm	- CEM conductor - AEM conductor - Partially coincident with weak aeromagnetic anomaly - Close to narrow greenstone lense containing occasional flecks of visible chalcopyrite and abundant pyrite
No. 2	Hoho-Bram Grid 56E, 14S	2 anomalous stations highest value 57 ppm	- Partially coincident with AEM conductor
No. 3	Recon. Grid extension of Hoho-Bram Grid co-ord. 60W, 38S	3 anomalous stations highest values 120 ppm	- Coincident anomalous lead-zinc values
No. 4	Recon. Grid extension of Hoho-Bram Grid Co-ord. 74W, 38S	3 anomalous stations highest values 140 ppm	
No. 5	Recon. Grid extension of Hoho-Bram Grid Co-ord. 106W, 36S	5 anomalous stations highest values 110 ppm	
No. 6	Recon. Grid extension of Hoho-Bram Grid Co-ord. 106W, 30S	4 anomalous stations highest values 120 ppm	- Coincident AEM conductor
No. 7	Recon. Grid extension of Hoho-Bram Grid Co-ord. 150W, 36S	2 anomalous stations highest values 51 ppm	

A third sample taken 1000 feet northwest of the first two samples and along the direction of geologic strike assayed 78 ppm lead.

Although this recon. anomaly is small and is made up of only three anomalous sites, it is nevertheless a significant target in that it follows the strike of the quartzose phyllite unit, it has coincident anomalous values in zinc and copper and it falls near a weak 20 gamma aeromagnetic gradient.

Zinc

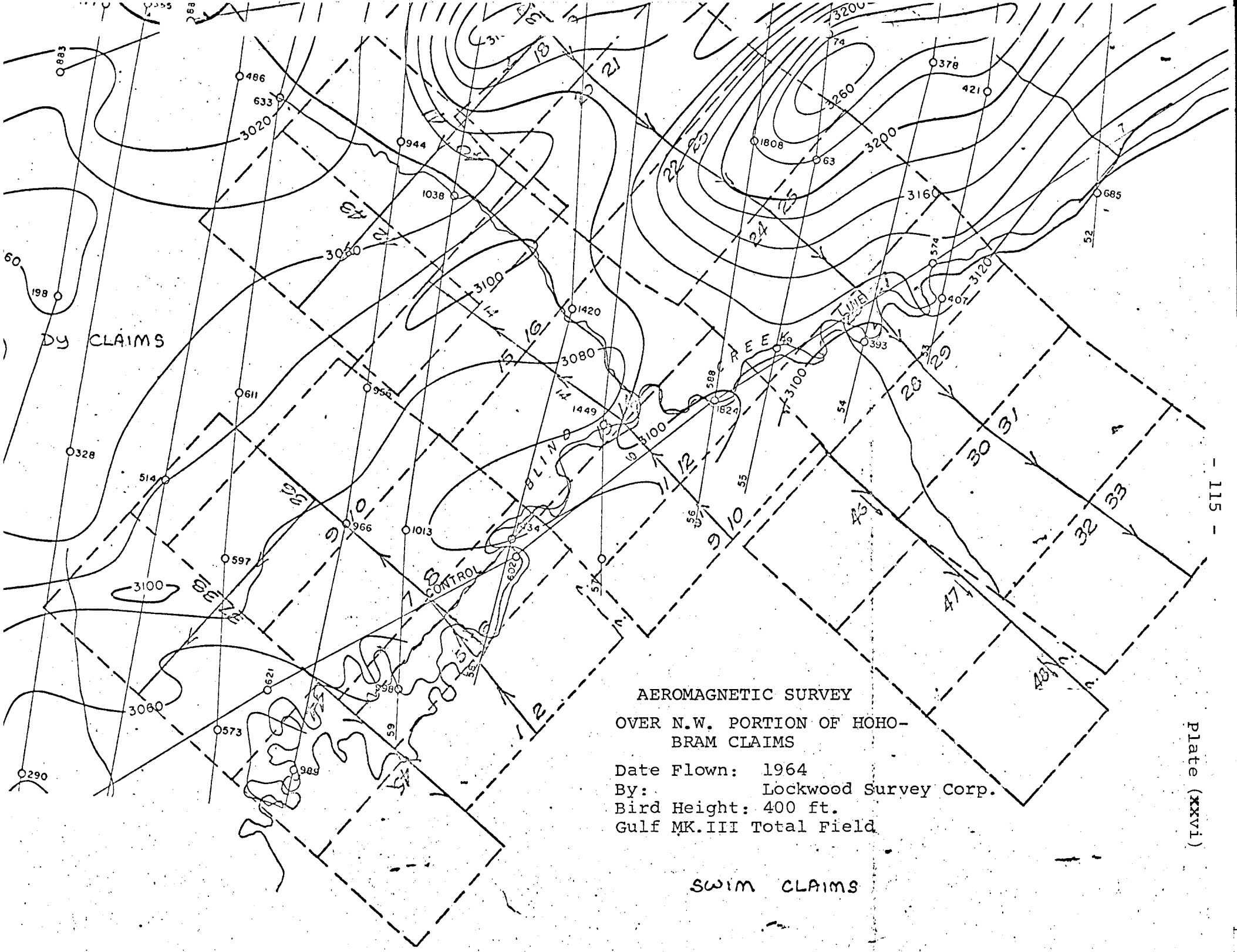
Zinc values range from 20 to 410 ppm, average values are in the order of 60 ppm and threshold is 100 ppm.

The major zinc anomaly in soils coincides with the abovementioned copper and lead anomaly on the northwest border of the property. As expected, the zinc anomaly is larger than the copper and lead anomalies and has dimensions of 2000 feet by 500 feet in width. Several small zinc anomalies were outlined, most are in close proximity to the contact of the Anvil Batholith and are probably of no economic significance.

Geophysical Surveys

A helicopter-borne A.E.M. survey was flown over the Hoho-Bram area in 1965 for Dynasty Explorations by Lockwood Survey Corporation. Two well-defined conductors were outlined, one west of Blind Creek and located within sericite chlorite schists, the other is east of Blind Creek and located within limestone and limy-phyllite units.

The western conductor is partially coincident with a small aeromagnetic expression. This 20 gamma aeromagnetic anomaly



AEROMAGNETIC SURVEY

OVER N.W. PORTION OF HOHO-BRAM CLAIMS

Date Flown: 1964
By: Lockwood Survey Corp.
Bird Height: 400 ft.
Gulf MK.III Total Field

Plate (xxvi)

A.E.M. SURVEY
OVER HOHO-BRAM CLAIMS
Date Flown: 1965
By: Lockwood Survey Corp.
Bird Height: 100 ft.
Lockwood MK III
SWIM CLAIMS
BLIND
TREK

Plate (xxvii)

is likely covered by a thin band of greenstone mapped in close proximity to the plotted location of the aeromag feature. No aeromagnetic survey coverage was completed east of Blind Creek in the vicinity of the property.

Ground geophysical follow-up consisted of Crone C.E.M. surveys and magnetometer surveys over the Hoho-Bram picket-line grid.

Magnetic Survey

A scintrex MF-2 fluxgate magnetometer was used for the magnetic survey. This instrument is hand-held and measures the vertical component of the magnetic field. Cross lines on the gird were 'looped' and readings were corrected for diurnal drift by re-reading established base stations.

A combination of nearly continuous magnetic storms and a suspected malfunction within the circuitery of the magnetometer gave unreliable data thus causing the survey to be abandoned. Available aeromagnetic data was used ror geophysical interpretations.

Electromagnetic Survey

An E.M. survey was carried out over the grid area with a Crone C.E.M. instrument. A horizontal loop configuration was used with a coil separation of 400 feet. Resultant dip angles from the 1800 cps frequency were plotted on a base scale of 1:400 ft. and were profiled and contoured. Field strength ratios were also profiled. A large tense conductor was revealed in the area of the A.E.M. anomaly located west of Blind Creek. This conductor as defined by the C.E.M.

survey has dimensions of 2200 feet by 2400 feet, its major axis trends in an east-west direction and is on strike with the Vangorda Deposit located 5 miles west of the Hoho-Bram claims. Conductive response reaches negative resultant dip angle values in excess of -50 degrees. The negative dip angle profile is typical of flat-lying conductive body. The field strength ratio profiles closely approximate the dip angle response and also typify a flat-lying body of good conductivity.

Three other C.E.M. anomalies were outlined on the grid:

Location-Mid point conductor Axis	Maximum Response	Coincident Features
4E 7N	-20^{o}	Aeromagnetic anomaly
72E 3S	-30^{o}	A.E.M. conductor
72E 18S	$+30^{o}$	

The two anomalies on line 72E are related to the A.E.M. conductor outlined in that area. Ground survey coverage in this area is not complete. The north-south strike of the main axis of the A.E.M. conductor coincides with the strike of nearby outcrops.

WEST SECTOR - LOWER ANVIL CREEK

Rock types similar to the Anvil, Vangorda and Swim deposits are not exposed in this overburden covered area, yet its proximity to the Faro deposit and other properties of merit make these holdings attractive for further work. Diamond drilling of geophysical targets is proposed for a cost of $100,000.

Exploration to date on the Lower Anvil Creek properties has involved the following:

1970	- Geology	- Preliminary regional mapping and geological reconnaissance.
	- Geochemistry	- Regional silt sampling
		- Sidehill contour soil sampling
		- Soil sampling on grids over geophysical anomalies.
	- Geophysics	- Interpretation of aeromagnetic and A.E.M. data from previous surveys.
		- Electromagnetic, magnetic and gravity surveys.
	- Diamond Drilling	- One hole on geophysical anomaly on 'Lorna' grid.
1971	- Geology	- Detailed geologic mapping of stratigraphic and structural features projected northwest of Faro deposits.

Lower Anvil Creek Claims - Geology

The 207 claims included in the Roto, Gran, Lorna, Jean and Aro groups form a contiguous block centred on Anvil Creek. The Anvil Creek claims are underlain by favourable phyllite

although previous mapping has not discerned between non-quartz and quartz rich phyllite. The belt of phyllites, bordered on the north and south by intrusive, are largely covered by fluvial glacial material deposited in the Anvil Creek Valley. Overburden depths in excess of 200 feet are common. Lack of outcrop makes geologic interpretation and correlation with stratigraphy farther to the east difficult. During late 1970 a drill hole tested a coincident magnetic-gravity anomaly on the Lorna group. Massive greenstone and chlorite schist belonging to Unit 3d was encountered throughout the hole. The total depth of the drill hole was 576 feet with the initial 150 feet being overburden.

Regional mapping carried out during the 1971 season was unsuccessful in tracing the quartz rich phyllite northwest of the Anvil Mine. Between the mine and the Anvil Creek fault there is fair geologic correlation indicating the contact of Units 2b and 3b with the absence of Units 3a and 2d. Northwest of the Anvil Creek fault the overburden covered Anvil Creek valley conceals much of the narrow belt of Units 2 and 3. Stratigraphically, the Anvil Creek claims cover Unit 3a, if indeed this unit does exist below the gravel deposits found throughout the Lower Anvil Creek area.

Roto Group

Bedrock is exposed only in the northern part of the claim group, where massive horizons of amphibolite alternate with phyllite outcrop periodically. The stratigraphy dips gently to the south and under the main part of the claim group. Mineralization is confined to a few specks of pyrrhotite in the phyllite. The amphibolite is quite magnetic and its ubiquity in the area could explain the broad mag anomalies. A strange metallic mineral was found in massive amphibolite on

line E32 at station 1300N; it is not unlike galena, however, its presence in amphibolite leaves some doubt as to its identity. In general, the crystals are too minute to see with a hand lens. The mineral is metallic, has a black streak and a hardness of about 4. It makes up about 1-2% of the whole rock.

Lorna Group

This group, located on the south side of Anvil Creek, is underlain by southerly-dipping black phyllites and mica-quartz schist intercalated with minor amphibolite horizons. No mineralization apart from some pyrrhotite and specks of galena in quartz was found on the group. Sericitic alteration in the mica-quartz schist as well as alteration in greenstones were observed along the cliffs outcropping on Anvil Creek. Stratigraphically and structurally, the Lorna is well located since it overlies the phyllite-mica-quartz schist contact.

Gran Group

No outcrop was observed on this group except for granite along its north boundary. Mapping to the southwest and north of the group suggests that the Gran is underlain party by granite in possible contact with mica-quartz schist and/or phyllites.

Jean Group

No outcrop was observed on this property. However, mapping carried out along regional strike indicates that the claims could be underlain by phyllites. The proximity of the mica-quartz schist contact is unknown, however, it appears that the group may be too 'high' up in the phyllites.

Aro Group

Much of the Aro group appears to overlie quartz biotite-sericite schist and possibly quartz rich phyllite. Outcrop of quartz biotite-sericite schist in the Anvil Creek canyon is slightly altered by the nearby intrusive. Minor pyrite and pyrrhotite are disseminated throughout as well as traces of galena. This claim group is stratigraphically well located.

The Anvil Creek properties hold good possibilities for discovery of a large lead-zinc orebody. The claims, cover a portion of the belt on strike with the linear trend of known deposits;cover favourable stratigraphy; and cover several geophysical anomalies similar in character to others caused by the known sulphide deposits in the area. Further geologic information is required to assess this area. A minimum of three drill holes are proposed to test stratigraphy within the Lower Anvil Creek claims

Geophysics of the Lower Anvil Creek Claims

A brief description of the general geophysical and geological features of each of the Lower Anvil Creek properties follows. Further and more detailed interpretations of these results may be referred to within individual reports dealing with each claim group.

Lorna Group

Geologic, geochemical and geophysical surveys, as well as diamond drilling, so far have suggested that the existing geophysical anomalies are caused by a denser greenstone body. However, greenstone units have been mapped in close proximity to the Faro orebody as well as the Vangorda deposit. Further work is warranted to determine if the geophysical anomalies

are caused by greenstone alone. An electromagnetic survey over magnetic and gravity anomalies will indicate the conductiveness of the causative mass. Additional gravity surveys should also be done to detail the existing gravity anomaly and provide additional information for location of future drill holes.

Roto Group

Exploration work carried out on the Roto Group outlined a possible greenstone body within phyllitic rocks. Plans are to extend the present survey grid to the west over an airborne electromagnetic anomaly and to conduct electromagnetic and gravity surveys in that area.

Drilling of existing geophysical targets will be done in 1972. At the same time, selected deep drilling is planned to properly locate the stratigraphic position of the phyllite unit.

Gran Group

The Gran mineral claims cover a quartz-mica schist unit contacting the Anvil Batholith. The geologic setting is similar to that of the Faro claims where quartz-mica schist is found above are. Coincident airborne magnetic and electromagnetic responses have been defined on the property. Further ground follow-up surveys are required to better position drill targets.

Jean Group

Two reconnaissance lines of gravimetric survey did not conclusively indicate a causative structure coincident with airborne geophysical targets on the Jean claims. In order to properly explore the potential of the Jean Group, a control picket-line grid must be established, deep penetrating electromagnetic surveys run, followed up by drill testing of conductors.

Aro Group

The Aro Group was staked to cover airborne magnetic and electromagnetic anomalies to the west and north of the Lorna claims. The Aro claims are stratigraphically well located, covering a band of quartz-sericite schist, the host for the massive sulphide deposits in the Anvil Range. The proposed budget will provide funds for detailed ground geophysical, geochemical and geological surveys to assess the airborne anomalies.

A compilation map, Figure 21, shows the relative locations of more pertinent geophysical and geochemical anomalies.

PROPOSED EXPLORATION

Drilling of numerous geophysical targets and other specific areas for additional geologic information is recommended for a continuation of this program through 1972.

Emphasis on a continued regional geologic mapping program to further define the limits of the phyllite unit is also warranted. Regional and detailed mapping should be continued next season throughout areas of 'open' ground where quartz rich phyllite probably occurs. The known section of Unit 3a should be traced north from the Capa group through to the general area of the Ace claims. The large area located north of the Lower Anvil Creek claims, west of Anvil Creek, and southwest of Anvil Lakes containing phyllite and schist should also be investigated by detailed geologic mapping.

Additional claim staking of geophysical anomalies found over areas of favourable geology will be carried out in anticipation of follow-up drilling.

Certain areas of conductive response will be further investigated with gravity and magnetic surveys.

Of primary importance is the need for drill information from existing target areas. In view of this, drill holes to a maximum depth of 600 feet are recommended.

Rock geochemical analysis will be carried out on all holes drilled to aid in logging as well as to possibly follow significant geochemical trends within the individual rock units.

Overburden samples will also be taken for geochemical analysis in the hope that subsurface sulphide float trains, not geochemically obvious from surface sampling, may be mapped.

Drilling is recommended for the following targets :

Hoho-Bram Claims

	Hole	Location	Target
72-27	D.D.H. 1	Hoho-Bram grid 28W 35S	CEM-Ve dip angle AEM conductor Cu anomaly in soils
72-28	D.D.H. 2	Hoho-Bram grid 20W 30S	Aeromag anomaly CEM anomaly AEM conductor
72-29	D.D.H. 3	Hoho-Bram grid 4E 10N	CEM anomaly Aeromag anomaly
72-30	D.D.H. 4	Hoho-Bram grid 72E 20S	+Ve CEM dip angle
72-31	D.D.H. 5	Hoho-Bram grid 72E BL	-Ve CEM dip angle AEM conductor

Lower Anvil Creek Claims

Hole No.	Location	Target
72-32	Gran Claims	Gravity anomaly on flank of magnetic anomaly in close relation to zinc geochemical anomaly in silts.
72-33	Gran Claims	Gravity anomaly coincident with zinc in soils
72-34	Aro Claims	Drill test for geologic information to confirm presence of phyllite host.
72-35	Aro Claims	Drill test for geologic information to confirm presence of phyllite host. H.E.M. conductor
72-36	Roto Claims	Drill hole for geologic information, aeromagnetic anomaly.
72-37	Roto Claims	Gravity anomaly
72-38	Roto Claims	Gravity anomaly

Hole No.	Location	Target
72-39	Roto Claims	Gravity anomaly coincident with zinc in soils.
72-40	Roto Claims	Magnetic-gravity anomaly coincidence
		Magnetic-H.E.M. anomaly coincidence
72-41	Gran Claims	H.E.M. conductor
72-42	Lorna Claims	Aeromagnetic anomaly
72-43	Roto Claims	H.E.M. conductor axis

CONCLUSIONS

The Anvil Range is an area holding a high potential for discovery of massive lead-zinc deposits. Although the source and process of mineralization is still unknown, all major zinc-lead mineralization is apparently stratigraphically controlled. The Faro orebodies, the Swim, Vangorda, Champ and Firth deposits, as well as the Sea showings, occur in quartzite within Unit 3a, the quartz rich phyllite. Pre-metamorphic emplacement is proposed since the deposits have features common to metamorphosed ores. Structural controls of ore deposition, if any, have been obliterated by metamorphism. Only through recent exploration has the extent and potential of the quartz rich phyllite host been realized. Detailing of such areas with geophysics and follow-up drilling will be an integral part of continued exploration as based on previous success with similar programs.

The success of the exploration leading to the discovery of the Faro orebodies was based on thorough prospecting of 'elephant country' for geophysical anomalies of a certain size and particular type. Further exploration of the area is warranted. Other major deposits can be discovered at depth in the district with recent better-developed and improved exploration techniques because the known discoveries all occur at the present fortuitous bedrock erosion surface, sizeable areas therefore remain relatively unexplored. Numerous, more subtle geophysical targets, have not been investigated by more detailed interpretations and drilling. Refinements in geologic, geochemical and geophysical approach using previous methods as a base will undoubtedly reveal other deposits in the area. Modifications of the electromagnetic method both for airborne and ground surveys, to allow greater depth penetration and conductor discrimination coupled with gravimetric detailing of all conductors, has been found to be the best method of continued geophysical

exploration in selected geologic environments of the Anvil area. All targets will have to be systematically drilled without exception since the most obvious massive sulphide targets would appear to have been found.

The current holdings of Dynasty Explorations within the Anvil area are well located with respect to the quartz rich phyllite section that hosts other massive sulphide deposits in the area. All properties require extensive drill testing of geophysical anomalies closely related to similar magnetic, electromagnetic and gravimetric expressions over known sulphide occurrences found in the Anvil Range.

Respectfully submitted,

J. S. Brock

W. J. Roberts

P. Dean

LEGEND

AGE	PROBABLE THICKNESS		
TERTIARY	140'	14	14 — FINELY LAMINATED, LIGHT GREY, DEVITRIFIED TUFF. (913)
	140'	14	14 — APHANITIC, LIGHT GREEN TO MEDIUM GREY, MEDIUM QUARTZ FELDSPAR PORPHYRY.
			MASSIVE, MEDIUM GREY, PORPHYRITIC MONZONITE. (942)
			ANVIL BATHOLITH
			MEDIUM GREY, EQUIGRANULAR TO PORPHYRITIC AND FOLIATE, MEDIUM GRAINED QUARTZ-FELDSPAR PHYRIC RANGES FROM BIOTITE QUARTZ MONZONITE TO BIOTITE GRANODIORITE. (928)
TRIASSIC	300'	10a	10a — THIN BEDDED, PLATY, MEDIUM GREY CALCAREOUS SLATE, WITH LOCALLY INTERBEDDED FINE GRAINED ARGILLACEOUS LIMESTONE.
TRIASSIC	2000'	10	10 — BROWN WEATHERING CONGLOMERATE WITH QUARTZITE, SCHIST GRANITE GNEISS, BASALT, CHERT AND LIMESTONE PEBBLES. (944)
U. PERMIAN TO TRIASSIC		9	9 — DARK GREEN TO BLACK SERPENTINITE AND RELATED PERIDOTITE. (907)
U. PERMIAN		8c	8c — ANVIL RANGE GROUP ORIGINALLY LIGHT GREY CRINOIDAL OR BIOCLASTIC LIMESTONE, NOW RECRYSTALLIZED, WEATHERS BUFF, CONTAINS MINOR QUARTZ, ESSENTIALLY A SPARITE. (906)
PERMIAN	1500'	8b	8b — MEDIUM TO DARK GREEN, MASSIVE, BASALTIC VARIETIES INCLUDING TUFFS, MASSIVE AMYGDALOIDAL FLOWS, PILLOWS AND PYROCLASTIC TYPES. (908)
L. PERMIAN	2000'	8a	8a — PALE GREEN, GREENISH BROWN, LIGHT GREY MASSIVE TO THIN BEDDED ARGILLACEOUS AND TUFFACEOUS CHERT, WEATHERS OFF-WHITE LOCALLY BRICK RED DUE TO HEMATITE JASPER LOCALLY BRECCIATED. (926)
U. DEVONIAN TO MISSISSIPPIAN		7	7 — DARK GREY TO BLACK, MASSIVE TO THICK BEDDED, GRAPHITIC CHERT, ASSOCIATED DARK GREY GRAPHITIC CHERTY ARGILLITE AND ARGILLACEOUS SILTSTONE, MINOR ARGILLACEOUS LIMESTONE, GREYWACKE AND CHERT PEBBLE CONGLOMERATE. (918)
M. DEVONIAN	100'	6	6 — THIN BEDDED, PLATY, BLACK, CARBONACEOUS FETID, CRINOIDAL LIMESTONE TO MASSIVE BUFF WEATHERING GREY, BIOCLASTIC DOLOMITE. (905)
SIL. DEVONIAN	50'	5	5 — MASSIVE MED. TO LIGHT GREY, MED.-COARSE GRAINED ORTHOQUARTZITE. (927)
ORDOVICIAN SILURIAN	400'	4	4 — GRAPTOLITIC BLACK CARBONACEOUS SLATE, BLACK SILTY SHALE, ARGILLITE, MINOR BLACK CHERT BANDS, MINOR PYRITE. (949)
		3d	3d — "GREENSTONE" DARK TO PALE GREEN FOLIATED TO MASSIVE AMPHIBOLITE, CHLORITIC TUFF, AND ANDESITE. (911)
		3c	3c — THINLY LAMINATED SILTY LIMESTONE, INTERBEDDED LAMINAE OF PHYLLITE AND SILTY FINE GRAINED GREY LIMESTONE. (920)
MIDDLE UPPER CAMBRIAN?	4000'+	3b	3b — SILVERY GREY WEATHERING, GREY TO BLACK FOLIATED SERICITE CHLORITE, BIOTITE, GRAPHITE PHYLLITE. CAN CONTAIN LARGE GREENSTONE LENSES. (934)
		3a	3a — LIGHT TO DARK GREY, BLACK QUARTZ SERICITE, BIOTITE, CHLORITE, PHYLLITE. ALSO INCLUDES QUARTZ GRAPHITE PHYLLITE (3aq) AND QUARTZITE (3aq) GENERALLY CONTAINS SMALL GREENSTONE LENSES. (933)
		2f	2f — DARK GREEN MASSIVE AMPHIBOLITE OCCURING AS LENSES THROUGHOUT UNIT 2. (921)
		2d	2d — TAN WEATHERING MEDIUM GRAINED QUARTZ BIOTITE SERICITE (MUSCOVITE) SCHIST WITH ANDALUSITE, GARNETS, AND STAUROLITE. (941)
LOWER CAMBRIAN?	2000'+	2c	2c — MASSIVE WHITE TO CREAMY CRYSTALLINE LIMESTONE TO MARBLE. (903)
		2b	2b — WHITEISH WEATHERING, BANDED PALE TO DARK GREEN, PURPLISH BROWN BANDED CALC-SILICATES WITH PHYLLITIC AND SCHISTOSE PARTINGS. (916)
		2a	2a — BROWN WEATHERING, MEDIUM TO COARSE GRAINED QUARTZ BIOTITE SCHIST WITH MINOR MUSCOVITE, ANDALUSITE, GARNET, AND STAUROLITE PORPHYROBLASTS COMMON. (947)
PROTEROZOIC		1	1 — "GRID UNIT" GREY WEATHERING MEDIUM - DARK GREY, MUSCOVITE METAQUARTZITE LOCALLY COLOUR BANDED, MINOR CHLORITE, TOURMALINE AND CARBONATE. INTERBEDDED BLACK GRAPHITIC QUARTZITE COMMON. (946)

SYMBOLS

- LIMIT OF MAPPING
- FOLIATION
- POSTULATED FOLD AXIS
- DEFINED, ASSUMED FAULTS
- CONTACTS, DEFINED, ASSUMED
- CLAIM BOUNDARIES
- MASSIVE SULPHIDE DEPOSITS

CROSS - SECTION 'A-A' LOOKING NORTHWEST
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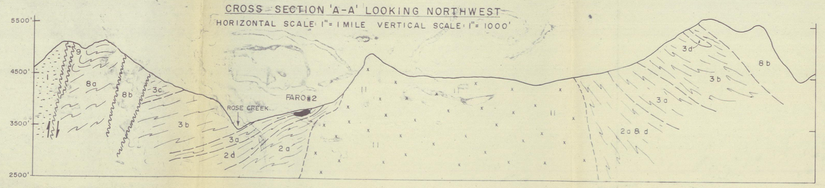
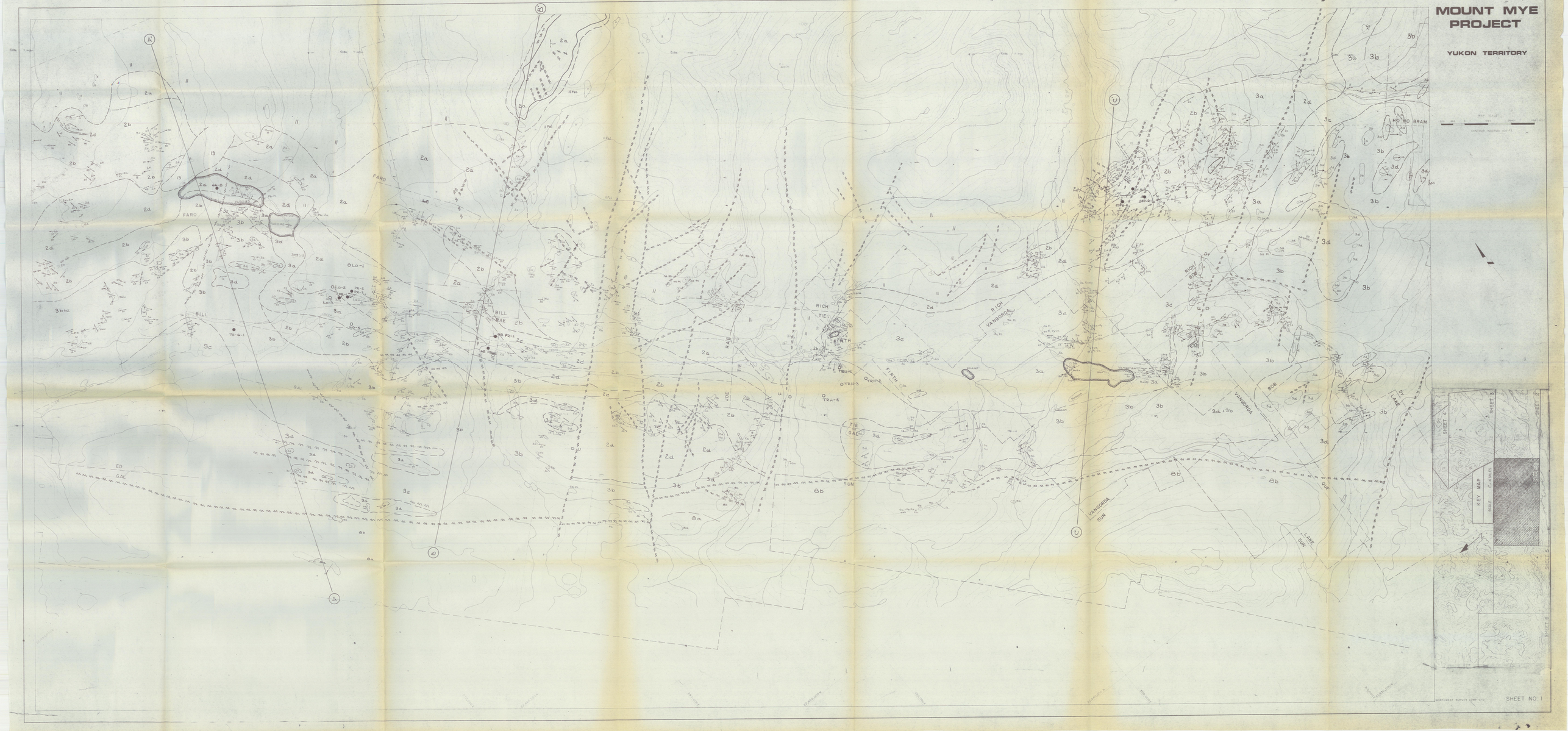


DYNASTY EXPLORATIONS LTD.	
TINTINA ANVIL PROJECT	
REGIONAL GEOLOGY NTS - 105 K 2,3,5,6,& 7	
GEOLOGY:	W.J. ROBERTS, P. DEAN after B. KARVINEN and D. TEMPLEMAN-KLUIT
SCALE:	1" = 1 MILE
DATE:	NOVEMBER, 1971

MOUNT MYE PROJECT

YUKON TERRITORY



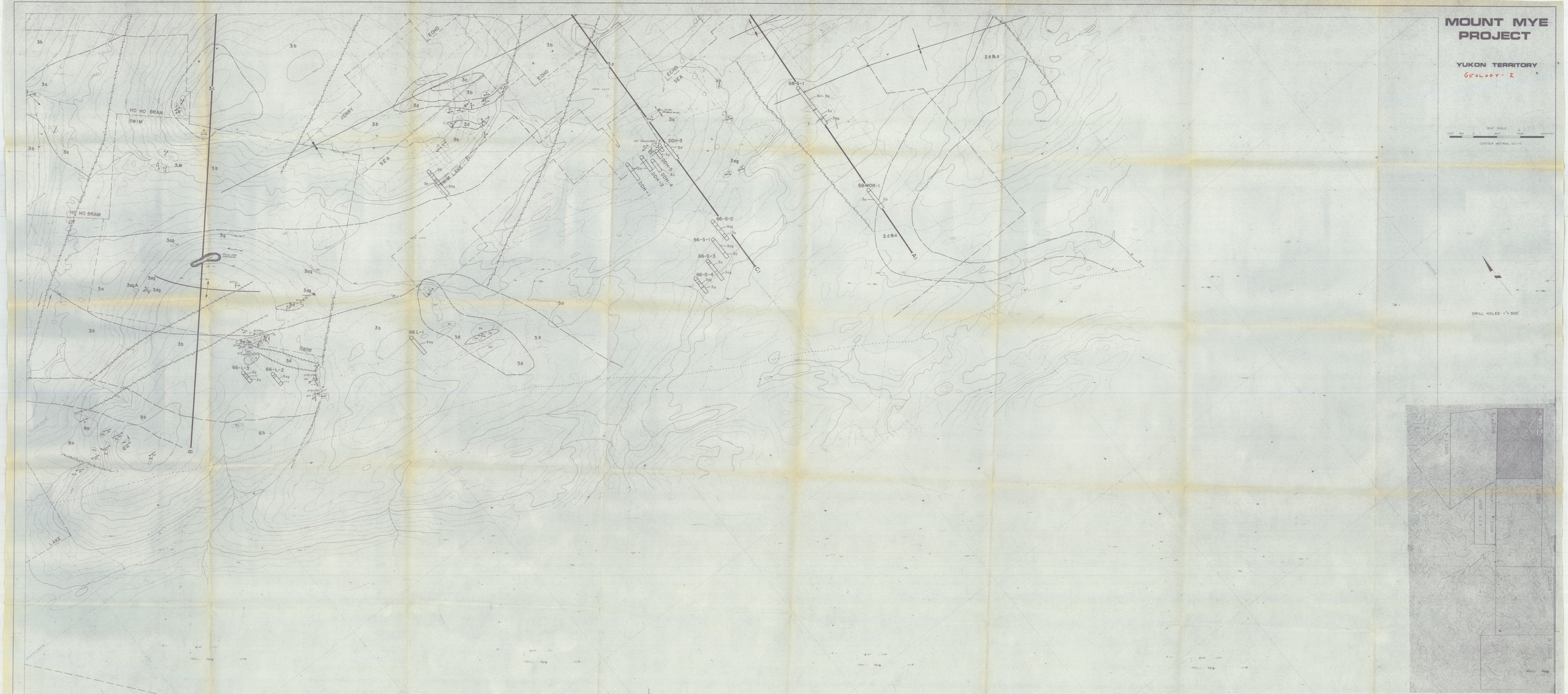
NORTHWEST SURVEYS COMP. LTD.

SHEET NO. 1

MOUNT MYE PROJECT

YUKON TERRITORY

GEOLOGY - 2



MAP SCALE

CONTOUR INTERVAL 100 FT.

DRILL HOLES: 1"= 500'

NORTHWEST SURVEY COMP. LTD.

SHEET NO. 2

MOUNT MYE PROJECT
YUKON TERRITORY
GEOLOGY SHEET 3
MAP SCALE
CONTOUR INTERVAL 100 FT
DRILL HOLES 1" = 500'
KEY MAP
SHEET 1
SHEET 3
SHEET 4
SHEET 5
SHEET 6
NORTHWEST SURVEY CORP. LTD.
SHEET NO. 3
BRH-1
BRH-2
BRH-3
CRH-1
CRH-2
CRH-3
CRH-5
NRH-1
NRH-2
NRH-3
CAPA
ECHO
DELTA
NASTY
FELSITE DIKE
FLOAT
2a
2a-2b
2c
2d
2d?
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3b
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14a
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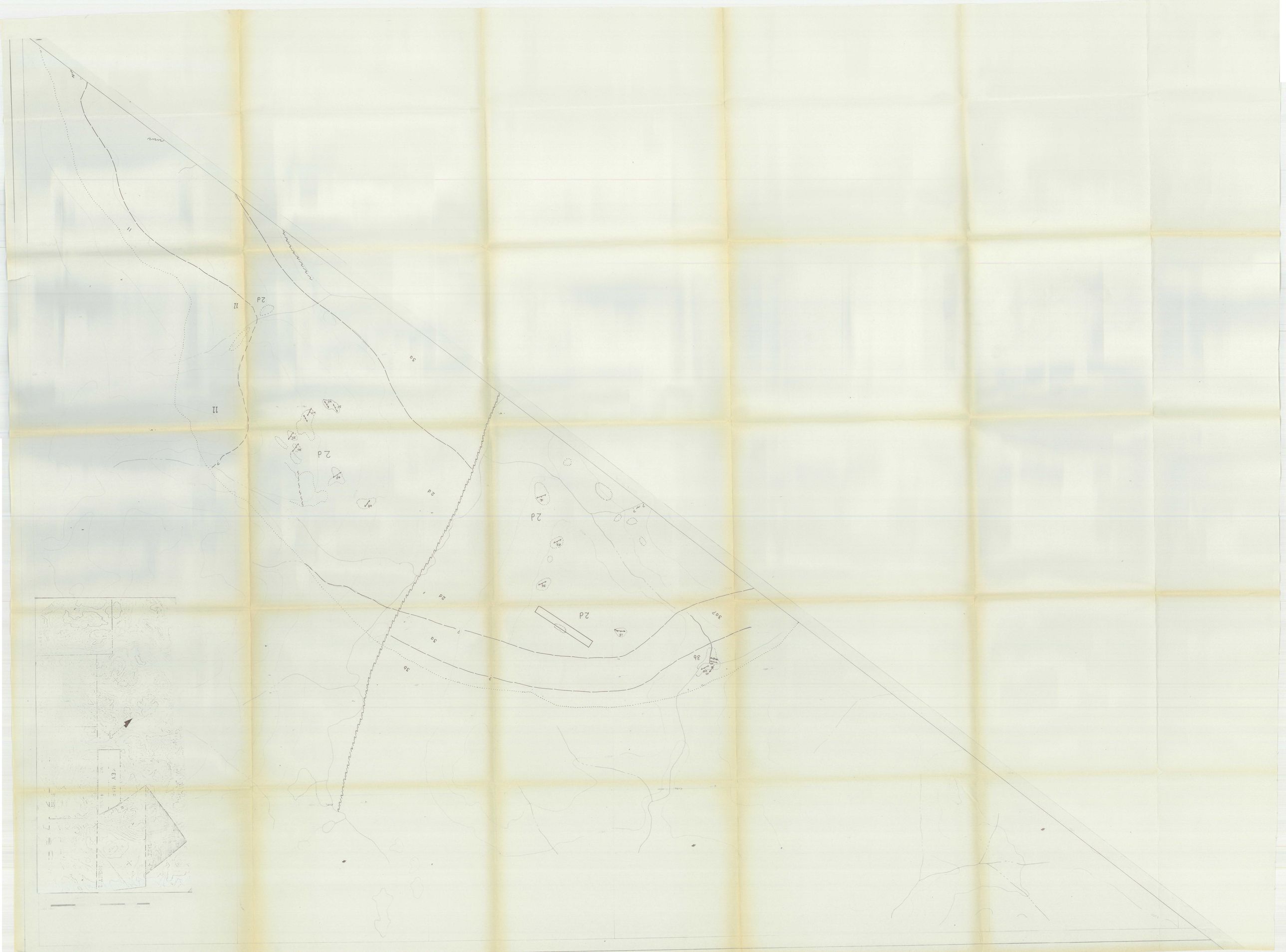

II
2d
30
II
2d
2d
2d
30
36
30
2d
II
KEY MAP
SHEET 2

YOUNGER VOLCANICS AND SEDIMENTS

YOUNGER VOLCANICS AND SEDIMENTS

HOG GAL

JO GAL

ARO LORNA

ARO

ROTO

FARO

JO FARO

LEE FLAG

KEY MAP

SCALE 1" = 4 MILES

SHEET 1

SHEET 2

SHEET 3

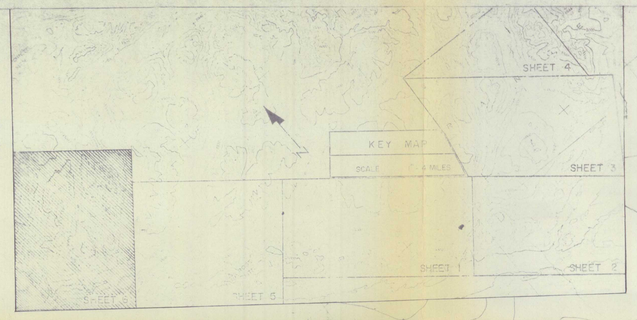
SHEET 4

SHEET 5

SHEET 6

CONTOUR INTERVAL 100 FT.

MAP SCALE


KEY MAP
SCALE 1" = 5 MILES
SHEET 4
SHEET 3
SHEET 1
SHEET 2
SHEET 5
SHEET 6
N
CONTOUR INTERVAL 50 FEET
MAP SCALE
1 MILE

3d
3b
2a
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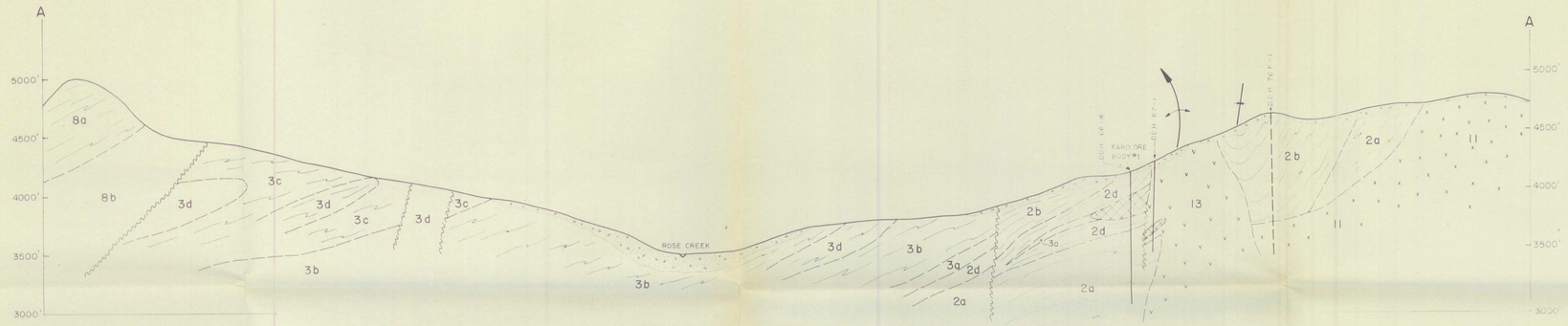
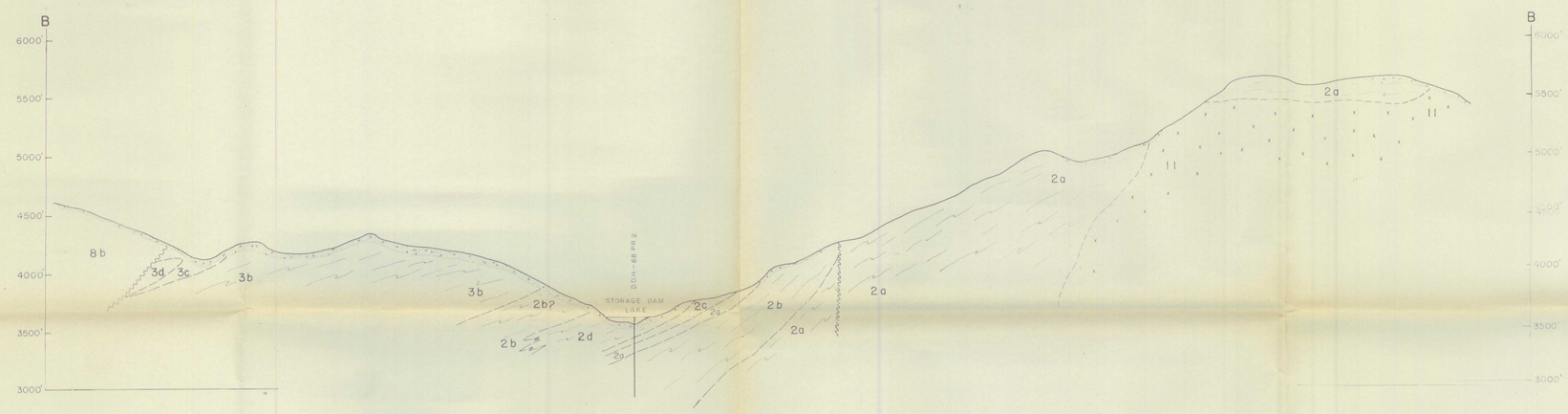
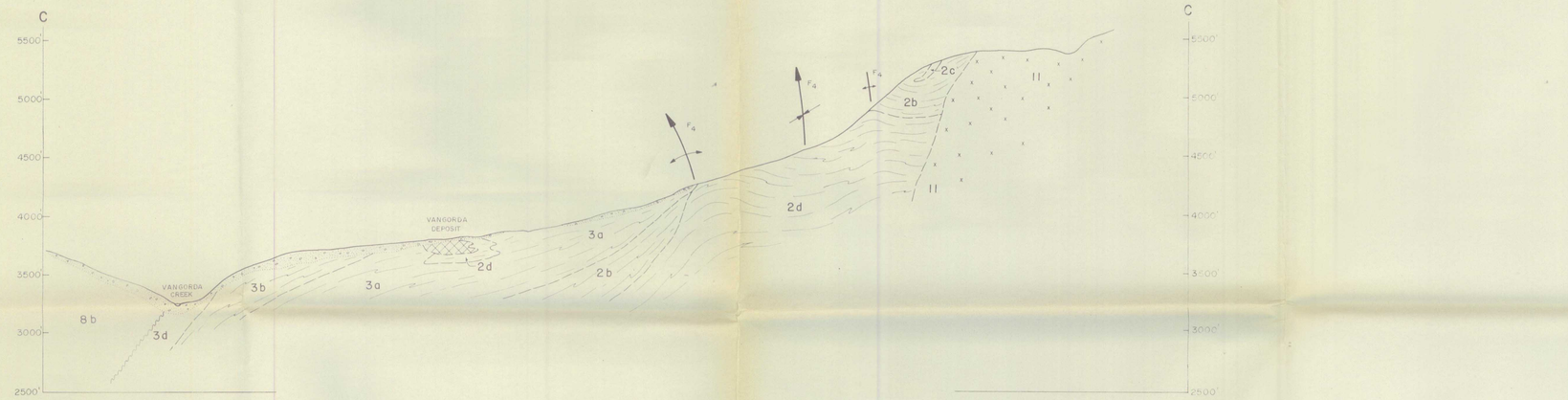
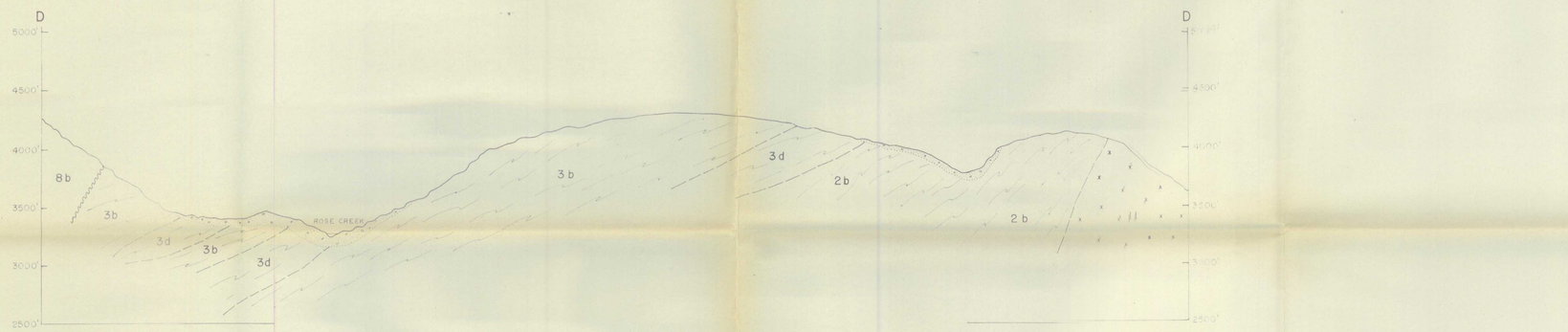
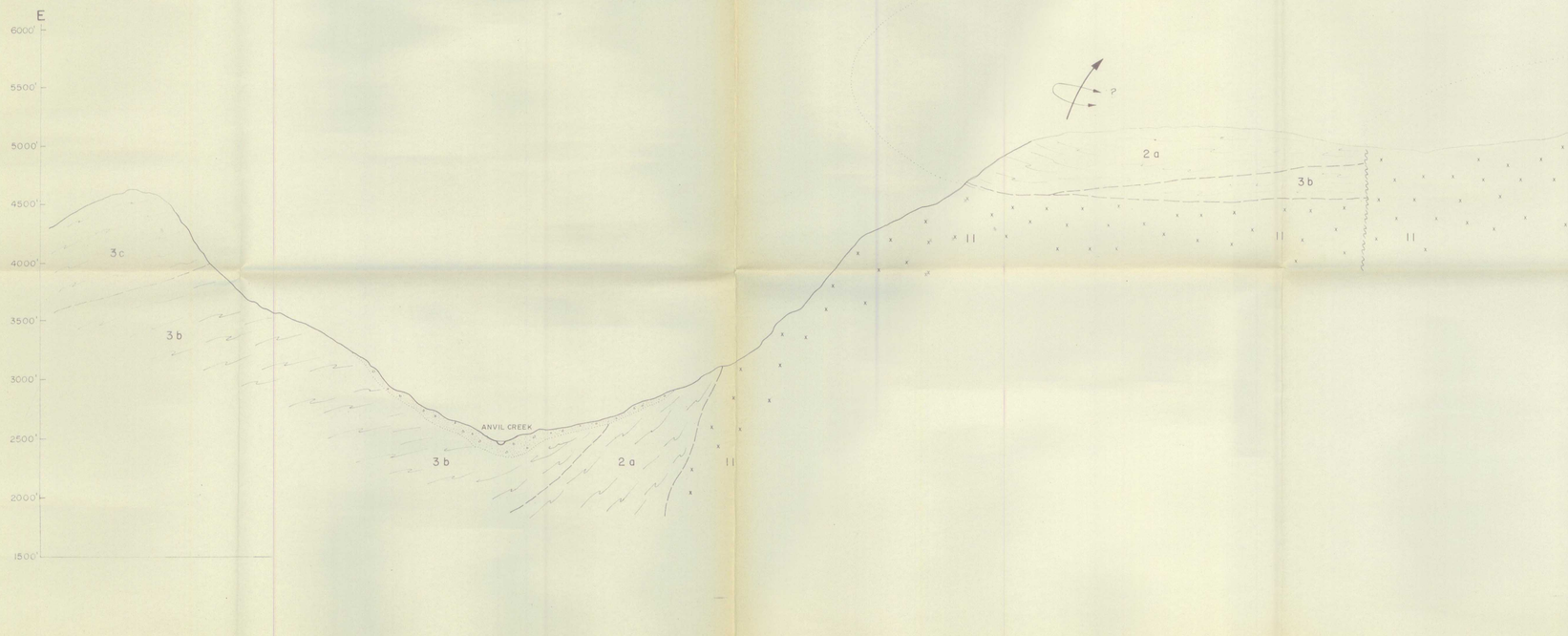
3c
3d
3b
3c
JEAN
GRAN
ARO
ARO
LORNA
E1
E
D











LEGEND

- ---GEOLOGICAL CONTACT, ASSUMED
- ---S_2 FOLIATION
- ---POSTULATED FOLD AXIS
- ---ASSUMED FAULT
- ---MASSIVE SULPHIDE DEPOSIT
- ---OVERBURDEN

AGE		PROBABLE THICKNESS
CRETACEOUS TO TERTIARY		15
INTRUSIVE		
PROTEROZOIC	PRE-68	61
	3d	3d—
	3c	3c—
	3b	3b—
	3a	3a—
	2c	2c—
	2d	2d—
	2b	2b—
	2a	2a—

ANVIL BATHOLITH

61— MASSIVE TO SOMEWHERE, MEDIUM TO COARSE GRAINED BIOTITE GRANITE TO QUARTZ MONZONITE AND PEGMATITE (1968)

3d— CARBONATE, QUARTZ TO BLUE QUARTZ, SERICITE, CHLORITE PHYLLITE (1968)

3c— THINLY LAMINATED, SILTY LIMESTONE ALTERNATING LAMINAE OF PYRRHOTITE AND SILTY WHITE BANDED GREY LIMESTONE (1970)

3b— 3 SUB-UNITS DARK GREY, BLACK QUARTZ SERICITE, BIOTITE, CHLORITE, PHYLLITE & SILTY LIMESTONE, QUARTZ - PYRRHOTITE PHYLLITE (1964) AND GRANITE (1968) GENERALLY CONTAINS SMALL GROUND AND LENSES (1970)

3a— 3 SUB-UNITS DARK GREY, BLACK QUARTZ SERICITE, BIOTITE, CHLORITE, PHYLLITE & SILTY LIMESTONE, QUARTZ - PYRRHOTITE PHYLLITE (1964) AND GRANITE (1968) GENERALLY CONTAINS SMALL GROUND AND LENSES (1970)

2c— DARK GREEN MASSIVE AMPHIBOLITE OCCURS AS LENSES THROUGHOUT UNIT 2 (1971)

2d— TAN WEATHERING MEDIUM GRAINED QUARTZ SERICITE (MUSCOVITE) SCHIST WITH MINOR BIOTITE, GARNET AND STAUROLITE (1968)

2b— MASSIVE WHITE TO CREAMY CRYSTALLINE LIMESTONE TO MARBLE (1965)

2b— WHITE ISH WEATHERING, SANDED, PALE TO DARK GREEN TO REDDISH BROWN BANDED CALC SILICATES WITH PHYLLITIC AND SCHISTOSE PARTINGS (1965)

2a— BROWN WEATHERING, MEDIUM TO COARSE GRAINED QUARTZ BIOTITE SCHIST WITH MINOR MUSCOVITE, ANDALUSITE, GARNET AND STAUROLITE PORPHYROBLASTS COMMON (1967)

DYNASTY EXPLORATIONS LTD.

TINTINA ANVIL PROJECT

GEOLOGIC CROSS - SECTIONS

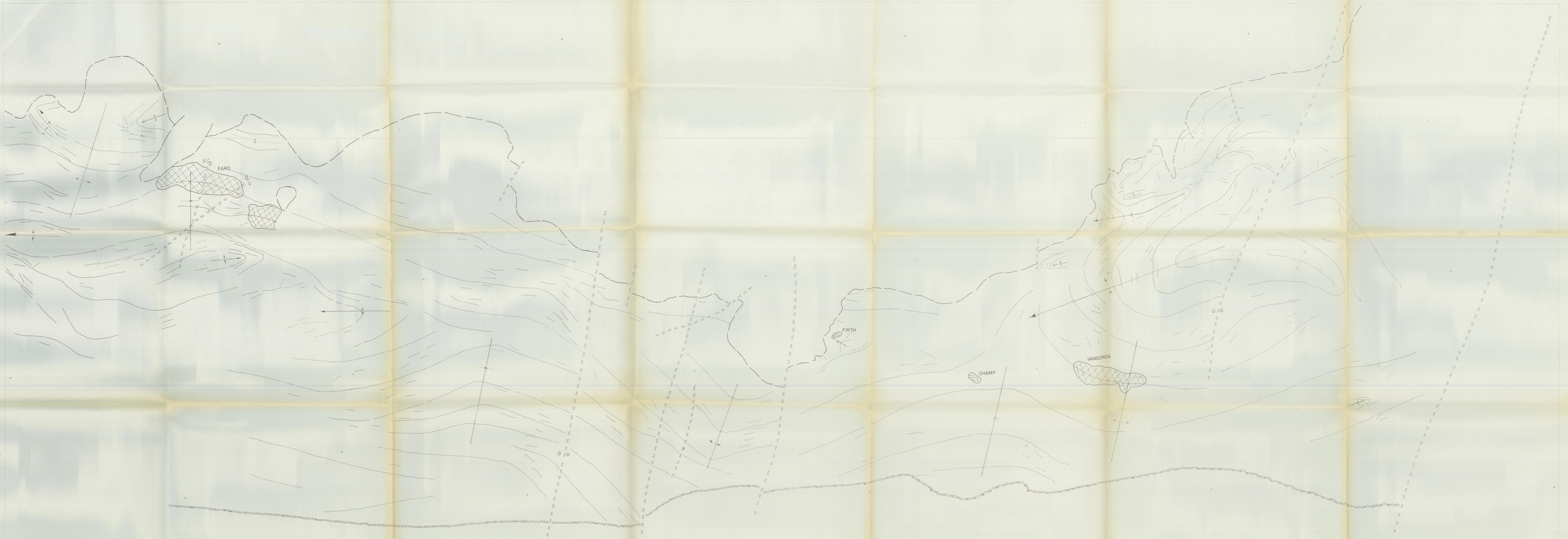
LOWER ANVIL CREEK TO BLIND CREEK

HORIZONTAL SCALE: 1"= 1320', VERTICAL SCALE: 1"= 500'

GEOLOGY BY: W. ROBERTS

DRAWN BY: C. GEORGE

DATE: NOVEMBER, 1971



LEGEND

- ASSUMED FOLD AXIS
- FORM LINES
- ANVIL BATHOLITH
- ASSUMED FAULTS
- FAULT OR UNCONFORMITY
- ORE DEPOSIT

DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL PROJECT

FARO - BLIND CREEK
STRUCTURAL OVERLAY

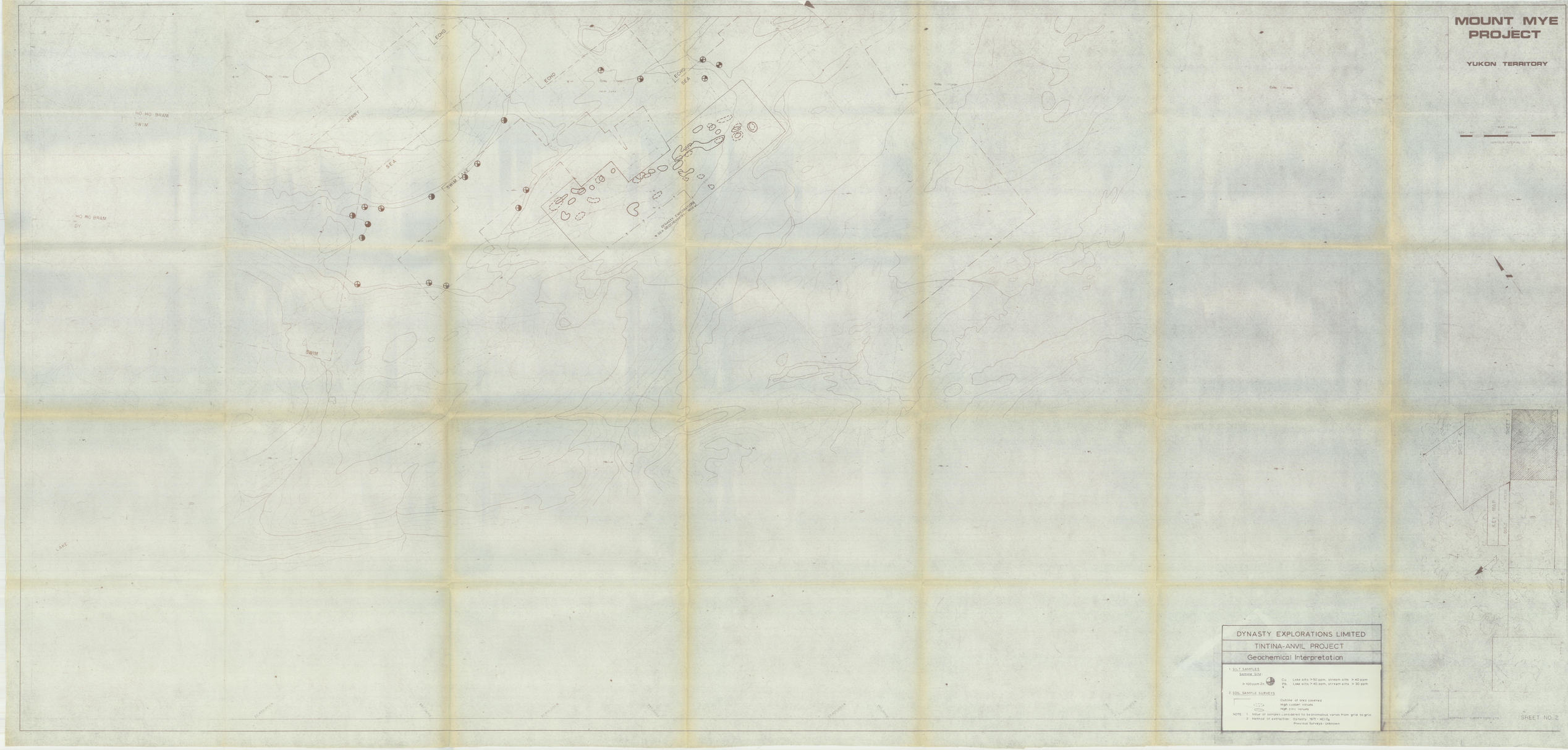
NAME W. ROBERTS
SCALE 1" = 1320'

GEOLOGY W. ROBERTS
P. DEAN

DATE NOVEMBER 18, 1971

MOUNT MYE PROJECT

YUKON TERRITORY



DYNASTY EXPLORATIONS LIMITED

TINTINA-ANVIL PROJECT

Geochemical Interpretation

1 SILT SAMPLES

Sample Site

> 100 ppm Zn

Cu Lake silts > 50 ppm, stream silts > 40 ppm

Pb Lake silts > 40 ppm, stream silts > 30 ppm

Zn

2 SOIL SAMPLE SURVEYS

Outline of area covered

High copper values

High lead values

NOTE 1 Value of samples considered to be anomalous varies from grid to grid.

2 Method of extraction: Dynasty 1971 - $HClO_4$

Previous Surveys - unknown

SHEET NO. 2

MOUNT MYE
PROJECT
YUKON TERRITORY
CAIN
ECHO
DELTA
DYNASTY EXPLORATIONS LIMITED
TINTINA-ANVIL PROJECT
Geochemical Interpretation
SHEET NO.

N

GRAN

ARO

JEAN

LORNA

ROTO

ANVIL CREEK

ROSE CREEK

CAMP

100 PPM Zn

100 PPM Zn

100 PPM Zn

DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL PROJECT

LOWER ANVIL CREEK AREA
ROTO, GRAN, JEAN, LORNA, ARO CLAIMS

GEOCHEMICAL INTERPRETATION

ANOMALOUS SAMPLES:
- Cu > 50ppm
- Pb > 30ppm
- Zn > 100 ppm

SILT SAMPLE SITES:

SOIL SAMPLE SITES: x

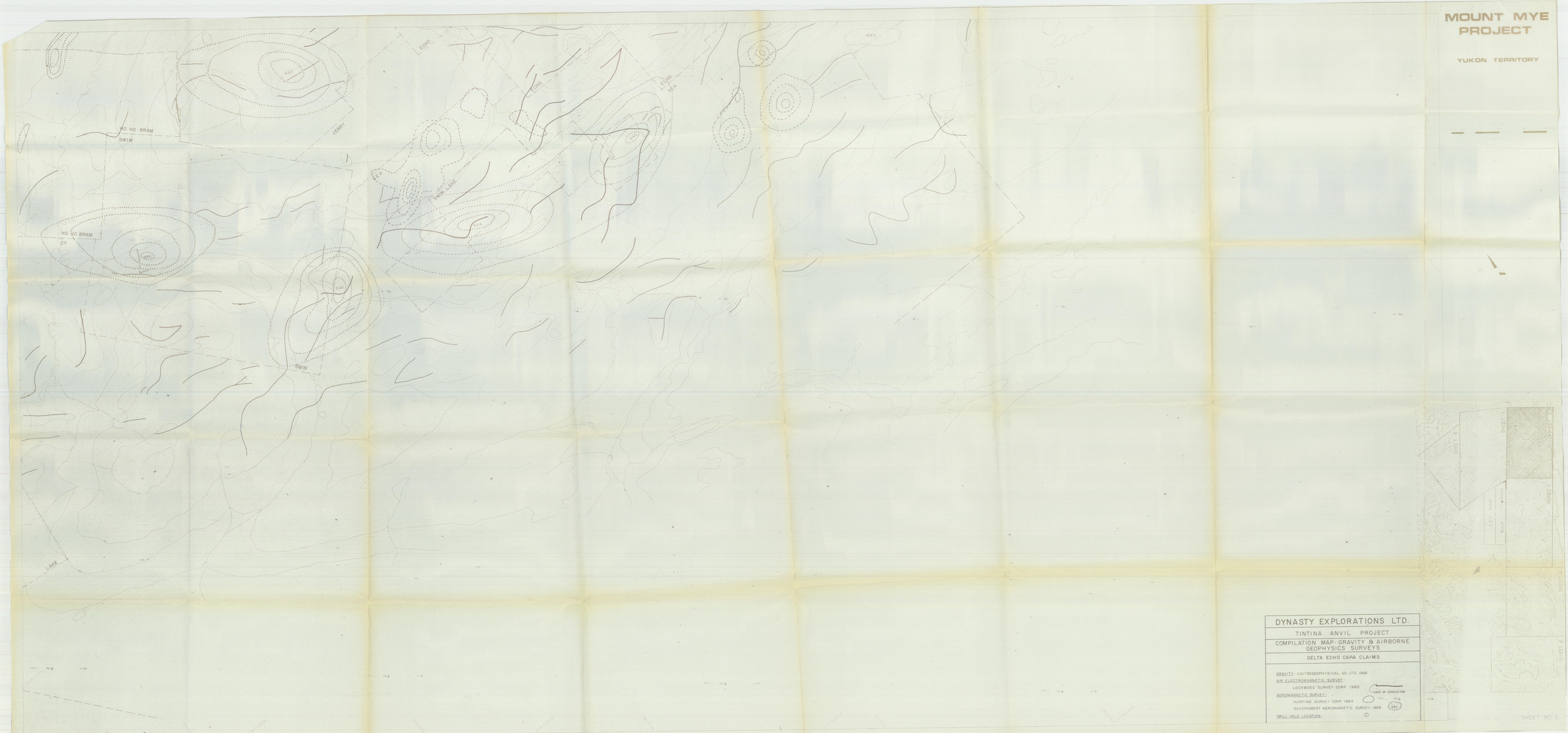
COPPER CONTOURS:

ZINC CONTOURS:

SAMPLED: 1970

January 1972

PART OF SHEETS 5 & 6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PROJECT
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DYNASTY EXPLORATIONS LTD.
TINTINA ANVIL PROJECT
COMPILATION MAP: GRAVITY & AIRBORNE GEOPHYSICS SURVEYS
DELTA ECHO CAPA CLAIMS
GRAVITY: UNITEDGEOPHYSICAL CO. LTD. 1966
AIR ELECTROMAGNETIC SURVEY:
LOCKWOOD SURVEY CORP. 1965
AXIS OF CONDUCTOR
AEROMAGNETIC SURVEY:
HUNTING SURVEY CORP. 1964
GOVERNMENT AEROMAGNETIC SURVEY 1968
DRILL HOLE LOCATION:

MOUNT MYE PROJECT

YUKON TERRITORY

DYNASTY EXPLORATIONS LTD.

TINTINA ANVIL PROJECT

COMPILATION MAP GRAVITY & AIRBORNE GEOPHYSICS SURVEYS

DELTA ECHO CAPA CLAIMS

GRAVITY UNITED GEOPHYSICAL CO LTD 1966

AIR ELECTROMAGNETIC SURVEY:
LOCKWOOD SURVEY CORP. 1965

AEROMAGNETIC SURVEY:
AXIS OF SYNCLINE
HUNTING SURVEY CORP. 1964
GOVERNMENT AEROMAGNETIC SURVEY 1968
DRILL HOLE LOCATION

SHEET NO. 3

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GRAN

JEAN

ARC

ARO

ANVIL

LORNA

ROTO

BL 0400

BL 0400S

ROSE CREEK

L 32W
L 24W
L 16W
L 8W
L 0
L 8E
L 16E
L 24E
L 32E
L 40E
L 48E
L 56E
L 64E

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5000
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4000

DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL PROJECT

LOWER ANVIL CREEK AREA
ROTO, GRAN, JEAN, LORNA, ARO CLAIMS

COMPILATION MAP
Airborne Geophysics East half sheet 6, West half sheet 5

Legend:

ELECTROMAGNETIC ANOMALIES

AEROMAGNETIC ANOMALIES

SURVEYS BY : LOCKWOOD SURVEY CORP., 1965
DATA PLOTTED AT 1:1320 JANUARY, 1972

0 1000 2000 3000
SCALE 1 1320

LEGEND

GRAVITY ANOMALIES

MAGNETIC ANOMALIES

CRONE CEM ANOMALIES — AXIS OF CONDUCTOR

GEOCHEMICAL ANOMALIES — Cu COPPER, Zn ZINC

SILTS — COPPER > 50 PPM, LEAD > 40 PPM, ZINC > 100 PPM

DRILL SITE — ○ CRH-1

SOURCES OF INFORMATION

GRAVITY:	UNITED GEOPHYSICAL CO. LTD. 1965
MAGNETICS:	DYNASTY EXPLORATIONS LTD. 1965 EXPLORATION GEOPHYSICS LTD. 1966 DYNASTY EXPLORATIONS LTD. 1971
CRONE C.E.M.:	DYNASTY EXPLORATIONS LTD. 1971
GEOCHEMICAL:	DYNASTY EXPLORATIONS LTD. 1965 ANVIL MINING CORP. 1966, 1967 DYNASTY EXPLORATIONS LTD. 1971

DELTA CLAIM GROUP BOUNDARY

DELTA GRID BASELINE

ECHO CLAIM GROUP BOUNDARY

ECHO LAKE GRID BASE LINE

NASTY LAKE GRID BASELINE

MOOSE LAKE GRID BASELINE

CAPA CLAIM GROUP BOUNDARY

BLIND CREEK

CUB LAKE

ECHO LAKE

NASTY LAKE

MOOSE LAKE

FINGER LAKE

SWIM LAKE

CAMP

NRH-1

NRH-2

NRH-3

CRH-1

CRH-2

CRH-3

CRH-5

N

LEGEND:

GRID LINE

CAT. ROAD

CLAIM GROUP BOUNDARY

DYNASTY EXPLORATIONS LIMITED

Tintina - Anvil Project

DELTA, ECHO, CAPA CLAIMS

N.T.S. 105-K-2

COMPILATION MAP: GROUND GEOPHYSICAL & GEOCHEMICAL SURVEYS

DATE: DECEMBER 1971

1000 0 1000 2000 3000

Scale 1:1320

DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL - PROJECT

LOWER ANVIL CREEK AREA
ROTO, GRAN, JEAN, LORNA, ARO CLAIMS

COMPILATION MAP
Ground Geophysics & Geochem Surveys, East half Sheet 6,
West half Sheet 5 Lower Anvil Creek

LEGEND:

- GRAVITY ANOMALY
- MAGNETIC ANOMALY
- ELECTROMAGNETIC ANOMALY
- GEOCHEMICAL ANOMALY

SCALE 1" = 1320'

DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL PROJECT

LOWER ANVIL CREEK AREA
ROTO, GRAN, JEAN, LORNA, ARO CLAIMS

PROPOSED DRILL SITES

LEGEND:

- LR-1 — PREVIOUS DRILL SITES
- 72-1 — PROPOSED DRILL SITES

0 1000 2000 3000
SCALE - 1320

N

72-32
72-33
72-34
72-35
72-36
72-37
72-38
72-39
72-40
72-41
72-42
72-43
LR-1

ARO
GRAN
JEAN
LORNA
ROTO
ANVIL CREEK
ROSE CREEK

Legend:

- A.E.M. CONDUCTOR OUTLINE
- cem — C.E.M. CONDUCTOR OUTLINE
- — AEROMAGNETIC ANOMALY
- Cu — COPPER ANOMALY IN SOILS
- Pb — LEAD ANOMALY IN SOILS
- Zn — ZINC ANOMALY IN SOILS
- D.D.H. 4 — PROPOSED DRILL SITES

GEOPHYSICAL, GEOCHEMICAL COMPILATION AND PROPOSED DRILL SITES

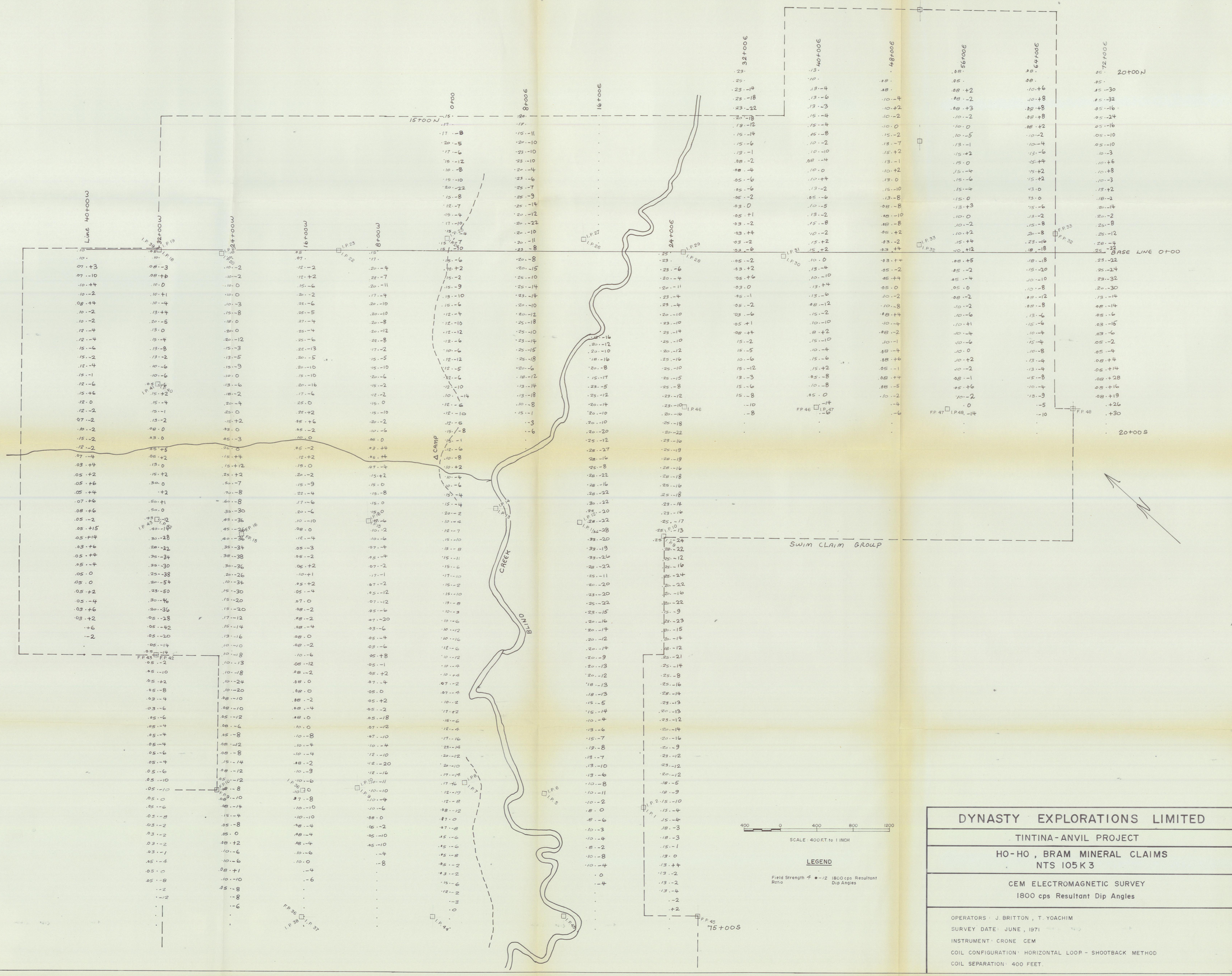
DYNASTY EXPLORATIONS LIMITED

TINTINA-ANVIL PROJECT

BRAM - HO, HO MINERAL CLAIMS
105 K-2

GRID LOCATION MAP

DATE NOV. 1971
SCALE 1" = 1320'



DYNASTY EXPLORATIONS LIMITED

TINTINA-ANVIL PROJECT

HO-HO, BRAM MINERAL CLAIMS
NTS 105K3

CEM ELECTROMAGNETIC SURVEY
1800 cps Resultant Dip Angles

OPERATORS: J. BRITTON, T. YOACHIM

SURVEY DATE: JUNE, 1971

INSTRUMENT: CRONE CEM

COIL CONFIGURATION: HORIZONTAL LOOP - SHOOTBACK METHOD

COIL SEPARATION: 400 FEET.

LINE 40+00 W
32+00 W
24+00 W
16+00 W
8+00 W
0+00
8+00 E
16+00 E
24+00 E
32+00 E
40+00 E
48+00 E
56+00 E
64+00 E
72+00 E

20+00 N
16+00 N
12+00 N
8+00 N
4+00 N
BASE LINE
4+00 S
8+00 S
12+00 S
16+00 S
20+00 S
24+00 S
28+00 S
32+00 S
36+00 S
40+00 S
44+00 S
48+00 S
52+00 S
56+00 S
60+00 S

I.P. 39 I.P. 19 I.P. 18 I.P. 21 I.P. 20 I.P. 23 I.P. 22 I.P. 25 I.P. 24 I.P. 27 I.P. 26 I.P. 29 I.P. 28 I.P. 31 I.P. 30 I.P. 33 I.P. 32 F.P. 33 F.P. 32
I.P. 41 I.P. 40 I.P. 46 I.P. 47 I.P. 48 F.P. 48
I.P. 43 I.P. 42 F.P. 16 F.P. 15 F.P. 14 F.P. 13 I.P. 14 I.P. 13 I.P. 12 I.P. 11 I.P. 10 F.P. 9
F.P. 43 F.P. 42 F.P. 10 F.P. 9 I.P. 38 I.P. 10 I.P. 9 F.P. 8 F.P. 7 I.P. 6 I.P. 5 I.P. 2 I.P. 1
F.P. 36 I.P. 37 I.P. 44 F.P. 45

CAMP
CREEK
ROAD
CAT
BLIND

SWIM CLAIM GROUP

SCALE : 400 F.T. to 1 INCH

400 0 400 800 1200

LEGEND

Field strength ratio profile
Resultant dip angle profile

1" 1"
+50° Resultant Dip Angle
0
-50° Resultant Dip Angle
.20 Field strength ratio

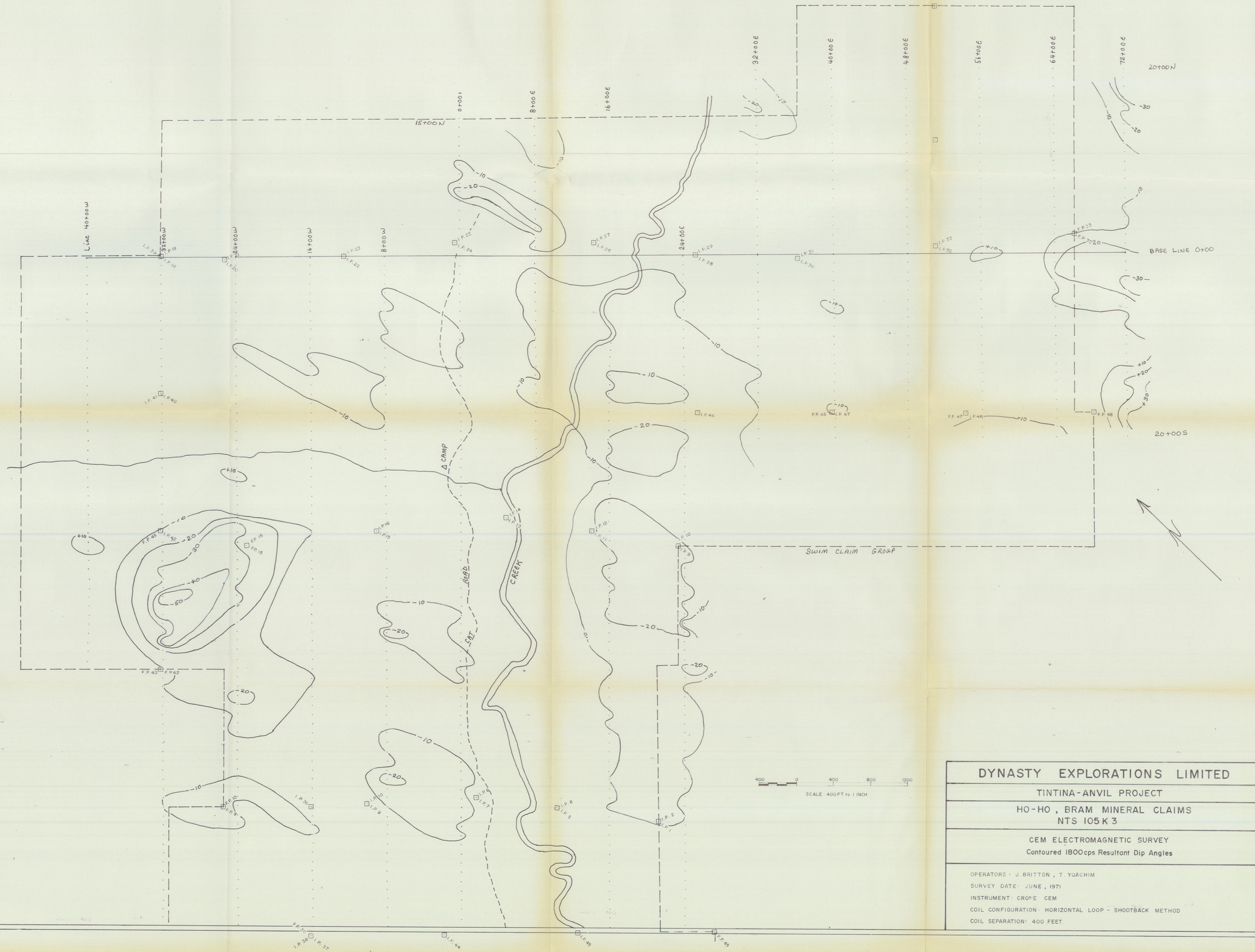
DYNASTY EXPLORATIONS LIMITED

TINTINA-ANVIL PROJECT

HO-HO, BRAM MINERAL CLAIMS
NTS 105K3

CEM ELECTROMAGNETIC PROFILES
1800 cps Resultant Dip Angles

OPERATORS : J. BRITTON, T. YOACHIM
SURVEY DATE: JUNE, 1971
INSTRUMENT: CRONE CEM
COIL CONFIGURATION: HORIZONTAL LOOP - SHOOTBACK METHOD
COIL SEPARATION: 400 FEET.



DYNASTY EXPLORATIONS LIMITED

TINTINA-ANVIL PROJECT

HO-HO, BRAM MINERAL CLAIMS
NTS 105K 3

CEM ELECTROMAGNETIC SURVEY
Contoured 1800cps Resultant Dip Angles

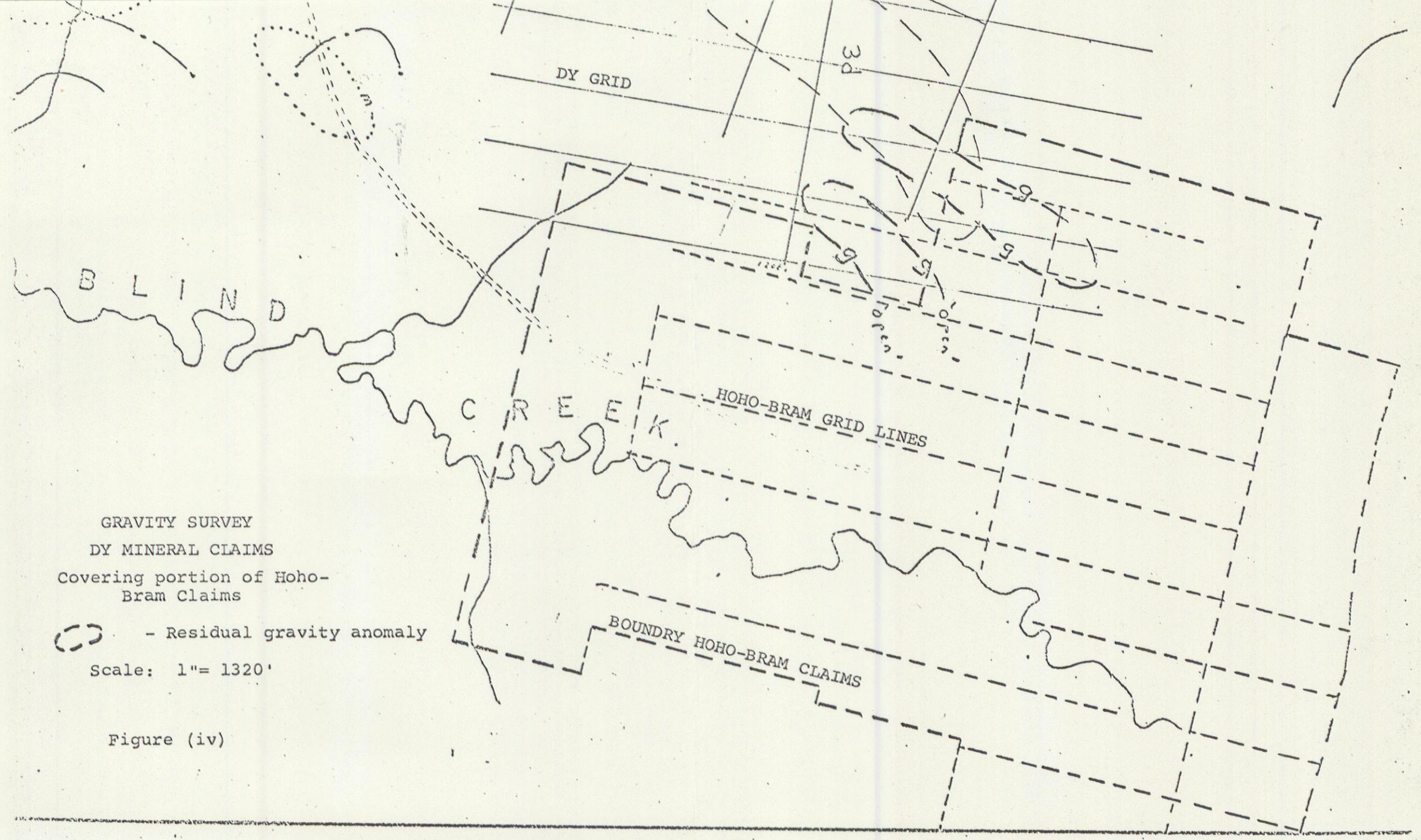
OPERATORS : J. BRITTON, T. YOACHIM

SURVEY DATE: JUNE, 1971

INSTRUMENT: CRONE CEM

COIL CONFIGURATION: HORIZONTAL LOOP - SHOOTBACK METHOD

COIL SEPARATION: 400 FEET.



GRAVITY SURVEY

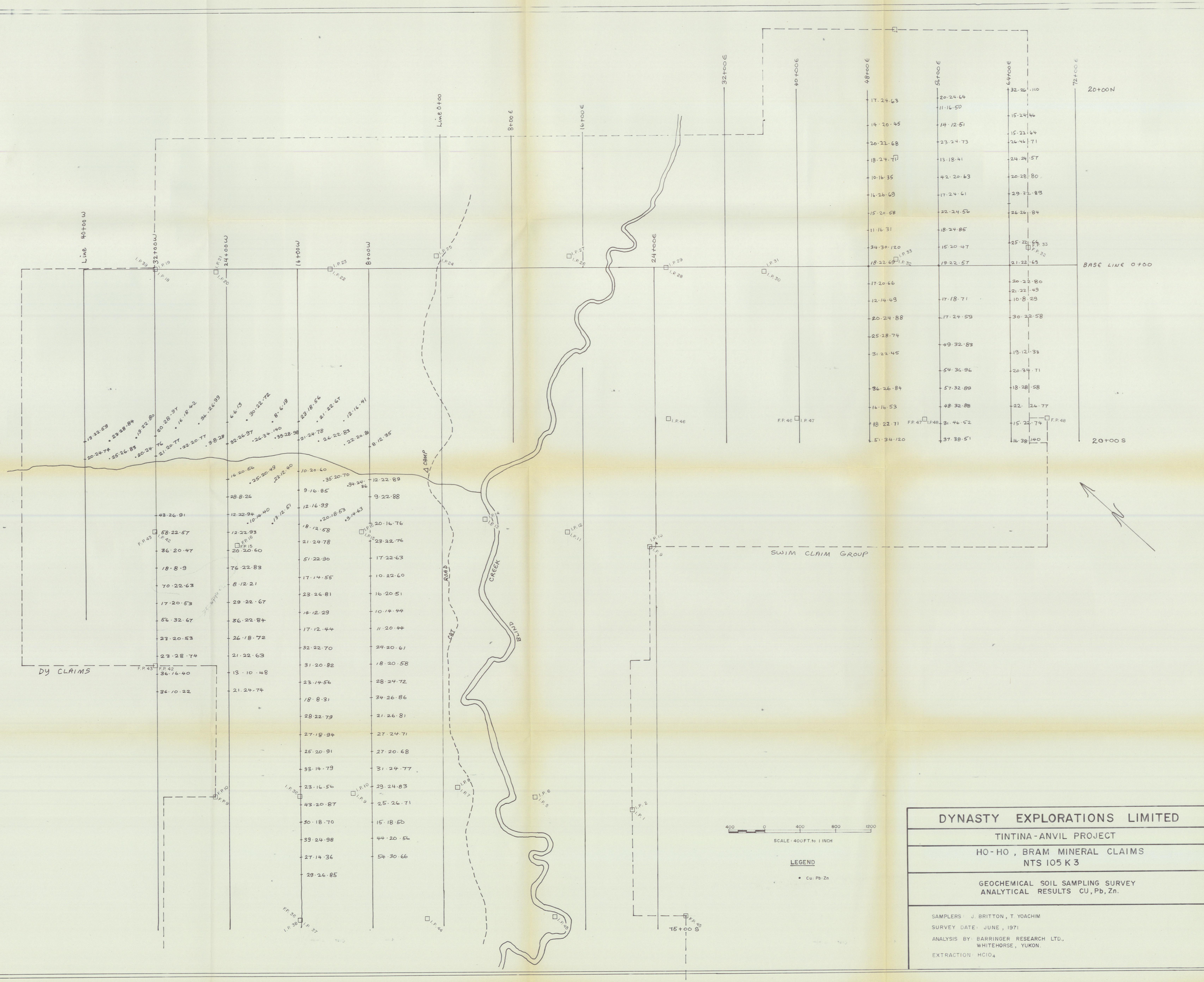
DY MINERAL CLAIMS

Covering portion of Hoho-Bram Claims

- Residual gravity anomaly

Scale: 1"= 1320'

Figure (iv)



DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL PROJECT

HO-HO, BRAM MINERAL CLAIMS
NTS 105 K 3

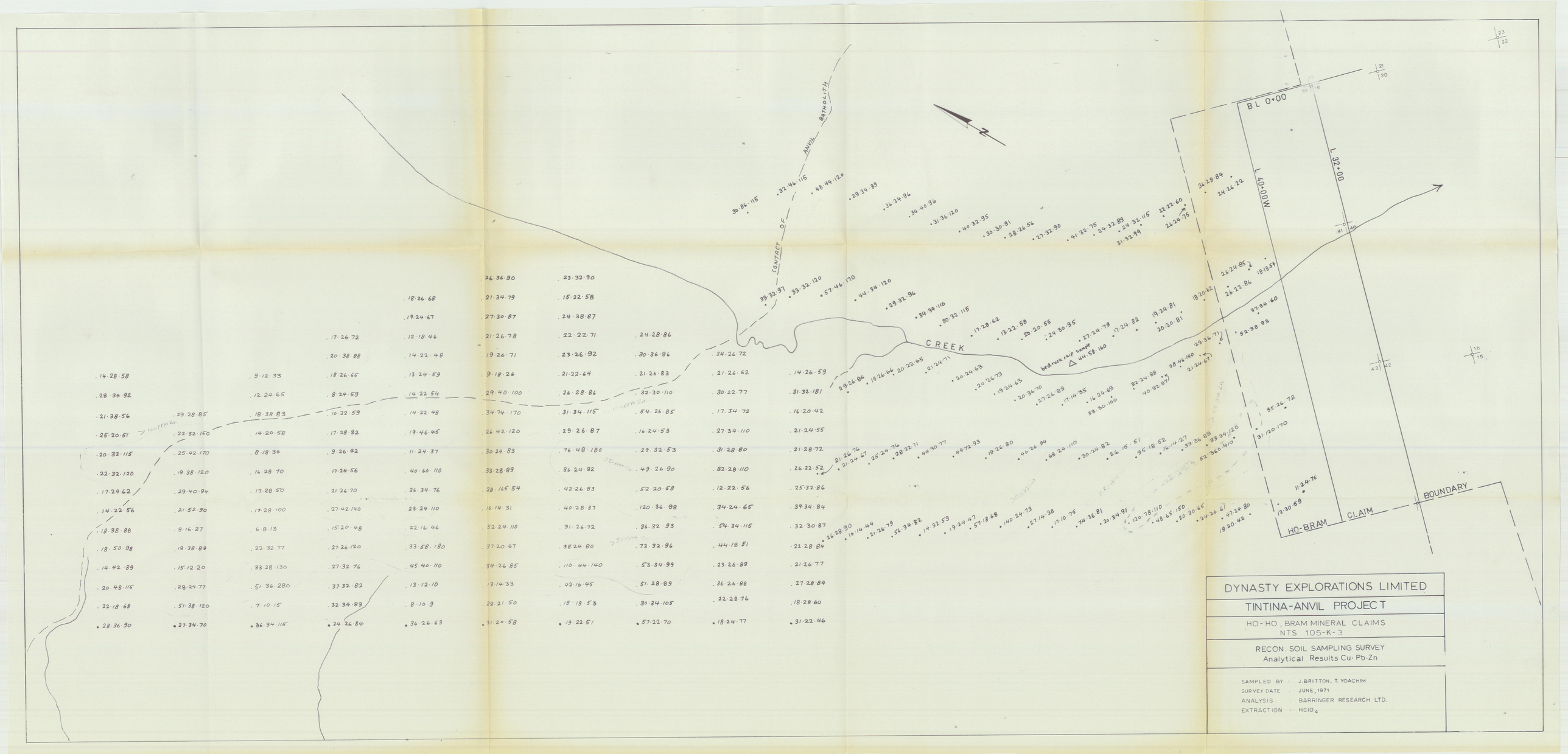
GEOCHEMICAL SOIL SAMPLING SURVEY
ANALYTICAL RESULTS CU, Pb, Zn.

SAMPLERS: J. BRITTON, T. YOACHIM

SURVEY DATE: JUNE, 1971

ANALYSIS BY: BARRINGER RESEARCH LTD.,
WHITEHORSE, YUKON.

EXTRACTION: $HClO_4$



DYNASTY EXPLORATIONS LIMITED

TINTINA-ANVIL PROJECT

HO-HO, BRAM MINERAL CLAIMS
NTS 105-K-3

RECON. SOIL SAMPLING SURVEY
Analytical Results Cu·Pb·Zn

SAMPLED BY : J.BRITTON, T. YOACHIM
SURVEY DATE : JUNE, 1971
ANALYSIS : BARRINGER RESEARCH LTD.
EXTRACTION : $HClO_4$

40+00 W
32+00 W
24+00 W
16+00 W
8+00 W
0+00
8+00 E
16+00 E
24+00 E
32+00 E
40+00 E
48+00 E
56+00 E
64+00 E
72+00 E

15+00 N
20+00 S
BL 30+00 S
40+00 S
60+00 S
BL 0+00

BLIND CREEK
BLIND CREEK FAULT
CAMP

IP 1 IP 2 IP 3 IP 4 IP 5 IP 6 IP 7 IP 8 IP 9 IP 10 IP 11 IP 12 IP 13 IP 14 IP 15 IP 16 IP 17 IP 18 IP 19 IP 20 IP 21 IP 22 IP 23 IP 24 IP 25 IP 26 IP 27 IP 28 IP 29 IP 30 IP 31 IP 32 IP 33 IP 34 IP 35 IP 36 IP 37 IP 38 IP 39 IP 40 IP 41

FP 42 FP 43 FP 44 FP 45 FP 46 FP 47 FP 48

SWIM CLAIM GROUP BOUNDARY

Legend

- TRACE OF FOLD AXIS
- FOLIATION
- JOINTING
- LIMIT OF OUTCROP
- GEOLOGICAL CONTACT DEFINED, ASSUMED.

3d — "GREENSTONE". DARK TO PALE GREEN FOLIATED TO MASSIVE AMPHIBOLITE, CHLORITIC TUFF, & ANDESITE. (911)

3c — THINLY LAMINATED SILTY LIMESTONE, ALTERNATING LAMINAE OF PHYLLITE AND SILTY FINE GRAINED GREY LIMESTONE. (920)

3b — SILVERY GREY WEATHERING, GREY TO BLACK FOLIATED SERICITE CHLORITE, BIOTITE, GRAPHITE PHYLLITE. CAN CONTAIN LARGE GREENSTONE LIMESTONE. (934)

3a — LIGHT TO DARK GREY, BLACK QUARTZ SERICITE, BIOTITE, CHLORITE, PHYLLITE. ALSO INCLUDES QUARTZ GRAPHITE PHYLLITE (3ag) AND QUARTZITE (3aq). GENERALLY CONTAINS SMALL GREENSTONE LENSES (931)

DYNASTY EXPLORATIONS LIMITED

TINTINA - ANVIL PROJECT

HO-HO, BRAM MINERAL CLAIMS
NTS 105 - K - 3

GRID GEOLOGY

SCALE : 1" = 400 feet
GEOLOGY BY : P. Dean
DATE : June, 1971