



WELCOME NORTH MINES LTD. (N.P.L.)

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VANGORDA PROJECT

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

ON THE

ALICE 1 - 48 CLAIM GROUP

Latitude 62°24'N

Longitude 133°39'W

N.T.S. 105K-5

WHITEHORSE MINING DISTRICT

YUKON TERRITORY

During the Period June 1 - July 29, 1975

by

F. Foster

and

J.S. Brock

February 12, 1976



061987



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

\$ 12,600

12,600

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Resident Geologist or
Resident Mining Engineer

Considered as representation work under Section 53 (2) Yukon Quartz Mining Act.

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S. BAXTER
Supervising Mining Recorder

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Commissioner of Yukon Territory

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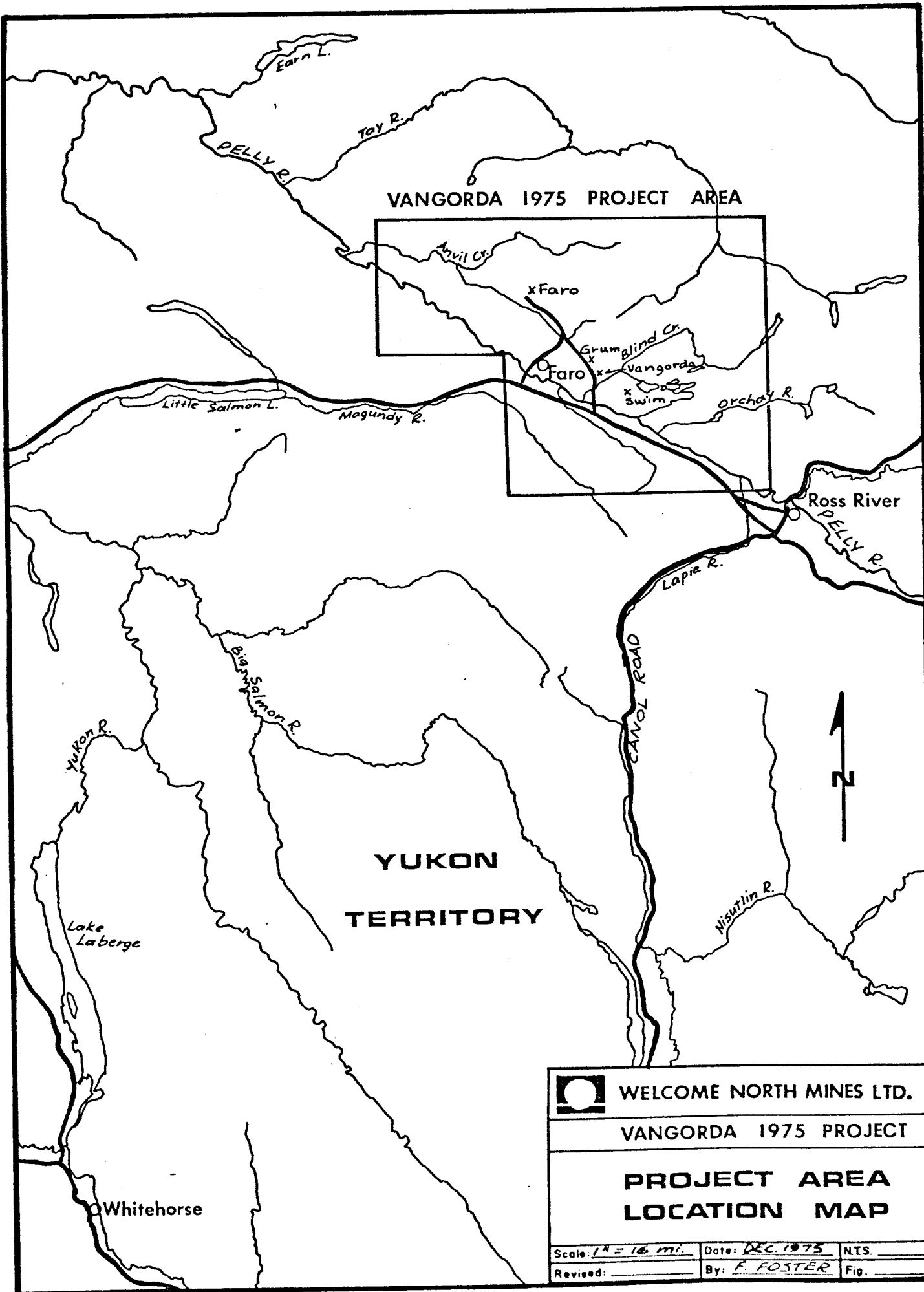
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 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
PROJECT AREA LOCATION MAP		
Scale: 1" = 16 mi.	Date: DEC. 1975	NTS.
Revised:	By: F. FOSTER	Fig.

INTRODUCTION

The ALICE 1-30 claims were staked by Welcome North Mines in February, 1975, and the ALICE 31-48 claims were later tied on in April, 1975. The property was located over what was considered to be a favourable geologic environment for Anvil-Vangorda type massive sulphide deposits.

The ALICE claims were subsequently joint ventured to Getty Mining Pacific Ltd. in March, 1975 as part of the Vangorda 1975 Project. Under the joint venture agreement, Getty Mining Pacific currently holds a 60 percent working interest in the property, with Welcome North as partner with a 40 percent carried interest.

Welcome North, as operator, during the period June 1, 1975 to July 29, 1975, carried out an exploration program consisting of geological mapping, soil and silt geochemistry surveys and an electromagnetic survey.

MINERAL CLAIMS

The ALICE 1-48 claim group consists of the following 48 contiguous mineral claims located in the Whitehorse Mining District of the Yukon Territory (see Fig. 1).

<u>CLAIMS</u>	<u>GRANT NUMBERS</u>	<u>RECORDING DATE</u>
ALICE 1-28	Y92118-Y92145	Feb. 13, 1975
ALICE 29-30	Y92401-Y92402	Feb. 13, 1975
ALICE 31-48	Y93353-Y93370	April 7, 1975

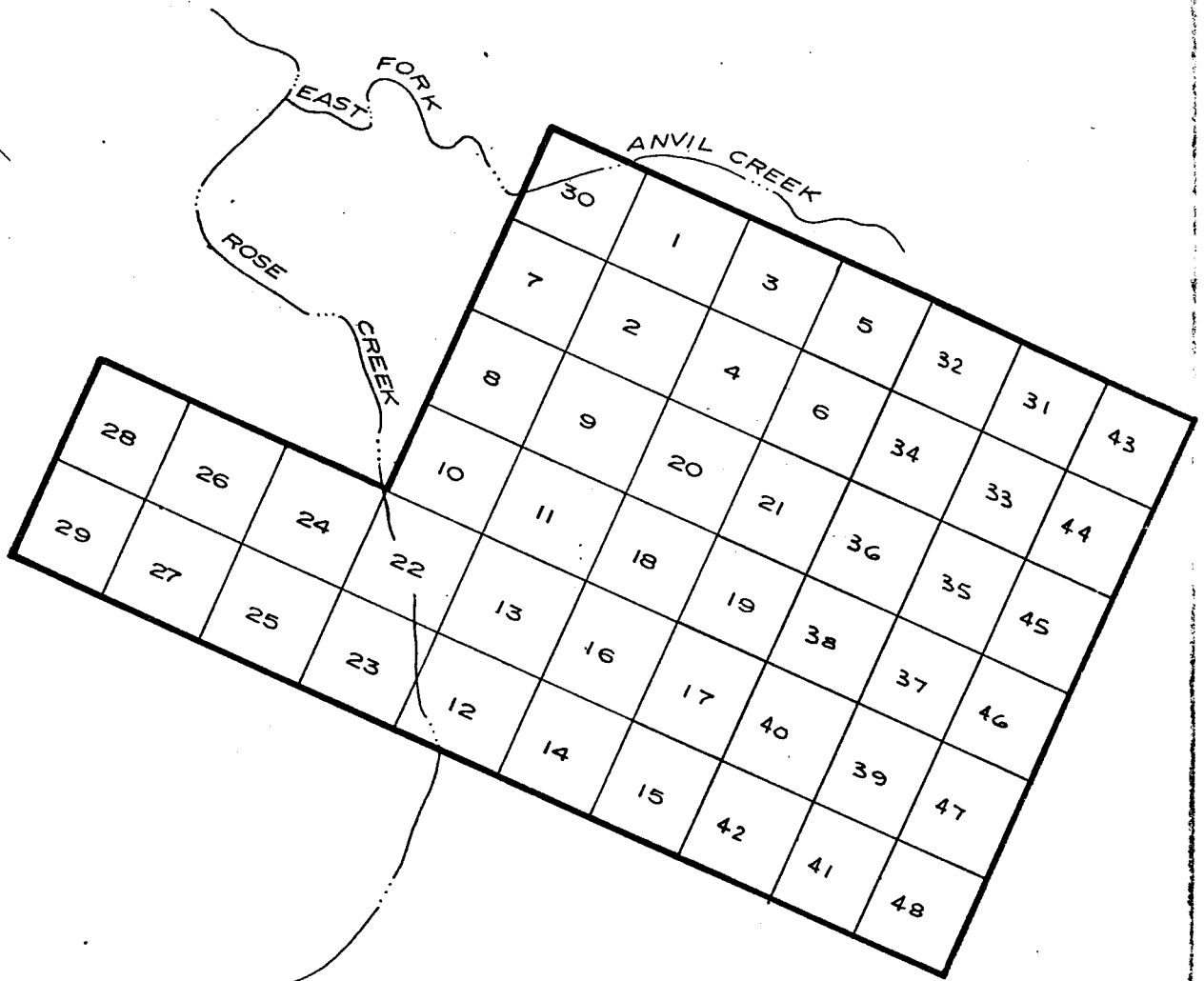
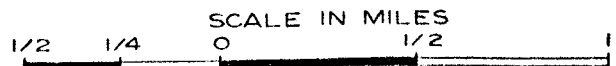


Fig. 1
VANGORDA 75 PROJECT
WELCOME NORTH/
GETTY MINING PACIFIC
ALICE 1-48
105-K-5



SUMMARY AND CONCLUSIONS

The ALICE claims cover a broad ridge which has limited outcrops on its flanks. The claims are underlain in their northern half by gently southerly dipping phyllites and greenstones of Unit (3a) and (3c) which are in contact with gabbro and granodiorite of units (12b) and (11) on the south. Several northeast trending faults disrupt Units (3a) and (3c) at their contact with the previously mentioned intrusive rocks.

Geophysical surveys carried out on the property delineated three extensive zones of high magnetic and electromagnetic susceptibility, two of which appear to be underlain by rocks of Units (3a) and (3c). Several localized weaker magnetic and electromagnetic responses have also been outlined over the same rock units.

Geochemical surveys carried out over the claim group so far have delineated several zones of anomalous copper response, none of which are coincident with the previously mentioned zones of anomalous geophysics. Anomalous geochemical response of lead and zinc is restricted to a small area of good rock exposure which has been mapped as Unit (3a) in contact with gabbro of Unit (12b).

Further work on the claim group in the form of a geological and geochemical survey is recommended to better determine the geological and geochemical setting in order that further evaluation of the existing geophysical features may be considered.

LOCATION AND ACCESS

The ALICE 1-48 claims are located in the Whitehorse Mining District of the Yukon Territory (N.T.S. 105K-5) at latitude $62^{\circ}24'N$, and longitude $133^{\circ}39'W$, 125 miles northeast of Whitehorse, Yukon Territory and 14 miles northwest of the town of Faro, Yukon Territory (see Fig. 2).

Access to the property can best be gained by helicopter from Faro or by one cat trail from the Anvil mine site situated 7 miles east of the property in Rose Creek valley. This ground access route is serviceable only by tracked vehicle or trail bike. The route traverses the northeast slope of Rose Creek valley and ends above treeline one mile east of the property. A cat trail in much poorer condition provides access to the eastern portion of the property from the end of the more serviceable cat trail.

The property is located at the junction of Rose Creek and Anvil Creek at an elevation of 4,500 feet on a small peak which terminates a broad southwest trending ridge that divides Anvil Creek valley to the north from Rose Creek valley to the south. Most of the property lies below treeline except for a small portion on the eastern reaches of the property which is at treeline and vegetated with buck brush.

Outcrop is found on the moderate to steep sloping flanks of the ridge and peak which occupy the southeastern portion of the property. The northwestern portion of the property, in the bottom of Anvil Creek valley, is covered by thick (100 feet) overburden and muskeg and little or no outcrop is exposed.



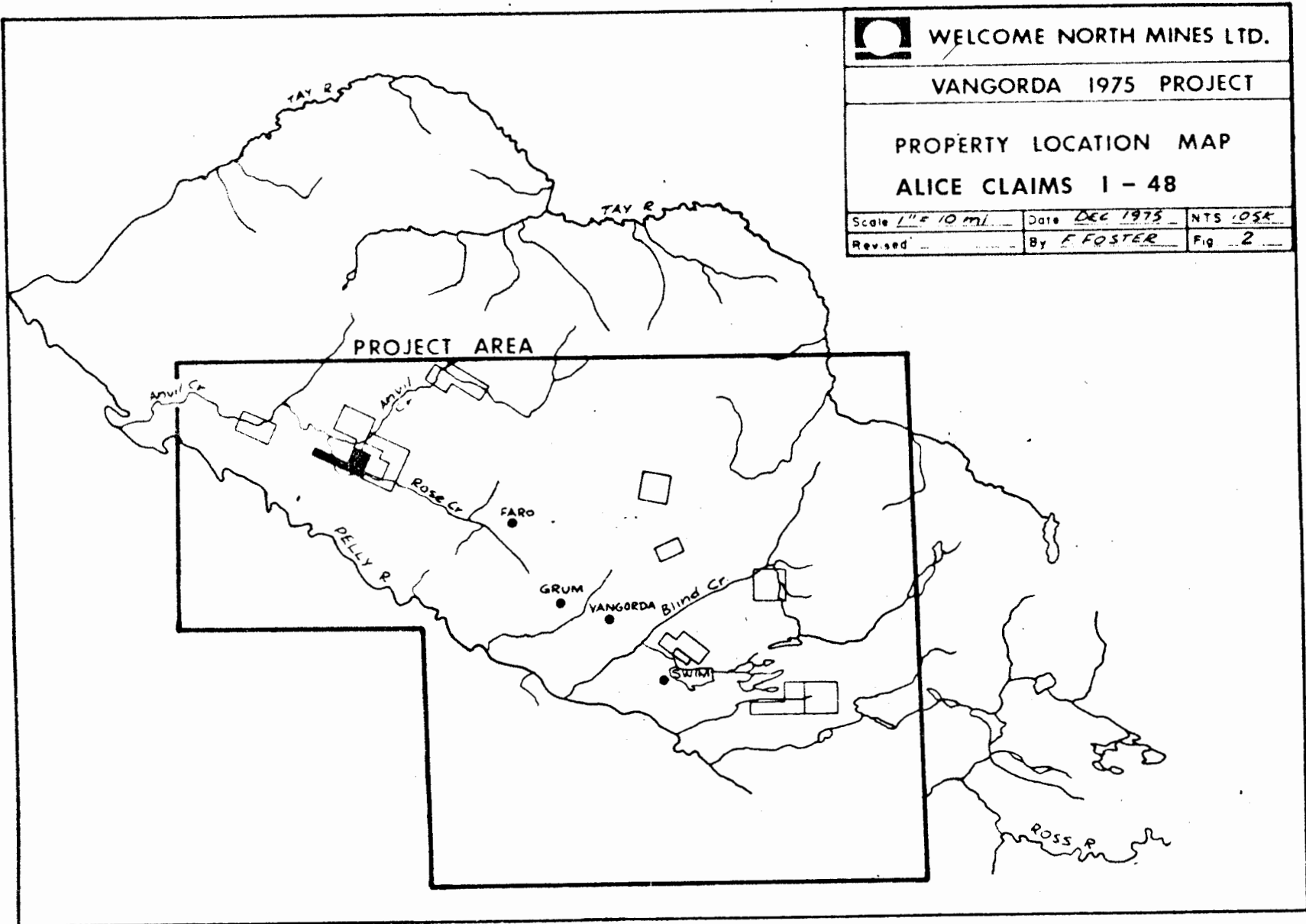
WELCOME NORTH MINES LTD.

VANGORDA 1975 PROJECT

PROPERTY LOCATION MAP

ALICE CLAIMS 1 - 48

Scale 1" = 10 mi.	Date DEC 1975	NTS OSK
Revised	By F FOSTER	Fig 2



REGIONAL GEOLOGY

The Anvil District, as outlined in Fig. 3, lies immediately north-east of the Tintina Trench, the probable locus of a major zone of northwest-southeast transcurrent faulting.

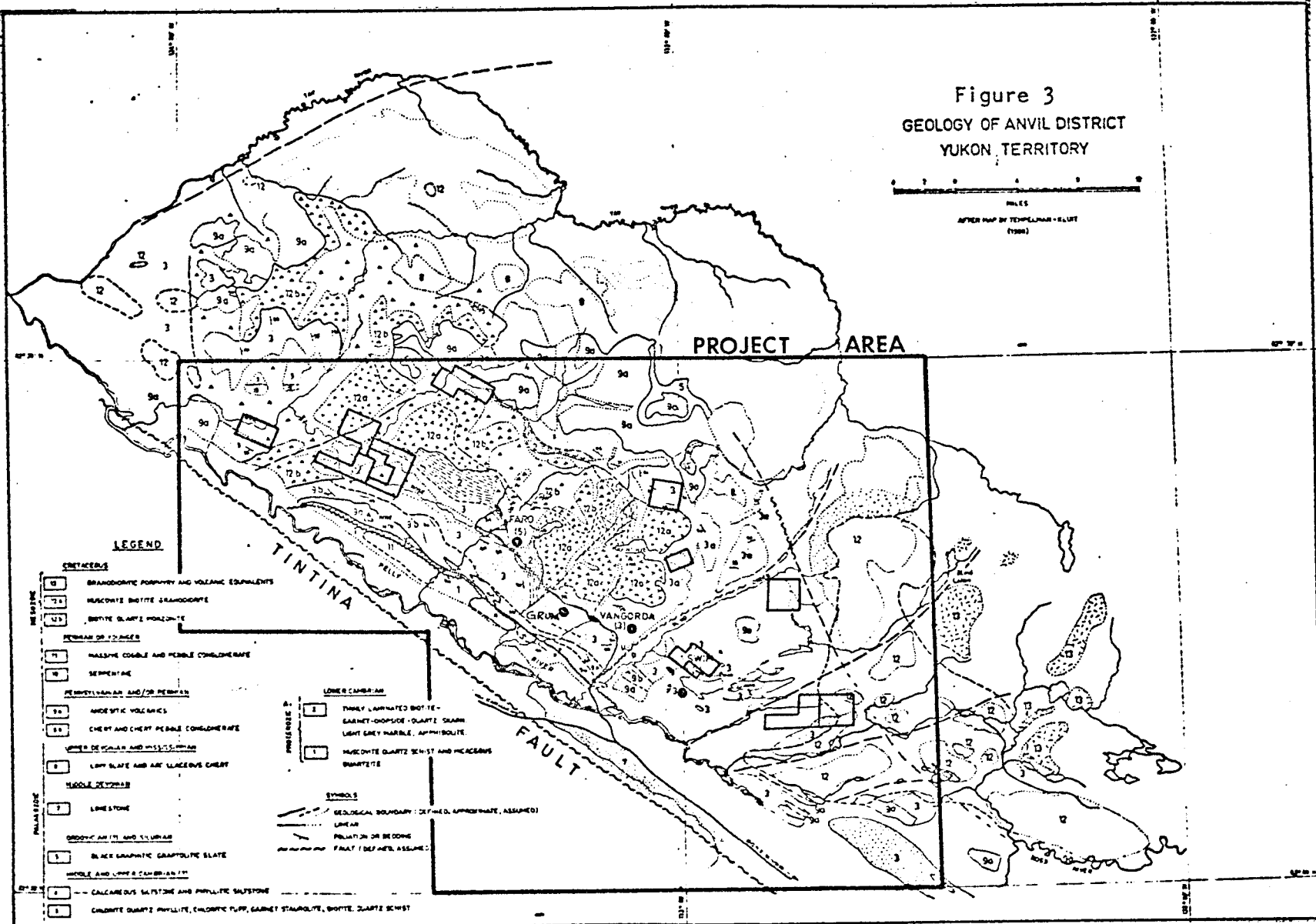
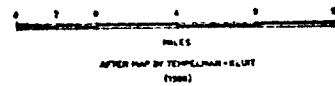
The central part of the district is formed by the Anvil Range, the dominating structure being a doubly plunging arch-like feature around the Anvil batholith. The core of the Anvil Range is underlain by granitic rocks for which potassium-argon age determinations suggest an age of 80 - 90 million years. The Anvil Arch is flanked on the southwest and northeast by phyllites, calc-silicate gneisses and schistose rocks thought to be of Cambrian (?) to Ordovician age; these metasediments which have undergone at least three phases of deformation are host to the known massive sulphide deposits of Faro, Vangorda, Grum and Swim.

The schistose quartz rich host rocks of the Faro sulphide deposits are confined to the lower part of a unit of muscovite-biotite schist whose lower sections are sometimes graphitic. Small greenstone lenses are often found in the upper part of this sequence. This section constitutes the lower member of a 6,000 foot thick sequence of biotite-muscovite schist, calc-silicate gneiss and skarn, phyllite, chloritic greenstone bodies, and tuffaceous phyllite.

The phyllitic host rocks of the Grum, Vangorda and Swim sulphide deposits are confined to graphitic quartz-rich sections of phyllite situated close to relic volcanic complexes of greenstone, chloritic phyllite, limestone, and pyroxenite in the lower part of an estimated 3,000 foot thick unit of phyllite. The phyllite unit is separated from the lower schist unit in many areas by thick sections of calc-silicate gneiss.

The sulphide bodies of the Anvil district are tabular and lie in the plane of the crenulation foliation developed during the first phase of deformation. Their long axes coincide with the intersection of primary and secondary foliation. The sulphide deposits appear to have been only slightly affected by the regional metamorphism of phyllite host rocks.

Figure 3
GEOLOGY OF ANVIL DISTRICT
YUKON TERRITORY



LEGEND

- | | |
|---|---|
| CRETACEOUS | |
| 1 | BRANDORFITE PORPHYRY AND VOLCANIC EQUIVALENTS |
| 2 | MUSCOVITE BIOTITE GRANODIORITE |
| 3 | BIOTITE QUARTZ PORZONITE |
| PERMAN OR YOUNGER | |
| 4 | MASSIVE COBBLE AND PERLE CONGLOMERATE |
| 5 | SERPENTINE |
| PERMIAN AND/OR PERMAN | |
| 6 | ANDREOTIC VOLCANICS |
| 7 | CHERT AND CHERT PERLE CONGLOMERATE |
| LOWER DEVONIAN AND MISSISSIPPIAN | |
| 8 | LOFT SLATE AND AIR LACEDONS CHERT |
| MIDDLE DEVONIAN | |
| 9 | LIMESTONE |
| ORDOVICIAN (?) AND SILURIAN | |
| 10 | BLACK GRANITIC GRANULITE SLATE |
| PROTEROZOIC AND LOWER CAMBRIAN (?) | |
| 11 | CALCAREOUS SLATSTONE AND PHYLLITE SLATSTONE |
| 12 | CALCAREOUS SLATSTONE AND PHYLLITE SLATSTONE |
| 13 | CHLORITE QUARTZ PHYLLITE, CHLORITE FLUFF, GARNET STAUROLITE, BIOTITE, QUARTZ SCHIST |
-
- | | |
|--------------------|---|
| PROTEROZOIC | |
| 14 | THINLY LAMINATED BIOTITE-GARNET-CHLORITE QUARTZ SLAUB |
| 15 | LIGHT GREY MARBLE, AMPHIBOLITE |
| 16 | MUSCOVITE QUARTZ SCHIST AND MICACIOUS QUARTZITE |
-
- | | |
|----------------|---|
| SYMBOLS | |
| | GEOLOGICAL BOUNDARY (DEFINED, APPROXIMATE, ASSUMED) |
| | LINEAR |
| | FOLIATION OR BEDDING |
| | FAULT (DEFINITE, ASSUMED) |

However, a distinct average grain size increase from the Swim northwest to the Faro deposits reflects a thermal metamorphic gradient caused by the intrusion of the Anvil Batholith. The base metals have been introduced into the phyllite prior to its metamorphism and deformation.

It appears that two units, the pelitic schists and phyllites, are host rocks for the four economically important sulphide masses and are also host to several smaller, presently non-economic deposits in the area.

Chloritic tuffaceous greenstone outcrops are close to all four deposits but are nowhere immediately against ore. Graphite is present in host rocks around all four deposits, but it is far more prevalent around the Swim body than near the Vangorda, Grum or Faro deposits.

A description of the rocks that make up the stratigraphic section of the Anvil Arch, and their tentative ages is listed on the following page. The description has been taken from Templemen-Kluit (1968) and modified by field observations and by information obtained from Cyprus-Anvil Mining Company.

ERA	PERIOD OR EPOCH	FORMATION	MAP UNIT	LITHOLOGY	
Cenozoic	Tertiary		14b	Rhyolitic tuff	
			14a	Quartz-feldspar porphyry	
RELATIONS NOT KNOWN					
Mesozoic	Cretaceous or Tertiary		13	Saussuritized porphyritic hornblende diorite	
			INTRUSIVE INTO UNITS 2, 3, AND 11		
	Age unknown		12b	Hornblende diorite, gabbro	
			12a	Pyroxenite, sometimes cataclastic and serpentized	
	INTRUSIVE INTO UNITS 2 AND 3				
	Cretaceous	Anvil Batholith		11	Porphyritic biotite-quartz monzonite and granodiorite; muscovite-biotite granodiorite; foliated equivalents
INTRUSIVE INTO UNITS 2, 3, AND 8					
Lower or Middle Triassic			10	Massive, well indurated cobble and pebble conglomerate with fragments of mica quartz schist (Unit 1), basalt (Unit 8), chert (Unit 8a), limestone (Unit 8c) and serpentinite (Unit 9); brown sandstone slate and argillaceous limestone	
Upper Permian or Lower Triassic			9	Serpentinite and serpentized peridotite	
FAULT BOUNDED					
Paleozoic	Upper Permian	Anvil Range Group	8c	Light grey, massive resistant recrystallized limestone	
	Lower Permian		8b	Massive green basalt, commonly amygdaloidal, includes common pyroclastic and less common pillowed varieties, metamorphosed equivalents near granitic bodies	
	Lower Permian and Upper Permian		8a	Greenish grey, pale green and brick red argillaceous and tuffaceous chert	
	UNCONFORMABLE ON UNITS 3, 4, 5, 6, 7				
	Upper Devonian			7	Grey slate, chert, greywacke, chert pebble conglomerate and limestone
	UNCONFORMABLE ON UNITS 3 AND 4				
	Middle Devonian			6	Limestone and dolomite
	Silurian and Devonian			5	Light grey, medium bedded, medium-grained orthoquartzite
	CONFORMABLE				
	Middle Ordovician Lower Silurian			4	Dark grey and black graptolitic slate, minor thin-bedded black chert
	UNCONFORMABLE ?				
	Ordovician-Silurian			3d	Rhyolitic quartz-feldspar porphyry, sometimes pyritic
				3c	Medium green foliated actinolite schist, andesitic greenstone, foliated fine grained amphibolite, amygdaloidal chlorite phyllite
3b				Sulphide horizon; muscovite phyllite and quartzite, siliceous graphitic phyllite, massive and banded pyrite and pyrrhotite	
3a				Dark grey biotite-chlorite schist and phyllite, medium greenish grey lustrous chlorite-muscovite-quartz phyllite, locally calcareous or graphitic	
GRADATIONAL CONTACT					
Cambro-Ordovician			2b	Foliated amphibolite, pale green chloritic phyllite, greenstone, chlorite	
			2a	Calc-silicate schist, phyllite, and gneiss with interbanded biotite and calc-silicate rich layers, can contain 2b	
GRADATIONAL CONTACT					
Cambrian			1d	Chloritic schist and phyllite, and greenstone	
			1c	Muscovite schist, muscovite-biotite schist, muscovite-andalusite schist + graphite, biotite-andalusite-muscovite schist + garnet and staurolite, graphitic schist	
			1b	Faro sulphide horizon, muscovite quartzite + sulphides, massive and banded pyrite and pyrrhotite	
			1a	Quartzo-feldspathic biotite-muscovite schist and gneiss, in part bleached and hornfelsed	

TABLE 1

PREVIOUS WORK

The first work to be carried out in the area of the ALICE claims was by Dynasty Explorations, who flew helicopter-borne EM and magnetic surveys as part of a regional exploration program conducted in 1965. As a result of this work, the CROWN claims, located east of the ALICE Group, were staked over aeromag and EM anomalies.

The CROWN claims were later explored in 1967 by Anvil Mining Corporation, who completed soil sampling, magnetic and electromagnetic surveys on the property as well as regional geological mapping of the area. In 1971 a limited program of bulldozer trenching was completed and a Turam-EM survey was carried out. In 1974, portions of the CROWN Group were allowed to lapse and were subsequently re-staked as the B.G. 1-16 claims by Claymore Resources.

In 1966, as a result of the 'Anvil staking rush', the FAIR and JOE claims were staked by New Far North Explorations Ltd. Prior to 1968, New Far North carried out airborne EM and mag, linecutting, geo-chemical, magnetic and gravity surveys on the JOE and FAIR properties. The JOE 1-8 claims are currently in good standing and are held under option by Lion Mines. The balance of the original property was allowed to lapse and was subsequently re-staked by Welcome North with the ALICE 1-48 mineral claims.

The northwestern portion of the FAIR claims was re-staked as the ROTO 35-46 claims by Dynasty Explorations.

GEOLOGY

The property is underlain by moderately southwesterly dipping phyllites and andesitic greenstones of Units (3a) and (3b) [Table 1] which are separated from an offshoot of the Anvil Batholith in the southwest corner of the property by gabbro of Unit (12b).

Mapping was carried out on a scale of 1" = 400 feet; control was maintained from the geophysical grid using cut lines spaced 800 feet apart. Geology has been plotted on a topographic base map, derived from an Energy, Mines and Resources 1:50,000 topographic publication (Plate 11).

A northeast-southwest trending ridge crosses the central region of the Alice claims. The ridge is flanked to the northwest by the Anvil Creek valley, and to the south by the Rose Creek valley. Outcrop on the property is most abundant in the vicinity of the centrally located ridge.

Lithology

Unit (3a) has been mapped in two areas on the ALICE claims. Unit (3a) is found within a northwest-trending belt of rocks located immediately north of the baseline between grid lines 32E and 72E (see Plate 11). This belt appears to narrow to the northwest.

In this area Unit (3a) exists as dark-grey to grey, thinly laminated (1/4" to 1/8"), very fine-grained quartz (25-30%)-biotite (30-35%)-plagioclase (30-40%) schist which grades to phyllite (Fig. 4 and 5).

On the southern portion of the property, Unit (3a) is mapped as a discontinuous belt of rocks, disrupted by several faults. The unit is in contact with medium-grained to coarse-grained gabbro of Unit (12b). The rocks in this belt are comprised of dark-grey to grey phyllites made up of bands of varying amounts of quartz and biotite. K-feldspar occurs frequently in biotite-rich bands. Composition

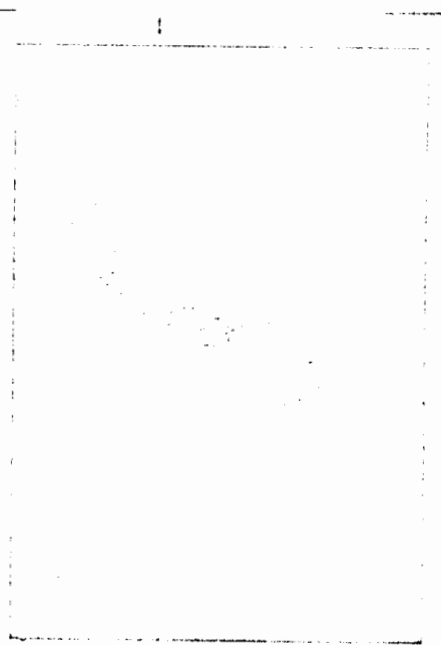


Figure 4

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Thin section of quartz-biotite-plagioclase phyllite showing vertical compositional banding with remnants of an older disrupted layering still present. (Crossed Nicols)

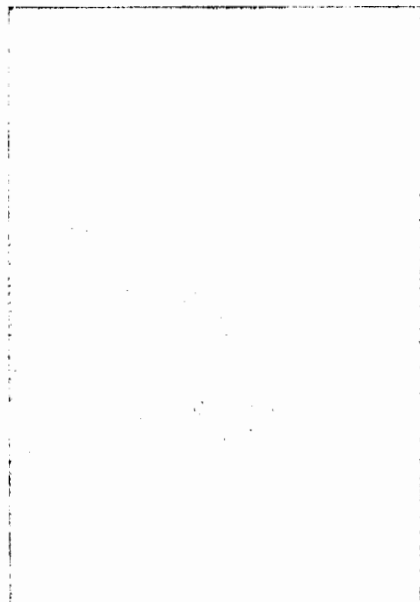


Figure 5

.05 mm

Thin section of quartz-biotite-plagioclase phyllite showing vertical compositional banding with remnants of an older disrupted layering still present. (Plain light)

of the bands comprising the phyllites ranges from quartz (95%), biotite (5%), and no K-feldspar, to quartz (20%), biotite (60%) and K-feldspar (20%).

Unit (3c), as presently mapped, appears to cover at least half of the property. A northwest-trending belt of Unit (3c) of a minimum width of 1400 feet (Plate 11) occurs just south of the baseline over the eastern portion of the property. A second belt of Unit (3a) trending in the same direction, is situated in the northeast corner of the property. These two belts are composed of pale-green to grey chlorite-actinolite-biotite schist, (type locality L33E-0N), and massive grey to dark-grey fine-grained, sometimes thinly laminated (1/4" to 1/2") andesitic greenstone.

The mapping of Unit (3c) is subject to further interpretation due to the fact that Units (3a) and (3c) weather differentially, Unit (3c) being more resistant than the recessively weathering Unit (3a). Therefore it has been surmised that the two belts of Unit (3c), as mapped, could be contained within a recessive belt of Unit (3a).

Gabbro [Unit (12b)] previously mentioned as occurring within the southern portion of the property also has been mapped as a 1000-foot wide lens, pinching out to the southeast, immediately north of the baseline between lines 24E and 56E.

Unit (11) is mapped in the southwest corner of the property as intruding the gabbro of Unit (12b). Unit (11) consists of massive, well-jointed muscovite-biotite granodiorite.

Structure

Rocks of Units (3a) and (3c), and contact rocks of Unit (12b) underlying the property are affected by at least three periods of deformation. Three axial plane cleavages and related schistositities have been developed in the area. The cleavage and schistosity associated with the first period of deformation (called S_1) has destroyed any bedding relationships in the rocks. This cleavage and schistosity is dominant near the crests of folds produced by the second period of deformation.

The second period of deformation is represented by a very strong axial plane cleavage and schistosity (S_2) which, where exposed, strikes WNW on the property. S_2 completely transposes S_1 on the flanks of second deformation folds such that only remnants of S_1 can be seen between major S_2 surfaces but S_2 is much less dominating over S_1 at crests of these folds.

The third period of deformation is represented by a very weak cleavage and schistosity (S_3) which is related to northeast trending folds that gently warp the S_2 surfaces.

Intersections of S_1 , S_2 and S_3 produce crenulations which are best observed on phyllitic partings.

Figures 6 and 7 illustrate, on a microscopic scale, the relations of S_1 and S_2 . S_1 occurs as small S-shaped folds between major S_2 cleavage planes along which opaques tend to concentrate. Note in Figure 7 that the crenulation of the S_2 plane may be suggestive of yet another phase of deformation.

Present data obtained from outcrop on the property is insufficient to determine if major folds exist in the rocks underlying the property or indeed what the axial trends of such folds might be.

Late stage faulting is represented on the property by two minor northeast-trending faults which have offset the contact between Unit (12b) and Unit (3) in two places. These faults are expressed topographically, however as interpreted from current mapping they do not appear to have any major structural influence in the area.

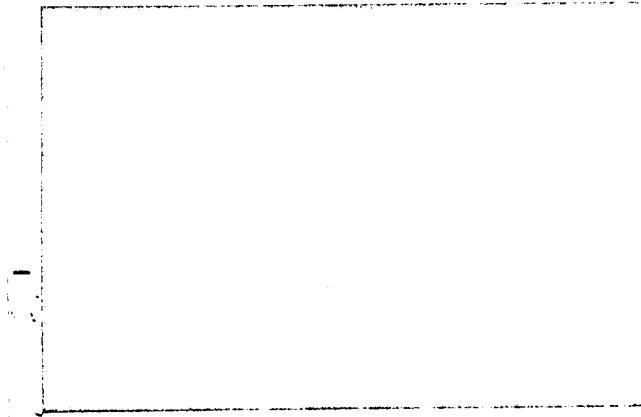


Figure 6

.05 mm

Thin section of quartz-biotite-plagioclase phyllite showing S_1 folds between horizontal S_2 cleavage planes.

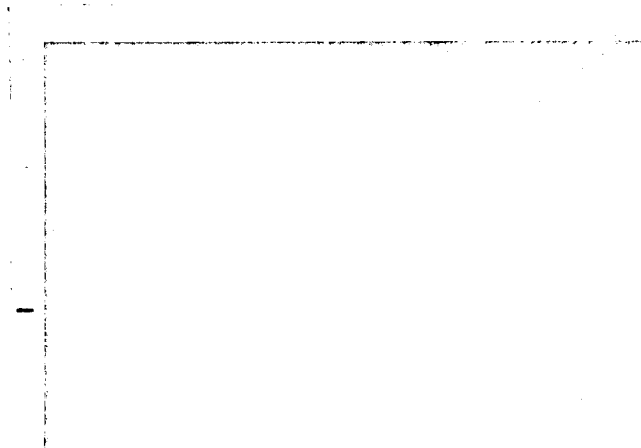


Figure 7

.05 mm

Thin section of quartz-biotite-plagioclase phyllite showing S_1 folds between horizontal S_2 cleavage planes.

LINE CUTTING

An old grid system utilized for previous geochemical and magnetometer surveys by New Far North Explorations, Ltd. was brushed out by line cutters of Eastern Associates, hired on a contractual basis from Whitehorse. The grid system consists of an 8,000 foot long base line trending at 120° with perpendicular crosslines of varying length spaced 800 feet apart along the base line. Survey control was maintained by picket and chain methods with periodic line bearing checks by Sylva compass. Picket stations were established on the cross lines at 100-foot intervals. A total of 13.65 miles of line were either cut or brushed out (see Fig. 8).

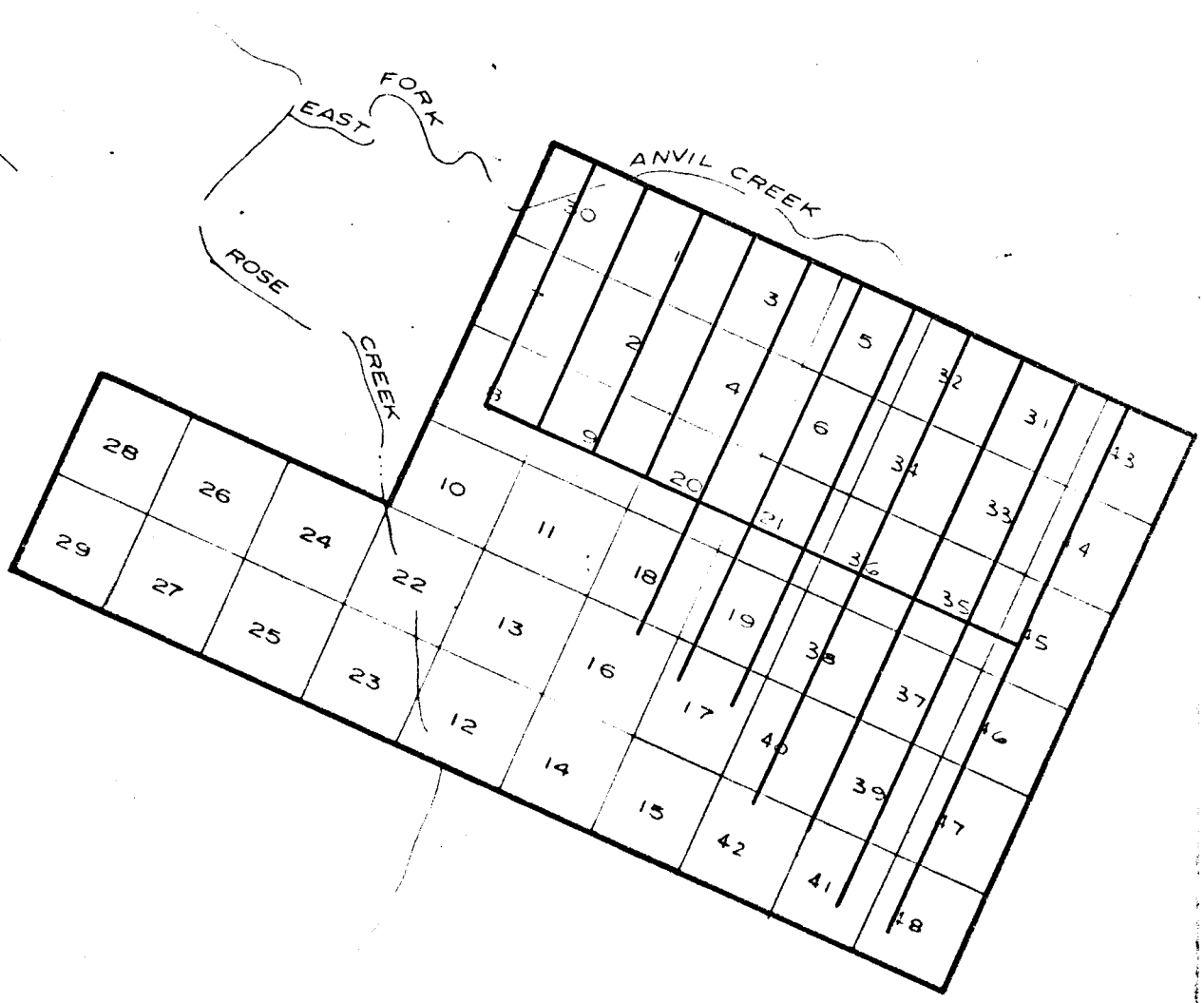
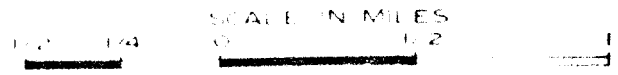


Fig. 8
VANGORDA 75 PROJECT
WELCOME NORTH/
GETTY MINING PACIFIC
ALICE I-48
105-K-5



GEOCHEMICAL SURVEYS

1. Method of Survey

After close study of geochemical evidence leading to the discovery of the Anvil massive sulphide deposit, it was decided to modify the geochemical sampling method to better adapt to the search for deep-seated sulphide deposits.

Sampling was confined to the base of slope contours, sidehill silt seepages, stream sediments and frost boils in order to tap possible drainage emergence from deep-seated sources.

Previous results from other 'grid controlled' geochemical surveys were available for review and revised interpretation.

All soil samples were obtained with a prospector's grub hoe, which was found adequate as a tool for cutting through heavy layers of organic material overlying the soil.

Certain areas determined as being anomalous in lead, zinc, and copper from previous surveys were further investigated with rock geochemistry to determine if the geochemical anomalies in soils were either in situ or transported. All geochemical samples were collected in Kraft brown paper bags and shipped for testing to Acme Analytical Laboratories in Ross River, Yukon.

2. Method of Analysis

All samples were analysed by Acme Analytical Laboratories Ltd. at Ross River. When the samples were received, each was dried while in its Kraft bag, then screened to 80 mesh, weighed out to 0.5 grams and digested in hot aqua regia. Rock samples were crushed and pulverized before undergoing this process. Samples were then diluted, clarified for 20 hours and then tested for copper, lead and zinc content on an

atomic absorption spectrophotometer. The 'AA' unit used was a Perkins Model 290 and accuracy of the instrument ideally is 1% of the amount of metal present. Individual cathode lamps were used for each element determination, a direct readout being given in parts per million of the element being tested.

3. Treatment of Data

All results of geochemical tests were returned to the field where results were plotted on field maps kept by the party chief for aid in carrying out preliminary follow up of anomalous areas while still in the field.

All results were grouped under soil, silt, rock analyses for each of Cu, Pb and Zn. Data for each of these categories was plotted later onto graphs of trace element quantity (ppm) versus cumulative percent.

A partitioning procedure (see A.J. Sinclair 1973) was used to separate two populations, one being anomalous and the other being background. The overlap of these two populations was determined and thresholds chosen arbitrarily to isolate three priority populations. The population of first priority consists of only anomalous values. Of second priority is a population consisting mainly of anomalous values and a small percentage of background values. Finally, of third priority is a population consisting only of background values. Where only two priority populations are shown, the partitioning procedure could not be applied or no overlap of populations existed.

Separate maps were prepared using a scale of 1" = 400', showing values obtained for copper, lead and zinc. Values were color coded to aid in distinguishing areas anomalous in copper, lead, and zinc.

4. Interpretation of Results


Study of the statistical analysis for copper content in soils sampled during the 1975 season by the Vangorda project in the Anvil District reveals that an anomalous population whose threshold value is 41 ppm (arbitrarily chosen) overlaps with a lower background population as illustrated in Fig. 9. The overlap of these two populations, again arbitrarily chosen, occurs between 41 ppm and 55 ppm. Samples obtained with values in this range (41-55 ppm) are considered to be anomalous only if other samples collected in the immediate vicinity of these yield distinctly anomalous values; otherwise samples with values in the 41-55 ppm range are considered as samples in areas of high background geochemistry.

Inspection of the statistical analysis for copper content in silts sampled in the Anvil District (Fig.10) reveals that three geochemical populations, such as those outlined above for copper in soils, exist and that the overlap between the anomalous and background populations ranges between 30 to 34 ppm.

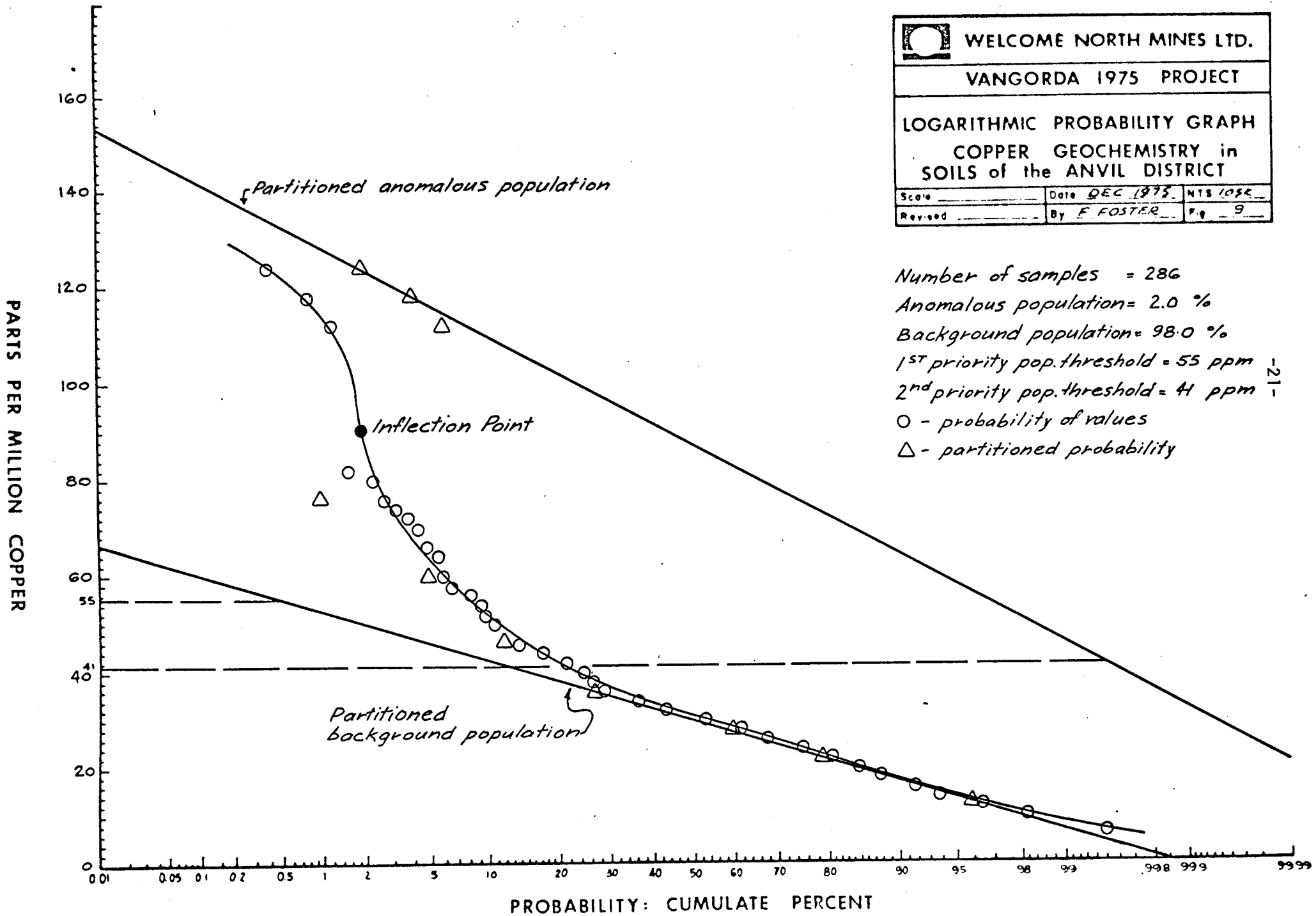
Inspection of statistical analysis for lead content in soils (Fig.11) reveals that as above three populations exist and that the overlap between the anomalous and background populations ranges between 38 to 49 ppm.


With reference to lead content in silts, the statistical analysis for this (Fig.12) reveals three populations exist such as described above for copper in soils and silts and lead in soils. Values greater than 34 ppm are anomalous, values in the range 26 to 33 ppm are either anomalous or high background, and values less than 25 ppm are background.

The statistical analysis for zinc content in soils (Fig.13) shows three populations as well. Values greater than 100 ppm are anomalous, values in the range 90 to 100 ppm are either anomalous or high background, and the values less than 89 ppm are background.

 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH COPPER GEOCHEMISTRY in SOILS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105E</u>
Revised _____	By <u>F. FOSTER</u>	Fig. <u>9</u>

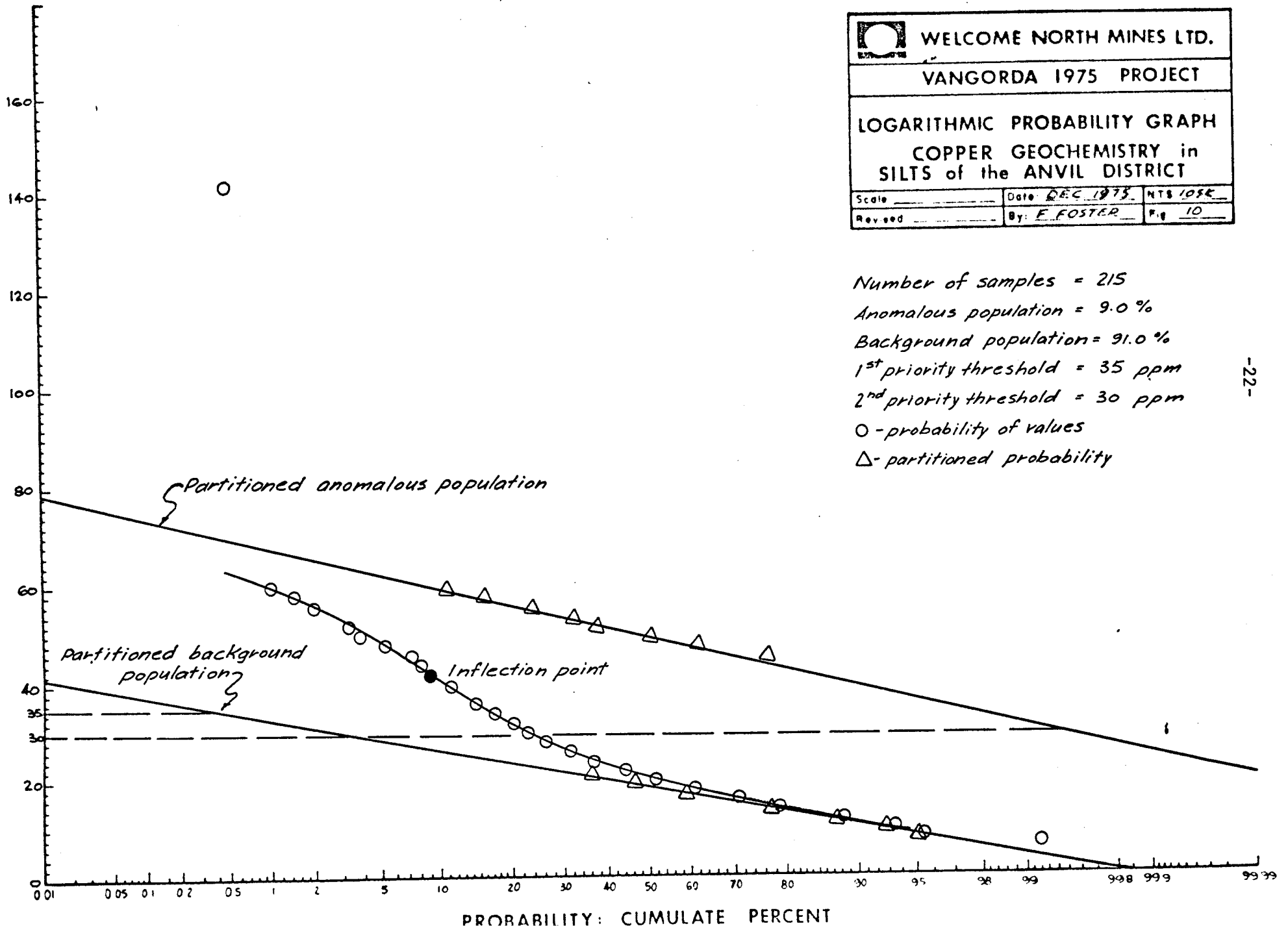
Number of samples = 286
 Anomalous population = 2.0 %
 Background population = 98.0 %
 1st priority pop. threshold = 55 ppm
 2nd priority pop. threshold = 41 ppm
 ○ - probability of values
 △ - partitioned probability



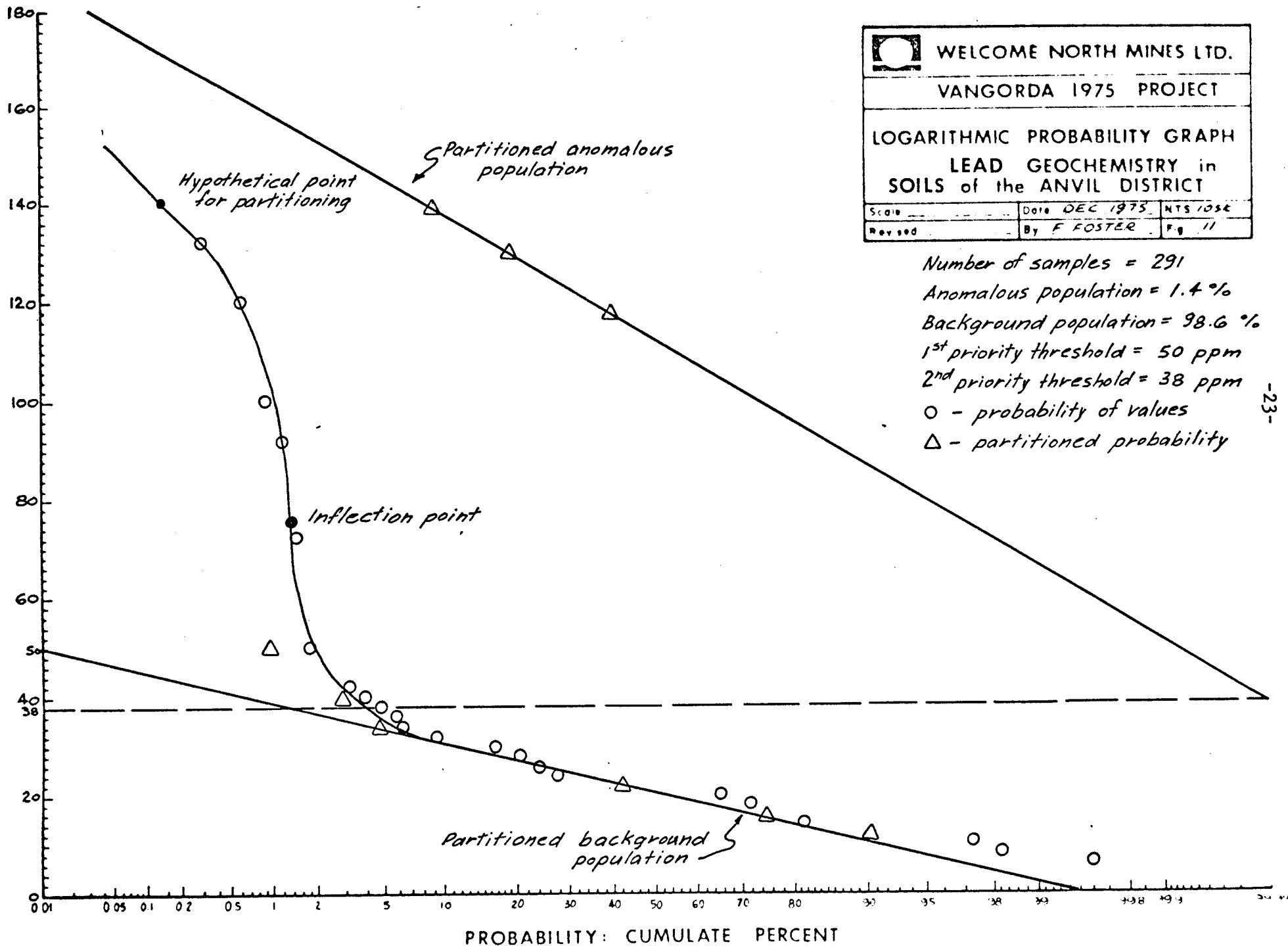
 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH COPPER GEOCHEMISTRY in SILTS of the ANVIL DISTRICT		
Scale _____	Date: <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By: <u>F. FOSTER</u>	Fig. <u>10</u>


Number of samples = 215
 Anomalous population = 9.0 %
 Background population = 91.0 %
 1st priority threshold = 35 ppm
 2nd priority threshold = 30 ppm
 O - probability of values
 Δ - partitioned probability

PARTS PER MILLION COPPER

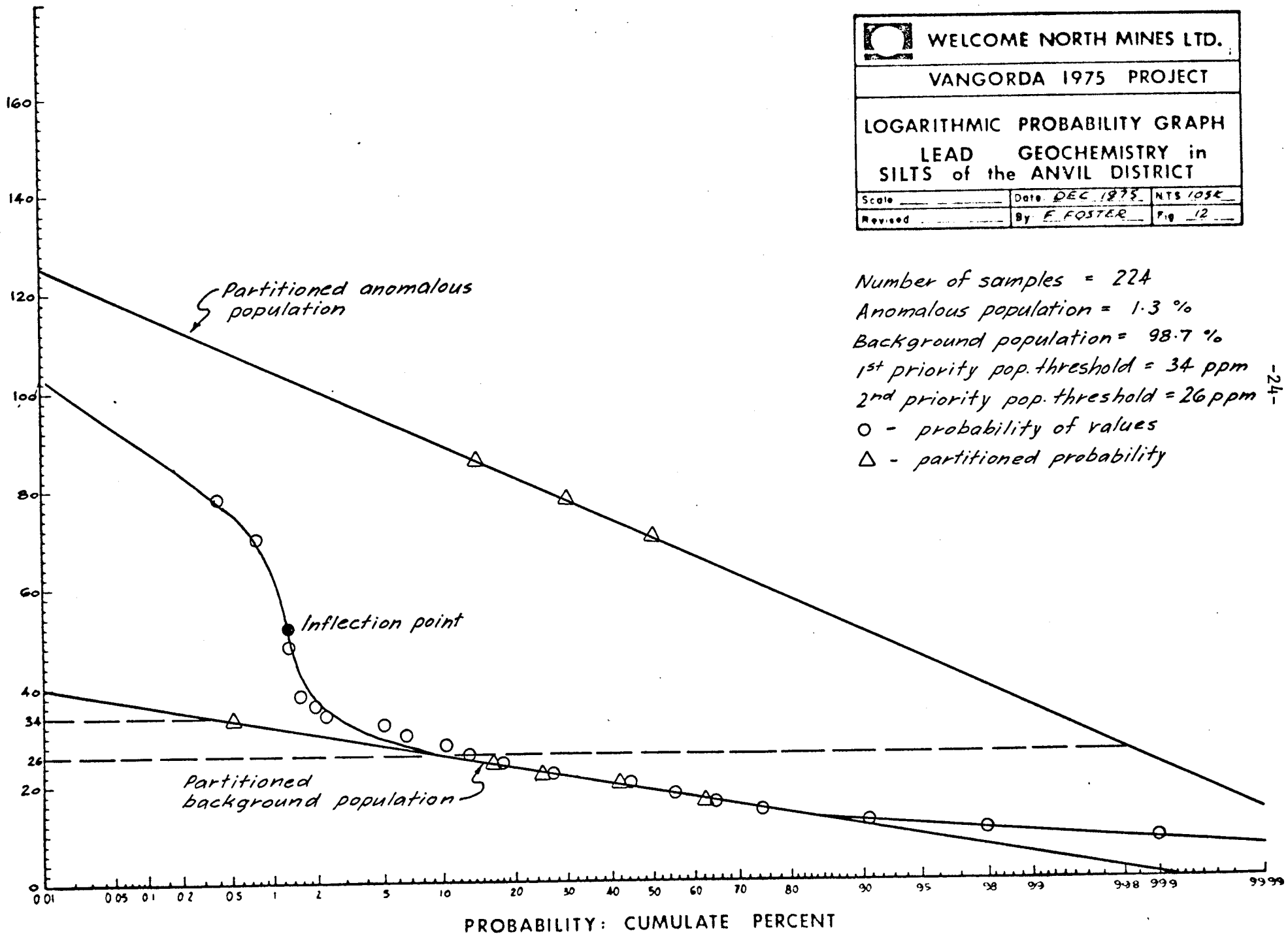


PARTS PER MILLION LEAD




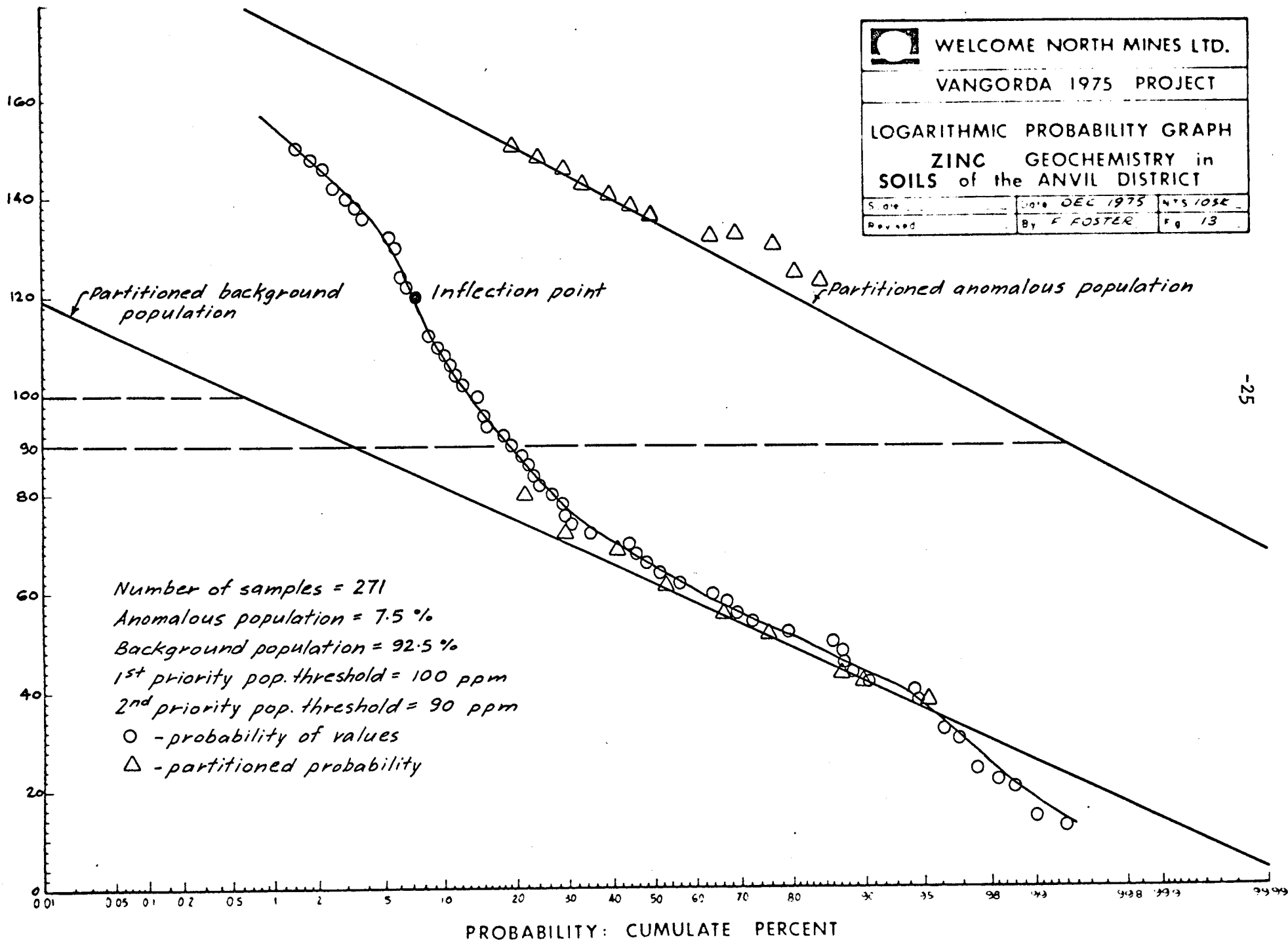
 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH LEAD GEOCHEMISTRY in SILTS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By <u>F. FOSTER</u>	Fig <u>12</u>

PARTS PER MILLION LEAD



-24-

 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH ZINC GEOCHEMISTRY in SOILS of the ANVIL DISTRICT		
Scale	Date DEC 1975	N/S 1052
Revised	By F FOSTER	Fig 13





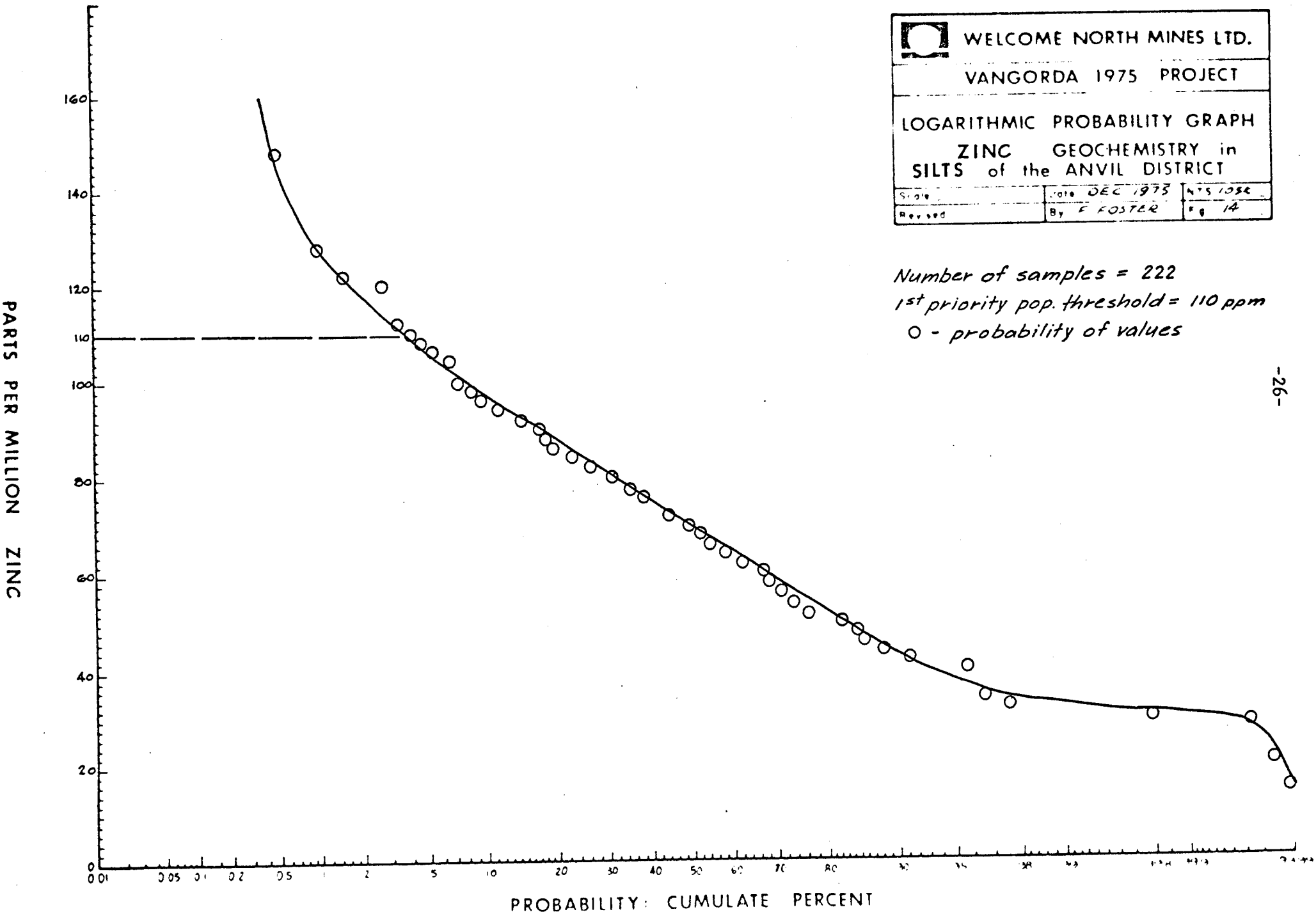
WELCOME NORTH MINES LTD.

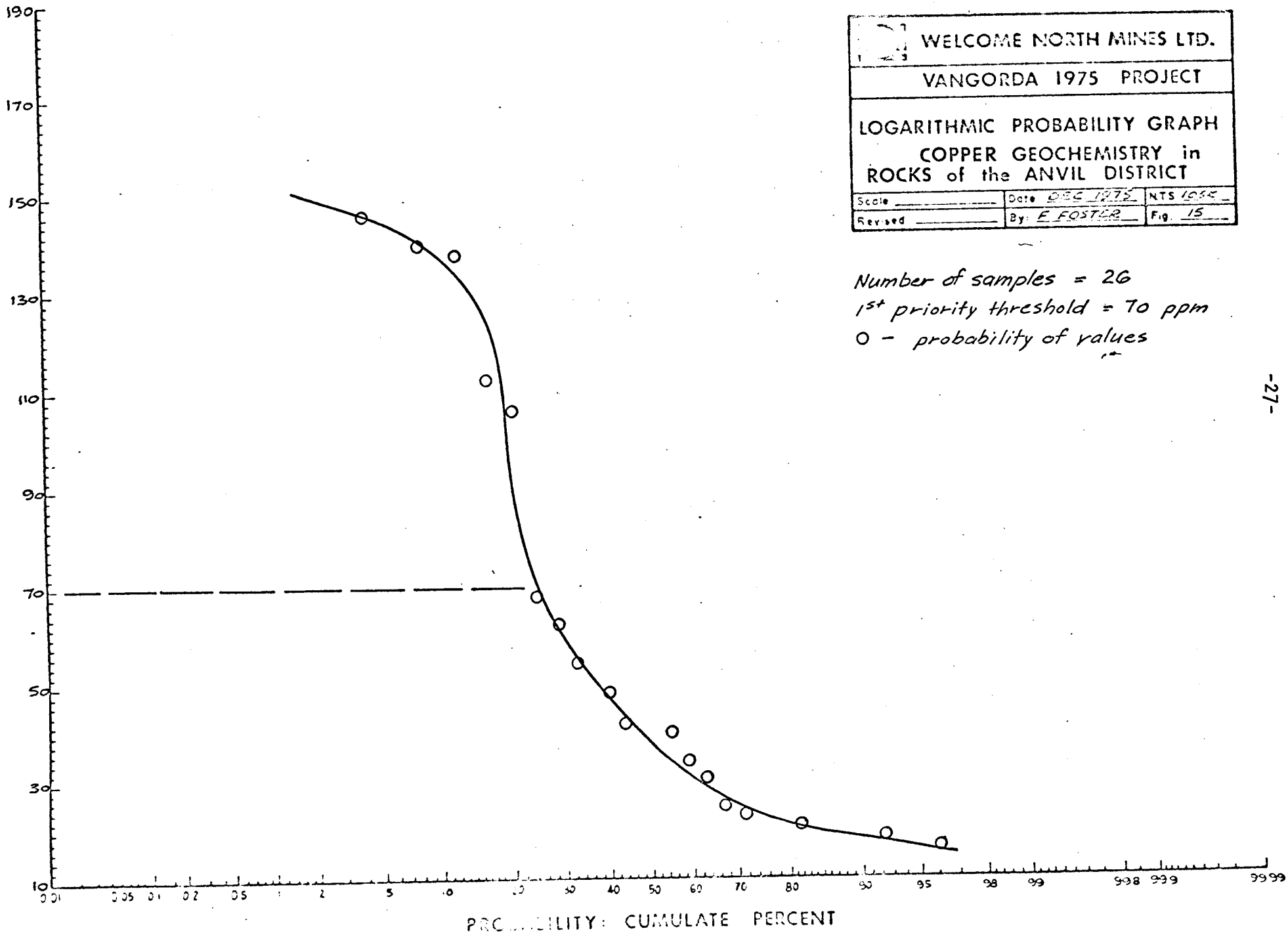
VANGORDA 1975 PROJECT


LOGARITHMIC PROBABILITY GRAPH
ZINC GEOCHEMISTRY in
SILTS of the ANVIL DISTRICT

Scale	Date DEC 1975	NTS 1084
Revised	By F FOSTER	pg 14

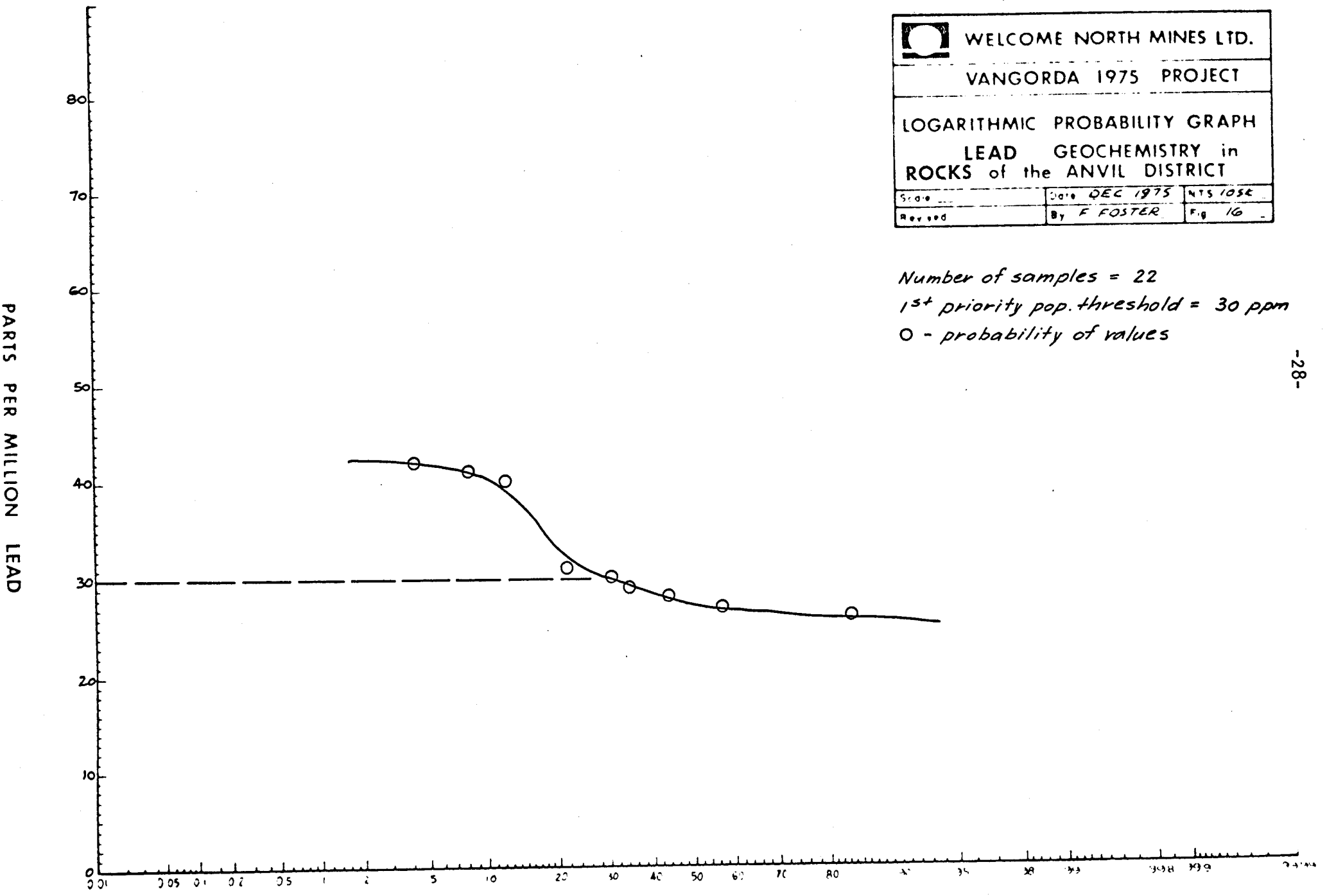
Number of samples = 222
1st priority pop. threshold = 110 ppm
O - probability of values






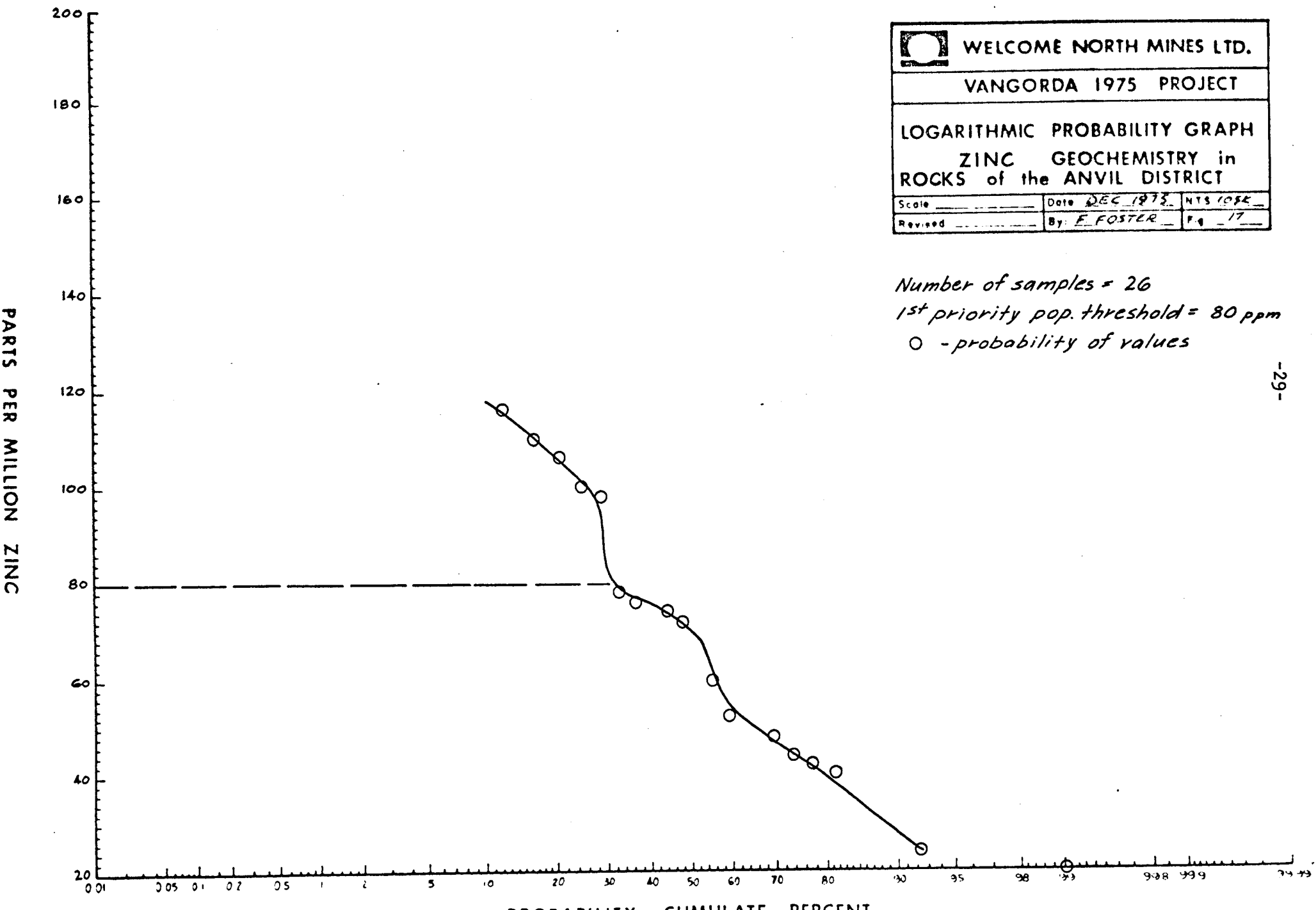
 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH LEAD GEOCHEMISTRY in ROCKS of the ANVIL DISTRICT		
Scale ...	Date DEC 1975	NTS 1:50K
Revised	By F FOSTER	Fig 16

Number of samples = 22
 1st priority pop. threshold = 30 ppm
 O - probability of values



 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH ZINC GEOCHEMISTRY in ROCKS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By: <u>F. FOSTER</u>	Pg. <u>17</u>

Number of samples = 26
 1st priority pop. threshold = 80 ppm
 ○ - probability of values



Examination of the statistical analysis for zinc content in silts (Fig. 14) shows that a major background population exists. The partitioning procedure cannot be applied in this case due to there being such a small percentage of anomalous samples. The configuration of the logarithmic probability plot shown in Fig. 14 suggests that the values greater than the arbitrarily chosen threshold of 110 ppm contain high background values as well as anomalous values. Unfortunately there is insufficient data to distinguish the highest possible background value and all values greater than 110 ppm are thus considered as anomalous.

Insufficient data was collected for a proper statistical analysis of the copper, lead, and zinc content in rocks sampled in the Anvil District, therefore threshold values of 70, 30, and 80 ppm for copper, lead, and zinc, respectively were arbitrarily chosen by visual inspection of the logarithmic probability plots (Fig. 15, 16, and 17).

Geochemical sampling on the ALICE claims was restricted to frost boil soil sampling, "sidehill" seepage silt sampling and to a lesser extent rock chip sampling. Anomalous geochemical response in copper, lead, and zinc was generally poor on the property, however, this was anticipated in certain areas due to the extensive cover of overburden.

Copper

There are four limited zones of anomalous geochemical response in copper outlined within the claim group boundaries. The most extensive of the four zones is situated in the southwest corner of the property in an area believed to be underlain by granitic rocks of the Anvil Batholith. A maximum value of 44 ppm copper was obtained from sidehill seepages draining this weakly anomalous zone.

The second largest zone is situated along the northern boundary of the property between lines 8W and 8E. This zone occurs in an overburden covered area which is believed to be underlain by phyllites of Unit (3a). Maximum values of 142 ppm Cu were obtained from silts sampled along Anvil Creek within this zone.

A third still smaller zone of moderately anomalous geochemical response in Cu was delineated by silt samples yielding values up to 86 ppm

copper over greenstone of Unit (3c) immediately north of the baseline on line 24E.

A fourth zone of moderate geochemical response, located between lines 8W and 0W at 21N, yielded values up to 84 ppm Cu from silts collected from a stream draining a large swampy area.

Additional geochemical responses in Cu were obtained from samples collected at the following sites:

grid location: 24E-17N	silt sample yielding 46 ppm Cu
grid location: 17W-32N	silt sample yielding 60 ppm Cu
grid location: 32E-18+50S	rock chip of Unit (3a) yielding 112 ppm Cu
grid location 32E-25S	rock chip of Unit (3a) yielding 146 ppm Cu

Lead and Zinc

Anomalous geochemical response on the property was very poor for lead and zinc. Only two rock chips, mentioned above as anomalous in copper, yielded up to 40 ppm lead and 220 ppm zinc.

In summary, the more extensive anomalous response of copper over lead and zinc on the property is anticipated due to the predominance of greenstone lenses, Unit (3c), and gabbro, Unit (12b), which are known to contain trace amounts of pyrite, pyrrhotite, and chalcopyrite.

GEOPHYSICAL SURVEYS

1. Instruments Used

The electromagnetic survey was carried out with a Crone CEM dual frequency unit. The Crone is of the inductive type and may be used either as a horizontal or vertical loop apparatus. Measurements are made of the resultant dip angle of the field and the width of null or out of phase component. It is designed to be operated with a maximum coil spread of 600 feet on frequencies of 390 and 1830 cycles per second with no interconnecting cables. The effective depth penetration is 300 feet for a horizontal conductor with maximum coil spread (no skin effect allowance) and 100 feet for a vertical conductor. The effective lateral coverage is a direct function of the spread under ideal conditions. The equipment was chosen in order to give reliable information on the attitude and configuration of a conductor, the physical properties of the host rock, dimensions of the conductor and results free from error due to topographic relief.

2. Method of Survey

All surveys were run with horizontal loop configuration and 300 foot coil spacing in order that highest response could be obtained from flat lying sulphide bodies. Readings at 1830 cps were taken at each station. The coil configuration was not adaptable to conditions of conductive overburden and maximum response from such was expected. All traverses were made by the "in line method". In some cases a lower frequency (390 cps) was adopted for better resolution of conductors, within areas of more specific interest.

3. Treatment of Data

All results as derived in the field were plotted each night by the EM operators on a grid plan using a scale of 1 inch = 400 feet. Results were presented to the party chief for inspection, profiling and preliminary contouring in order that this data be compared with the other surveys and

the course of the electromagnetic survey be directed on a daily basis. Final plotting was done on maps of 1" = 400 ft. scale showing major drainage features and location of mineral claim posts.

Electromagnetic data is presented in this report showing values profiled and contoured(see Appendix).

4. Interpretation of Results

a) Magnetometer Survey

Results from a previous magnetometer survey carried out by New Far North Expl. Ltd. were re-interpreted by the project geologist and plotted on a 1 in. = 400 ft. base map (Plate 6).

The re-interpreted results indicated that, with the exception of one major northwest trending anomalous magnetic response, the magnetic susceptibility over the claim group is fairly uniform. The aforementioned northwest trending anomalous magnetic response is situated in the south central region of the property. Although discontinuous this 8,000 ft. long feature corresponds very closely with the intrusive contact between gabbroic rocks of Unit (12b) and greenstones and phyllites of Unit (3) as presently mapped. Local highs up to 1100 gammas above background are found within this linear trend. Some of these are coincident with small faults in the area.

Several more local magnetic anomalies, their magnitude as much as 400 gammas above background, are situated in the eastern portion of the property north of the baseline. All these anomalies are located over phyllites and greenstones of Unit (3).

Of particular interest is a magnetic anomaly in the extreme northeast corner of the property. This anomaly, 400 gammas above background, is located over Unit (3) and is open to the east.

Of little interest is a 300 gamma above background magnetic response 1200 feet x 300 feet which is situated just south of the previously mentioned major, linear, magnetic feature over gabbro of Unit (12b).

b) Electromagnetic Survey

The results of the electromagnetic survey delineated two extensive moderately conductive (-15° dip-angle) zones and several weakly conductive zones of more restricted nature. One of the moderate dip-angle responses occurs as part of a complex northeast trending conductive zone more than 4,800 feet long situated in the eastern central portion of the property. The largest dip-angle response (-13°) within this zone occurs at station 40E-10S over a fault in Unit (3c). Several smaller dip-angle responses within this zone are partially coincident with localized magnetic anomalies which are located over Units (3a) and (3c).

The second moderately conductive zone is situated in the northwest corner of the property in an extensively overburden covered area that is believed to be underlain by phyllites of Unit (3a).

This conductive zone is 3,000 feet x 800 feet and elongate in an east-west direction.

The other weakly conductive zones are as listed below:

- grid location: 0W-21N, negative 5° dip-angle response over postulated Unit (3a)
- size and shape: 1400 ft. x 300 ft., elongate east-west

- grid location: 16E-23N, negative 5° dip-angle response over postulated Unit (3a)
- size and shape: 1300 ft. x 400 ft., elongate east-west

- grid location: 32E-13N, negative 5° dip-angle response over Unit (12b)
- size and shape: 800 ft. x 300 ft., elongate east-west

- grid location: 32E-24N, negative 5° dip-angle response over Unit (3c)
- size and shape: 1100 ft. x 500 ft., elongate southwest-northeast

- grid location: 32E-36N, negative 5° dip-angle response over postulated Unit (3c)
- size and shape: 700 ft. x 500 ft., oval shaped.

- grid location: 72E-27N, negative 5° dip-angle response over Unit (3c)
- size and shape: 1200 ft. x 200 ft., elongate east-west and open to the east.

RECOMMENDATIONS

As illustrated in Plate 10 there are two zones of high magnetic and electromagnetic susceptibility which are located over areas of potentially favourable geology, that is, areas possibly underlain by Unit (3a), the host of the Vangorda-Grum massive sulphide horizons.

It is recommended that further work on the ALICE claims consist of a continuing (from the previous year) geochemical and geological survey. The geochemical survey should cover areas which are, or are believed to be underlain by Unit (3a) that have had poor sampling coverage in the previous year. The geological survey should consist of detailed mapping and re-interpretation of rocks previously mapped as Units (3a) and (3c) in an attempt to further extend the limits of Unit (3a); especially within the zones of high magnetic and electromagnetic susceptibility.

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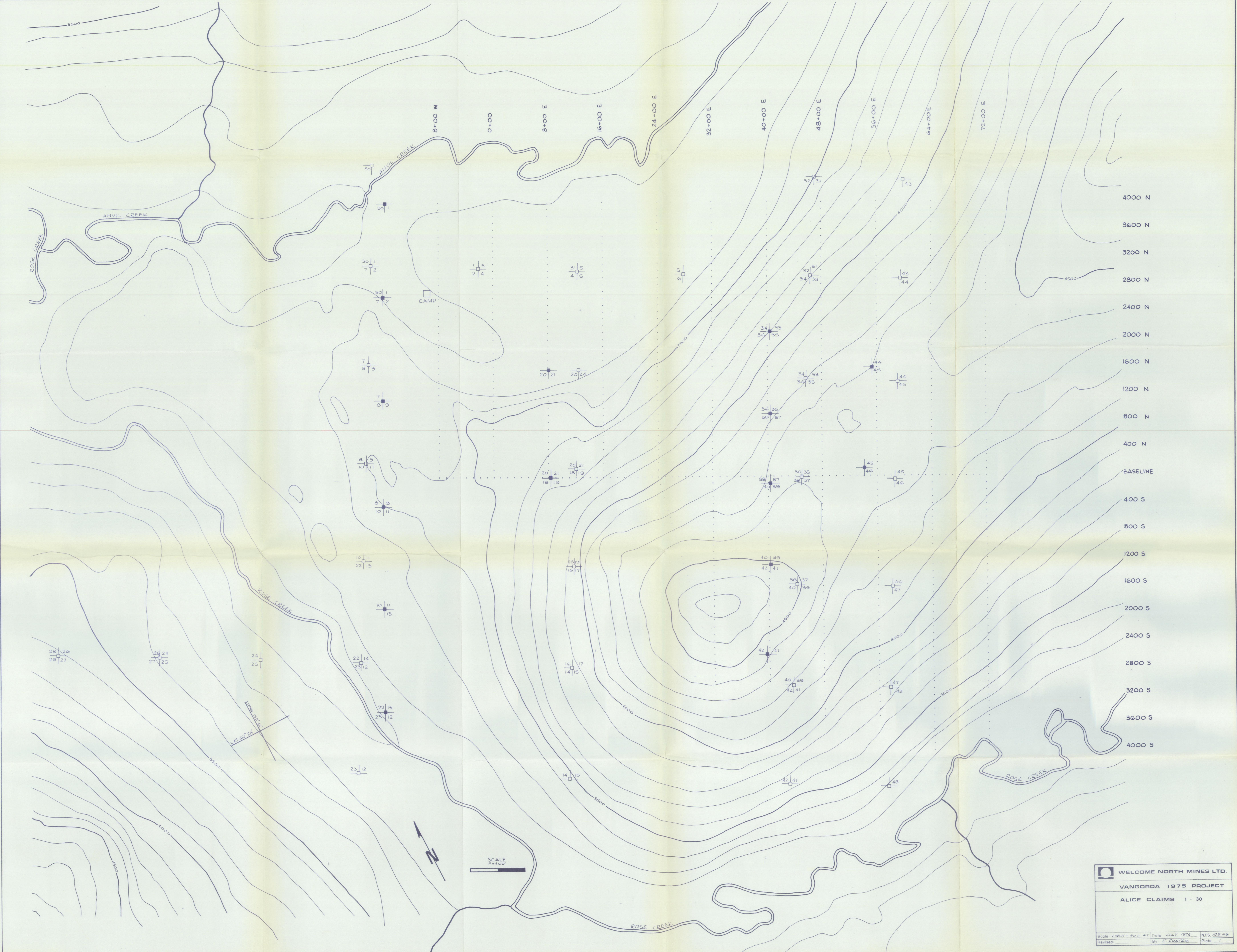
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Map: Dynasty Expl. Ltd., Rose Creek Area, 105K-5, Airborne Magnetometer Survey, scale 1" = 1320 feet, Hunting Survey Corp. 1964.

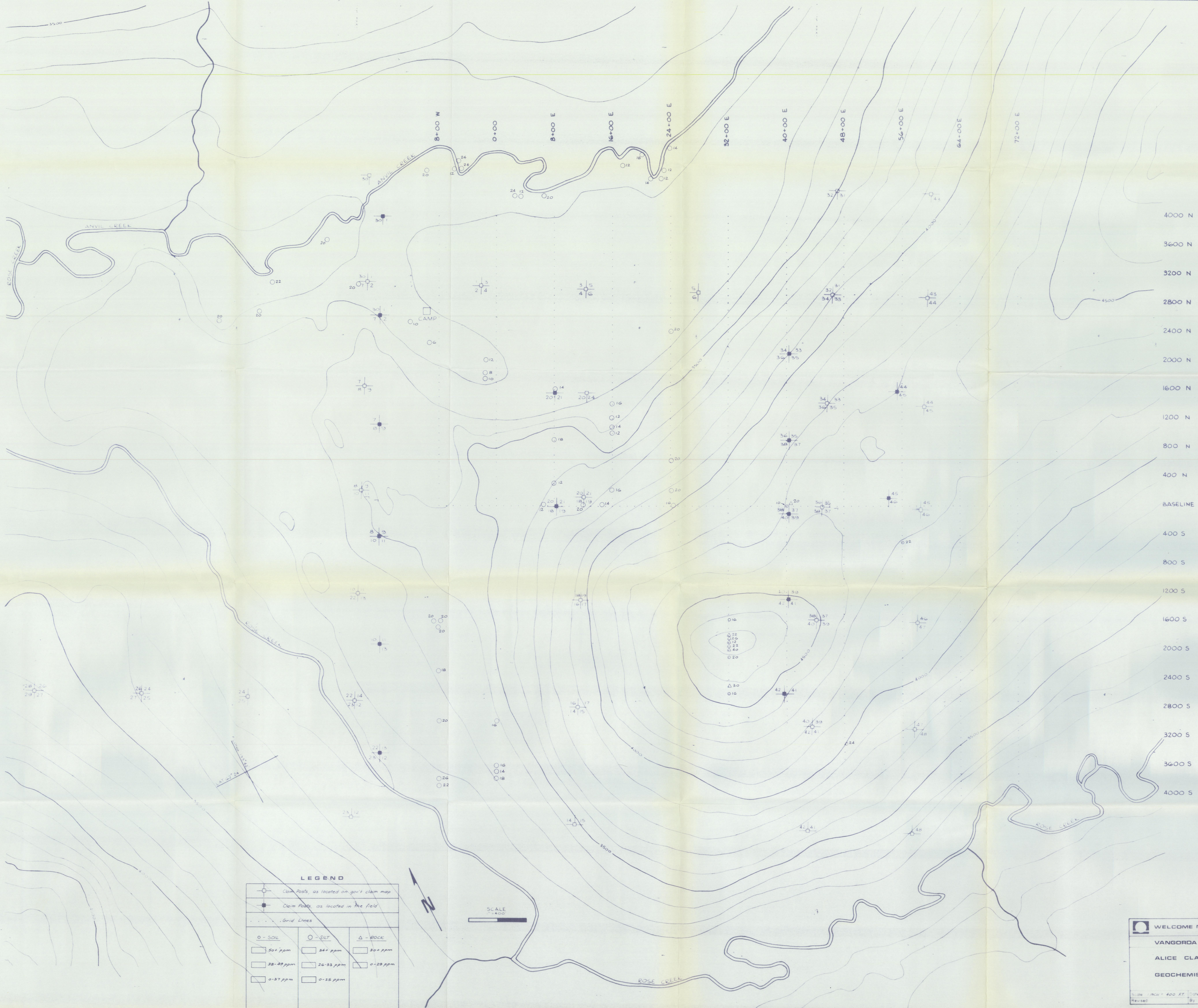
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Map: Dynasty Expl. Ltd., Anvil District, 105K, Airborne Magnetometer Survey, scale 1" = 1 mile, Lockwood Survey Corp. 1965.

Map: Dynasty Expl. Ltd., Anvil District, 105K, Airborne Electromagnetic Survey, scale 1" = 1 mile, Lockwood Survey Corp. 1965.



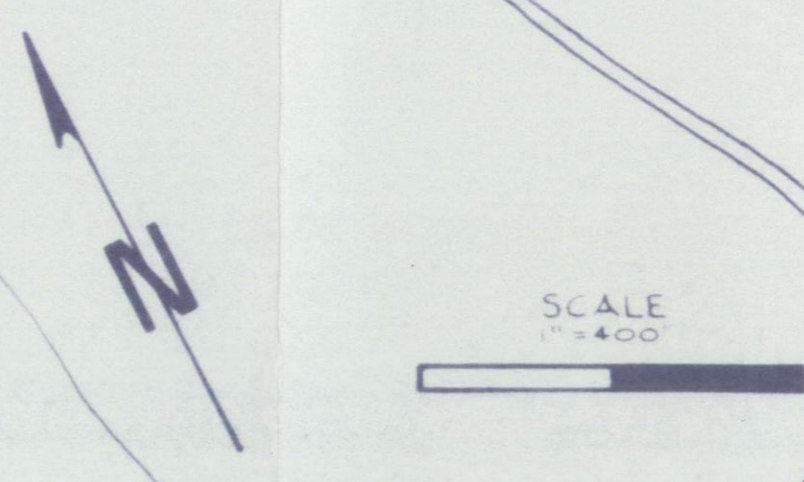
 WELCOME NORTH MINES LTD.			
VANGORDA 1975 PROJECT			
ALICE CLAIMS 1 - 30			
Scale 1" = 400' ET	Date JULY 1975	NTS 105 X 8	
Revised:	By F. FOSTER	Plate 1	



4000 N
 3600 N
 3200 N
 2800 N
 2400 N
 2000 N
 1600 N
 1200 N
 800 N
 400 N
 BASELINE
 400 S
 800 S
 1200 S
 1600 S
 2000 S
 2400 S
 2800 S
 3200 S
 3600 S
 4000 S

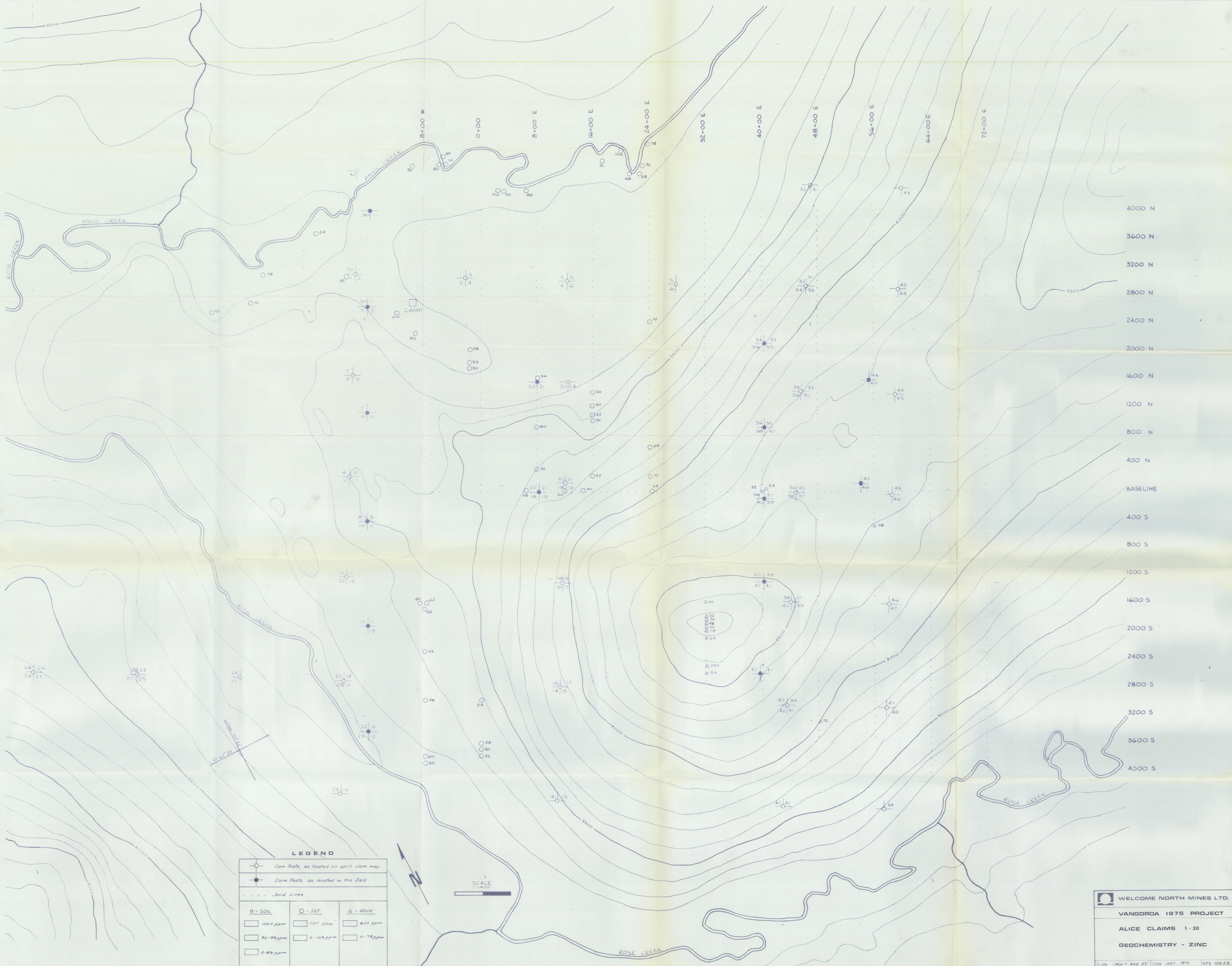
LEGEND

	Claim Posts, as located on gov't claim map				
	Claim Posts, as located in the field				
	Grid Lines				
	SOIL				
	SILT				
	ROCK				
	50+ ppm		34+ ppm		30+ ppm
	38-49 ppm		26-33 ppm		0-20 ppm
	0-37 ppm		0-15 ppm		



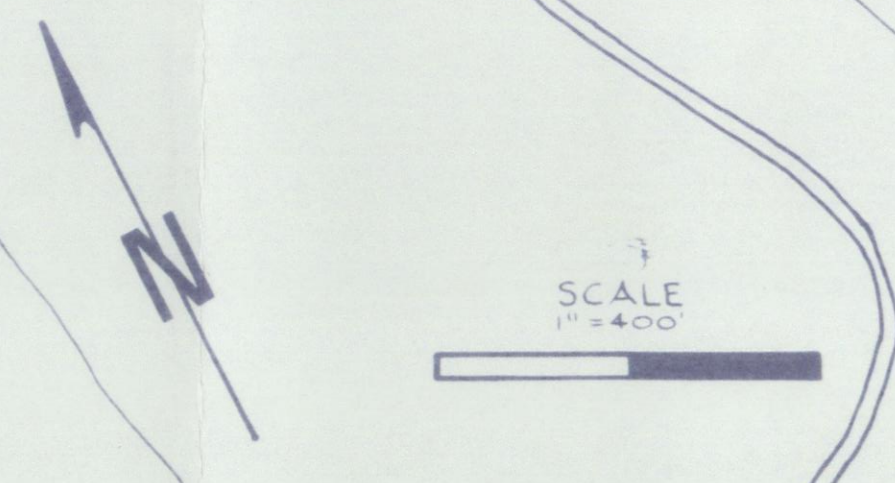
WELCOME NORTH MINES LTD.
VANGORDA 1975 PROJECT
ALICE CLAIMS 1-30
GEOCHEMISTRY - LEAD

Scale: 1 inch = 400 feet Date: JULY 1975 NTS 10545
 Revised: By: F. FOSTER Page: 3

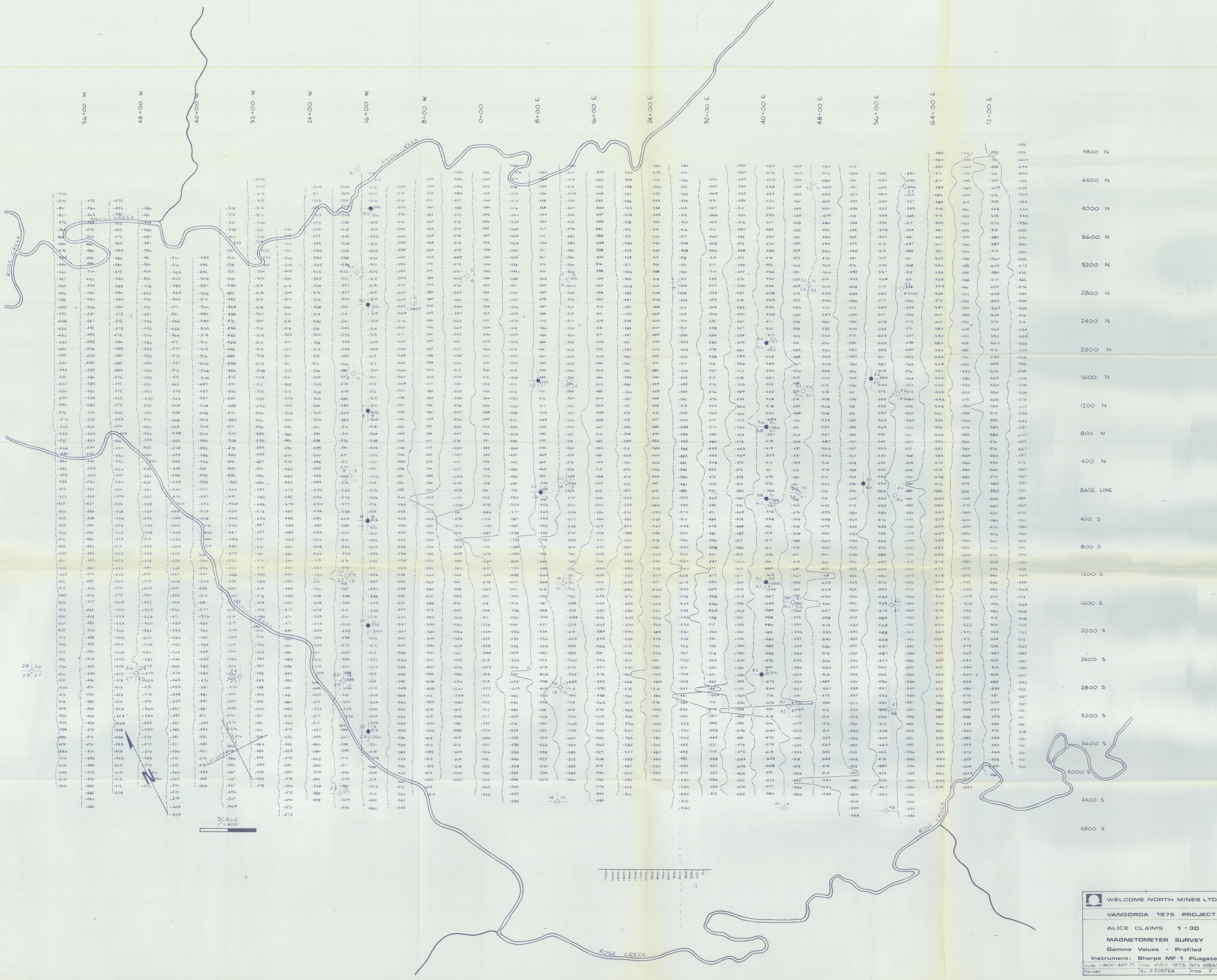


LEGEND


	Claim Posts, as located on gov't claim map				
	Claim Posts, as located in the field				
	Grid Lines				
	SOIL				
	SILT				
	ROCK				
	100+ ppm		110+ ppm		80+ ppm
	90-99 ppm		0-100 ppm		0-79 ppm
	0-89 ppm				



WELCOME NORTH MINES LTD.			
VANGORDA 1975 PROJECT			
ALICE CLAIMS 1-30			
GEOCHEMISTRY - ZINC			
Scale 1/4" = 400 FT.	Date JULY 1975	NTS 105.K5	
Revised	By E. FOSTER	Plate 4	





 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
ALICE CLAIMS 1-30		
MAGNETOMETER SURVEY		
Gamma Values - Contoured		
Instrument: Sharpe MF-1 Fluxgate		
Scale: 1 inch = 400 FT	Date: JULY 1975	NTS 10565
Revised:	By: F. FOSTER	Plate: G




4000 N
3600 N
3200 N
2800 N
2400 N
2000 N
1600 N
1200 N
800 N
400 N
BASE LINE
400 S
800 S
1200 S
1600 S
2000 S
2400 S
2800 S
3200 S
3600 S
4000 S

LEGEND
 □ Claim Posts, as located on gov't claim map
 ■ Claim Posts, as located in the field
 ... Grid Lines
 ~ Dip Angle $f = 1830$ Hz.
 - - - Dip Angle $f = 390$ Hz.

WELCOME NORTH MINES LTD.
VANGORDA 1975 PROJECT
ALICE CLAIMS 1-30
CRONE ELECTROMAGNETIC
SURVEY - DIP ANGLES - PROFILED
Coil Spacing - 300 ft.
 Scale: 1 INCH = 400 FT Date: JULY 1975 NTS 10545
 Revised: By: F. FOSTER Page: 7




WELCOME NORTH MINES LTD.
VANGORDA 1975 PROJECT
ALICE CLAIMS 1-30
CRONE ELECTROMAGNETIC SURVEY
DIP ANGLES - CONTOURED
 Horizontal Shootback Method
 Coil Spacing - 300 ft. ; Contour Interval - 2°
 Scale 1 INCH = 400 FT. Date JULY 1975 NTS 105K5
 Revised By F.FOSTER Plate 2

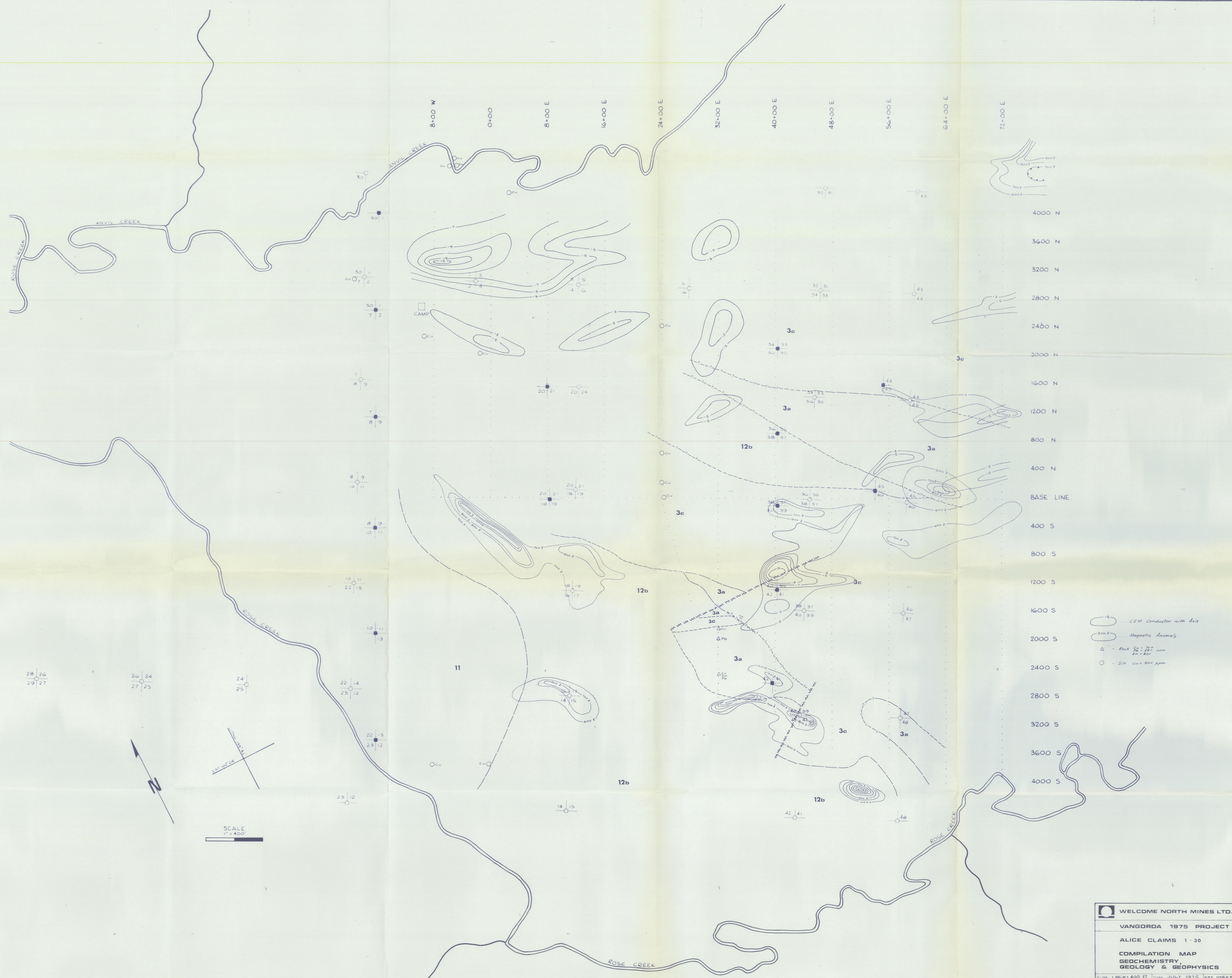
LEGEND

Mesozoic	AGE UNKNOWN
	12b Norrbönde diorite, gabbro
Mesozoic	CRETACEOUS
11 Porphyritic biotite-quartz monzonite and granodiorite; muscovite-biotite granodiorite; foliated equivalents	
Paleozoic	ORDOVICIAN & SILURIAN
	3c Medium-green foliated actinolite schist, andesitic greenstone, minor pale green crystalline limestone
Paleozoic	3a Dark gray biotite-chlorite schist and phyllite

Geological boundary (defined approx., gradational assumed)	
Limit of geological mapping	
First foliation (S ₁)	
Second foliation (S ₂)	
Third foliation (S ₃)	
Limestone	
Minor fold axis related to S ₂	
Joints (inclined, vertical)	
Fault (defined, approx., assumed)	
Anticline (approx., assumed)	
Arrow indicates direction of plunge	
Syncline (approx., assumed)	
Arrow indicates direction of plunge	
Anticline, Syncline overturned	
Outcrop	
Subcrop	



WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
ALICE CLAIMS 1-30		
GEOLOGY		
Scale 1 INCH = 400 FT.	Date JULY 1975	NTS 10565
Revised	By F.FOSTER	Plate 3



-5- CEM Conductor with Axis
 -300- Magnetic Anomaly
 Δ - Rock Zn = 20+ ppm
 Pb = 20+ ppm
 Cu = 30+ ppm
 ○ - Silt Cu = 30+ ppm

WELCOME NORTH MINES LTD.
VANGORDA 1975 PROJECT
ALICE CLAIMS 1 - 30
COMPILATION MAP
GEOCHEMISTRY
GEOLOGY & GEOPHYSICS
 Scale 1 INCH = 400 FT. Date JULY 1975 NTS 105K5
 Revised By F.FOSTER Plate 12