



**WELCOME NORTH MINES LTD. (N.P.L.)**  
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VANGORDA '75 PROJECT

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

ON THE

EVA 1-39 CLAIM GROUP

Latitude 62°26'N

Longitude 133°48'W

N.T.S. 105K-5

WHITEHORSE MINING DISTRICT

YUKON TERRITORY

During the Period June 26- Sept. 30, 1975.

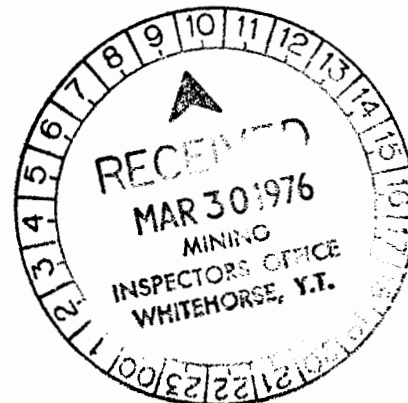
by

F. Foster

and

J.S. Brock

January 14, 1975



061507



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

\$ 14,800

14,800

W. Sinclair

~~at Whitehorse or  
Resident Mining Engineer~~

Considered as representation work under Section 33 (4) Yukon Quartz Mining Act.

B. R. BAXTER  
Supervising Mining Recorder

Commissioner of Yukon Territory

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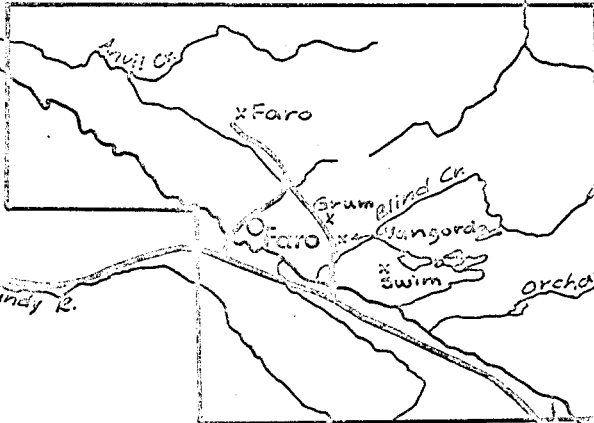
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VANGORDA 1975 PROJECT AREA



YUKON  
TERRITORY

	WELCOME NORTH MINES LTD.
VANGORDA 1975 PROJECT	
PROJECT AREA LOCATION MAP	
Scale: 1" = 15 mi.	Date: 1/25/75
Revised:	By: R. P. [unclear]

Whitehorse

Lake Laberge

Yukon R.

Big Salmon R.

Little Salmon L.

Mayundy R.

DELLY R.

Tay R.

Earn L.

x Faro

Grumallind Cr.

O Faro

x Swim

Orchard R.

Ross River

Lapie R.

CANAL ROAD

Wentlin R.

INTRODUCTION

The EVA 1-39 claims were staked by Welcome North Mines in February, 1975. The property was located over what was considered to be a favourable geologic environment for Anvil-Vangorda type massive sulphide deposits.

The EVA 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 26 1975 to Sept. 30, 1975, carried out an exploration program consisting of geological mapping, soil and silt geochemistry surveys and electro-magnetic and magnetic surveys.

MINERAL CLAIMS

The EVA 1-39 claim group consists of the following 39 contiguous mineral claims located in the Whitehorse Mining District of the Yukon Territory (see Figure 1).

<u>CLAIMS</u>	<u>GRANT NUMBERS</u>	<u>RECORDING DATE</u>
EVA 1-24	Y92403-Y92426	Feb. 13, 1975
EVA 25-39	Y92427-Y92441	Feb. 17, 1975

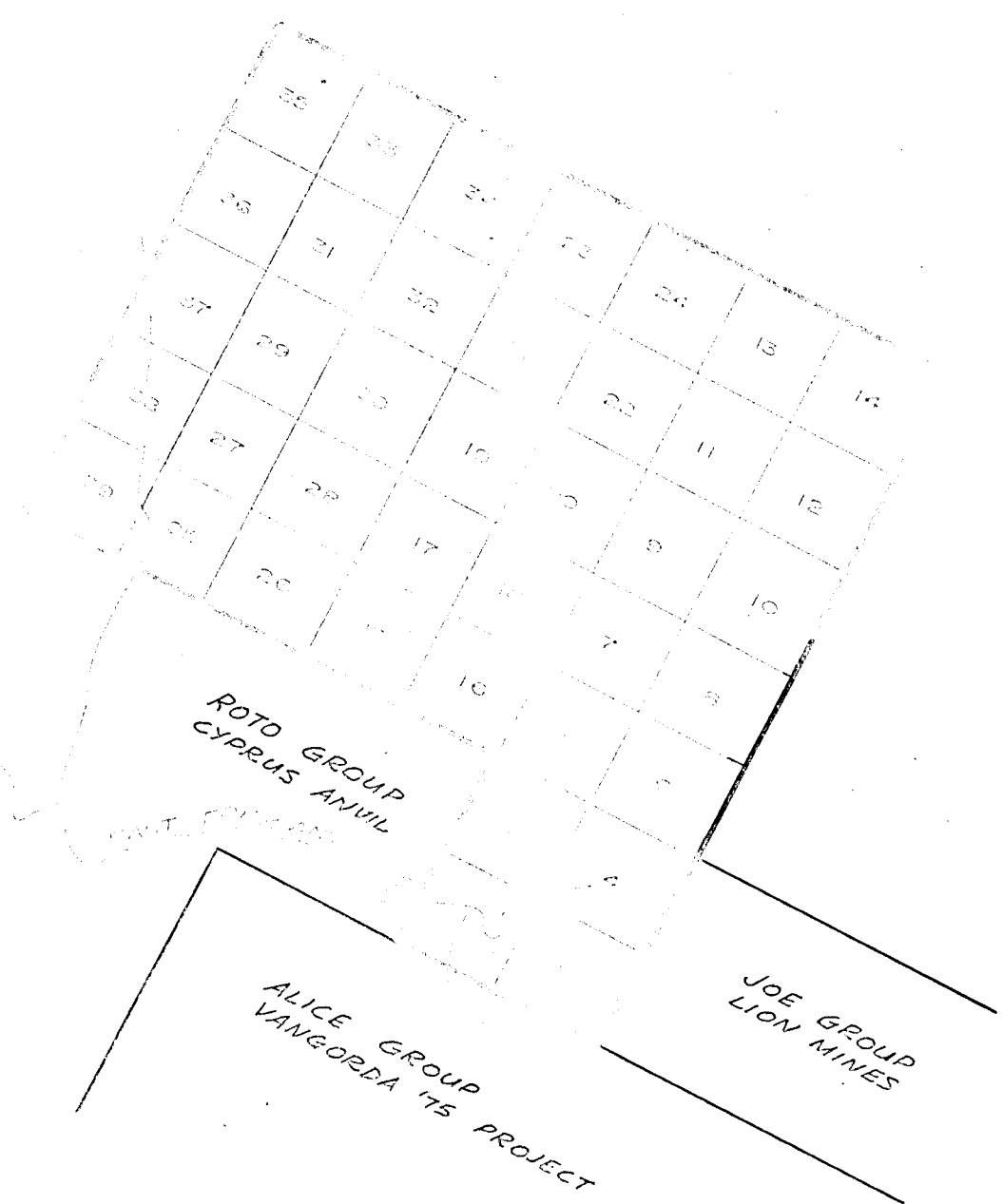


Figure 1

SUMMARY AND CONCLUSIONS

Lack of outcrop prohibits a detailed geological interpretation, however through on-strike extrapolation from the surrounding region it appears that the EVA property is favourably located within the same units (1c) that host the Faro deposit.

Of particular significance is the coincident EM, magnetic, gravity and geochemical anomaly centered on line 48E - 6+00N. Although the anomalous area is thought to be underlain by calc-silicates of Unit (2a) this area should be drill tested to depth with the intention of penetrating underlying Unit (1c), the possible host of the massive sulphide target.

LOCATION AND ACCESS

The EVA 1-39 claims are located in the Whitehorse Mining District of the Yukon Territory (N.T.S. 105K-5) at latitude 62°26'N, and longitude 133°48'W, 125 miles northeast of Whitehorse, Yukon Territory and 13 miles northwest of the town of Faro, Yukon Territory (see Figure 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 on a ridge one mile east of the property. Several cat trails in much poorer condition provide access to the eastern portion of the property from the top of this ridge.

The property is located on a broad bench of glacial overburden, about 200 feet thick, in the bottom of Anvil Creek valley two miles northeast of the junction of Anvil Creek and Rose Creek. All the property is below treeline and 70 percent of the property is covered by muskeg. Anvil Creek borders the property on its eastern side and a gentle hill which gives way to the slopes of a northeast trending ridge flanking the north of Anvil Creek valley occupies the central and western portion of the property.

Outcrop is extremely limited and occurs in a few isolated locations on the eastern flanks of the gentle hill found in the central region of the property.

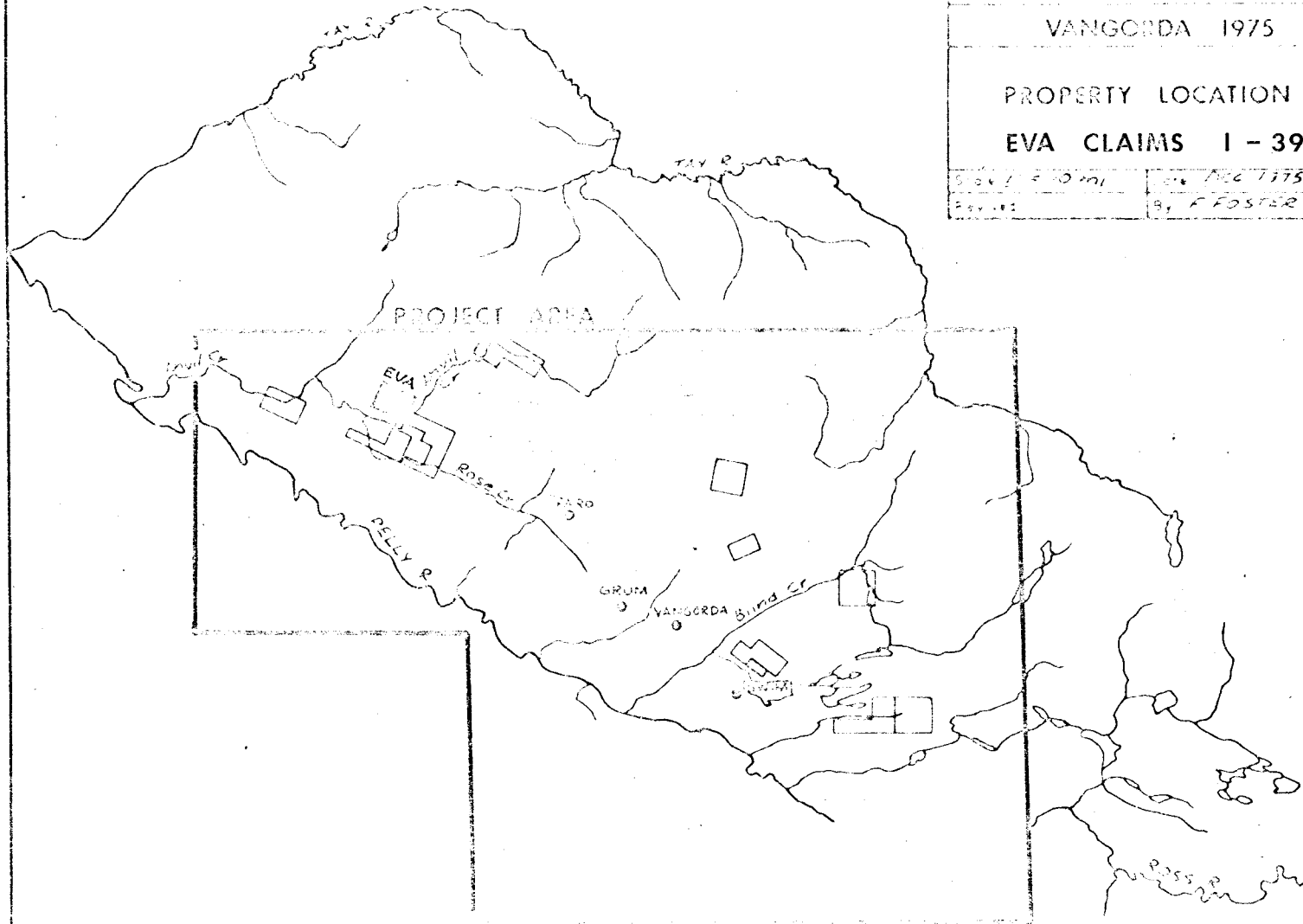
WELCOME NORTH MINES LTD.

VANGORDA 1975 PROJECT

PROPERTY LOCATION MAP

EVA CLAIMS 1 - 39

Scale 1:20,000	Map No. 100 7175	NTS 1054
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.

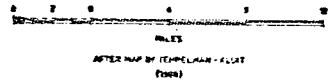
The central part of the district is formed by the Anvil Range, the dominating structure being a doubly plunging arch-like feature around the Anvil batholith. The core of the Anvil Range is underlain by granitic rocks for which potassium-argon age determinations suggest an age of 80 - 90 million years. 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.

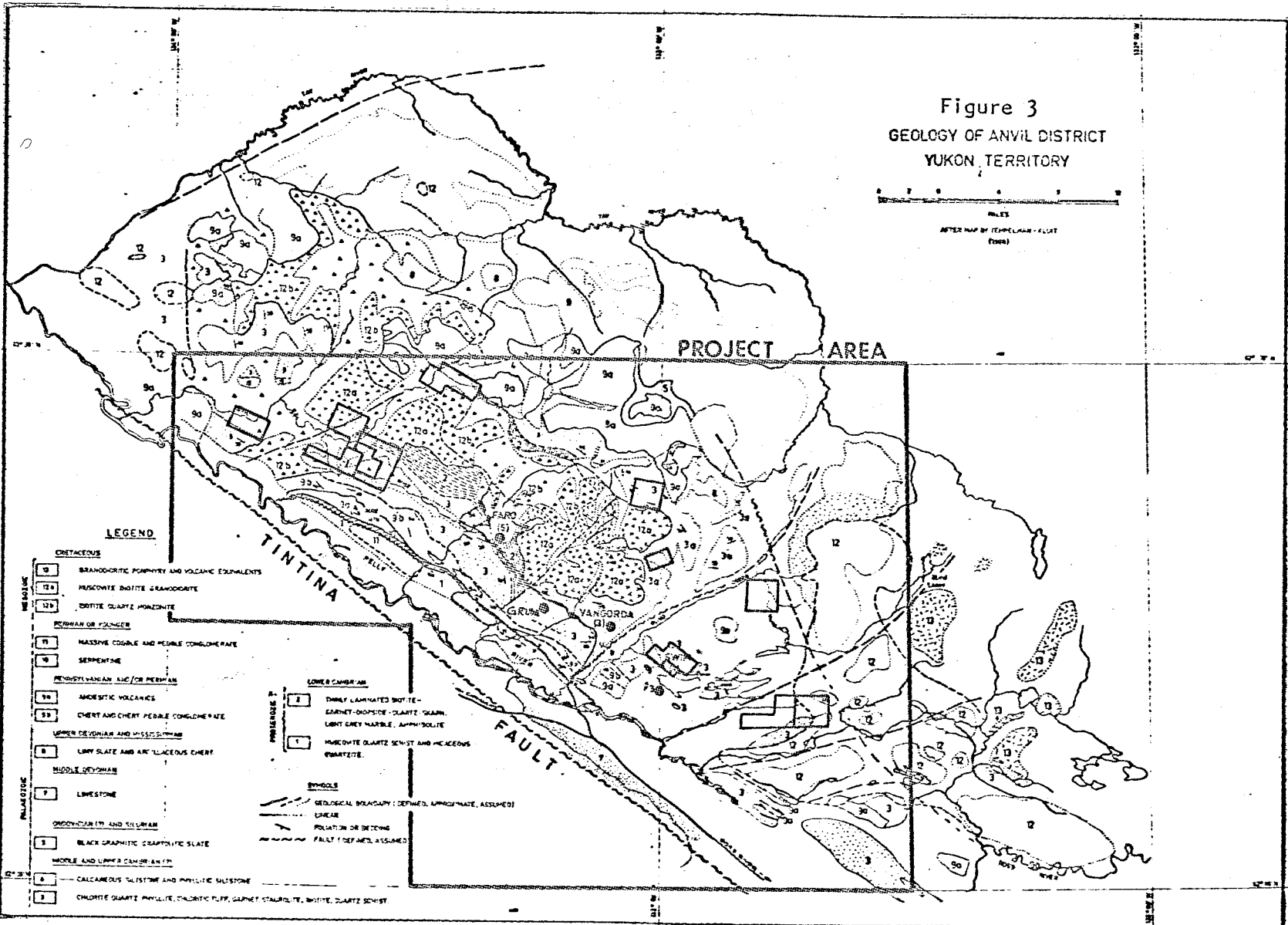
Figure 3  
GEOLOGY OF ANVIL DISTRICT  
YUKON TERRITORY



PROJECT AREA

LEGEND

- |   |  |
|---|--|
| <b>CRETACEOUS</b>                       |  |
| 10                                      | BRANODORITIC PORPHYRY AND VOLCANIC EQUIVALENTS                                     |
| 11                                      | MUSCOVITE BIOTITE GRANODIORITE   |
| 12a                                     | BIOTITE QUARTZ MONZONITE   |
| <b>PERMIAN OR YOUNGER</b>               |  |
| 13                                      | MASSIVE COGNEIL AND PEBBLE CONGLOMERATE  |
| 14                                      | SERPENTINE   |
| <b>PENNSYLVANIAN AND/OR PERMIAN</b>     |  |
| 15a                                     | ANDRESITIC VOLCANICS   |
| 15b                                     | CHERT AND CHERT PEBBLE CONGLOMERATE  |
| <b>LOWER DEVONIAN AND MISSISSIPPIAN</b> |  |
| 16                                      | LEAFY SLATE AND ARGILLACEOUS CHERT   |
| <b>MIDDLE DEVONIAN</b>                  |  |
| 17                                      | LIMESTONE  |
| <b>ORDOVICIAN (?) AND SILURIAN</b>      |  |
| 18                                      | BLACK GRAPHITIC GRANITIC SLATE   |
| <b>MIDDLE AND LOWER CAMBRIAN (?)</b>    |  |
| 19                                      | CALCAREOUS SLISTONE AND PHYLLITE SLISTONE  |
| 20                                      | CHLORITE QUARTZ PHYLLITE, CHLORITE SLIP, GARNET STAUROLITE, BIOTITE, QUARTZ SCHIST |
- 
- |                       |   |
|-----------------------|---|
| <b>LOWER CAMBRIAN</b> |   |
| 21                    | THINLY LAMINATED BIOTITE-GARNET-DIOPSIDE-QUARTZ GRANITE, LIGHT GREY MARBLE, AMPHIBOLITE |
| 22                    | MUSCOVITE QUARTZ SCHIST AND MICACEOUS QUARTZITE   |
- 
- |                |   |
|----------------|---|
| <b>SYMBOLS</b> |   |
|                | GEOLOGICAL BOUNDARY (DEFINED, APPROXIMATE, ASSUMED) |
|                | SPHERE  |
|                | POLLUTION OR DIVISION                               |
|                | FAULT (DEFINED, 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	EPOCH	FORMATION	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	8c	Light grey, massive resistant recrystallized limestone	
	Lower Permian	Range	8b	Massive green basalt, commonly amygdaloidal, includes common pyroclastic and less common pillowed varieties, metamorphosed equivalents near granitic bodies	
	Lower Permian and Upper Permian	Group	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 interbedded 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	Fero sulphide horizon, muscovite quartzite + sulphides, massive and banded pyrite and pyrrhotite	
			1a	Quartz-feldspathic biotite-muscovite schist and gneiss, in part bleached and hornfelsed	

TABLE 1 LITHOLOGIC SECTION, ANVIL DISTRICT

PREVIOUS WORK

The first work to be carried out in the area of the EVA 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, in 1970 Dynasty staked the LORNA, ARO and ROTO claims over airborne geophysical anomalies obtained in 1965. The original ROTO claims are now re-staked in part as the EVA 1-8 and 15-18 claims.

Dynasty conducted ground geophysical surveys, including gravity, electromagnetic and magnetic surveys, and geological mapping and soil sampling over the claims in 1970. A Turam electromagnetic survey was carried out over the claims in 1973.

In 1966, as a result of the 'Anvil staking rush' the JOE claims were staked by New Far North Explorations Ltd. Prior to 1968, New Far North carried out airborne EM and magnetometer, linecutting, geochemical, magnetic and gravity surveys on the JOE property. The JOE 1-8 claims are currently in good standing and are held under option by Lion Mines (see Fig. 1). The balance of the original property was allowed to lapse and was subsequently re-staked by Welcome North with the EVA 40-47 mineral claims.

Engineering data and reports that have been utilized during the course of the geological, geophysical and geochemical compilations are summarized in the bibliography appended to this report.

## GEOLOGY

Due to extensive deep overburden cover, outcrop is almost non-existent on the property. However, based on the outcrop present and on information extrapolated from the MABEL claims to the east, rocks underlying the property are interpreted as gently southerly dipping muscovite-biotite schists of Unit (1c) and calc-silicate gneisses of Unit (2a) which are further documented in Table 1 (illustrated earlier in report).

Granodiorites of the Anvil Batholith [Unit (11)] are separated from rocks of Units (1c) and (2a) by a northeast trending fault located in the northwestern portion of the property. Large talus slopes composed of granodiorite occupy the flanks of the ridge which borders the Anvil Creek valley on the northwest side of the property.

Outcrops of calc-silicate schist [Unit (2a)] composed of laminated pale-green and purplish-brown banded skarn, layers of fine-grained tremolite-actinolite with minor chlorite and phyllitic partings occur at station 48E-15N and 600 feet northeast of the end of line 32S. Foliated greenstone of Unit (2b) exhibiting a well developed plane of schistosity crops out 300 feet west of 40E-30N.

Subcrop of dark green well foliated amphibolite of Unit (2b) was also found 500 feet west of 48E-38N.

Rocks underlying the property are affected by at least three periods of deformation. Three axial plane cleavages and related schistosity 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.

Present data obtained from limited 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.

LINE CUTTING

An old grid system utilized for previous geochemical, magnetometer, and gravity surveys by Dynasty Explorations Ltd. was brushed out and extended by line cutters of Eastern Associates, hired on a contractual basis from Whitehorse. The grid system consists of a 6,400 foot long base line and a 4,800 foot long tie line, both trending at 118° 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 12.7 miles of line were either cut or brushed out (see Fig. 4).

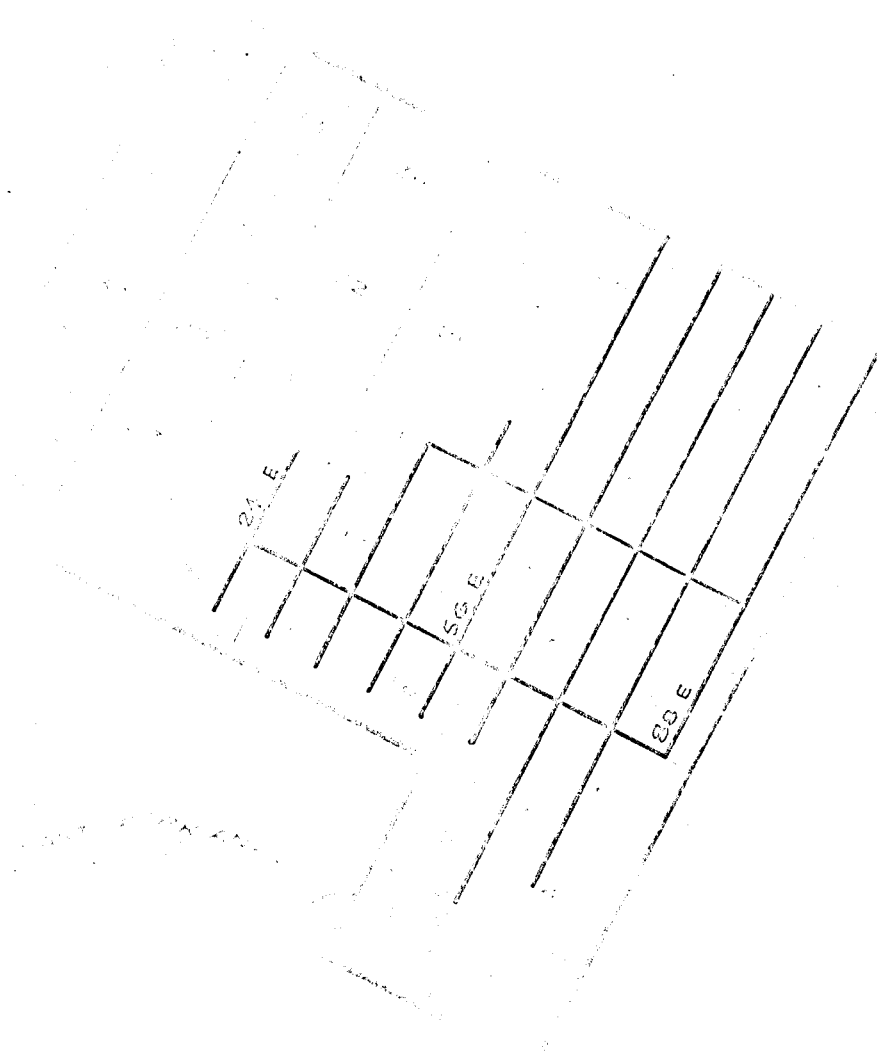


Figure 4  
 GRID LOCATION MAP  
 WELCOME CO.  
 CITY OF  
 1930

## 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.

In many cases previous results from other 'grid controlled' geochemical surveys were available for review and revised interpretation. On the EVA claims 2.5 miles of grid line soil sampling were carried out to complement a previous survey over the same grid.

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. 5. 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.

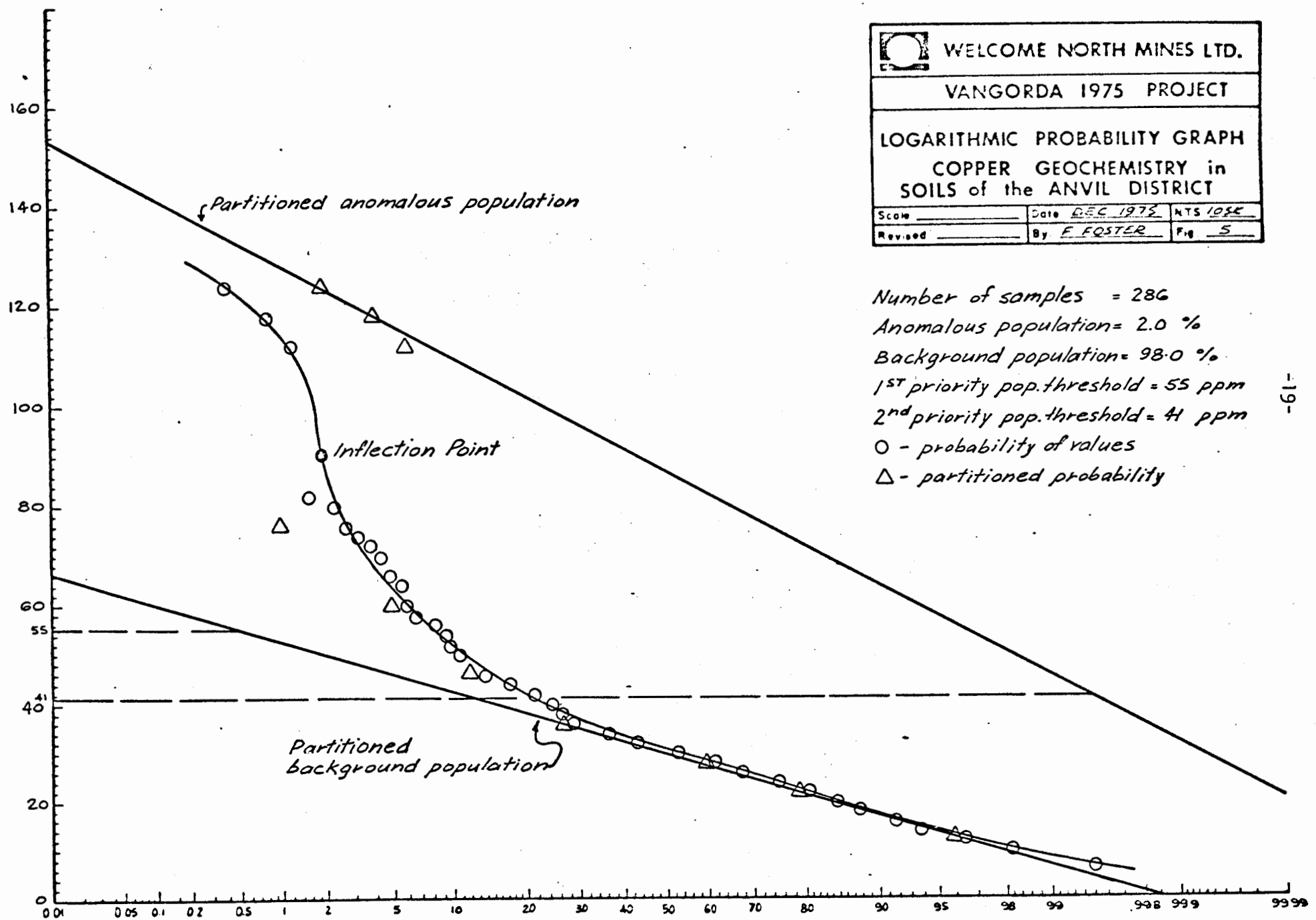
Inspection of the statistical analysis for copper content in silts sampled in the Anvil District (Fig. 6) reveals that three geochemical populations, such as those outlined above for copper in soils, exist and that the overlap between the anomalous and background populations ranges between 30 to 34 ppm.


Inspection of statistical analysis for lead content in soils (Fig. 7) 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. 8) 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. 9) 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.

PARTS PER MILLION COPPER

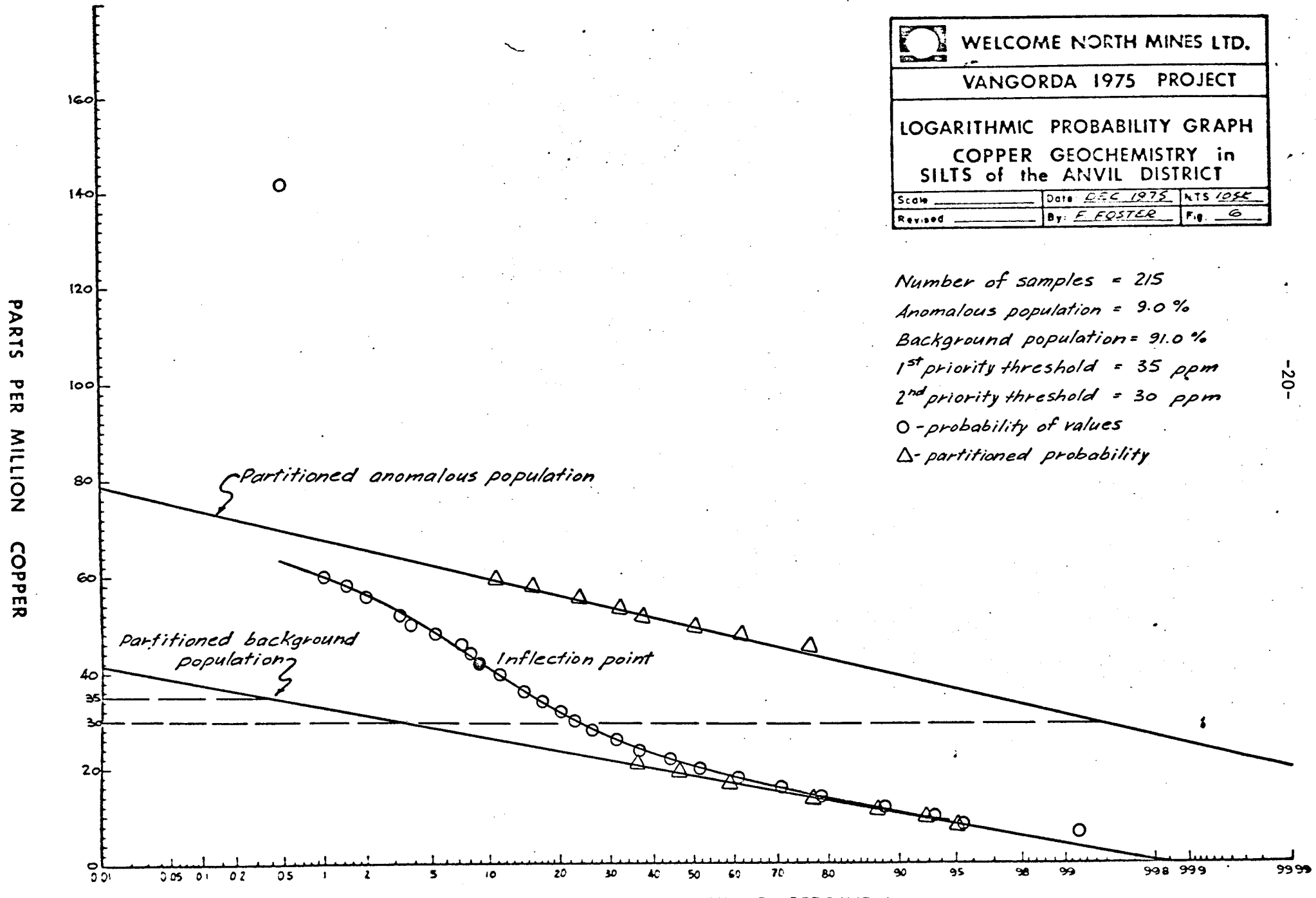


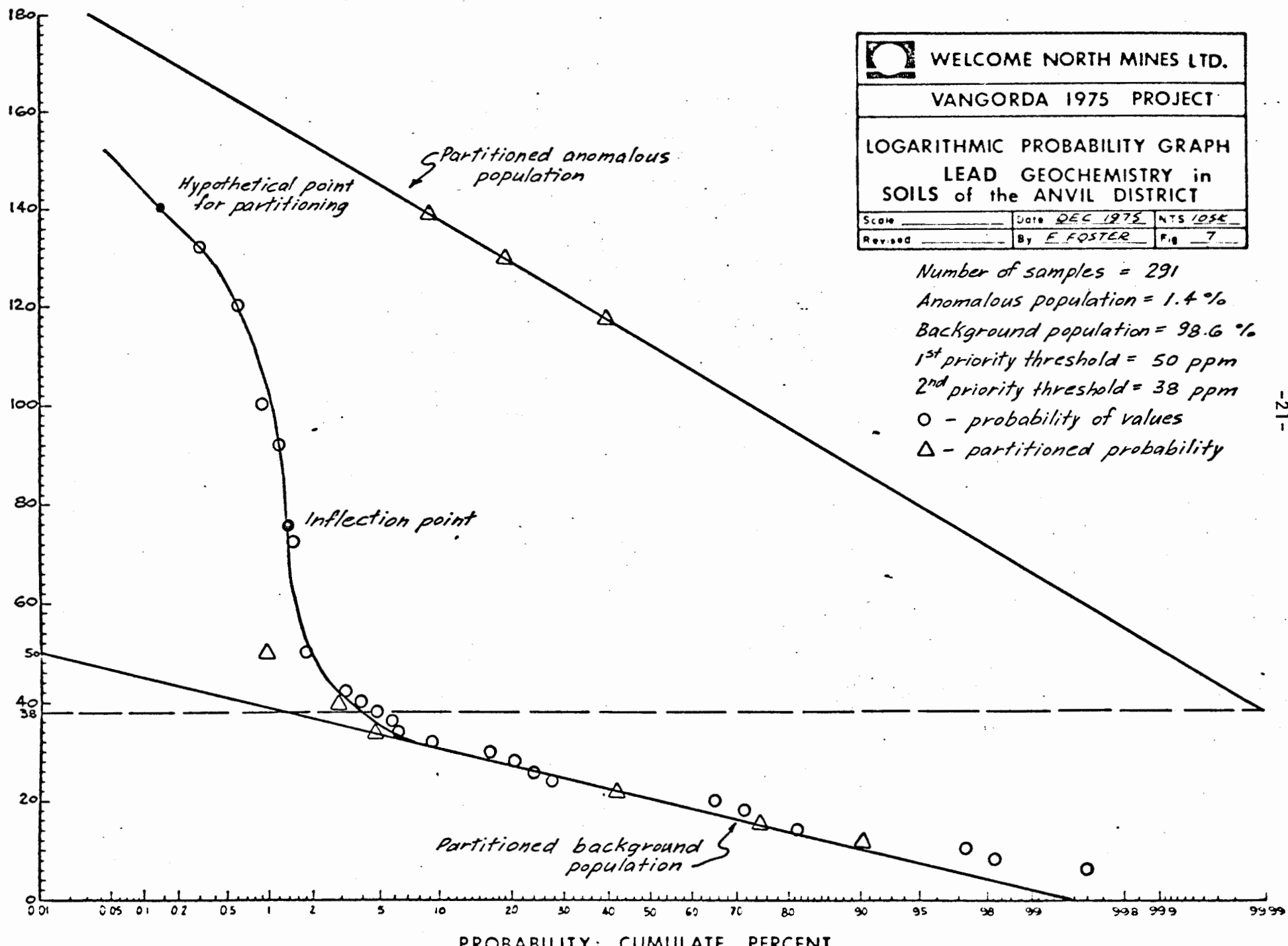
 <b>WELCOME NORTH MINES LTD.</b>		
<b>VANGORDA 1975 PROJECT</b>		
<b>LOGARITHMIC PROBABILITY GRAPH</b> <b>COPPER GEOCHEMISTRY in</b> <b>SOILS of the ANVIL DISTRICT</b>		
Scale _____	Date <u>DEC 1975</u>	NTS <u>10SE</u>
Revised _____	By <u>F. FOSTER</u>	Fig <u>5</u>


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

 <b>WELCOME NORTH MINES LTD.</b>		
<b>VANGORDA 1975 PROJECT</b>		
<b>LOGARITHMIC PROBABILITY GRAPH</b> <b>COPPER GEOCHEMISTRY in</b> <b>SILTS of the ANVIL DISTRICT</b>		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By: <u>F. EOSTER</u>	Fig. <u>6</u>

Number of samples = 215  
 Anomalous population = 9.0 %  
 Background population = 91.0 %  
 1<sup>st</sup> priority threshold = 35 ppm  
 2<sup>nd</sup> priority threshold = 30 ppm  
 ○ - probability of values  
 △ - partitioned probability

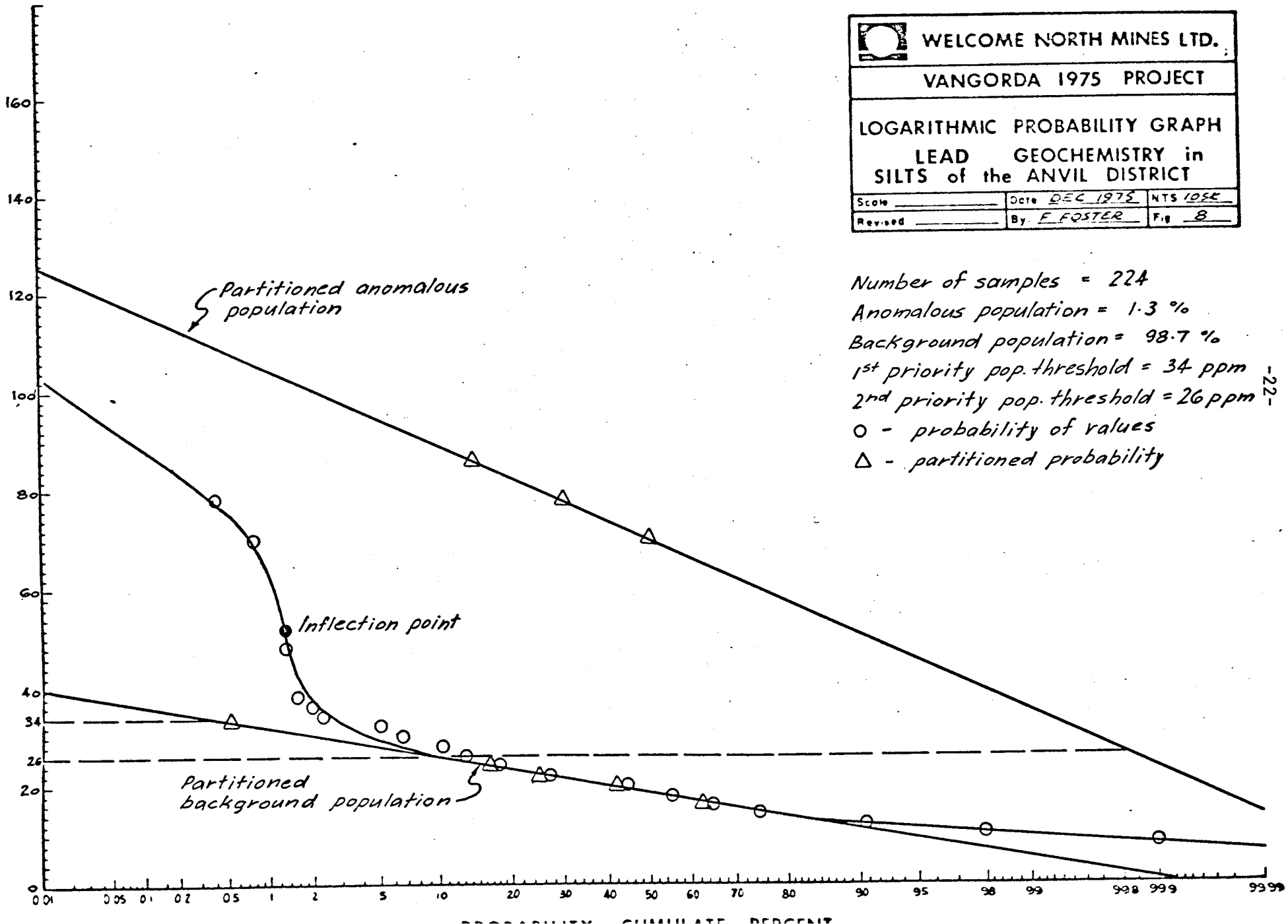





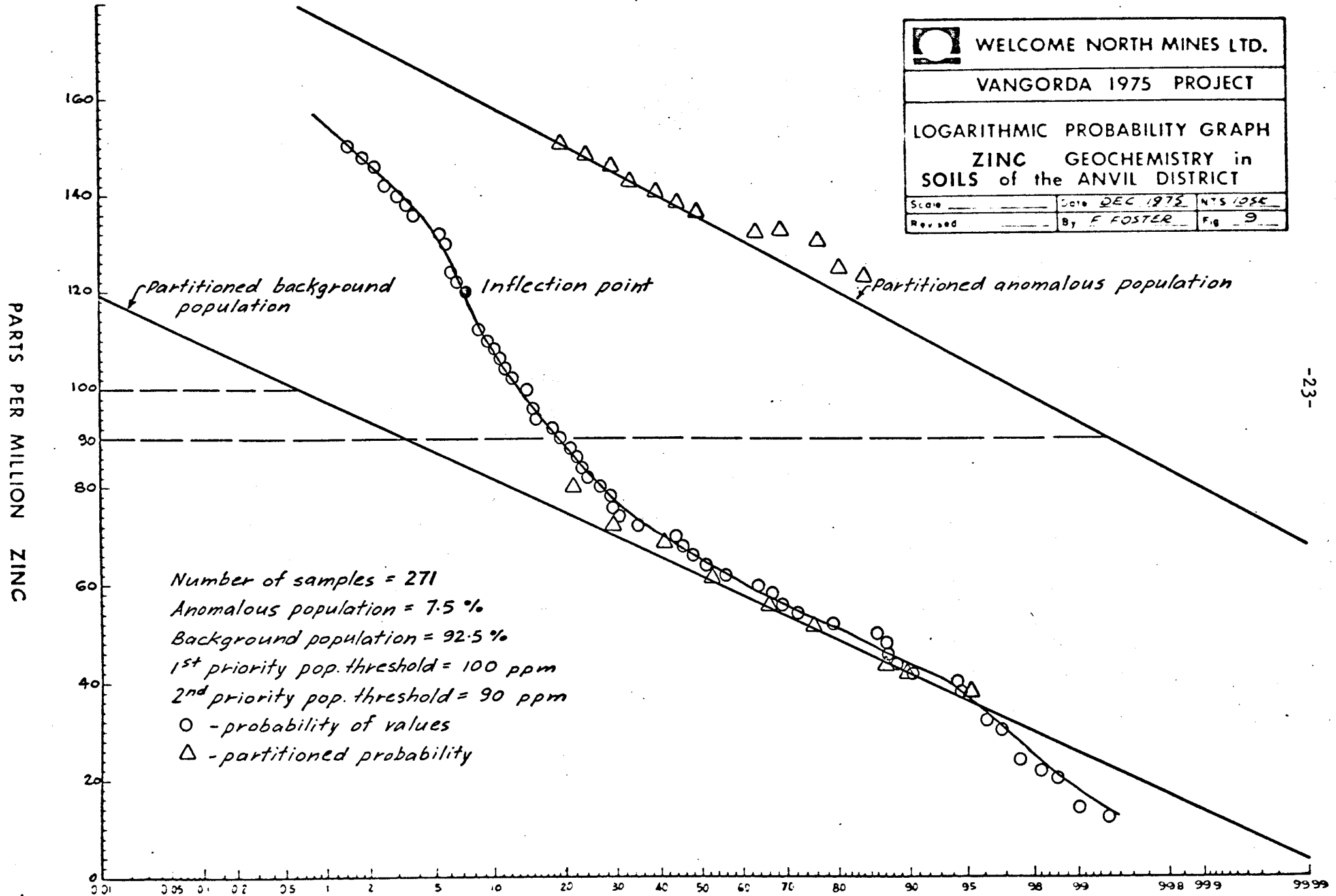
 <b>WELCOME NORTH MINES LTD.</b>		
<b>VANGORDA 1975 PROJECT</b>		
<b>LOGARITHMIC PROBABILITY GRAPH</b> <b>LEAD GEOCHEMISTRY in</b> <b>SILTS of the ANVIL DISTRICT</b>		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105E</u>
Revised _____	By <u>F. FOSTER</u>	Fig <u>8</u>


Number of samples = 224  
 Anomalous population = 1.3 %  
 Background population = 98.7 %  
 1st priority pop. threshold = 34 ppm  
 2nd priority pop. threshold = 26 ppm  
 ○ - probability of values  
 △ - partitioned probability

-22-

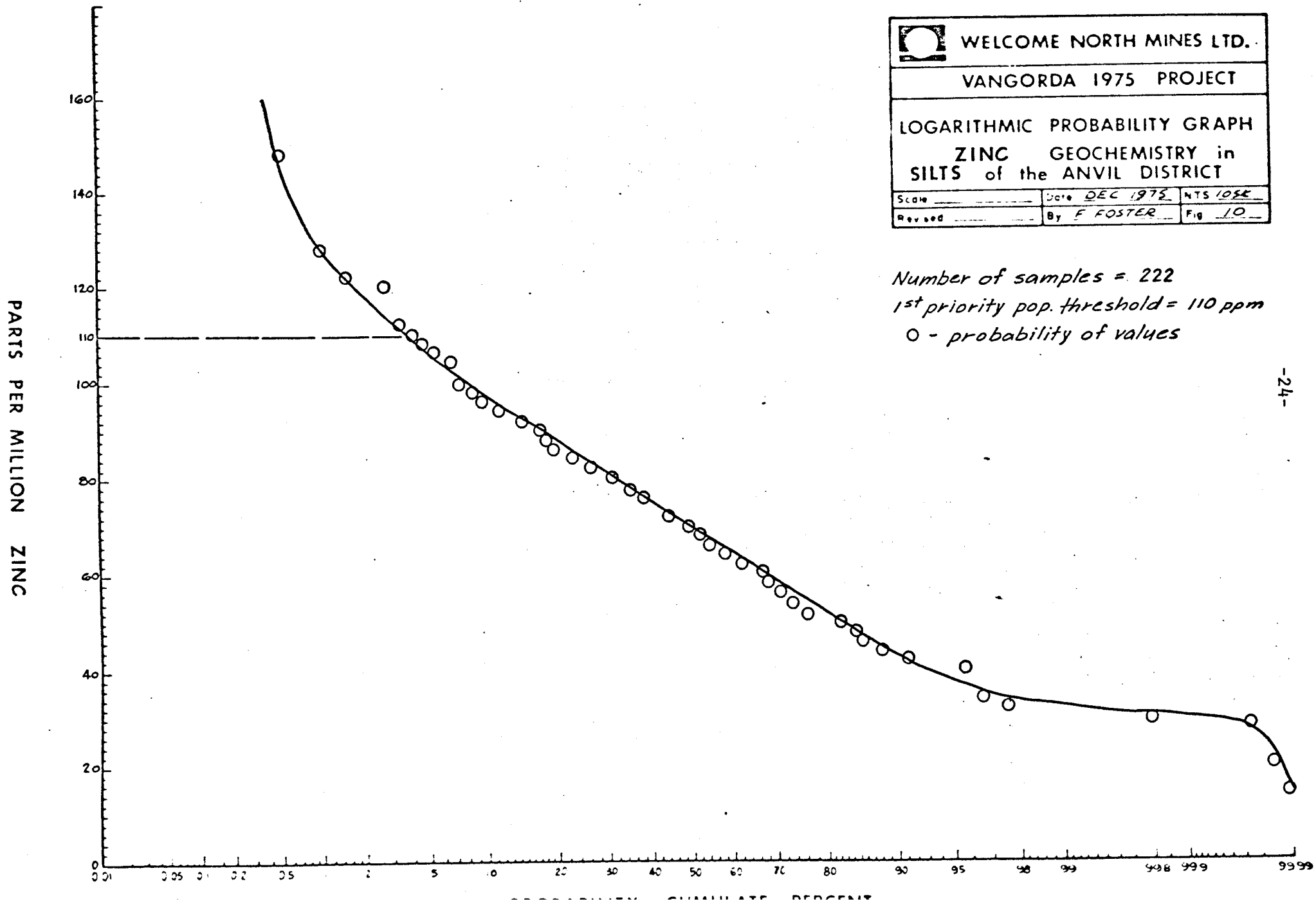


 <b>WELCOME NORTH MINES LTD.</b>		
<b>VANGORDA 1975 PROJECT</b>		
<b>LOGARITHMIC PROBABILITY GRAPH</b> <b>ZINC GEOCHEMISTRY in</b> <b>SOILS of the ANVIL DISTRICT</b>		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105E</u>
Revised _____	By <u>F FOSTER</u>	Fig <u>9</u>

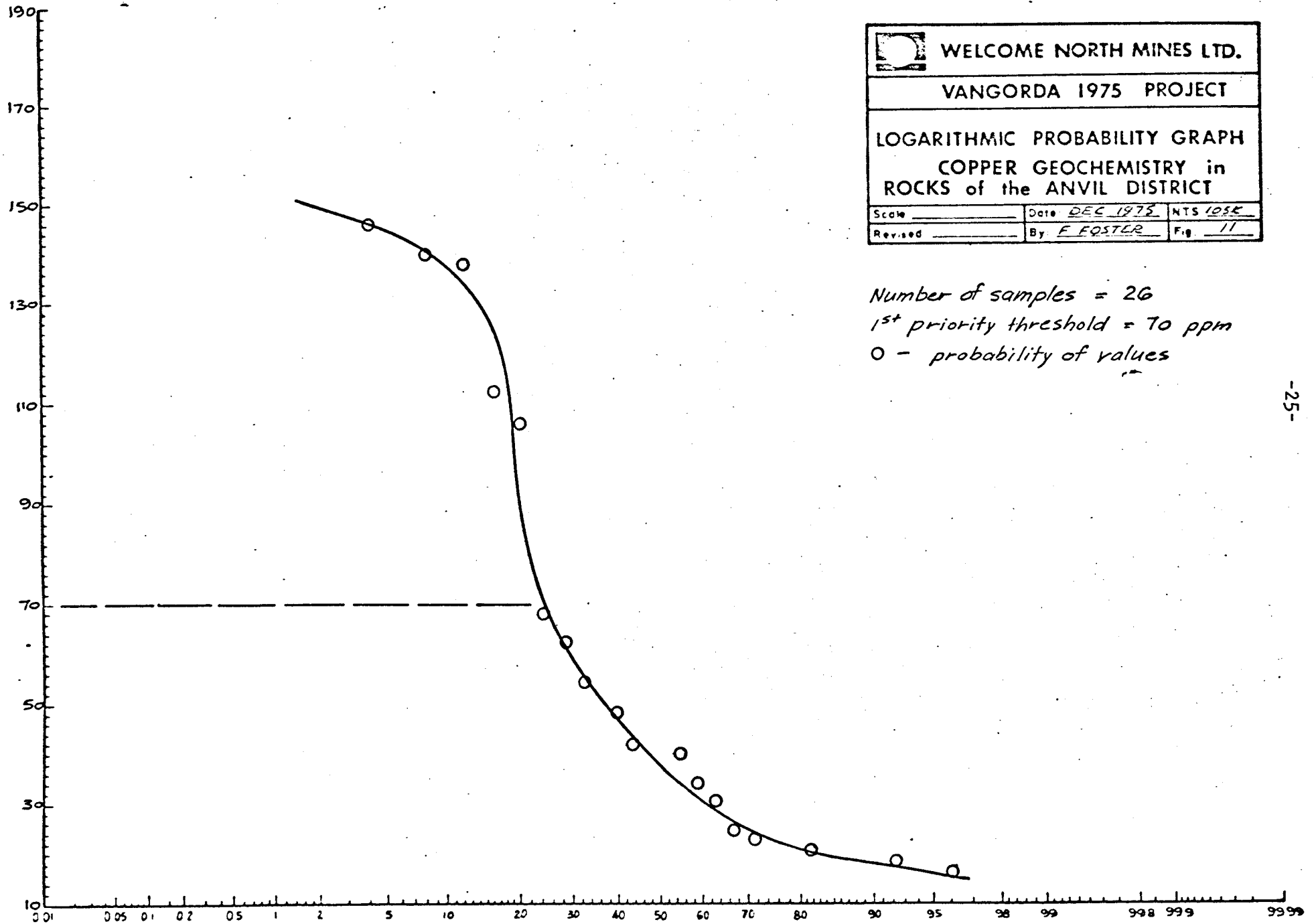



 <b>WELCOME NORTH MINES LTD.</b>		
<b>VANGORDA 1975 PROJECT</b>		
<b>LOGARITHMIC PROBABILITY GRAPH</b> <b>ZINC GEOCHEMISTRY in</b> <b>SILTS of the ANVIL DISTRICT</b>		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By <u>F FOSTER</u>	Fig <u>10</u>

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



PARTS PER MILLION COPPER



	WELCOME NORTH MINES LTD.	
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH COPPER GEOCHEMISTRY in ROCKS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By <u>F. FOSTER</u>	Fig <u>11</u>

Number of samples = 26  
1<sup>st</sup> priority threshold = 70 ppm  
O - probability of values



WELCOME NORTH MINES LTD.

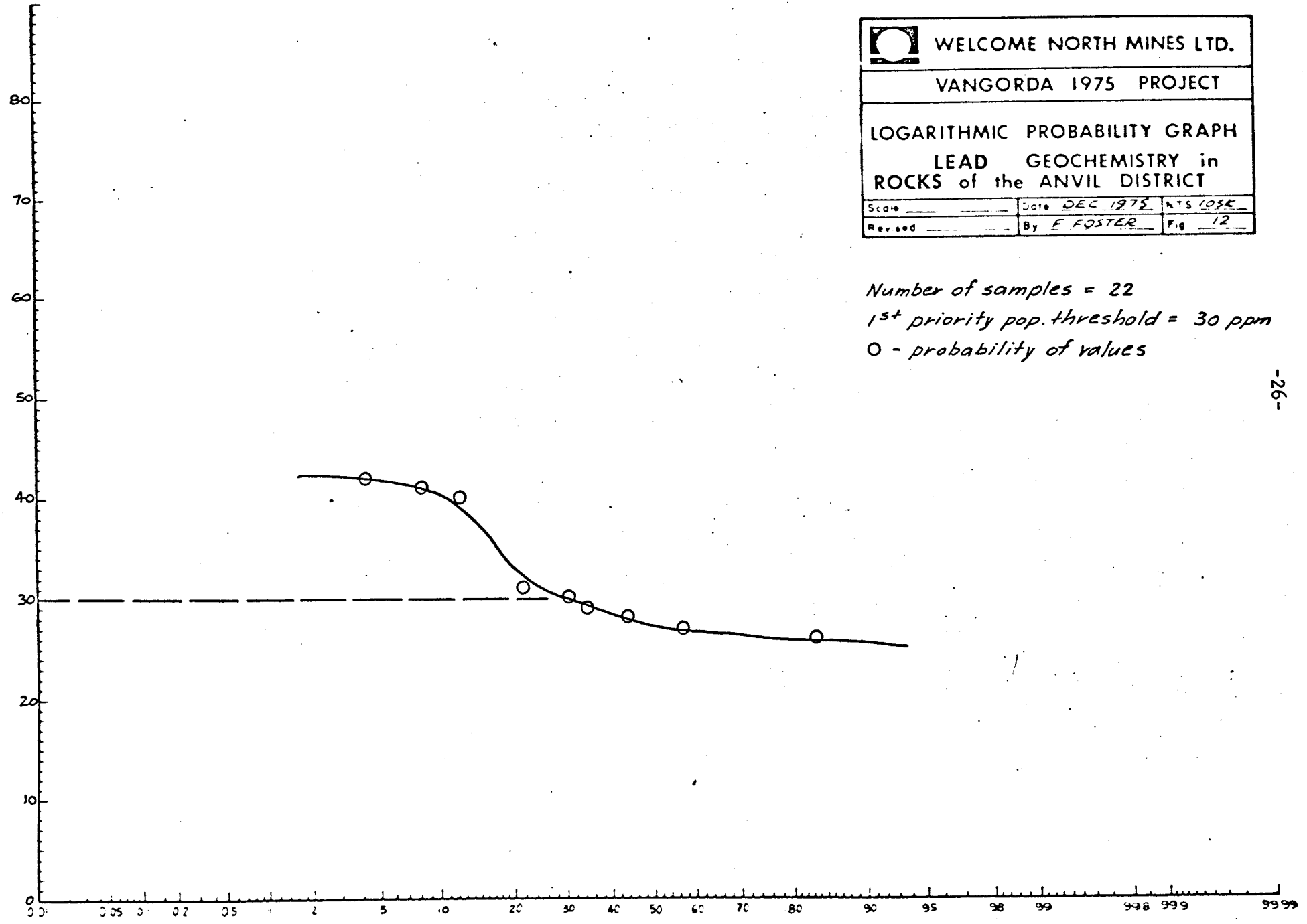
VANGORDA 1975 PROJECT

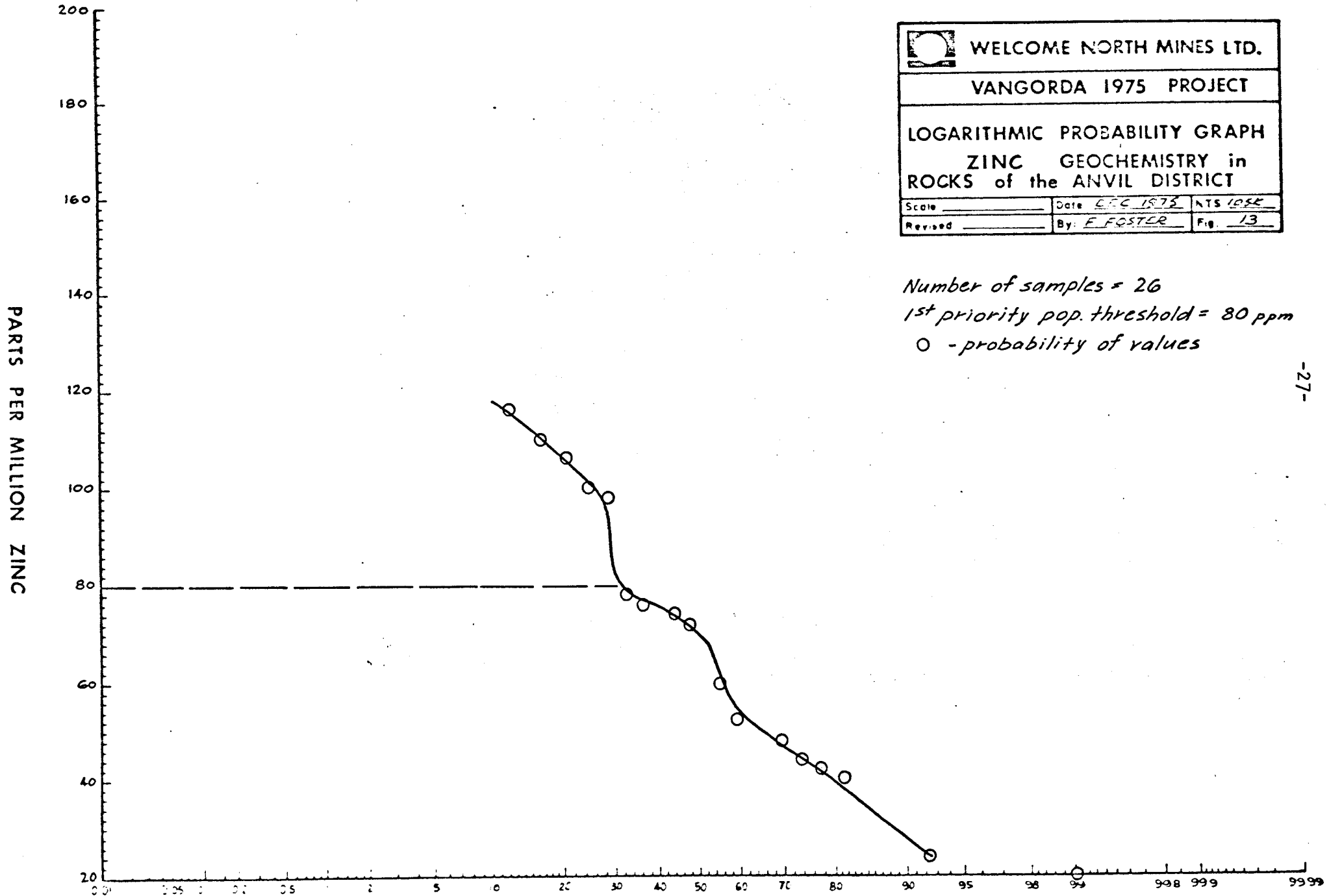
LOGARITHMIC PROBABILITY GRAPH  
LEAD GEOCHEMISTRY in  
ROCKS of the ANVIL DISTRICT


Scale _____	Date <u>DEC 1975</u>	NTS <u>105K</u>
Revised _____	By <u>E FOSTER</u>	Fig <u>12</u>

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

PARTS PER MILLION LEAD





	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>1:50K</u>
Revised _____	By: <u>F. FOSTER</u>	Fig. <u>13</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. 10) 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. 10 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. 11, 12, and 13).

The geochemical soil sampling survey carried out over the EVA claims was restricted in effectiveness due to extensive areas of deep overburden cover. In this regard, portions of four cross lines were soil sampled over areas not previously covered by Dynasty during the course of their 1971 program on the ROTO. The 1975 survey coverage was also designed to further investigate geophysically anomalous areas in the vicinity of line 48E-30N. The lines sampled were also thought to be over areas of thinner overburden deposition.

Several zones of weakly anomalous geochemical response were reported by Dynasty within the EVA grid area (Geological, geochemical, and geophysical report "Roto Claims", W.J. Roberts, 1971). Unfortunately no values have been summarized, the zones outlined are (see Plate 12):

- 1) 56E-72E, 0 - 30N      lead, zinc, copper
- 2) 48E-68E, 0N              copper, lead  
    This zone has been further extended to the west by  
    the 1975 survey.
- 3) 56E-72E, 6S      - Anvil Creek      copper, lead
- 4) 40E, 4S-10S              copper and associated lead

a) Copper

As derived from the 1975 soil sampling survey, a geochemical expression of anomalous copper in soils is contained in an area bounded by lines 40E and 56E between 23N and 38N in the central region of the property. This area is located over two narrow belts mapped as greenstones of Unit (2b). These rocks are believed to be the cause of the anomaly.

Two soil samples located at stations 39E and 48E on the baseline yield anomalous copper values (112 ppm and 56 ppm). These samples are believed to overlie calc-silicate gneiss of Unit (2a).

In general geochemical response of copper in soils is poor over the property.

b) Lead

None of the areas covered by the 1975 survey yielded samples with anomalous lead geochemistry.

c) Zinc

Two areas were outlined in the area of the 1975 survey as anomalous in zinc geochemistry. The first area is within the vicinity of station L40E 30N (soil samples yielding up to 142 ppm zinc) and appears to overlie greenstone and calc-silicate schist of Units (2a) and (2b). The second area occurs along the baseline between station 48E and 55E over what is postulated as calc-silicate gneiss of Unit (2a). Soil samples in this area yield zinc values as high as 150 ppm.

The combined results of the Dynasty and EVA soil sampling surveys are not singularly encouraging, however the value of geochemical surveys in this area of deep overburden, estimated to be in excess of 200 feet, is dubious.

## GEOPHYSICAL SURVEYS

### 1. Instruments Used

For the magnetometer survey, a Sharpes MF-1 magnetometer was used. The instrument is hand-held and measures the vertical magnetic component by use of an oil-dampened fluxgate which automatically levels itself in the direction of the vertical field. The magnetometer is of light weight and a direct read-out of gamma values can be obtained quickly.

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 our 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

#### a) Magnetometer Survey

Prior to the actual magnetometer survey, readings were taken along the central base line at cross line intersection points. These stations were looped and re-read every hour as a means of controlling drift and diurnal variations. With base stations of an established value serving as a means of controlling drift and diurnal variations, a rapid and

precise check was kept on magnetic variations and the entire survey was thus kept on a relative basis during day to day operation. Each cross line was read with re-checks at the base station within every hour, this method provided an internal control for detecting diurnal and drift variations. The survey was done by one operator using the same instrument.

b) Electromagnetic Survey

All surveys were run with horizontal loop configuration and 200 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" and done over the same grid as used for the magnetometer surveys. In some cases a lower frequency (390 cps) was adopted for better resolution of conductors, within areas of known gravity anomalies. The two-man EM crew did all their ground work in coincidence with the magnetometer crew.

3. Treatment of Data

a) Magnetic Results

Magnetic results were corrected in the field for diurnal and drift variations by the field operator. The final gamma values were then plotted on a grid plan using scale of 400 feet to 1 inch. This data was presented to the party chief who profiled and contoured the data on overlay material in order that he could remain familiar with day to day results and progress of the survey, direct its course, and have results available for comparison with electromagnetic and geological-geochemical data. Magnetic data is presented in this report on maps of 1" = 400 ft. scale showing gamma value profiles and contoured results (see Appendix). All maps show major drainage features and locations of mineral claim posts.

b) Electromagnetic Results

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 similar to those used for the magnetic maps. Electromagnetic data is presented in this report showing values profiled and contoured.

4. Interpretation of Results

Portions of the EVA grid were originally surveyed by gravimetric methods during the course of an exploration program conducted by Dynasty on their formerly held ROTO claims. Although complete survey results are not available for interpretation, the outlines of the Dynasty gravity anomalies are located on Plate 12 appended to this report.

Of prime significance is a 0.6 milligal anomaly centered on line 48E, 7+00N. This anomaly can likely be extended eastward to encompass a 0.4 milligal response centered on line 64E, 3+00N. The total dimension of this residual gravity feature is 3,200 feet in length and 1,000 feet in width, striking east-west (see Plate 10). Rule of thumb half-width calculations would place the depth to the top of a flat-lying causative mass at about 350 feet.

This gravity feature is directly coincident with a magnetic anomaly on line 48E as well as a negative dip-angle response obtained on the 390 HZ low frequency CEM survey.

A magnetometer survey, conducted over the EVA grid, showed a generally flat magnetic gradient over the claims, with the exception of anomalous response at the following locations (see Plates 5 and 6):

- 1) 32E, 5+00S - a local 400 gamma anomaly partially coincident with the western end of the gravity anomaly on line 48E. A local negative dip angle response (CEM) is also coincident with the magnetic profile.

- 2) 48E, 7+00N - well defined magnetic anomaly associated with gravity and CEM coincidence
- 3) 56E, 60+00N - a 150 gamma gravity anomaly, within projections of Unit (1c) and associated with a moderate conductive trend. Gravity survey coverage does not extend to this area.

Although the above mentioned magnetic anomalies could be attributed to greenstone bodies, their coincidence with EM and gravity anomalies gives them importance as possible sulphide rich zones.

The electromagnetic survey (CEM) was, due to instrument power problems, conducted with only a 200-foot coil spread, thereby limiting its depth penetration capabilities.

Of priority interest is a 10 degree resultant negative dip angle conductor in the vicinity of line 40E, 8+00N. The 390 Hz and 1830 Hz (see Fig. 14 and 15) coincidence with magnetic and gravity profiles is typical of those expected from massive sulphides in the Anvil area.

Other EM response is likely limited by overburden, but the negative angle conductors trend with some magnetic correlation in the northern part of the grid area could deserve further attention.

- 2) 48E, 7+00N - well defined magnetic anomaly associated with gravity and CEM coincidence
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Other EM response is likely limited by overburden, but the negative angle conductors trend with some magnetic correlation in the northern part of the grid area could deserve further attention.

RECOMMENDATIONS

Based on the delineation of a coincident gravity, magnetic and electromagnetic anomaly within a broadly interpreted favourable geologic environment, the drilling of one diamond drill hole is recommended as the next phase of exploration on the EVA mineral claims.

The target area is centered in the vicinity of line 48E-7N. A vertical hole to a depth of 1000 feet is proposed to test the area of peak coincident geophysical response as well as to provide much needed geologic information for this overburden covered area.

DDH 76E-1	Location	EVA grid co-ord. - 46+00E, 5+50N
	Angle	Vertical (-90°)
	Proposed Depth	1000 feet

Further diamond drilling will be contingent on geological information obtained from DDH 76E-1.

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- New Far North Expl. Ltd., Joe and Fair Claims, 105K-5, Geological Report, 2 maps, scale 1" = 400 ft., R.D. Lawrence, 1967.
- New Far North Expl. Ltd., Joe and Fair Claims, 105K-5, Geological, Geophysical, and Geochemical Summary Report, R.D. Lawrence, 1967.






**LEGEND**

○ - SOIL	○ - SILT
□ 55+ ppm	□ 35+ ppm
□ 41-54 ppm	□ 30-34 ppm
□ 0-40 ppm	□ 0-29 ppm

- Claim Posts, as located on gov't claim map
- Claim Posts, as located in the field
- ..... Grid Lines

SCALE  
1" = 400'

LONG. 105° 29'  
LAT. 62° 25'

 WELCOME NORTH MINES LTD.			
VANGORDA 1975 PROJECT			
EVA 1-39 CLAIMS			
GEOCHEMISTRY - COPPER			
Scale 1 INCH = 400 FT	Date JULY 1975	NTS 109K5	
Revised	By F. FOSTER	Plate 2	



**LEGEND**

○ - SOIL	□ - SILT
50+ ppm	34+ ppm
38-49 ppm	26-33 ppm
0-37 ppm	0-25 ppm

□ Claim Posts, as located on gov't claim map  
 \* Claim Posts, as located in the field  
 . . . . . Grid Lines

SCALE  
1"=400'

**WELCOME NORTH MINES LTD.**  
**VANGORDA 1975 PROJECT**  
**EVA 1-39 CLAIMS**  
**GEOCHEMISTRY - LEAD**  
 Scale 1 INCH=400 FT Date JULY 1975 NTS 105MS  
 Revised By E. FORSTER Plate 5




**LEGEND**


○ - SOIL	○ - SILT
□ 100+ ppm	□ 110+ ppm
□ 90-99 ppm	□ 0-109 ppm
□ 0-89 ppm	

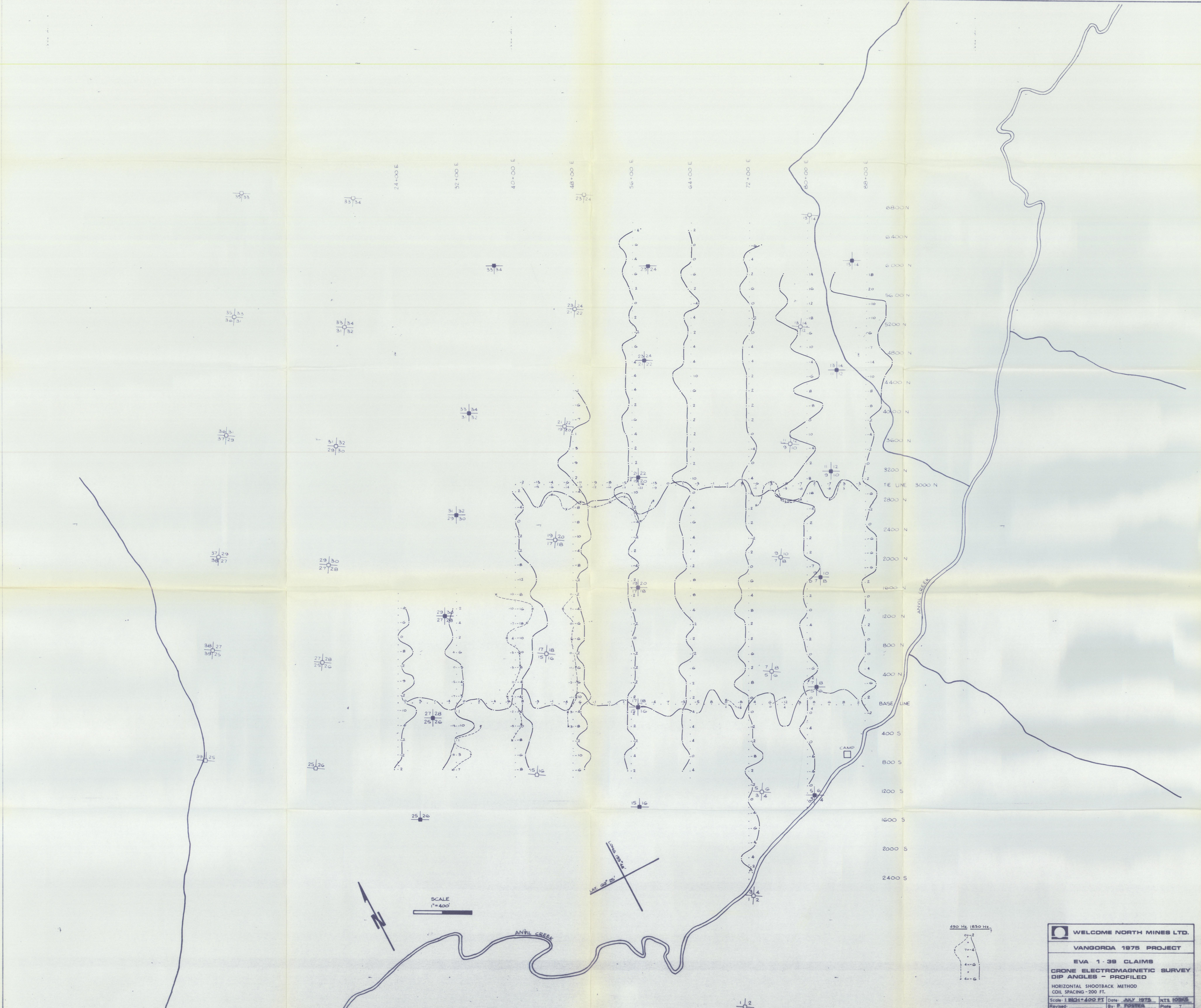
- Claim Posts, as located on gov't claim map
- Claim Posts, as located in the field
- ..... Grid Lines




 WELCOME NORTH MINES LTD.			
VANGORDA 1975 PROJECT			
EVA 1-39 CLAIMS			
MAGNETOMETER SURVEY			
Gamma Values - Profiled			
Instrument: Sharpe MF-1 FLUXGATE			
Scale: 1 INCH = 400 FT	Date: JULY 1975	NTS: 105K5	
Revised:	By: F. POSTER	Plate: 5	




**WELCOME NORTH MINES LTD.**  
**VANGORDA 1975 PROJECT**  
**EVA 1-39 CLAIMS**  
**MAGNETOMETER SURVEY**  
**Gamma Values - Contoured**  
 Instrument: Sharpe MF-1 Fluxgate  
 Scale: 1 INCH = 400 FT Date: JULY 1975 NTS 108K5  
 Revised: By: F. FOSTER Plate: G




**WELCOME NORTH MINES LTD.**  
**VANGORDA 1975 PROJECT**  
**EVA 1-38 CLAIMS**  
**CRONE ELECTROMAGNETIC SURVEY**  
**DIP ANGLES - PROFILED**  
 HORIZONTAL SHOOTBACK METHOD  
 COIL SPACING - 200 FT.  
 Scale 1 INCH = 400 FT. Date: JULY 1975 NTS 10986  
 Revised: By: P. FOSTER Plate 7



**LEGEND**

- Claim Posts, as located on gov't claim map
- Claim Posts, as located in the field
- Grid Lines

**WELCOME NORTH MINES LTD.**

**VANGORDA 1975 PROJECT**

**EVA 1-39 CLAIMS**

**CRONE ELECTROMAGNETIC SURVEY**

**DIP ANGLES - CONTOURED**

Horizontal Shootback Method  
 Coil Spacing - 200 ft. ; Contour Interval - 2'

Scale 1 INCH = 400 FT Date JULY 1975 NTS 10SK5  
 Revised By F. FOSTER Plate 8



**LEGEND**

- CAM PLOTS as located on 200' x 200' cam mass
- CAM PLOTS as located in the field
- ..... grid lines

SCALE  
1"=400'






LONG 103° 25'

**WELCOME NORTH MINES LTD**  
**VANGORDA 1975 PROJECT**  
**EVA 1 39 CLAIMS**  
**RESIDUAL GRAVITY PROFILES**  
**For ATLAS EXPL. LTD.**  
**By Overland Expl. Services Ltd.**

Scale 1 INCH = 400 FT Date JULY 1975 NTS 105K5  
 Revised By F. FOSTER Page 9



**LEGEND**

-  Claim Posts, as located on gov't claim map
-  Claim Posts, as located in the field
-  Grid Lines

**WELCOME NORTH MINES LTD.**

VANGORDA 1975 PROJECT

EVA 1-39 CLAIMS

**RESIDUAL GRAVITY MAP**  
For ATLAS EXPL. Ltd.  
By Overland Expl. Services Ltd.  
CONTOURS IN MILLIGALS

Scale 1 INCH = 400 FT	Date JULY 1975	NTS 105K5
Revised	By E FOSTER	Plate 10



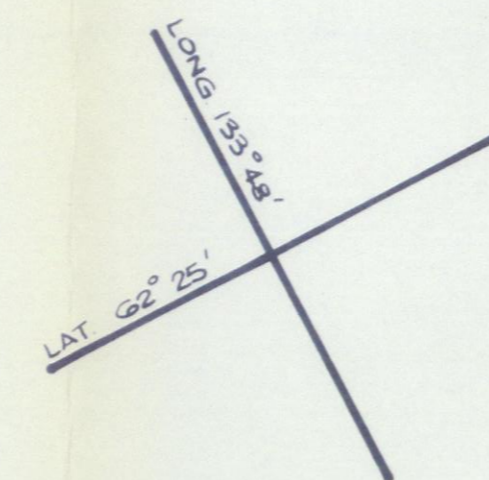
**LEGEND**

- MESOZOIC**
- 11** Cretaceous  
Porphyritic biotite-quartz monzonite and granodiorite, muscovite-biotite granodiorite, foliated equivalents
- 3a** Ordovician and Silurian  
Dark grey biotite-chlorite schist and phyllite
- PALEOZOIC**
- 2b** Cambrian and Ordovician  
Foliated amphibolite, pale green chloritic phyllite, andesitic greenstone, chlorite schist
- 2a** Cambrian and Ordovician  
Calc-silicate schist, gneiss and phyllite, can contain 2b
- 1c** Cambrian  
Muscovite-biotite schist, muscovite andalusite-biotite schist & garnet and staurolite

- Geological boundary (defined, approx, gradational, assumed) .....
- Limit of geological mapping .....
- First foliation (S<sub>1</sub>) .....
- Second foliation (S<sub>2</sub>) .....
- Third foliation (S<sub>3</sub>) .....
- Lineation .....
- Minor fold axis related to S<sub>2</sub> .....
- 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 .....
- Residual Gravity Anomaly (milligals) .....
- CEM conductor .....
- CEM Conductor Axis .....
- Magnetic Anomaly .....
- Proposed Diamond Drill Target .....

LEGEND	
	Claim Posts, as located on gov't claim map
	Claim Posts, as located in the field
	Grid Lines

SCALE  
1"=400'



0 - Soil  
Cu - 4% ppm  
Zn - 90% ppm

**WELCOME NORTH MINES LTD.**

**VANGORDA 1975 PROJECT**

**EVA 1 39 CLAIMS  
COMPILATION MAP**

Scale 1 INCH = 400 FT Date JULY 1975 NTS 105K5  
 Revised By P FOSTER Plate II