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SUMMARY REPORT
EXPLORATION ACTIVITIES ON THE OROFINO JOINT VENTURE PROPERTY - PROJECTS 775,780,781,782 AND 783.
SILK AND HORWOOD TOWNSHIPS, TIMMINS AREA, ONTARIO.

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MINING LANDS SECTION

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Toronto, Ontario.

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0.0 SUMMARY

The 1981 exploration programme for the Orofino Joint Venture Property had two main objectives. The first of which was to expand the dimensions of the Orofino diorite and to increase the known tonnage and grade. Secondly to attempt to outline other gold bearing structures remote from the minesite area.

A totally integrated programme was devised to investigate both objectives with diamond drilling on the minesite being heavily relied upon for that phase.

Surface work on the outlying claims (Project 780,781,782 and 783) was in part detailed follow-up of various VLF-EM conductors and anomalous humus values(Zone 3) outlined during 1980. This same programme revealed a North-South trending band of meta-gabbros west of Stangiff Lake (Old grid) which could have hosted similar mineralization as the Orofino diorite.

Those claims staked in 1980 constituted projects 781 and 782 and the work this year included both reconnaissance as well as detailed follow-up on numerous anomalous zones.

Overall, results from the 1981 field season could, without an indepth study, be taken as discouraging. However, a closer scrutiny of individual zones, whether they be at the minesite or elsewhere, shows that in fact the property still has many areas of potential.

In the minesite, the surface programme revealed that the humus geochemistry was a useful technique in that it outlined not only the number 1,2,3, and 4 veins, but to the south of the shaft one anomalous zone was drilled, successfully returning ore grade intersections.

Further the VLF-EM and the magnetometer surveys proved to be a useful mapping tool by outlining numerous shear zones, as well as a diabase dyke.

Mapping coupled with mechanical stripping, confirmed a northeasterly strike of the country rock, its volcano-sedimentary stratigraphy and its, in part, faulted contact with the diorite. Also,convincing evidence was found that the diorite was formed by the dioritization of basic volcanics and the presence of granitic dykes supports the metasomatic "intrusion" of the diorite by a deeply buried granitic source.

The first half of the diamond drill programme completed the information required to calculate the ore reserves which now total 825,705 tons grading 0.146 oz Au/ton.

Later, the second half revealed that both replacement as well as quartz vein hosts continue south of the shaft and that one shear vein system requires further drill tests.

On the outside projects, the detailed programmes outlined numerous structural, geochemical and geophysical targets that should receive additional study. These include Zone 3, Anomaly A, the HBF Grid, the RPNS Grid,which has a base metal potential, and the intersection between a Max-Min and VLF-EM conductor.

Recommendations for future work generally include deep overburden drilling on most zones, due to the depth of overburden, as well as the paucity of outcrop exposures.

Geophysical techniques should also be used, especially over conductor R (RPNS Grid - Project 782) to further define the possible sulphide source.

It is envisaged and recommended that several of these zones upon further study will return encouraging results and that diamond drilling will be necessary to find the sources.

On the minesite, diamond drilling should be continued to expand the intersection in Hole CF-81-19.

Further work should also be completed on the Gifford Prospect (Project 783) in an attempt to extend the mineralization eastwards and on the minesite the silica enrichment within the diorite should be outlined and drilling should be undertaken beneath the volcanic-diorite contact.

STATISTICAL DATA - PROJECT 775 - ZONE 1E

1. General		
a) Linecutting	14.8 km	100%
b) Surveying - Extension of Minesite Grid		100%
- Remainder of Drill Holes		100%
2. Geology		
a) Mapping - Zone 1E (1:600)	0.83 Km^2	100%
- Stripped Areas:		
Minesite Extension (1:600)	26013 sq. m.	100%
Prospect # 75 (1:600)	3723 sq. m.	100%
b) Site Clearing - Minesite Extension	30000 sq. m.	100%
- Prospect # 75	3723 sq. m.	100%
3. Geochemistry		
a) Humus Sampling	1424 samples	100%
4. Geophysics		
a) Magnetometer	1523 readings	100%
b) VLF-EM	1797 readings	100%
5. Drilling		
a) Diamond Drill Holes	38/29145 feet	100%
6. Construction & Installations		
a) Road - Mine Rd to ½ km W of Bridge (maintenance)		100%
b) Repair bridge over Swayze River		100%
c) Installation of Radio Telephone		100%
d) Core Storage Shacks for an additional 40,000 feet.		100%

STATISTICAL SUMMARY - PROJECT 780

1.	Linecutting - Flagged Lines (Zone 3)	1.75 kms	100%
2.	Geochemistry - Humus Sampling (Zone 3)	192 samples	100%
	- Rock Samples (Grab)	3 samples	100%
3.	Geophysics - Magnetometer	402 stations	100%
	- VLF-EM	370 stations	100%

STATISTICAL SUMMARY - PROJECT 781

A.	1.	Geological Mapping (1:2500)	1440 acres	100%
	2.	Geochemistry - Humus Sampling - EM and MAG Amonalies	290 samples	100%
	3.	Geophysics - Magnetometer	Complete grid coverage 30 m. stations	100%
		- VLF-EM	Complete grid coverage 30 m. stations	100%
B.	HBF Grid			
	1.	Geochemistry - Humus Sampling	372 samples	100%
C.	WSL Grid			
	1.	Geochemistry - Humus Sampling	159 samples	100%
	Anomaly A			
	1.	Linecutting - Flagged Lines	980 metres	100%
	2.	Geochemistry - Humus Samples	94 samples	100%
	3.	Geophysics - Magnetometer	323 stations	100%
		- VLF-EM	207 stations	100%
D.	Anomaly B			
	1.	Linecutting - Flagged Lines	3.15 kms	100%
	2.	Geochemistry - Humus Sampling	39 samples	100%
	3.	Geophysics - Magnetometer	570 stations	100%
		- VLF-EM	484 stations	100%

STATISTICAL SUMMARY - PROJECT 782

A.	1. Geological Mapping (1:2500)	1040 acres	100%
	2. Geochemistry - Humus Samples - EM and Mag Anomalies	347 samples	100%
	3. Geophysics - Magnetomoter	Completed grid coverage 30 metre stations.	100%
	- VLF-EM	Complete grid coverage 30 metre stations.	100%
B.	North & South Veins		
	1. Geochemistry - Humus Sampling	61 samples	100%
	- Rock Sampling (Grab)	16 samples	100%
C.	RPN Grid		
	1. Geochemistry - Humus Sampling	320 samples	100%
D.	RPNS Grid		
	1. Geochemistry - Soil Sampling	88 samples	100%
	2. Geophysics - Magnetometer	220 stations	100%
	- VLF-EM	143 stations	100%
E.	L Grid		
	1. Geochemistry - Humus Sampling	62 samples	100%
F.	M Grid		
	1. Geochemistry - Humus Sampling	108 samples	100%
G.	QUO Grid		
	1. Geochemistry - Humus Sampling	159 samples	100%

STATISTICAL SUMMARY - PROJECT 783

OLD Grid

1.	Linecutting - Flagged Lines	780 metres	100%
2.	Geology - Mapping (1:600)	0.85 sq.kms.	100%
3.	Geochemistry - Humus Sampling	410 samples	100%
	- Rock Sampling (Grabs)	11 samples	100%

1.0 INTRODUCTION

The exploration programme undertaken by Northgate Exploration Limited in 1981 on the Orofino Joint Venture property had the following main objectives:

1. To increase the tonnage of the Orofino deposit at the minesite, and
2. To explore for and to locate zones of potential gold mineralization; away from the minesite.

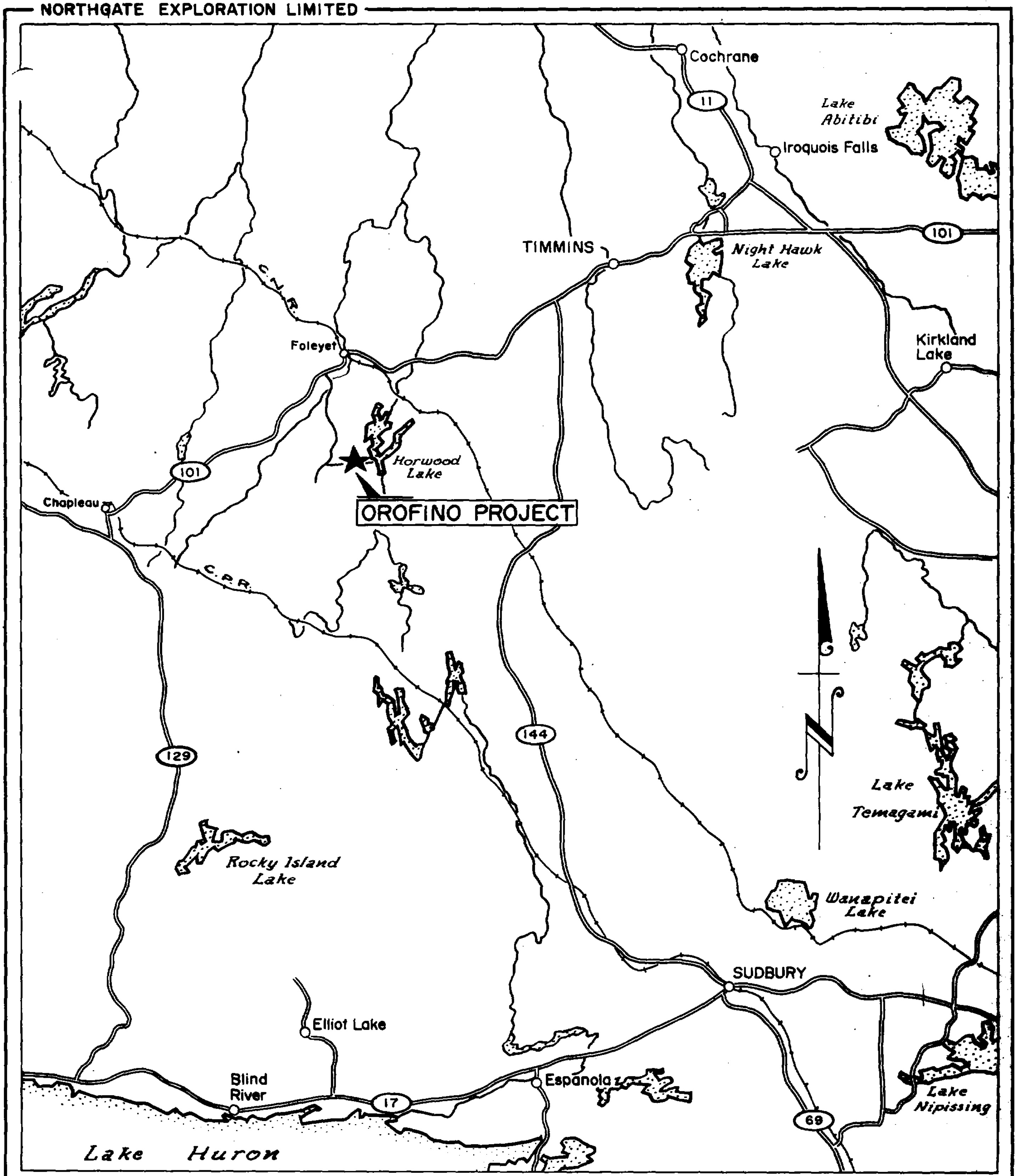
Diamond drilling at the minesite continued through the winter months with a hiatus for the Easter holiday. At that time drill contractors were changed with the programme continuing on May 31, 1981.

Reconnaissance geophysical, geochemical and geological surveys were completed on Projects 781, 782 while detailed work centered on 1980 targets, as well as new anomalies as a result of the recon programmes.

Although both the diamond drilling and detailed work at the minesite did not add appreciably to the tonnage, several geological problems were solved and one shear-vein zone was shown to have significant gold mineralization.

On the other grids the combination of exploration techniques revealed, in most cases, numerous anomalous zones requiring further work.

It has been recommended that work be continued on these zones as well as at the minesite.

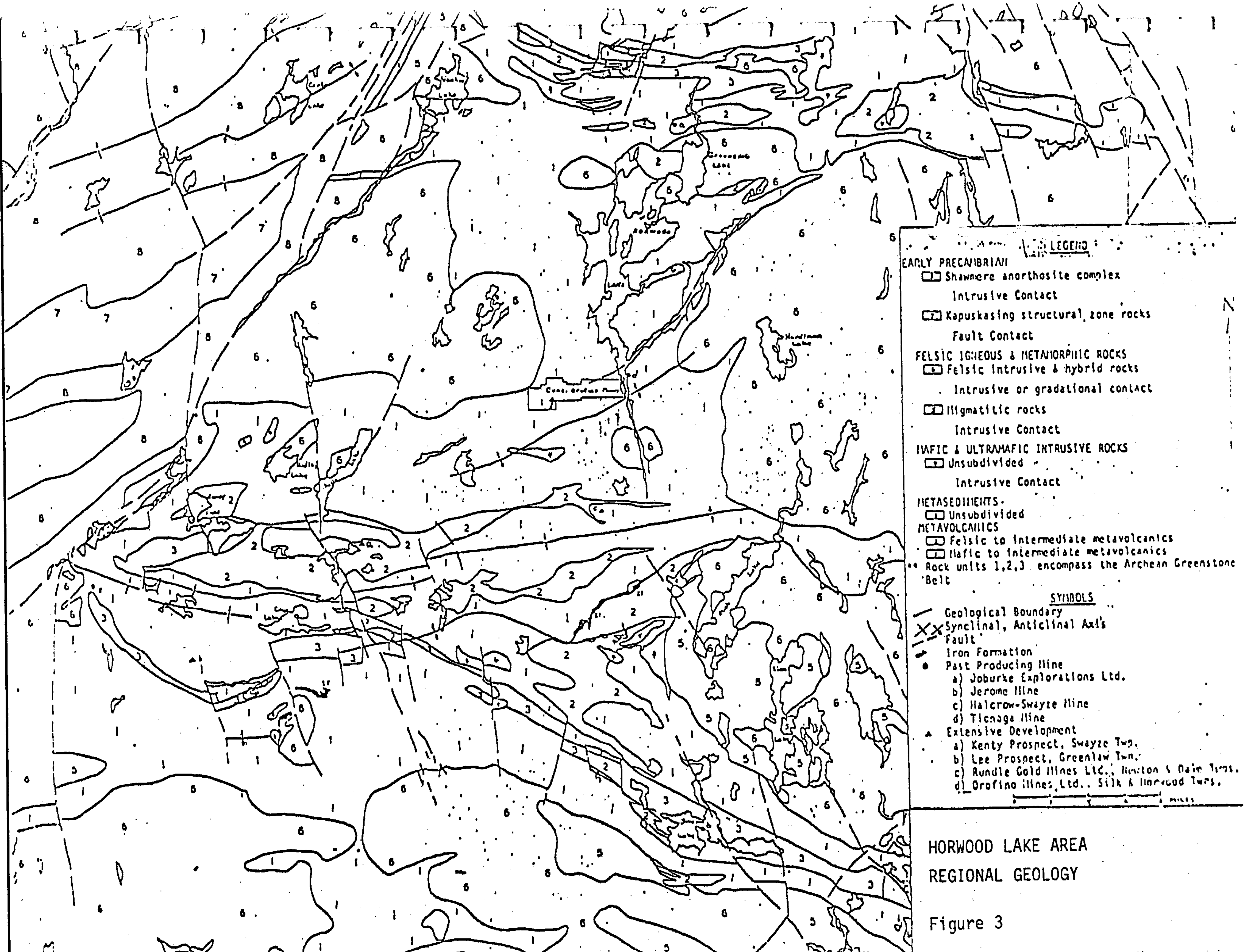


LOCATION MAP

Showing

OROFINO PROJECT AREA

Figure 2



HORWOOD LAKE AREA
REGIONAL GEOLOGY

Figure 3

1.1 PROPERTY AND OWNERSHIP (Figure 1)

The Orofino Joint Venture property was increased in size by the staking of six new claims. Five of these joined the original patented ground to the south and filled the gap to the township line. Any promising structures adjacent to Prospect # 75 as well as northeasterly extensions to the Rundle North Property would lie beneath these claims.

The sixth claim was located on Project 782, directly south of the Tionaga Patent S-25339. This ground was previously believed to be held after the 1980 staking but recent mapping revealed an opening of at least half a claim. It appears that the original plotting of this claim on the claim sheet was in error. This in turn has shown an overstaking which was corrected by the cancellation of claim P-529359.

Overstakings also occurred on Project 781 where, upon correction claims P-529286, P-565943 and P-565944 were cancelled.

This now brings the joint venture property to 145 claims in size or approximately 5,800 acres.

1.2 LOCATION AND ACCESS (Figure 2)

"See Introductory Report".

1.3 AUXILIARY SERVICES

"See Introductory Report"

1.4 TOPOGRAPHY

"See Introductory Report"

1.5 CLIMATE

"See Introductory Report"

1.6 PREVIOUS WORK

"See Introductory Report"

2.1 REGIONAL GEOLOGY (Figure 3)

The Orofino Property lies within the east-west trending Swayze-Deloro Metavolcanic-Metasedimentary belt which forms part of the Abitibi subprovince. All rocks are Archaean in age with the exception of the middle to late Pre-Cambrian diabase dyke swarms.

This belt contains two complete sequences of mafic and felsic metavolcancis with associated metasediments. The mafic metavolcanics predominate and consist of massive flows which in many exposures display pillow or amygdaloidal structures. Flows and pyroclastic rocks of rhyolitic, dacitic or trachytic composition form the felsic metavolcanic units with rhyolitic varieties being the most common.

?.1 REGIONAL GEOLOGY (Continued)

Less than ten percent of the Swayze-Deloro belt is composed of metasedimentary rocks. In decreasing order of abundance they include greywacke, arkose, conglomerate, quartzite and argillite.

Numerous Algoman granitic intrusives have deformed the belt's margin into an arcuate pattern typical of many Archaean greenstone belts.

Mafic and ultramafic intrusions having dioritic, gabbroic and serpentinized compositions occur throughout the belt. These bodies form as sills or stocks and pre-date the granitic intrusives.

A green schist facies regional metamorphism predominates over the entire area with epidote-almandine amphibolite grade being present in contact metamorphic aureoles.

2.1.1 REGIONAL STRUCTURE

The Swayze-Deloro belt which consists of two separate east-west striking stratigraphic sequences forms an "S" shaped system, bordered by late granitic intrusives. The duplication of stratigraphy in the north and south segments suggests that they were one continuous series prior to folding and faulting.

2.1.1.1 FOLIATION

Foliation trends throughout the belt, generally parallel the east-west strikes of the bedrock exposures. However, in the vicinity of the granites these trends warp around parallel to the contacts.

2.1.1.2 FAULTING

In the southern portion of the belt, felsic metavolcanic and metasedimentary rocks have been offset by northwesterly trending faults which have left lateral movements and displacements ranging from 500 feet to ½ a mile. To the north, northwesterly trending faults are rare with the northeasterly trends more common. Displacements are considerably less with most faults having offsets of several hundred feet or less.

2.1.1.3 FOLDING

Doubly plunging isoclinal folds are characteristic of the Swayze sub-belt, but more open folds do occur such as the easterly trending anticline that passes through Heenan, Marion and Dore Townships. Further to the west in Halcrow and Denyes Townships is a major synclinal structure which is overturned. To the south in the Opeepeesway Lake Area another synclinal structure trends eastward.

To the north in the Deloro sub-belt, the majority of the folds are isoclinal while those in Horwood Township are more open and gently plunging, reflecting a change in structural style.

3.1 EXPLORATION PROGRAMME: 1981

3.1.1 GENERAL

In order to simplify the submission of assessment reports, the Orofino Joint Venture Property was subdivided into five claim groups as per Figure 1.

Although this report deals with all the groups; the description of the overall exploration programme has been broken into the separate projects.

3.2 EXPLORATION PROGRAMME: PROJECT 775 - OROFINO

3.2.1 GENERAL

The 1981 field programme was aimed at extending the known dimensions of the Orofino diorite and increasing the known ore reserves.

Various surveys were utilized to accomplish this including detailed geological mapping, humus sampling, diamond drilling, geophysics and extensive mechanized surface stripping.

A section of the existing cut grid (1980) was blocked out according to the results from previous data and designated Zone 1E. It was upon this grid that all work was performed.

3.2.2 LINECUTTING

During the 1981 field season, ten new lines, total length of 14 km, were cut over Zone 1E. These new lines were placed between L12E and L48W, and ran south from BL1 to BL2 and from BL2 to TL1S. These lines were placed in positions intermediate to the existing grid lines to facilitate better control for the geological mapping, detailed humus sampling and the detailed geophysics.

3.2.3 GEOLOGY (Figure 4)

3.2.3.1 GENERAL

The mapping of Zone 1E was done at a scale of 1:600 with a portion being remapped at the same scale, after the mechanical stripping and washing had been completed.

The area is underlain in a large part by the Orofino and hybrid varieties of diorite of which most in the shaft area was mapped in 1980. To the east, no outcrops were found, but from drill hole data, the diorite continues for some distance. To the west, however, was a volcanic sequence which has been intruded by numerous basic and acid dykes.

Within the southern half, both the volcanics and the diorite have been found to be intruded by granitic dykes.

3.2.3.2 BASIC VOLCANICS

Volcanic rocks of basic composition occur both in the north and south sections of the grid and probably underlie a large proportion of the central swamp covered area as evidenced from drill hole data.

3.2.3.2 BASIC VOLCANICS (cont'd)

Both massive and pillowed flows were found, with both being soft, fine grained, green in colour and chloritized. Pillows were, in general, well formed, quite large, with widths to 75 centimetres, had thick devitrified selvages and many contained gas bubbles and vesicles.

Thicknesses or correlation of individual flows were impossible to determine due to the limited exposures.

3.2.3.3 INTERMEDIATE TO ACID VOLCANICS

Rocks of this compositional range were restricted to the northern quarter of the grid where massive acid tuffs were moderately well exposed. Again, drill data has indicated rocks of rhyolitic composition further to the south, but no surface exposures could be found.

A buff weathered surface marked these rocks which had a dark grey to blackish fresh face and were sparsely mineralized with fine grained pyrite.

Fine grained and thinly bedded units were most common, but some exposures consisted of a coarse grained lapilli tuff interbedded with narrow seams of chert.

3.2.3.4 SEDIMENTS

Accumulation of sediments was not large and only two outcrops were mapped in the northern section.

The first of these was a fine grained massive grey-white quartzite interbedded between two acidic tuff horizons. One exposed contact showed that the unit was conformable.

Its lateral extent could not be ascertained, but in the immediate area it would have a maximum width of about 6 metres.

The second exposure consisted of an arkosic quartzite of which no information could be found on its dimensions either along strike or width wise, or its relationship in the volcano-sedimentary sequence.

It was a fine to medium grained, massive, pinkish rock that revealed no structural data in regards to either strike, dip or direction of transport.

Clasts of quartz and feldspar constituted the bulk of the rock, but small angular rock fragments made up several percent. Both were set in a fine grained greyish matrix.

Chert bands were mapped as being interbedded with the acidic tuffs and were in general, narrow, highly siliceous and grey to black in colour.

3.2.3.5 BASIC INTRUSIVES (Excluding Diorite)

Basic intrusives were not common and consisted almost entirely of diabase, although several narrow lamprophyre dykes were noted.

Exposures of diabase were few and their relationship to the other rocks was only assumed to be intrusive.

3.2.3.5 BASIC INTRUSIVES (Excluding Diorite) cont'd

In the north end a dyke was found in two adjacent outcrops only, with one contact being essentially east-west and dipping to the north.

Outcrops nearby have no diabase and the dyke's dimensions and path could not be determined.

To the south, however, the information on a dyke has been increased by magnetics where it has been shown to be striking northwesterly. But again, its dimensions and relationship to the country rock was not ascertained.

In both exposures the diabase was massive, had an even medium grain and contained disseminated pyrite mineralization.

3.2.3.6 DIORITE

Within Zone 1E, two basic types of diorite were mapped while the diamond drilling (1980) indicated a quartz-eye variety which has not been found on surface.

The first of the two varieties was a hybrid-type derived from the dioritization of basic volcanic rocks.

It is characterized by a "salt and pepper" like texture of feldspar and hornblende, a greenish colouration and variable hardness. Pyrite mineralization is ubiquous and consists of fine to medium sized cubes.

Other characteristics and distinguishing features include masses of epidote and wispy fragments representing the altered remnants of partially digested blocks of volcanic material. Thin broken pillow selvages were discernable in some exposures while in others completely dioritized pillows could be seen, that had rims of carbonate and epidote. Although the distinctive pillow outline was, in most cases, highly irregular these features could be recognized.

The hybrid diorite made up the largest proportion of the dioritic rocks while the second variety, the retrograde type, constituted a lesser percentage.

In some cases, the retrograde diorite could not, if mapped elsewhere, be distinguished from massive andesitic flows.

Most exposures revealed this diorite as an extremely soft, greenish-blue rock devoid of discernible feldspar laths or pyrite.

It occurred within sheared sections of the hybrid diorite and was closely associated with quartz veins. Its origin has been determined to be a product of intense shearing and alteration of the host diorite.

3.2.3.7 FELSIC INTRUSIVES

Two distinctive felsic intrusives have been mapped, one of which occurs throughout the area while the other appears to have more limited extent.

The first of these are feldspar porphyries which occur as east-northeast trending dykes crosscutting all rock types. Numerous such dykes have been found on the minesite which being composed of a more competent rock would provide a larger number of openings upon shattering.

3.2.3.7 FELSIC INTRUSIVES (cont'd)

The composition and character of these dykes does not change from the minesite in that medium grained white to pink feldspar phenocrysts float within a greyish white sometimes carbonatized matrix. Fine grained pyrite has been found in most exposures.

At the south end of Zone 1E one such dyke intruded into basic volcanics and quartz veins (Prospect #75) during a period of continued east-northeast movement. This caused some of the narrow dykes to raft small angular fragments of the host rock.

The second felsic intrusive was that of a granite. It was exposed on the east side of the hybrid diorite and intruded it as well as basic volcanics. Hole CF-81-10 located about 160 metres west, intersected a granitic dyke at depth.

These dykes were variable in composition and colour, but generally were greyish to greyish-white-pink, fine to medium grained and were composed of quartz, feldspar, 1-2% mafics and had fine grained pyrite as an accessory.

3.2.3.8 QUARTZ VEINS AND MINERALIZATION

Several quartz veins were found during the course of mapping, the largest of which was at Prospect #75. All were composed of massive bull white quartz although one did have some black, glassy quartz.

East-northeast strikes were common but were variable to the north. The largest concentration of the veins occurred within the diorite which probably reflects the competence of this rock type. However, the two most promising veins occurred in basic volcanics with one being of considerable length and breadth.

With the exception of narrow stringers exposed on the newly stripped area, the quartz veins contained numerous blocks of wall rock which in most exposures showed an increase in assoicated pyrite mineralization. Assay results unfortunately were not encouraging.

3.2.3.9 STRUCTURE

Shearing in an east-northeast direction was the most notable structural feature. However, the shearing related to the main north-northeast fault was mapped at the extreme western edge of the stripped area in the vicinity of CF-81-5 and CF-81-6. VLF-EM and extrapolation from the underground workings show that a parallel fault exists some 600 feet to the east.

Other shear zones were detected by the VLF-EM and can be matched to topographic depressions with those just south of the mine dump being most distinctive. However, other known zones have not been detected probably due to re-cementing of the fracture.

Bedding, where observable, is highly variable, but does have a general east-northeast trend with moderate northwesterly dips.

3.2.4 GEOPHYSICS

3.2.4.1 PROTON MAGNETOMETER

The possible north-south extensions of the Orofino diorite were investigated

3.2.4.1 PROTON MAGNETOMETER (cont'd)

by a detailed magnetometer survey due to the lack of sufficient outcrop and/or diamond drill hole data.

To the north of baseline one, east-west lines at 50 metre intervals were flagged between existing north-south lines to provide adequate control. Readings were then taken at 10 metre intervals.

In the south (south of baseline two) surveyed grid lines provided the control and no intermediate lines were required. Once again, readings were taken every 10 metres.

In both cases, the survey was not able to detect any further extensions of the diorite.

3.2.4.2 VLF-EM (Figure 5 & 5a)

A detailed VLF-EM survey was conducted over the minesite on north-south lines using Cutler, Maine as the transmitting station. All readings were taken at 10 metre intervals.

The theory behind this survey was three fold. First to clearly define those conductors previously delineated during the 1980 reconnaissance survey, second to formulate a cause, if possible, for them through mapping or drill core data and thirdly, to outline possible north-south structural features through interpretation. All three of these objectives were met.

A total of 14 conductors were clearly defined some of which were not detected during the 1980 survey. The Fraser filtering has rendered a highly detailed picture of their extents and has provided an estimate on their relative strengths.

With the original survey it was initially thought that most if not all of the conductors could be attributed to shear zones reflecting the regional Hardiman Bay Fault. The results from this survey have, in part, substantiated these first theories; however, this can now be expanded such that some of the conductors do not have the regional trend and may, in fact, be caused by contact zones or possibly another weakly developed shear pattern.

Considering the interpretation of north-south structural elements, it was quite evident by truncation or flexure of contours that a prominent feature cuts the grid at approximately line 9.6W. This fault was expected and was first discovered in the underground workings. The VLF-EM has merely confirmed its existence and possible lateral extent.

3.2.5 HUMUS GEOCHEMISTRY

Humus sampling over Zone 1E was broken down into two grids. The first and most northerly was labeled the NGX Grid and the second and most southerly was labeled the NJV Grid. A total of 1353 samples (906 NGX Grid, 447 NJV Grid) were collected at 10 metre intervals on the existing grid lines.

Results from the humus sampling over the NVJ Grid (BL2--TL1S) were very sporadic with only four samples returning assays greater than 10 ppb gold. (Results in Table 1). Interpretation of these humus results was made very difficult by

3.2.5 HUMUS GEOCHEMISTRY (cont'd)

the lack of corresponding geophysical anomalies and geological information. The only exception was a 12 ppb gold assay which was returned for sample number NJV-604 (L14.4W at 91S). This station was within one metre of an outcrop of altered diorite.

Results for the NGX Grid (BL1 to BL2) were sporadic (see Table 1), as well as, being localized in six areas. (see Fig. 6) Area one, with a high of 180 ppb gold, was found over a major east-northeast fault or shear zone. This fault zone has given drill intersections in CF-74-21 (Camflo hole) and CF-81-19 (0.208 oz Au/ton/14.2', NGX Hole). This location, may infact, be a junction of this east-northeast fault and a major north-south fault. The lack of an electromagnetic conductor could be due to the east-northeast fault being re-cemented and/or possibly to overburden depth.

Area two, (high of 530 ppb gold) is explained in part by the presence of the No. 1 vein and an east-northeast electro-magnetic conductor, as well as, possible contamination from the mine dump. Area three (high of 470 ppb gold) is found in the same general area as the No. 2 vein. Area four (29 ppb gold) is found with the No. 3 vein. Area five, although giving only low results (5 and 7 ppb gold) correlates very well with the No. 4 vein, and is on strike with area six, (high of 19 ppb gold) which overlies the western extension of the No. 4 vein. There is one other area of localized humus results. Area seven corresponds to an east-northeast EM conductor.

The No. 1 vein, No. 2 vein and the eastern portion of the No. 4 vein, are quartz veins in well mineralized (pyritic) diorites. The No. 3 vein is similar to the above three veins, except more mineralization is found in the quartz veins, while the No. 4 vein (western extension) is composed of quartz veins in pyritic basic volcanics.

3.2.6 TRENCHING

The two zones of interest in Prospect #75 (named after DDH #75) were trenched and sampled during the past field season. Trench one was in a massive quartz vein with well mineralized (pyritic) basic volcanic (tuffaceous) xenoliths. The trench was sampled over 10 metres at 1.66 metre intervals with the highest assay returning 0.023 oz Au/ton. Trench two was in a sheared well mineralized basic tuff with numerous small quartz veins. A total of four samples were taken over a length of 6 metres (sample interval 1.5 metres), the highest assay returned 0.003 oz Au/ton.

3.2.7 MECHANICAL STRIPPING

In an effort to provide a detailed map of the surface geology in the vicinity of some of the drill holes, a large area was flagged and subsequently stripped of overburden.

The area was located about 600 feet southwest of the shaft and continued south for about 1200 feet. The width was variable, but averaged 250 feet. The total area stripped was about 7 acres.

A John Deere 850 bulldozer was used and was adequate in most areas. Final washing was undertaken using a Wajax fire pump located 1800 feet west on the Swayze River.

3.2.7 MECHANICAL STRIPPING (cont'd)

In addition to this main area, some stripping was done at Prospect #75 located a further 800 feet south. Here the area cleared measured approximately one half acre.

Total time required for this programme was 6 weeks.

3.2.8 DIAMOND DRILL PROGRAMME

The Orofino diamond drill programme continued through the first half of 1981 with operations being concluded by mid August.

A hiatus occurred during the Easter holiday where upon the Morissette contract was terminated. Norex diamond drilling was awarded a new contract and their drilling commenced late in May.

One unitized drill was utilized and performed very well with only minor delays for repairs.

Drilling expenditures totalled $429,957.48 in 1981 which represents an average cost of $14.68 per foot of coring.

Drill footage in 38 holes aggregated to 29145 feet of which 17525 feet were drilled as fill in holes for ore reserve calculations; and 11,620 feet were drilled to extend the replacement zone(s) south of the minesite.

Assay results are listed in Table 2.

3.2.9 DRILL DISCUSSION

The diamond drill programme can be subdivided into two sections based not only on contractor, but also on the basis of proposed targets.

The first phase was a continuation of the 1980 programme and continued until April. This drilling mainly centred on the minesite and was completed in an effort to provide geological control upon which an ore reserve calculation could be made.

Two holes CF-81-5 and CF-81-6 were as part of this phase, but were located southwest of the shaft and were drilled to investigate replacement type mineralization in Camflo hole CF-74-23. Although a zone was intersected in both holes, no ore grade assays were returned.

The second phase could be further subdivided into two sections with the first being successful in tracing a basal replacement zone south from the minesite. However, CF-81-9 spotted between two Camflo set ups failed to intersect this zone, but did have two narrow intersects related to quartz veins. Upon further study it became apparent that an east-northeast fault occurs between the more northerly Camflo set up and CF-81-8 which also seems to change the host rock from a replacement type saturation to bull and glassy quartz veins.

The second phase, the "Wildcatting" phase, began with the drilling of CF-81-10 which was meant as a large step out hole from the above drilling and was in fact suppose to continue this quartz vein zone to the south, as well as, investigating the presumed trace of the major north-northeast fault traceable from

3.2.9 DRILL DISCUSSION (cont'd)

the minesite.

This step, however was too far south for the first objective and although not fulfilling the second either did core through a thick succession of basic volcanics and stopped within a granitic "dyke". This latter rock type had not been previously encountered.

A distinct topographic break suggested another east-northeast fault and with the locating of a diorite outcrop to the west it appeared that the main diorite had been offset.

Holes CF-81-11, CF-81-12 and CF-81-13 were collared to check this possibility. All started in hybrid diorite, but passed through into a sequence of intermediate to basic volcanics in which one lapilli tuff horizon assayed 0.365 oz Au/ton over 5 feet in CF-81-11.

A possible east-northeast break as previously stated probably occurred between CF-81-9 and CF-81-10 and was the target for holes CF-81-14 and CF-81-15. Again, both were collared in hybrid diorite then passed into volcanics. No major fault zone was recognized but the sulphide-rich lapilli tuff was. It did not return any gold assays.

The trace of the main ore grade related north-northeast fault was tested with holes CF-81-16 and 17 with the initial target being a source for a local humus anomaly.

The zone as intersected had a true width of 75 feet and displayed well developed shearing, veining and alteration. Mineralization consisted of pyrite with lesser pyrrhotite and chalcopyrite. Assay results again were discouraging.

All of the above holes in this second phase including CF-81-18, a second attempt to establish the continuity of the intersection in CF-81-11, were within a small area measuring 500 x 400 feet.

CF-81-19 moved to the east of CF-74-21 and 22 to follow-up these vein intersections to the east. Unfortunately, the good assay results were not received prior to the end of the drill programme and no further tests were made.

For the last two holes, CF-81-20 and 21 another probable east-northeast shear zone was drilled after locating a favourable quartz vein structure on surface. Unfortunately, the zone was not intersected however, the veining within basic volcanics was not well developed or mineralized. A second pyritic zone, this time within a flow top breccia prompted the drilling of CF-81-21, a short hole, designed to intersect the same zone down dip. Assays from this zone were not greater than 0.035 oz Au/ton in Hole CF-81-20 while hole CF-81-21 failed to penetrate this horizon.

The 1981 diamond drill programme has revealed that there is a dramatic change in stratigraphy just south of hole CF-81-21 which is probably marked by an east-northeast trending fault zone. Also that gold mineralization continues south of the minesite, but the host environment changes from a basal silica replacement type to high angle east-northeast shear-vein systems.

3.2.10 ORE RESERVES

There has now been completed five tonnage and grade calculations for the Orofino

3.2.10 ORE RESERVES (cont'd)

mineral deposit.

The first of these was done by S. C. Brown, who was the resident engineer between 1947 and 1952. His calculations have been stated to be optimistic due to various factors, however, he did estimate a total of 784,970 tons grading 0.28 oz Au/ton.

E. E. Ansara, an engineer, prepared the second estimate and had a total of 757,960 tons grading 0.15 oz Au/ton. This figure was deemed reasonable based on his figures and allowances.

During the initial stages of Northgate's involvement in the property, D. Pudifin, an independent engineer, was contracted to prepare the third tonnage and grade estimate. His figures were not as optimistic (506,645 tons averaging 0.197 oz Au/ton) but were accepted and provided a starting point for the initial drill programme by Northgate.

At the conclusion of 1980 and after the completion of 34 diamond drill holes, W. W. Weber made his estimate. His report and calculations were the most comprehensive to date and heavily relied on the new drill data. He arrived at a combined ore reserve for both the vein and replacement zones of 896,000 tons averaging 0.21 oz Au/ton.

The final calculations were completed by P. Tyler, a mine geologist, in March and April of this year.

By this time, most of the drill sections had been finalized and the geology and structure had been correlated between sections. His calculation, which was based on all the new data as well as the old workings and assay plans, arrived at a total figure for proven, probable and possible tonnage and grade of 825,705 tons averaging 0.146 oz Au/ton. This figure did not change appreciably as a result of the 1981 drill programme between May and August.

3.2.11 ROAD MAINTENANCE

Road upgrading was initiated on the new road joining the minesite with the trailer camp. Mine muck was spread over the road and a sufficient supply of gravel was available to continue this for a mile west of the Swayze River. Numerous wooden culverts were installed to aid drainage and the road bed was widened substantially.

Grading and the elimination of a steep hill was completed further to the west.

Several days were also spent repairing the Swayze River Bridge after a number of the support beams snapped.

3.2.12 CAMP MAINTENANCE

Camp maintenance was minimal this year, but did include the installation of a radio telephone, the purchase of a 1.5 ton truck for light duty and the construction of the core storage shed capable of storing about 65,000 feet of AQ core.

Presently two of the trailers are being rented to Babcock Mining Limited.

.ABLE 1 LOCATION AND RESULTS OF SPORADIC HUMUS SAMPLES

SAMPLE NO.	LINE NO.	STATION	ASSAY RESULTS	POSSIBLE CAUSE
NGX-155	L4E	54S	10 ppb	Hydromorphic
NGX-230	L00	29S	14 ppb	EM Conductor
NGX-573	L9.6W	72S	15 ppb	Unknown
NGX-842	L24W	41S	11 ppb	Unknown
NGX-853	L24W	52S	15 ppb	Possible Fault Juncture
NGX-901	L28W	00	10 ppb	Unknown
NGX-940	L28W	39S	14 ppb	Unknown
NGX-958	L28W	57S	21 ppb	Unknown
NGX-1038	L32W	38S	11 ppb	Unknown
NGX-1308	L44W	7S	11 ppb	EM Conductor
NJV-457	L6.4W	142S	10 ppb	Unknown
NJV-604	L14.4W	91S	12 ppb	Altered Diorite
NJV-1402	L44W	72S	15 ppb	Hydromorphic
NJV-1408	L44W	78S	14 ppb	Hydromorphic

3.3 EXPLORATION PROGRAMME: PROJECT 780 - WEST GAUVREAU GROUP

.3.1 ZONE 3

3.3.1.1 GENERAL

A small section of the 1980 cut grid was blocked out on the basis of the 1980 humus sample results and VLF-EM conductors and termed Zone 3.

This sub grid was located directly east of the exploration camp and straddled the Swayze River. Several intermediate lines were flagged in order to provide adequate control.

3.3.1.2 GEOPHYSICS

Zone 3 received total coverage by both VLF-EM and proton magnetometer surveys with all readings taken at 10 metre intervals.

.3.1.2.1 Interpretation: Proton Magnetometer (Figure 7)

Upon plotting, the corrected readings indicate general east to west trends with no notable anomalous zones.

A relative high of 1350 gammas lies adjacent to the river on lines 36+25E and 42E and parallels a presumed shear zone. This same feature was coincident with VLF-EM conductor 36-E-1 from the 1980 survey. Other causes for this anomaly could not be found due to the almost total absence of outcrop on the grid.

On line 60E the truncation or flexure of the contour lines tends to support the theory that a north-south shear exists in this area.

3.3.1.2.2 Interpretation: VLF-EM (Figure 7)

The interpretation of the VLF-EM data has been complicated by not only the inherent subtleties of the system, but also the problems related to the small angle between the regional strike and the direction of the incoming signal. The latter difficulty was eleviated by having northeasterly shears as the main targets.

Fraser filtering of the data has revealed seven conductors, two of which correspond to 36-E-1 and 60-E-1 as determined from the 1980 survey.

The strongest conductors occur on line 36E and 36+25E at 710N and 740N respectively. Their cause, however, could not be determined. It appears that they may in fact be one conductor that has been faulted since a north-south fault was predicted and was consistent with the magnetic interpretation.

Although the conductor axis 36-E-1 could not be duplicated, a short one line anomaly of medium intensity occurs along strike on line 42E. A possible faulted extension occurs on line 30E. Both of these would hold up the conjecture of a northeasterly fault zone.

Other conductors on the grid, one being quite strong but short, could not be explained directly, but all had east to northeasterly trends and probably had small shear zones as causes.

3.3.1.3 GEOCHEMISTRY: HUMUS SAMPLING (Figure 7)

An analysis of the humus sample results indicates that one sampler had a faulty technique when collecting material south of the Swayze River. This was unfortunate and renders a large portion of the central section as meaningless.

However, north of the river (a separate sampling team was used), the results have shown anomalous values directly related to the double VLF-EM conductors on lines 36E and 36+25E, once again however, no cause could be ascertained.

Again, north of the river one value of 6 ppb Au could be correlated with an EM conductor on line 30E, but no cause could be found.

3.4.1 EXPLORATION PROGRAMME: PROJECT 781 - STANGIFF LAKE GROUP

3.4.1.1 GENERAL

The Stangiff Lake claims were in part those staked during the 1980 field season to cover the possible extension of the Hardiman Bay Fault.

The 1981 exploration programme was of the reconnaissance type with detailed follow-up being performed on those areas of merit.

Geological mapping and geophysical surveys were conducted over the entire block while humus sampling and detailed geophysical work was centred on particular structural features and/or geophysical and geochemical targets.

3.4.2 GEOLOGICAL MAPPING (Figure 8)

It was estimated that less than 10% of the area was rock outcropping which made correlations and interpretation more difficult.

3.4.2.1 BASIC VOLCANICS

Basic volcanic rocks constituted the largest proportion of the outcrop exposures, with massive and pillowed flows being most common.

At the west end of the group, pillowed flows interbedded with massive units were spottedly exposed over an area of several claims. In both cases, these rocks were fine grained, grey-green in colour and were fairly soft. Carbonate and silica alterations were common, but did not form any distinct zones.

Pillows in most cases were well formed with vesicles being quite large and evident in most exposures. Shearing had deformed most flows such that the pillows were stretched and more lenticular in outline This made top determinations more difficult, but in general, tops were in a northwesterly direction.

Individual flows, whether massive or pillowed, attained thicknesses in the order of 10 to 25 metres. This was an estimate only since correlation of individual flows was difficult.

Narrow units of pillow breccia and agglomerate were present, but constituted only a minor proportion of the pile. Again correlation of these units was next to impossible.

Within the central portion of the block were three small exposures of dioritized volcanics one of which displayed narrow and faint relict pillow selvages. These exposures were generally smaller than 3 square metres in extent.

To the east, pillowed flows became less abundant with tuffaceous units and massive flows being more common.

3.4.2.2 INTERMEDIATE TO ACID VOLCANICS

Volcanic rocks of intermediate to acid composition became more abundant to the east with large exposures of such rocks being mapped on the shore of Horwood Lake.

3.4.2 GEOLOGICAL MAPPING (cont'd)

3.4.2.2 INTERMEDIATE TO ACID VOLCANICS (cont'd)

Narrow, massive, and siliceous flows were found to be interbedded with rocks of more basic composition. These inevitably were associated with tuffaceous units being either fine or medium grained. Lapilli tuffs were not uncommon and like the other tuffs were generally sheared and accompanied by some sericite alteration.

Again, lack of sufficent exposure made correlation difficult, but it would seem that these units represent the end of short volcanic cycles marked by a more basic base.

3.4.2.3 ACID INTRUSIVES

One feldspar porphyry dyke was observed and was of limited extent.

It was intrusive into a massive pillowed flow, had a thickness of 1.5 metres and was typical of other such dykes in the area.

A fine grained siliceous, grey groundmass constituted about 70% of the rock while the remainder was well developed white feldspar phenocrysts. No metallic mineralization was evident.

3.4.2.4 STRUCTURE

The lack of outcrop also hampered the structural analysis.

From west to east strikes varied from north-northeast to northeast with all dips at fairly steep angles to the northwest. The central section of the block was very poorly exposed and no structural elements were mapped. It appears that the gentle warping of the units occurs in this area which was more readily observed from the mapping done directly adjacent to Stangiff Lake and south of the western end. (See sections on Project 783). Here a syclinal axis has been mapped with the possibility of overturned stratigraphy.

Should this hypothesis hold true, then the western section of Project 781 would represent the western flank of an adjacent antiform; while the eastern end could be more correlative with the Project 783 mapping.

Evidence for faulting was tenuous at best in most areas with steep scarps being the only indication. However, to the northeast shearing of tuffaceous units was definitely evident indicating northeasterly strike slip movement. Such shearing was quite common and parallels the regional fault, the Hardiman Bay Fault.

3.4.2.5 MINERALIZATION

Pyrite mineralization was common throughout the area, but no major accumulations were found during the mapping or detected by the geophysical surveys.

Base or precious metal mineralization was not found during any of the surveys.

3.4.3 GEOPHYSICAL SURVEYS

3.4.3.1 GENERAL

During February and March of 1981, MPH Consulting Limited undertook a programme of VLF-EM and magnetometer surveying on Project 781.

Although a separate report containing their findings is available, the following is a brief summary of their results.

3.4.3.2 MAGNETICS

Within the gridded area, the magnetics outlined a basic east-west axial trend. However, the grid could be separated into an east and west section based on the magnetic relief.

The west section, although maintaining the general trend had two north-south features which were initially interpreted to be cross-cutting diabase dykes, these match quite well with magnetic highs to the south and were found to correspond to what has been mapped as metagabbros.

To the east, the magnetic relief decreases markedly and could possibly be due to a change in rock type or also deeper overburden. Outcrops are few in this area, but where present are basic to intermediate volcanics, therefore, it would seem that the deepening of the overburden is the cause of the change in relief.

No strong magnetic highs were found in the east half even in the areas of near surface outcroppings.

The magnetic survey provided a useful tool for planning the 1981 exploration programme and providing a method for geological mapping.

3.4.3.3 VLF-EM

As with the magnetics, a sectioning of the grid could be done based, in this case, on the number and strength of conductors.

A total of eleven conductors were found with the largest aggregations appearing at either end of the grid. This may also be an indication of deep overburden in the central area.

All conductors have a general east-west trend which originally was thought to reflect discrete stratigraphic sources. Geological mapping has indicated, however, that at least in the western section, these conductors crosscut the regional strike.

MPH has not put forth any distinct causes for the conductors, but they do parallel the regional fault trend and are probably due to related structures.

3.4.4 GEOCHEMISTRY

3.4.4.1 GENERAL

This section will outline the geochemical programme and its results for two subgrids and the reconnaissance-type sampling of VLF-EM conductors not within the boundaries of these grids.

The two sub-grids have been designated "WSL" and "HBF" and stand for West Stangiff Lake and Hardiman Bay Fault, respectively.

Humus sampling done on Anomaly A and B will be outlined under sections describing these anomalies.

.4.4.2 THE WEST STANGIFF LAKE GRID (WSL) (Figure 11)

3.4.4.2.1 GENERAL

The WSL grid was blocked out on the basis of geological and geophysical targets.

Geologically, the gabbroic rocks exposed south of the grid, were the main target and were believed to be possible hosts to similar gold mineralization as found in the Orofino diorite. Although not exposed on this grid, the magnetic data revealed two separate north-south bands being extensions of those to the south.

In addition to this, the grid boundaries embrace five VLF-EM conductors.

.4.4.2.2 HUMUS SAMPLING INTERPRETATION

Coverage by humus sampling was good over the WSL grid with samples being taken at 10 metre intervals.

Upon plotting, the assay results do not indicate any major trends. A threshold of 5 ppb Au was used to delineate an anomalous reading with those above 10 ppb Au being of greater interest.

Several spot highs occurred over the grid ranging in value from 5 ppb Au to 15 ppb Au; however, the largest accumulation of anomalous values occurred at the east side of the grid. This area has received further work and designated Anomaly A (see applicable sections).

With the lack of outcrop exposure, no direct bedrock source could be found for the anomalous readings. There was no correlation either with VLF-EM conductors or magnetometer highs or lows.

From mapping, however, it seemed that a number of these spot anomalies lie within swampy areas and that a hydromorphic concentration of the gold was the most plausible explanation.

Those anomalies that do not occur in swampy areas may be caused by local accumulations of gold in the underlying till which probably does not actually represent a bedrock source or they may be caused by the capacity of the vegetation's metabolism to retain gold.

No further work was conducted on these spot highs, due to the inconclusive evidence of their source.

3.4.4.3 HARDIMAN BAY FAULT GRID (HBF)

.4.4.3.1 GENERAL

The Hardiman Bay Fault grid was located in the extreme northeast corner of Project

TABLE 3

HUMUS SAMPLE RESULTS - VLF-EM CONDUCTORS

PROJECT 781

CONDUCTOR	HUMUS ANOMALY	SOURCE	DETAILED PROGRAMME
A	No	--	WSL Grid
B_1	No	--	WSL Grid
B_2	Yes	Transported Overburden	WSL Grid Anomaly A
C	Yes	Possibly Hydromorphic	No work, north of Property Boundary
D	No	--	WSL Grid
E	No	--	nil
F_1	No	--	nil
F_2	No	--	nil
G_1	No	--	On Anomaly A Grid
G_2	Yes		Anomaly B Grid
H	Yes	Hydromorphic	nil
I_1	No	--	On HBF Grid
I_2	Yes	Transported Overburden	On HBF Grid
I_3	Yes	Transported Overburden	On HBF Grid
J	Yes	Hydromorphic	nil
K	Yes	Unknown - Possibly Transported Overburden	On HBF Grid

781 and covered not only six VLF-EM conductors, but also the trace of the Hardiman Bay Fault.

Blanket coverage by humus sampling was undertaken with samples taken at 10 metre intervals.

3.4.4.3.2 HUMUS SAMPLING INTERPRETATION (Figure 9)

As with the WSL grid, analytical results were erratically distributed over the grid with most values showing no direct correlation to the VLF-EM conductors.

Scanty outcrop exposures reveal that the area is underlain by basic to intermediate tuffs and flows, but none appear to have any bearing on the anomalous readings.

Those anomalous values clustered between conductors I_2 and I_3 were taken on high ground with Jack pine being the dominant tree type. Although no definite contourable zone was present, these readings approximate a linear trend parallelling that of both I_2 and I_3. The Hardiman Bay Fault zone presumably underlies the area as well.

According to MPH's intepretation, the cause of the conductors lie at depths of 20 and 23 metres respectively and it would seem that this may be beyond the detection limit of the humus sample.

It would seem more likely, therefore, that the overburden which is sandy (evidenced by the Jack pine) had probably been transported.

3.4.4.4 HUMUS SAMPLING: VLF-EM CONDUCTORS

Those VLF-EM conductors not within the boundaries of either the WSL or HBF grids were tested for gold by taking a short series of samples (generally 10) perpendicular to the conductor axis. Several sample lines were run across each conductor.

Analysis of these samples outlined two conductors with associated anomalous values. The first of these, designated Anomaly B received further detailed work while the second did not since a hydromorphic cause was determined for the high values.

Conductor "C" had two anomalous readings associated with it, however, being north of our new property boundary, no further work was done.

Table 3 is a breakdown of the conductors and the sampling results.

3.4.4.5 EXPLORATION PROGRAMME: ANOMALY A

3.4.4.5.1 GENERAL

Anomaly A, located between lines 1+20W and 3+60W, underwent a "mini" exploration programme in an effort to further define the coincident magnetometer and humus anomalies discovered during the more reconnaissance-type surveys.

To provide adequate control, five intermediate flagged lines were required.

VLF-EM, magnetometer and humus surveys were conducted over the grid. Geological mapping was deemed sufficient from the reconnaissance program with no outcrops being found.

3.4.4.5.2 MAGNETOMETER INTERPRETATION (Figure 12)

The reconnaissance survey performed earlier in the year delineated a linear, east-west trend across the grid.

Plotting of the detailed data does not substantiate these initial survey results. Instead the magnetic contours reveal a more north-south trend, although a vague east-west trend was evident at the grid's west end.

Anomalous zones were small and point-like and do have a north-south trend. These no doubt reflect bedrock sources and were probably extensions of the gabbroic rocks exposed further to the south.

.4.4.5.3 VLF-EM INTERPRETATION (Figure 13 & Figure 14)

The VLF-EM data has been filtered and contoured as shown in Figure 14 .

Three moderately strong conductors have been outlined of which two (located on lines 3+20W and 2+80W at 8N and 5N respectively) probably represent fracture zones which have a common juncture 20 metres to the west. Truncations and flexures of other contours supports the hypothesis.

The third conductor on line 2+80W at 0N was inadequately developed to clearly define its cause. It may indicate a similar structure as outlined on line 3+20W at 8N.

Four weak conductors were also present and probably represent a faulted re-cemented shear trending in a northeasterly direction.

.4.4.5.4 GEOCHEMISTRY: HUMUS SAMPLING (Figure 15)

Analytical results from this survey were disappointing as it was hoped that the anomalous zone could be extended.

However, with the compilation of all the data, an anomalous zone does occur on line 2+40W and was coincident with a magnetic high. Other anomalous humus readings coincide with a northeasterly fault and numerous marginal values match with the northwesterly fault.

Spot highs over the rest of the grid were problematical since no definite source could be placed upon them. With high ground and sandy soil, the possibility of transported overburden should not be overlooked, however, the correspondence of the magnetics and fault structures with other values may dispell this as a likely cause.

3.4.4.6 EXPLORATION PROGRAMME: ANOMALY B

3.4.4.6.1 GENERAL

Anomaly B resulted from the reconnaissance geochemical survey over VLF-EM conductors G_1 and G_2. A significant number of anomalous humus analysis were found associated with these conductors and, therefore, a small sub-grid was established upon which geochemical and geophysical surveys were run.

3.4.4.6.2 INTERPRETATION: VLF-EM (Figure 17 & Figure 18)

Numerous moderately strong and weak conductors were found in the eastern section of the grid which contrasts with the other side which only has one weak conductor. A lake dominates the central section of the grid and with the sharp contrasts between the two sides, it seems that a north-south fault exists in this position. The reconnaissance VLF survey also was interpreted in this way.

The Fraser Filter data when contoured, shows that the conductors trend just north of east and had curvilinear axis.

Geological mapping and prospecting did not reveal any explanations for the conductors; however, with the arcuate axial trends and high electrical response, a graphitic source is suggested.

No outcrops were found on the grid, but to the north and east, exposures of basic volcanic flows and tuffs were mapped with strikes similar to the northeasterly trends of the conductors. It seems plausible that narrow graphitic units could be found in this type of geological setting where individual volcanic cycles were of short duration.

3.4.4.6.3 INTERPRETATION: MAGNETICS (Figure 16)

The magnetic survey data reflects the results obtained by MPH crew, in that a general east-west trend was evident and that there were no anomalous zones.

3.4.4.6.4 GEOCHEMISTRY: HUMUS SAMPLING (Figure 19)

The initial humus sampling revealed numerous anomalous values across the G_1 and G_2 conductors. Upon more detailed sampling, however, duplicate samples could not substantiate these values.

No conclusive explanation can be given for the failure to expand the anomalous zone. In part, it seems it could be due to poor sampling technique since on the second survey little humus was found in many areas because of swampy conditions. It was also possible that scavenging by mossy vegetation could account for the erroneous values.

3.5 EXPLORATION PROGRAMME: PROJECT 782 - HARDIMAN BAY GROUP

3.5.1 GENERAL

With the exeption of one claim, all claims in the Hardiman Bay Group were staked in 1980 in order to surround the Tionaga Mine, a former gold producer.

As with Project 781, the exploration programme was initially of a reconnaissance nature with detailed follow-up being performed on "anomalous" areas.

Geological mapping and geophysical surveys were conducted over the entire block while humus and soil geochemistry and trenching were done over smaller areas requiring more detail.

3.5.2 GEOLOGICAL MAPPING (Figure 20)

3.5.2.1 GENERAL

The entire grid was mapped at a scale of 1:2,500 using the cut grid as a control.

Unlike Project 781, outcrop exposure in general was greater averaging about 15%.

3.5.2.2 BASIC VOLCANICS

Basic volcanic rock types formed the largest percentage of rock over the gridded area.

They varied from being massive basaltic-andesitic flows, pillowed flows to tuffs. Fine to medium grained varieties predominated with coarse dioritic textures being observed in thick units.

Colouration ranged from black to greyish-green with lighter colours if rock was highly carbonatized.

Pillows where present, had well defined selvages and were well formed. Top determinations were based on shape as well as vesicles and were generally to the northeast.

Basic tuffs were fine grained, highly sheared with varying amounts of carbonate and silica alteration.

As with the geophysical trends, the basic volcanic units had east-west strikes with local flexures due to folding and doming effects of acid intrusives.

3.5.2.3 INTERMEDIATE TO ACID VOLCANICS

As in other volcanic piles, rocks within this compositional range are not predominant.

During the course of mapping, rocks of intermediate composition were found mainly as tuffaceous units, but also as pillowed flows. Grain size did not vary markedly with fine grained types being prevalent. Colours did not frequently change with grey to greyish-black being the most common, depending on type and extent of alteration.

The possibility of some of these rocks actually being more basic in composition due to the masking effects of alteration, should not be overlooked especially with pillowed flows.

True acid volcanics were quite abundant and are represented by waxy sericitic flows and tuffaceous beds. The largest accumulation was located on the southern boundary; however, sporatic exposures have been identified as possible acidic rocks elsewhere on the grid.

Other occurrences could have been mistaken for rocks of intermediate and possibly basic composition by the darker colouration.

Outcrops of quartz "eye" porphyry and quartz feldspar porphyry were found and upon mapping, occur as two distinct east west bands which in some cases appeared to have conformable contacts.

These rocks were typified by having a soft buff weathered surface with a fresh colouration being grey to whitish black. Quartz "eyes" were ubiquitous and measured about 3 mm. in length. Although in some exposures the rocks were highly sheared, they were in total quite massive and uniform in composition. Disseminated pyrite was quite common, but was fine grained and was certainly less than 1%.

The origin of these porphyries is in doubt since some exposures show an intrusive nature while in others, the rocks are conformable.

Carbonate alteration was common and well developed within sheared varieties.

3.5.2.4 ACID INTRUSIVES - QUARTZ VEINS

Quartz veins were found throughout the claim group and in general, were quite common. They occurred in all rock types as narrow fissures and joint fillings, as well as, blows or following foliation planes, which are most common in the basic tuffs, white, bull quartz composed the veins, however, glassy, black pockets were evident in some.

Although most were narrow and discontinuous two such occurrences not only showed substantial widths but also lengths. The two most notable were designated the North and South veins.

These veins are described under their own headings.

3.5.2.5 MINERALIZATION

Suphide mineralization consisting exculsively of pyrite was the only mineral found during the programme. It occurred in all rock types as disseminated fine to medium grained cubes or masses. Concentrations were no greater than 1% with percentages as high as 3-4% in the North and South veins in association with included blocks of wall rock.

3.5.2.6 STRUCTURAL GEOLOGY

Structural trends were East-West parallelling similar trends in stratigraphy and geophysics.

Shearing was most evident and well developed in all rock types.

Presumed northwesterly faults have been mainly determined from work performed on detailed grids, since each grid did not receive identical surveys, some of the traces of these faults were based on MPH's geophysical work.

Two such faults arose from the surveys done on the RPNS grid but their extent based on other results was tenuous. Topographic features tend to support their placement but the geological mapping cannot substantiate it.

.5.3. GEOPHYSICS

3.5.3.1 GENERAL

VLF-EM and Magnetometer surveys were completed early in 1981 as part of a programme of similar surveys conducted on Project 781. The following is a brief summary of MPH's conclusions.

3.5.3.2 MAGNETICS

Unlike the central and eastern sections of Project 781, the magnetic relief over these claims was in general greater, although an East-West trend was maintained.

A number of small, discrete isolated anomalies were outlined with the greatest concentration being in the southeast corner of the grid.

With the lack of continuous magnetic trends no structural interpretation was possible.

3.5.3.3 VLF-EM

As with the magnetic data, the VLF-EM survey results indicated a general east-west trend.

Those conductor axis placed upon the first derivative map were based upon the interpretor's experience, in relation to possible true bedrock causes as opposed to possible topographic generated sources. A total of thirteen such conductors were outlined and lettered. It was recommended, however, that the remaining topographic conductors should not be overlooked.

No structural interpretation was made and there was no response to either the Horwood Lake or Hardiman Bay Fault, when lines were run over the frozen lake.

3.5.3.4 MAX-MIN EM

A very limited Max-Min survey was conducted over three short east-west lines in an attempt to obtain some response to the Horwood Lake Fault.

Upon plotting a very weak conductive zone was found which may or may not have been caused by the fault zone.

3.5.4. GEOCHEMISTRY

3.5.4.1 GENERAL

Both humus and soil sampling was conducted over designated areas on the cut grid, with the concentration being on humus collection.

Blanket coverage of several sub-grids (QUO,RPN,M and L) by humus sampling was completed to test for gold mineralization over VLF-EM conductors(Q,O,R,P,N,M and L). Those conductors lying outside these areas were tested by the collection of a short string of samples across each axis.

The discovery and defining the limits of both the North and South veins prompted the taking of samples over intermediate lines in each area.

Only one VLF-EM conductor (R) received full coverage by soil sampling, because of its possible sulphide cause.

3.5.4.2 HUMUS SAMPLING: QUO GRID (Figure 21b)

Three very low assays were recorded over Conductor "O", while conductor "Q" had four associated anomalous values, with two being 10 ppb Au or greater.

The origin of the source or sources for these readings can not be exactly determined. Conductor "O" corresponds to a creek with its low values marking the swampy edges and are hydromorphic in origin.

Conductor "Q" on the other hand was located beneath high ground and probably represents a bedrock feature. Those anomalous values, however, do not have any obvious source. Whether they relate to the conductor is questionable, depending on whether or not the humus layer could detect it with overburden depth of 8 metres and more.

Outcrop was exposed north of "Q" conductor as well as to the west and was mapped as sheared basic volcanics with quartz carbonate stringers. One humus reading of 6 ppb Au was located adjacent to these outcrops but mapping did not indicate any favourable mineralization.

3.5.4.3 HUMUS RESULTS RPN GRID (Figure 21b)

As with the "QUO" grid anomalous results from this grid were erratically distributed and difficult to interpret.

Those samples taken across the western extension of "N" conductor and "P" conductor returned a large number of anomalous values and can be attributed to poor sampling techniques. In comparison to the geological map, several of these readings can however, be matched with a change in topography and vegetation type.

On the eastern half of the grid the "N" conductors have in general poor results however, numerous anomalous values on two lines, again marked questionable sampling techniques. "R" conductor results were also ambiguous. In each case a total of three readings could be considered valid and were either directly above or adjacent to the conductor axis. Two of these correspond to swamp boundaries and are probably hydromorphic in origin, while the third occurs on high ground in a hardwood forest.

Lastly, a one sample anomaly (5 ppb Au) located between the east and west halves of "N" conductor, lies over top a presumed northwesterly fault zone.

3.5.4.4 HUMUS RESULTS: M GRID (Figure 21a)

Although adequate samples were collected to test the three "M" conductors; no anomalous gold values were detected.

A value of 4 ppb Au occurs on the axis of the longest and strongest conductor and may indicate favourable mineralization, although the source is unknown and may be at depth.

Basic volcanics are exposed in the area but do not indicate any economic mineralization.

.5.4.5 HUMUS RESULTS: L GRID (Figure 21a)

All humus analysis returned non-detectable amounts of gold and no further work would be required.

3.5.4.6 HUMUS RESULTS: VLF-EM CONDUCTORS AND MAGNETOMETER ANOMALIES (Figure 21a & 21b)

The various anomalies tested were not lettered by MPH Consultants as they were believed to have causes possibly topographic in origin. Although putting forth a caution MPH did recommend that they should not totally be overlooked. For this reason a limited test was made of a large number of the anomalies and the results have indicated that further work should be done on some.

For convenience these anomalies have been numbered and appear on Figure 21a & 21b. Table 4, lists the anomalies and summarizes all of the results. Only those with encouraging results are discussed and include numbers 782-13 and 782-15.

Anomaly 782-13 was located in the southern part of the grid and was directly west of the QUO sub-grid. It lies along the same trend as the "Q" VLF-EM conductor and consists of two, short but strong VLF responses and one magnetometer high.

Although humus values were not of great magnitude, one reading of 5 ppb Au was attained directly atop the magnetic high, while the EM responses were consistently and quite discretely marked by a reading of 2 - 3 ppb Au.

These values may only represent higher background levels but may also reflect a true bedrock anomaly. Geologically the magnetic high corresponds to an outcrop of dioritized basic volcanics while the EM anomalies were within an area of no outcrop but probably underlain by more basic volcanics.

Shearing in all outcrops in the vicinity and the presence of quartz veins makes this relative anomaly appear to have some potential.

The second anomaly 782-15 was a collection of two northeasterly VLF-EM conductors and their intersection with the Max-Min conductor. No magnetic responses were associated with this zone.

Structurally the Max-Min conductor may represent the northwesterly trending Horwood Lake Fault, while the two VLF-EM conductors may be a response to either faults or possibly contact zones.

A third structural element was present and has been postulated from the filtered EM data by MPH as well as detailed work on the RPNS grid. This would be either one or two north-northwesterly faults which can be extrapolated to the north and south from the RPNS grid.

In conjunction with anomaly 782-15 (Figure 21b) this fault(s) intersect the two VLF-EM conductors and have anomalous humus results associated with these junctures. Further, the junction between the Max-Min conductor and the more northerly VLF conductor marks a highly anomalous zone.

Underlying anomaly 782-15 was a series of sheared basic volcanic rocks which have been intruded by quartz-feldspar porphyries. Even though a higher background level would be expected from these rocks; none seems to have been detected on other lines and it would seem that this anomalous zone was directly related to a structural source.

3.5.5. EXPLORATION PROGRAMME: RPNS GRID (Figure 22)

3.5.5.1 GENERAL

The "RPNS" grid was a portion of the 'RPN" grid and was singled off to isolate the "R" conductor, since MPH Consultants had stated that its cause may have been due to sulphide mineralization.

To test for base metals, a soil sampling survey was conducted over the existing lines in conjunction with magnetometer and VLF-EM.

3.5.5.2 MAGNETIC INTERPRETATION

The detailed magnetic survey did not reveal any new anomalous zones.

3.5.5.3 VLF-EM INTERPRETATION

The filtered data has shown two strong conductors both having northeasterly trends. Between them, was an area of lower conductivity which corresponds to a flexure and truncation of contours. This suggests that a north-northwest fault zone cuts through this area.

3.5.5.4 SOIL GEOCHEMISTRY

A total of 97 samples of "B" horizon soil were collected and analyzed for copper, lead, zinc, and gold.

The results have indicated four anomalous zones with three having coincident Cu, Pb,Zn readings. The best defined zone occurs on lines 2+40 W and 3+60 W at 2+00S and 2+10S respectively.

This anomaly is adjacent to the VLF-EM "R" conductor and can be traced an additional 480 metres to the west where, although its width decreases, its magnitude increases (for zinc only).

The remaining three anomalies parallel this zone with one to the north and two to the south. To the north is a discrete multi-element anomaly on line 4+80 W extending for at least 360 metres.

In the south is a narrow branching zinc anomaly with copper and lead forming spot highs.

Gold and silver concentrations were low but upon plotting generally coincide with the base metal anomalies.

The contoured maps tend to indicate that there are anomalous zones which parallel the east-west "R" conductor; however, it is significant to note that three high zinc readings and a weak copper value lie above the trend of the northwesterly shear and that most of the anomalous gold values occur on line 4+80 W just to the east. Also three weak copper values and one gold reading correspond to a parallel structural feature on line 8+60 W.

An explanation for the anomalies could in large part be due to hydrothermal fluids within the fault zones, however, this does not explain those strong values away from these zones.

The area is underlain by a sequence of basic volcanic rocks which have been sheared and well jointed. Should the structural hypothesis be valid then the shearing and jointing could also be the source for the more distant anomalies.

.5.6 EXPLORATION PROGRAMME: NORTH AND SOUTH VEINS

3.5.6.1 GEOLOGY (Figure 20)

Both the North and South veins uncovered during the mapping programme occur in sheared basic tuffaceous units.

Black smokey quartz is typical of the North vein which has been exposed over a length of 6 metres and has an approximate width of 2.5 metres.

Mineralization consists of fine to medium grained pyrite which is intimately associated with sheared and chloritized wall rock inclusions.

The South vein was not fully exposed but it appeared that the system was at least 5 metres wide and 160 metres long.

White bull quartz was most common in the vein but black, glassy quartz became prevalent in southern exposures. Pyrite, again closely associated with chloritized inclusions, seemed to be the only sulphide present.

.5.6.2 HUMUS GEOCHEMISTRY

A limited survey was conducted over each vein system in an attempt to extend their dimensions. Results were disappointing with only several samples being greater than the non-detection limit.

This survey was considered to reflect the lack of bedrock mineralization , since overburden thicknesses were slight.

3.5.6.3 TRENCHING AND ROCK SAMPLING

Several grab samples representative of each vein and its mineralization were collected from small trenches and sent for assay. Results were not encouraging with the highest being 0.005 oz Au/ton.

3.6. EXPLORATION PROGRAMME: PROJECT 783 - EAST GAUVREAU GROUP

.6.1 GENERAL

Exploraton on Project 783 was restricted to a small area located immediately west of Stangiff Lake. This zone, designated the "Old" grid, encompassed an area of approximately 0.85 square kms. Lines from the original (1980) cut grid, along with intermediate cut and flagged lines (on the eastern portion of the zone) were used for control. The boundaries for the "Old" grid were line 168E on the west, line 276 E on the east, base line 1 to the south and tie line 1N to the north. The "Old" grid lies directly south of and contiguous with the WSL grid of project 781. The "Old" grid and the WSL grid comprise what was known as Zone 2.

3.6.2 GEOLOGICAL MAPPING (Figure 23)

Outcrop exposures in the "Old" grid total about 10%, with compilation , although not good, being aided by the fact that all exposures were limited to the eastern half of the mapped area. The mapping was conducted at a scale of 1:600 with the intention of further delineating the nature of both the gabbroic and volcanic rocks and their relationship, if any, to local mineralization.

3.6.2.1 BASIC VOLCANICS

The basic volcanics are by far the most dominant rock type found in the map area, with individual units averaging 15 metre thickness and in places reaching a maximum of 50 m. The three main types are massive and pillowed flows, along with massive tuffs. All three have the same general characteristics, being dark green to dark grey in colour, very fine to fine grained, and being quite soft. Alternation consists of carbonaceous, chloritic and sericitic types and are confined to areas of quartz veining and shearing.

The pillowed flows are well developed in all exposures, with individual pillows ranging in size from 20 cm to 1 m in width. The selvages, being chloritic in nature, are also well developed and can attain a maximum size of 3 cm in width. Vesicles are also evident in individual pillows and in some cases show an increase in size from the base of the pillow to the top.

Massive flow identities, were determined by the presence of flow top rinds along with the positioning of vesicles amygdules, flow banding and in one location a frothy flow top breccia. Due to the nature of massive flows as compared with massive tuffs, any rock type that lacked distinguishing features was termed a flow.

Tuffs in general were quite massive and were identified by the presence of angular (what appeared to be) feldspathic fragments. Fragmental abundance varied considerably from area to area. In some instances bedding of the tuffs was apparent, especially where shearing was evident.

3.6.2.2 INTERMEDIATE VOLCANICS

After the basic volcanics, rocks of intermediate composition were the most abundant. The main criteria used to distinguish between the basic and intermediate volcanics, were colour and hardness (due to a higher percentage of silica). The intermediate volcanics have a colour ranging from grey to light green, are very fine to fine grained, massive and harder than the basic volcanics. These units do not attain thicknesses greater than 15 metres and in general are quire narrow.

Pillowed flows were fairly well developed, but only attained a maximum width of 30 cm. The pillows were separated by well developed rims , of up to 15 cm in width. Vesicles were found in many exposures and often helped in top determinations along with general shape and packing of the pillows.

Field identification of the intermediate massive flows was facilitated by recognition of amygdules and vesicles. While the only indicator of the massive tuffs were the angular fragments.

3.6.2.3 ACID VOLCANICS

Only two exposures of acid volcanics were found within the map area. One exposure consisted of a small outcropping of massive flow (L 246E, 55N), while the second (found between lines 264E and 270E at 40N) was comprised of separate units of massive flow and tuff. These latter units were contained within a complete volcanic cycle. All of the above units had a maximum thickness of 1 m.

The acid flows were massive, showing flow banding and a chill margin indicating the top of the flow. The tuffs consisting of a large percentage of angular fragments, were also massive units. Colours were predominantly white to light grey, and these acid volcanics were extremely hard (due to high silica %). No alteration was evident.

.6.2.4 BASIC INTRUSIVES

A series of gabbroic dykes or sills have been intruded into the surrounding volcanic rocks. In general the gabbros have been injected parallel to the strike of the wall rocks, but in one location they appeared to trend across strike. These gabbros were fine to medium grained in nature, and had a salt and and pepper appearance due to the presence of equal amounts of felsic and mafic minerals. The felsic minerals were mainly feldspars with quartz, not exceeding 5%, while the mafic minerals appeared to be in the compositional range of the amphiboles.

3.6.2.5 ACID INTRUSIVES

Acid intrusives are of two varieties these being quartz eye porphyry and granitic dykes. Quartz veining will be discussed below.

The quartz eye porphyry was intruded into a basic flow, and attained a width of two metres. Compositionally this porphyry had a fine grained, highly siliceous grey ground mass (about 90%), with the remainder being composed entirely of equigranular quartz phenocrysts.

3.6.2.6 QUARTZ VEINING

Quartz veining was found throughout the "Old" grid, with sizes varying from very thin stringers up to three metre wide veins. Bull quartz was the most commonly found variety and on occasion smokey and glassy varieties were seen. The three metre wide vein had been intruded into a basic tuff, and as with all quartz veins found, it was not mineralized. The basic tuff was fairly well mineralized (10% pyrite) but assayed only trace amounts of gold.

3.6.3 STRUCTURE

Interpretation of structure could be achieved only to a limited extent, due to the position and lack of outcrop exposures. Three main areas of exposure were seen:

1) L 204E to L 240E; from 3S to 30N
2) L 246 E to L 240E; from 51N to 66N
3) L 258E to L 276E; from 30N to 50N

Structural information was acquired by the use of strikes and dips of contacts, flow banding, flow tops and top determinations from pillowed flows. In general the geology trends north by northeast with only a few minor flexures.

Area one shows a synform, with the fold axis crossing the baseline at L228E and striking N45°E. The second area shows an overturned sequence of intermediate to basic volcanics. Individual units dip northwest, while the tops(from pillows) face south. Area three has the volcanic units dipping northwest and the tops facing south to southwest. As well, area three was the same location where the gabbros intruded the volcanics.

Faulting, where observed, was minor having apparent offsets no larger than 1 metre. Faults with greater displacements, possibly occur in the map area, but none were observed.

.6.4 MINERALIZATION

Mineralization is found primarily as fine to medium grained disseminated pyrite and occurs sporadically through all rock types excepting the acid volcanics. Two areas of relatively high pyrite concentrations (10%) occur on the "Old" grid. The first is a basic tuff located 30 metres west of L270E 40N. The second area, located on L264E 30 metres east of 36N, is the aforementioned quartz vein with basic tuff.

Both of the above locations were grab sampled, along with nine other areas throughout the "Old" grid. With all samples returning only trace gold values.

3.6.5 GEOCHEMISTRY (Figure 23)

During the 1981 field season a humus sampling programme was conducted over the eastern half of the "Old" grid. The reason for this survey was two fold. First, to test the zone of gabbros for possible gold mineralization (similar to the Orofino Diorite) and, second, to explain the anomalous stream sediment results (1980) on the two streams east of the grid and draining north and west.

The survey was initially conducted over seven, 800 metre lines. The results from these samples, although sporadic, outlined a northwesterly trending zone. Four, 200 metre intermediate lines were flagged in and sampled in an attempt to make the zone continuous. With results from these four lines, it was very difficult to make any correlation between lines.

TABLE 4

HUMUS SAMPLE RESULTS - VLF-EM & MAG ANOMALIES - PROJECT 782

CONDUCTOR	HUMUS ANOMALY	SOURCE
782 - 1	NO	-
782 - 2	NO	-
782 - 3	NO	-
782 - 4	NO	-
782 - 5	NO	-
782 - 6	NO	-
782 - 7	NO	-
782 - 8	POSSIBLE	PROBABLY A SHEAR, LOW GEOCHEMICAL RESPONSE
782 - 9	NO	-
782 -10	NO	-
782 -11	POSSIBLE	PROBABLY A CONTACT, LOW GEOCHEMIC RESPONSE
782 -12	NO	-
782 -13	YES	LOW GEOCHEMICAL RESPONSE, PROBABL A SHEAR
782 -14	NO	-
782 -15	YES	JUNCTURE OF SHEAR ZONES

TABLE 2

ASSAY RESULTS: 1981 DIAMOND DRILL PROGRAMME, PROJECT 775.

HOLE	INTERSECTION	CORE LENGTH	Au oz./ton
C-80-9	748.2 - 753.4	5.2	0.142
	812.0 - 831.8	19.8	0.092
E-81-13	694.5 - 706.7	12.1	0.146
	733.1 - 741.4	8.3	0.132
E-81-11	769.0 - 733.0	4.0	0.128
	783.0 - 787.0	4.0	0.153
	767.0 - 787.0	20.0	0.075
	767.0 - 773.0	6.0	0.100
	937.0 - 942.0	5.0	0.163
C-81-12	711.0 - 715.4	4.4	0.172
	764.3 - 770.4	6.0	0.080
	774.7 - 779.6	4.9	0.096
	787.6 - 793.3	5.7	0.117
A-81-2	720.9 - 721.5	0.6	0.135
	777.0 - 778.7	1.7	0.093
G-81-14	171.8 - 181.0	9.2	0.895
	including 1.2 feet assaying 4.09 oz Au/ton.		
C-81-11	765.0 - 767.5	2.5	0.130
	821.0 - 826.0	5.0	0.115
E-81-10	797.0 - 829.7	32.7	0.154
A-81-1	No Intersections		
G-81-5	514.0 - 523.5	9.5	0.146
	a)853.5 - 862.0	8.5	0.116
	b)853.5 - 864.0	10.5	0.107
J-81-1	No Intersection		
CF-81-6	No Intersection		
H-81-9	309.7 - 314.7	5.0	0.135

TABLE 2 (CONTINUED)

HOLE	INTERSECTION	CORE LENGTH	Au oz./ton
H-81-10	502.4 - 504.4	2.0	0.278
	509.2 - 514.2	5.0	0.258
	518.8 - 521.0	2.2	0.235
	502.4 - 421.0	18.6	0.128
	509.2 - 521.0	11.8	0.155
	855.5 - 859.5	4.0	0.125
	851.2 - 859.5	8.3	0.102
A-81-9	588.0 - 590.0	2.0	0.148
CF-81-7	No Intersections		
CF-81-8	403.1 - 405.0	1.9	0.060
	411.9 - 417.0	5.1	0.080
CF-81-9	287.0 - 288.8	1.8	0.143
	564.3 - 565.7	1.4	0.120
CF-81-10	No Intersections		
CF-81-11	288.0 - 293.0	5.0	0.365
I-81-1	No Intersections		
J-81-3	850.8 - 857.0	6.2	0.113
CF-81-14	No Intersections		
CF-81-15	No Intersections		
CF-81-16	No Intersections		
H-81-9 (deepened)	805.0 - 812.4	7.4	0.138
CF-81-13	No Intersections		
CF-81-17	No Intersections		
CF-81-18	No Intersections		
CF-81-19	1)304.8 - 306.3	1.5	0.308
	2)309.5 - 317.0	7.5	0.290
	3)317.0 - 319.0	2.0	0.145
	3a)304.8 - 319.0	14.2	0.208
CF-81-20	No Intersections		
J-81-1 (deepened	549.0 - 554.0	5.0	0.298

TABLE 2 (CONTINUED)

HOLE	INTERSECTION	CORE LENGTH	Au oz./ton
*C-81-2	No Intersections		
*G-80-2	No Intersections		
*A-81-1	No Intersections		
*E-81-	No Intersections		
*E-80-2	No Intersections		
*D-80-2	No Intersections		
*G-81-14	No Intersections		
*CF-81-14 (Deepened)	No Intersections		
*C-81-12	No Intersections		

*Additional Sampling

These sporadic gold values, can, in part, be explained by improper sampling of the humus layer. This improper sampling has been noticed in results from other projects in the 780 - 782 Group. In part there appears to be a correlation between the humus results and the gabbroic outcroppings, albeit the results were only marginally higher than the background. As for the remaining gold values, they probably resulted from low and highly dispersed mineralization throughout the volcanics.

4.1 CONCLUSIONS AND RECOMMENDATIONS

4.1.1 GENERAL

Since this report has described each project separately, the concluding remarks and recommendations will follow, using the same procedure.

4.1.2 PROJECT 775 CONCLUSIONS AND RECOMMENDATIONS

Zone 1E located between lines 8E and 44W and from baseline 1 to tie line 1S, was intensely studied during the 1981 field season.

The objectives although being two fold, were integrated with one being the expanding of the known reserves by diamond drilling and two, increasing the overall dimensions of the Orofino diorite in an attempt to locate new drill targets.

To accomplish the latter an integrated surface exploration programme was initiated using geological, geophysical and geochemical techniques.

To begin, a series of intermediate lines were cut over which humus sampling and VLF-EM surveys were conducted, with all stations at 10 metre intervals. Both were successfuly in delineating numerous anomalies which were in part tested by either diamond drilling and/or mechanical stripping and mapping.

A magnetic survey was done as an aid to mapping in those areas remote from the minesite or lacking sufficient outcrop exposures. About half of the readings were taken north of baseline one in an effort to extend the diorite northwards. Results, unfortunately were negative.

Geologically it was found that a faulted contact exists between the diorite and the country rock, south of the minesite. This had been expected from the extrapolation of such faults from the minesite.

To the west, Zone 1E was underlain by a volcano-sedimentary sequence consisting of basic to intermediate flows and tuffs, interbedded with quartzitic sediments and intruded by feldspar porphyry, diabase and lamprophyre dykes.

The central part of the grid was underlain by a massive hybrid diorite containing blocks of altered basic volcanics and remnant pillow selvages.

South of the shaft, the diorite was found to be intruded by a series of granitic dykes. This was evident both on surface and from drill core.

The conclusions from this first objective revealed that the diorite was in part intrusive, formed from the dioritization of primarily basic volcanics, and had limited dimensions to the north, south and west.

Secondly, that the geophysical and geochemical surveys were successful in pin pointing numerous anomalous zones, some of which correspond (humus) with the number 1,2,3, and 4 veins.

The second objective, heavily depended on drill core data and assaying. The first part of the programme involved the extension of the known replacement zone to the south of the minesite and its relationship to intersections in several Camflo holes. This initial step was in part successful but it was found that an intervening ENE fault changed the mineralized host from replacement type to a quartz vein type.

Further to the South and West, step-out holes probed an occurrence of diorite, first believed to be an offset extension of the Orofino diorite. This, however turned out to be a thin dioritized volcanic unit which was underlain by basic and acid volcanics, including one pyritized lapilli tuff horizon, which returned 0.365 over 5 feet. Numerous other holes tested this intersection as well as local shear zones, but results were all negative.

Of the remaining three holes one (CF-81-19) intersected ore grade material in a quartz filled shear.

Recommendations for Zone 1E are all drill oriented and include two separate targets. The first of these would be the further testing of the intersection in hole CF-81-19 and would require at least five holes to continue the zone to a greater depth as well as to the East and West.

The second target would require extensive study of the core and drill logs to outline the extent of the quartz saturation (quartz eyes) within the Orofino diorite. This data would reveal, if any, the relationship between the replacement zones and the alteration. Should a correspondence be found then new holes could be spotted to probe this zone beneath the diorite -volcanic contact.

4.1.3 PROJECT 780 - CONCLUSIONS AND RECOMMENDATIONS

Zone 3 consisting of numerous VLF-EM conductors with coincident anomalous humus results (1980) was the target for a more detailed study this year.

Although several cut lines were within the zone, others were flagged for increased control.

Magnetometer, VLF-EM and humus sampling were conducted over the entire grid with stations established at 10 metre intervals.

With the exception of some structural information the magnetic data did not outline any anomalies. The filtered VLF-EM results however, indicated seven conductors of which one seems to be split and contorted by a North-South fault.

Humus assays were misleading with those south of the Swayze River being highly anomalous and probably due to an error in the sampling technique. On the other hand, to the north of the river four anomalous values were found to be directly associated with the split VLF-EM conductor.

Although a large proportion of the zone can not be fully interpreted due to the faulty humus sampling, the coincident VLF-EM and humus anomalies have indicated an area requiring further study.

The cause of the VLF-EM conductor could not be determined but is possibly a shear zone. Its juncture with a N-S fault would provide additional void space for the infiltration of hydrothermal fluids and possible economic mineralization. The presence of several anomalous humus samples strengthens this possibility considerably.

The lack of rock exposures eliminates the chance of a surface explanation to this anomaly but it is recommended that additional grid lines be installed such that deep overburden sampling can be conducted, not only over the juncture but along strike of the N-S fault, as well as its juncture with a northeasterly fault 60 metres to the north.

Due to the depth of overburden the possibility of mechanical stripping is eliminated and therefore based on the geochemical and geophysical data, this would be elevated to a drill situation, probably requiring one hole.

4.1.4 PROJECT 781 - CONCLUSIONS AND RECOMMENDATIONS

Reconnaissance as well as detailed surveys were conducted over these claims, beginning early in the year with VLF-EM and magnetometer surveys, completed by MPH Consultants of Toronto.

Results from these surveys formed the basis of the exploration programme especially the humus sampling. Although each VLF-EM conductor and magnetic anomaly was tested, two areas embracing a number of such features, received blanket coverage. These two areas were designated the WSL and HBF grids, respectively. The remaining anomalies had a limited number of humus samples taken across them as a quick test.

In each case one anomalous area was outlined and the detailed work began relying exclusively on geophysics and geochemistry.

The first of these was termed the "A" anomaly and was on the WSL grid. It consisted of a coincident magnetometer and humus anomaly, upon which the detailed surveys revealed a limited extent to this anomaly. Anomalous humus values could also be related to a fault juncture.

The second situation arose from the regional humus sampling and was termed anomaly "B". All detailed surveys had discouraging or problematical results which could not be shown to warrant any further work.

As with the WSL grid, the HBF grid located at the extreme east end of the claim group contained within its boundaries numerous VLF-EM conductors. Humus sampling was the only survey completed even through the results defined a zone coincident with the trace of the Hardiman Bay fault.

Geological mapping found that the claims were underlain by a predominately basic volcanic terrain intruded by asmall number of feldspar porphyry dykes.

Correlation, however, could not be made between the surface exposures and either the geochemical or geophysical data.

With the conclusion of the 1981 programme it becomes apparent that both anomaly A and the HBF grid should receive further exploration.

It is recommended that due to the overburden depths that mechanized stripping should be avoided. Therefore in the case of anomaly A, overburden sampling could be used effectively and should be centered on the magnetic - humus anomaly and the juncture between the two faults. Based on these results it is conceivable that a drill test should be made where upon one or two holes would be required.

For the HBF grid on the other hand, the central anomalous portion should be further tested by humus then possibly overburden sampling, depending on the source of the humus values. Once again, should everything prove encouraging, several drill holes could be used to test bedrock causes.

No further work would be recommended on anomaly B.

4.1.5 PROJECT 782 - CONCLUSIONS AND RECOMMENDATIONS

As with Project 781, reconnaissance geophysical surveys performed earlier in the year, formed the basis for a ground follow-up programme.

This programme included geological mapping, humus geochemistry, detailed geophysics and to a limited extent soil geochemistry.

Four sub-grids were blocked out each containing numerous East-West trending VLF-EM conductors or magnetometer anomalies. Blanket humus sampling was then conducted and based on results, more detailed work was performed.

Although several erratically distributed anomalous values were found on two of these grids, no further exploration was deemed necessary (QUO and RPM grids).

However, MPH's "R" conductor was thought to have a sulphide source, therefore, a further sub-grid (RPNS) was established over this conductor and was followed by geophysical and geochemical surveys.

The geophysics outlined several anomalies and further defined the local structure which consisted of two northwesterly trending fault zones. The geochemistry, on the other hand, outlined several coincident copper, lead and zinc anomalies which albeit narrow, had lengths of several hundreds of metres and were in part coincident with the "R" conductor.

Reconnaissance type humus collection was conducted over any remaining conductors with results being generally low and not encouraging. However two such conductors did respond favourably.

The first of these was at the junction of a VLF-EM and Max-Min conductors while the second was a combination of short VLF-EM conductors and a magnetic high (numbers 782-15 and 782-13 respectively).

The geological mapping revealed a similar volcanic stratigraphy as Project 781 however, stratigraphic correlations were not possible.

Two quartz vein systems(North and South veins) were investigated and although each contained numerous blocks of well mineralized wall rocks no gold could be found.

Future work is therefore recommended on the "R" VLF-EM conductor, where an effort should be made to determine the source(s) of the geochemical anomalies. Fill-in lines and additional soil samples should be completed to better define the zones and due to the lack of outcrop overburden sampling could be utilized to search out a bedrock source. The use of a deep pentrating EM system should not be overlooked to outline a possible deeply buried sulphide source. Again diamond drilling would be recommended should the detailed data prove positive.

A second area which should receive additional work would be conductor 782-15 (Max-Min -VLF Juncture). Here humus sampling over intermediate lines could be used effectively to define the zones. A Max-Min unit would further outline the conductors and is highly recommended. Overburden sampling is also a tool that could confirm a bedrock source and is also recommended. Due to the overburden in the area, diamond drilling would have to be planned for in order to test the anomaly.

4.1.6 PROJECT 783 - CONCLUSIONS AND RECOMMENDATIONS

Exploration on Project 783 centered on Zone 2, over a portion of the 1980 grid (Old grid).

The programme was initiated to test the north-south band of gabbros mapped last year. It was believed that such rocks could have been a likely host for gold mineralization similar to that of the Orofino diorite.

Geological mapping revealed a sequence of basic to acid volcanic flows and tuffs striking to the northeast with dips to both the southeast and northwest, depending on which limb of the synform they occurred. The gabbro was intrusive and was found only on the east limb.

All pyritiferous rocks as well as quartz veins were sampled, but no assays of economic importance resulted.

The second part of the programme was the flagging of intermediate lines and humus sampling of the eastern half of the grid. These results indicated a northwesterly trending zone at the north end, Several new lines were added with more sampling following. Although several anomalous values were returned an explanation for the zone has not yet been determined.

Recommendations for future work on this zone are few and consist only of reconnaissance mapping and prospecting of the gabbroic rocks to the south. Although this year's data did not indicate any favourable mineralization, the theory supporting the programme is still valid, especially since only a small portion of these rocks have been studied.

Additional geophysical or geochemical surveys would not be justified at this time.

The Gifford prospect which was not re-evaluated this year should receive a second look in the future. Here the programme should focus on locating any possible extension of the quartz veining along strike, with preference given to exploring to the east.

Past surveys have shown that both magnetic and VLF-EM techniques were incapable of tracing the tuffaceous horizon or its accompanying shearing. It would seem therefore, that humus sampling over closely spaced lines may be the quickest and least expensive method for this particular job. Should anomalous results be obtained, overburden sampling could be done as a follow-up tool.

W. W. Weber,
Exploration Manager

P. A. Dadson,
Project Supervisor

S. Conquer,
Geologist.

/st.

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	783 - ~~787~~-303	87.	00			
	772-304	14,083.	05			

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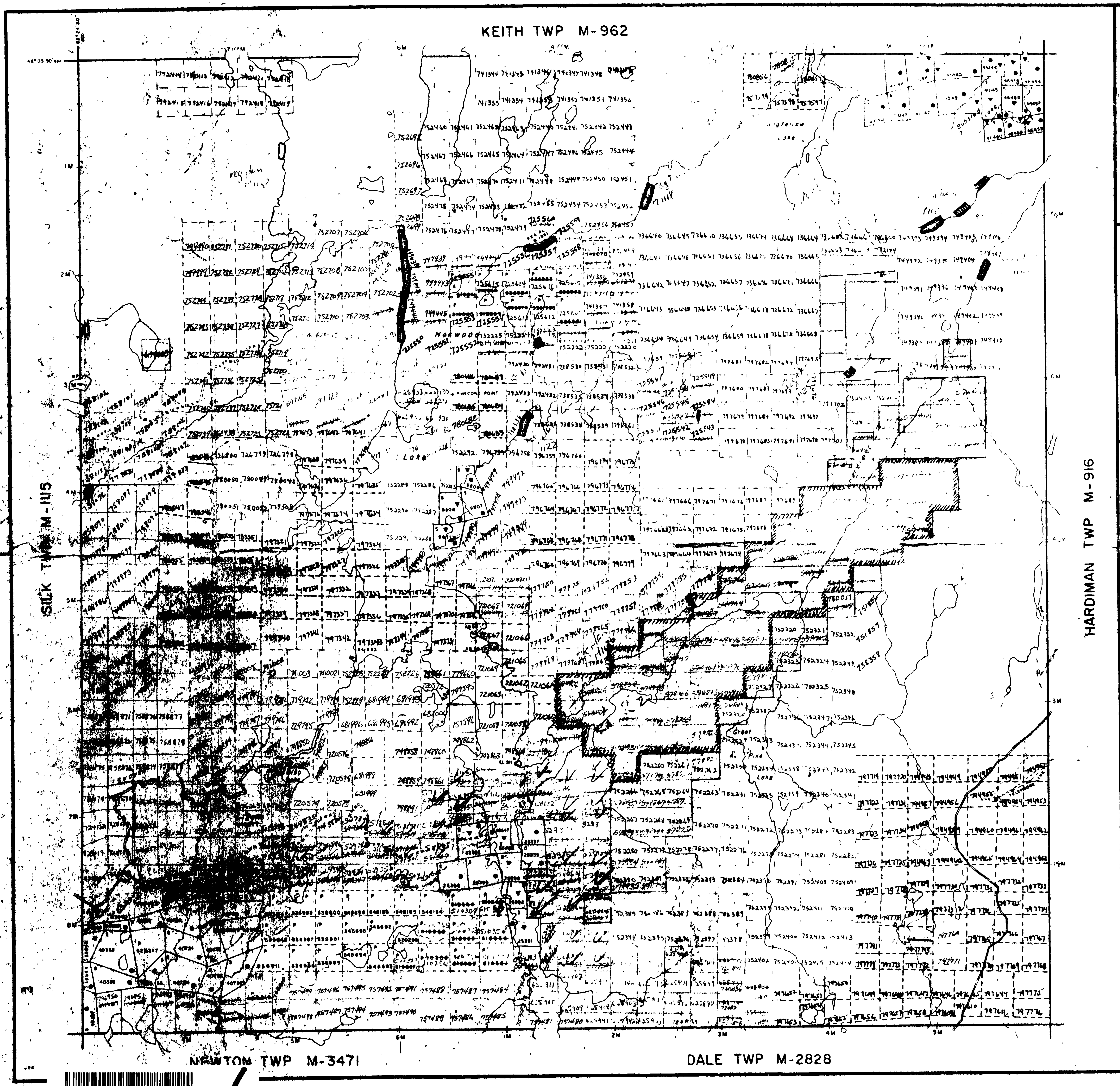

THE TOWNSHIP
OF

HORWOOD

DISTRICT OF
SUDBURY

2.5286, 21

PORCUPINE
MINING DIVISION

SCALE 1-INCH 40 CHAINS

DISPOSITION OF CROWN LANDS

PATENT,	SURFACE AND MINING RIGHTS	●
" ,	SURFACE RIGHTS ONLY	◒
" ,	MINING RIGHTS ONLY	◓
LEASE,	SURFACE AND MINING RIGHTS	■
" ,	SURFACE RIGHTS ONLY	▤
" ,	MINING RIGHTS ONLY	▣
LICENCE OF OCCUPATION		▼
ROADS		
IMPROVED ROADS		
KING'S HIGHWAYS		
RAILWAYS		
POWER LINES		
MARSH OR MUSKEG		
MINES		⚒
CANCELLED		C
REGISTERED PLAN OF SUBDIVISION		

NOTES

400' Surface Rights Reservation
along the shores of all lakes & rivers

R-2 (N R W 2)
Mining and Surface Rights
with-drawn Section-36, By
Order of Mining Recorder

PLAN NO. M-936

May 10/84 ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

41016NW0018 2.5286 HORWOOD

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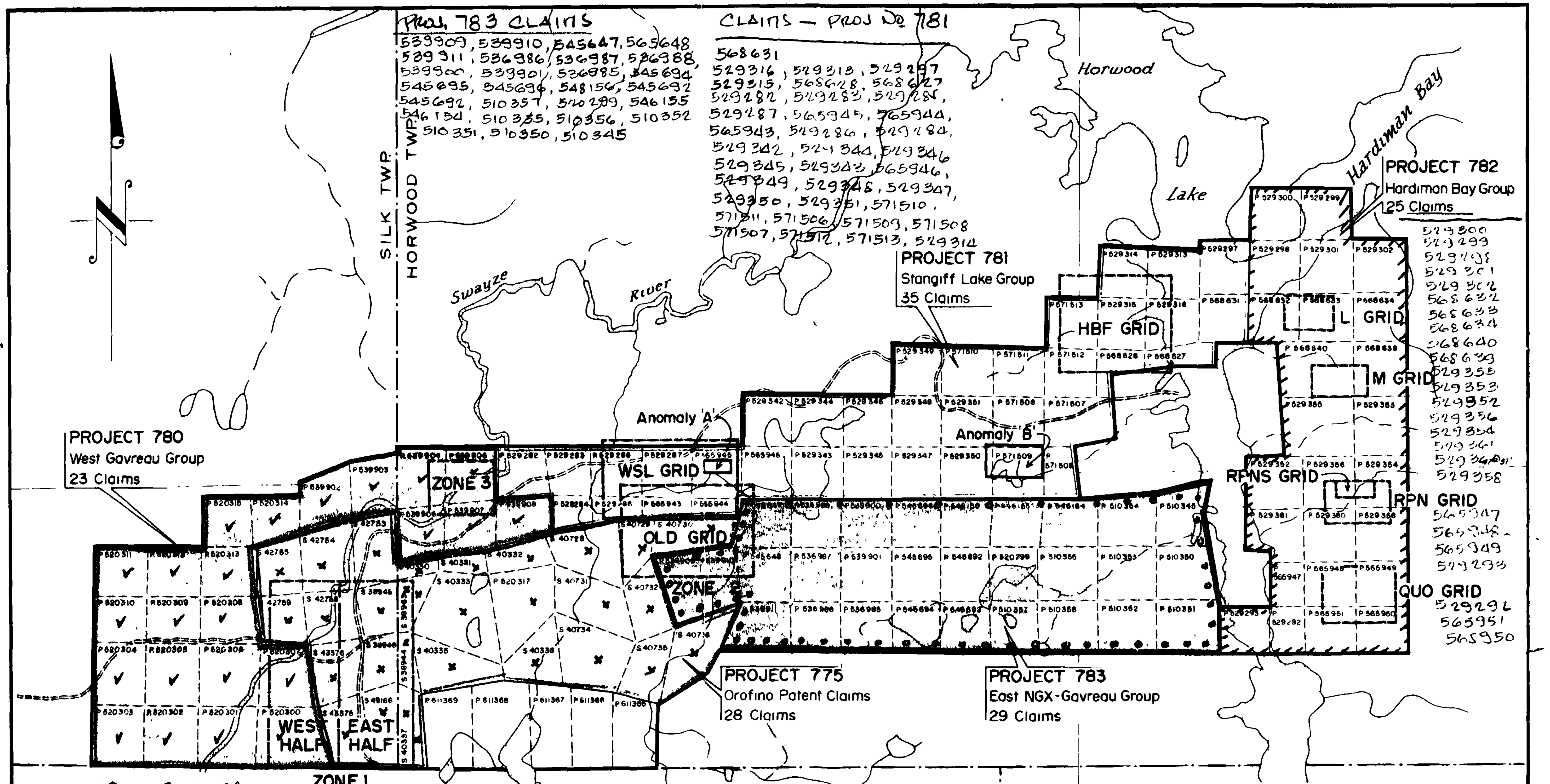

PROJ. 783 CLAIMS

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539900, 539901, 536885, 545694
545695, 545696, 548156, 545692
545692, 510357, 520299, 546155
546154, 510355, 510356, 510352
510351, 510350, 510345

CLAIMS — PROJ No 781

568631
529316, 529318, 529297
529315, 568628, 568627
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529349, 529348, 529347,
529350, 529351, 571510,
571511, 571506, 571509, 571508
571507, 571512, 571513, 529314

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PROJ 780 CLAIMS

520311, 520312, 520310
520309, 520308, 520304
520304, 520305, 520306,
520303, 520302, 520301,
520307, 520300

PROJ

FIGURE 1

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT

CLAIMS LOCATION MAP

Showing

DETAIL GRIDS

SCALE 1 31,680

MILES
1/2 1/4 0 1/2 1

800 400 0 800 1600
METRES

G. HARPER

A R Gunther

July 2, 1981

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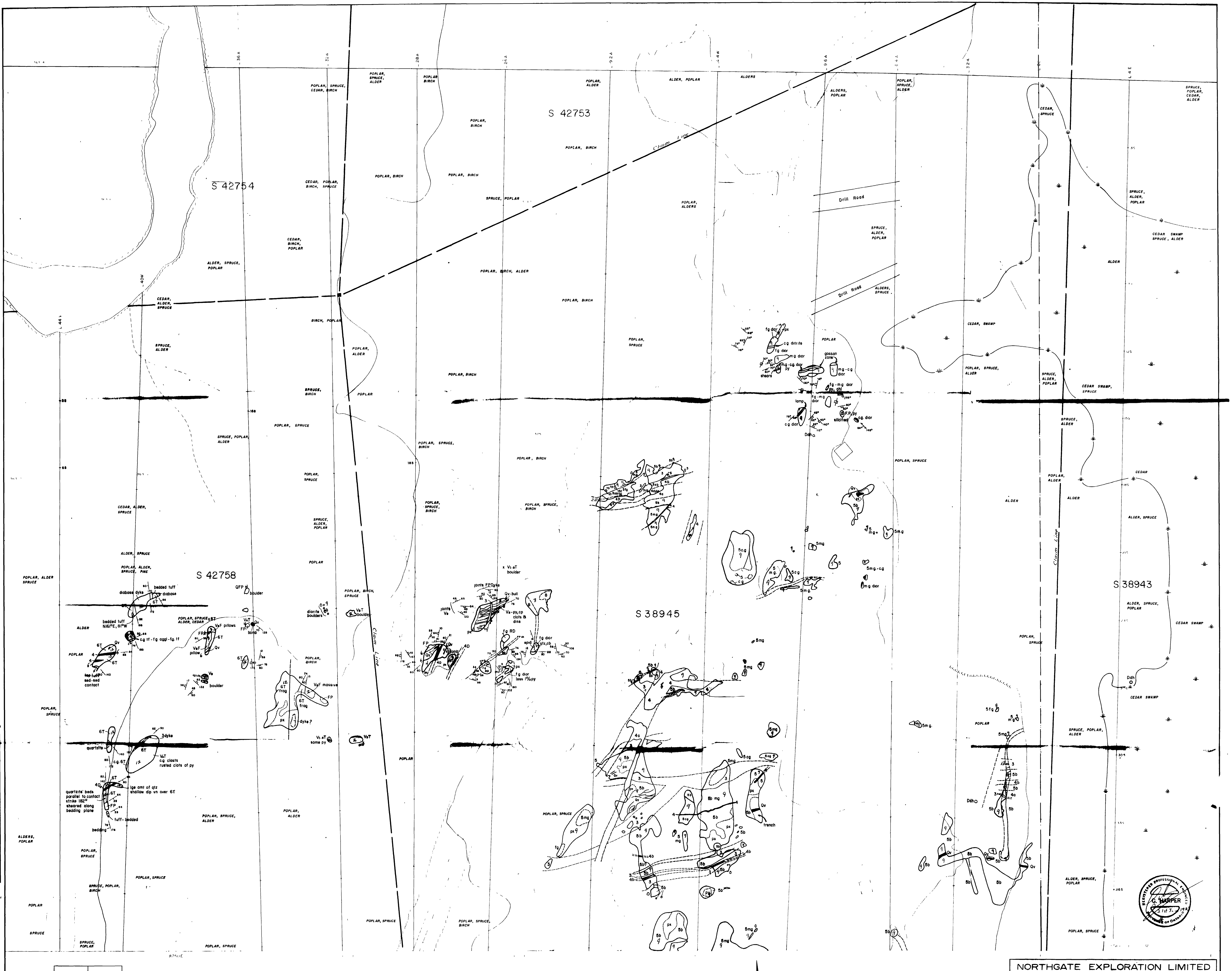

Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

1 ▨ Acid volcanics
2 Vi Intermediate volcanics
3 Va, (B) Basic volcanics
4 QFP Quartz feldspar porphyry
5 ■ Lamprophyre
6 qtz, Qv Quartz, Quartz vein
7 FP (3) Feldspar porphyry
8 D (dk) Dyke

9 dior (5) Diorite
10 RD (5b) Retrograde diorite
11 6 Sediments
12 6T Tuffaceous sediments
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F Flow
bx Breccia
boul Boulder

py Pyrite
cpy Chalcopyrite
epid Epidote
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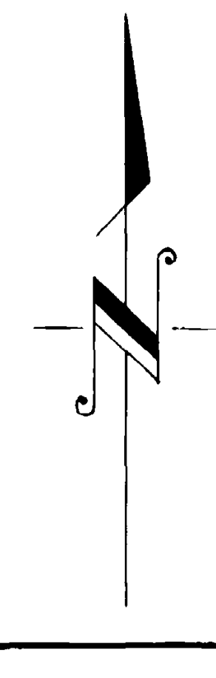
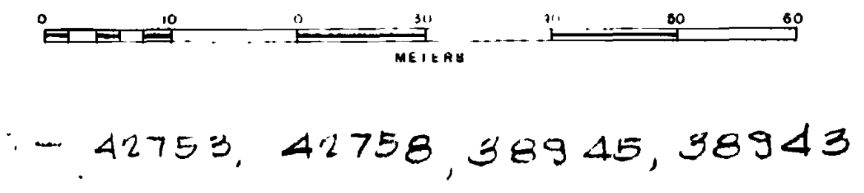
f.g. Fine grained
m.g. Medium grained
c.g. Coarse grained

Strike & Dip
Inclined, vertical jointing
Outcrop
Swamp area
Contact known, assumed



SCALE 1:600



– 42753, 42758, 38945, 38943

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – No 775

ZONE 1 – EAST HALF

GEOLOGY MAP

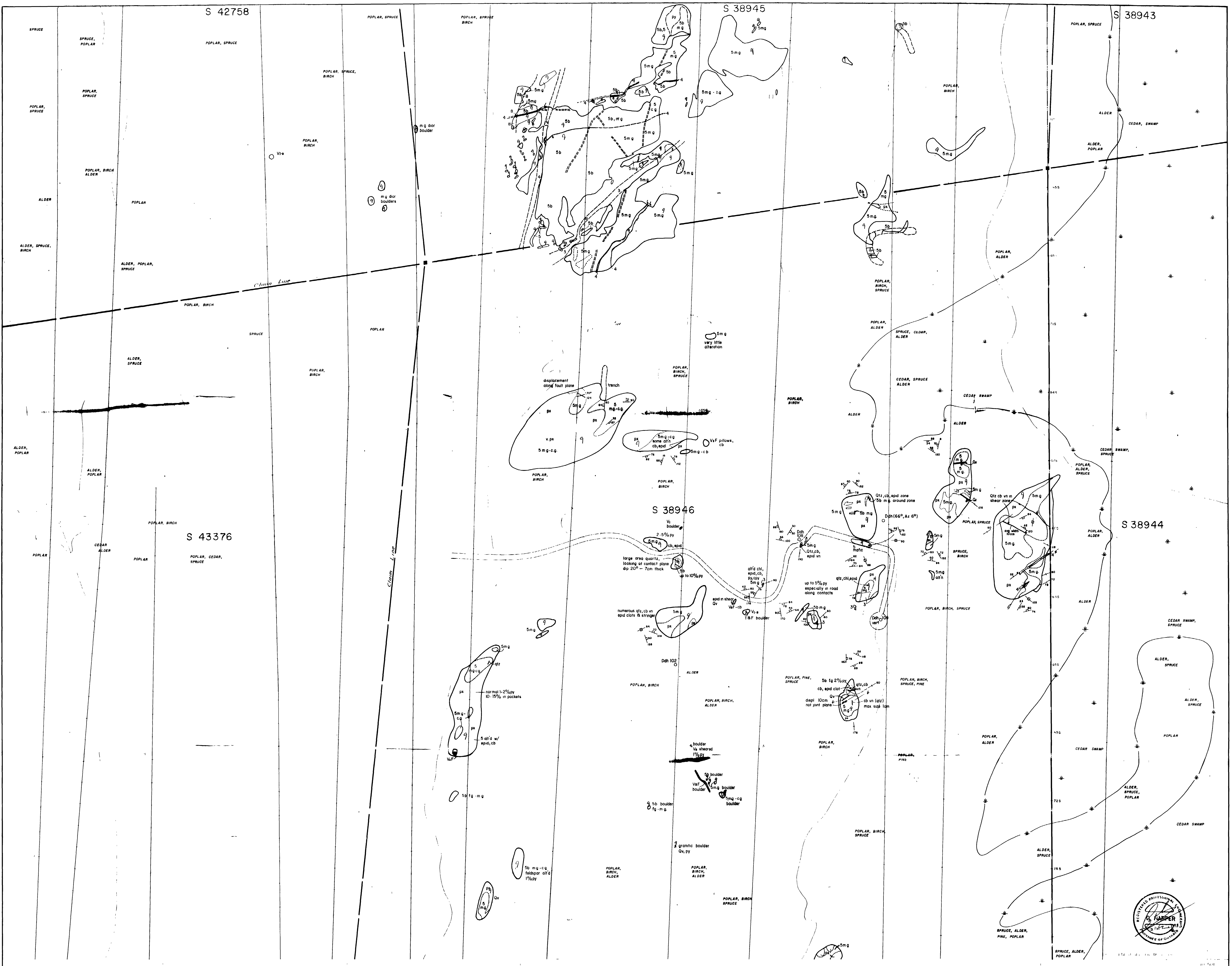
SHEET 1

Work by	Date	N.T.S. 41 O/16	Scale 1:600
Drawn by	Date July '82	Revision	

2.5286,23

Figure 4

220



Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

ZONE 1

1 Va Acid volcanics
2 Vi Intermediate volcanics
3 Vb (8) Basic volcanics
4 QFP Quartz feldspar porphyry
5 ▨ Lamprophyre
6 qtz, Qv Quartz, Quartz vein
7 FP (3) Feldspar porphyry
8 D (dk) Dyke

9 dior (8) Diorite
RD (5b) Retrograde diorite
6 Sediments
6T Tuffaceous sediments
T Tuff
F Flow
bx Breccia
boul Boulder

py Pyrite
cpy Chalcopyrite
epid Epidote
px Poor exposure
f.g. Fine grained
m.g. Medium grained
c.g. Coarse grained

Strike & Dip
Inclined, vertical jointing
Outcrop
Swamp area
Contact known, assumed

SCALE 1 : 600

FEET

METERS

[illegible] - 42758, 38945, 38943
43376, 38946, 38944

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE 1 – EAST HALF

GEOLOGY MAP

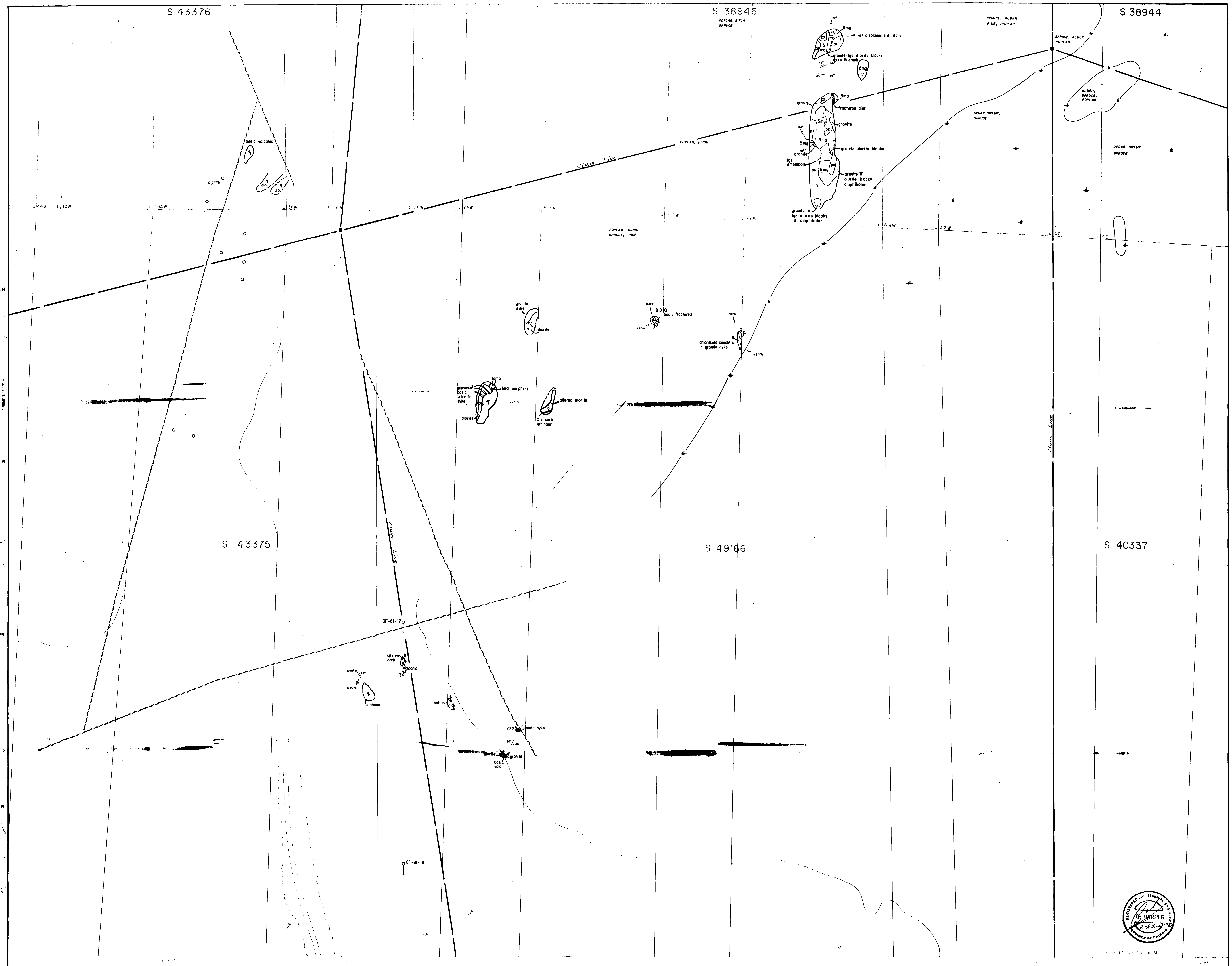
SHEET 2 2.5286, 24

Work by	Date	NTS 41 O/16	Scale 1 : 600
Drawn by	Date July '82	Revision	

B. HARPER

Figure 4

230



Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

1	▨	Acid volcanics
2	V₂	Intermediate volcanics
3	V₃ (8)	Basic volcanics
4	QFP	Quartz feldspar porphyry
5	▨ L (4)	Lamprophyre
6	qtz, Qv	Quartz, Quartz vein
	FP (3)	Feldspar porphyry
	D (dk)	Dyke
7	dior (5)	Diorite
	RD (5b)	Retrograde diorite
	6	Sediments
	6T	Tuffaceous sediments
	T	Tuff
	F	Flow
	bx	Breccia
	boul	Boulder
	py	Pyrite
	cpy	Chalcopyrite
	epid	Epidote
	px	Poor exposure
	f.g.	Fine grained
	m.g.	Medium grained
	c.g.	Coarse grained

10° 60° Strike & Dip

20° 45° 20° Inclined, vertical jointing

Outcrop

Swamp area

Contact known, assumed

SCALE 1:600

0 10 20 30 40 50 100 150 200 FEET

0 10 20 30 40 50 60 METERS

CLAIMS - 43376, 38946, 38944
43375, 49166, 40337

G. HARPER
21st June 1983

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE I – EAST HALF

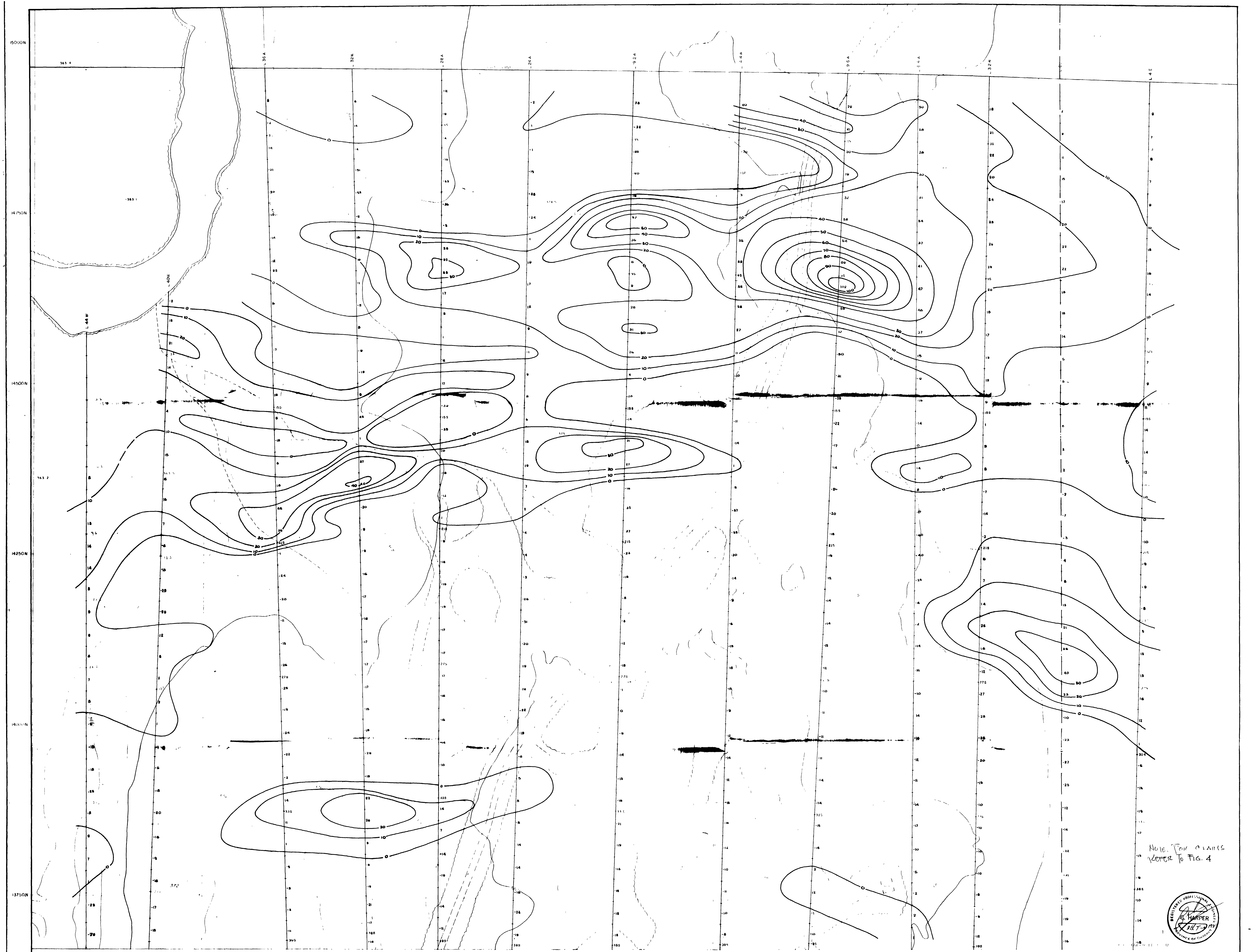
GEOLOGY MAP

SHEET 3 2 5286,25

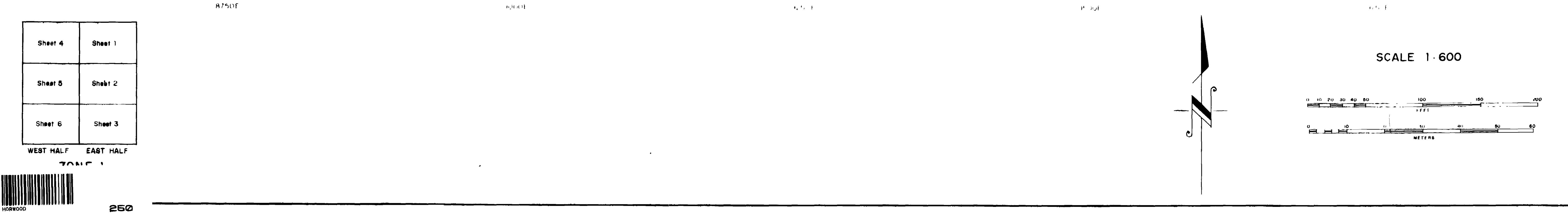
Work by	Date	NTS 41 O/16	Scale 1 600
Drawn by	Date July '82	Revision	

240

Figure 4



Note: For claims refer to Fig. 4



G. HARPER

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE 1 – EAST HALF

VLF – EM FRASER FILTER

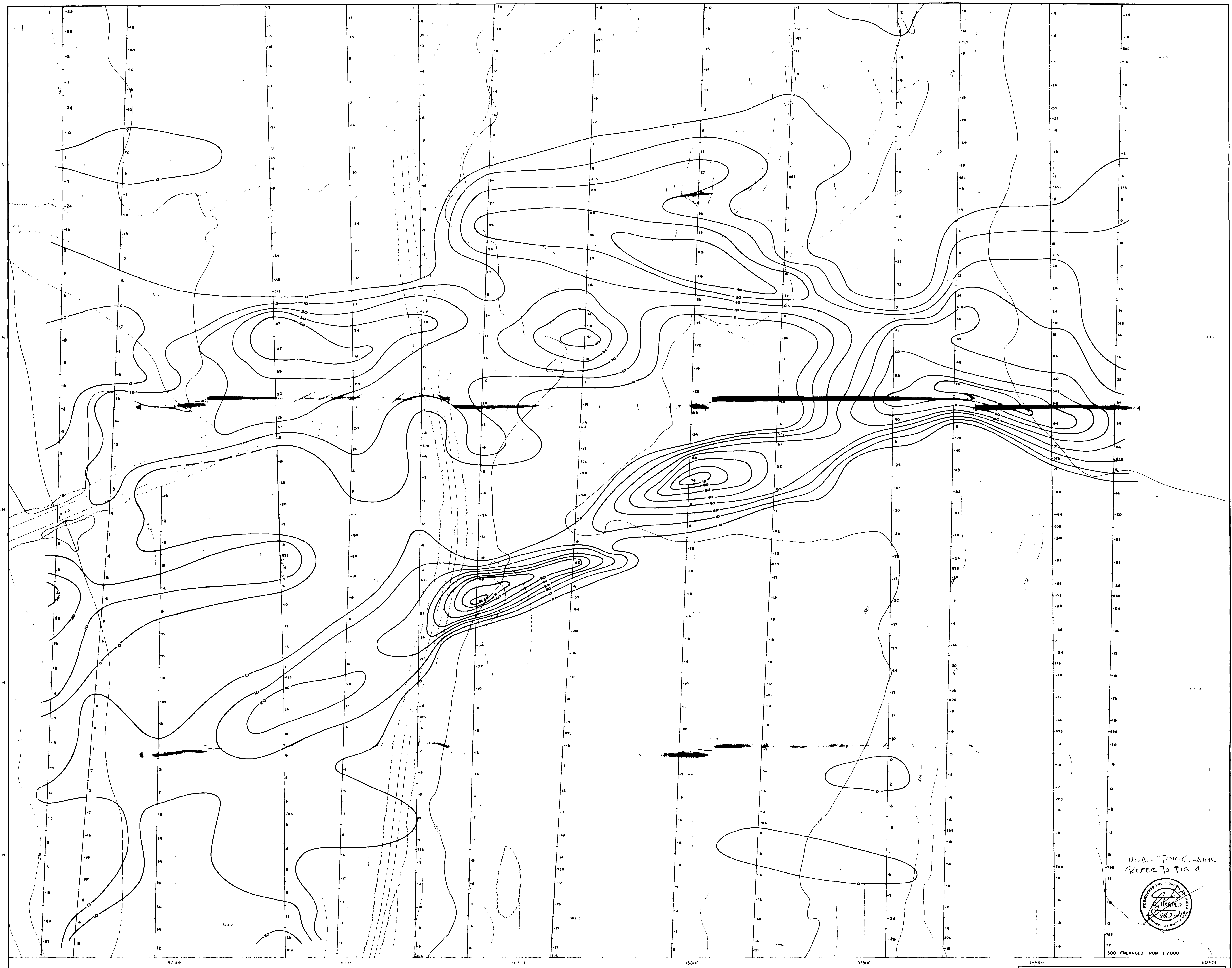
SHEET 1

Work by	Date	NTS 41 O/16	Scale 1:600
Drawn by	Date Aug '82	Revision	

250

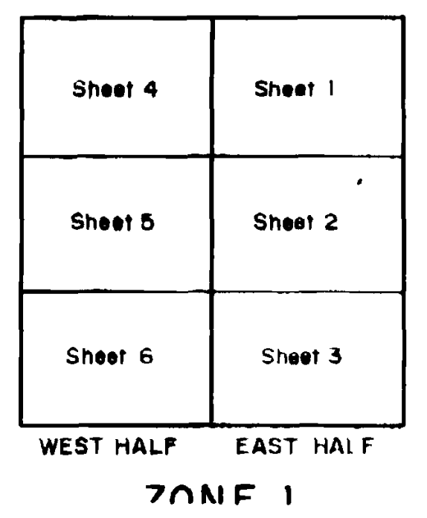
2 5286, 26

Figure 5



NOTE: TOR. CLAIMS
REFER TO FIG 4

G. HARPER
8th J 198



SCALE 1:600

FEET

METERS

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE 1 – EAST HALF

VLF - EM
FRASER FILTER

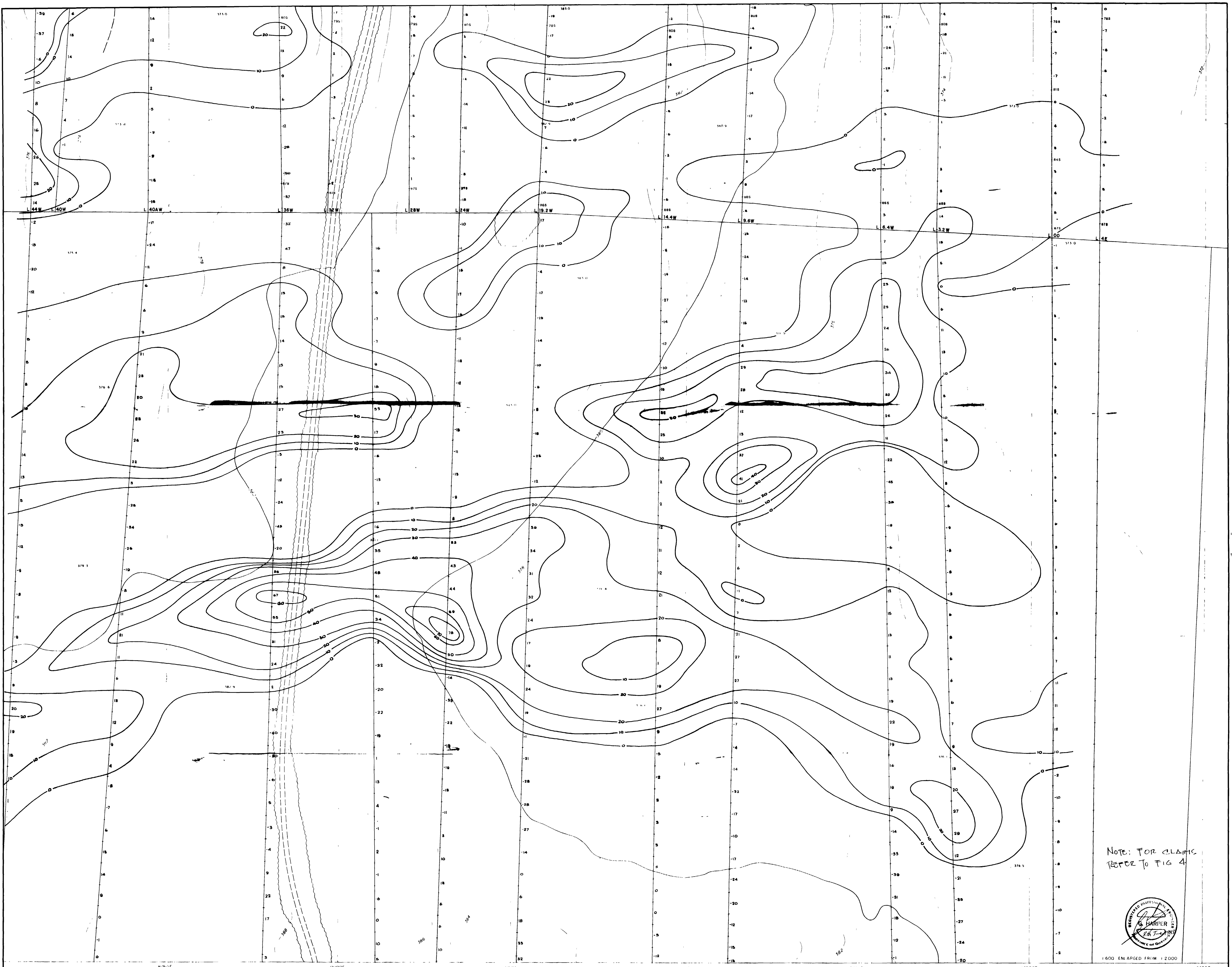
SHEET 2

Work by	Date:	NTS 41 O/16	Scale 1 600
Drawn by	Date Aug '82	Revision	

260

2.5286,27

Figure 5



NOTE: FOR CLAIMS REFER TO FIG 4

G. HARPER
8th June 1983

Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

SCALE 1:600

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT — № 775

ZONE I — EAST HALF

VLF - EM
FRASER FILTER

SHEET 3

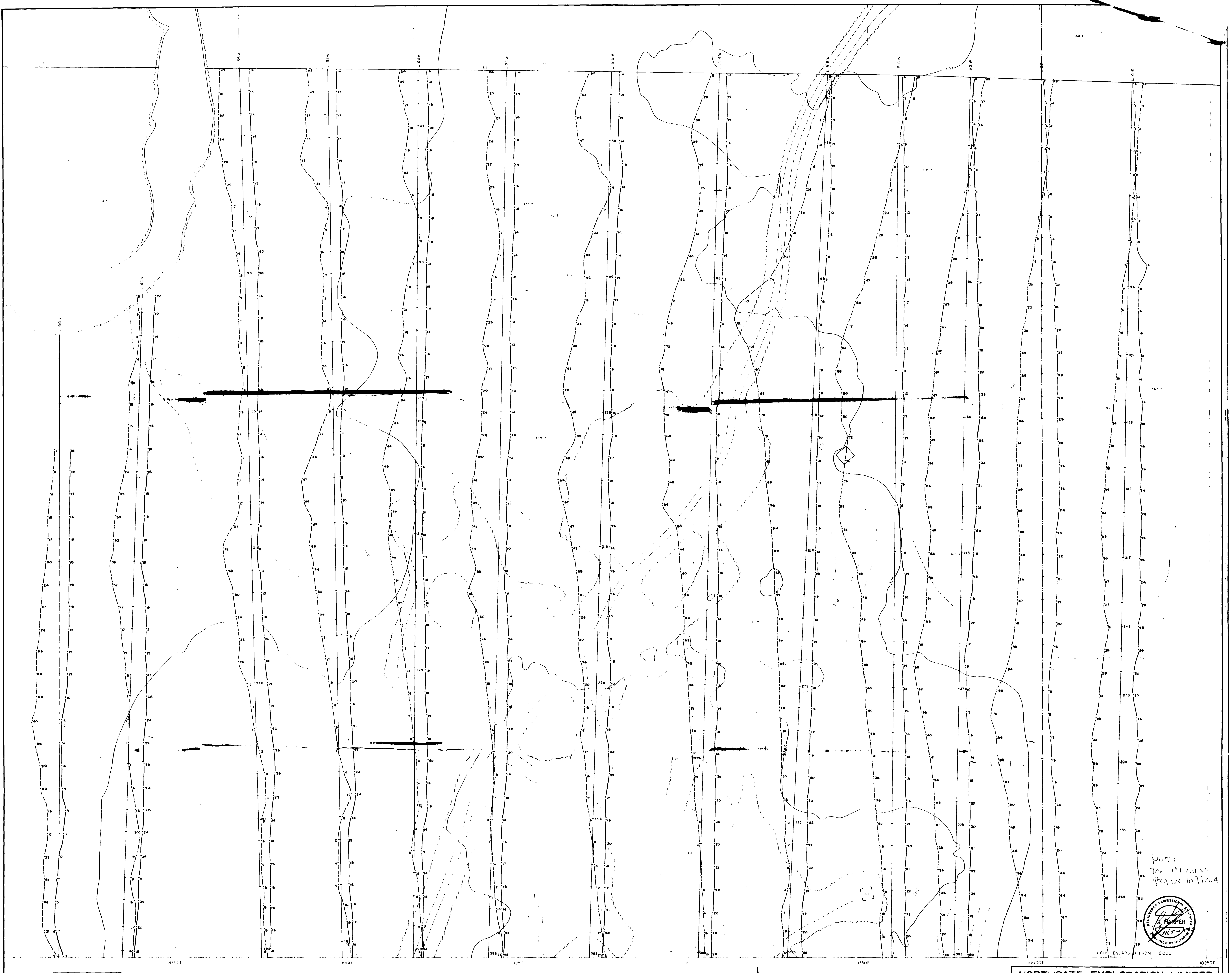
Work by	Date	NTS 41 O/16	Scale 1:600
Drawn by	Date Aug '82	Revision	

2.5286, 28

Figure 5

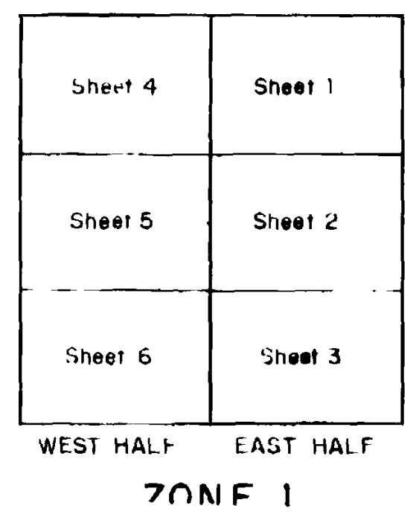
41O16NW0018 2.5286 HORWOOD

270



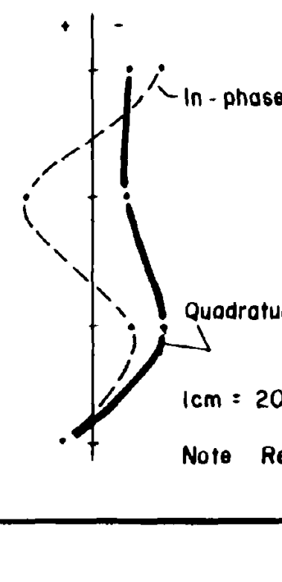
NOTE:
FOR CLAIMS
REFER TO FIG. 4

G. HARPER
8th June 1983



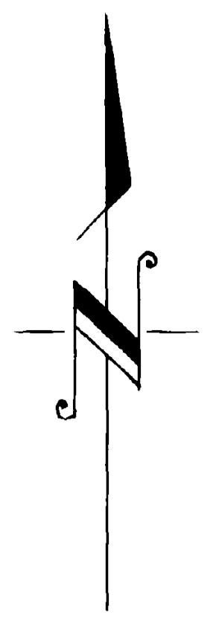
ZONE 1

Legend:

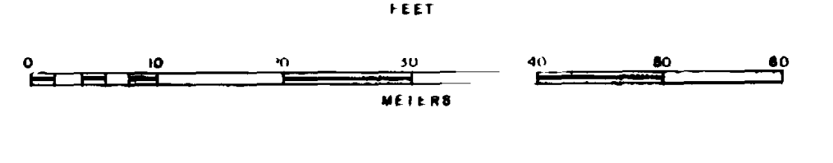


1cm = 20%

Note Readings taken facing north



SCALE 1:600



NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT — № 775

ZONE 1 — EAST HALF

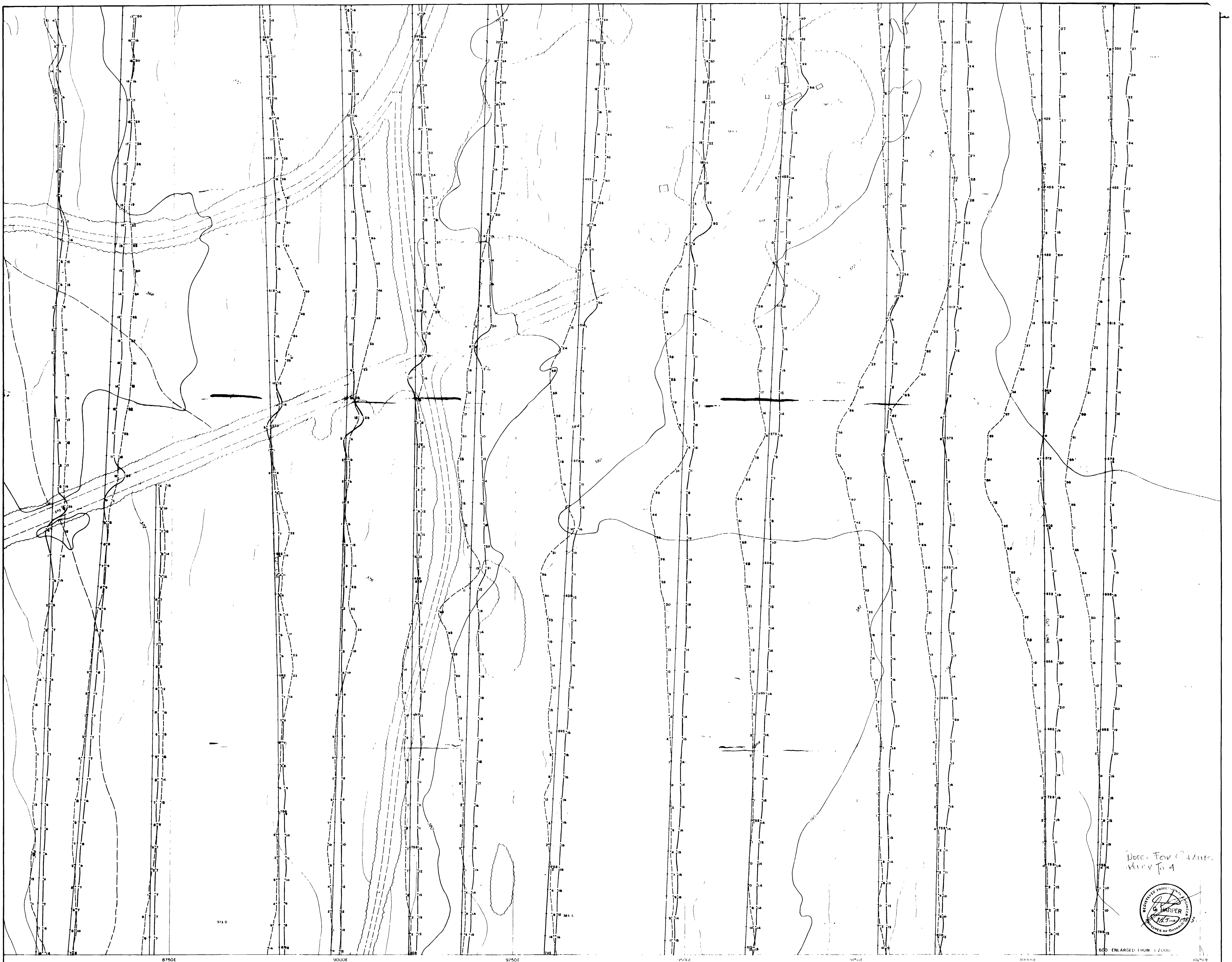
VLF - EM SURVEY

SHEET 1

Work by	Date	NTS 41 O/16	Scale 1:600
Drawn by	Date July '82	Revision	

2.5286, 29

Figure 5a

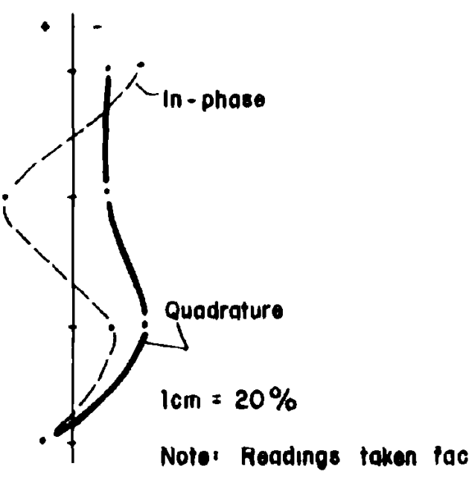


Note: For Claims, Refer To 4

G. HARPER
8th June 1983.

Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

Legend:



1cm = 20%

Note: Readings taken facing north

SCALE 1:600

0 10 20 30 40 50 100 150 200
FEET

0 10 20 30 40 50 60
METERS

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE 1 – EAST HALF

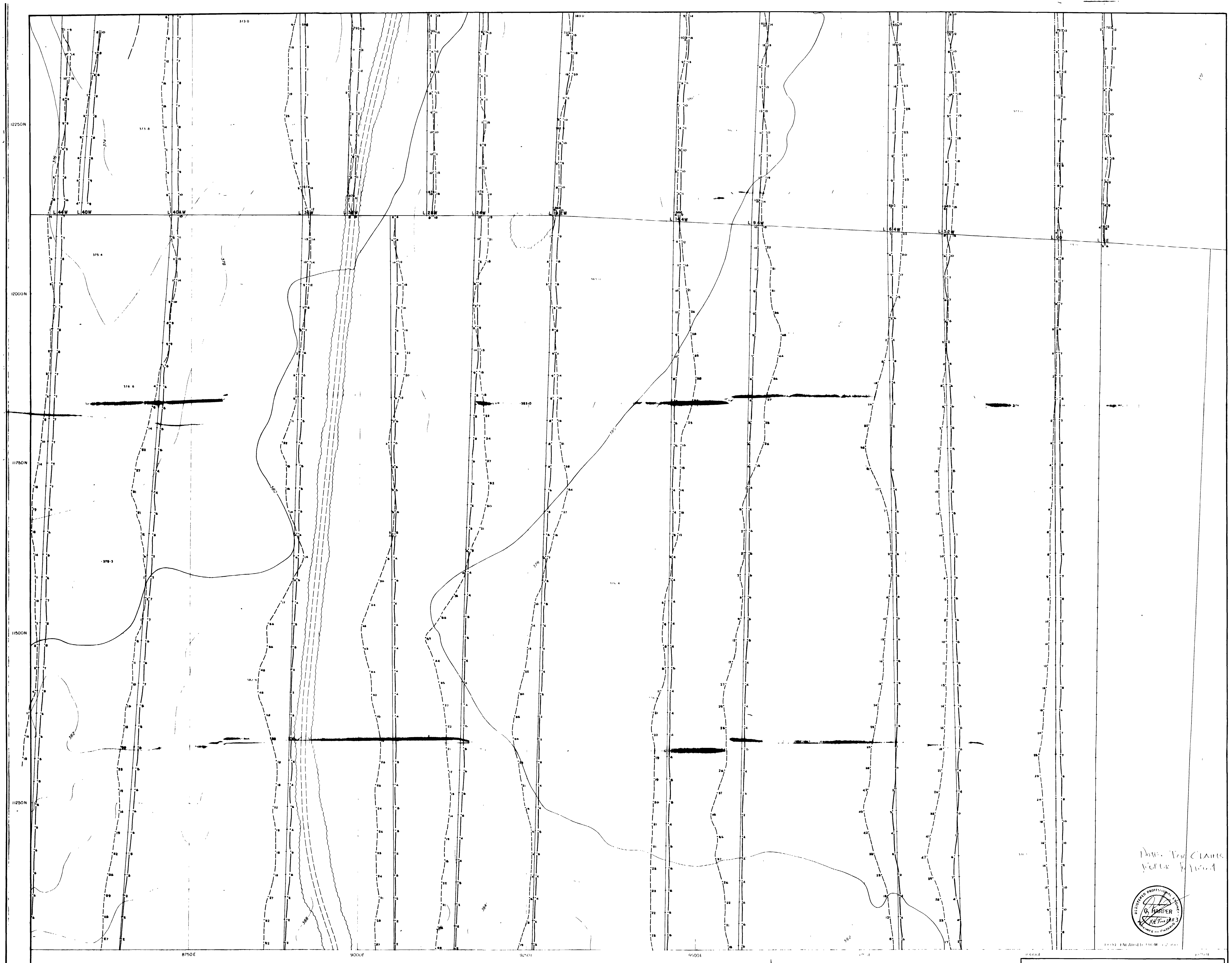
VLF - EM SURVEY

SHEET 2

Work by	Date:	NTS 41 O/16	Scale 1:600
Drawn by	Date: July '82	Revision	

280

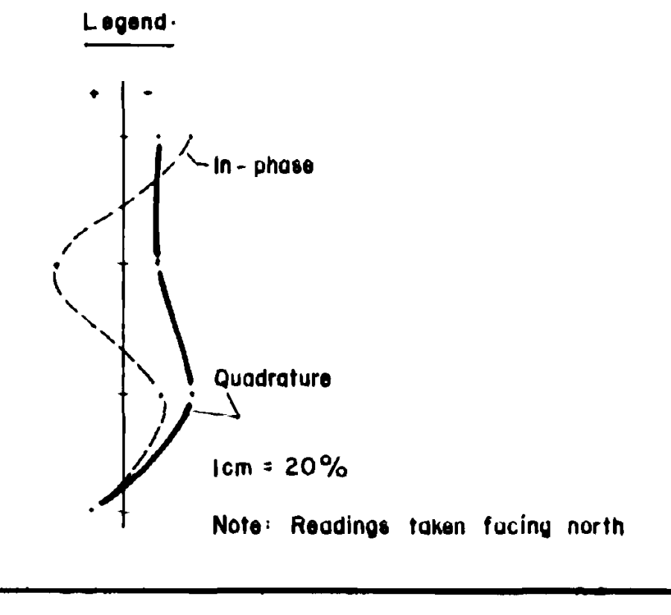
2.5286,30 Figure 5a



[illegible] Claims
[illegible]

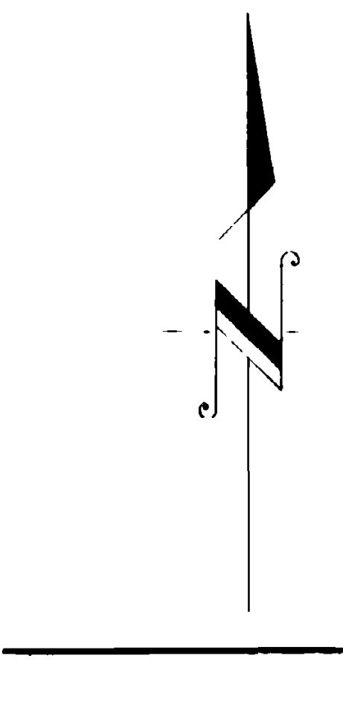
G. HARPER
8th June 1983

Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

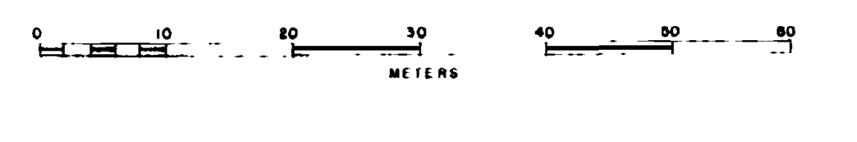


1cm = 20%

Note: Readings taken facing north



SCALE 1:600



NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – Nº 775

ZONE I – EAST HALF

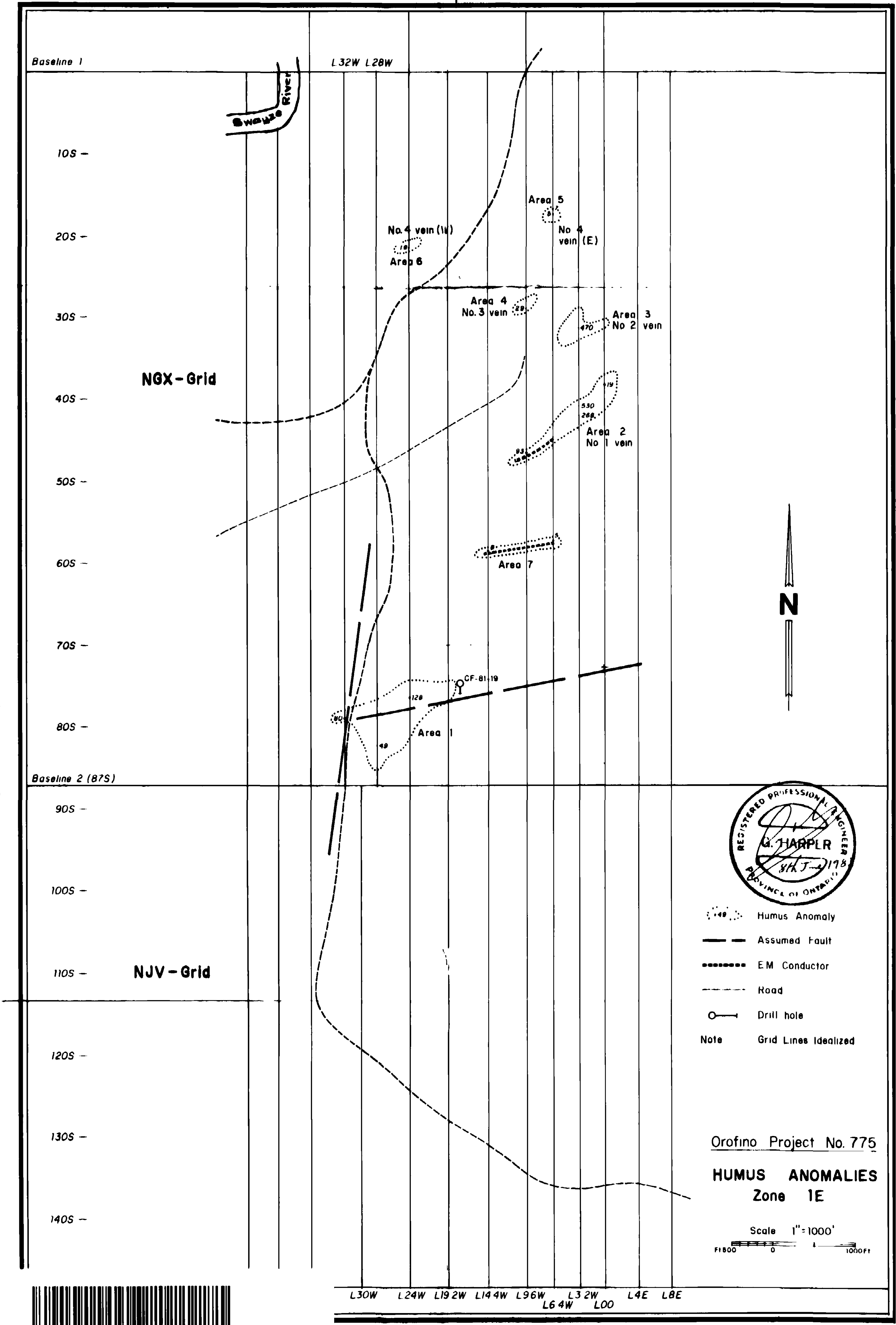
VLF - EM SURVEY .

SHEET 3

Work by	Date	NTS 41 O/16	Scale 1 600
Drawn by	Date July '82	Revision	

2.5286, 31

Figure 5a



G. HARPER

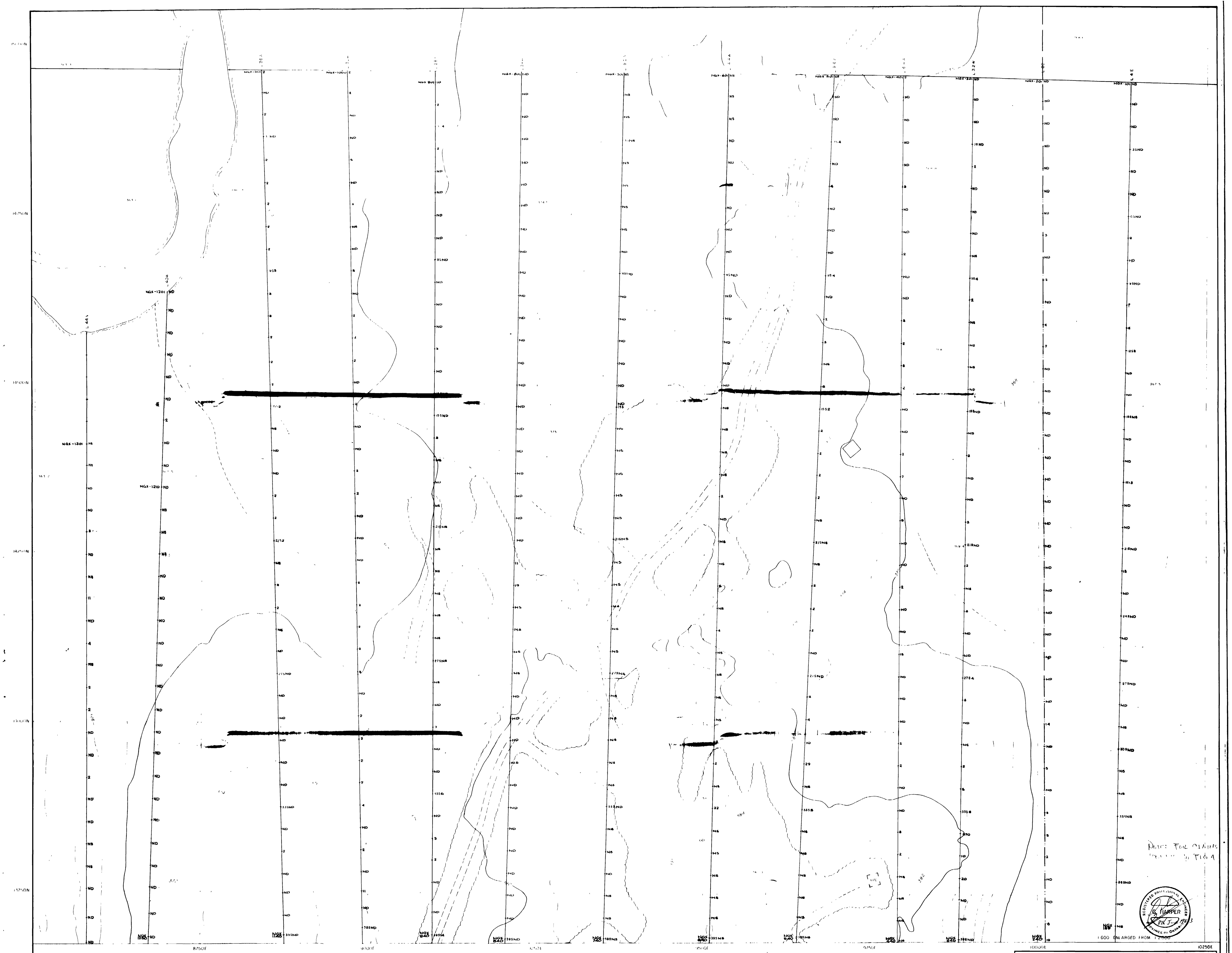
Orofino Project No. 775

HUMUS ANOMALIES
Zone 1E

Figure 6

310

2.5286,32



G. HARPER

8th June 1983

Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

Legend:

10	Au (ppb)
ND	Not detected
NS	Not sampled
NGX 12	Sample number

SCALE 1:600

FEET

METERS

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

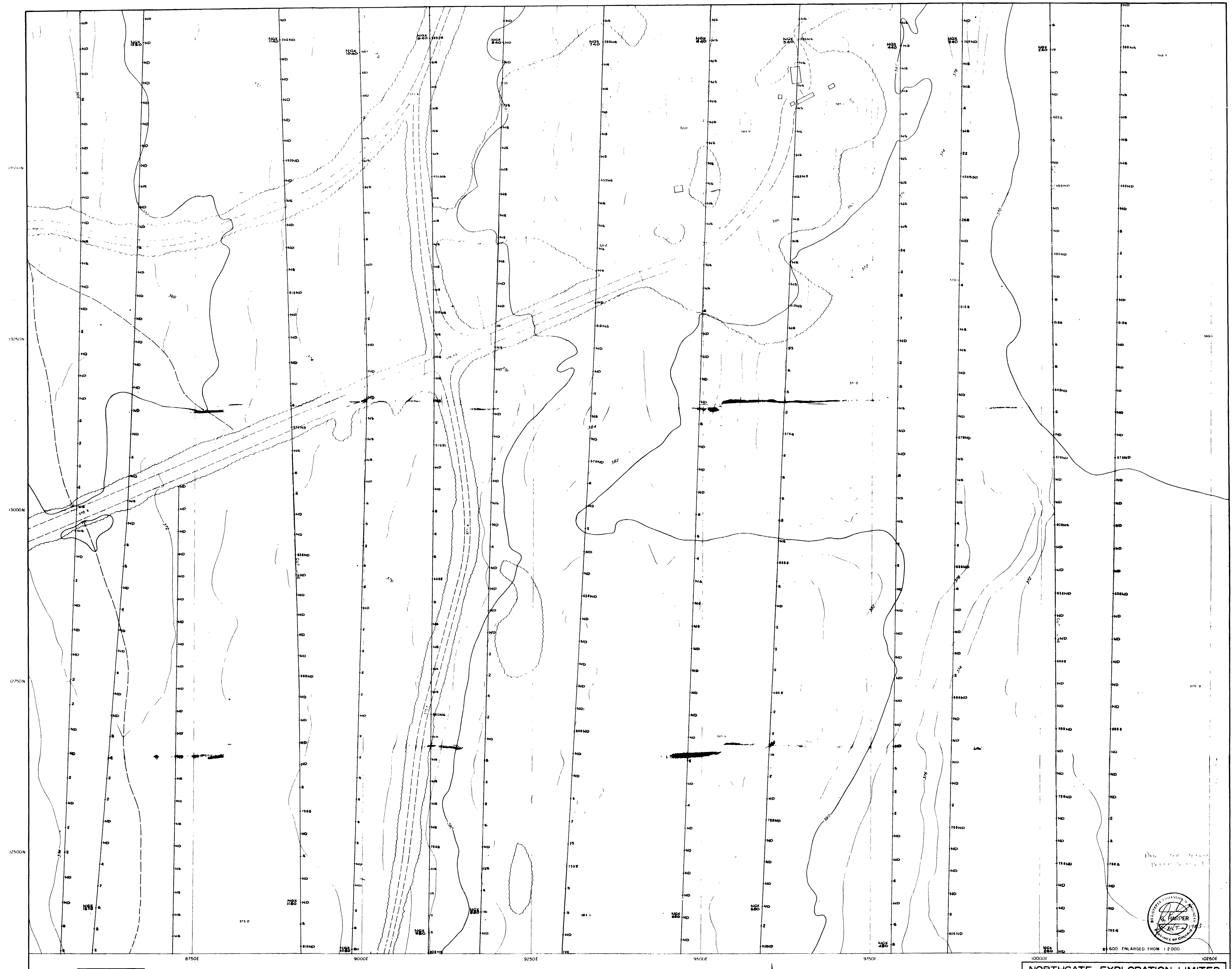
ZONE 1 – EAST HALF

HUMUS SAMPLING

SHEET 1

Work by	Date	NTS 41 O/16	Scale 1 600
Drawn by	Date July '82	Revision	

Figure 6a



Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

Legend:

10	Au (ppb)
ND	Not detected
NS	Not sampled
NGX 12	Sample number

SCALE 1:600

FEET 0 10 20 30 40 50 100 150 200

METERS 0 10 20 30 40 50 60

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE 1 – EAST HALF

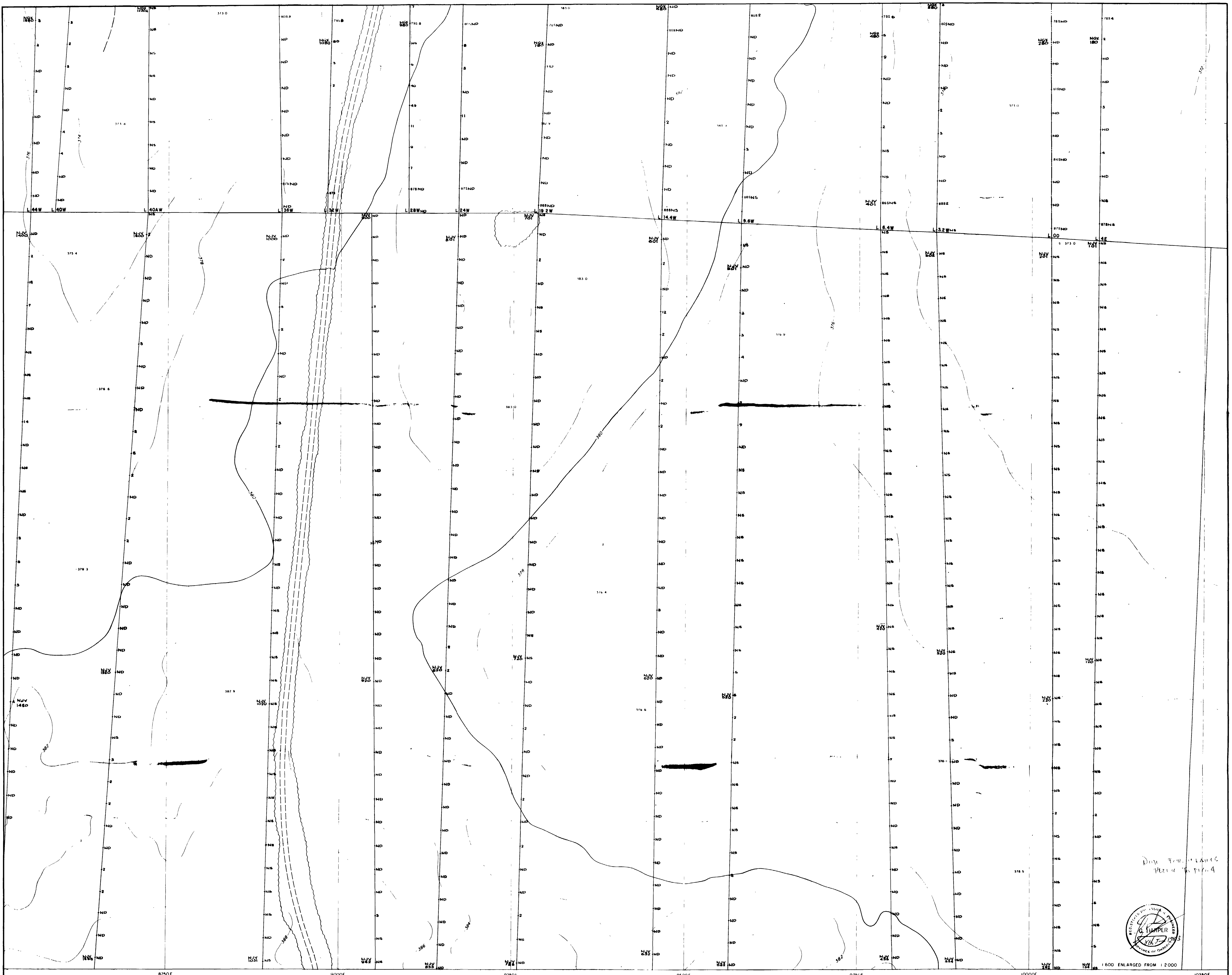
HUMUS SAMPLING

SHEET 2

Work by	Date	NTS 41 O/16	Scale 1:600
Drawn by	Date July '82	Revision	

330

2.539.6,34 Figure 6a



G. HARPER 8th June 1983

Sheet 4	Sheet 1
Sheet 5	Sheet 2
Sheet 6	Sheet 3
WEST HALF	EAST HALF

ZONE 1

Legend:

- 10 Au (ppb)
- ND Not detected
- NS Not sampled
- NGx 12 Sample number

SCALE 1:600

NORTHGATE EXPLORATION LIMITED

OROFINO PROJECT – № 775

ZONE 1 – EAST HALF

HUMUS SAMPLING

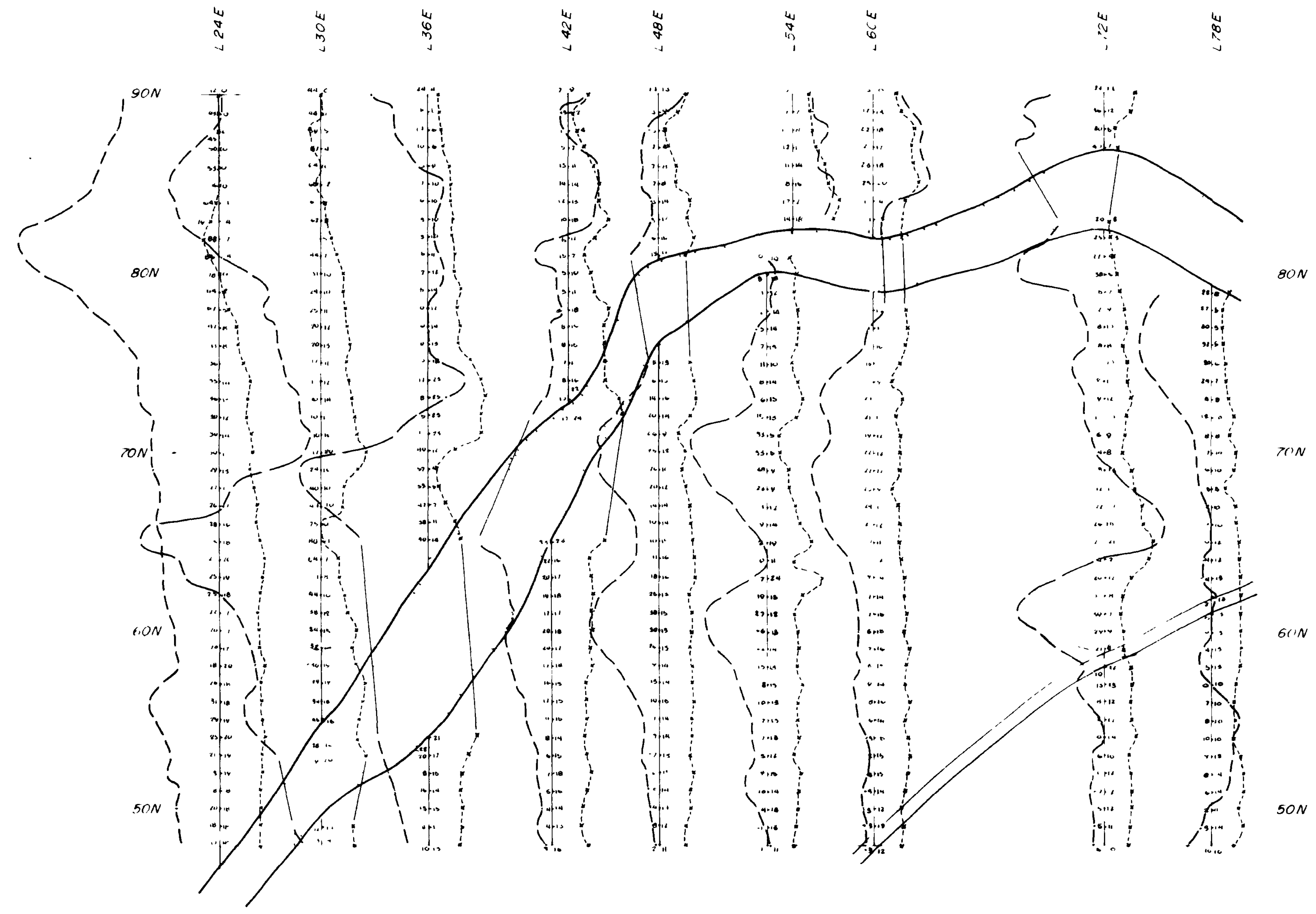
SHEET 3

Work by	Date	NTS 41 O/16	Scale 1 600
Drawn by	Date July '82	Revision.	

340

D.C.?.6, 35

Figure 6a



VLF ELECTROMAGNETIC SURVEY

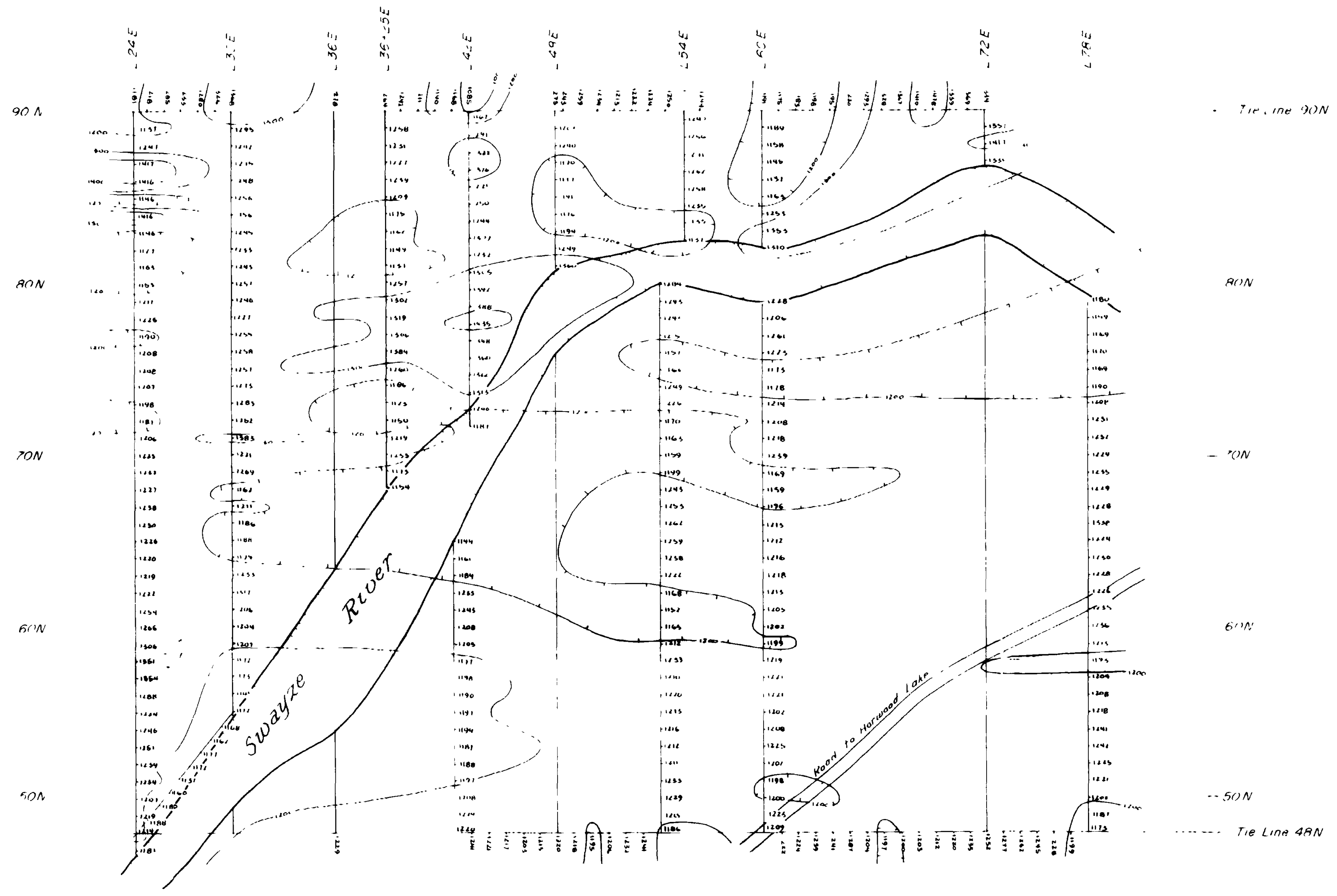
LEGEND

20%
+20%
Quadrature
In Phase

Instrument EM-16

Serial Nº 16,900

Transmitter Station Cutler, Maine



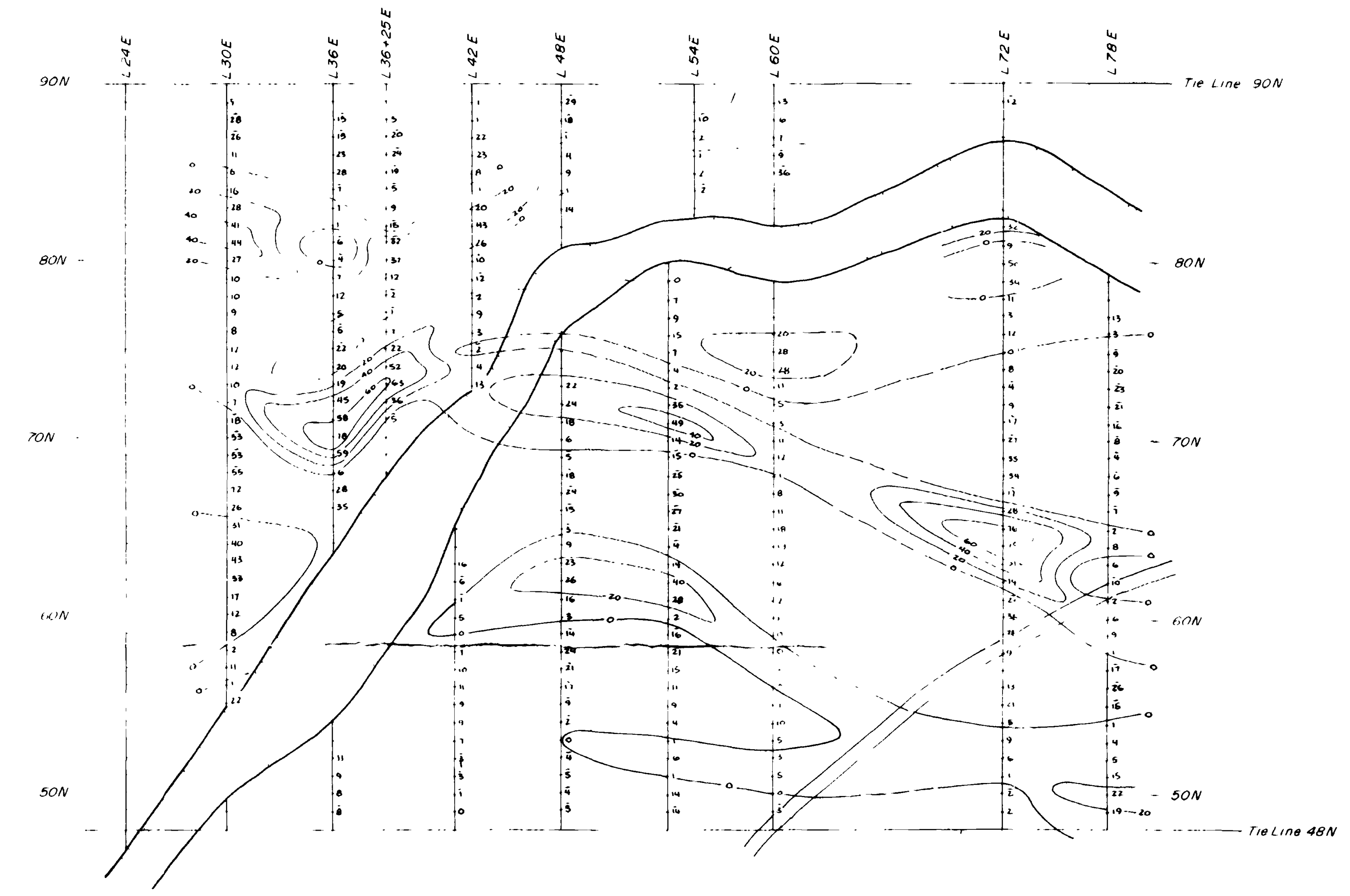
MAGNETOMETER SURVEY

LEGEND

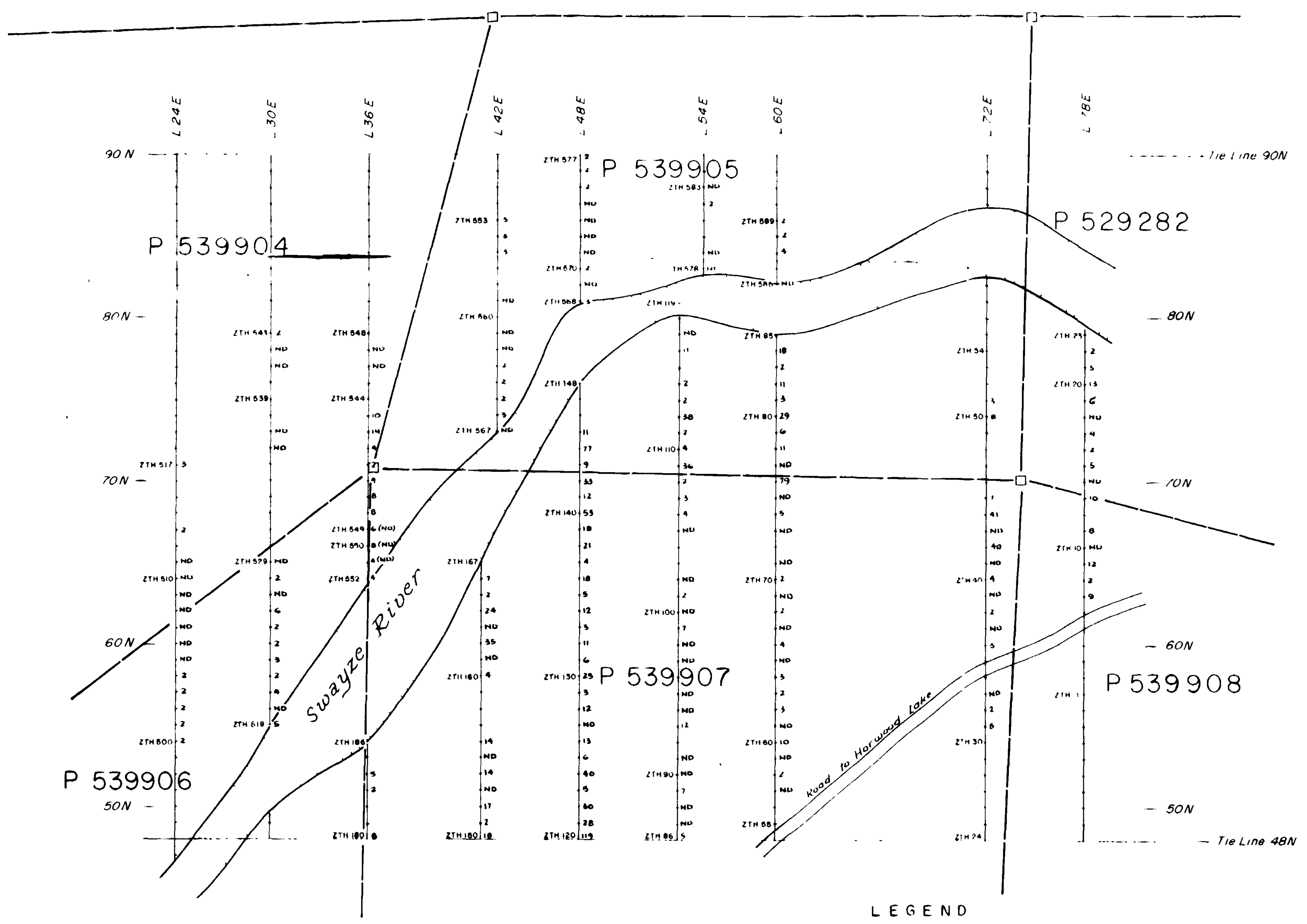
Readings in gammas

Contour interval 100 gammas

Instrument Scintrex MP 2



VLF ELECTROMAGNETIC SURVEY - FRASER FILTER



HUMUS SAMPLING RESULTS

LEGEND

Sample Number ZTH 465 Sampling Results in Parts per billion

REGISTERED PROFESSIONAL ENGINEER
G. HARPER
8th June 1983
PROVINCE OF ONTARIO

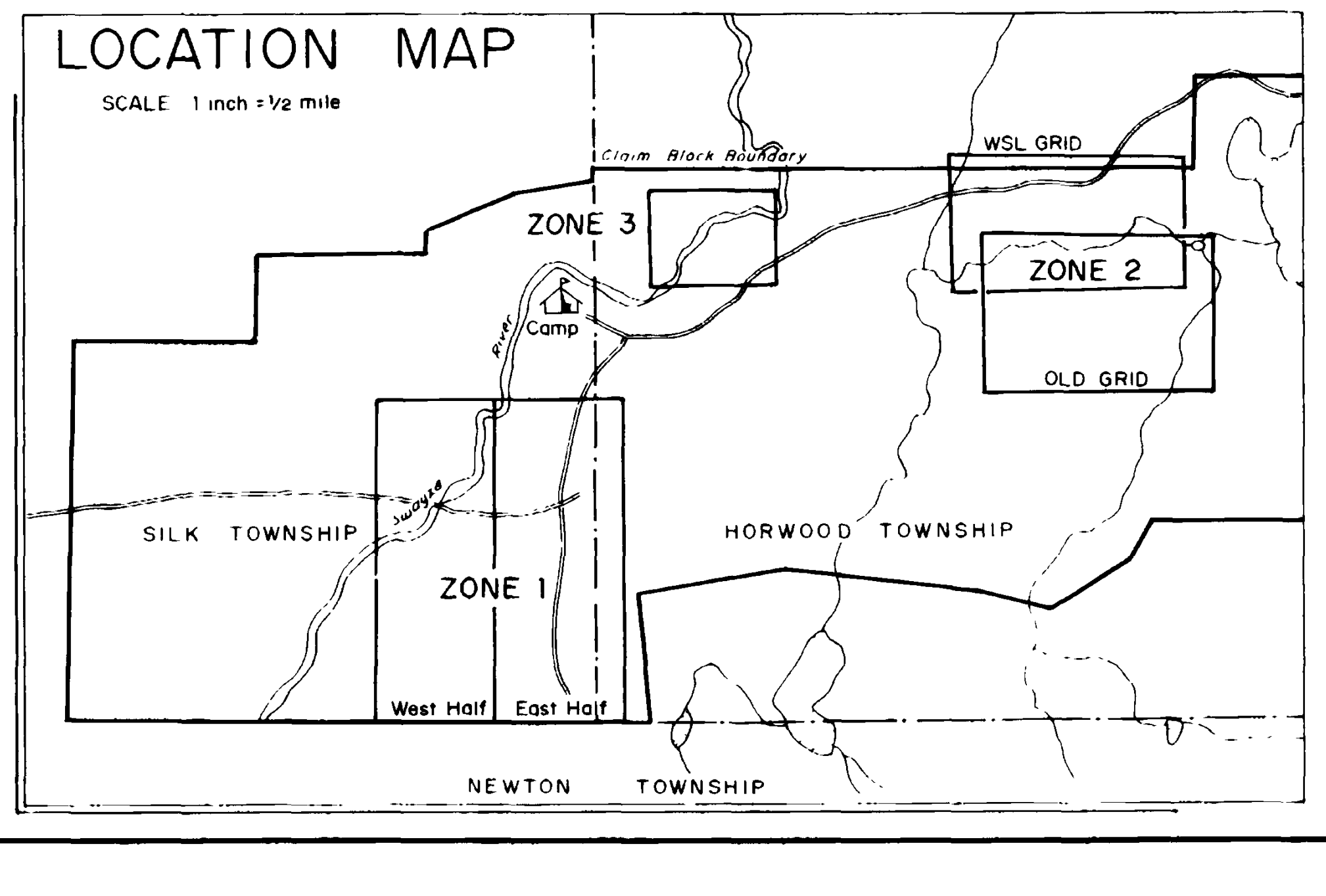
CLAIMS 539904, 539905, 539906, 539907, 539908, 529282

See humus map for posts and exact locations.

SCALE 1 2500

0 50 100 150 200 300 400 600 800 1000
FEET

0 10 20 40 60 80 100 160 200 300
METERS



Northgate Exploration Limited

N.T.S No.

OROFINO PROJECT - Nº 780

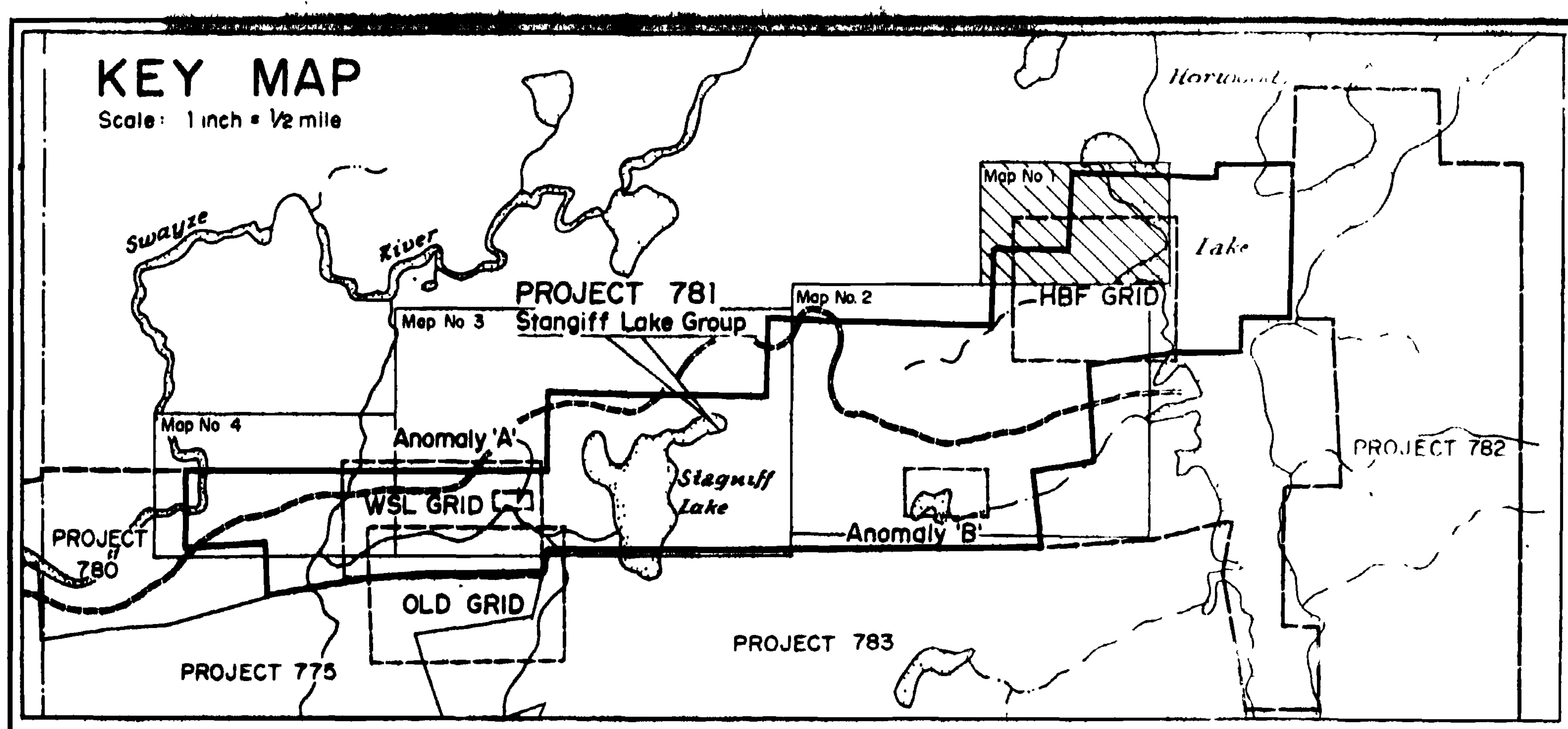
- ZONE 3 -

VLF E.M., MAGNETOMETER AND HUMUS SAMPLING

Work by P Dodson	Date Summer 81	Proj no 780	Scale 1 2500
Drawn by A R Gunther	Date Nov, 81	Rev by	Date

2.528[illegible],36

Figure 7



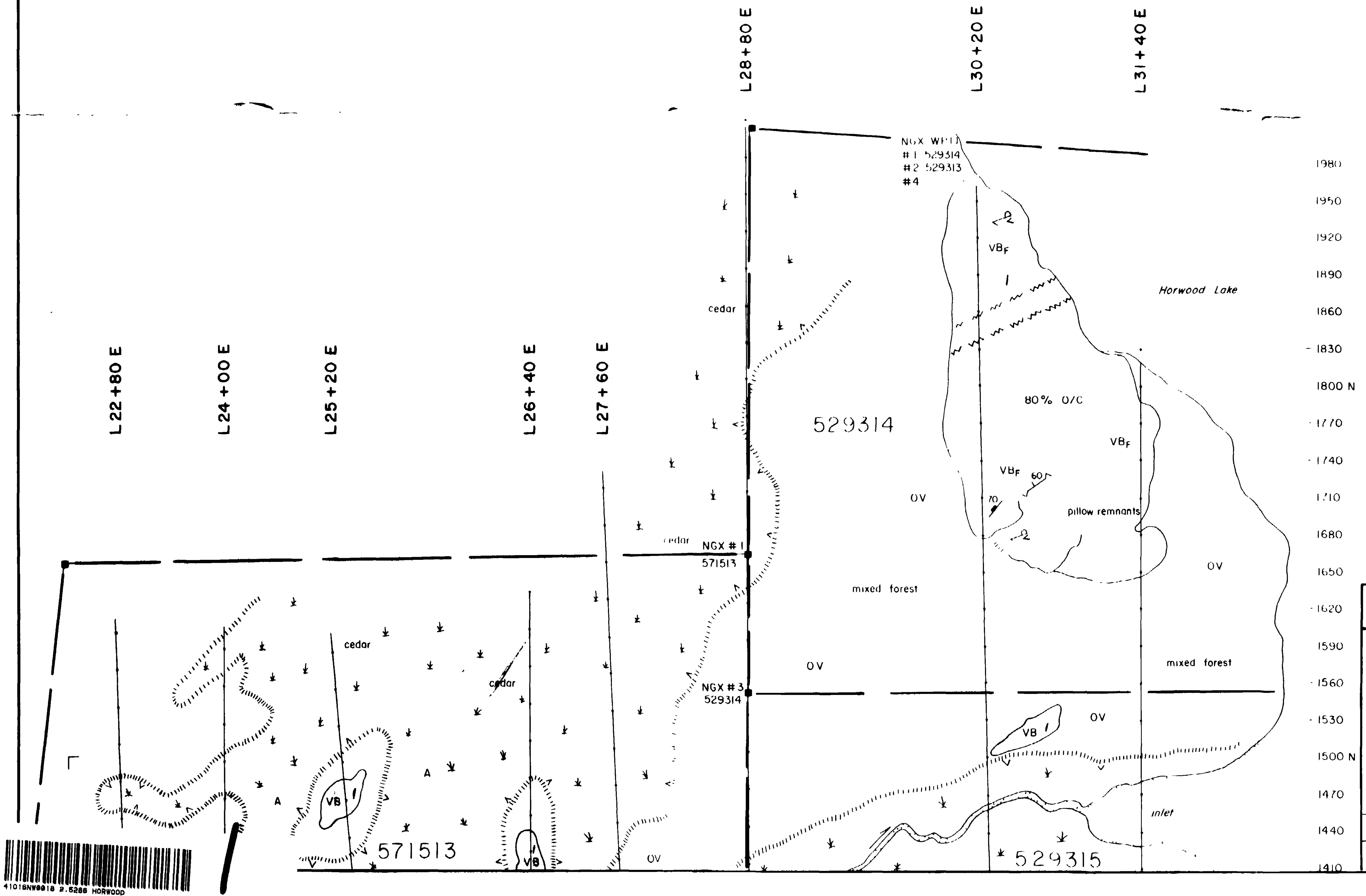
LEGEND

VEGETATION
JP Jack pine
P Poplar
A Alder
B Birch
S Spruce
OV Over burden

TOPOGRAPHY
high ground (ridge)
low ground (depression)
river
swamp
lake
intermitent stream
direction of flow

GEOLOGY
VB$_F$ Basic volcanic flow
VB$_T$ Basic volcanic tuff
VI Intermediate volcanic
o/c Out crop
Shearing
Quarts veins
Fault
Jointing

CLAIMS - 529314, 571513, 529315



G. HARPER

Northgate Exploration Limited

NTS
No

STANGIFF LAKE GROUP - PROJECT No. 781

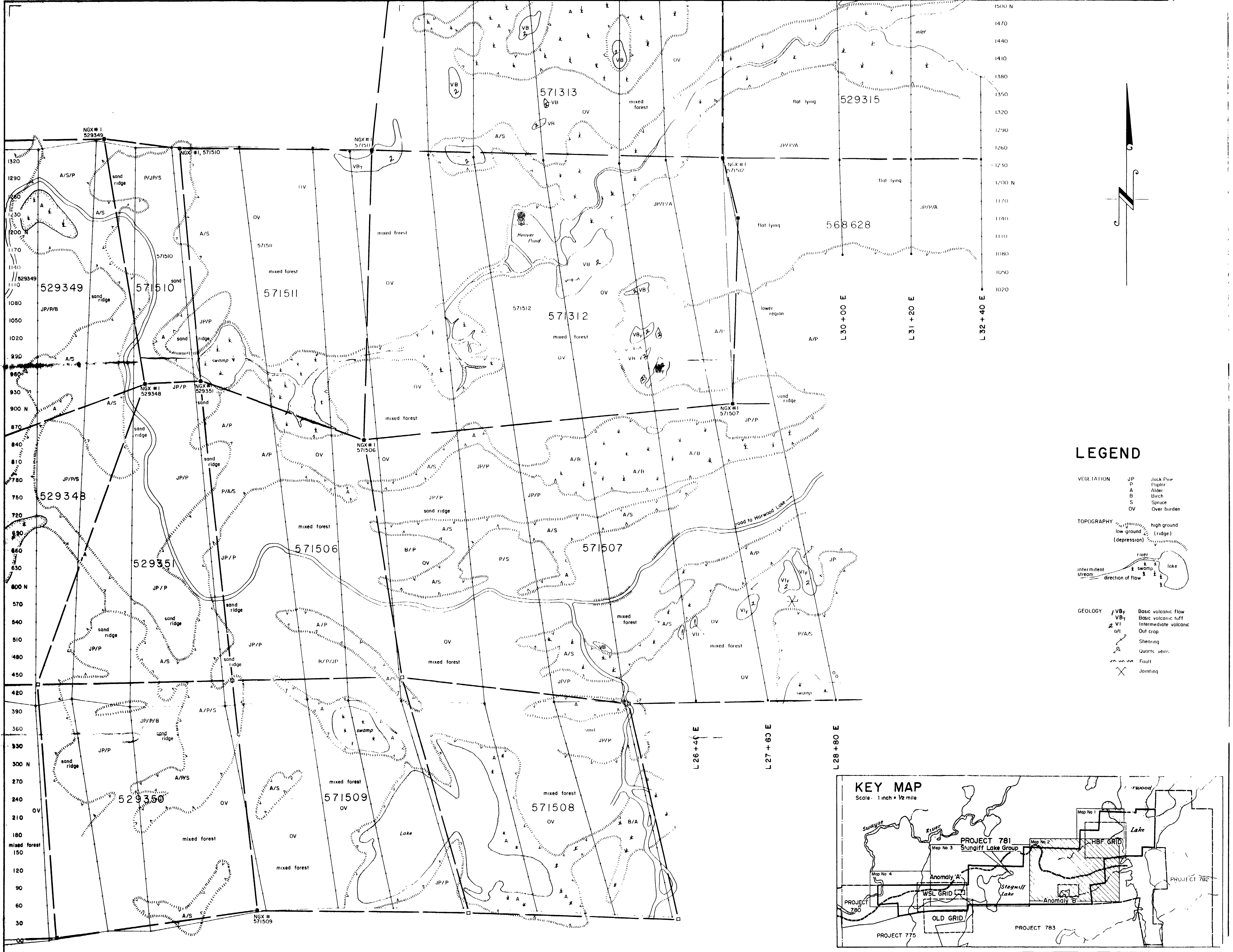
GEOLOGICAL MAP

2.5286, 37

MAP No. 1

Work by	Date	Proj no 781	Scale 1 2500
Drawn by Denis Gagné	Date Aug /81	Rev by	Date

Figure 8



S C A L E

50 30 10 0 50 100 150
Metres

CLAIMS - 571313, 529315, 568628,
571314, 571511, 571310, 529349
529348, 529351 571506, 571507
529350, 571509, 571508

Northgate Exploration Limite

N.T.S
Nr

STANGIFF LAKE GROUP - PROJECT

GEOLOGICAL M'

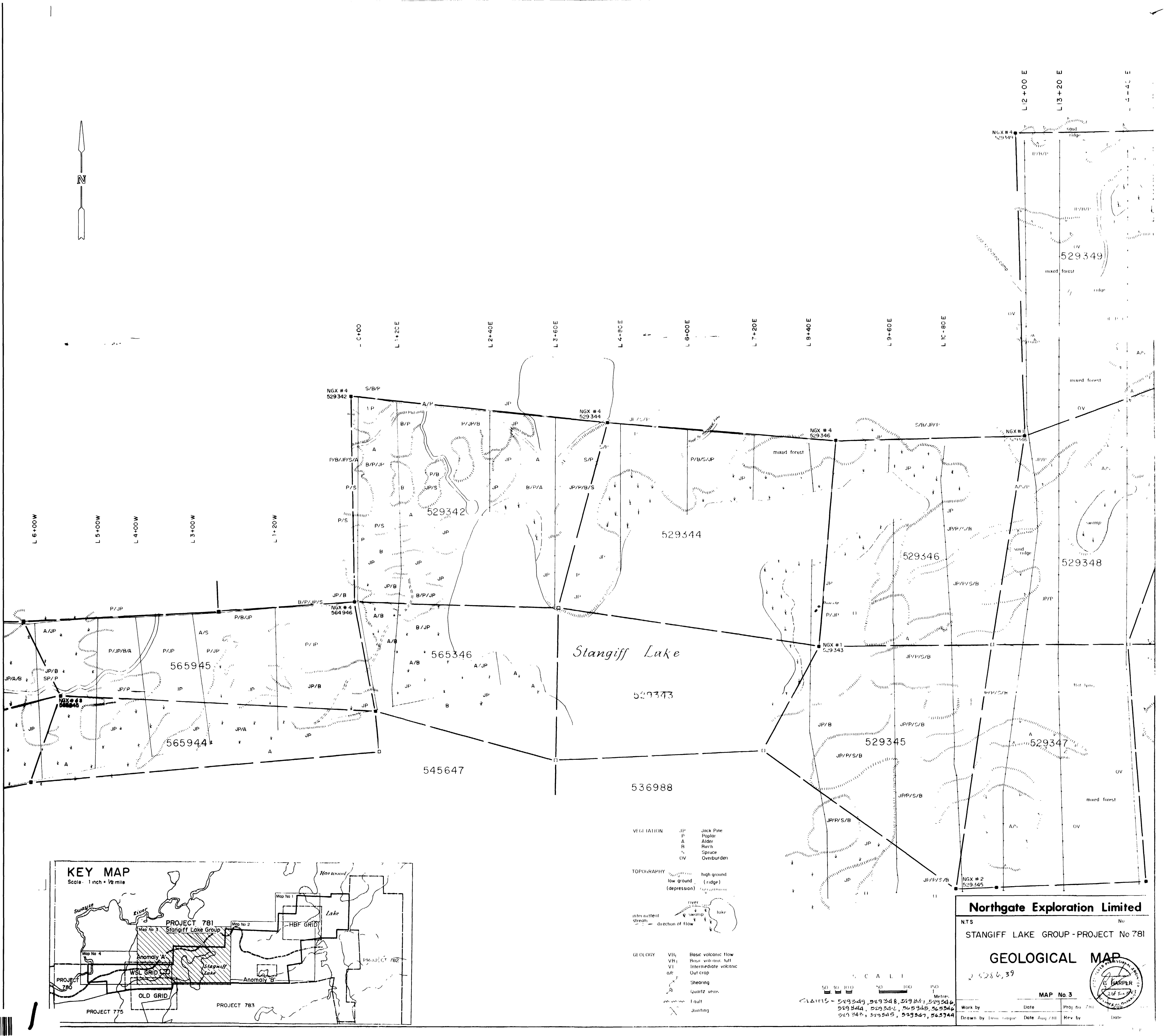
2.5286,38

MAP No

Work by Date

Drawn by Denis Gagne Date Aug /81 Rev

370



CLAIMS - 529349, 529348, 529341, 529346, 529344, 529342, 565945, 565346, 529343, 529345, 529347, 565944

Northgate Exploration Limited

N.T.S No

STANGIFF LAKE GROUP - PROJECT No 781

GEOLOGICAL MAP

2 5286,39

G. HARPER
21st June 1983

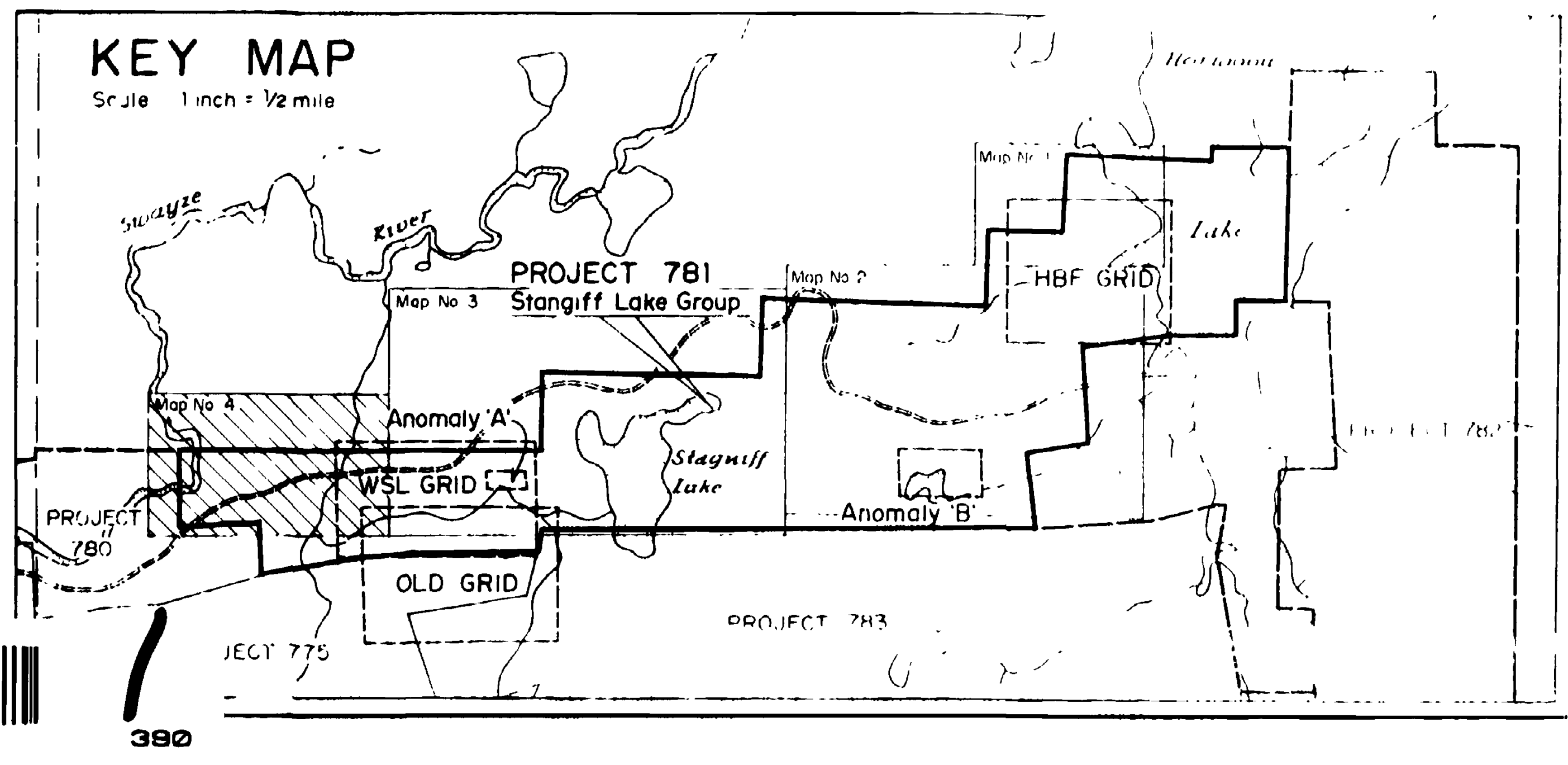
MAP No. 3

Work by	Date	Proj no 781	Scale
Drawn by Dem Gagne	Date Aug /81	Rev by	Date

380

LEGEND

1	VB	Basic Volcanic
2	VB-I	Basic to Intermediate Volcanic
	p/B	Pillowed Basic Volcanic
3	QFP	Quartz Feldspar Porphyry
	QZ	Quartz
	PY	Pyrite
	( )	Area of Outcrop
	↓	Swamp
	⋰	Ridge
	JP	Jack Pine
	P	Poplar
	A	Alder
	B	Birch
	S	Spruce



SCALE 1 2500

METER

CLAIMS — 529287 529285, 529283, 529282,
534908, 529284, 529286, 565943

Northgate Exploration Limited

N.T.S

No

STANGIFF LAKE GROUP - PROJECT No 781

GEOLOGICAL MAP

2.5288,40

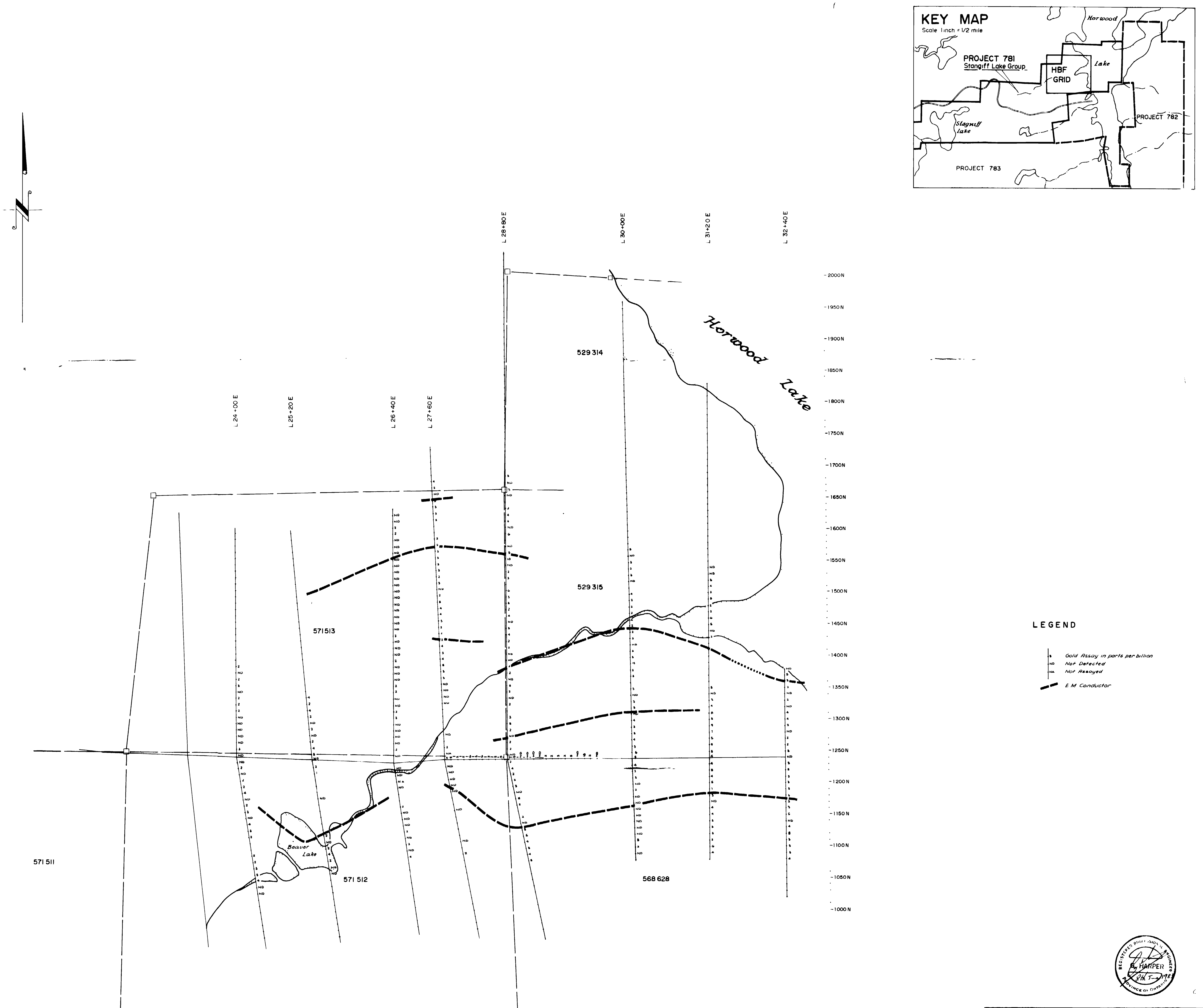
MAP No 4

G. HARPER
21st June 1983

Work by	Date	Proj no	Scale
Drawn by	Date March 8	Rev by	Date

Figure 8

380



SCALE 1 : 2500

0 10 20 30 40 50 75 100 150 200 250
METERS

0 50 100 150 200 300 400 600 800
FEET

CLAIMS - 529 314 , 529 315 , 571 513
571 512 , 568 628

Northgate Exploration Limited

N.T.S No.

STANGIFF LAKE GROUP - PROJECT № 781

HBF GRID

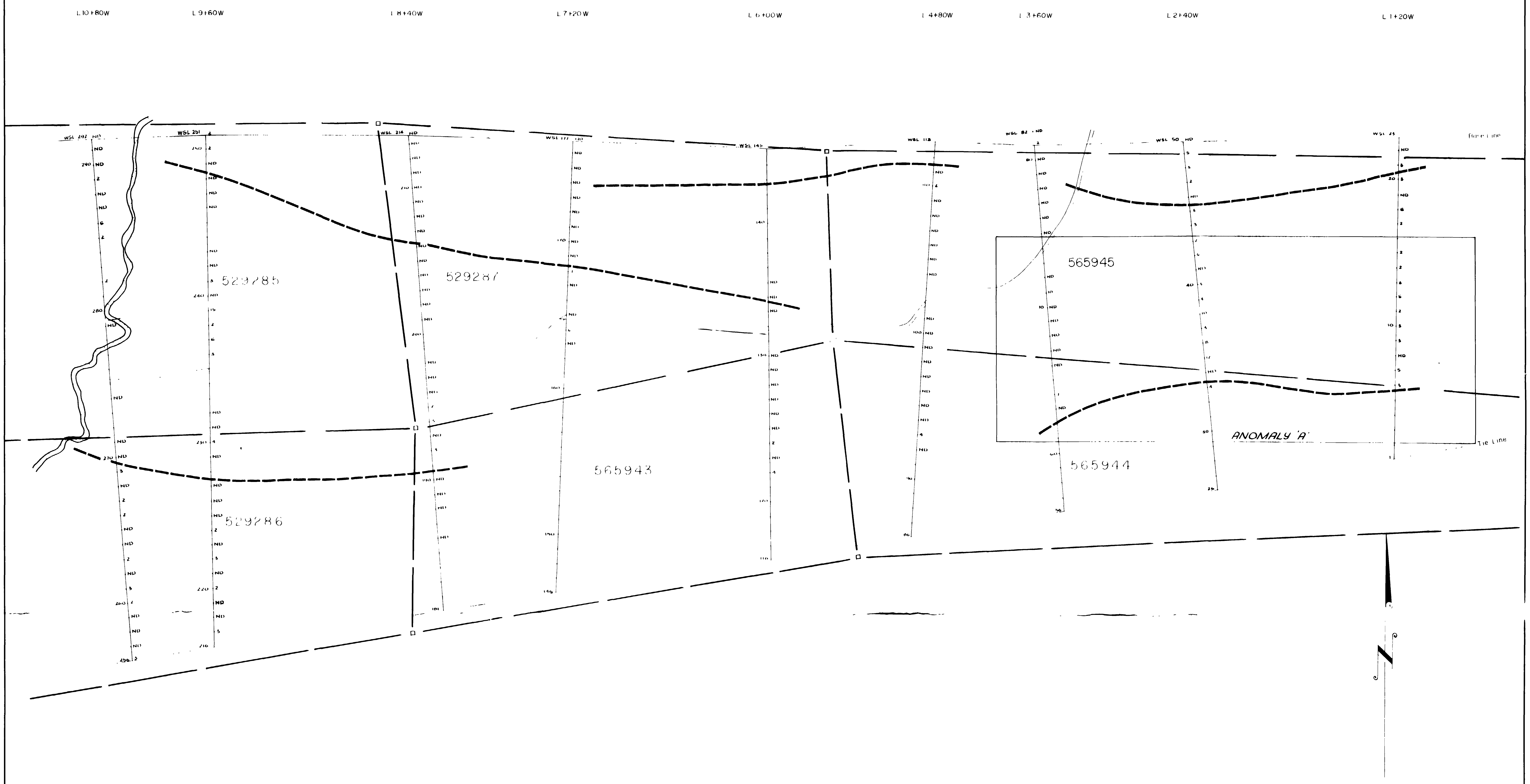
HUMUS SAMPLING

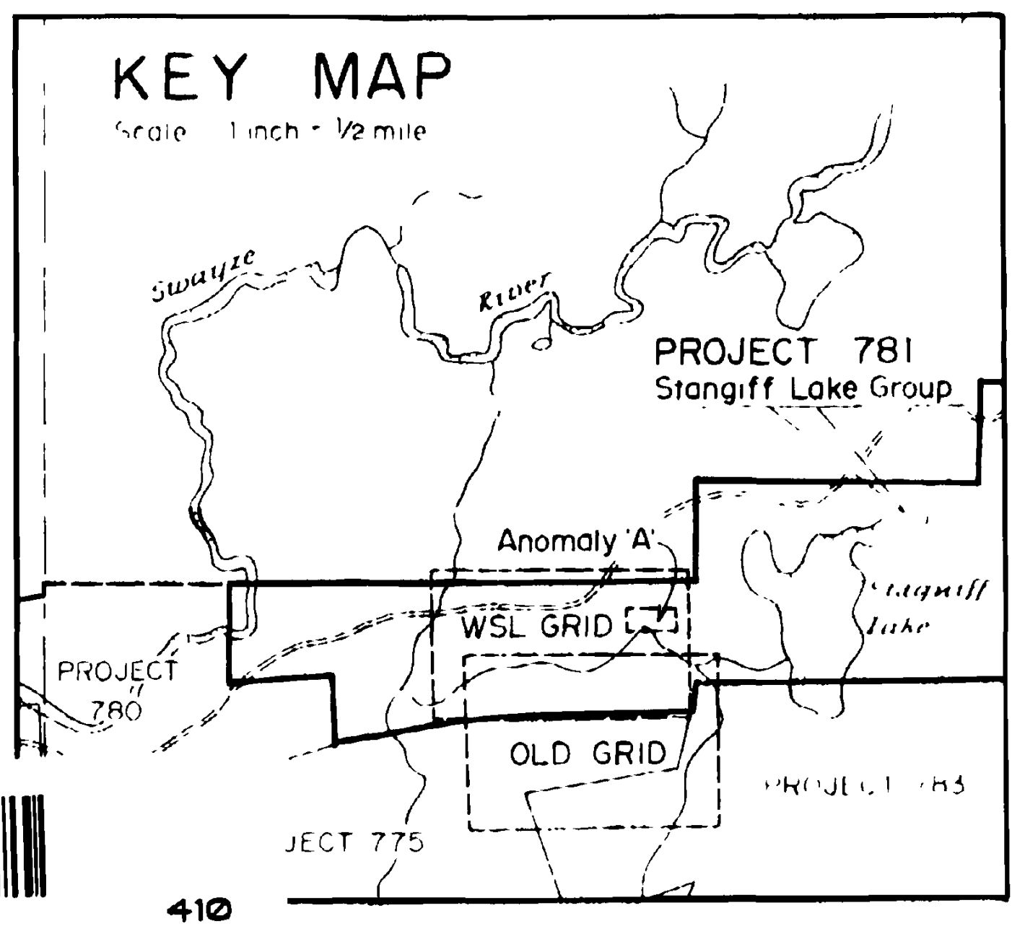
Work by	Date	Proj no 781	Scale 1:2500
Drawn by A R Gunther	Date : March '82	Rev by	Date

2.5286,41

Figure 9

400





LEGEND

Sample Number WSL 50 ND — Not Detected

ND

5
7 — Gold Assay in ppb

▬ ▬ ▬ E M Conductor

SCALE 1 1250

0 25 50 75 100 125 METERS

0 25 50 75 100 200 300 400 FEET

CLAIMS 565945, 565944,
565943, 529287,
529286, 529285

G HARPER
21st June 1983

Northgate Exploration Limited

N.T.S No

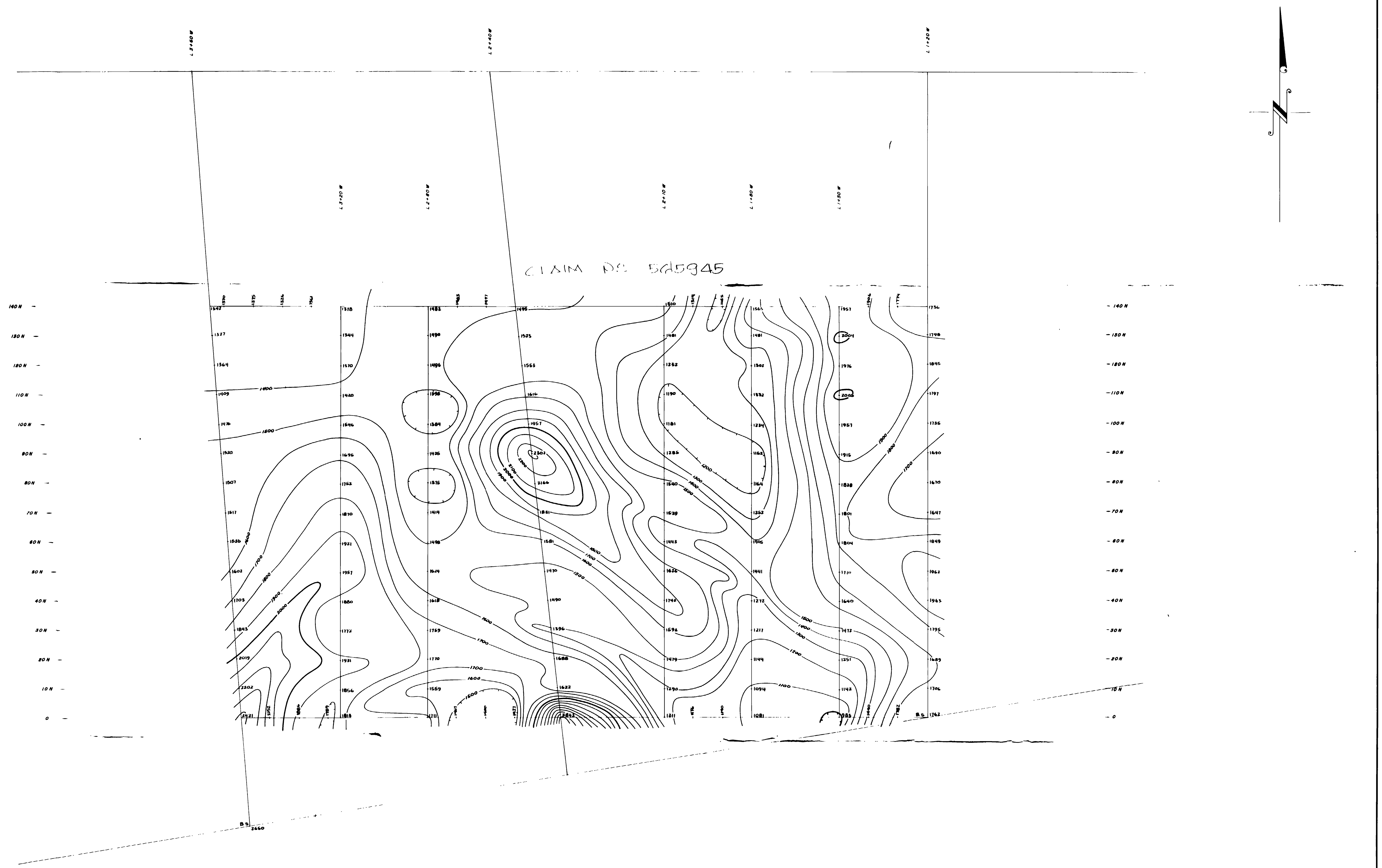
STANGIFF LAKE GROUP - PROJECT № 781
- WSL GRID -

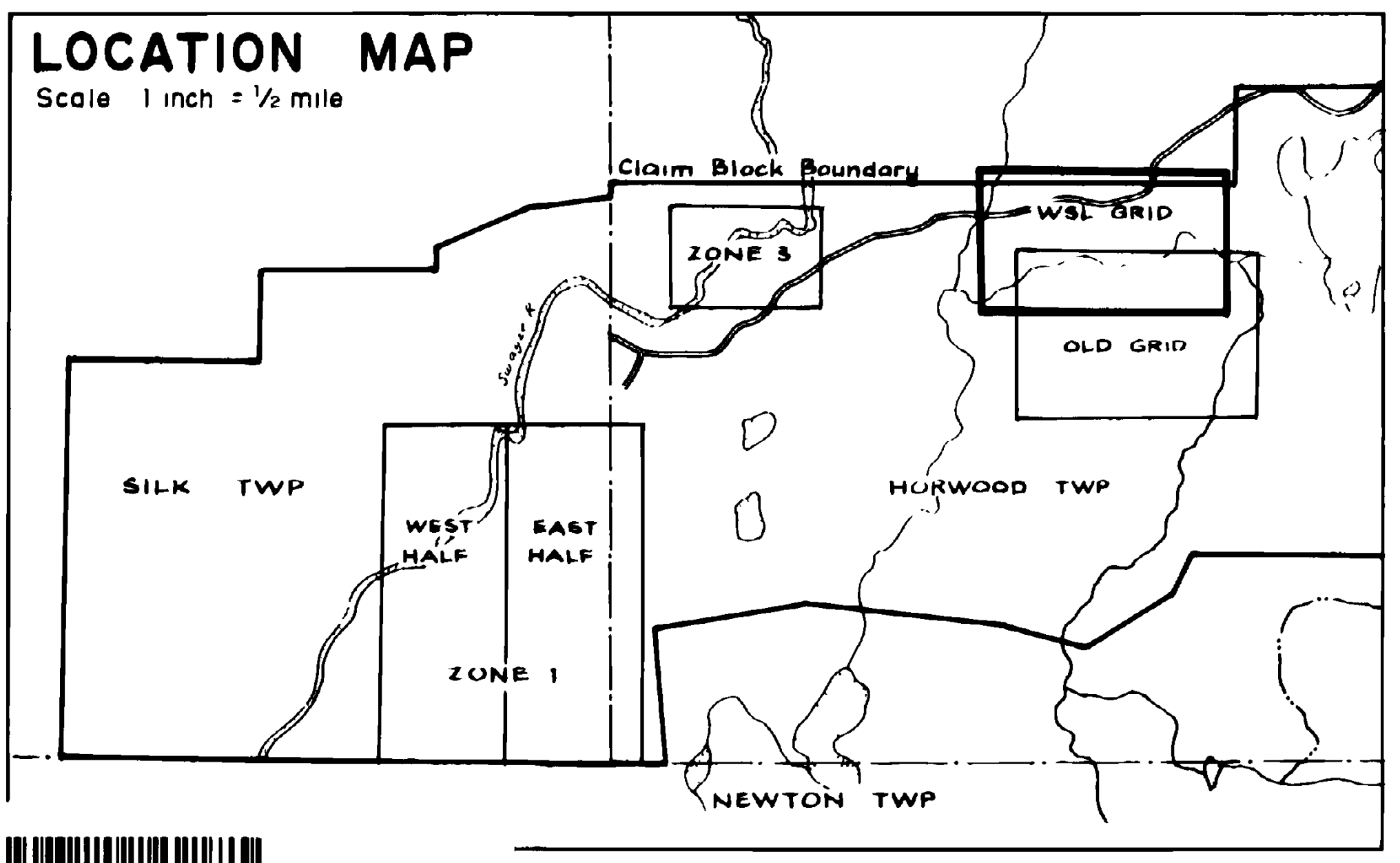
HUMUS SAMPLING

.2 52861

Work by F. Dodson	Date Aug 1981	Proj no 781	Scale 1:1250
Drawn by A.K. Gunther	Date March 1982	Rev by	Date

Figure 11





LEGEND

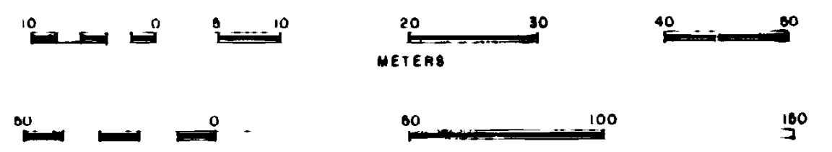
Readings in gammas

Contour Interval 100 gammas

Instrument: Scintrex MP-2

⬭ Magnetic Low

SCALE 1 600



CLAIM 565945

G. HARPER

8th June 1983

Northgate Exploration Limited

N.T.S

No.

OROFINO PROJECT - Nº 781

WSL GRID

MAGNETOMETER SURVEY

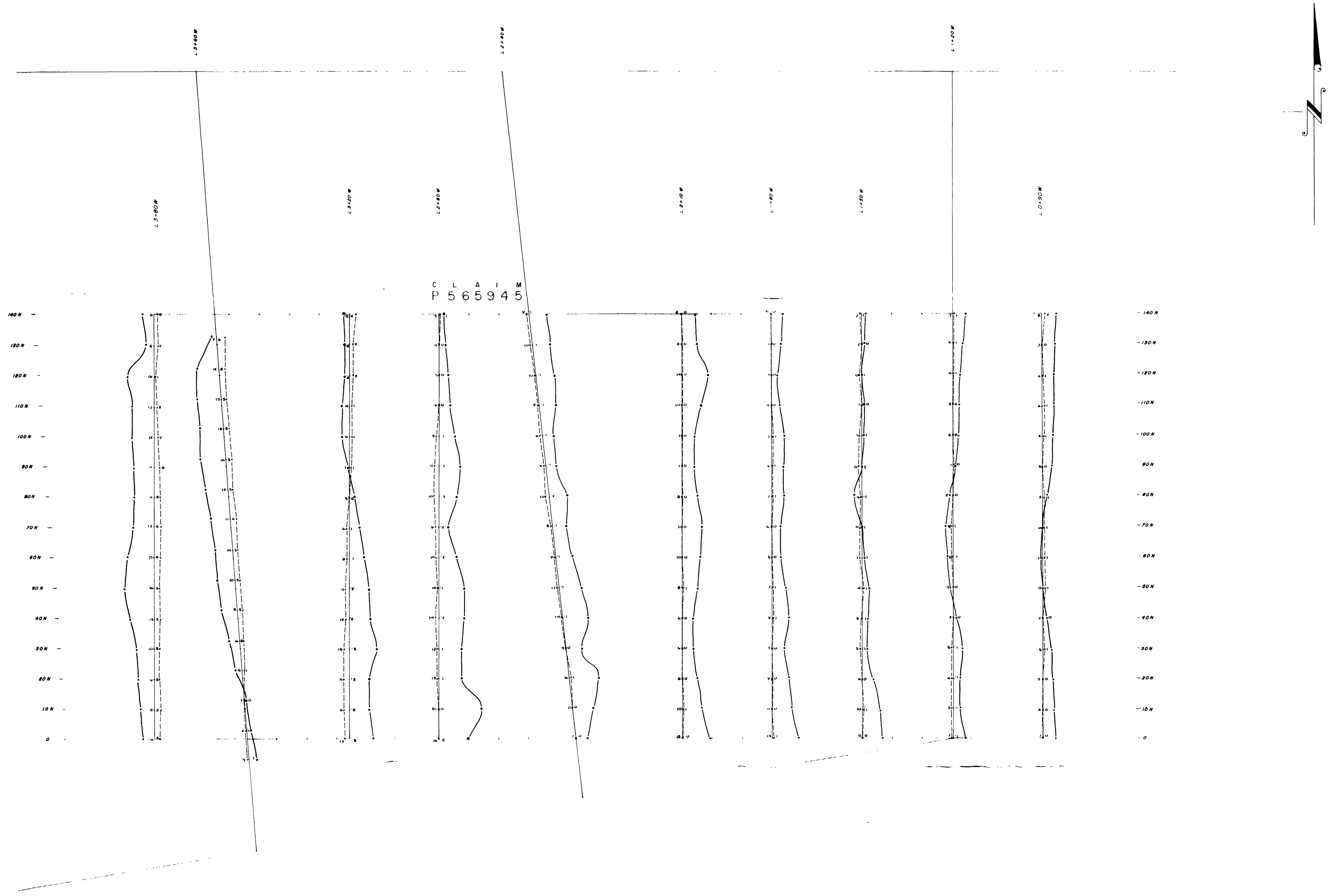
ANOMALY A

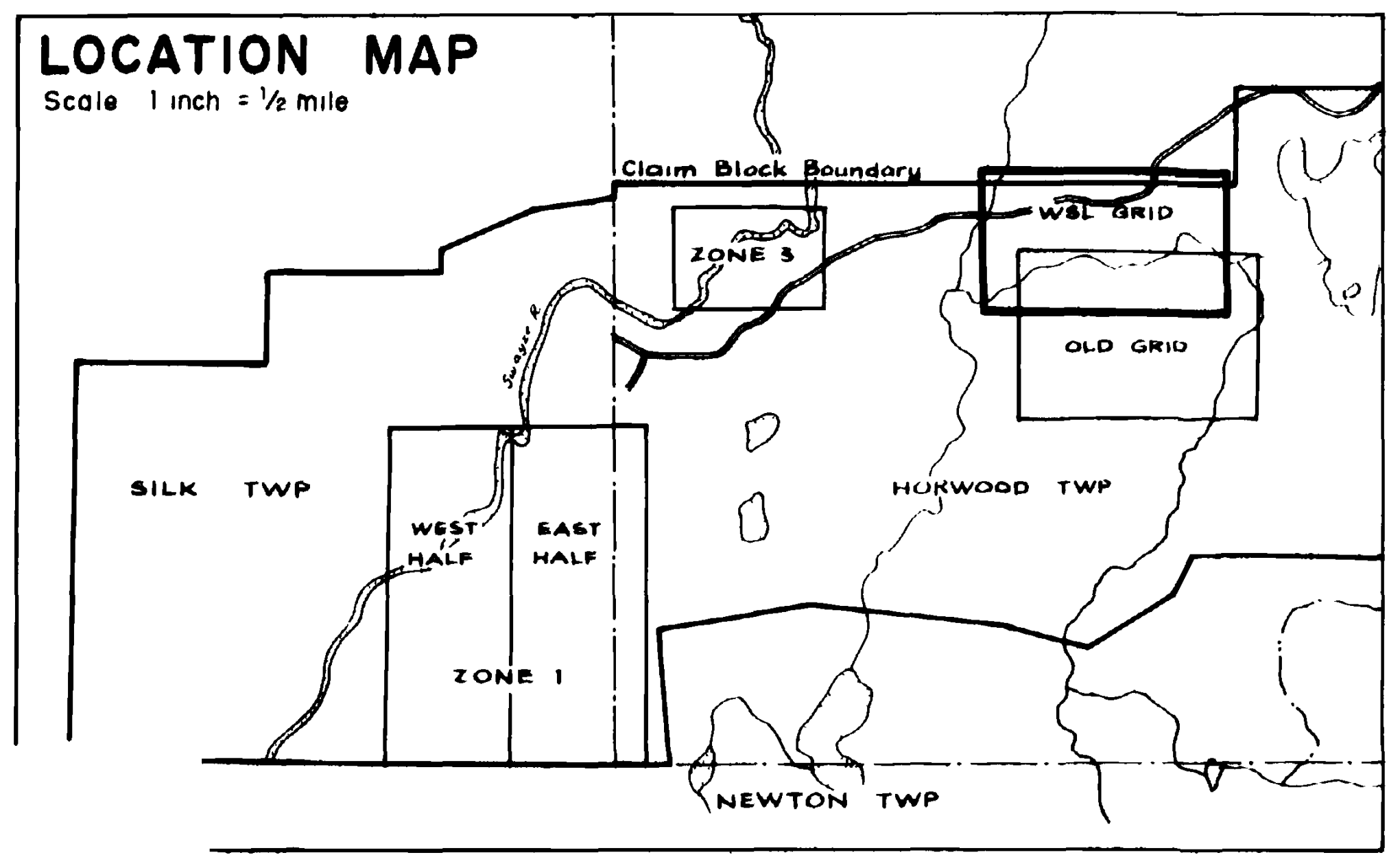
Work by P Dadson	Date Aug 1981	Proj no 781	Scale 1 600
Drawn by A R Gunther	Date Dec 1981	Rev by	Date

Figure 12

2.5286.2

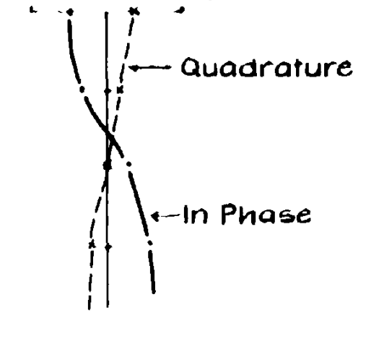
420





430

LEGEND



Instrument E.M. 16

Serial N° 16,900

Transmitter Station Cutler, Maine

SCALE 1 600

CLAIM 565945

G. HARPER
8th June 1983

Northgate Exploration Limited

N.T.S. No.

OROFINO PROJECT - № 781

WSL GRID

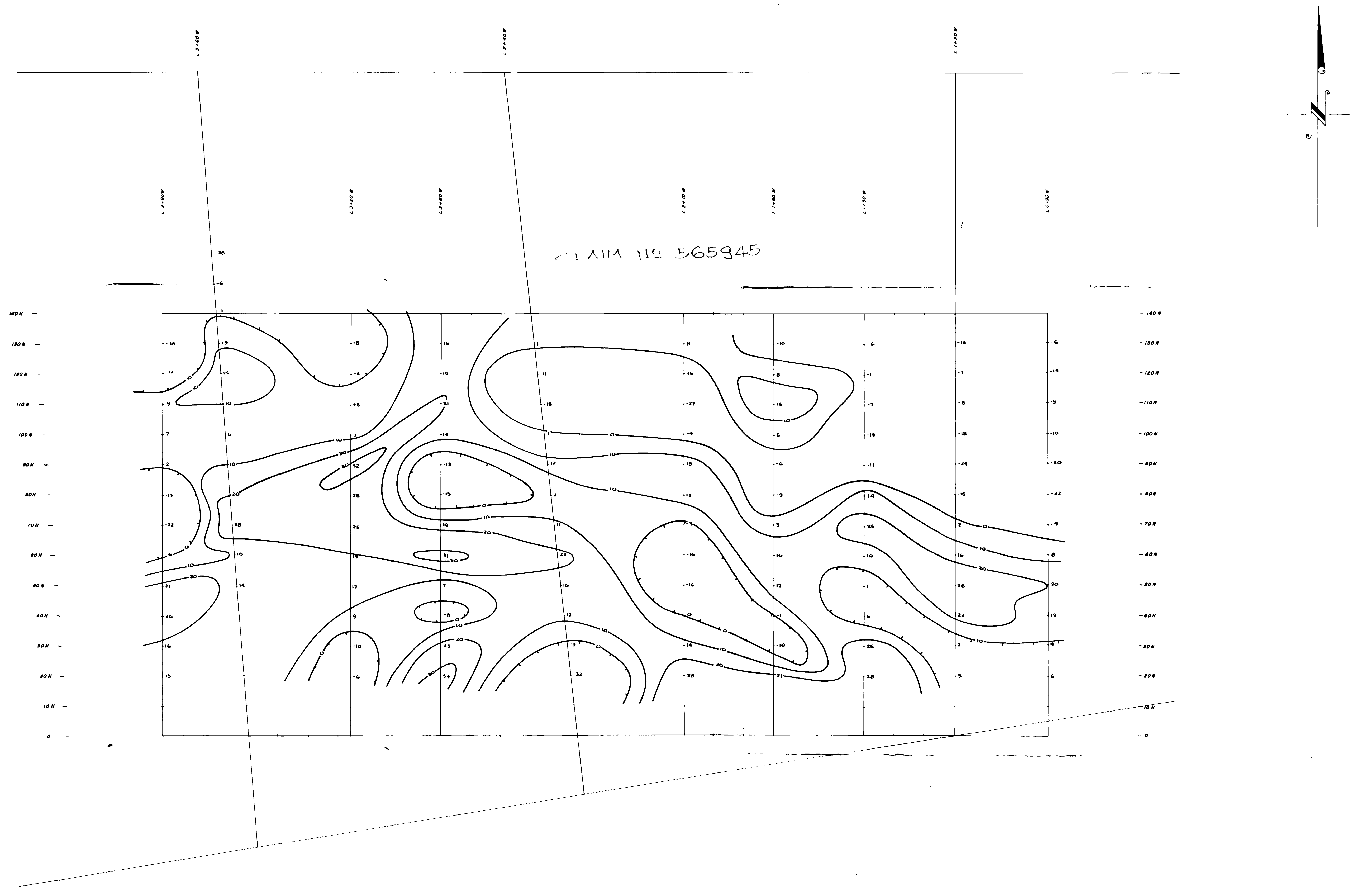
VLF - E.M. SURVEY

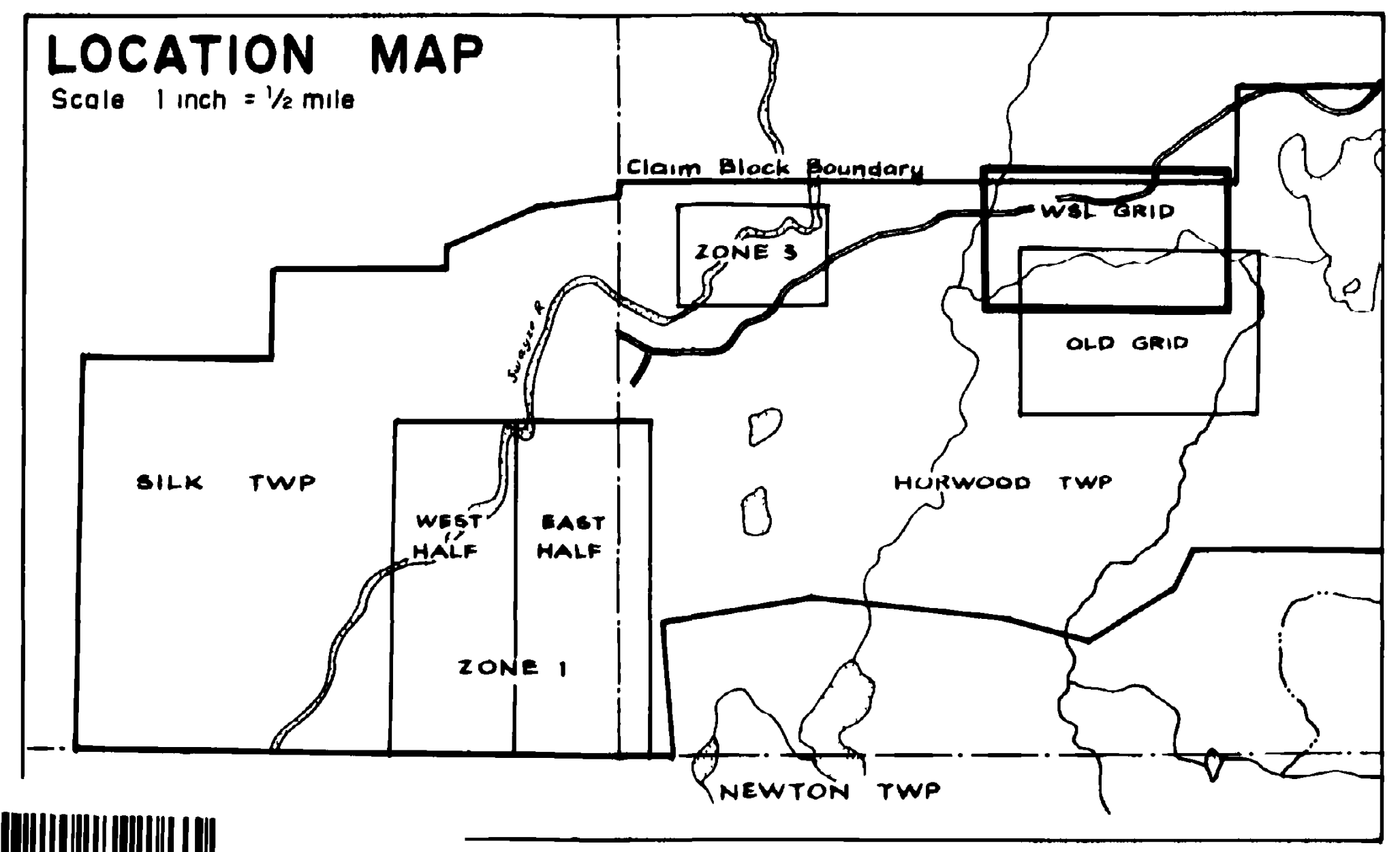
ANOMALY A

2 5286,3

Work by P. Dadson	Date Aug 1981	Proj no 781	Scale 1:600
Drawn by A.R. Gunther	Date Dec 1981	Rev by	Date

Figure 13





SCALE 1 600

METRES

FEET

CLAIM 565945

G. HARPER
8th June 1983

Northgate Exploration Limited

N.T.S No.

OROFINO PROJECT - No 781

WSL GRID
VLF - E.M. SURVEY
- FRASER FILTER -
ANOMALY A

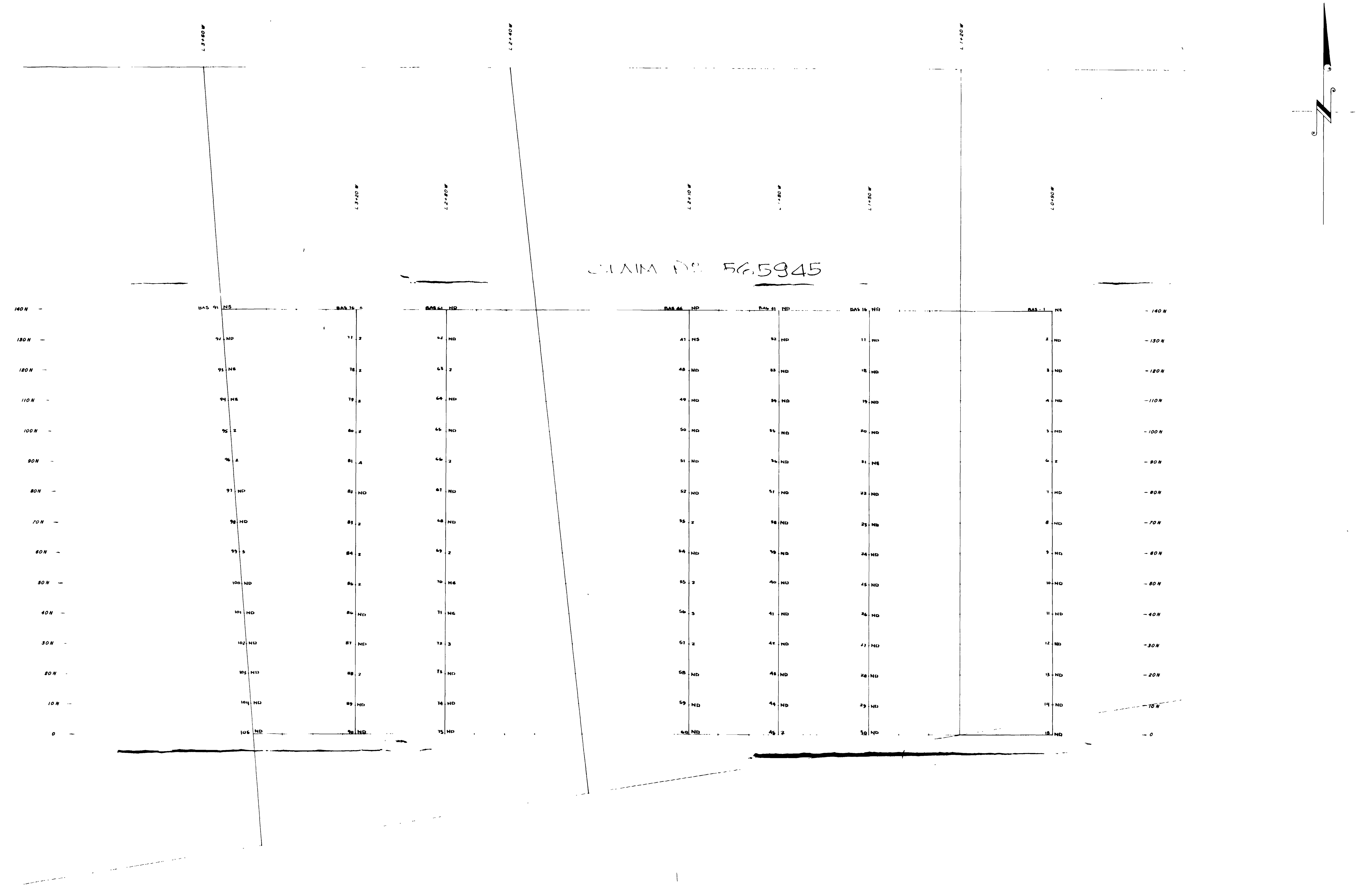
Work by P Dadson	Date Aug 1981	Proj no 781	Scale 1 600
Drawn by A R Gunther	Date Dec 1981	Rev. by	Date

2.5286,4

Figure 14

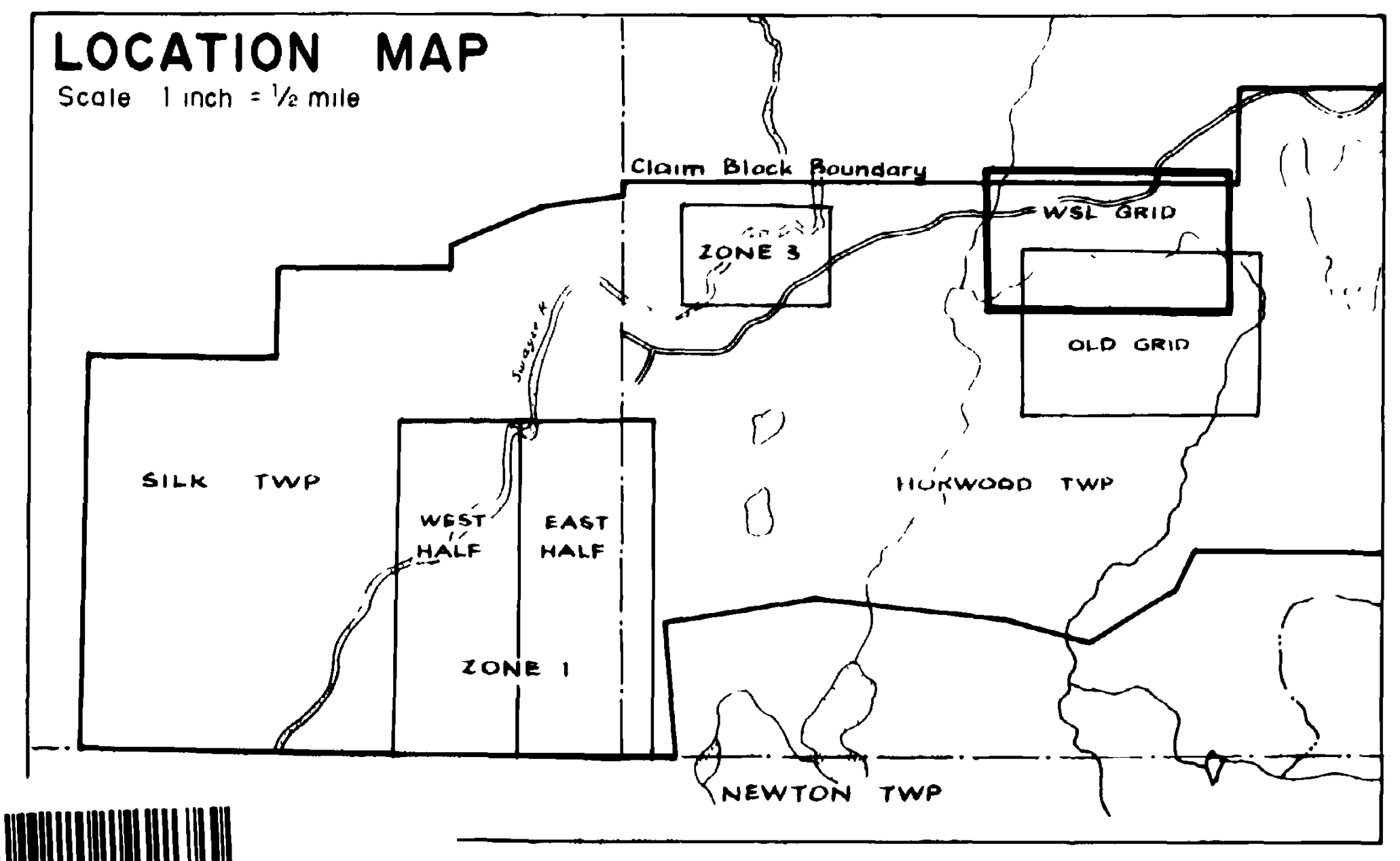
41O18NW8818 2.5288 HORWOOD

440



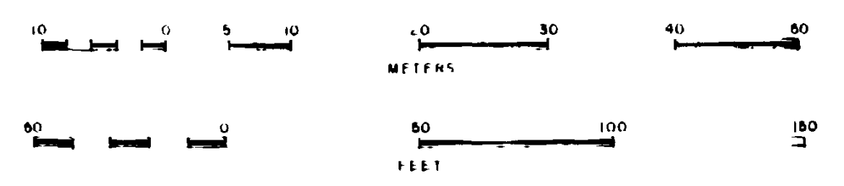
LOCATION MAP

Scale 1 inch = ½ mile



Sample Number	BAS 46	ND	Not Detected
	47	2	Assay Gold in ppb
	48	NS	No Sample

SCALE 1 600



G. HARPER

Northgate Exploration Limited

N.T.S

No

OROFINO PROJECT - Nº 781

WSL GRID

HUMUS SAMPLES

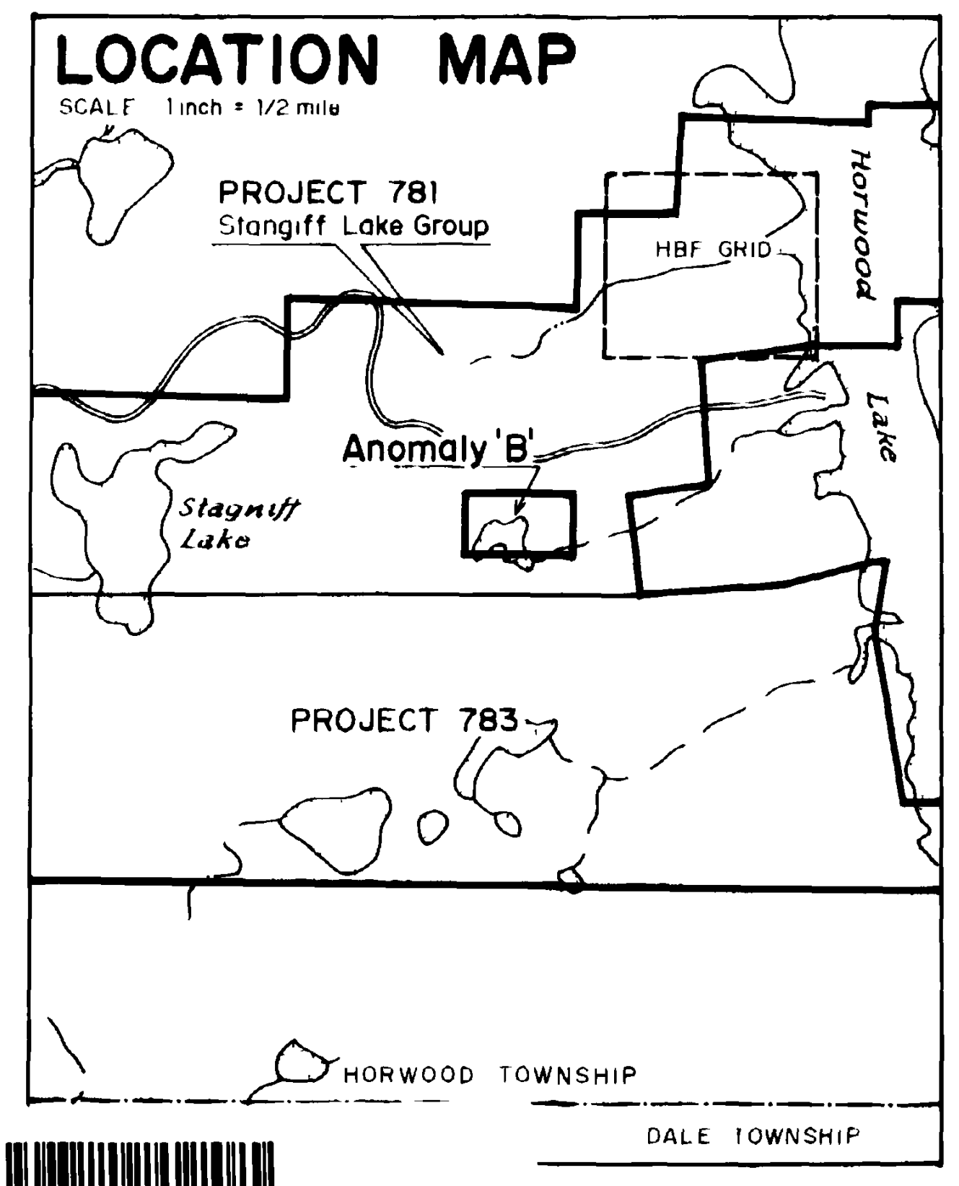
ANOMALY A

Work by P Dadson	Date Aug 1981	Proj no 781	Scale 1 600
Drawn by · A R Gunther	Date : Dec 1981	Rev. by	Date ·

2 5286,5

Figure 15

450



LEGEND

Readings in gammas

100 gamma contour interval

Instrument Scintrex MP-2

SCALE 1 1000

20	10	0	20	40	60	80	METERS			
100	80	60	40	20	0	50	100	200	300	FEET

NOTE. FOR CLAIMS REFER TO FIG 13

REGISTERED PROFESSIONAL ENGINEER
G. HARPER
8th June 1983
PROVINCE OF ONTARIO

Northgate Exploration Limited

N.T.S No.

STANGIFF LAKE GROUP - PROJECT No.781

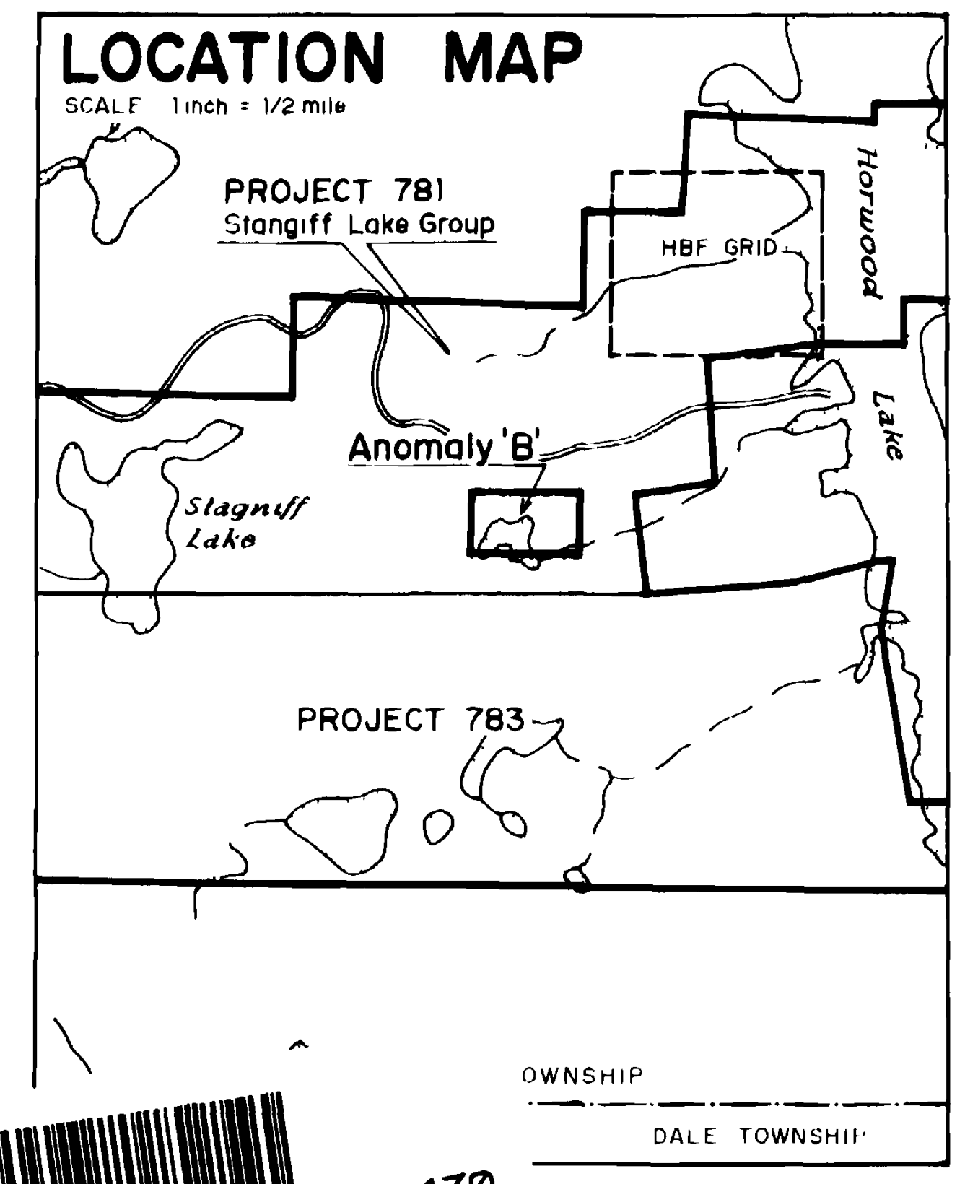
ANOMALY B

MAGNETOMETER SURVEY

Work by	Date	Proj no	Scale 1 1000
Drawn by A R GUNTHER	Date March '82	Rev by	Date

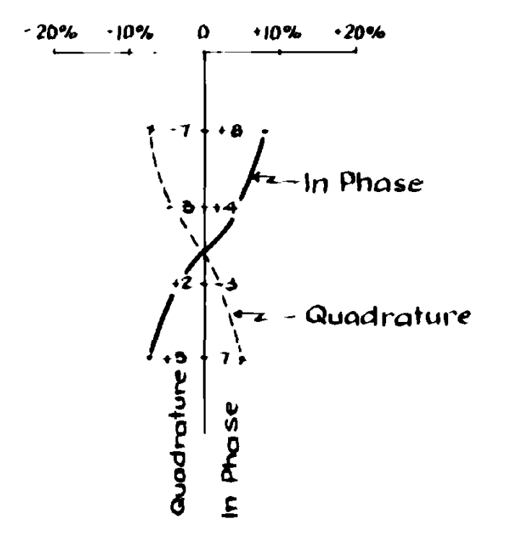
Figure 16

2.5286,6



470

LEGEND

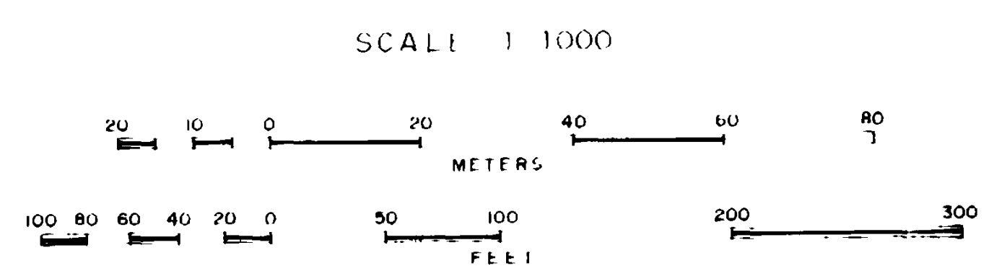


Scale of Profiles 1cm · 10%

Instrument EM · 16

Serial Nº 16,900

Transmitter Station Cutler, Maine



NOTE;
THE CLAIM NUMBER IO
FIG. 13

C. HARPER
8th June 1983

Northgate Exploration Limited

N.T.S

No

STANGIFF LAKE GROUP - PROJECT No. 781

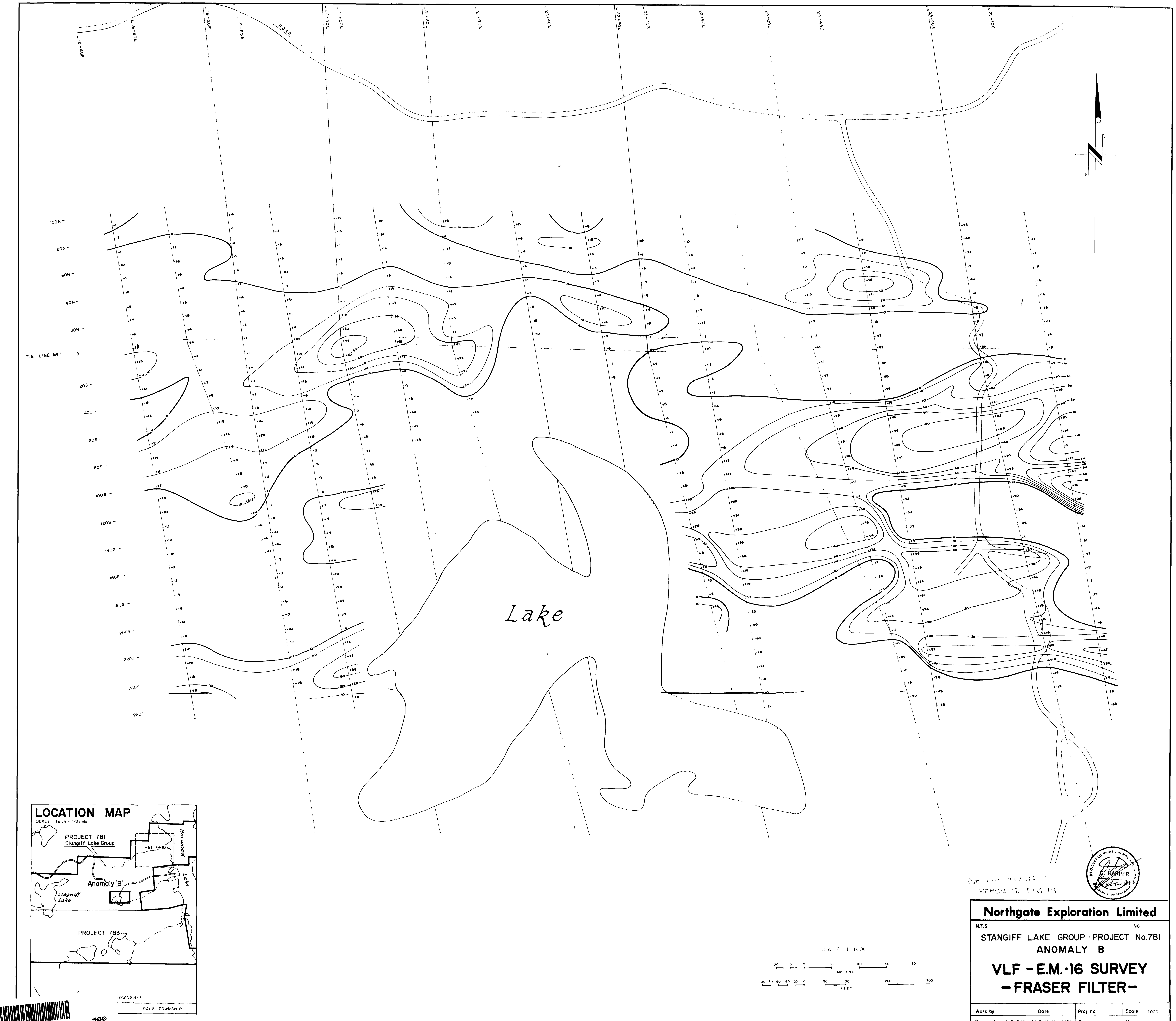
ANOMALY B

VLF - E.M. - 16 SURVEY

Work by	Date	Proj no	Scale 1 1000
Drawn by A R GUNTHER	Date March '82	Rev by	Date

2 5286 17

Figure 17



Note: For claims
Refer to Fig 19

REGISTERED PROFESSIONAL ENGINEER
G. HARPER
8th June 1983.
PROVINCE OF ONTARIO

Northgate Exploration Limited

N.T.S No

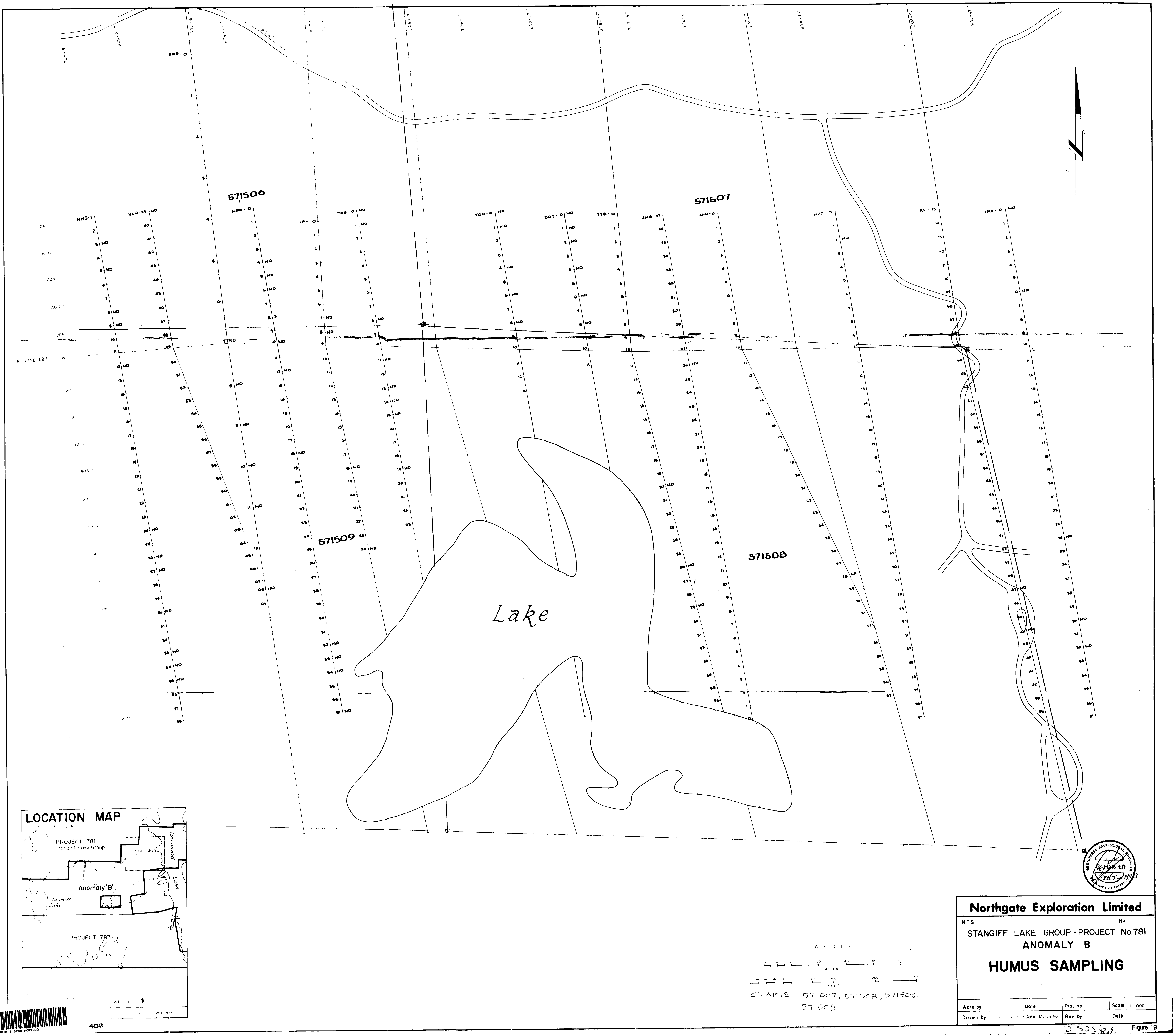
STANGIFF LAKE GROUP - PROJECT No.781
ANOMALY B

VLF - E.M.-16 SURVEY
-FRASER FILTER-

Work by	Date	Proj no	Scale 1 1000
Drawn by A R GUNTHER	Date March '82	Rev by	Date

Figure 18

2 5286 B



CLAIMS 571507, 571508, 571506
571509

G. HARPER
8th June 1983

Northgate Exploration Limited

N.T.S No

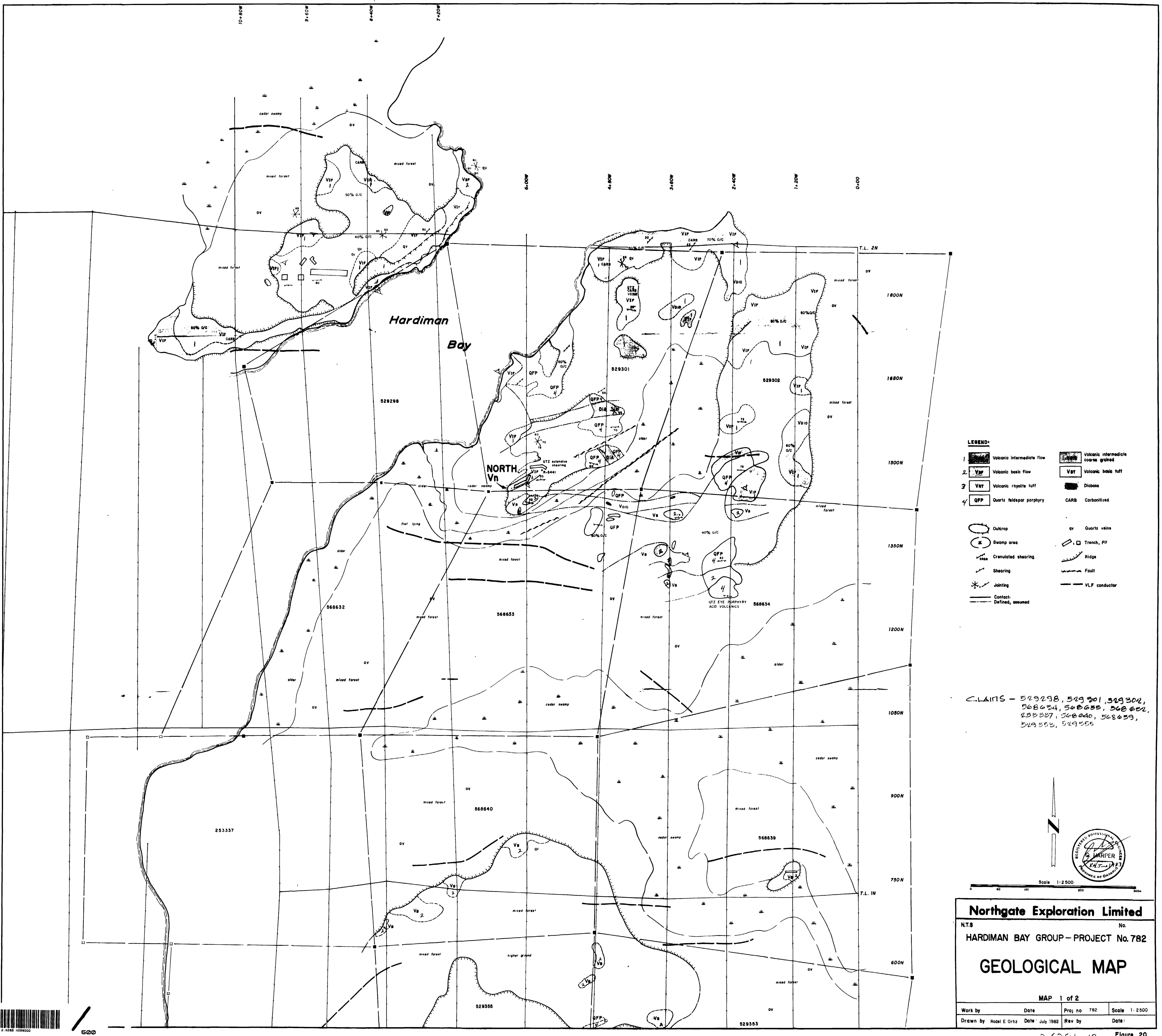
STANGIFF LAKE GROUP - PROJECT No.781
ANOMALY B

HUMUS SAMPLING

Work by	Date	Proj no	Scale 1 1000
Drawn by	Date March 82	Rev by	Date

2.5286.9

Figure 19



CLAIMS - 529298, 529301, 529302, 568634, 568633, 568632, 253337, 568640, 568639, 529353, 529355

G. HARPER
8th June 1983
PROVINCE OF ONTARIO

Northgate Exploration Limited

N.T.S No.

HARDIMAN BAY GROUP – PROJECT No. 782

GEOLOGICAL MAP

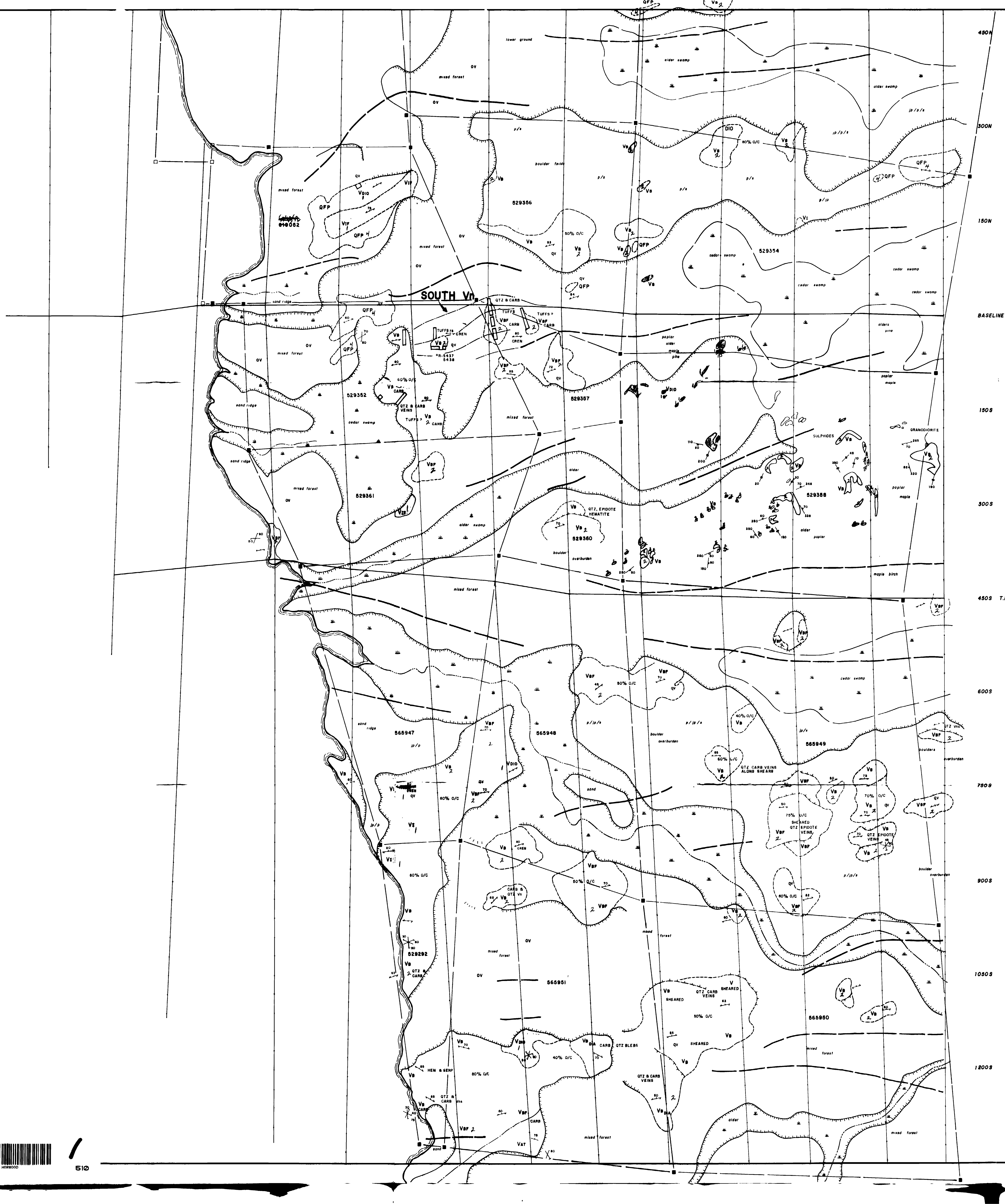
MAP 1 of 2

Work by	Date	Proj no 782	Scale 1 · 2500
Drawn by Rodel E Ortiz	Date · July 1982	Rev by	Date:

2 5286,10

Figure 20

500



LEGEND:

1	VIF	Volcanic intermediate flow	VDIO	Volcanic intermediate coarse grained
2	VBF	Volcanic basic flow	VBT	Volcanic basic tuff
3	VRT	Volcanic rhyolite tuff	DIA	Diabase
4	QFP	Quartz feldspar porphyry	CARB	Carbonitized

	Outcrop	qv	Quartz veins
	Swamp area		Trench, Pit
CREN	Crenulated shearing		Ridge
	Shearing		Fault
	Jointing		VLF conductor
	Contact Defined, assumed		

CLAIMS - 619052, 529356, 529354,
529358, 529357, 529352,
529361, 529360, 565949
565948, 565947, 565951,
565950

N

G. HARPER
8th June 1983

Scale 1:2500
0 50 100 200 300m

Northgate Exploration Limited

N.T.S No.

HARDIMAN BAY GROUP – PROJECT No. 782

GEOLOGICAL MAP

MAP 2 of 2

Work by	Date	Proj no 782	Scale 1 2500
Drawn by Rodel E Ortiz	Date July 1982	Rev by	Date

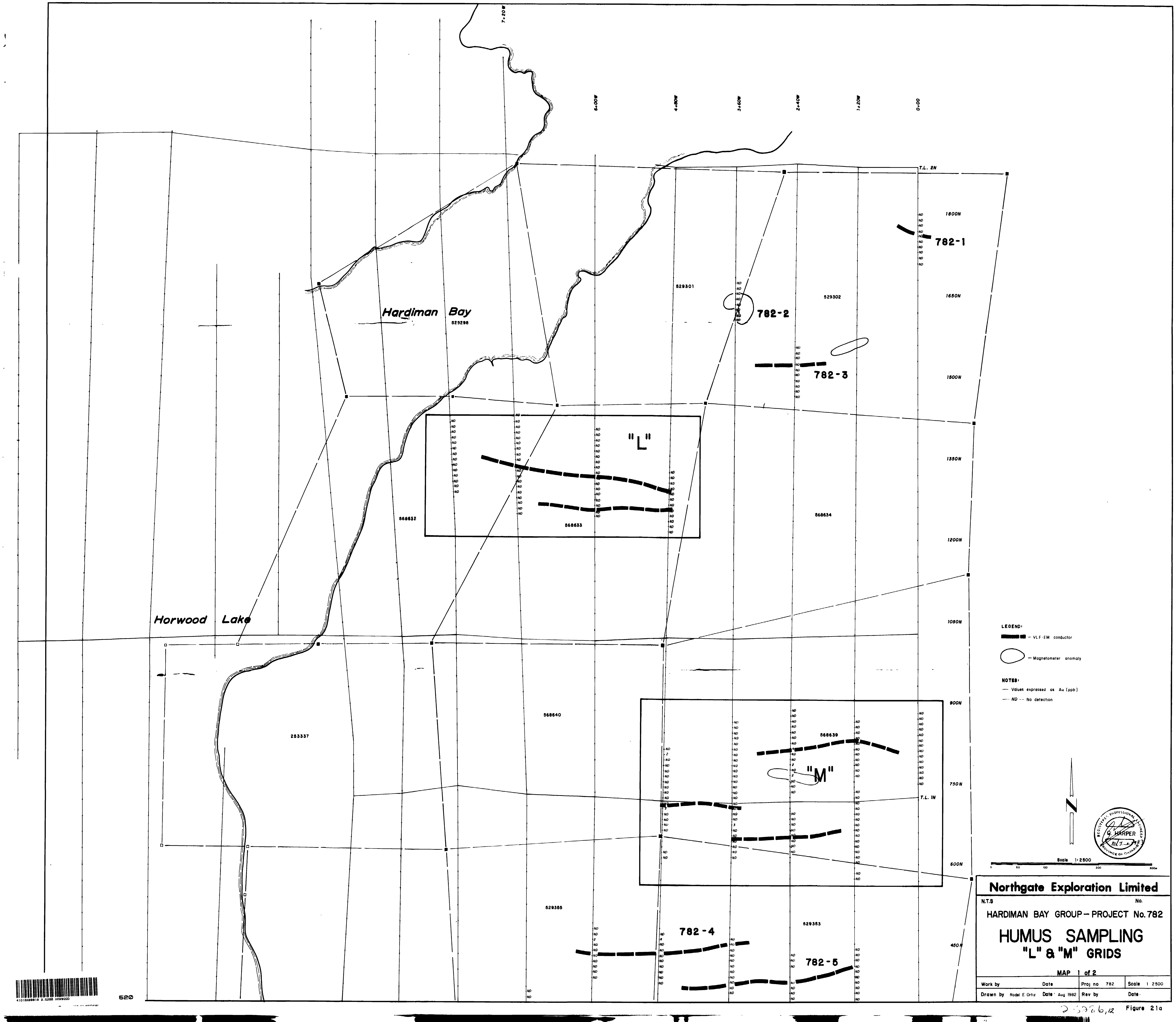
2.5286,11

Figure 20

41O16NW0018 2.5286 HORWOOD

1

510



LEGEND:

▬ — VLF-EM conductor

◯ — Magnetometer anomaly

NOTES:

— Values expressed as Au (ppb)

— ND -- No detection

G. HARPER
8th June 1983

Scale 1:2500

0 50 100 200 300m

Northgate Exploration Limited

N.T.S No.

HARDIMAN BAY GROUP – PROJECT No. 782

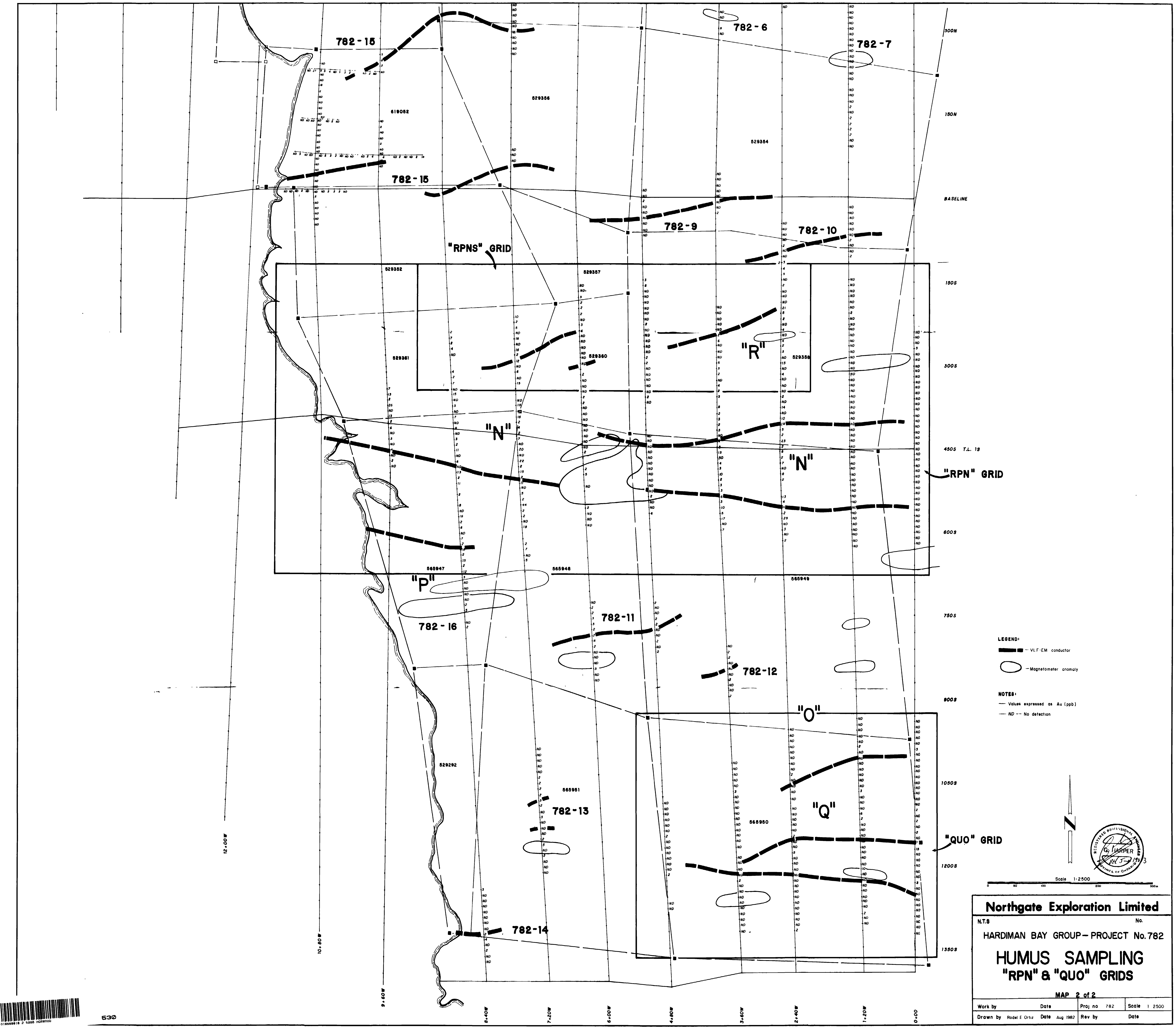
HUMUS SAMPLING
"L" & "M" GRIDS

MAP 1 of 2

Work by	Date	Proj no 782	Scale 1 2500
Drawn by Rodel E Ortiz	Date: Aug 1982	Rev by	Date:

2.5286,12

Figure 21a



LEGEND:

▬ — VLF-EM conductor

◯ — Magnetometer anomaly

NOTES:

— Values expressed as Au (ppb)

— ND -- No detection

REGISTERED PROFESSIONAL ENGINEER
G. HARPER
PROVINCE OF ONTARIO
8th June 1983

Scale 1:2500

Northgate Exploration Limited

N.T.S No.

HARDIMAN BAY GROUP — PROJECT No. 782

HUMUS SAMPLING
"RPN" & "QUO" GRIDS

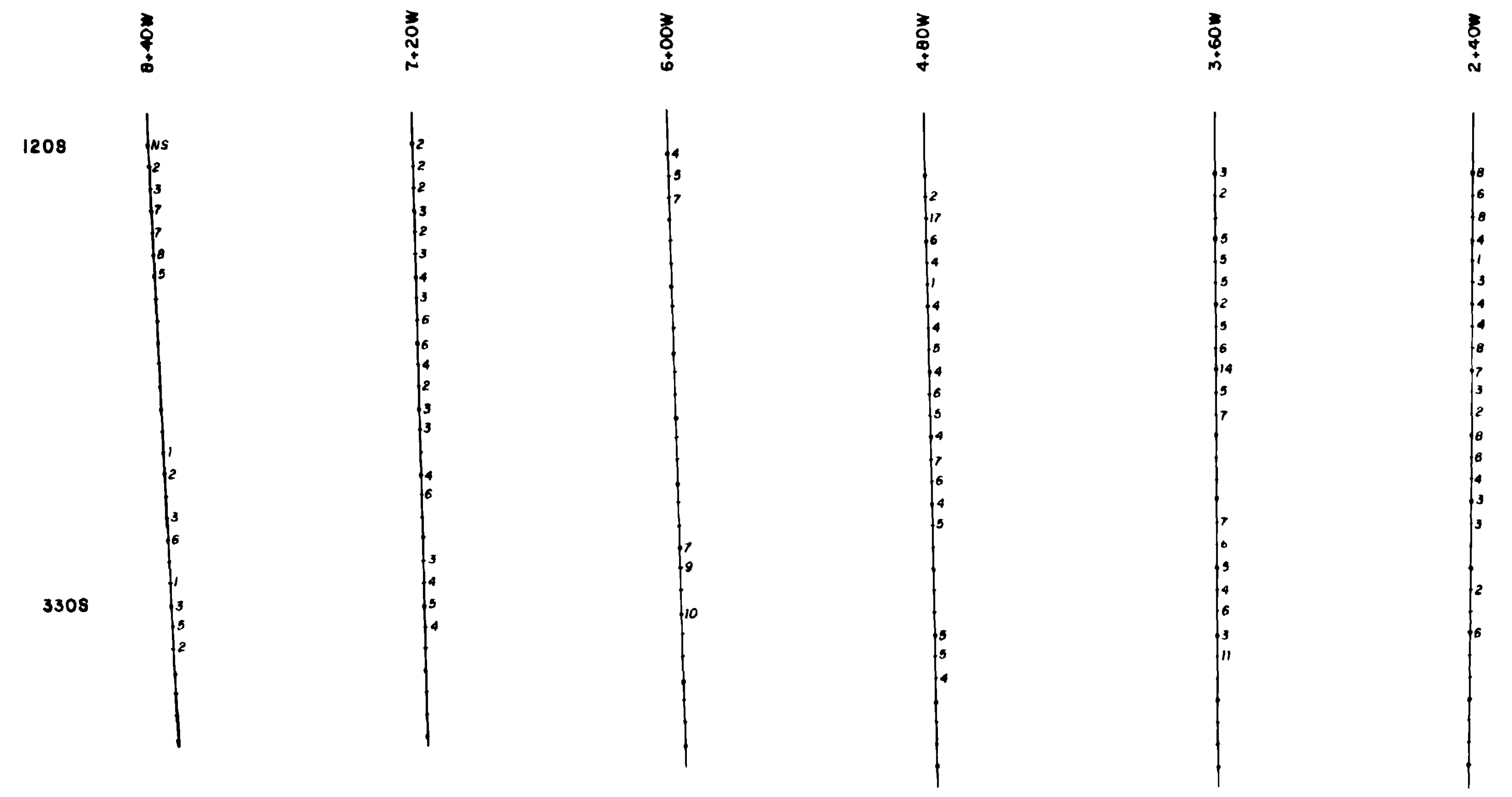
MAP 2 of 2

Work by	Date	Proj no 782	Scale 1 2500
Drawn by Rodel E Ortiz	Date Aug 1982	Rev by	Date

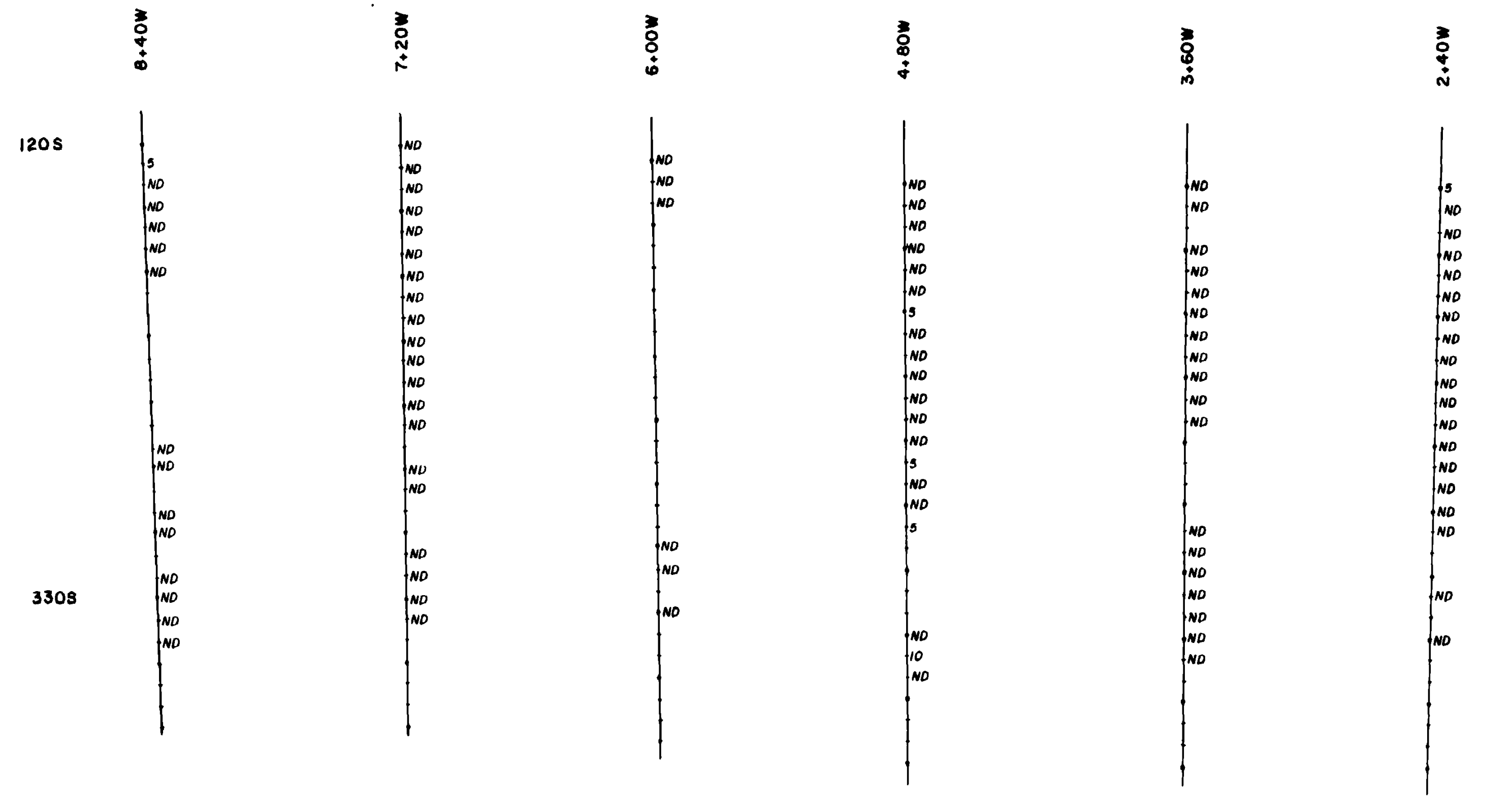
D.2.2.6,12

Figure 21b

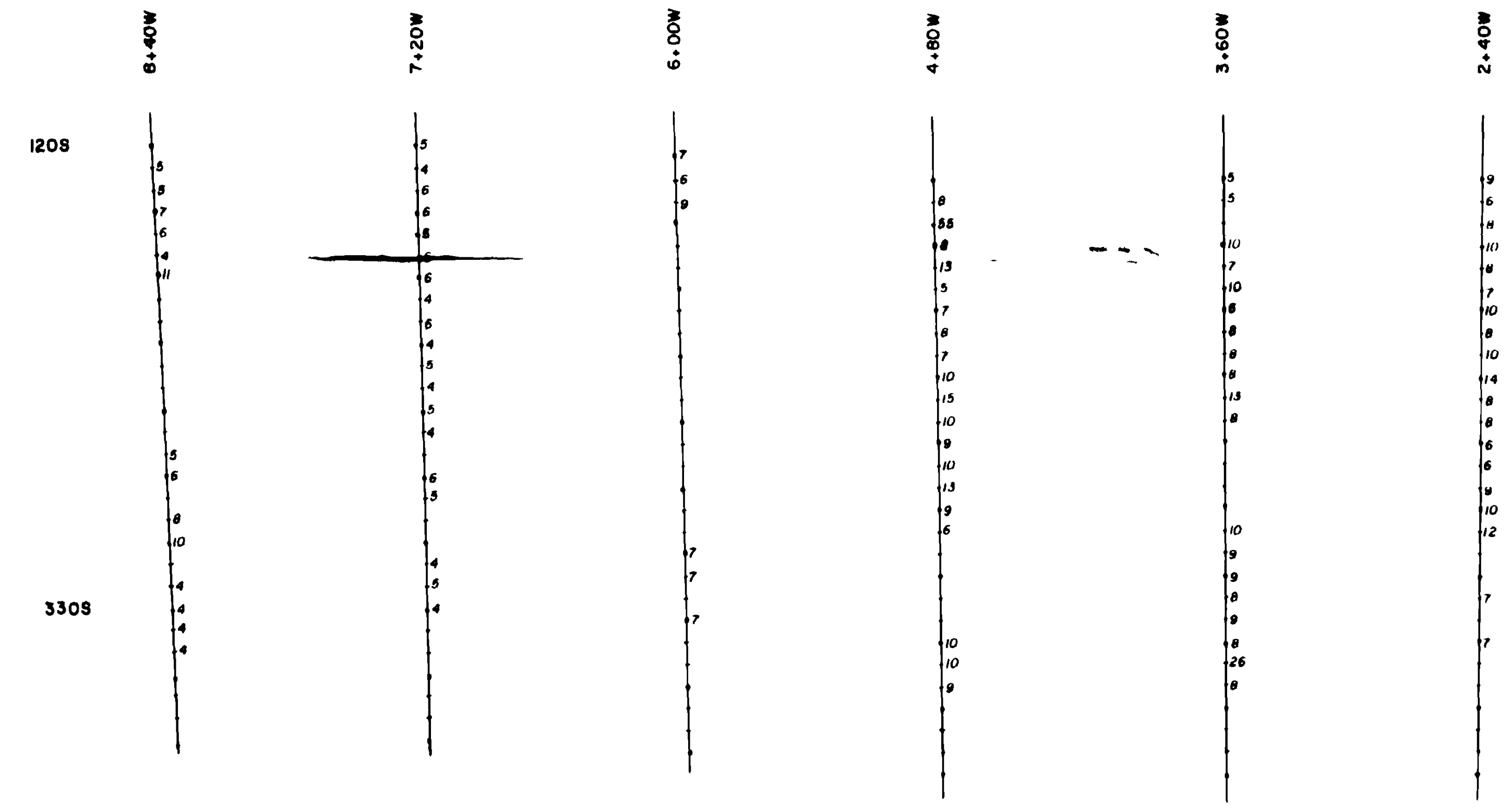
530



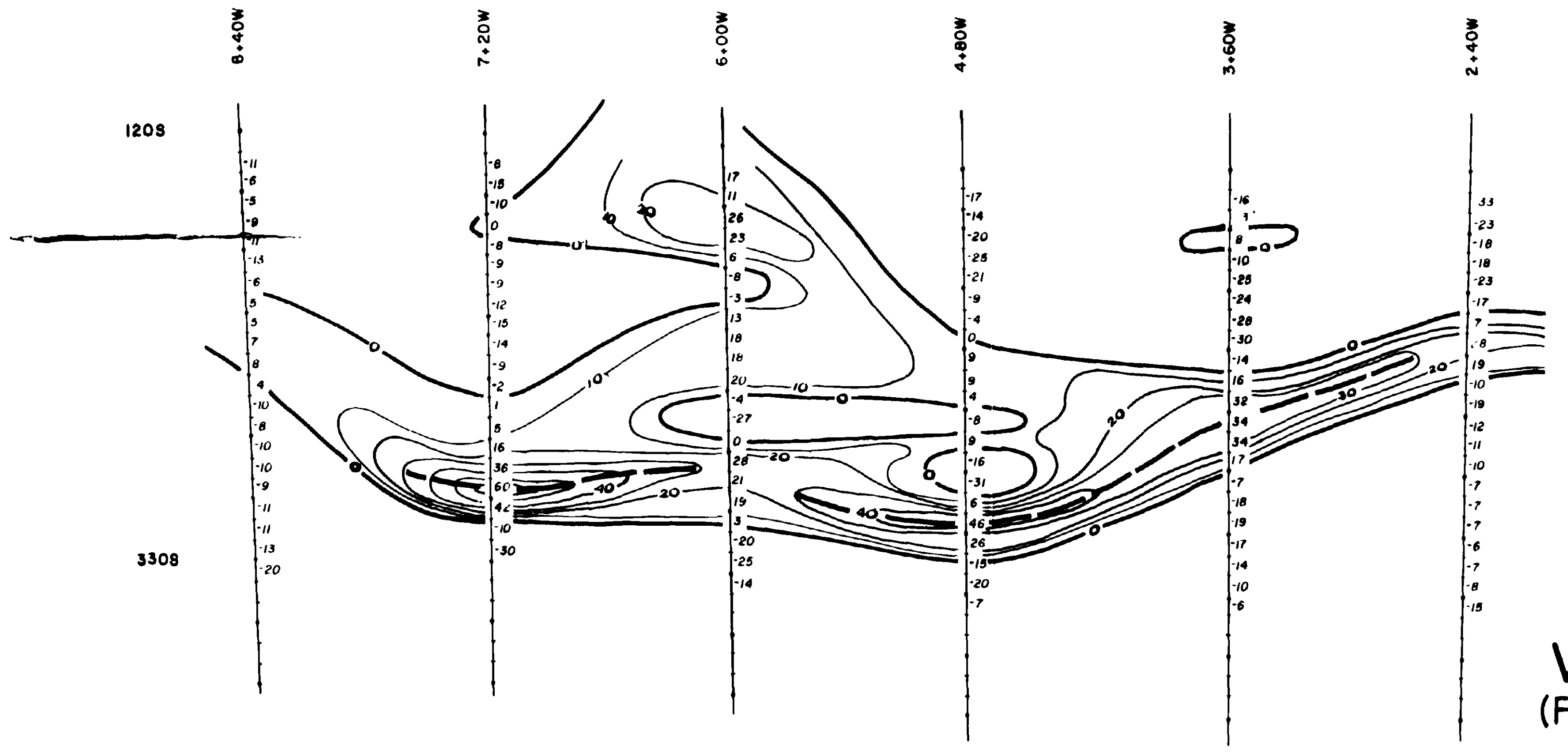
COPPER (ppm)



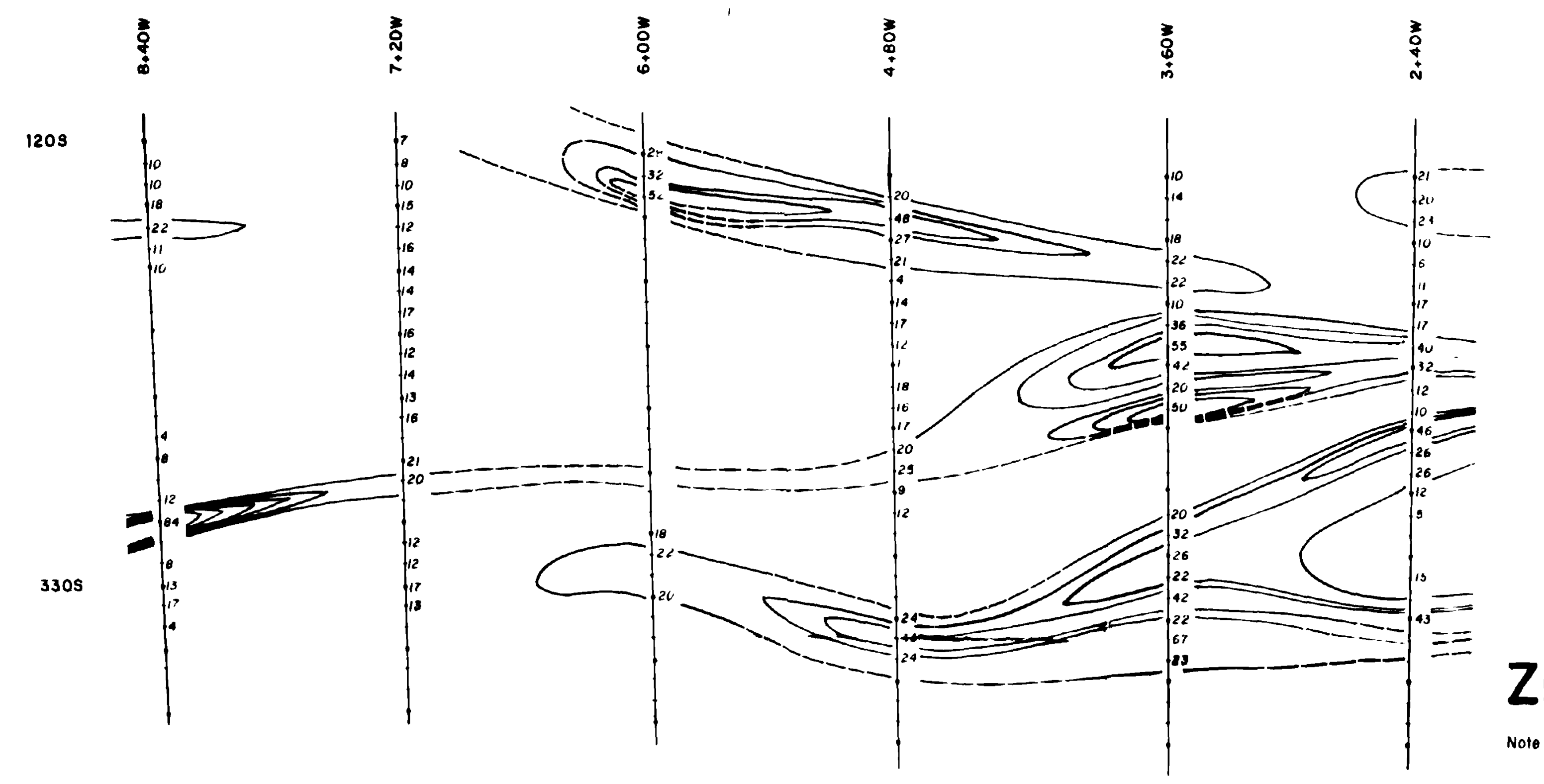
GOLD (ppb)



LEAD (ppm)

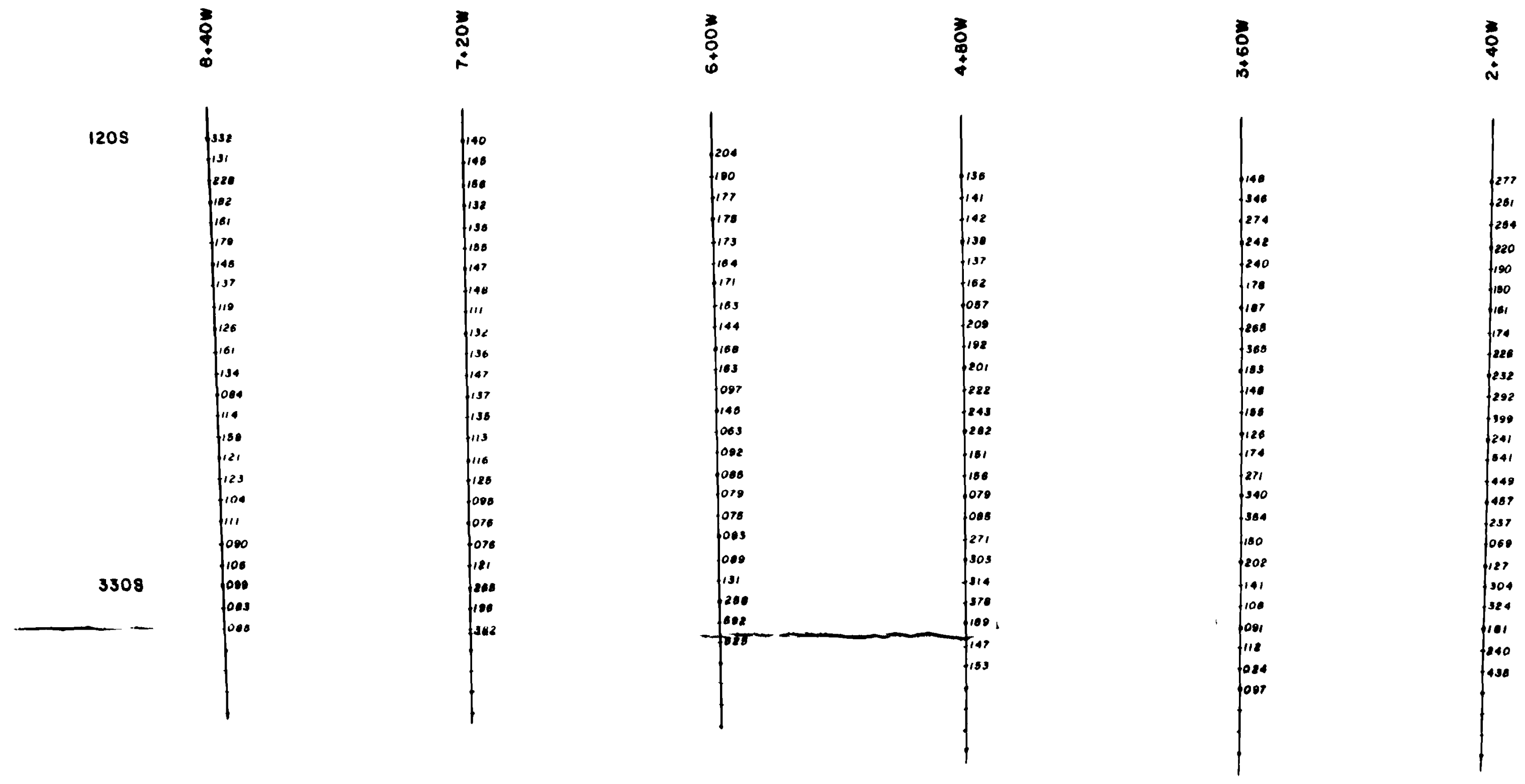


VLF - EM
(Fraser Filter)



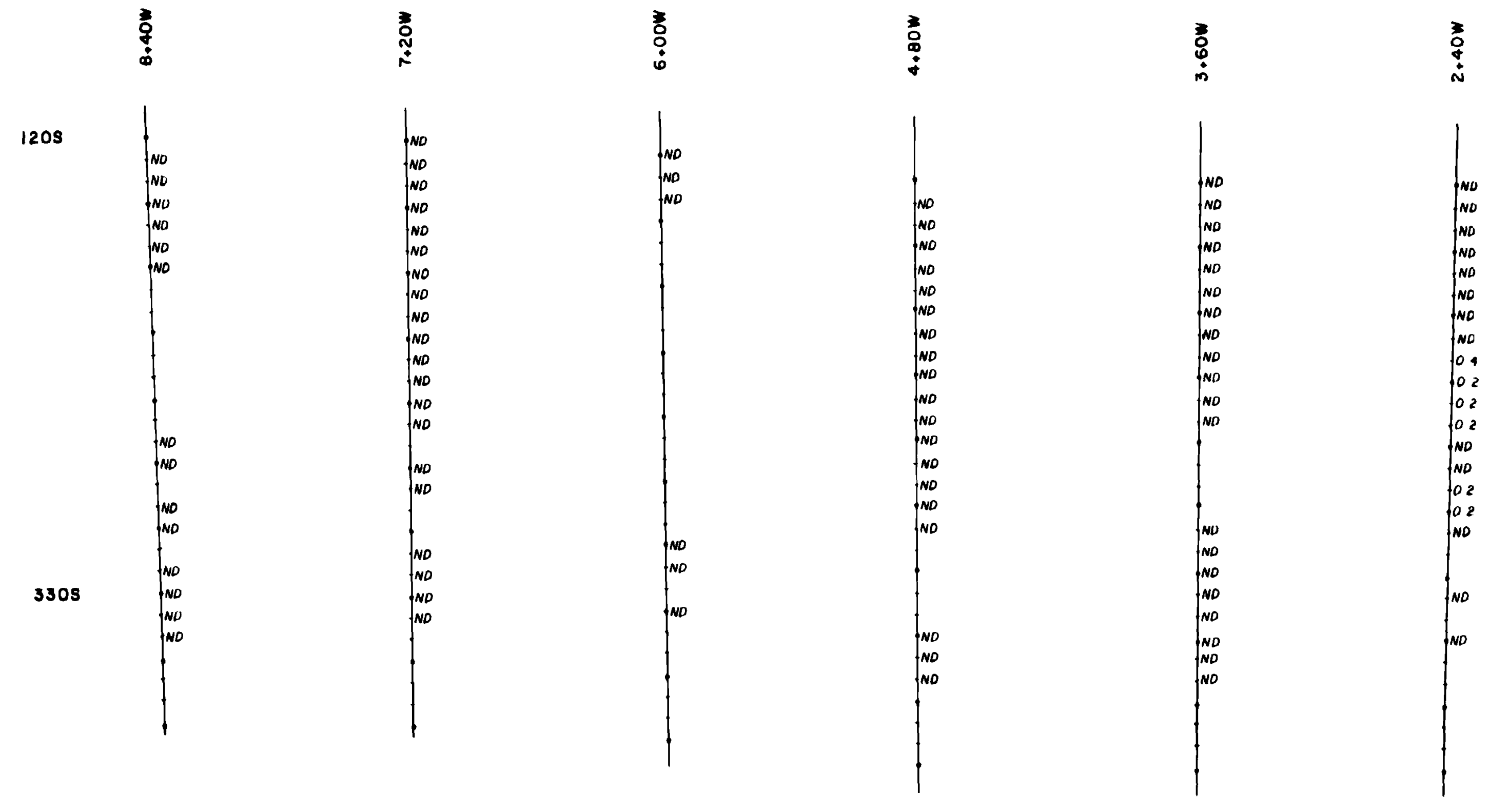
ZINC (ppm)

Note Contour interval every 10ppm

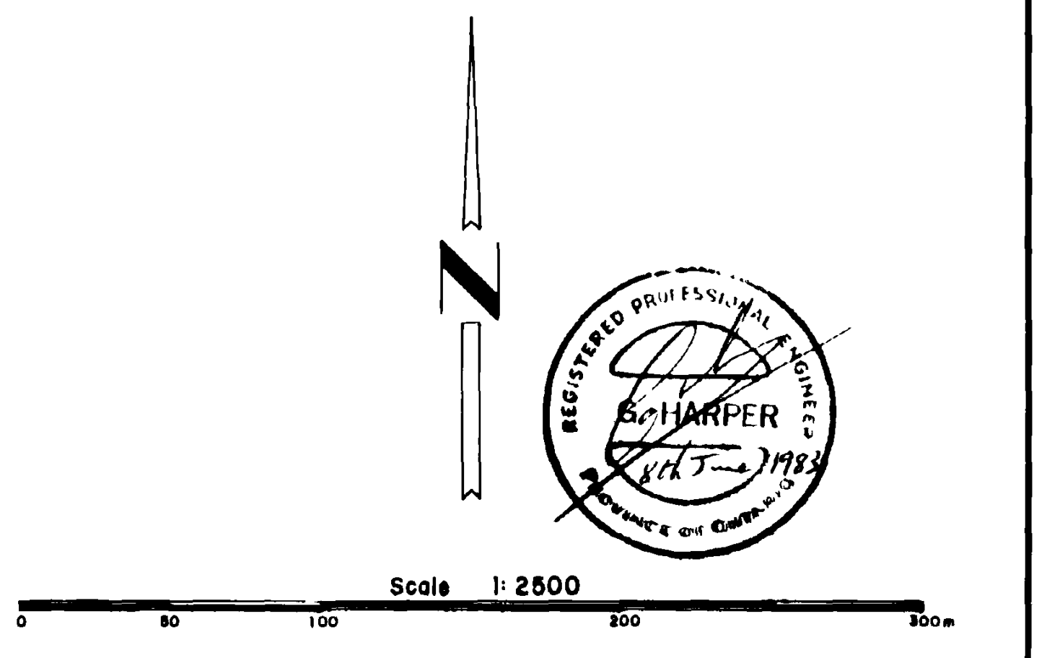


MAGNETOMETER

Note Add 59000gammas to all readings



SILVER (ppm)



HARPER

8th June 1983

NOTE: FOR CLAIMS
REFER TO FIG 21b
(MAP 2 OF 2)

Northgate Exploration Limited

N.T.S
No.

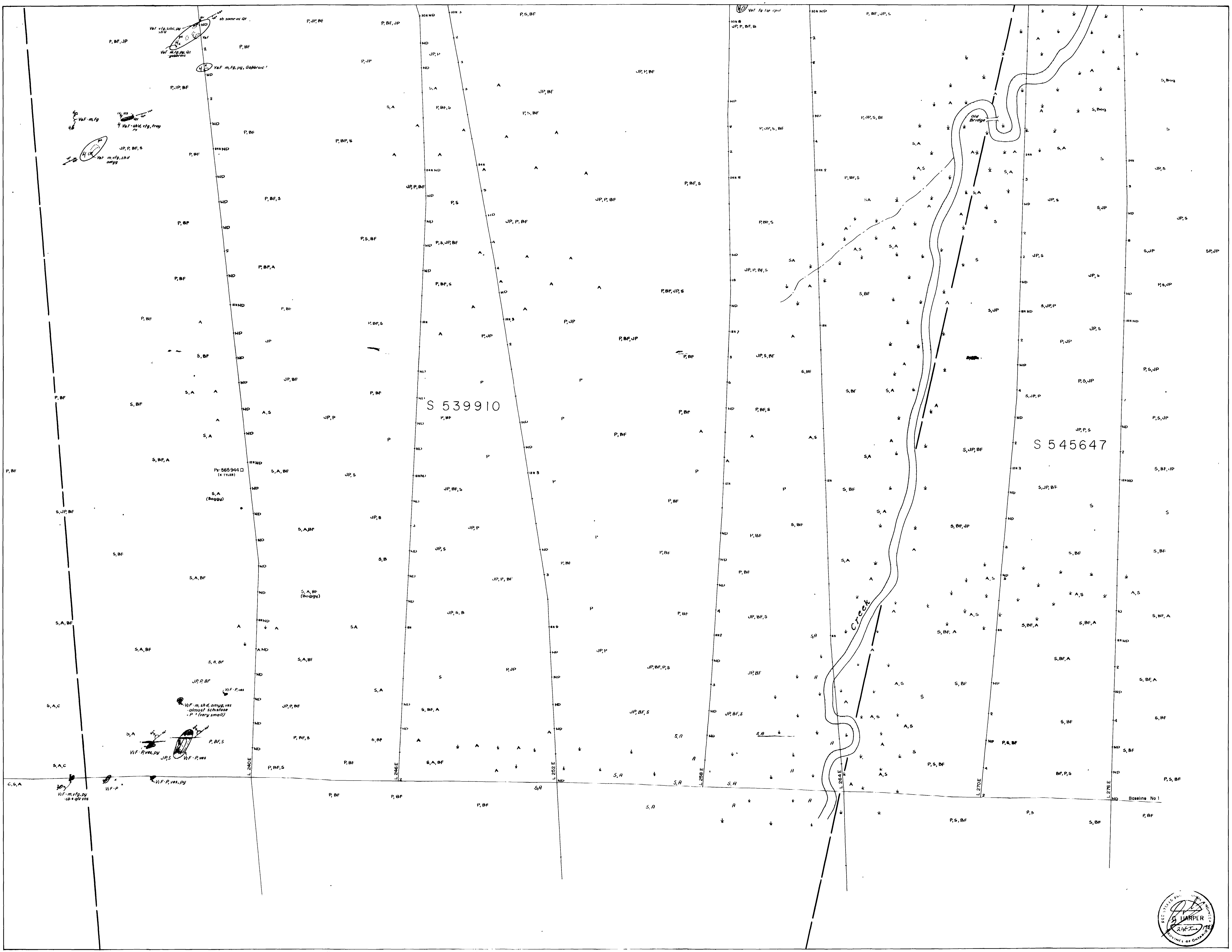
HARDIMAN BAY GROUP – PROJECT No. 782

GEOCHEMISTRY
& GEOPHYSICS
"RPNS" GRID

Work by	Date	Proj no 782	Scale 1 2500
Drawn by Rodel E Ortiz	Date Aug 1982	Rev by	Date

2.28614

Figure 22



SHEET KEY

SHEET 6	SHEET 5
SHEET 4	SHEET 3
SHEET 2	SHEET 1

LEGEND

PRECAMBRIAN

INTRUSIVES

QIP	Quartz Eye Porphyry
GD	Granite Dyke
GAB	Gabbro

METAVOLCANICS

1	V	Metavolcanics Unsubdivided
2	V_A	Acid Volcanics
3	V_I	Intermediate Volcanics
4	V_B	Basic Volcanics

ABBREVIATIONS

GENERAL

T	Tuff
F	Flow
P	Pillow
M	Massive
amyg	Amygdules
bx	Breccia
sh'd	Sheared
fg,mg,cg	Fine, medium, coarse grained
v	Very
vn	Vein
px	Poor exposure
silic	Silicified
fsp	Feldspar
cb	Carbonate
qtz	Quartz
Ves	Vesicular

TREE TYPES

S	Spruce
P	Poplar
C	Cedar
BF	Balsam Fir
JP	Jack Pine
WP	White Pine
B	Birch
A	Alder

COLOURS

d	Dark
gr	Green
gy	Grey
bl	Black
br	Brown
W	White

SYMBOLS

Contact Known, Assumed

Shear - inclined, Vertical

Jointing

Pillows - with top indicator and strike

o G-701 Sample Location and Number

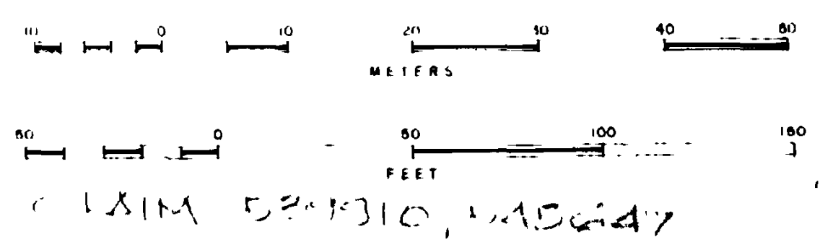
Outcrop Area with good exposure

Outcrop - Small

Swamp

ND Not Detected
ND
5
7 Gold Assay in ppb

SCALE 1 600



CLAIM 539910, 545647

Northgate Exploration Limited

N.T.S No

OROFINO PROJECT - № 783
OLD GRID
DETAIL GEOLOGY

25286,15

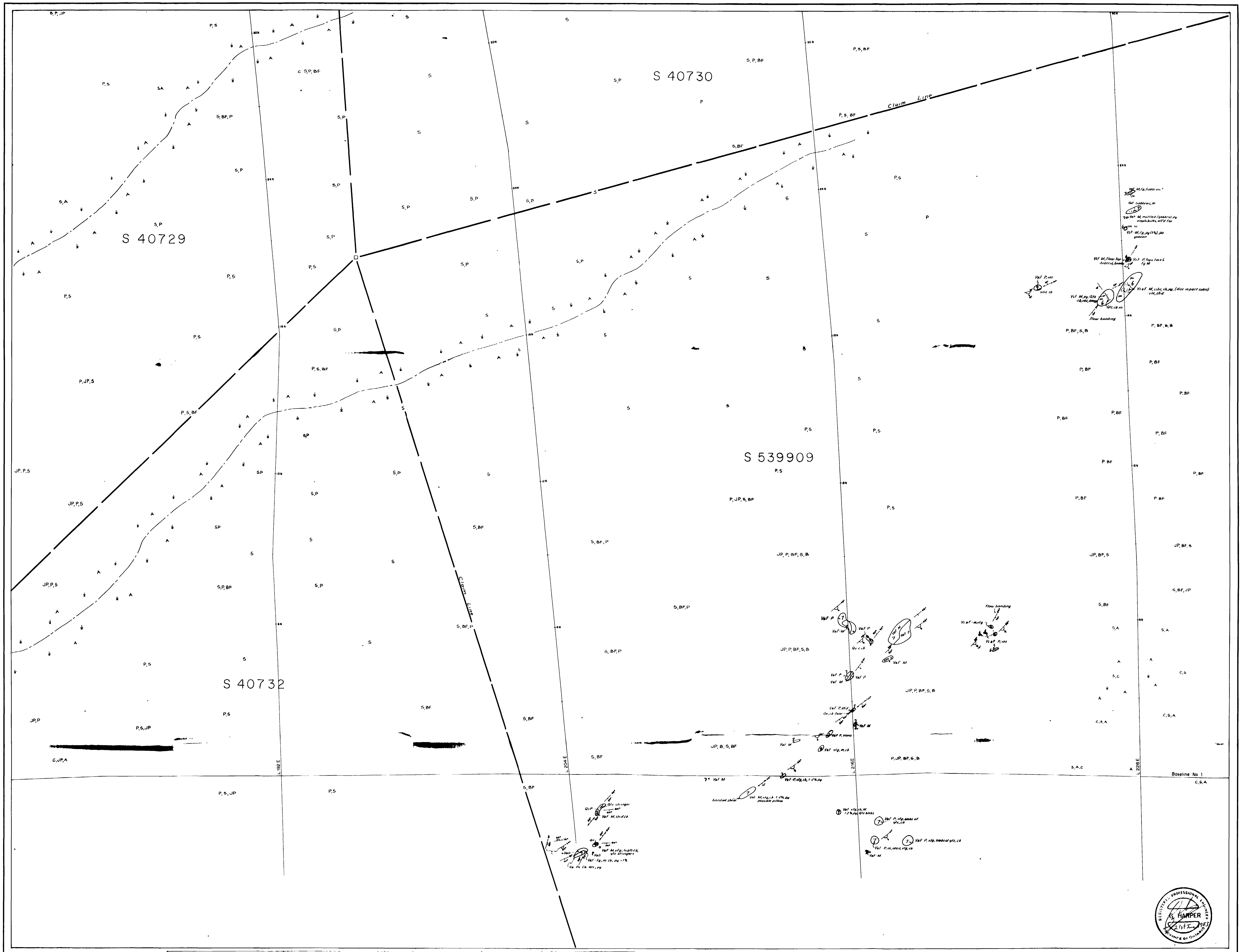
SHEET 1

Work by S CONQUER	Date July, 1981	Proj no 783	Scale 1 600
Drawn by A R GUNTHER	Date Nov, 1981	Rev by	Date

G HARPER
24th June 1983

Figure 23

550



G. HARPER
21st June 1983

SHEET KEY

SHEET 6	SHEET 5
SHEET 4	SHEET 3
SHEET 2	SHEET 1

LEGEND

PRECAMBRIAN

INTRUSIVES

- 1 QIP Quartz Eye Porphyry
- 2 GD Granite Dyke
- 3 GAB Gabbro

METAVOLCANICS

- 4 V Metavolcanics Unsubdivided
- 5 V_A Acid Volcanics
- 6 V_I Intermediate Volcanics
- 7 V_B Basic Volcanics

ABBREVIATIONS

GENERAL

T	Tuff
F	Flow
P	Pillow
M	Massive
amyg	Amygdules
bx	Breccia
sh'd	Sheared
fg,mg,cg	Fine, medium, coarse grained
v	Very
vn	Vein
px	Poor exposure
silic	Silicified
fsp	Feldspar
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qtz	Quartz
Ves	Vesicular

TREE TYPES

S	Spruce
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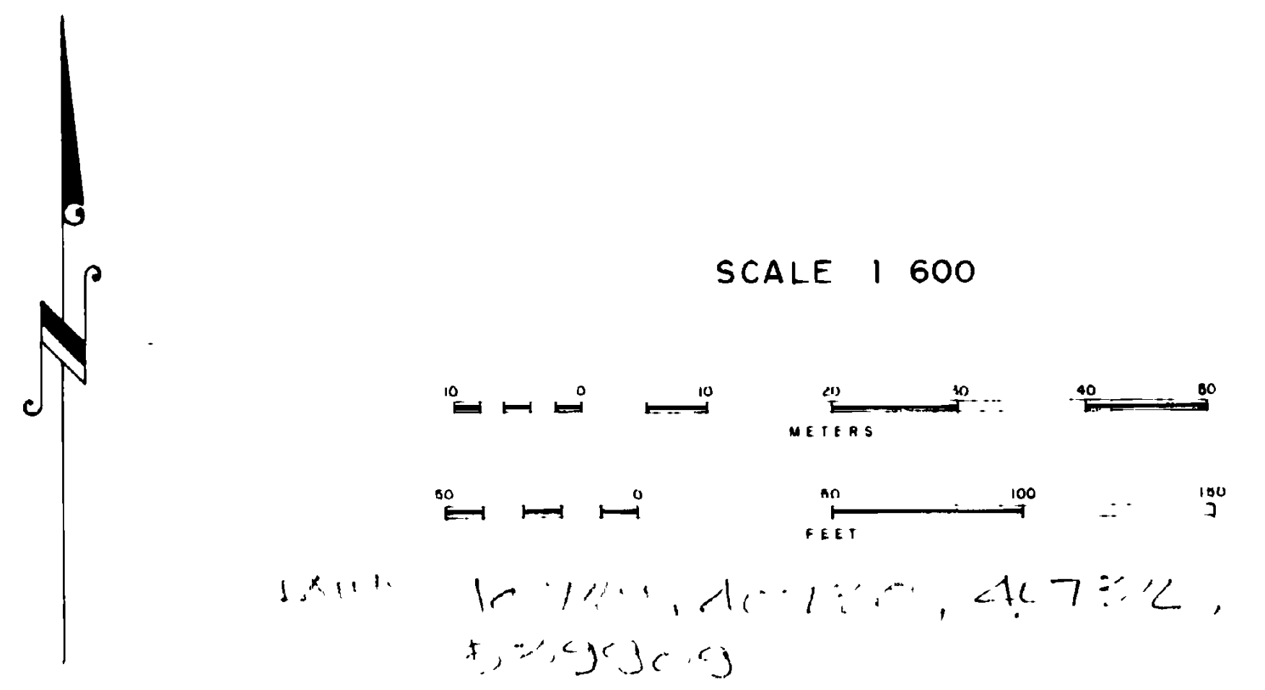
BF	Balsam Fir
JP	Jack Pine
WP	White Pine
B	Birch
A	Alder

COLOURS

d	Dark
gr	Green
gy	Grey
bl	Black
br	Brown
W	White

SYMBOLS

- Contact - Known, Assumed
- Shear - Inclined, Vertical
- Jointing
- Pillows with top indicator and strike
- ○ G-701 Sample Location and Number
- Outcrop Area with good exposure
- ✕ Outcrop - Small
- Swamp



[illegible] 40729, 40730, 40732, 539909

Northgate Exploration Limited

N.T.S No

OROFINO PROJECT - Nº 783

OLD GRID

DETAIL GEOLOGY

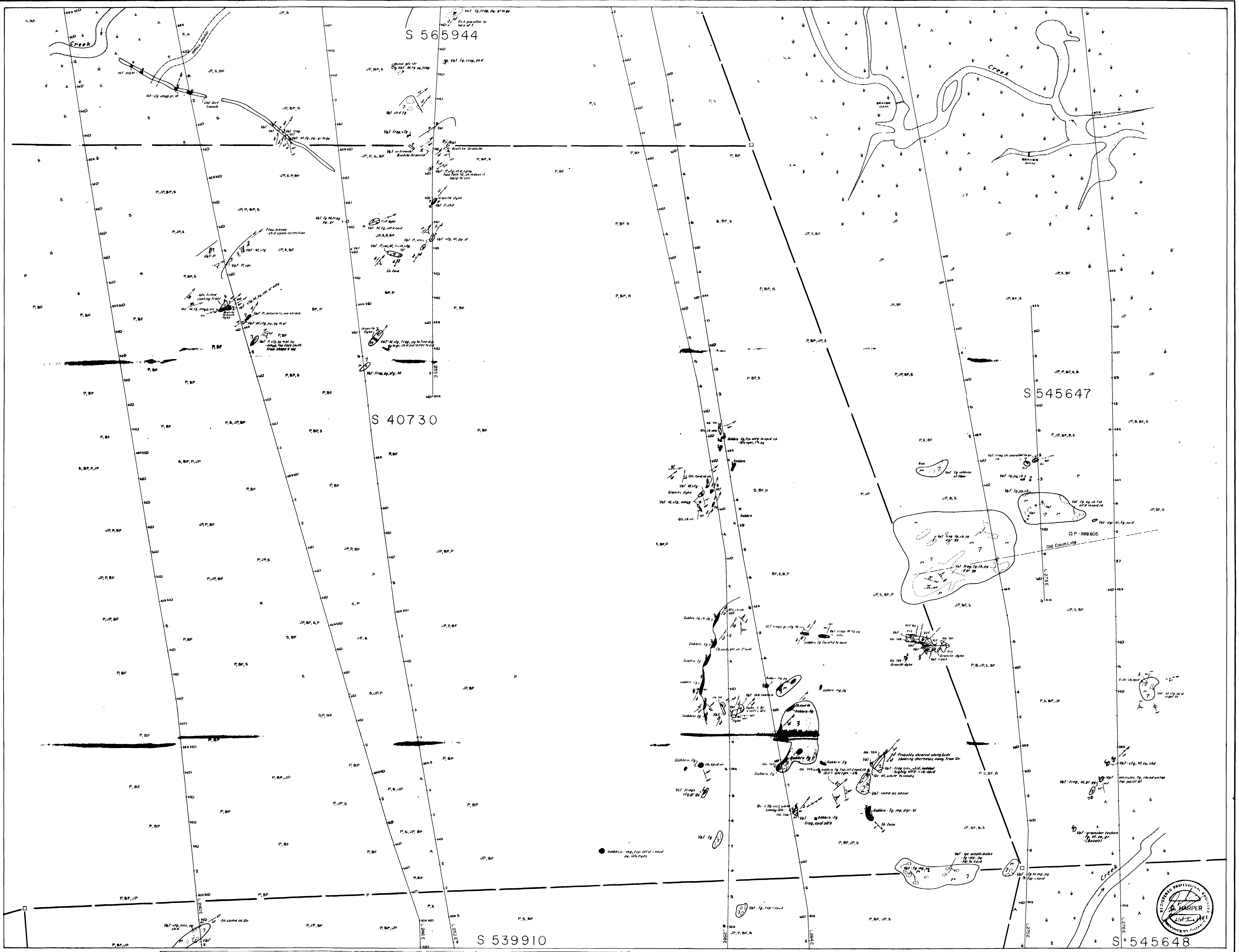
2.5286, 16

SHEET 2

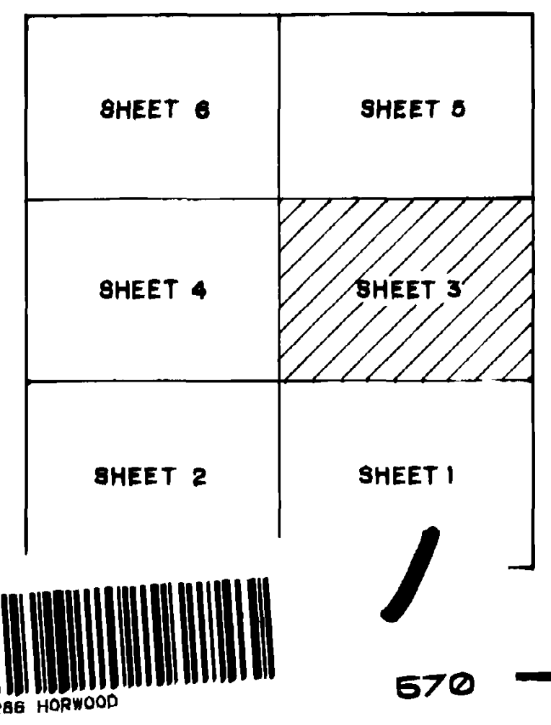
Work by S CONQUER	Date July, 1981	Proj no 783	Scale 1 600
Drawn by A R GUNTHER	Date Nov, 1981	Rev by	Date

Figure 23

580



SHEET KEY



LEGEND

PRECAMBRIAN

INTRUSIVES

1	QIP	Quartz Eye Porphyry
2	GD.	Granite Dyke
3	■	Gabbro

METAVOLCANICS

4	V	Metavolcanics Unsubdivided
5	V_A	Acid Volcanics
6	V_I	Intermediate Volcanics
7	V_B	Basic Volcanics

ABBREVIATIONS

GENERAL

T	Tuff
F	Flow
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M	Massive
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fsp	Feldspar
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8 qtz	Quartz
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TREE TYPES

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WP	White Pine
B	Birch
A	Alder

COLOURS

d	Dark
gr	Green
gy	Grey
bl	Black
br	Brown
W	White

SYMBOLS

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Shear - Inclined, Vertical

Jointing

Pillows - with top indicator and strike

o G-701 Sample Location and Number

Outcrop Area with good exposure

× Outcrop - Small

Swamp

ND Not Detected

5 Gold Assay in ppb

SCALE 1:600

10 0 10 20 30 40 50 METERS

50 0 50 100 150 FEET

Cl... 565944, 40730, 545647
545648, 539910

Northgate Exploration Limited

N.T.S No.

OROFINO PROJECT - Nº 783
OLD GRID

DETAIL GEOLOGY

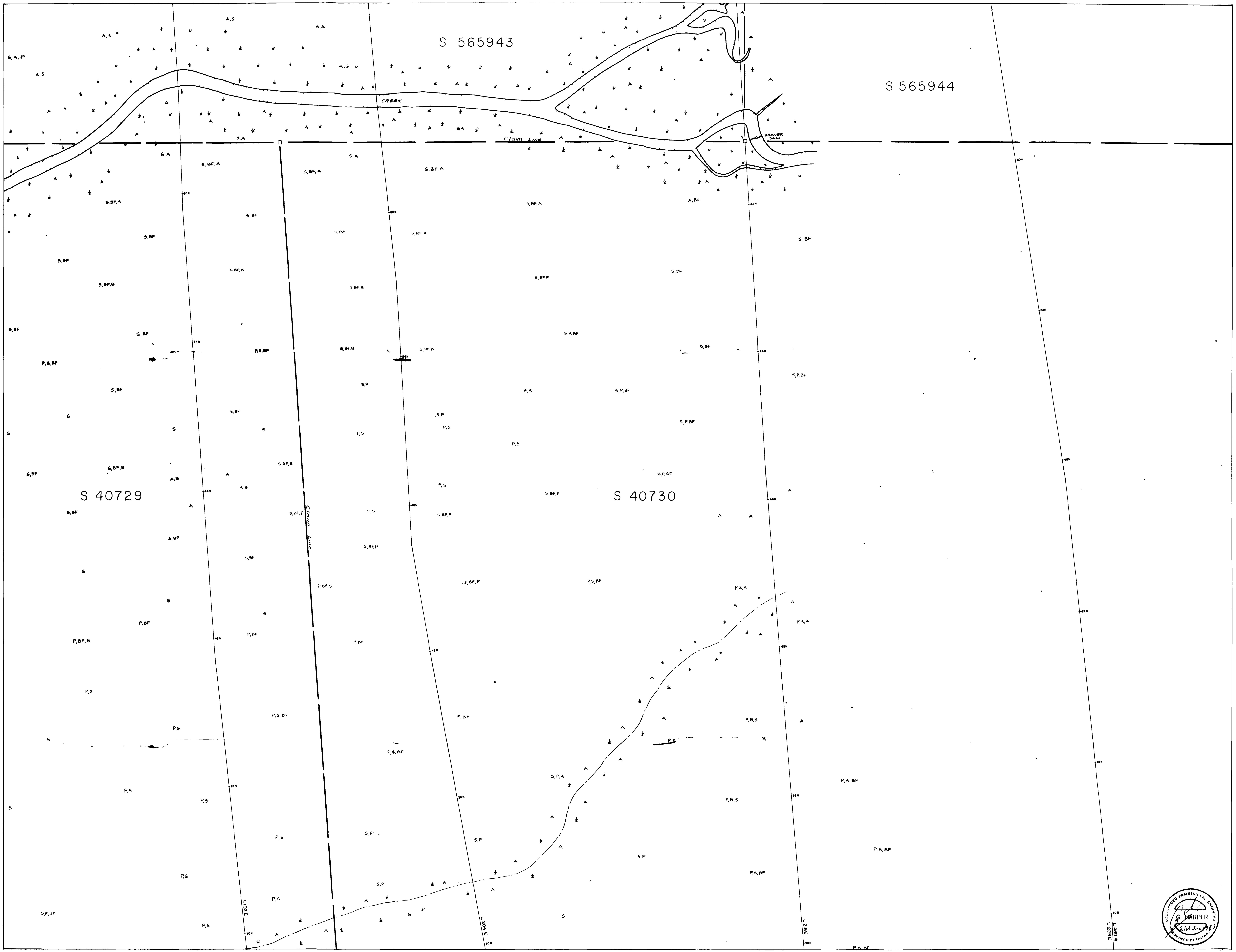
2.5286, 17

SHEET 3

Work by S CONQUER	Date July,1981	Proj no 783	Scale 1:600
Drawn by A R GUNTHER	Date Nov,1981	Rev by	Date

Figure 23

670



SHEET KEY

SHEET 6	SHEET 5
SHEET 4	SHEET 3
SHEET 2	SHEET 1

LEGEND

PRECAMBRIAN

INTRUSIVES

QIP	Quartz Eye Porphyry
GD	Granite Dyke
GAB	Gabbro

METAVOLCANICS

V	Metavolcanics Unsubdivided
V_A	Acid Volcanics
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V_B	Basic Volcanics

ABBREVIATIONS

GENERAL

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F	Flow
P	Pillow
M	Massive
amyg	Amygdules
bx	Breccia
sh'd	Sheared
fg,mg,cg	Fine, medium, coarse grained
v	Very
vn	Vein
px	Poor exposure
silic	Silicified
fsp	Feldspar
cb	Carbonate
qtz	Quartz
Ves	Vesicular

TREE TYPES

S	Spruce
P	Poplar
C	Cedar
BF	Balsam Fir
JP	Jack Pine
WP	White Pine
B	Birch
A	Alder

COLOURS

d	Dark
gr	Green
gy	Grey
bl	Black
br	Brown
W	White

SYMBOLS

	Contact - Known, Assumed
	Shear - Inclined, Vertical
	Jointing
	Pillows - with top indicator and strike
O G-701	Sample Location and Number
	Outcrop Area with good exposure
✗	Outcrop - Small
	Swamp

SCALE 1 600

CLAIMS 565943, 565944,
40729, 40730.

G. HARPER
21st June 1983

Northgate Exploration Limited

N.T.S

No.

OROFINO PROJECT - № 783

OLD GRID

DETAIL GEOLOGY

2 5286,18

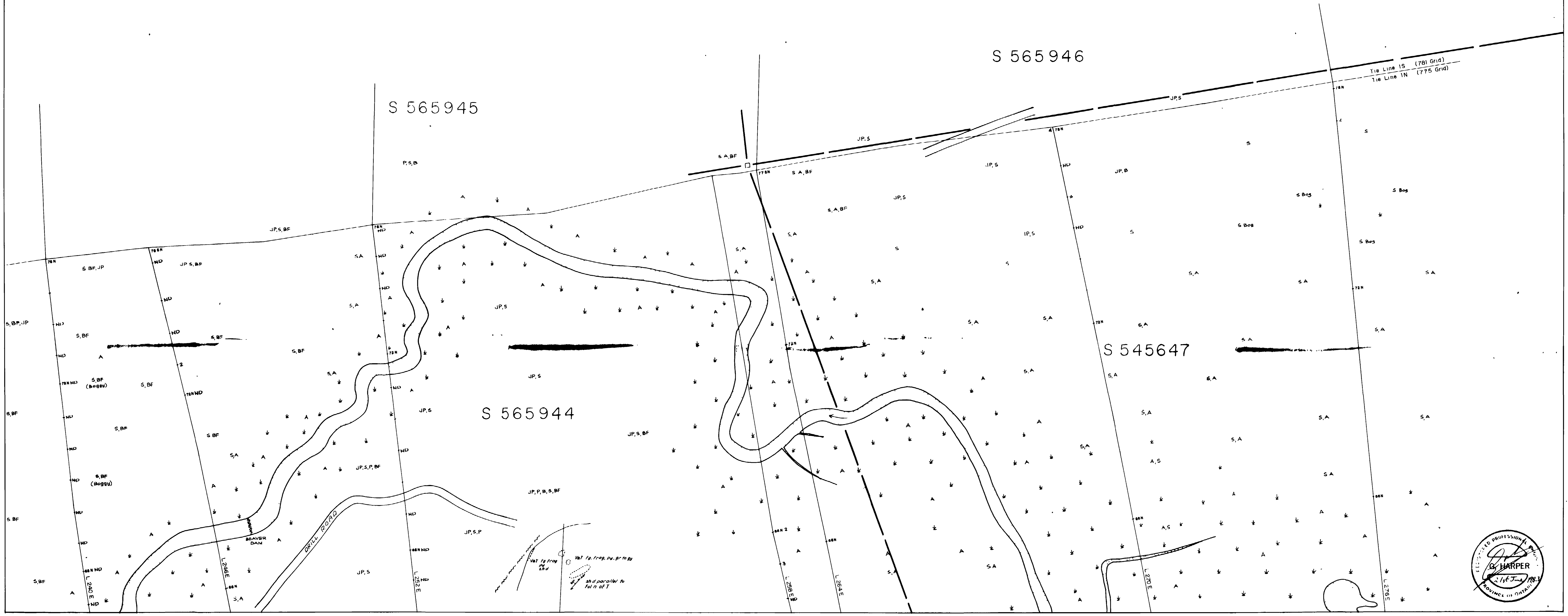
SHEET 4

Work by S CONQUER	Date July,1981	Proj no 783	Scale 1 600
Drawn by A R GUNTHER	Date Nov,1981	Rev by	Date

Figure 23

41016NW0018 2 5286 HORWOOD

580



SHEET KEY

SHEET 6	SHEET 5
SHEET 4	SHEET 3
SHEET 2	SHEET 1

41016NW0018 2.5286 HORWOOD

590

LEGEND

PRECAMBRIAN

INTRUSIVES

QIP	Quartz Eye Porphyry
GD	Granite Dyke
GAB	Gabbro

METAVOLCANICS

V	Metavolcanics Unsubdivided
V_A	Acid Volcanics
V_I	Intermediate Volcanics
V_B	Basic Volcanics

ABBREVIATIONS

GENERAL

T	Tuff
F	Flow
P	Pillow
M	Massive
amyg	Amygdules
bx	Breccia
sh'd	Sheared
fg,mg,cg	Fine,medium,coarse grained
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SYMBOLS

Contact - Known, Assumed

Shear - Inclined, Vertical

Jointing

Pillows - with top indicator and strike

O G-701 Sample Location and Number

Outcrop Area with good exposure

× Outcrop - Small

Swamp

ND Not Detected

ND

5

7 Gold Assay in ppb

SCALE 1 600

10 0 10 20 30 40 50 METERS

50 0 50 100 150 FEET

CLAIMS 565944, 565647

Northgate Exploration Limited

N.T.S No.

OROFINO PROJECT - Nº 783

OLD GRID

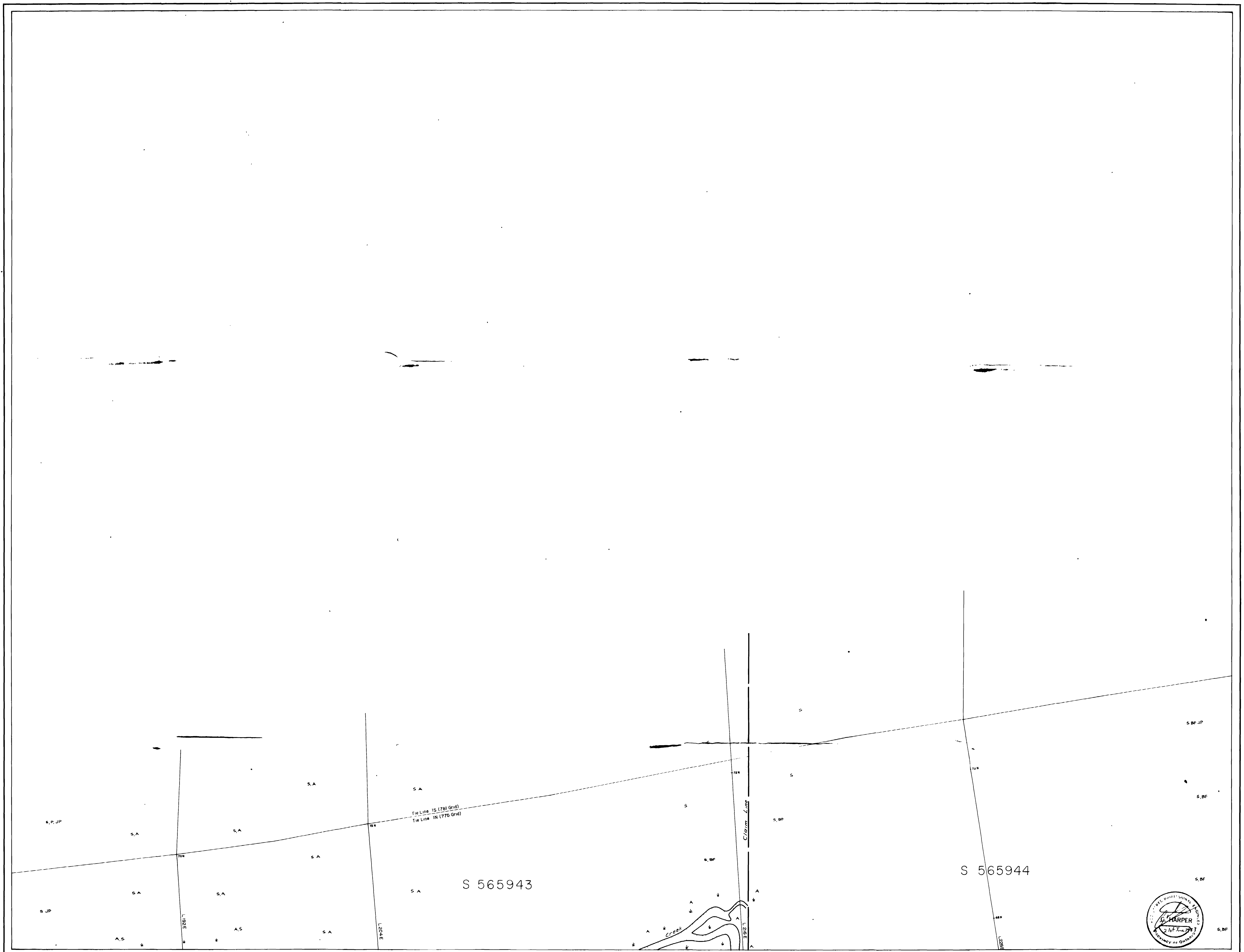
DETAIL GEOLOGY

2.5286,19

SHEET 5

Work by S CONQUER	Date July,1981	Proj no 783	Scale 1 600
Drawn by A R GUNTHER	Date Nov,1981	Rev by	Date

Figure 23



G. HARPER
21st June 1983

SHEET KEY

SHEET 6 ▨	SHEET 5
SHEET 4	SHEET 3
SHEET 2	SHEET 1

LEGEND

PRECAMBRIAN

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COLOURS

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bl	Black
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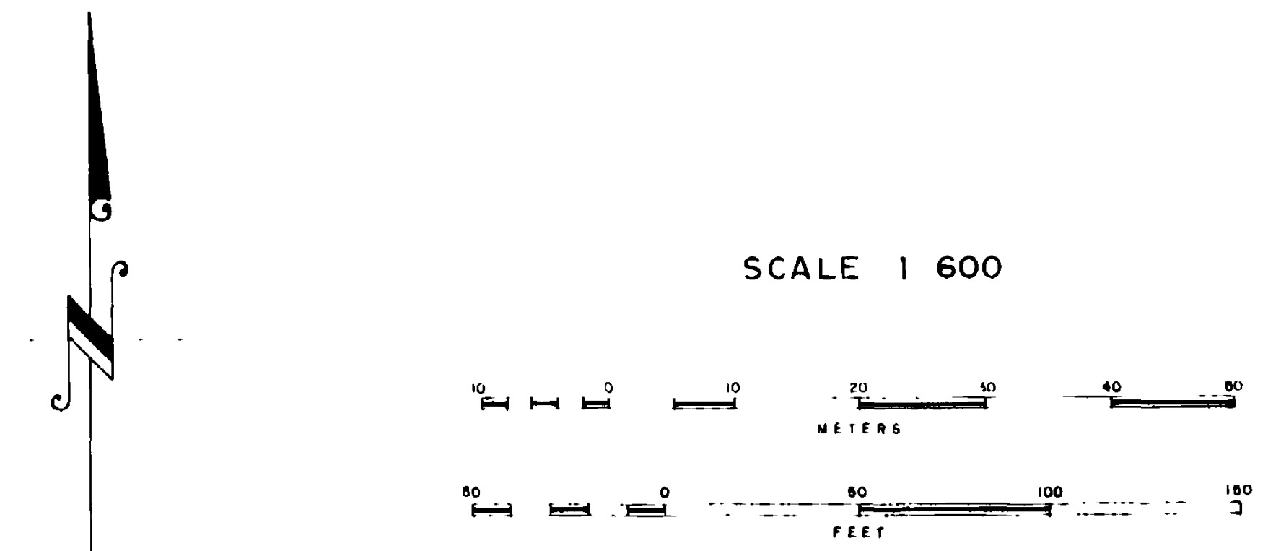
SYMBOLS

⁄⁄	Contact - Known, Assumed
⁄	Shear - Inclined, Vertical
⁄	Jointing
⁄	Pillows - with top indicator and strike
○ G 701	Sample Location and Number
◌	Outcrop Area with good exposure
×	Outcrop - Small
⁎	Swamp



CLAIMS 565944, 565943

Northgate Exploration Limited

N.T.S No.

OROFINO PROJECT - № 783
OLD GRID

DETAIL GEOLOGY

SHEET 6

Work by S CONQUER Date July, 1981	Proj no 783	Scale 1 600
Drawn by A R GUNTHER Date Nov, 1981	Rev by	Date

2.5286, 20

Figure 23

600