MAP NO.: 106 D 1	ASSESSMENT REPORT X PROSPECTUS CONFIDENTIAL X OPEN FILE	DOCUMENT NO: 092682 MINING DISTRICT: Mayo TYPE OF WORK: Geology, Geochem., Geophys.,DD

REPORT FILED UNDER: NDU Resources Inc.\ Cameco

DATE PERFORMED: June 6-Oct 28, 1988 — DATE FILED: March 3, 1989

LOCATION: LAT.: 64° 01' N — AREA: Patterson Range

LONG.: 134° 28' W — VALUE $: 153 250.00

CLAIM NAME & NO.:

TUDL 1-32	YA 76768-YA 76799
MARG 1-144	YB 2385-YB 2528
MARG 145-178	YB 2580-YB 2613
MARG 179-190	YB 2944-YB 2955

WORK DONE BY: R. Cathro

WORK DONE FOR: NDU Resources Inc.\Cameco

DATE TO GOOD STANDING:

REMARKS: #3 MARG

ARCHER, CATHRO
& ASSOCIATES (1981) LIMITED
CONSULTING GEOLOGICAL ENGINEERS

1016 - 510 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 1L8
(604) 688-2568

SUMMARY REPORT

1988 FIELD PROGRAM

MARG PROPERTY, YUKON

Latitude 64°01'N; Longitude 134°28'W

NTS 106D/1

NDU RESOURCES LTD.
CAMECO (FORMERLY SMD MINING CO. LTD.)

R.J. Cathro, B.A.Sc., P.Eng.

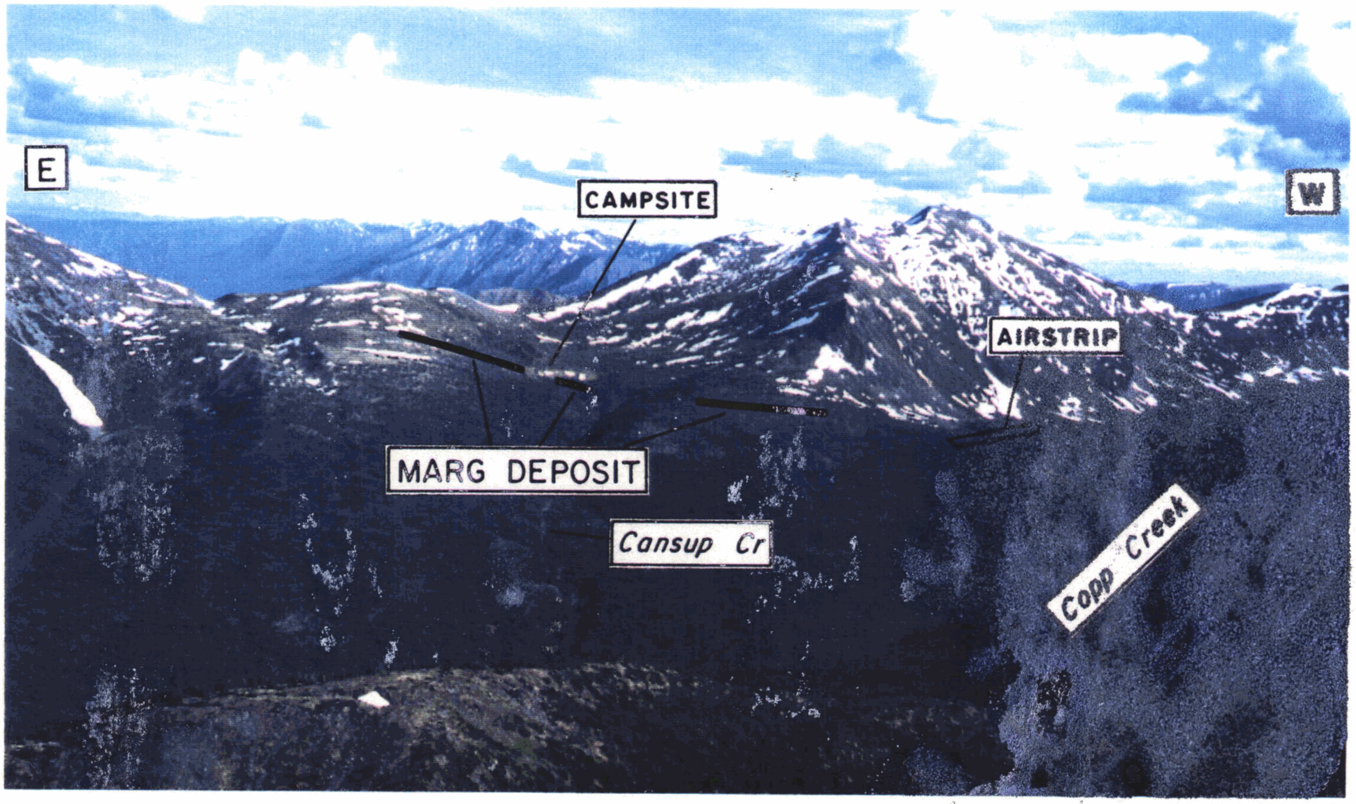
December, 1988

Field work performed between June 6 and October 28, 1988

BOX 4127, 3125 THIRD AVENUE, WHITEHORSE, Y.T. Y1A 3S9 (403) 667-4415

This report has been examined by
the Geological Evaluation Unit
under Section 53 (4) Yukon Quartz
Mining Act and is allowed as
[illegible]ntation [illegible] the amount
[illegible] 153 [illegible] 00

for [illegible] Bar[illegible]
[illegible] ation and
[illegible] Commissioner



Photograph 1: Aerial view looking south towards Marg deposit, June 28, 1988

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SUMMARY AND RECOMMENDATIONS

During 1988, initial drill testing of soil geochemical and electromagnetic anomalies resulted in the discovery of a new volcanogenic massive sulphide deposit on the Marg property, Yukon. The $1,600,000 program was funded jointly by NDU Resources Ltd. (2/3) and Cameco (formerly SMD Mining Co. Ltd. - 1/3) and included 6037.5 m (19,808 feet) of diamond drilling in 33 holes. The program was conceived and managed by Archer, Cathro & Associates (1981) Limited, with guidance in the late stages by Noranda Exploration Company, which acquired an option in August to earn control of NDU.

The new Marg discovery is already the largest volcanogenic massive sulphide deposit found in Yukon and is only exceeded in size and grade by a few deposits in British Columbia or Alaska. It also represents significant exploration potential because it lies in a belt of rocks that previously was not considered to have potential for this type of mineralization. The difficulty of recognizing strongly weathered mineralization of this type is demonstrated by the twenty-three year delay in locating a near-surface deposit that was clearly pinpointed by an intense stream sediment anomaly published on a Geological Survey of Canada (GSC) map in 1965.

The mineralization is a typical fine-grained, polymetallic, volcanogenic assemblage comprised principally of pyrite with significant amounts of sphalerite, chalcopyrite and galena, and lesser amounts of arsenopyrite and tetrahedrite. The valuable sulphides occur as an interstitial matrix component within an aggregate of pyrite cubes. Non-sulphide gangue is primarily quartz with minor carbonate, muscovite and barite.

The deposit is a tabular body hosted by interlayered and intensely deformed quartz-muscovite and quartz-graphite phyllite. It is isoclinally folded near its midpoint with the two limbs striking roughly parallel at surface but showing increasing divergence at depth because of dip changes. Both limbs trend easterly and dip south, while the deposit as a whole plunges southeasterly about the fold axis. The footwall fold limb dips 55 to 60° while the hangingwall limb dips flatter, from 40 to 55°.

A mineral reserve assessment carried out independently at the end of the drill program by consulting engineer, J.P. Franzen, P.Eng., produced the following results:

Cutoff Grade Cu+Pb+Zn	Tonnes*	Cu %	Pb %	Zn %	Cu+Pb+Zn %	Ag opt	Au opt
0	2,097,000	1.90	2.60	4.99	9.49	1.87	0.028
6%	1,922,000	1.97	2.72	5.19	9.88	1.97	0.030
8%	1,568,000	2.11	2.82	5.59	10.52	1.96	0.030
10%	994,000	2.48	3.03	6.16	11.67	2.04	0.030
12%	197,700	3.18	3.72	6.73	13.63	2.19	0.041
14%	42,600	3.48	4.57	8.83	16.88	3.15	0.046

*undiluted drill indicated and inferred.

Franzen concluded that there is little change in total tonnage below a cutoff grade of 5% and that, from there to about 12%, tonnage decreases fairly gradually and steadily by about 270,000 tonnes for each 1% increase in cutoff grade. Sixty-five percent of the total reserve tonnes lies within the 8 to 12% average grade interval. The reserve block encompasses both fold limbs, extends

280 m along strike and up to 335 m downdip, and is up to 22.9 m thick (average 4.8 m). Contouring gross metal values and thickness of drill hole intercepts suggests a weak alignment with the plunge of the fold nose. The deposit is open to depth and partially open along strike.

The host rocks have been variously interpreted by different geologists as the metamorphosed equivalents of intermediate to felsic volcanic and volcaniclastic rocks, clastic sediments and quartz porphyry. This assemblage has been assigned a probable Mississippian(?) and Devonian age by government geologists and interpreted as part of a package, including the overlying Mississippian "Keno Hill Quartzite" and Mesozoic "Lower Schist" units and the underlying Proterozoic(?) and Lower Cambrian "Grit Unit", that has been locally repeated three times by regionally extensive, southwest-dipping thrust faults.

Immediately after the drill discovery, extensions of the favourable host unit were protected with staking an additional 190 mineral claims, bringing the total to 222. The claim block now extends 6 km to the southwest to cover the Jane Zone, a float occurrence found in late 1988 while prospecting an old stream sediment anomaly. The Jane float, which resembles the Marg mineralization, indicates the potential for finding additional reserves in the area.

The next phase of exploration should consist of additional diamond drilling aimed at extending the deposit to depth and along strike. In addition, preliminary grid layout, soil geochemical and geophysical surveys, as appropriate, should be carried out in the vicinity of the Jane Zone. The only other expenditures warranted at this time are preparation of a detailed contour basemap from new photography flown in 1988, and additional water quality sampling to augment the initial sampling carried out in the fall of 1988. A budget of $675,000 is recommended.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

R.J. Cathro, B.A.Sc., P.Eng.

/mc

INTRODUCTION

The Marg property, Yukon, hosts a volcanogenic massive sulphide deposit discovered in 1988 while drilling a strong soil geochemical anomaly in a favourable geological setting. The program was managed by Archer, Cathro & Associates (1981) Limited on behalf of the owners, NDU Resources Ltd. (two-thirds) and Cameco (formerly SMD Mining Co. Ltd. - one-third). Chevron Minerals Ltd. holds a 5% net profits interest.

During 1988, approximately $1,600,000 was spent on exploration, including diamond drilling, additional geochemical and geophysical surveys and claim staking, camp and airstrip construction, aerial photography, geodetic control surveys, and a preliminary environmental study. This report summarizes data collected during the 1988 program.

LOCATION AND ACCESS

The Marg Deposit is situated 42 km northeast of Keno City, Yukon at 64°01'N and 134°28'W, within NTS map sheet 106D/1. Keno City is 8 km from Elsa, the administrative centre and millsite of United Keno Hill Mines Limited and 60 km by all-weather gravel highway from Mayo, which is connected by paved highway to Whitehorse (407 km) and the seaport of Skagway, Alaska (600 km) (see Figures 1 and 2).

Access is by helicopter from the nearest road at Keno City or McQuesten Lake (about 42 km) or the nearest helicopter base at Mayo (83 km). During 1988, a helicopter was based at the property and a D6 bulldozer was walked overland from McQuesten Lake. Freight was also mobilized by Otter aircraft from Mayo to Barry Lake, located 13 km west of the property (see Figure 3). A 380 m long airstrip was roughed out at the west end of the drill grid late in the season.

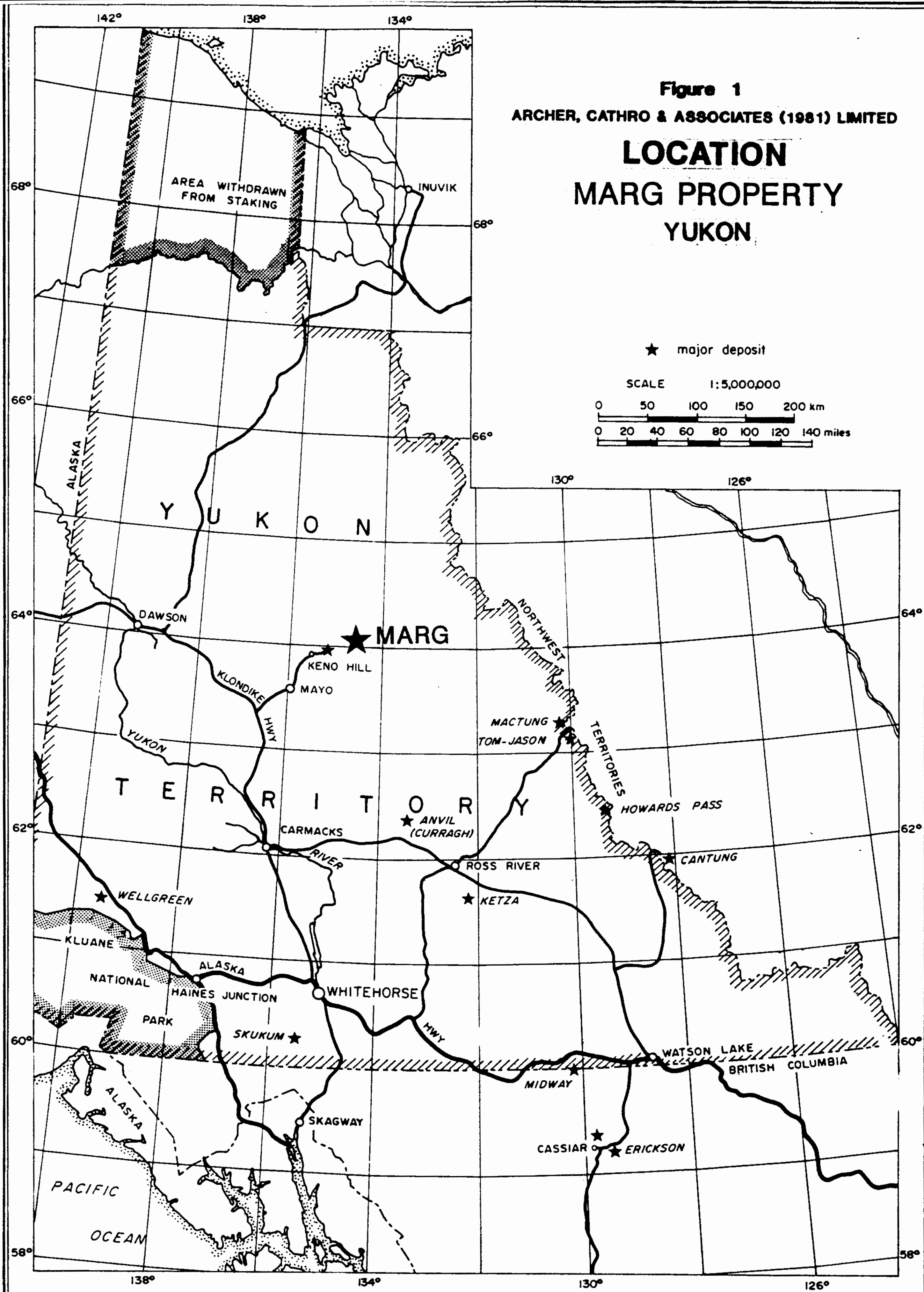


Figure 1

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

LOCATION
MARG PROPERTY
YUKON

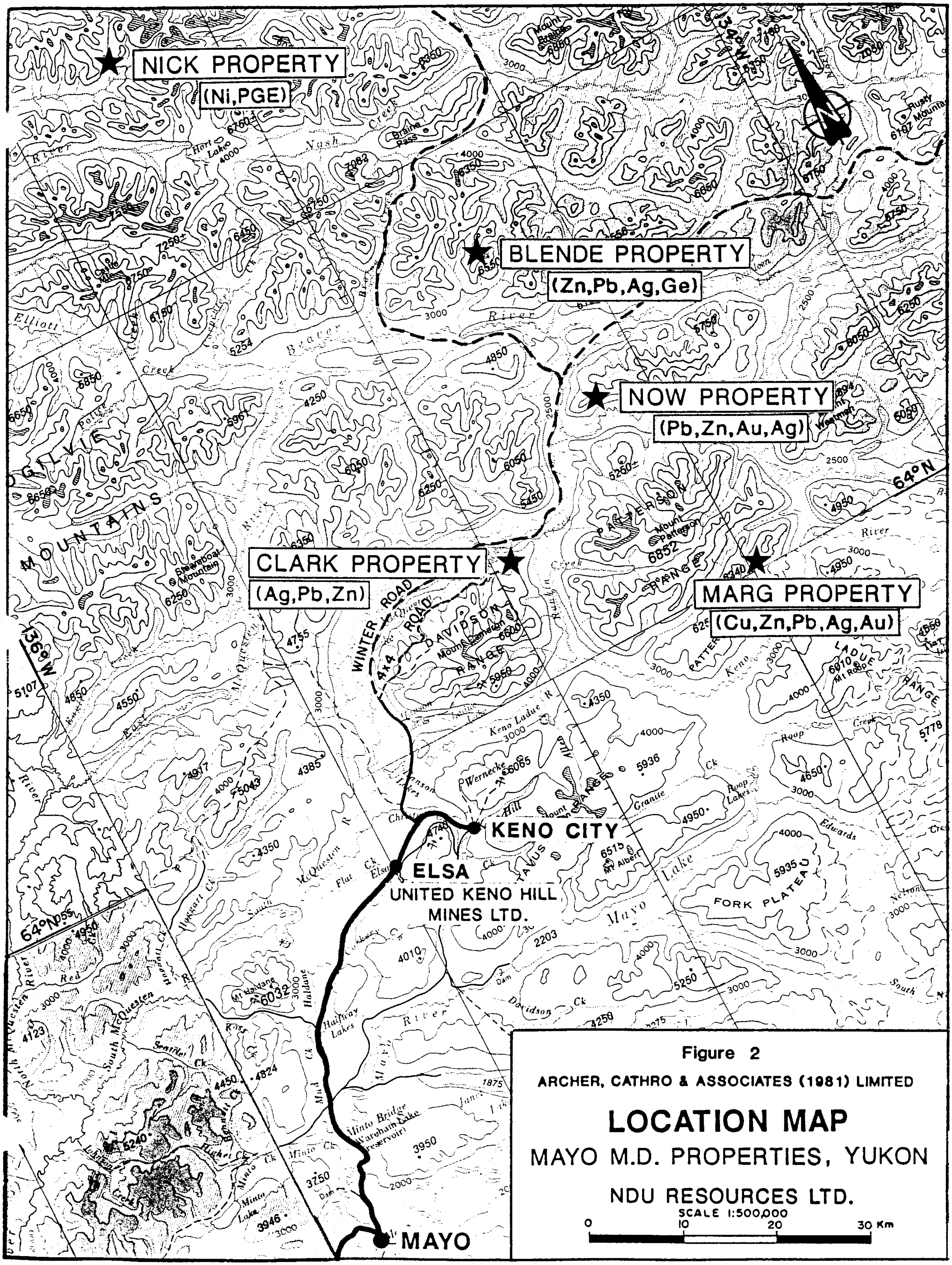


Figure 2

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

LOCATION MAP

MAYO M.D. PROPERTIES, YUKON

NDU RESOURCES LTD.

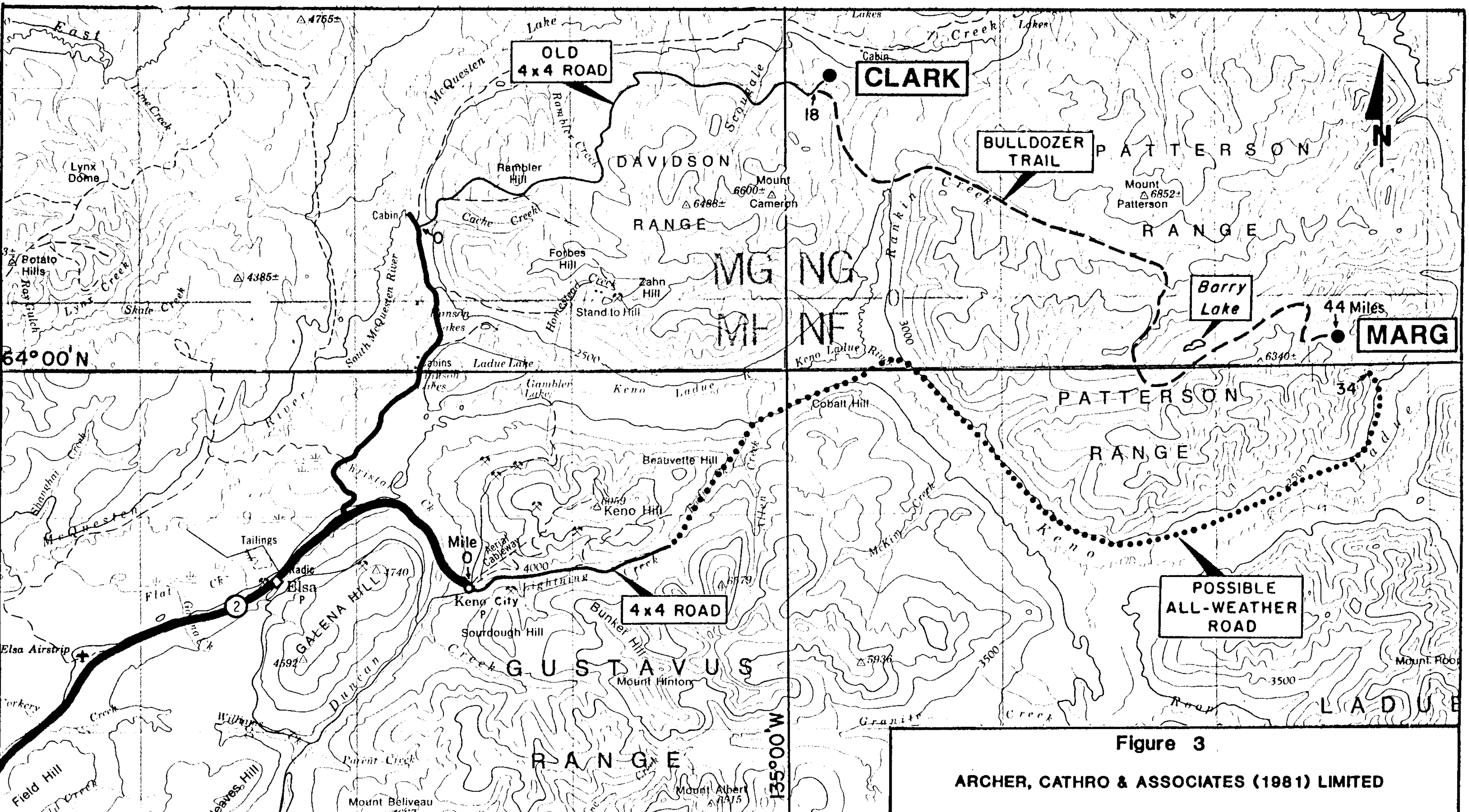


Figure 3

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

ACCESS MAP

MARG PROPERTY, YUKON

NDU RESOURCES LTD./ CAMECO

SCALE 1:250,000

0 5 Mi

0 5 10 Km

To accompany report by R.J. Cathro dated Dec./88

CLAIM STATUS

When drilling commenced in June, 1988, the property consisted of 32 Tudl claims staked in 1982. It was subsequently enlarged with the addition of 190 Marg claims (see Figure 4). The claims are registered in the name of Archer, Cathro at the Mayo Mining Recorder's office as follows:

Claim Name		Total	Record Numbers	Expiry Date*
Tudl	1-32	32	YA76768-YA76799	September 14, 1998
Marg	1-116	116	YB2385-YB2500	September 14, 1997
	117-144	28	YB2501-YB2528	September 14, 1993
	145-158	14	YB2580-YB2593	September 14, 1997
	159-178	20	YB2594-YB2613	September 14, 1993
	179-190	12	YB2944-YB2955	November 4, 1989
		222		

*Includes 1988 field costs that have been filed for assessment credit but are not yet approved by the Mining Recorder.

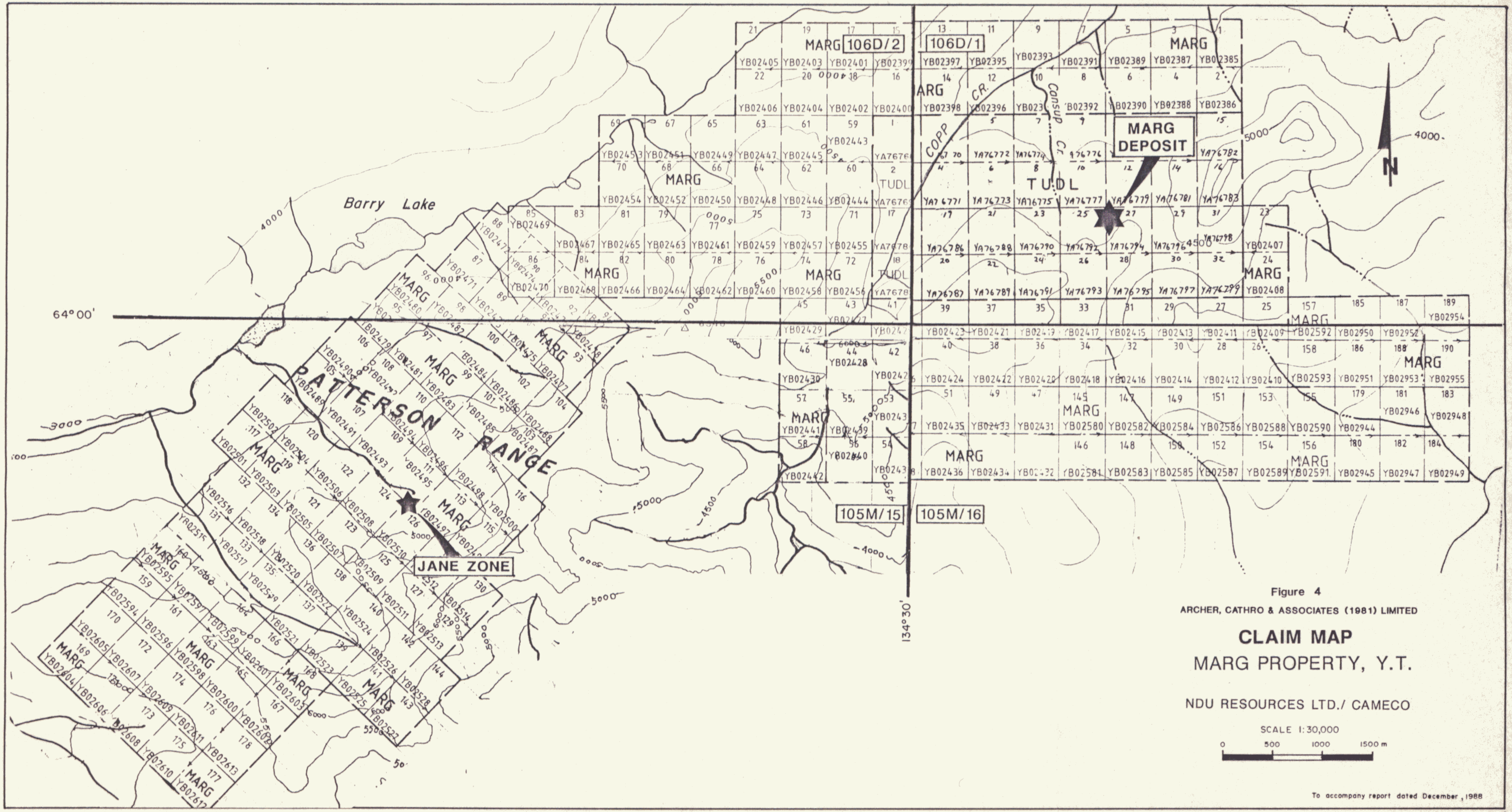


Figure 4

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

CLAIM MAP

MARG PROPERTY, Y.T.

NDU RESOURCES LTD./ CAMECO

SCALE 1:30,000

0 500 1000 1500 m

To accompany report dated December, 1988

HISTORY AND PREVIOUS WORK

The Marg mineralization was first indicated as an intense stream sediment anomaly on a series of twelve regional survey maps published by the GSC in April, 1965 (Maps 45-1965 to 56-1965). These maps showed that the principal creek draining the deposit, Cansup Creek (unofficial name), gave values (in ppm) of: 230 Cu, 300 Pb, 2400 Zn, <0.5 Ag, 2 As, 2.5 Sb, <1 Mo, <4 W, 70 Ni, 15 Co, 50 B and 500 Mn.

During a brief staking rush that immediately followed the release of the geochemical results, the Cansup Creek anomaly was staked as Jack 1-8 claims (84070) by a joint venture between Canadian Superior Exploration Ltd. and United Keno Hill Mines Limited. An additional 16 Marg, Heather and Jack claims were added later in the year during a program of linecutting, soil sampling and hand trenching. Similar work was continued in 1966 and 1967, the last year under the supervision of Archer, Cathro. Because of the proximity of this and nearby anomalies to the Keno Hill silver-lead camp, emphasis at that time was on the search for silver-rich galena veins. While the 1965 to 1967 work outlined an impressive soil geochemical anomaly (lead, zinc and copper), overburden complications, deep weathering and geological bias prevented the discovery of the mineralized source. The only clue to the volcanogenic nature of the source was obtained from microscopic study of a 5 mm long sulphide fragment from Hand Trench L, on the west side of Cansup Creek, during the winter of 1968-69 by C.A. Main of Archer, Cathro (see Appendix C). However, the 1965 claims were allowed to lapse.

In July 1977, Archer, Cathro persuaded Mountaineer Mines Ltd. to restake the anomaly as the Flash claim group (YA15282). Although C. Ikona recommended a work program, no work was performed by Mountaineer.

Archer, Cathro returned again in August, 1982 and staked the anomaly as Tudl 1-32 claims (YA76787) for the ZX Joint Venture, composed of SMD Mining Co. Ltd., Chevron Minerals Ltd. and Enterprise Exploration Limited (the Australian exploration subsidiary of Rio Tinto). ZX performed a program of hand trenching in 1982 and 1984 before optioning the property to All-North Resources Ltd. ZX's expenditures, including staking, totalled about $27,000.

All-North carried out a $103,000 program of linecutting, soil sampling, VLF and MaxMin EM, magnetometer and IP surveys and hand trenching in 1986 to earn a 50% interest. Enterprise abandoned its interest prior to the 1986 program.

Prior to the 1988 work program, NDU Resources purchased the All-North interest and Chevron converted its 25% working interest to a 5% net profits interest. This resulted in revised working interests of NDU Resources (66.67%) and SMD Mining (33.3%). Late in the year, SMD merged with Eldorado Nuclear to form a new company, Cameco - A Canadian Mining & Energy Corporation.

Exploration history and results in 1982 and prior years were summarized in a December, 1982 assessment report by R.J. Cathro and C.A. Main for ZX Joint Venture. The 1986 program was described in a December, 1986 report by R.J. Cathro for All-North.

1988 PROGRAM

The 1988 program was initially budgeted at $300,000 to carry out 900 m of drilling. After the first phase gave encouraging results, a second phase of mainly drilling was performed at a cost of about $1,300,000. NDU's share of the second phase was financed through an agreement with Noranda Inc. and Brenda Mines Ltd.

The first phase of drilling was conducted between June 15 and July 6 from a drill camp established at NDU's Clark property, located 26 km northwest of the Marg property. A new drill camp was constructed at Marg prior to the start of the second phase of drilling on August 6. This was later partially winterized to enable drilling to continue until October 23. The 1988 drilling totalled 6037.5 m in 33 holes. Location and orientation of the individual holes are summarized in relation to both the old drill grid and the new survey grid in Tables I and II on the following pages. Their locations are plotted on Figure 5.

Drilling was contracted to E. Caron Drilling Ltd. of Whitehorse and was performed initially with a wireline-equipped Boyles BBS-15 drill. A second drill, a Longyear 38, was added to the program on September 12. Most drilling was carried out with NQ rods although a few holes were collared with HQ rods and several were reduced to BQ when they surpassed the 125 m pulling limit of the BBS-15 mast or encountered serious ground problems. Drill water was obtained from Cansup Creek, which was still flowing strongly when the camp was closed for the winter. A steel waterline to the vicinity of Hole 88-19 and coil heaters were added in the fall to permit drilling in cold weather.

TABLE I
DRILL HOLE SUMMARY
(Old Drill Grid)

PHASE 1 (June-July, 1988)

Hole	Drill Grid Coordinates (m) E	N	Azimuth (°)	Collar Dip (°)	Depth (ft)	
88-1	1650	815	345	-50	597	
-2	2454	866	001	-50	371	
-3	2454	866	001	-80	267	
-4	2359	776	005	-50	299	
-5	2359	776	005	-70	287	
-6	2288	675	002	-50	477	
-7	1260	700	345	-50	457	
-8	1760	920	342	-50	407	
Sub-total - Phase 1					3162	(963.9 m)

PHASE 2 (August-October, 1988)

Hole	E	N	Azimuth (°)	Collar Dip (°)	Depth (ft)	
88-9	2297	768	356	-50	537	
-10	2453	802	0	-70	512	
-11	2453	802	0	-85	567	
-12	2518	844	0	-50	442	
-13	2518	844	0	-70	407	
-14	2567	848	2	-50	505	
-15	2378	829	357	-55	317	
-16	2368	710	0	-50	701	
-17	2368	710	0	-65	525	
-18	2368	710	0	-80	432	
-19	2440	620	0	-50	946	
-20	2510	700	0	-60	852	
-21	2580	760	0	-67	1005	
-22	2180	760	0	-50	667	
-23	2510	700	0	-75	967	
-24	2050	820	0	-50	180	
-25	2510	700	0	-48	816	
-26	1650	730	0	-50	707	
-27	1450	740	0	-50	620	
-28	2580	760	0	-50	701	
-29	1300	755	0	-50	697	
-30	2580	760	0	-88	416	
-30A	2580	760	0	-88	925	
-31	1850	810	0	-50	528	
-32	2050	770	0	-50	672	
-33	2440	620	0	-80	1002	
Sub-total - Phase 2					16646	(5073.6 m)*
TOTAL - 1988					19808	(6037.5 m)*

* = corrected figure

Revised November 14, 1988

TABLE II
DRILL HOLE SUMMARY
(New Underhill Survey Grid)

PHASE 1 (June-July, 1988)

Hole	Survey Grid Coordinates (m) N	E	Elevation (m)	Collar Dip (°)	Azimuth (Astronomic)	Depth (m)
88-1	100,113.73	99,091.78	1,373.08	-50	343	182.0
-2	100,187.63	99,883.13	1,438.28	-50	359	113.1
-3	100,187.63	99,883.13	1,438.28	-80	359	81.4
-4	100,093.56	99,790.14	1,438.89	-50	003	91.1
-5	100,093.56	99,790.14	1,438.89	-70	003	87.5
-6	99,989.28	99,720.70	1,416.85	-50	0	145.4
-7	99,985.42	98,701.92	1,324.91	-50	343	139.3
-8	100,223.01	99,197.19	1,357.35	-50	340	124.1
Sub-total - Phase 1						963.9

PHASE 2 (August-October, 1988)

Hole	Survey Grid Coordinates (m) N	E	Elevation (m)	Collar Dip (°)	Azimuth (Astronomic)	Depth (m)
88-9	100,084.26	99,727.85	1,412.85	-50	354	163.7
-10	100,124.41	99,884.59	1,464.07	-70	358	156.1
-11	100,124.41	99,884.59	1,464.07	-85	358	172.8
-12	100,165.96	99,943.19	1,461.80	-50	358	134.7
-13	100,165.96	99,943.19	1,461.80	-70	358	124.1
-14	100,171.05	99,993.89	1,470.18	-50	358	153.9
-15	100,147.64	99,807.95	1,432.44	-55	355	96.6
-16	100,026.88	99,800.17	1,445.94	-50	358	213.7
-17	100,026.88	99,800.17	1,445.94	-65	358	160.0
-18	100,026.88	99,800.17	1,445.94	-80	358	131.7
-19	99,942.18	99,877.59	1,480.48	-50	358	288.3
-20	100,024.01	99,940.80	1,509.00	-60	358	259.7
-21	100,083.32	100,009.26	1,495.90	-67	358	306.3
-22	100,070.07	99,612.85	1,380.09	-50	358	203.3
-23	100,024.01	99,940.80	1,509.00	-75	358	294.7
-24	100,134.00	99,483.00	?	-50	358	54.9
-25	100,024.01	99,940.80	1,509.00	-48	358	248.7
-26	100,034.22	99,073.09	1,399.42	-50	358	215.5
-27	100,033.81	98,877.01	1,355.94	-50	358	189.0
-28	100,083.32	100,009.26	1,495.90	-50	358	213.7
-29	100,039.52	98,744.00	1,326.40	-50	358	212.4
-30	100,083.32	100,009.26	1,495.90	-88	358	126.8
-30A	100,083.32	100,009.26	1,495.90	-88	358	281.9
-31	100,120.48	99,289.10	1,363.79	-50	358	160.9
-32	100,085.09	99,485.70	1,362.25	-50	358	204.8
-33	99,942.18	99,877.59	1,480.48	-80	358	305.4
Sub-total - Phase 2						5,073.6
TOTAL - 1988						6,037.5

November 14, 1988

Mineralized intervals were split for sampling purposes. One-half was shipped to Chemex Labs Ltd., North Vancouver, B.C., where it was assayed routinely for copper, lead and zinc (in percent) and silver and gold (in ounces per ton), as well as other selected elements and specific gravity on special request. The drill core is stored at the campsite on the property.

Access, camp supply and drill moves and support were provided by a Bell 206B helicopter chartered from Trans North Air Ltd. of Whitehorse. The machine was piloted by Dave Reid, with holiday relief provided by Spring Harrison. Total flying time was 491.4 hours.

The field management and geological control was provided by an Archer, Cathro crew led by field managers Lasha Cymbalisty and Ian Talbot, and geologist/core loggers Mike Phillips and Mary MacLellan under the overall direction of the writer. The Archer, Cathro personnel employed on this project during 1988 are listed in Appendix B.

Caron Drilling also provided a D6 bulldozer equipped with wide pads that was walked overland to the property in early September. The access route, which started from McQuesten Lake and followed an old 4x4 truck road to the Clark property, is shown on Figure 3. The bulldozer was used to construct drill sites, move the drills, dig water supply sumps and build an airstrip. Prior to the arrival of the bulldozer, drill sites were prepared by hand by the Archer, Cathro crew.

The major part of the 1988 claim staking (144 claims) was contracted to Coureur De Bois Contracting Ltd. of Whitehorse. The remainder was carried out by Archer, Cathro personnel, who also tagged and mounded-up the posts on all of the new claims except the last twelve. Although no claim surveys were conducted, all claims are thought to comply with the Yukon Quartz Mining Act and no open fractions are known to exist.

The 1965 cut grid, which was surveyed with chain and compass, picketed, brushed out and improved with the addition of a new 600N baseline in 1986, was used for drill hole control in 1988. Although this grid has serious inaccuracies, it was easily correlated with the geochemical, geophysical and hand trench data that constituted the original drill targets. Once the presence of a significant mineral deposit was recognized and the need for new photogrammetry, survey control and a detailed contour map became evident, ten airphoto targets were installed in early August. Although bad weather delayed aerial photography until September 10, resulting in strong shadows, the photography, by Geographic Air Surveys Ltd. of Edmonton and UMA Engineering Ltd. of Whitehorse, is otherwise of good quality. It was flown at scales of 1:12,500 and 1:25,000.

Underhill Engineering Ltd. of Whitehorse, supported by Leslie Leroux of Archer, Cathro, established geodetic north and elevations for the property and provided survey control for the 1988 drill holes, airphoto targets and the 1986 grid (see Figure 5). This will permit the preparation of an accurate, contoured basemap for the property.

J.P. Franzen, P.Eng., Vancouver, prepared an independent mineral reserve assessment at the completion of the program in November. His report is included as Appendix E.

J. Grant Abbott, Minerals Geologist with Indian and Northern Affairs Canada, Whitehorse, carried out reconnaissance stratigraphic and structural mapping in the vicinity of the property during September. His preliminary plan and cross section is included in this report as Figures 6 and 7.

The 1986 grid was expanded in 1988 to permit expansion of the geophysical and geochemical surveys. Linecutting and soil sampling were carried out by Archer, Cathro personnel. Delta Geoscience Ltd. expanded its 1986 EM and magnetometer surveys, employing wider MaxMin coil separation for deeper penetration. In addition, crews from Delta and Noranda conducted a Pulse EM survey and a test gravity survey. Archer, Cathro personnel assisted on the geophysical surveys. A geophysical report by Lyndon Bradish of Noranda is included as Appendix G.

Norecol Environmental Consultants Ltd. performed preliminary environmental studies in early September. Their report is attached as Appendix H.

A petrographic examination of sixteen drill core specimens of typical wallrocks was prepared by Dr. J.F. Harris of Vancouver Petrographics Ltd., whose report is attached as Appendix I.

Specimens of galena-bearing mineralization from Hole 88-5 and quartz muscovite phyllite from Hole 88-6 were submitted to Dr. James K. Mortensen of the GSC, Ottawa for lead isotope analysis and zircon fission-track dating, respectively. His results are not yet available.

GEOMORPHOLOGY

The claims lie along the southern margin of the rugged Patterson Range and cover a series of short, steep, north-facing drainages. Local elevation ranges from 1200 to 1675 m with the main area of interest straddling treeline at about 1400 m. Typical vegetation consists of stunted balsam, buckbrush and grasses, giving way to moss and lichen at higher elevations. The upper limit of Pleistocene valley glaciation crosses the property and a lateral moraine forms a pronounced terrace that rises from 1300 m near Copp Creek to 1350 m on the east side of Cansup Creek. Outcrop is limited to the ridge crest along the southern edge of the property. Seeps and springs are unusually abundant and occur either at the base of the glacial terrace or along a break in slope about 50 to 100 m above the terrace. Many of the seeps are associated with vegetation anomalies or, as they are commonly referred to, kill zones.

REGIONAL GEOLOGY

Geological mapping in the vicinity of the Marg property has advanced slowly over the years because of strong similarities between several resistant members of the stratigraphic section and structural complexity associated with intense regional thrust faulting. This led to difficulty in recognizing the volcanic component of the section and the mineral potential of this district.

Grant Abbott of Indian and Northern Affairs, Canada carried out several days of reconnaissance stratigraphic and structural mapping in the vicinity of the Marg property late in the 1988 field season that have shed new light on the geological setting. His preliminary results are shown in plan and cross section on Figures 6 and 7.

Abbott has subdivided rocks near the property into five major units, which are partially repeated three times by four southeast-dipping thrust faults. The two bounding thrusts have been correlated by Abbott with the regionally extensive Tombstone and Robert Service Thrusts. Near the Marg property, the thrust faults and rock units display northeast to east trends with evidence of local isoclinal folding about northwest-trending fold axes. Abbott's major units are shown below.

MESOZOIC

Massive greenstone, diorite

"LOWER SCHIST" - black siliceous phyllite

MISSISSIPPIAN

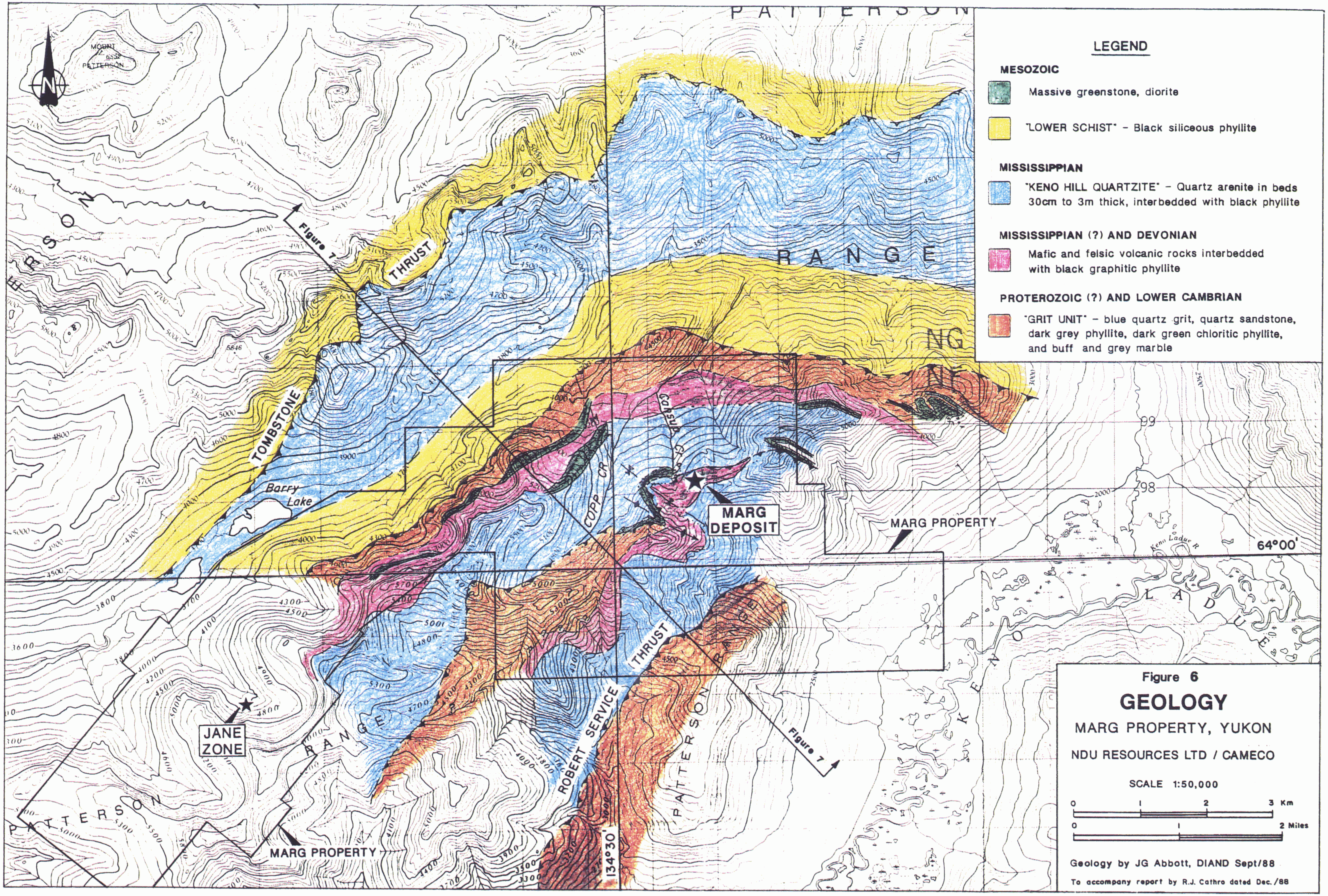
"KENO HILL QUARTZITE" - quartz arenite in beds 30 cm to 3 m thick, interbedded with black phyllite

MISSISSIPPIAN(?) AND DEVONIAN

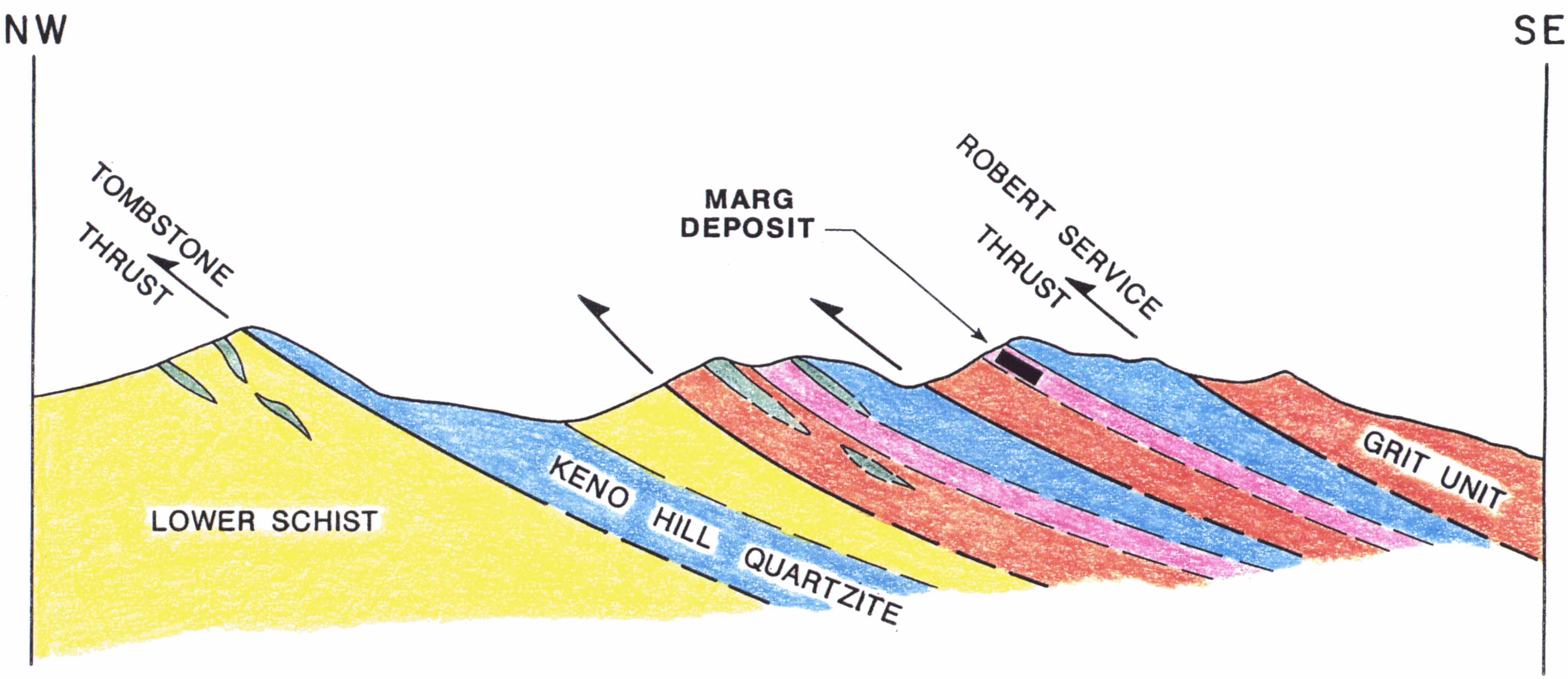
Mafic and felsic volcanic rocks interbedded with black graphitic phyllite; locally contains laminated and massive sulphide horizons

PROTEROZOIC(?) AND LOWER CAMBRIAN

"GRIT UNIT" - blue quartz grit, quartz sandstone, dark grey phyllite, dark green chloritic phyllite, and buff and grey marble



LEGEND
MESOZOIC
Massive greenstone, diorite
"LOWER SCHIST" - Black siliceous phyllite
MISSISSIPPIAN
"KENO HILL QUARTZITE" - Quartz arenite in beds 30cm to 3m thick, interbedded with black phyllite
MISSISSIPPIAN (?) AND DEVONIAN
Mafic and felsic volcanic rocks interbedded with black graphitic phyllite
PROTEROZOIC (?) AND LOWER CAMBRIAN
"GRIT UNIT" - blue quartz grit, quartz sandstone, dark grey phyllite, dark green chloritic phyllite, and buff and grey marble
Figure 6
GEOLOGY
MARG PROPERTY, YUKON
NDU RESOURCES LTD / CAMECO
SCALE 1:50,000
0 1 2 3 Km
0 1 2 Miles
Geology by JG Abbott, DIAND Sept/88
To accompany report by R.J. Cathro dated Dec./88
MOUNT PATTERSON
PATTERSON RANGE
TOMBSTONE THRUST
ROBERT SERVICE THRUST
Figure 7
Barry Lake
COPP CR
MARG DEPOSIT
MARG PROPERTY
JANE ZONE
KENO LADUE
Keno Ladue R
64°00'
134°30'



See LEGEND and SECTION LINE on Figure 6

Figure 7

SECTION THROUGH MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:50,000

0 1 2 km

Geology by JG Abbott, DIAND, Sept./88

To accompany report by R.J. Cathro dated Dec./88

The Devonian and younger rocks are separated from the Grit Unit by a profound unconformity that has been recognized regionally for long distances along strike and in both directions.

Previous regional mapping by the GSC was published as Map 1282A by L.H. Green in 1972. Although the complexity and regional extent of the thrust faults were not understood and the mapping was not sufficiently detailed to appreciate the fault repetitions of the section in the Marg area, the major subdivisions of Abbott's section can be recognized in the earlier mapping. The Grit Unit, a basement unit of regional extent throughout many areas in central and southern Yukon, is Green's Unit 3 of the same age. Abbott's Mississippian(?) and Devonian volcanic and graphitic phyllite, which hosts the mineralization, correlates with Green's Unit 18a, "thin bedded and phyllitic quartzite, graphitic and chlorite slate and phyllite; minor limestone and massive quartzite". Unit 18 is the Keno Hill Quartzite (Central Quartzite), which was assigned a Cretaceous age on Map 1282A. The Lower Schist Unit, which is now thought to overlie the Keno Hill Quartzite, was previously considered older and designated as Unit 17. The massive greenstone and diorite is Green's Unit 20.

MINERALIZATION

Introduction

Because the Marg deposit does not outcrop, mineralogical information prior to the 1988 drill program was restricted to specimens of intensely leached bedrock float encountered in hand trenches and interpretation of geochemical dispersion patterns. Based on sulphide and oxide mineralogy, banded texture, metal ratios and volcanic affinity, this float was interpreted in the 1986 Archer, Cathro report by the writer as probably derived from a volcanogenic massive sulphide deposit. That interpretation was confirmed by the 1988 drill program.

Previous mapping and petrographic study near the deposit had resulted in a simplistic, three-fold subdivision of rock units within an apparently conformable sequence striking N60°W and dipping 50° to the southwest. These were an upper quartzite unit, a central recessive graphitic unit and a lower recessive chloritic unit. Drilling has shown that the Marg deposit is associated with a mixture of the lower two units but that poor exposure had provided an inaccurate picture of their stratigraphic relationship.

The drill hole geology and assays are displayed in a series of 24 vertical cross sections (Figures 8 to 31). The significant drill hole intersections obtained in the 1988 drilling are listed in Table III on pages 20 and 21. Sections through the main part of the deposit between 2290E and 2580E (drill grid) are spaced at 70 m intervals, as shown on Figure 5. The other sections are drawn through individual holes that were drilled at more random spacing and orientation.

TABLE III
SIGNIFICANT DIAMOND DRILL HOLE INTERSECTIONS

Hole	Interval (m)	Thickness (m)	Cu (%)	Pb (%)	Zn (%)	Ag (oz/t)	Au (oz/t)
88-1	25.0 - 25.5	0.5	0.8	0.7	2.0	0.5	0.004
	29.0 - 34.1	5.1	0.7	0.5	1.5	0.3	<0.003
88-2	18.9 - 25.1	6.2*	0.3	5.8	<0.1	9.3	0.050
	28.2 - 32.6	4.4	4.0	1.7	3.4	1.7	0.029
	37.2 - 38.7	1.5	3.5	1.2	1.4	0.5	0.010
88-3	28.3 - 29.4	1.1	5.4	3.1	6.7	3.0	0.010
	35.1 - 35.7	0.6	1.1	1.7	3.5	1.2	0.040
	40.2 - 41.7	1.5	1.3	1.8	3.8	1.5	0.024
	45.4 - 46.8	1.4	1.1	1.0	2.1	0.9	0.008
88-4	65.2 - 68.3	3.1*	0.1	6.2	<0.1	2.8	0.027
88-5	64.1 - 74.8	10.7	3.3	3.7	6.6	2.1	0.030
88-9	32.6 - 35.7	3.1	2.3	4.6	2.9	2.4	0.028
88-10	62.6 - 68.6	6.0	2.9	3.3	5.8	1.8	0.048
	123.3 - 133.6	10.3	1.3	2.5	4.5	1.9	0.047
88-11	82.2 - 87.8	5.6	2.2	3.1	5.9	1.2	0.027
	150.0 - 152.9	2.9	1.5	3.2	5.6	2.5	0.050
88-12	65.0 - 68.7	3.7	3.1	4.8	9.2	3.2	0.053
	73.9 - 79.8	5.9	2.0	3.3	5.9	3.1	0.042
88-13	66.8 - 68.8	2.0	1.7	1.3	2.5	1.1	0.003
	82.3 - 94.0	11.7	1.4	2.5	4.5	2.3	0.031
88-15	58.8 - 61.2	2.4	1.7	2.7	5.2	2.2	0.032
	39.5 - 41.2	1.7	3.4	2.5	4.6	2.4	0.033
88-16	104.0 - 114.9	10.9	2.5	2.5	5.3	1.8	0.022
88-17	108.0 - 111.9	3.9	2.2	3.0	6.1	1.8	0.024
	116.9 - 118.3	1.4	2.3	1.4	3.7	0.9	0.016
88-18	114.3 - 120.7	6.4	1.2	1.2	2.8	0.7	0.010
88-19	203.7 - 214.9	11.2	2.6	2.7	6.3	1.9	0.022
	261.9 - 262.4	0.5	1.6	2.0	4.0	2.1	0.012
88-20	187.2 - 189.3	2.1	1.7	1.9	4.0	1.9	0.034
	221.3 - 223.5	2.2	1.3	2.1	4.0	1.6	0.018
	226.7 - 229.2	2.5	0.9	1.8	3.2	1.4	0.014
	231.7 - 233.4	1.7	1.1	1.8	3.4	1.6	0.022

* Oxidized surface mineralization leached of most copper and zinc.

TABLE III (cont'd)

Hole	Interval (m)	Thickness (m)	Cu (%)	Pb (%)	Zn (%)	Ag (oz/t)	Au (oz/t)
88-21	156.6 - 158.2	1.6	1.2	1.5	2.7	1.3	0.013
	161.4 - 164.8	3.4	2.6	2.5	5.3	2.1	0.034
	171.7 - 174.2	2.5	1.5	2.1	4.1	1.8	0.022
	182.4 - 187.5	5.1	1.5	2.3	4.8	2.0	0.031
88-22	107.7 - 111.3	3.6	2.0	2.9	5.6	2.0	0.026
88-23	209.2 - 215.1	5.9	1.9	3.0	6.5	2.2	0.028
	263.8 - 269.1	5.3	1.2	2.0	4.2	1.9	0.038
88-25	181.5 - 187.5	6.0	2.0	1.2	3.4	1.5	0.023
	208.9 - 209.7	0.8	0.9	1.8	3.4	1.2	0.014
	221.0 - 222.0	1.0	1.5	1.9	4.1	1.7	0.020
	225.0 - 225.3	0.3	0.9	1.7	3.6	1.2	0.014
88-26	63.0 - 63.3	0.3	1.1	2.7	6.4	1.7	0.014
88-28	156.9 - 160.0	3.1	1.4	1.8	3.5	1.5	0.015
88-30A	188.6 - 192.2	3.6	1.1	2.9	5.2	1.7	0.027
	229.7 - 231.4	1.7	0.9	1.5	2.7	1.2	0.017
	234.7 - 239.6	4.9	0.6	1.0	1.8	0.8	0.010
	243.3 - 245.1	1.8	1.3	2.0	3.9	1.4	0.021
	264.1 - 264.6	0.5	0.9	2.0	3.8	1.3	0.012
	270.1 - 273.3	3.2	0.9	1.2	2.2	1.1	0.013
88-31	74.6 - 76.2	1.6	0.6	2.8	5.3	1.5	0.046
88-33	222.5 - 227.2	4.7	1.6	2.2	4.3	1.4	0.016

The 1988 drilling has shown that the Marg deposit is a south-dipping and southeast-plunging sulphide body hosted by interlayered quartz-muscovite and quartz-graphite phyllite. The main zone, which subcrops beneath glacial drift on the east side of Cansup Creek, appears at surface to consist of two sub-parallel bodies with a combined strike length of about 400 to 450 m (Figure 8). Deeper drilling (up to 350 m downdip) showed that these are actually two limbs of a single body that is isoclinally folded near its midpoint about a southeast-plunging fold axis and that the limbs increasingly diverge away from the fold nose, both to the west and to depth. The footwall limb dips 55 to 60° to the south while the hangingwall limb gradually flattens westward from 55° near the nose to 40°. The shape of the fold is better illustrated on a level plan at the 1300 m elevation (Figure 32), which is between 150 and 200 m below surface. At surface, the fold nose terminates abruptly between the 2510E and 2580E drill sections, probably due to a fault. To the west of the main deposit, a single mineralized horizon was traced by wide-spaced drilling for another 750 m, as shown on Figure 8. This is interpreted as the footwall of the two limbs. The west extension is represented by intersections in 1988 Holes 1, 22, 26 and 31.

Lithology of Host Rocks

A schematic stratigraphic section through the deposit, showing the generalized relationships seen in drill core, is shown on Figure 33 (on the following page). It is a longitudinal representation of how the Marg deposit would appear in plan view if it was unfolded, with the west end of the footwall limb now trending to the east. The field names adopted for rock lithologies in the 1988 core logging are incorporated on the schematic section. The sulphide zone is usually associated with either quartz-muscovite phyllite or quartz-

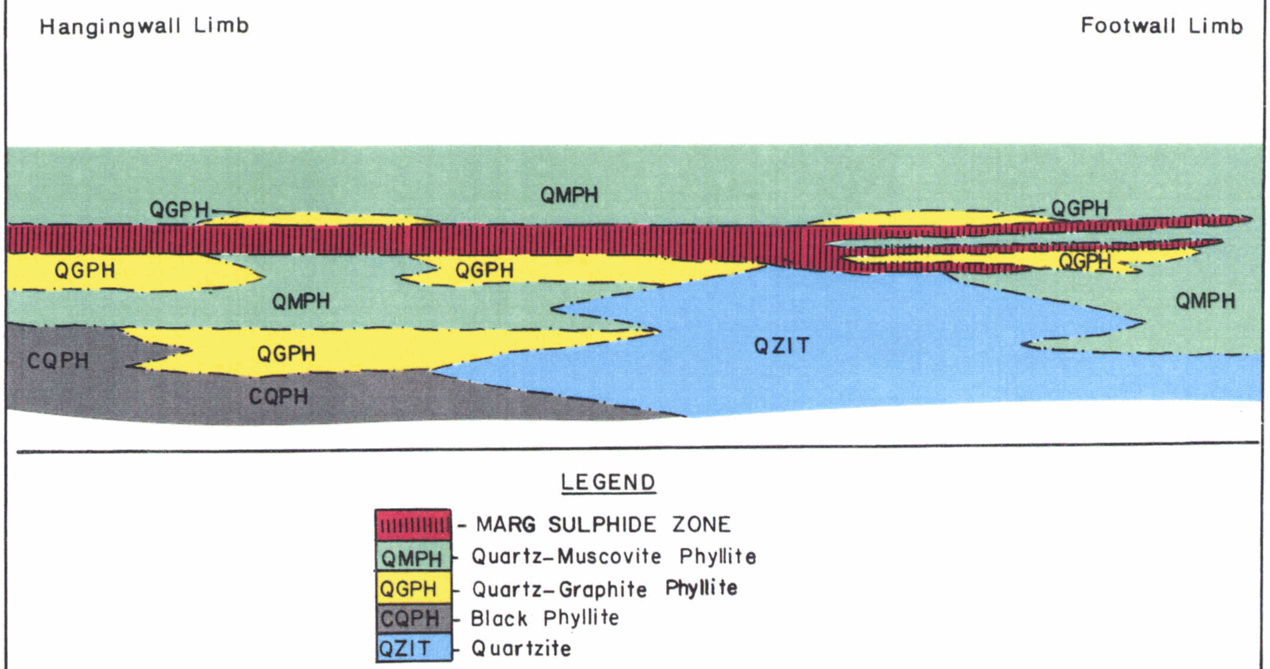


Figure 33 – Schematic Stratigraphic Section, Marg Deposit, Yukon

graphite phyllite or interlayered mixtures of the two. Other common rock types are black phyllite and quartzite, while chlorite phyllite and a carbonate-chlorite-quartz phyllite assemblage are occasionally present.

A petrographic study of these units was undertaken by Dr. J.F. Harris of Vancouver Petrographics Ltd., whose report is attached as Appendix I. The study revealed that, texturally, host rocks could be more accurately classified as schists rather than phyllite. However, in deference to existing field usage, the terminology "phyllite" has been retained. Similarly, the white mica found in these rocks could more accurately be called sericite but it is referred to as muscovite throughout this report, following the terminology established by a 1982 petrographic study by Dr. J.K. Mortensen. Although the origin of the Marg host rocks was definitely established by Harris, he regards the absence of albite or epidote as evidence that a volcanic-pyroclastic source was not present. This differs from Mortensen's conclusions in 1982 that the high chlorite content of some of the rocks suggested an intermediate volcanic parent. Mortensen also felt that the graphitic and carbonaceous phyllites represented a pyroclastic precursor and that the quartzite unit is a recrystallized volcaniclastic.

Quartz-muscovite phyllite is a pale grey to pale green rock composed of 30 to 60% quartz, 30 to 50% sericite (muscovite) with 3 to 10% carbonate and variable amounts of chlorite and carbonaceous material. This unit was interpreted by Mortensen as the metamorphosed equivalent of an intermediate volcanic or volcanoclastic rock. In contrast, the recent petrographic study by Harris interprets this unit as a recrystallized argillaceous sediment with cherty intercalations. A variety of this unit containing 10 to 20% bluish quartz augen, 2 to 3 mm across, has been interpreted as a metamorphosed quartz porphyry.

Quartz-graphite phyllite and black phyllite are related, gradational lithologies that apparently have a sedimentary parentage with a high shale component. Quartz-graphite phyllite, a very distinctive unit, has sharp contacts with other units. It is black with up to 50% quartz and 50% black, carbonaceous material. This unit contains up to 10% visible pyrite that can be coarse grained in places (up to 10 mm across). Black phyllite is dark grey in colour and contains 10 to 40% quartz, 10 to 40% sericite and 5 to 40% carbonaceous material. Pyrite content is generally low.

Quartzite is light grey in colour, thin bedded to massive and generally contains minor amounts of muscovite, chlorite and carbonaceous and calcareous material. Carbonaceous and calcareous material sometimes become significant over narrow widths while interbeds of black phyllite, often moderately to strongly graphitic, are common at the top.

Chlorite phyllite is pale green in colour, exhibits delicate lamination and contains 30 to 40% chlorite, 20 to 60% quartz, and up to 40% sericite. This unit can contain up to 10% carbon and up to 20% carbonate. It has been interpreted as a metamorphosed tuff or, alternatively, as metamorphosed clay or mud.

Carbonate-chlorite-quartz phyllite is pale green when fresh but weathering of the carbonate imparts a pale orange colour at surface. This unit contains 50 to 60% carbonate (ankerite), up to 30% sericite and up to 20% quartz. The sericite appears to have been misidentified as chlorite in the field, probably due to the greenish colour of the rock.

Thin beds of limestone, usually less than 2 cm but up to one metre thick, are occasionally present. These beds are usually brecciated and consist of angular clasts in a white quartz matrix. Cryptocrystalline silica is not common but in a few places the limestone unit is cherty.

Structure

Structure in the vicinity of the deposit is dominated by the east-verging and southeast-plunging fold that roughly bisects the main part of the Marg deposit. The axial plane of this major fold is approximately parallel to attitudes of small-scale structures such as cleavage, lineations and crenulations measured on nearby outcrops. Drill core logging has shown that rocks in the Marg area have a strongly pervasive S_1 foliation and tight isoclinal folds that appear to parallel the original bedding. The hinges of F_1 folds were occasionally seen in narrow, semi-massive to massive sulphide bands. A second period of deformation produced a weak S_2 foliation and small-scale open F_2 folds, which plunge on surface at moderate angles to the southeast. The S_2 foliation was observed in a few instances cutting the S_1 foliation in the sulphide body. Remobilization and recrystallization of the sulphides may have taken place during the first period of deformation.

A series of small graphitic faults was observed in most holes above the hangingwall sulphide limb. Faulting is commonly concentrated adjacent to the sulphide zone and within the nose of the fold. These faults are generally 0.1 to 3 m wide and lie within 10 m of the mineralization. Similar faulting is not commonly associated with the footwall sulphide limb. Small faults of uncertain orientation were observed cutting mineralization in Hole 9 and are suspected to have abruptly terminated the folded nose of the sulphide body at surface between Holes 12 and 13 (2510E) and Hole 14 (2580E).

Mineralogy

The Marg Deposit is a typical fine-grained, polymetallic, volcanogenic assemblage comprised principally of pyrite with major amounts of sphalerite, chalcopyrite and galena. Minor arsenopyrite is sporadically distributed as intimate intergrowths with pyrite in some samples. In addition, tetrahedrite is a minor constituent throughout, occurring in association with galena or with chalcopyrite. It shows a tendency to coarser grain size than the other components. The valuable sulphides occur as an interstitial matrix component within an aggregate of pyrite cubes. Non-sulphide gangue is primarily quartz with minor carbonate, muscovite and barite. A detailed description of two specimens from Hole 5 by Elizabeth Clemson of Noranda is included as Appendix D to this report. Another petrographic study of nine specimens from Holes 11, 15, 21 and 22 was undertaken by Dr. J.F. Harris of Vancouver Petrographics.

The hangingwall sulphide body usually has a fairly sharp upper contact. The top part of the zone consists of dense, fine-grained massive sulphide in which it is difficult to recognize galena and sphalerite with a hand lens. Chalcopyrite can be distinguished more easily. The lower portion of the mineralized layer is more weakly mineralized, with sulphide content described as varying from heavily disseminated to semi-massive. Mineral banding is more evident with dark coloured sphalerite and galena bands separated by lighter coloured, chalcopyrite-rich bands. The lower contact varies from fairly sharp to transitional over narrow widths. Below the sulphide zone, narrow bands (<1 cm) of sulphides and above average amounts of disseminated sulphides occur. The footwall limb of the fold tends to be less massive and more banded at surface, perhaps indicating that this portion lies closer to the edge of the deposit.

No mineralogical trend has been observed as yet towards a massive, barren pyrite core or stockwork phase of the deposit. Individual drill intercepts are remarkably similar from hole to hole and fold limb to fold limb in terms of mineralogy, sulphide textures and sulphide content. However, this apparent similarity is partly due to the difficulty in visually estimating sphalerite, chalcopyrite and galena content, even when these minerals are recognizable.

Metal grades do not exhibit predictable patterns across the mineralized horizon within individual holes, although contourable trends can be identified when metal ratios are displayed in unfolded longitudinal section, as discussed below. Within individual drill intercepts through the sulphide zone, the five metals of interest (copper, lead, zinc, silver and gold) sometimes show grade increases towards either the top or bottom of the hole but can also vary randomly. Within an intercept, similar grade trends are often observable in up to four of the five metals of interest, with the other metal(s) either showing no trend or the opposite trend. In some instances (e.g. footwall limb, Hole 15 and hangingwall limb, Hole 30A), silver and gold grades trend in the opposite direction to the base metals.

Changes in thickness and grade of the deposit are illustrated on vertical projections of longitudinal sections drawn along the average strike of the footwall limb (090°) and hangingwall limb (060°)

The deposit consists of a series of sulphide layers within a sheet-like mineralized interval up to 22.9 m thick. The thickness of the interval in individual holes is plotted on Figure 34 and the cumulative thickness of the sulphide layers themselves is also indicated for those holes in which the sulphides are mixed with significant layers of waste. Contouring the thickness

88-4 ● PIERCEMENT POINT

88-6 ○ UNMINERALIZED HOLE

6.0 (18.0)

THICKNESS OF MINERALIZED INTERVAL (m)

TOTAL THICKNESS OF SULPHIDE LAYERS (m) WITHIN MINERALIZED INTERVAL

8 CONTOUR OF THICKNESS OF SULPHIDE LAYERS

Figure 34

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

THICKNESS OF SULPHIDE LAYERS
VERTICAL LONGITUDINAL SECTION

MARG PROPERTY, YUKON

NDU RESOURCES LTD./CAMECO

106 D 1
092682

SCALE 1:2500

0 50 100 150 200 Metres

33

To accompany a report by R.J. Cathro dated December, 1988

of sulphide layers indicates a weak alignment with the southeast-plunging fold nose.

Figure 35 is a plot of grade trends between the holes. A gross metal value was calculated for each intercept in each fold limb by multiplying grades by metal prices by true thickness and dividing by 100. Metal prices used (all in U.S.$) were: copper - 1.00, lead - 0.35, zinc - 0.65, silver - 6.50 and gold - 400.00 Contouring these values also illustrates a weak alignment with the fold nose in the footwall limb. This alignment is more pronounced in the hangingwall limb.

Discussion

The absence of the detailed, small-scale folding in the sulphide zone that is present in the wallrock, and the lack of strong mineral zoning and metal ratio trends that are normally present in this type of deposit, suggest that the observed textures in the Marg deposit are secondary rather than primary. In other words, cataclastic deformation and metamorphism of an assemblage of volcaniclastic, porphyritic volcanic and sedimentary rocks to the mixed phyllitic sequence hosting the mineralization have resulted in recrystallization and remobilization of the sulphide body along a semi-conformable horizon. Drill results, although inconclusive, suggest that the sulphide body is dismembered into large and small lenses that probably plunge to the southeast and may have impressive continuity down the structural plunge.

Figure 35
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

GROSS METAL VALUES
VERTICAL LONGITUDINAL SECTION
MARG PROPERTY, YUKON
NDU RESOURCES LTD./CAMECO

MINERAL RESERVES

A mineral reserve assessment was carried out by consulting engineer J.P. Franzen, P.Eng., who evaluated diamond drill logs and assay results for twenty-one drill holes (4097 m) located on drill sections 2370E, 2440E, 2510E and 2580E. His report dated November 18, 1988 with an addendum dated December 12, 1988 is included as Appendix E to this report. The reserve blocks extend 280 m along strike, up to 335 m downdip and average 4.8 m in thickness. Franzen examined continuity of mineralization in section and plan and calculated two categories of reserves, drill indicated (projected for 35 m from a hole) and inferred (projected 35 to 70 m from a hole). Assay intervals were weighted for specific gravity to produce an undiluted reserve. Franzen's calculated tonnage and grade relationships are summarized below.

Cutoff Grade Cu+Pb+Zn	Tonnes*	Cu %	Pb %	Zn %	Cu+Pb+Zn %	Ag opt	Au opt
0	2,097,000	1.90	2.60	4.99	9.49	1.87	0.028
6%	1,922,000	1.97	2.72	5.19	9.88	1.97	0.030
8%	1,568,000	2.11	2.82	5.59	10.52	1.96	0.030
10%	994,000	2.48	3.03	6.16	11.67	2.04	0.030
12%	197,700	3.18	3.72	6.73	13.63	2.19	0.041
14%	42,600	3.48	4.57	8.83	16.88	3.15	0.046

*undiluted drill indicated and inferred.

Franzen concluded that there is little change in total reserve tonnes below a cutoff grade of 5%. From there to about 12%, reserve tonnes decrease fairly gradually and steadily by about 270,000 tonnes for each 1% increase in cutoff grade. Sixty-five percent of the total reserve tonnes lie within the 8 to 12% average grade interval.

Franzen also investigated the effect of substantial dilution on the reserves by adding at least 0.75 m of wallrock on both the hangingwall and footwall sides of each block. Using no cutoff grade, dilution increased reserve tonnes by 45.3% and decreased grade by 31.3%, as summarized below.

CATEGORY	TONNES	GRADE Cu (%)	Pb (%)	Zn (%)	Ag (oz/ton)	Au (oz/ton)
UNDILUTED						
Drill indicated	1,740,805	1.94	2.63	4.99	1.92	.029
Inferred	355,725	1.73	2.42	5.00	1.63	.024
Total	2,096,530	1.90	2.59	4.99	1.87	.028
DILUTED						
Drill indicated	2,557,830	1.31	1.79	3.40	1.32	.021
Inferred	488,060	1.23	1.70	3.53	1.15	.018
Total	3,045,890	1.30	1.78	3.42	1.29	.021

GEOCHEMICAL SURVEY

A small program of geochemical sampling, consisting of 198 soil and 14 stream sediment samples, was carried out in the vicinity of the drill grid in 1988. The soil sampling extended the 1986 grid survey to the east and southeast and extended five old lines to the north for about 2 km and one line to the southwest for about 1 km. The stream sediment sampling was performed in the vicinity of the ferricrete gossans and kill zones at the head of Cansup Creek, downhill from the campsite.

The samples were shipped by air to Chemex Labs where they were analyzed for 32 elements using aqua regia digestion and induced coupled plasma (ICP) atomic emission spectroscopy. Sample preparation consisted of sieving to minus 80 mesh and ring pulverizing to minus 100 mesh.

Copper, lead and zinc values are plotted on Figure 36 to 38, respectively. These maps also show the position of soil and stream sediment anomalies obtained in 1986 and the subcrop portion of the Marg deposit as outlined by the 1988 drilling. Values for the other elements can be located by comparing sample numbers plotted on Figure 39 with the assay certificates in Appendix F.

The results shown that the relationship between mineralization and soil anomalies is weak and inconsistent. The main portion of the deposit, which was discovered by drilling the uphill end of a strong lead and arsenic anomaly, produces no anomalous copper or zinc response in soil. The lead and arsenic anomalies trend southwest, oblique to the strike of the deposit. The strong steam sediment anomaly below the campsite is probably derived from the westerly extension of this zone. No source has been found for the strong soil anomalies in lead, arsenic, copper and zinc at the west end of the drill grid.

The problems in interpreting geochemical anomalies are partly due to geomorphological considerations. The deposit subcrops near a glaciofluvial terrace that is interpreted as a lateral moraine or kame terrace. The southwest trend of the top of the lead and arsenic anomaly associated with the main part of the deposit follows the contour of the hillside and could have resulted from dispersion by an ice-marginal stream flowing over the mineralization during the latest glaciation. The part of the property lying above the terrace is less glaciated and covered with a thinner layer of glacial drift while lower hillsides are mantled both with thicker drift and a thick cover of scrub trees and bushes.

The strong and extensive soil anomalies at the west end of the property are unexplained. Although they could be partially derived by leaching of metals from glaciofluvial drift containing mineralization derived from the main deposit to the east, strong evidence exists that the many springs in this area are metal-rich. This suggests that they are precipitating metal derived from oxidizing sulphides that do not reach surface, perhaps for structural reasons that have yet to be understood.

GEOPHYSICAL SURVEY

When the correlation between massive sulphides and the interpreted 1986 EM conductors proved inadequate for defining drill targets, and the overburden and depth of oxidation appeared to exceed the 1986 depth of penetration in some places, it was decided to resurvey the property using different techniques. This required some enlargement of the existing grid, namely the addition of new lines to the east and the extension of some old lines to the north and south.

The 1988 surveys included: (a) expanded magnetometer coverage (by Delta Geoscience); (b) deeper MaxMin penetration using a 160 m coil separation and an I9 instrument (Delta); (c) a Pulse EM survey of the entire grid (Noranda); and, (d) a test gravity survey over three selected areas (Noranda). The results are summarized in a brief report by Lyndon Bradish of Noranda dated December 8, 1988, which is included as Appendix G to this report. The Bradish report includes two plans and twenty-one profiles.

Contouring the magnetic data at 5 m intervals outlined several prominent magnetic features on the north edge of the grid that are apparently related to diorite sills. A second band with higher magnetic response occurs in the southeast corner of the grid. This feature is unexplained and probably related to stratigraphy. A general trend of 070° is apparent in the magnetic response of the rocks underlying the grid.

The Pulse EM survey outlined the 1986 conductors in more detail. Bradish has interpreted several features of above average conductivity that he has cited as being of particular interest.

The test gravity survey failed to define any anomalous features.

ENVIRONMENTAL SURVEY

Norecol visited the property on September 14-15 to collect five water samples, identify environmental concerns and examine the hydrology of the area. A brief report by W.E. Dunford dated December 8, 1988 is included as Appendix H to this report.

The initial observations and water quality data do not indicate any significant or unusual environmental sensitivities. This is somewhat surprising considering the obvious acid-generating capability of the Marg mineralization and the high metal content measured in stream sediments from Cansup Creek. This suggests that the flushing of heavy metals in spring waters into Cansup Creek may undergo seasonal fluctuations and that additional sampling in the spring and summer will be needed to measure this. The next phase of work should also examine fisheries values in the Keno Ladue River on the south side of the property.

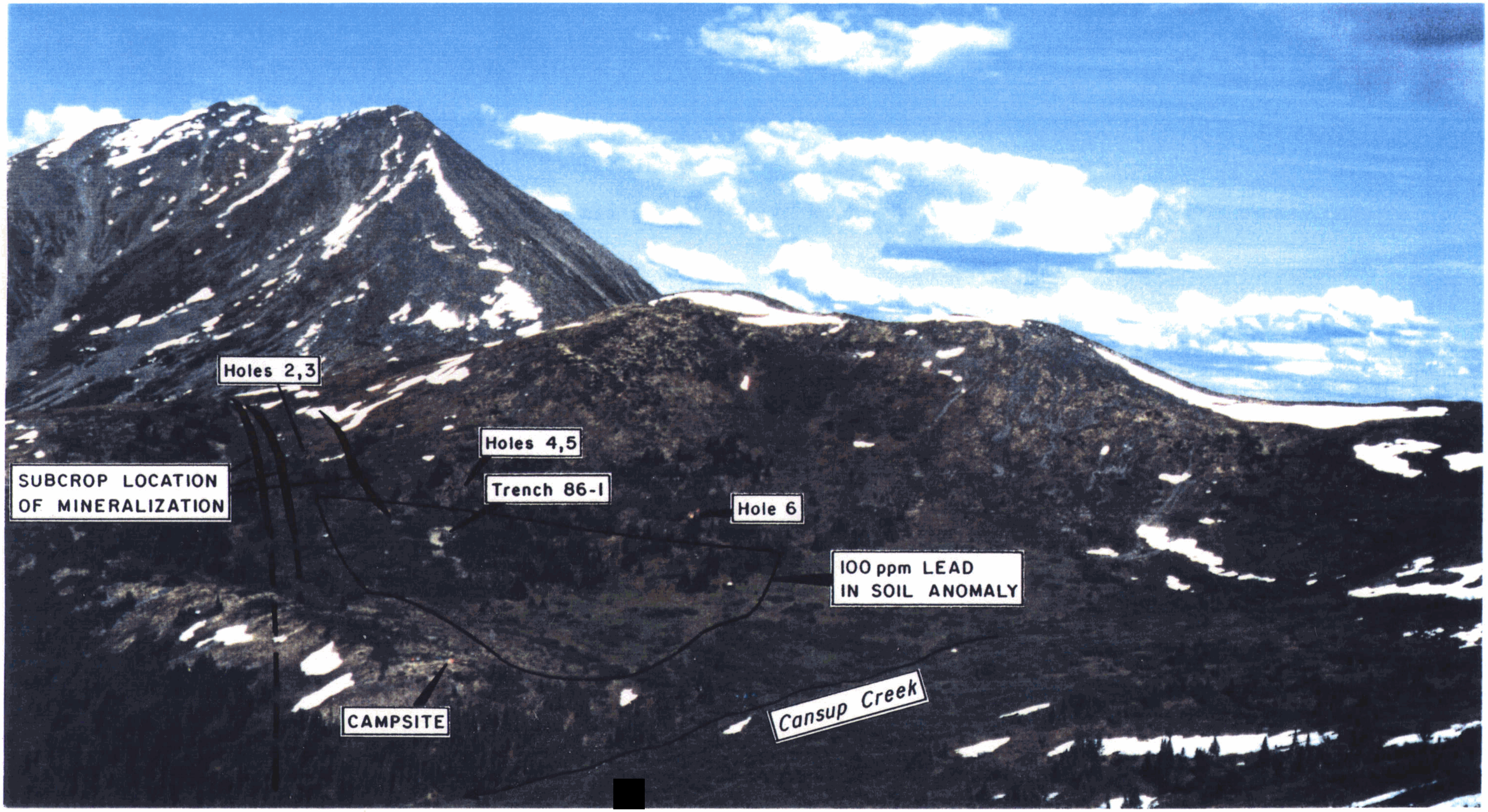
JANE ZONE

During 1988, the Marg property was substantially enlarged to the southwest along the trend of the favourable host rocks (see Figures 4 and 6). The new claims cover the Jane Zone, which is a GSC geochemical anomaly staked as the Jane claims by Canadian Superior and United Keno Hill in April, 1985. Following reconnaissance prospecting and sampling in 1965 and 1966, the claims were allowed to lapse and this anomaly remained unstaked until now, although Archer, Cathro collected 27 soil and rock samples here in 1982 on behalf of the ZX Joint Venture.

Following the staking, six mandays of prospecting and sampling (91 stream sediments, soils and rocks) were carried out in the vicinity of the anomaly. The 1988 assays are plotted at a scale of 1:5000 with the 1982 values on Figures 40 to 43.

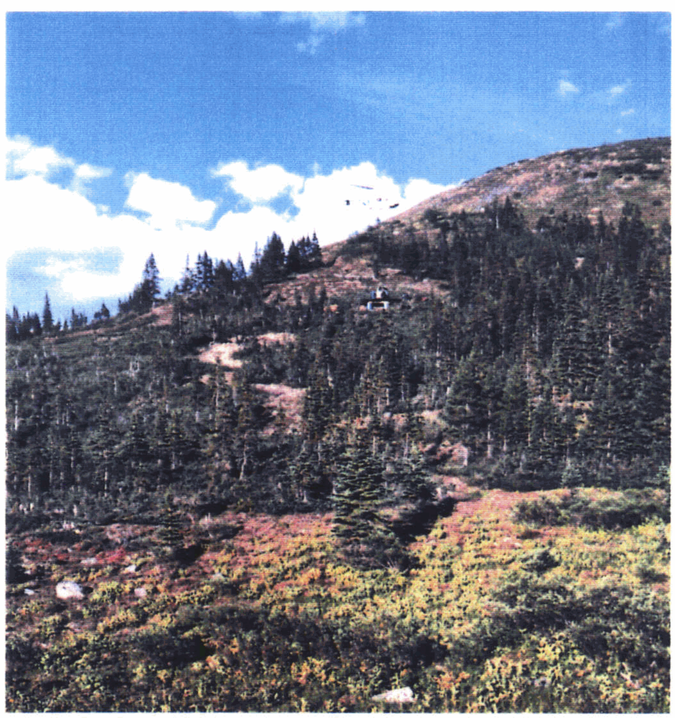
The 1988 sampling relocated the 1965 and 1982 anomaly near the head of a steep-walled valley. A brief prospecting traverse located small fragments of strongly oxidized, sulphide-bearing fragments in coarse talus below a steep slope. The best assay was 0.29% Cu, 4.34% Pb, 5.14% Zn, 1.12 oz/ton Ag, 0.008 oz/ton Au and >1.0% As. Another specimen containing low values in the other metals assayed 1.64% Cu. These specimens closely resemble the original oxidized Marg float both in appearance and metal ratios, which suggests a volcanogenic massive sulphide origin. Their source was not located due to the lateness of the season and pressures to accelerate the drill program.

The encouragement obtained at the Jane Zone illustrates the potential for locating extensions of the Marg Deposit within the favourable stratigraphy. The Jane anomaly is situated 6 km southwest of the airstrip and the intervening area has been explored only with stream sediment sampling. A sample of limonitic rubble collected in 1988 on the ridge west of the Jane float returned strongly anomalous values of 1265 ppm Pb, 645 ppm As, 11.2 ppm Ag, 936 ppm Zn and 96 ppm Cu. Most of the copper and zinc was probably leached out of this sample. The significance and extent of this material has not been investigated. Another GSC anomaly, collected from a limonitic spring, occurs at the southwest end of the claim block, about 3 km from the Jane float.

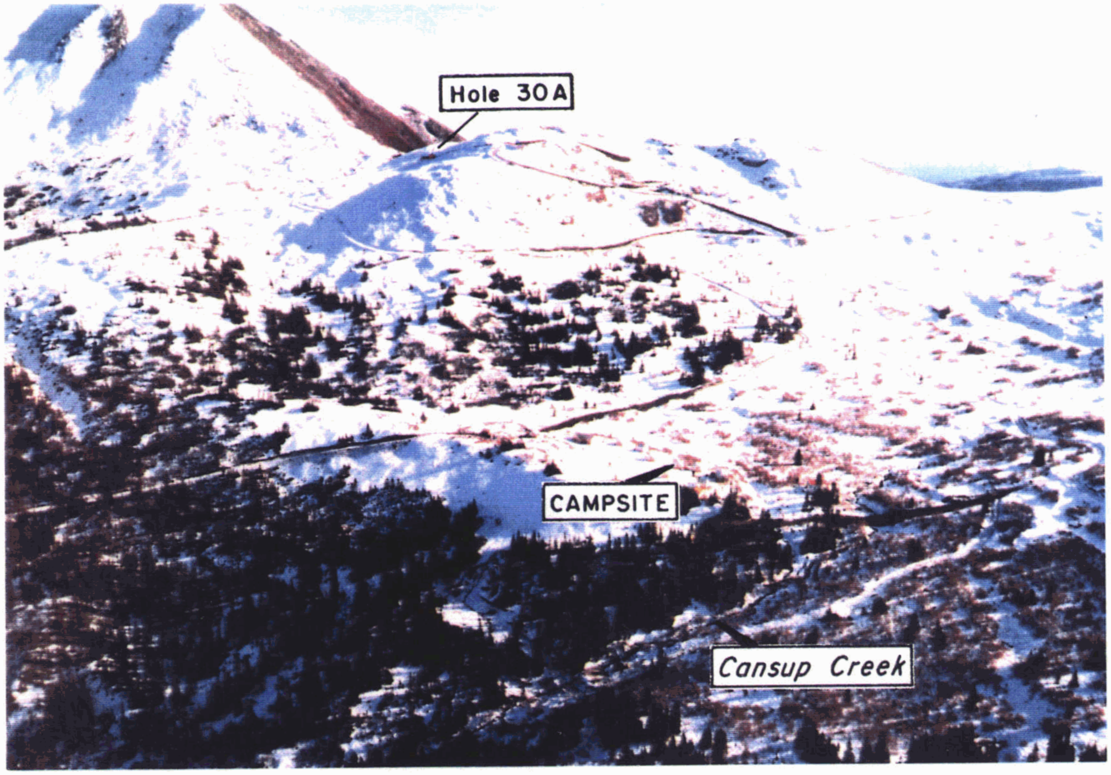


Photograph 2: Aerial view looking east of Marg deposit, June 28, 1988

Photograph 3: View west from Holes 4 and 5 across glaciofluvial terrace prior to construction of new campsite, June, 1988

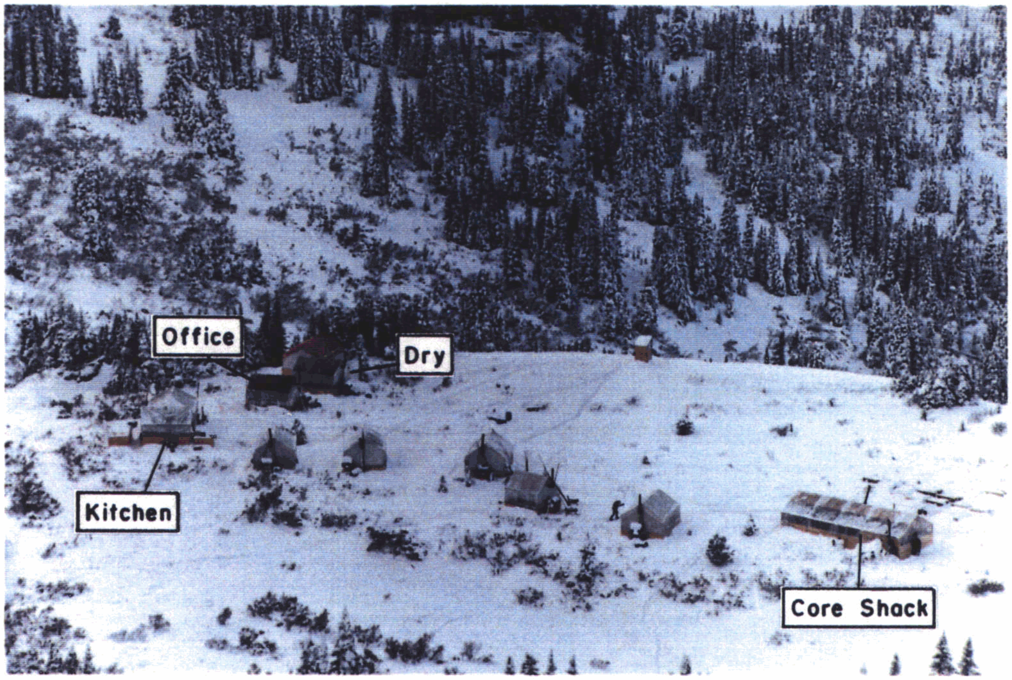


Photograph 4: Moving the drill to Hole 9 by helicopter, August, 1988



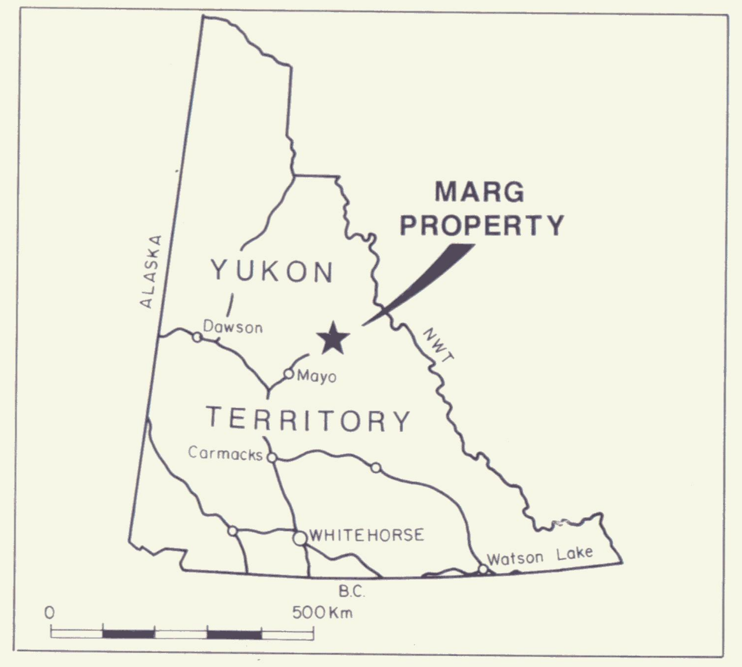
Photograph 5: Aerial view looking southeast over Marg property, October 1, 1988

Photograph 6: View looking southeast from airphoto target M3, showing drills on Holes 32 and 33, October 19, 1988



Photograph 7: Aerial view to west of new campsite, Marg property, October, 1988

Photograph 8: Moving the drill with the D6 bulldozer, October, 1988



GRID SURVEY NOTES

The **DRILL GRID** was cut in 1965 and extended in 1986 and 1988. All geochem, geophysics, geology and drill layouts to the end of 1988 are related to this grid system.

A new **SURVEY GRID** was established in October, 1988 and tied to the National Triangulation Grid to establish astronomic north and true elevations. Airphoto target M-1 was assigned coordinates of 100,000N and 100,000E. Geodetic elevation of this point is 1526.0m, compared to the previous assumed elevation of 1500.0m.

CONTOURS shown on this plan are uncorrected and are shown for reference purposes only.

LEGEND

- SUBCROP LOCATION OF SULPHIDE MINERALIZATION
- INFERRED LOCATION OF SULPHIDE MINERALIZATION
- ?∼ ?∼ ? POSSIBLE FAULT
- 88-5 DIAMOND DRILL HOLE
- M3 AIR PHOTO TARGET AND SURVEY STATION
- 40m GEOCHEMICAL AND GEOPHYSICAL SURVEY STATION

Figure 5

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

DRILL HOLE PLAN

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

MAYO MINING DISTRICT, YUKON

SCALE 1:2500

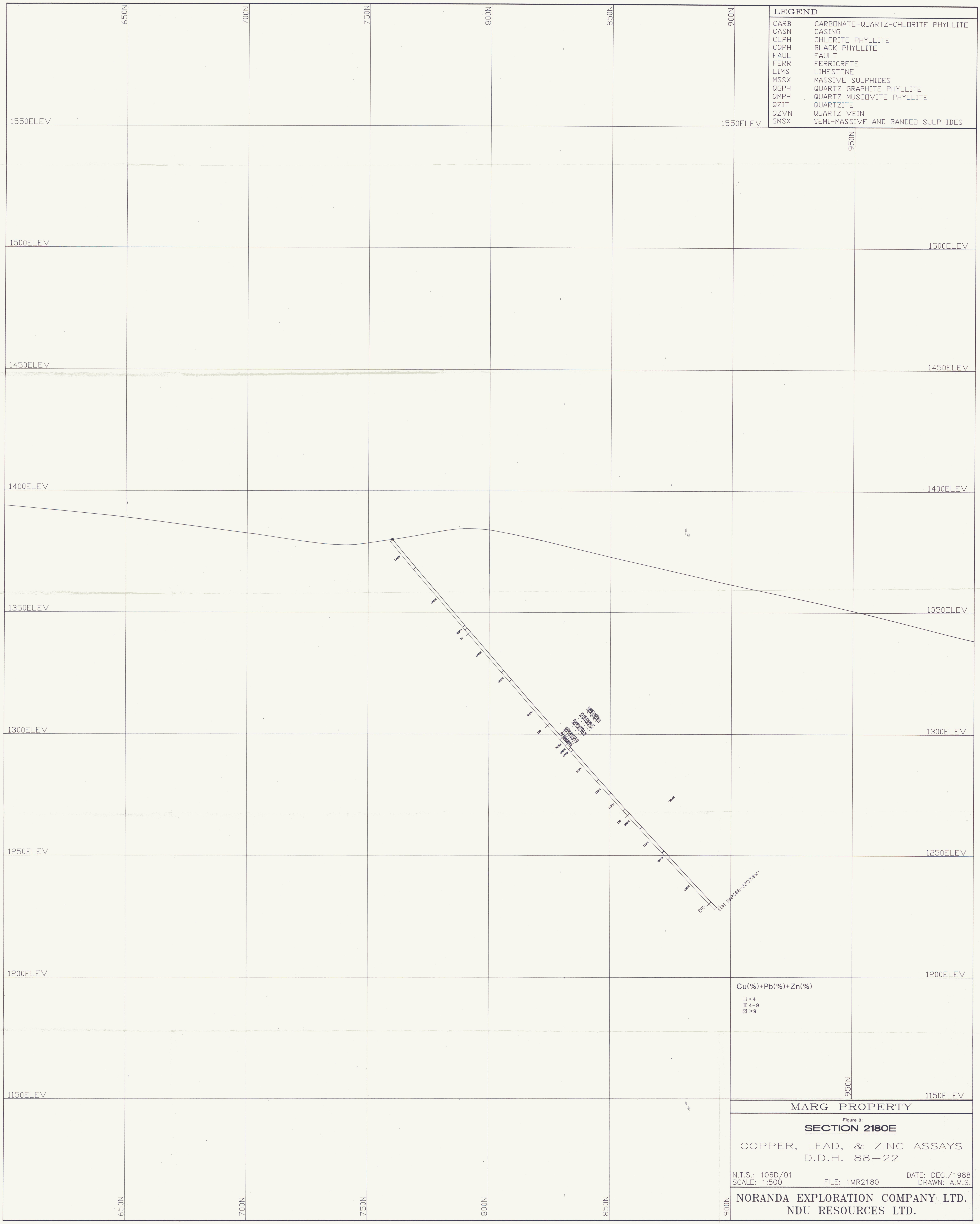
0 50 100 150 200 Metres

106 D1

(32)

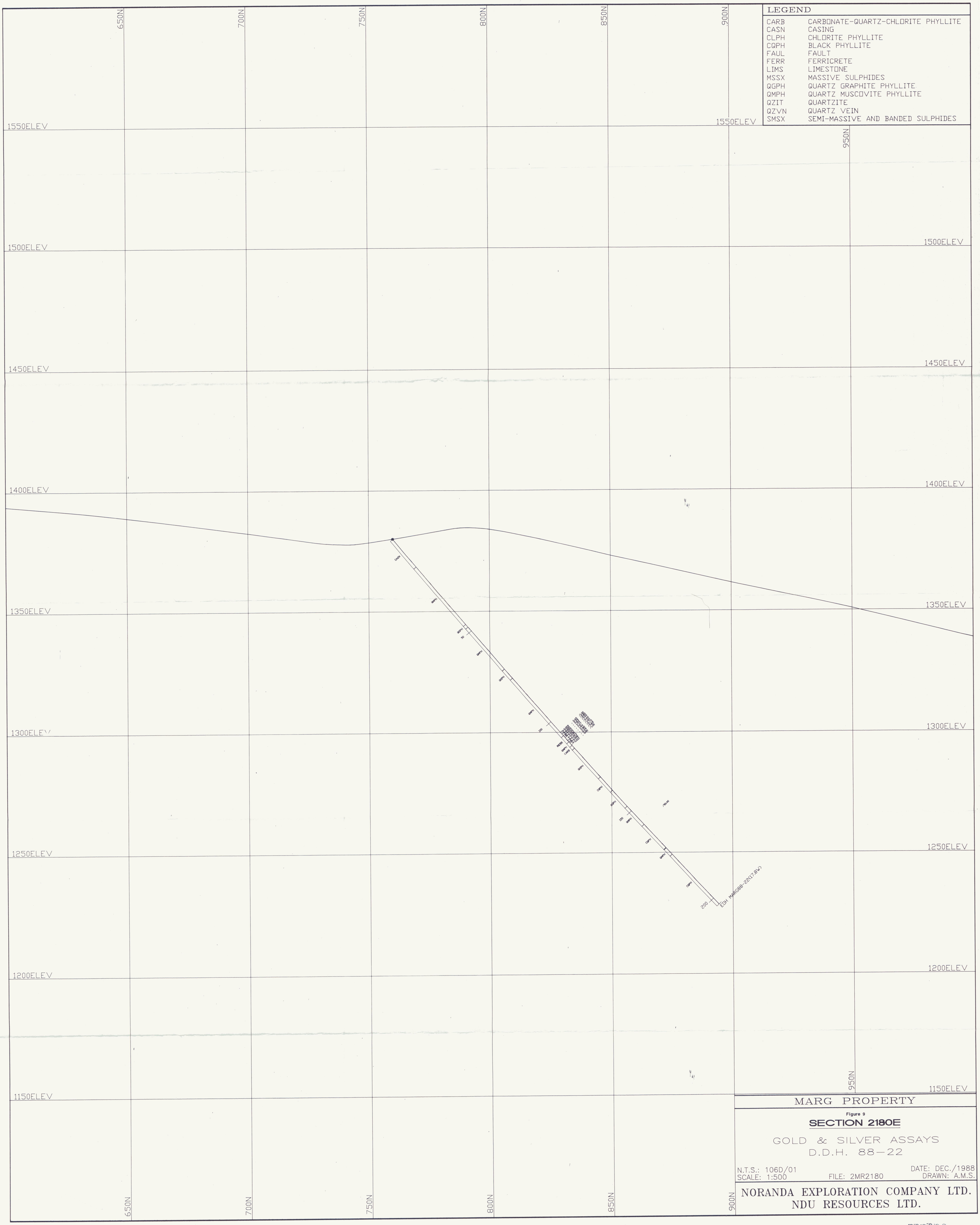
092682

To accompany report by R.J. Cathro dated December, 1988

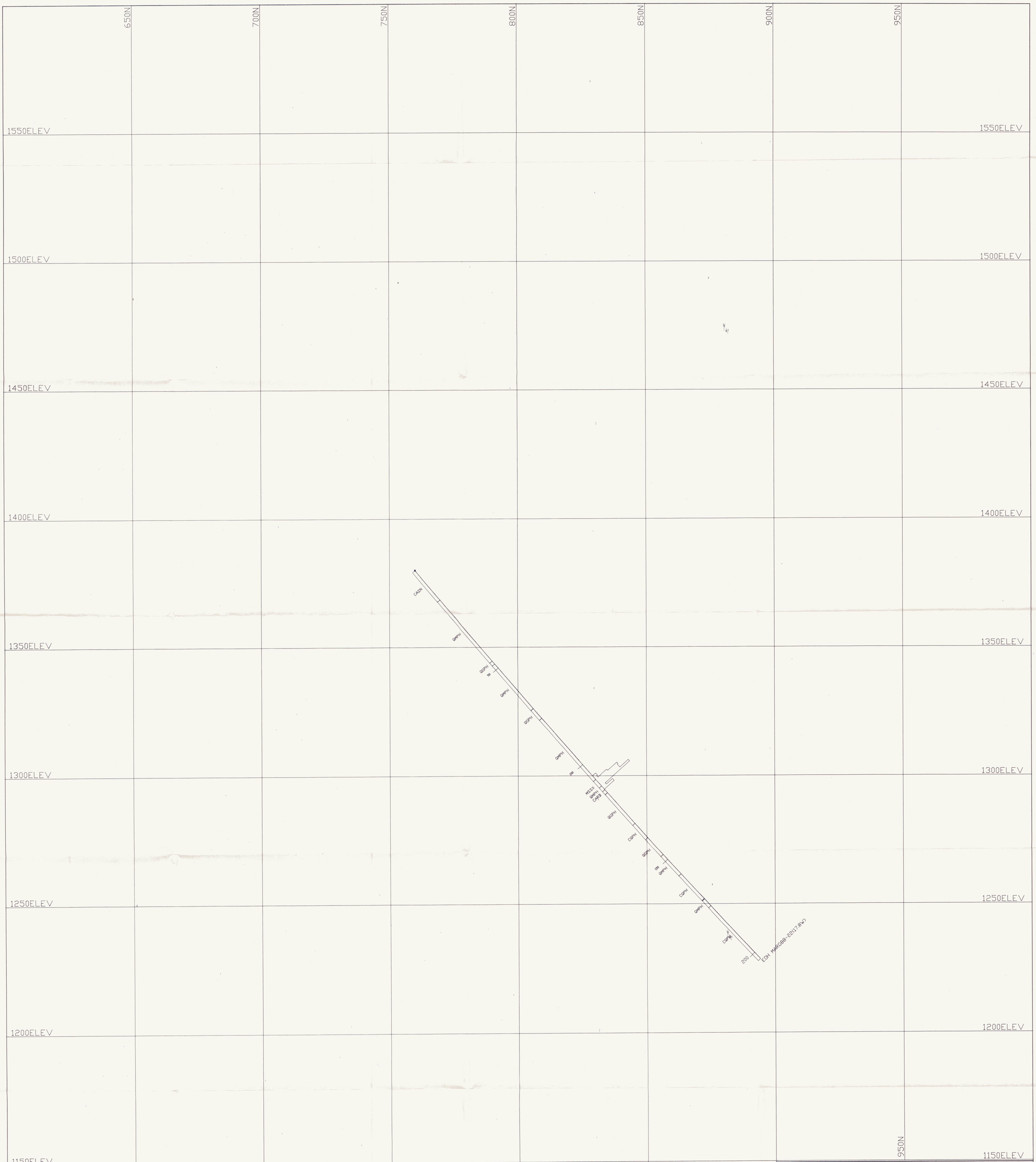


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
200
Cu(%)+Pb(%)+Zn(%)
<4
4-9
>9
MARG PROPERTY
Figure 8
SECTION 2180E
COPPER, LEAD, & ZINC ASSAYS
D.D.H. 88-22
N.T.S.: 106D/01
SCALE: 1:500
FILE: 1MR2180
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
200
EOH MARG88-22(17.8W)
MARG PROPERTY
Figure 9
SECTION 2180E
GOLD & SILVER ASSAYS
D.D.H. 88-22
N.T.S.: 106D/01
SCALE: 1:500
FILE: 2MR2180
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 10

SECTION 2180E

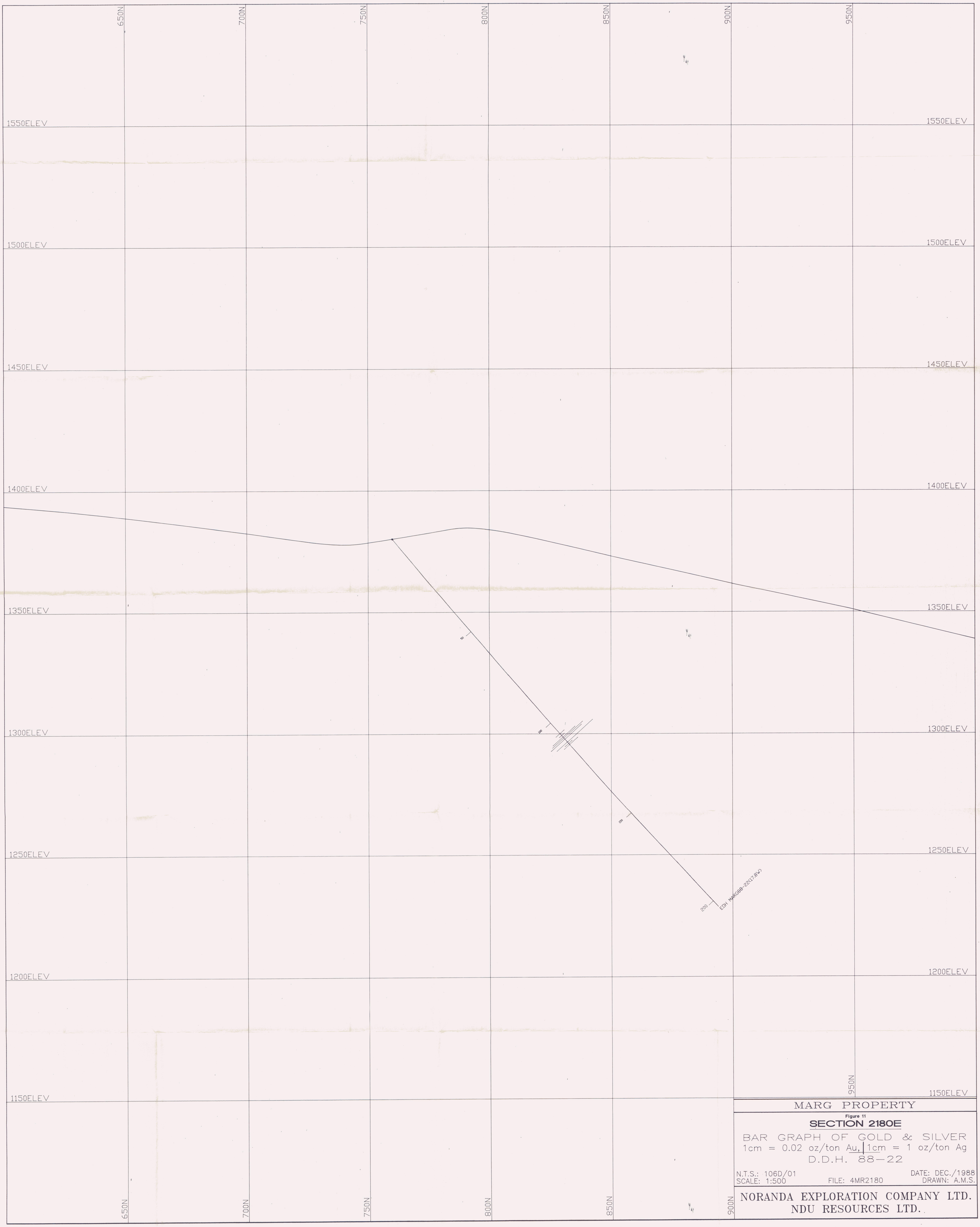
HISTOGRAM OF Cu + Pb + Zn, 1cm = 5%

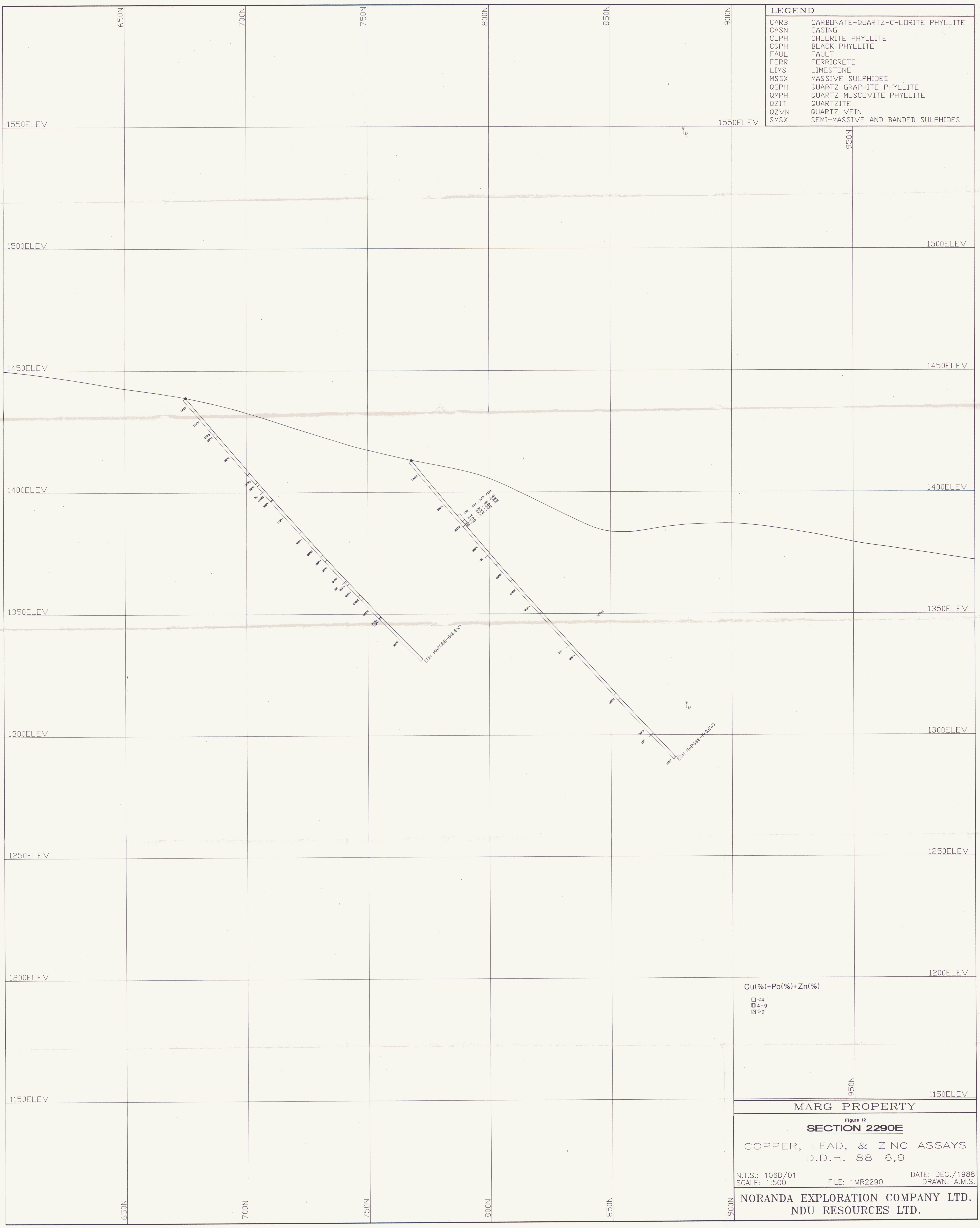
D.D.H. 88–22

N.T.S.: 106D/01
SCALE: 1:500
FILE: 3MR2180
DATE: DEC./1988
DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682


650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
200
EDH MARG88-22(17.8W)
MARG PROPERTY
Figure 11
SECTION 2180E
BAR GRAPH OF GOLD & SILVER
1cm = 0.02 oz/ton Au, 1cm = 1 oz/ton Ag
D.D.H. 88-22
N.T.S.: 106D/01
SCALE: 1:500
FILE: 4MR2180
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.



LEGEND

CARB	CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN	CASING
CLPH	CHLORITE PHYLLITE
CQPH	BLACK PHYLLITE
FAUL	FAULT
FERR	FERRICRETE
LIMS	LIMESTONE
MSSX	MASSIVE SULPHIDES
QGPH	QUARTZ GRAPHITE PHYLLITE
QMPH	QUARTZ MUSCOVITE PHYLLITE
QZIT	QUARTZITE
QZVN	QUARTZ VEIN
SMSX	SEMI-MASSIVE AND BANDED SULPHIDES

MARG PROPERTY

Figure 12

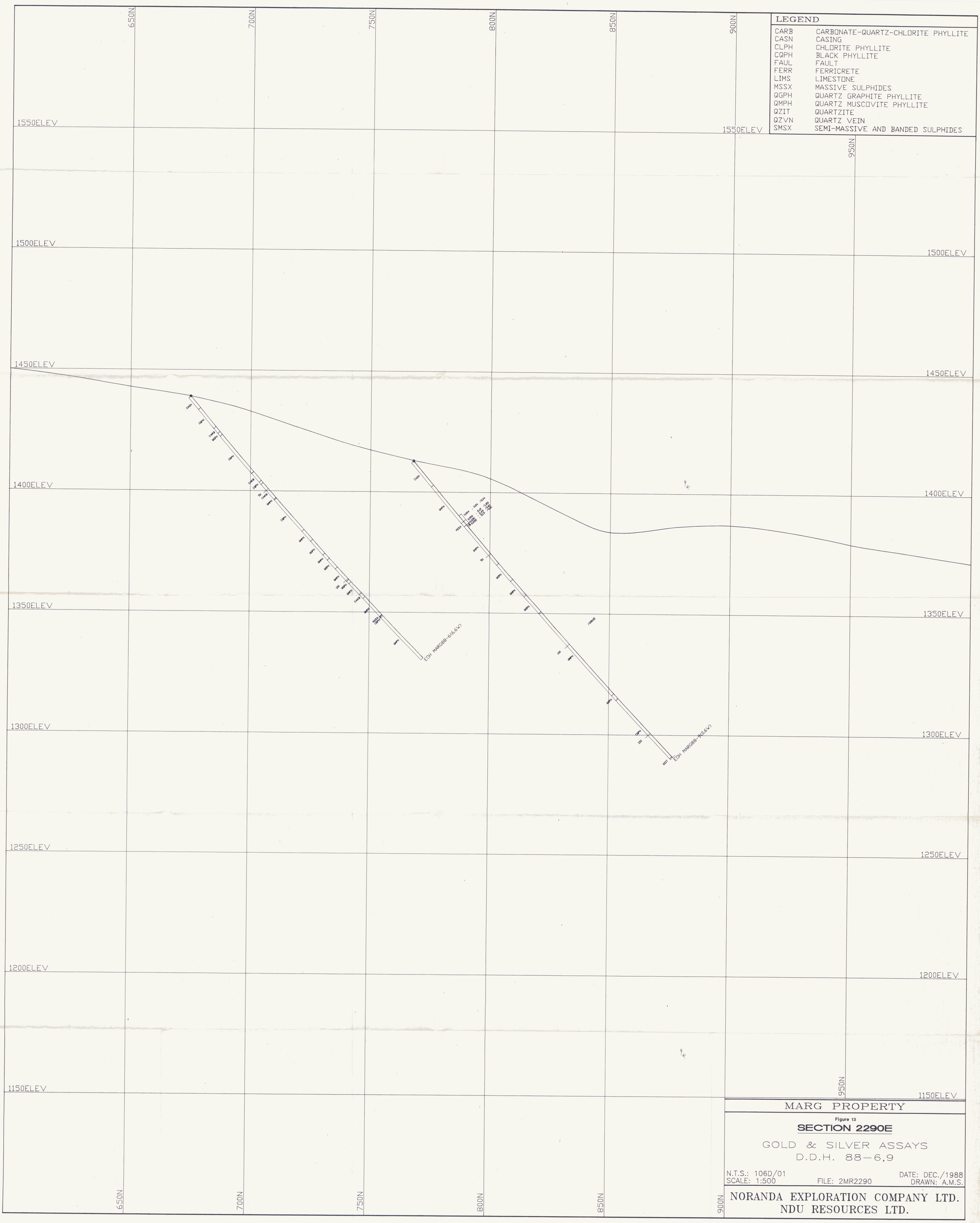
SECTION 2290E

COPPER, LEAD, & ZINC ASSAYS
D.D.H. 88–6,9

N.T.S.: 106D/01
SCALE: 1:500
FILE: 1MR2290
DATE: DEC./1988
DRAWN: A.M.S.

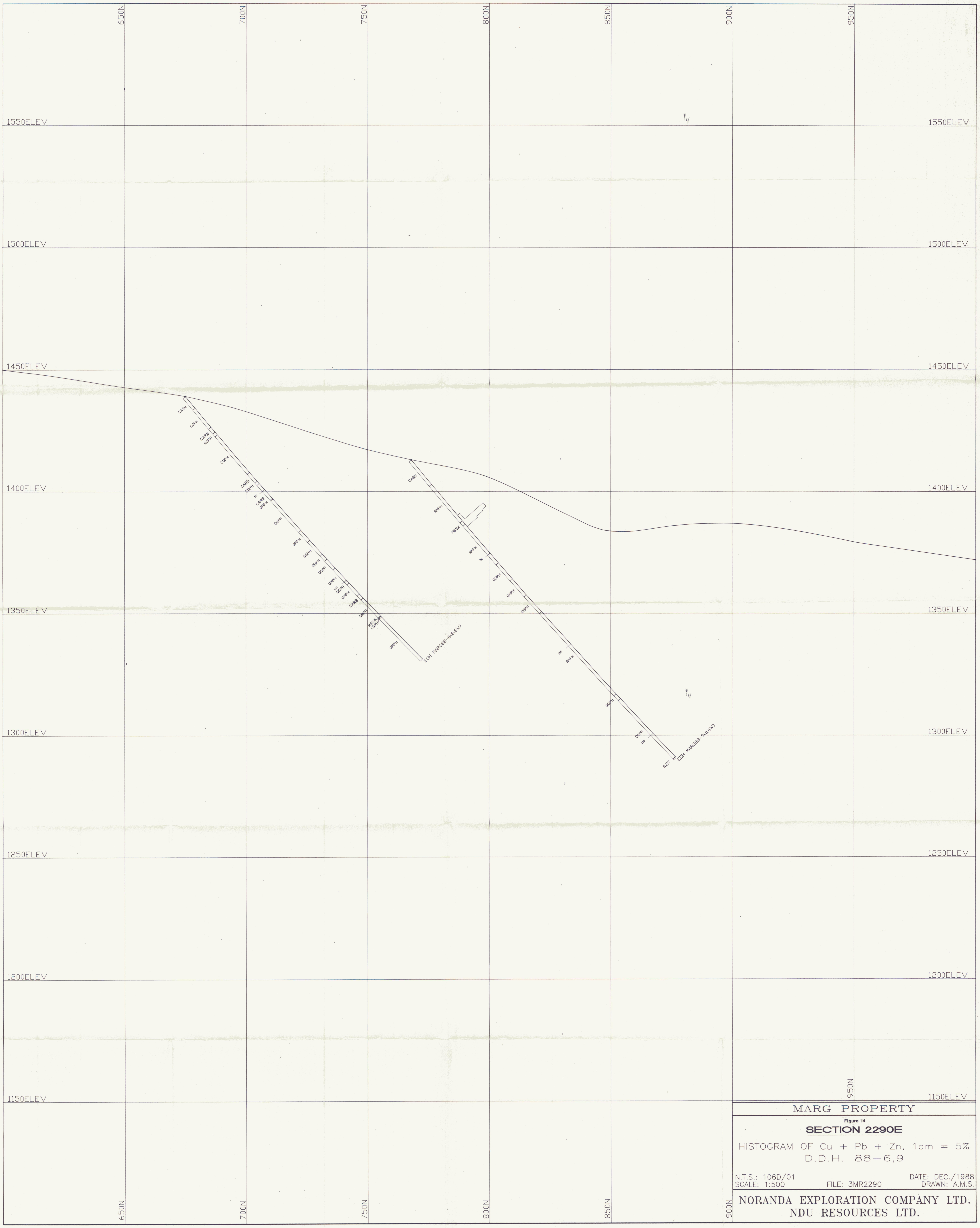
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
MARG PROPERTY
Figure 13
SECTION 2290E
GOLD & SILVER ASSAYS
D.D.H. 88–6,9
N.T.S.: 106D/01
SCALE: 1:500
FILE: 2MR2290
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 14

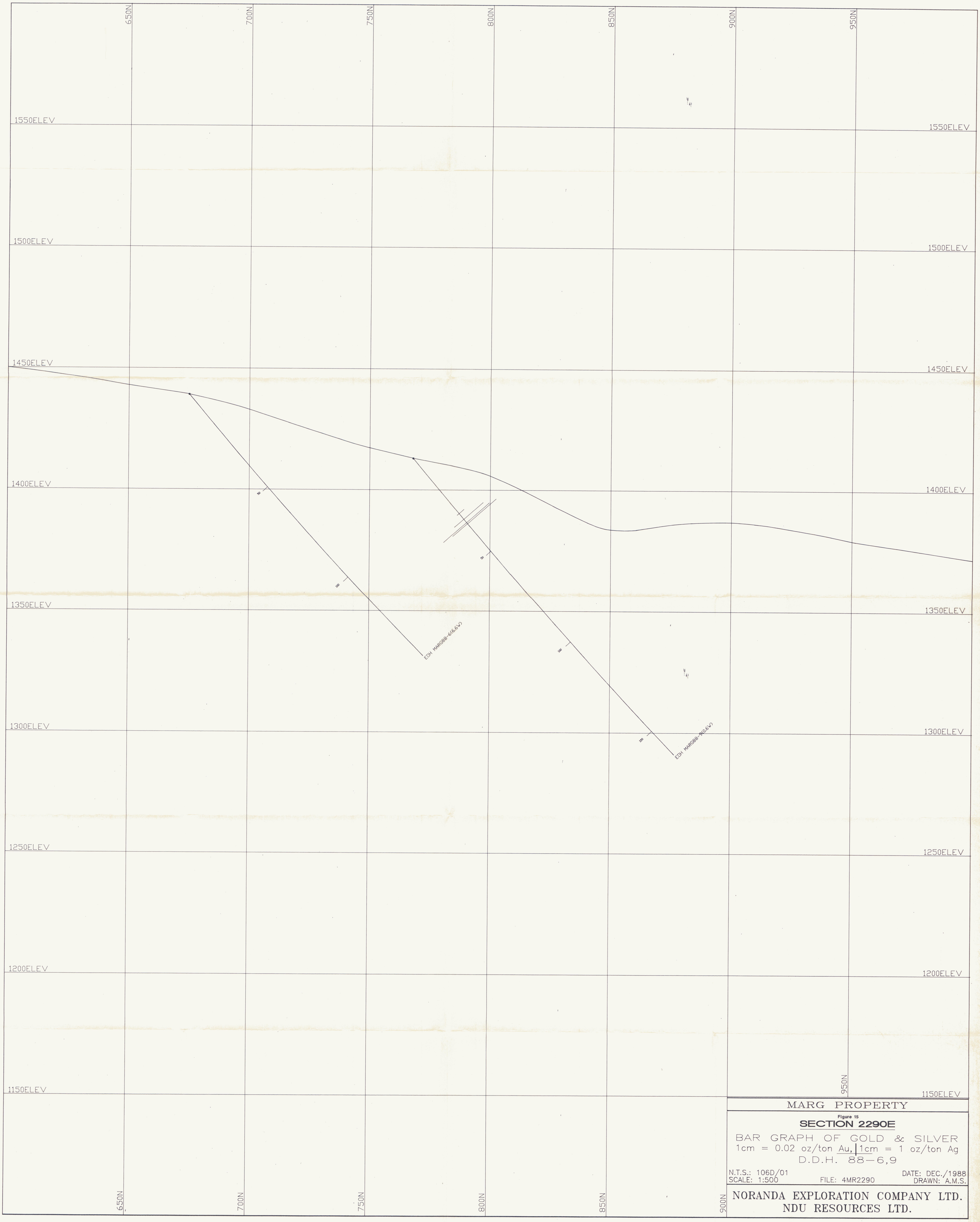
SECTION 2290E

HISTOGRAM OF Cu + Pb + Zn, 1cm = 5%
D.D.H. 88-6,9

N.T.S.: 106D/01
SCALE: 1:500
FILE: 3MR2290
DATE: DEC./1988
DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 15

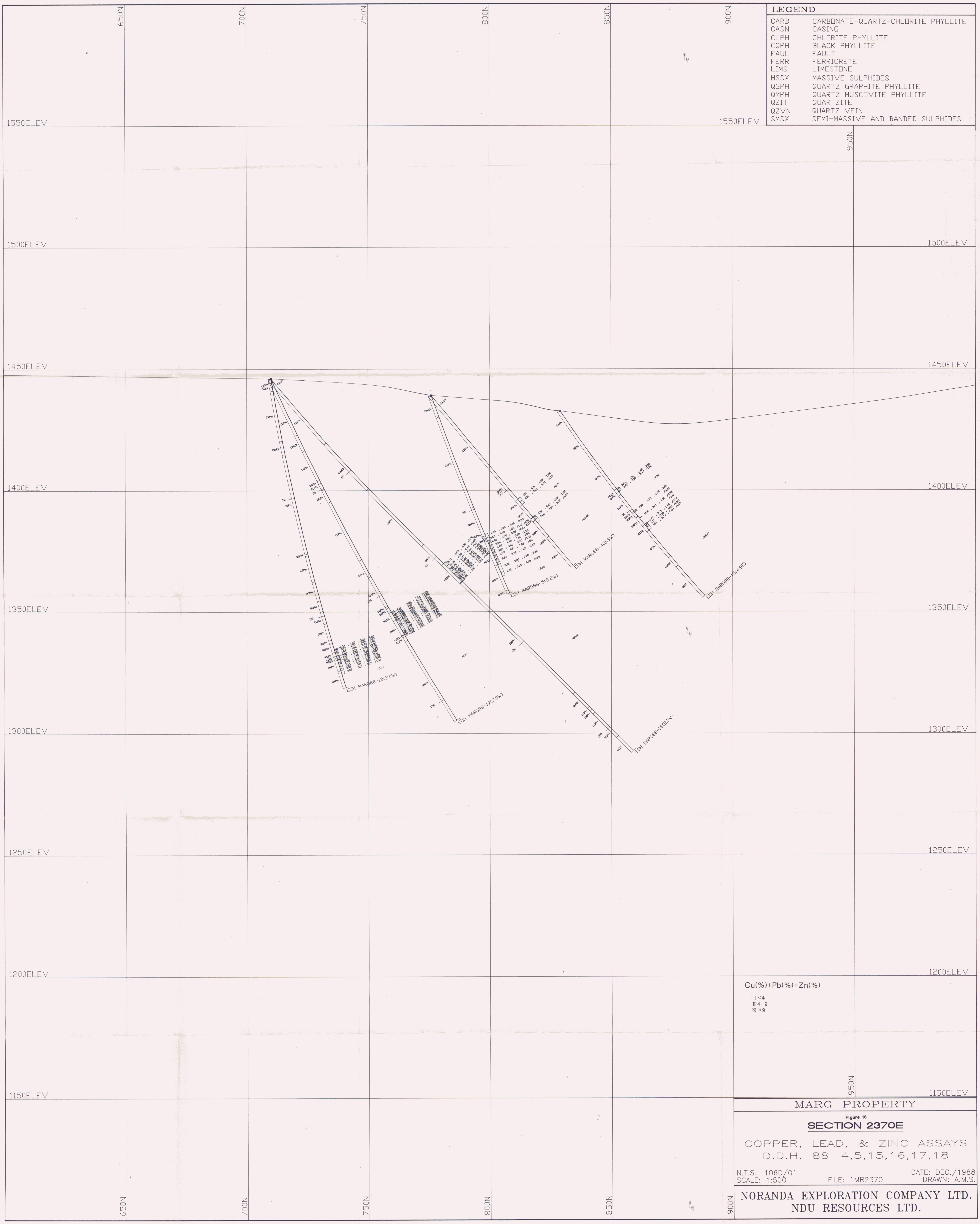
SECTION 2290E

BAR GRAPH OF GOLD & SILVER
1cm = 0.02 oz/ton Au, 1cm = 1 oz/ton Ag
D.D.H. 88—6,9

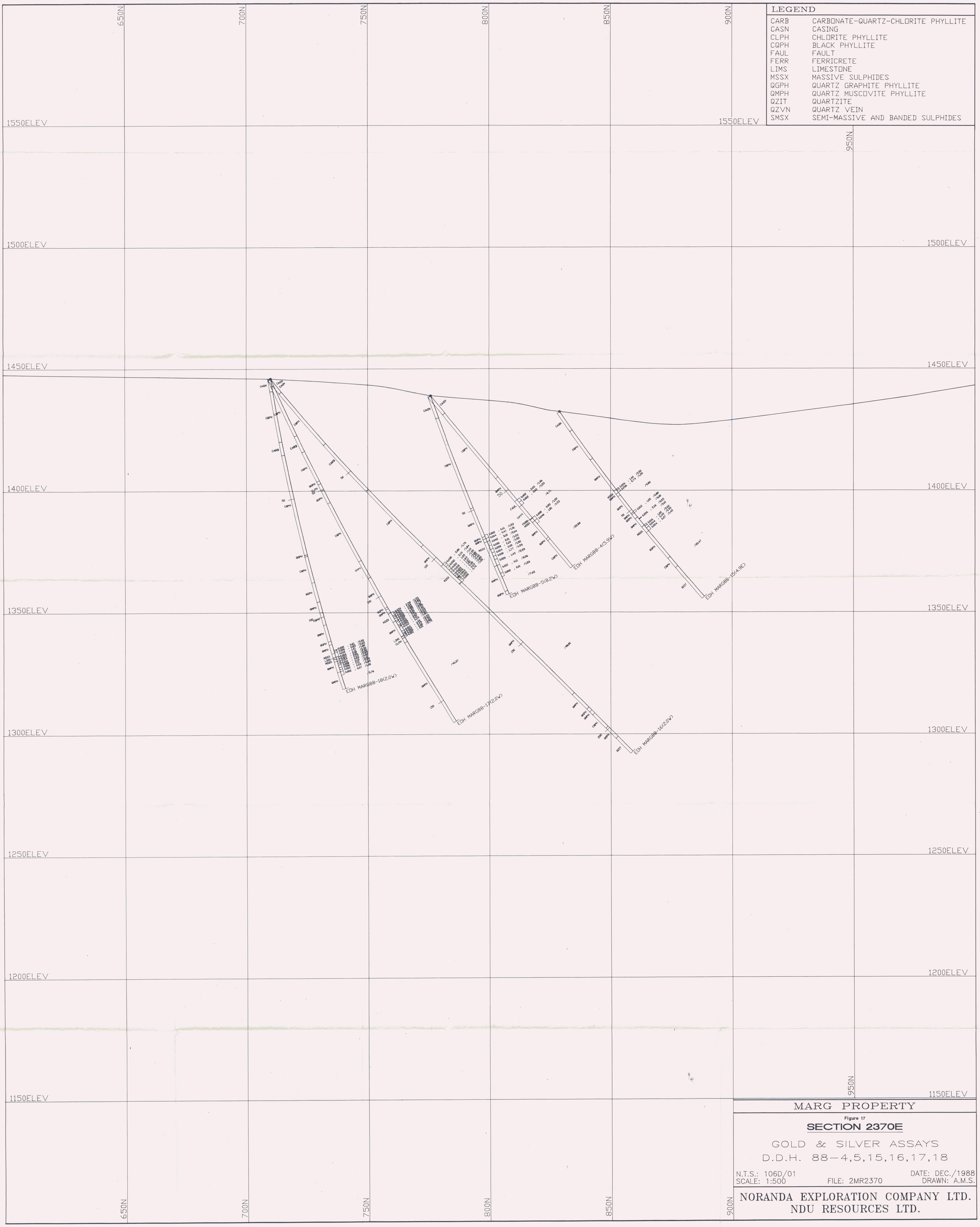
N.T.S.: 106D/01
SCALE: 1:500
FILE: 4MR2290
DATE: DEC./1988
DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
Cu(%)+Pb(%)+Zn(%)
<4
4-9
>9
MARG PROPERTY
Figure 16
SECTION 2370E
COPPER, LEAD, & ZINC ASSAYS
D.D.H. 88-4,5,15,16,17,18
N.T.S.: 106D/01
SCALE: 1:500
FILE: 1MR2370
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



LEGEND

CARB	CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN	CASING
CLPH	CHLORITE PHYLLITE
CQPH	BLACK PHYLLITE
FAUL	FAULT
FERR	FERRICRETE
LIMS	LIMESTONE
MSSX	MASSIVE SULPHIDES
QGPH	QUARTZ GRAPHITE PHYLLITE
QMPH	QUARTZ MUSCOVITE PHYLLITE
QZIT	QUARTZITE
QZVN	QUARTZ VEIN
SMSX	SEMI-MASSIVE AND BANDED SULPHIDES

MARG PROPERTY

Figure 17

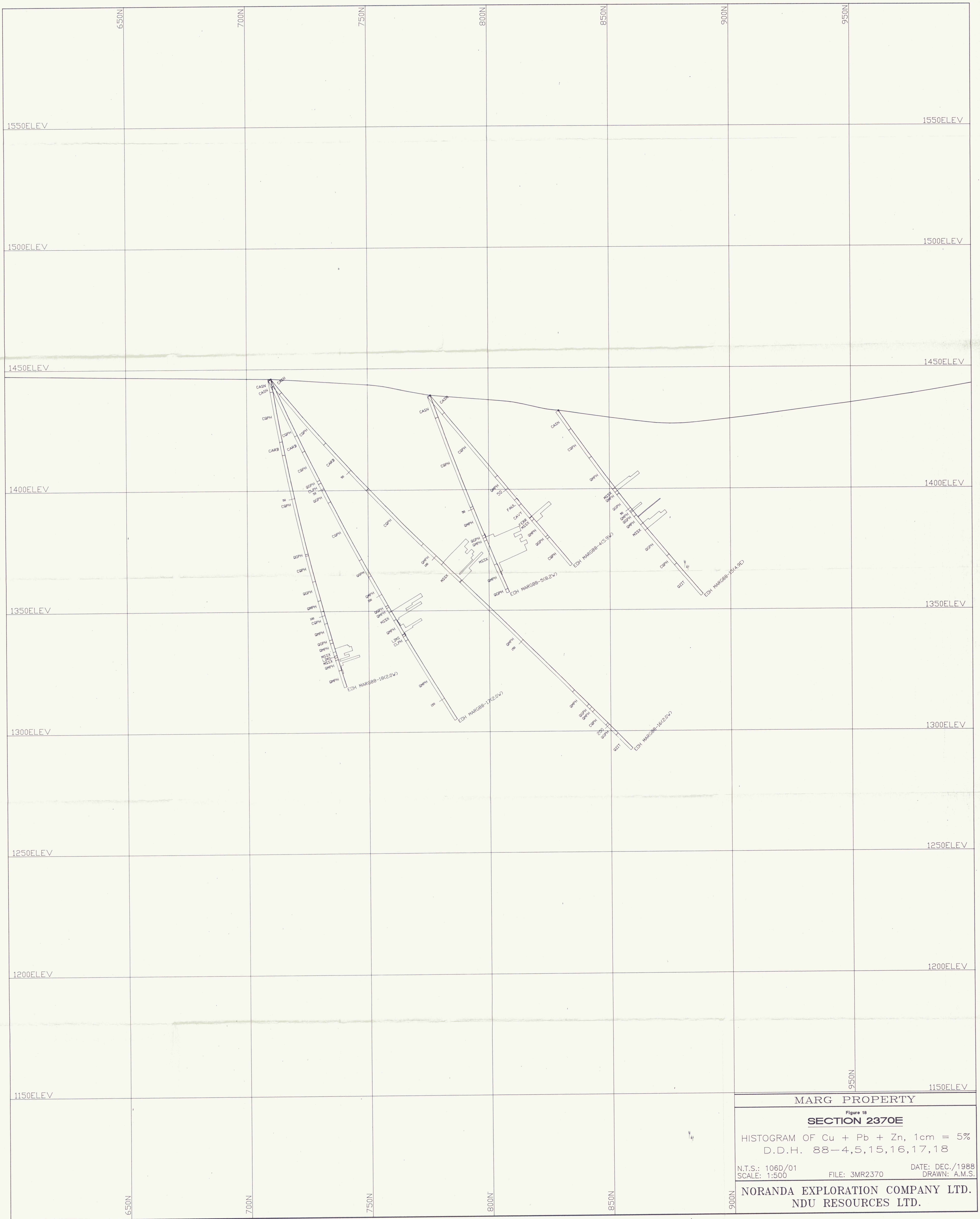
SECTION 2370E

GOLD & SILVER ASSAYS
D.D.H. 88–4,5,15,16,17,18

N.T.S.: 106D/01 DATE: DEC./1988
SCALE: 1:500 FILE: 2MR2370 DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 18

SECTION 2370E

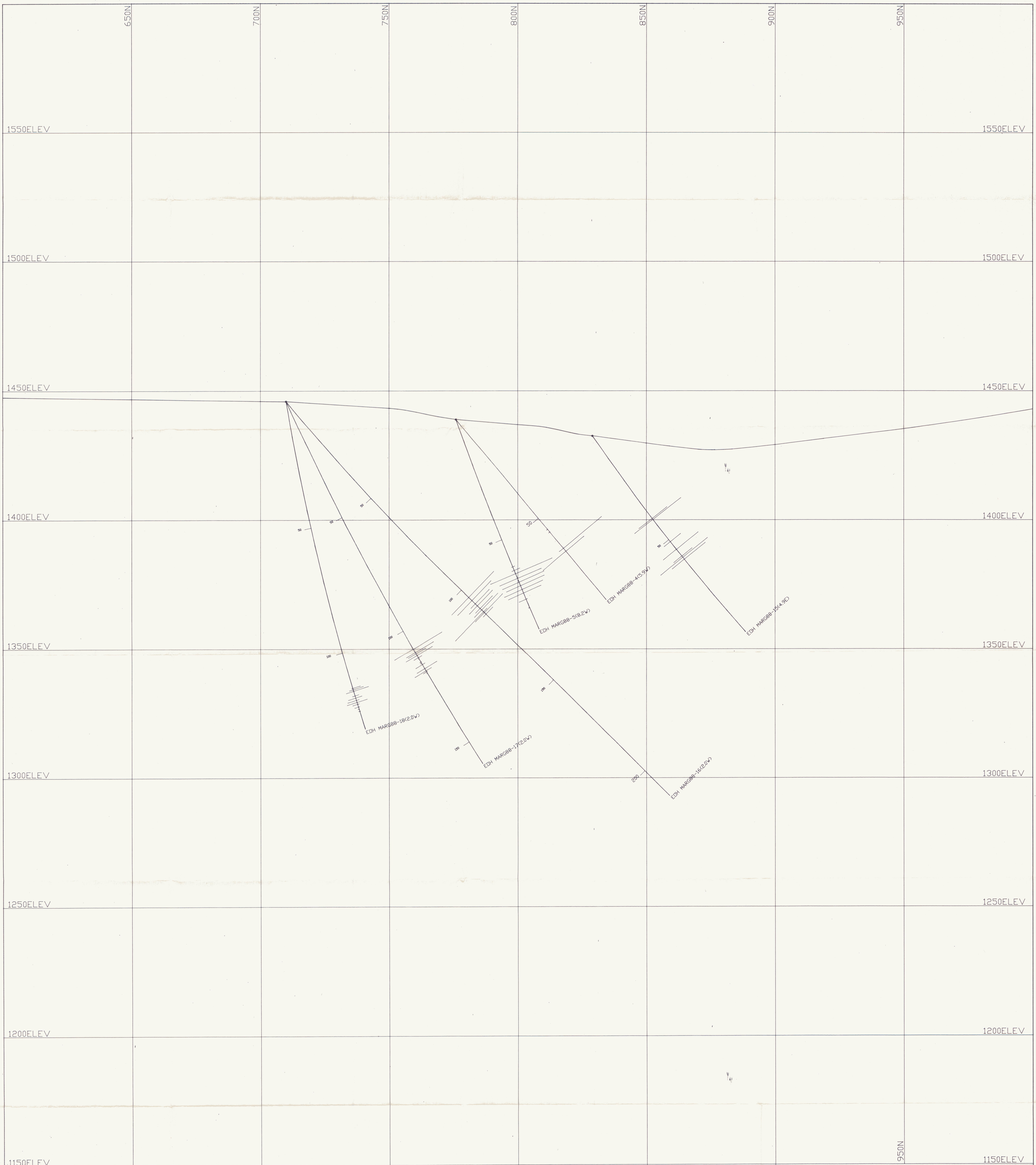
HISTOGRAM OF Cu + Pb + Zn, 1cm = 5%

D.D.H. 88–4,5,15,16,17,18

N.T.S.: 106D/01
SCALE: 1:500
FILE: 3MR2370
DATE: DEC./1988
DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 19

SECTION 2370E

BAR GRAPH OF GOLD & SILVER

1cm = 0.02 oz/ton Au, | 1cm = 1 oz/ton Ag

D.D.H. 88–4,5,15,16,17,18

N.T.S.: 106D/01 DATE: DEC./1988

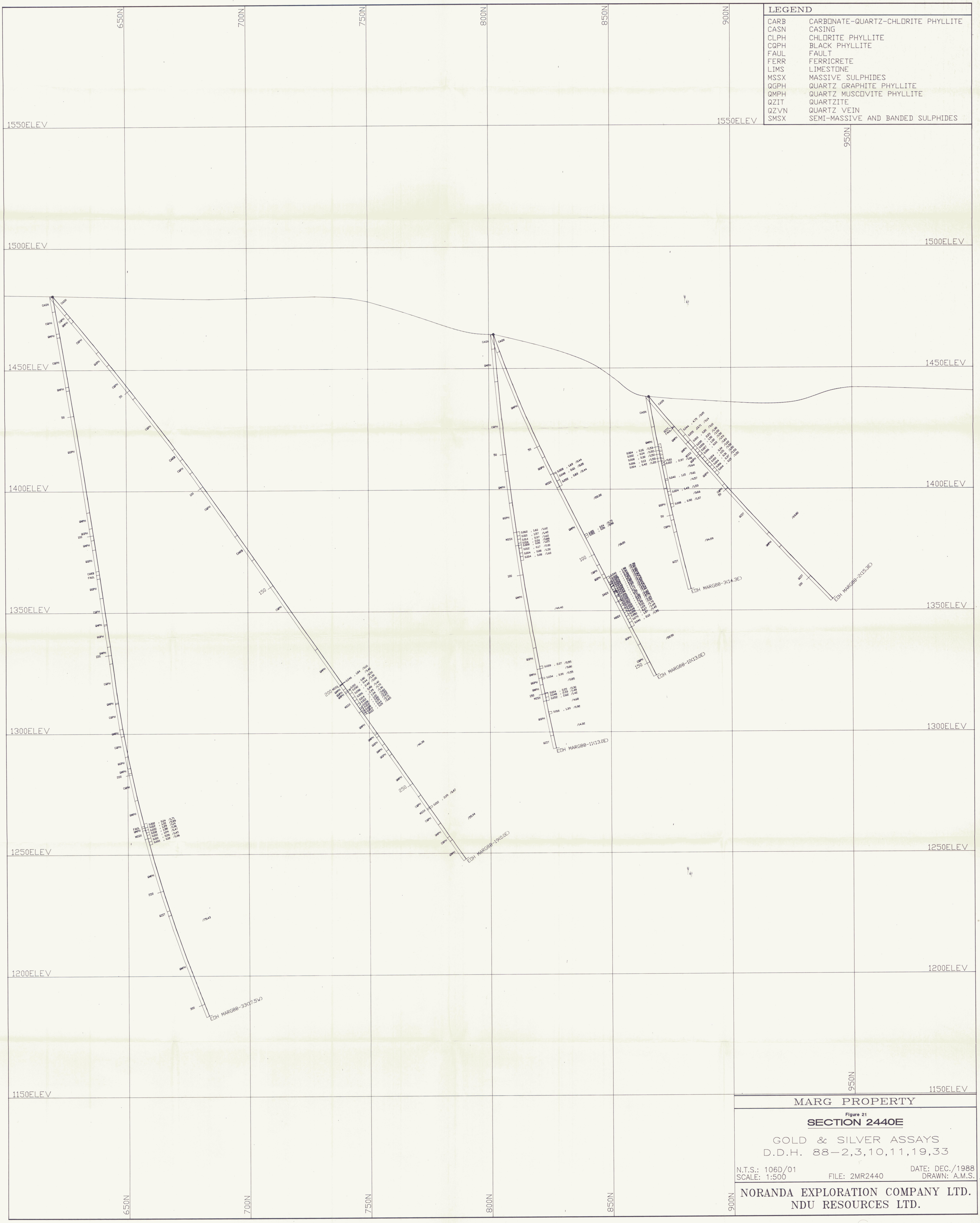
SCALE: 1:500 FILE: 4MR2370 DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

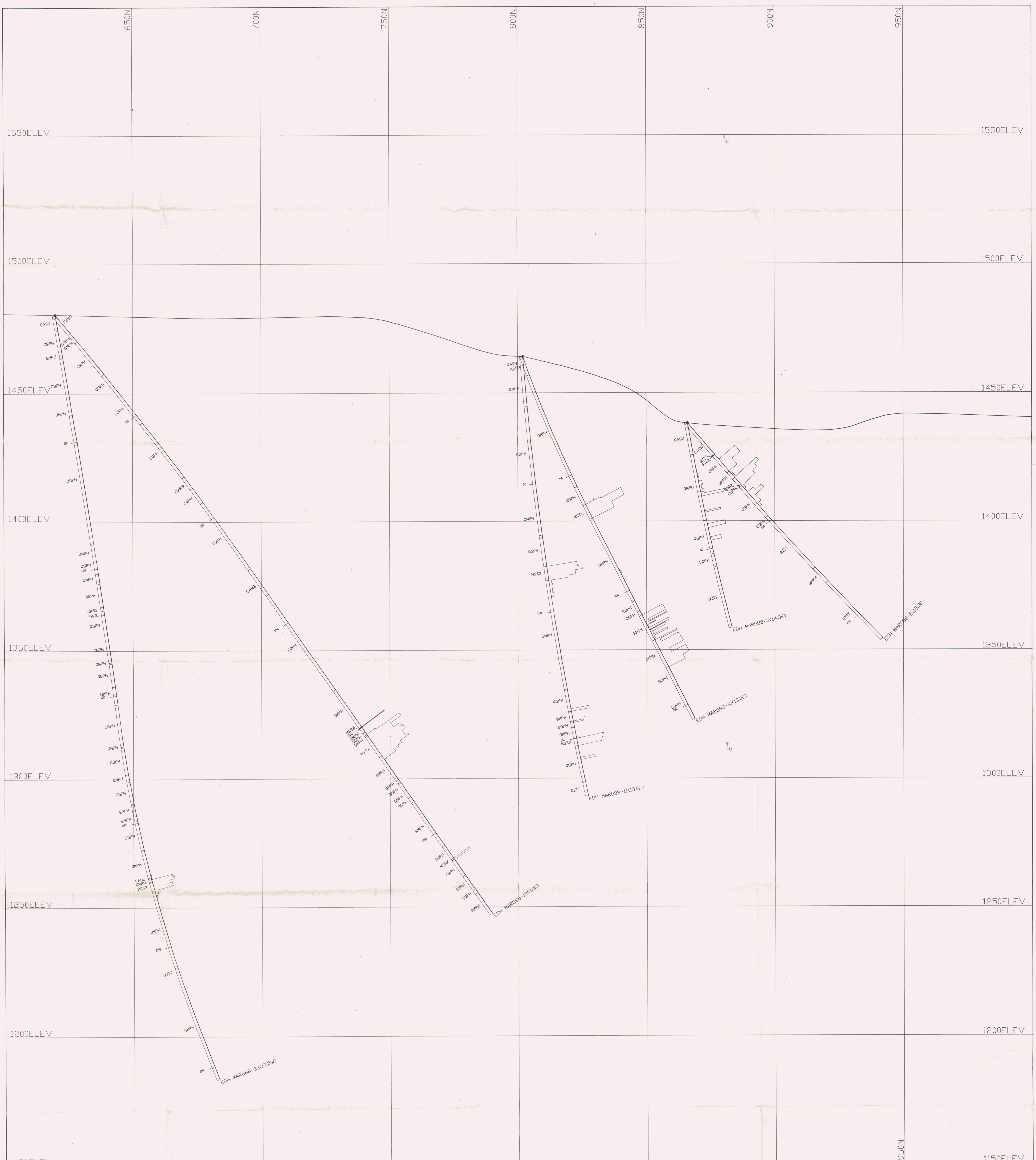
092682


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EOH MARG88-23(7.5V)
EOH MARG88-19(10.0E)
EOH MARG88-11(13.0E)
EOH MARG88-10(13.0E)
EOH MARG88-3(14.3E)
EOH MARG88-2(15.3E)
Cu(%)+Pb(%)+Zn(%)
<4
4-9
>9
MARG PROPERTY
Figure 20
SECTION 2440E
COPPER, LEAD, & ZINC ASSAYS
D.D.H. 88-2,3,10,11,19,23
N.T.S.: 106D/01
SCALE: 1:500
FILE: 1MR2440
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EDH MARG88-33(17.5W)
EDH MARG88-19(0.0E)
EDH MARG88-11(13.0E)
EDH MARG88-10(13.0E)
EDH MARG88-3(14.3E)
EDH MARG88-2(15.3E)
MARG PROPERTY
Figure 21
SECTION 2440E
GOLD & SILVER ASSAYS
D.D.H. 88-2,3,10,11,19,33
N.T.S.: 106D/01
SCALE: 1:500
FILE: 2MR2440
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 22

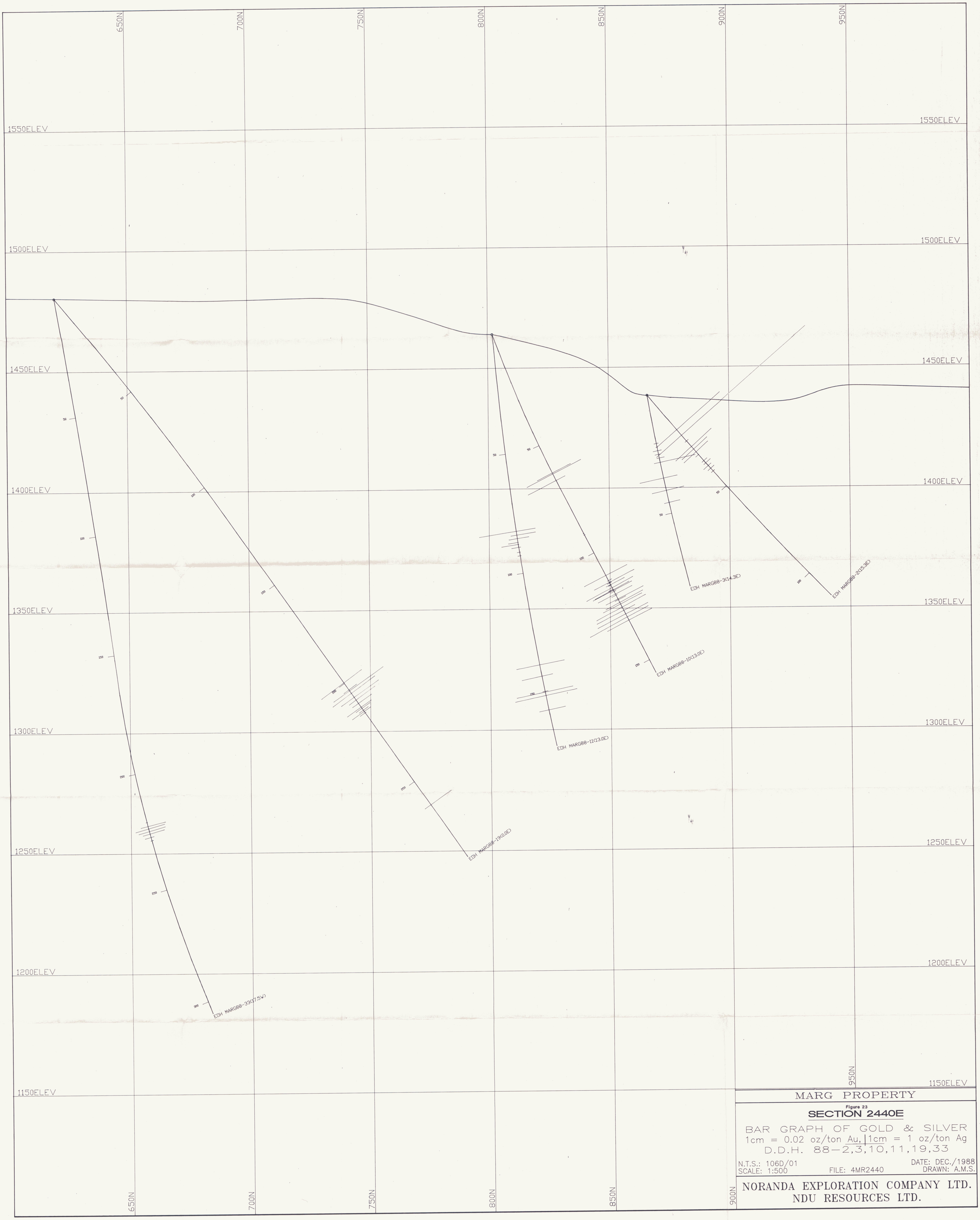
SECTION 2440E

HISTOGRAM OF Cu + Pb + Zn, 1cm = 5%
D.D.H. 88-2,3,10,11,19,23

N.T.S.: 106D/01 DATE: DEC./1988
SCALE: 1:500 FILE: 3MR2440 DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 23

SECTION 2440E

BAR GRAPH OF GOLD & SILVER

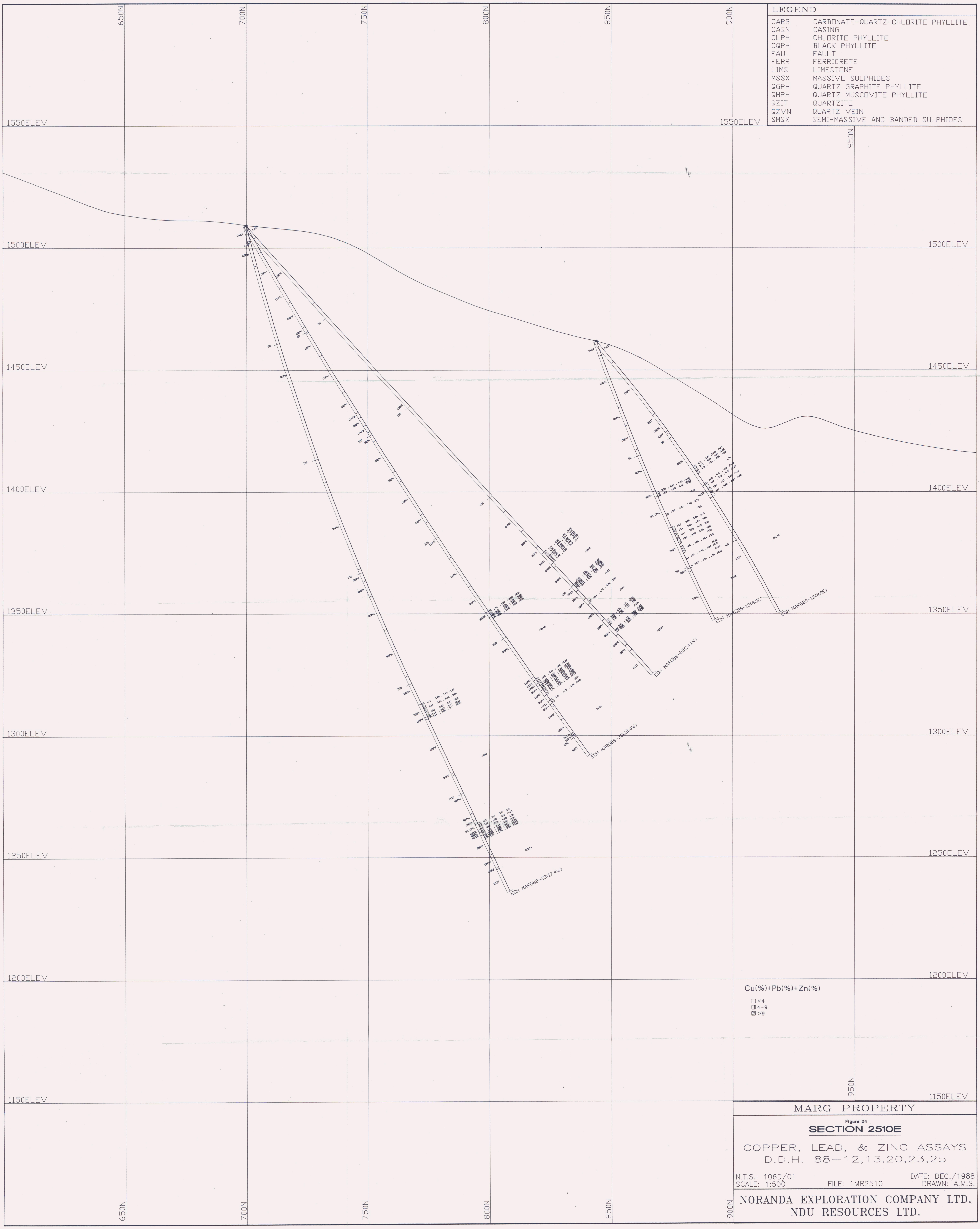
1cm = 0.02 oz/ton Au, | 1cm = 1 oz/ton Ag

D.D.H. 88–2,3,10,11,19,33

N.T.S.: 106D/01
SCALE: 1:500
FILE: 4MR2440
DATE: DEC./1988
DRAWN: A.M.S.

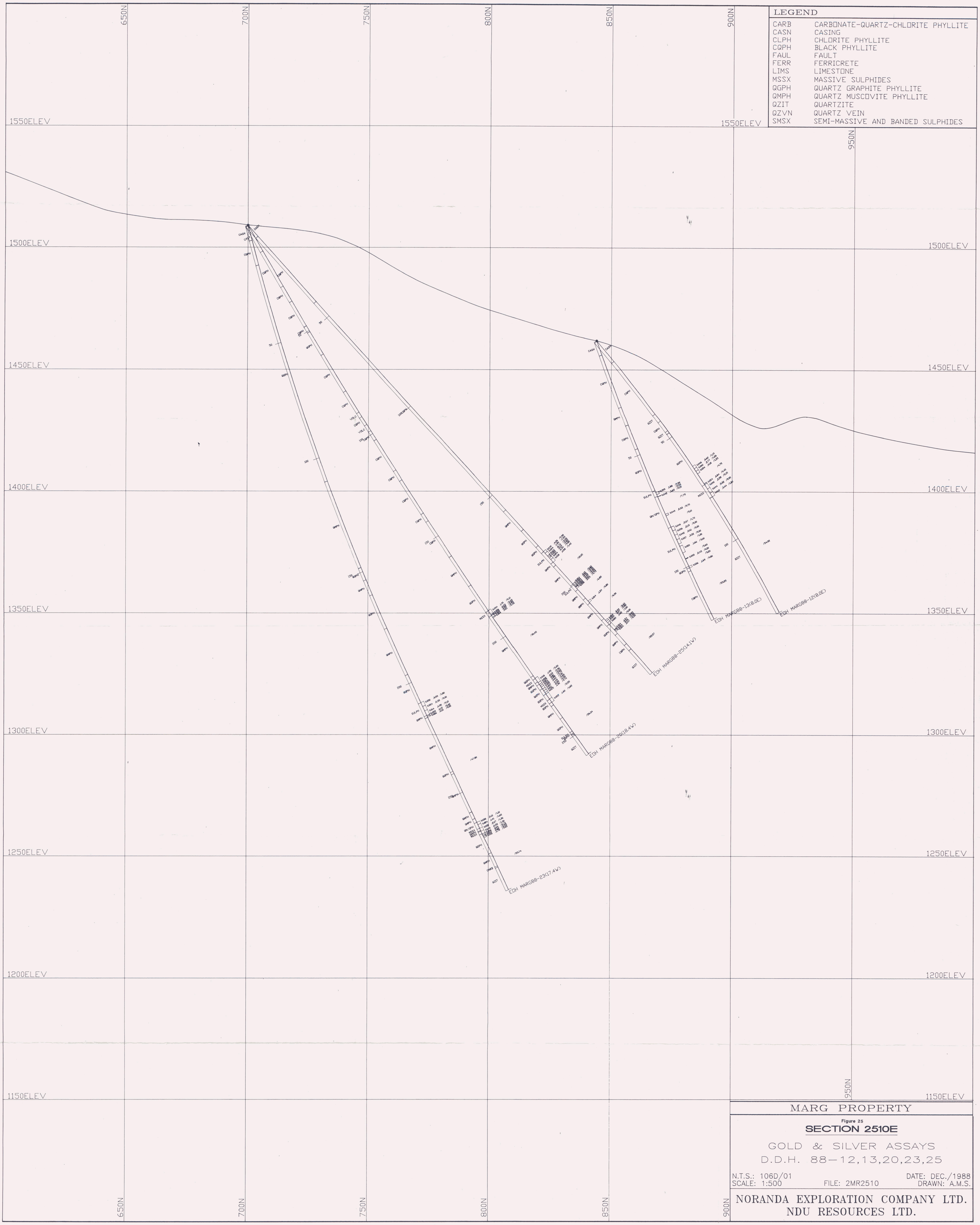
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682

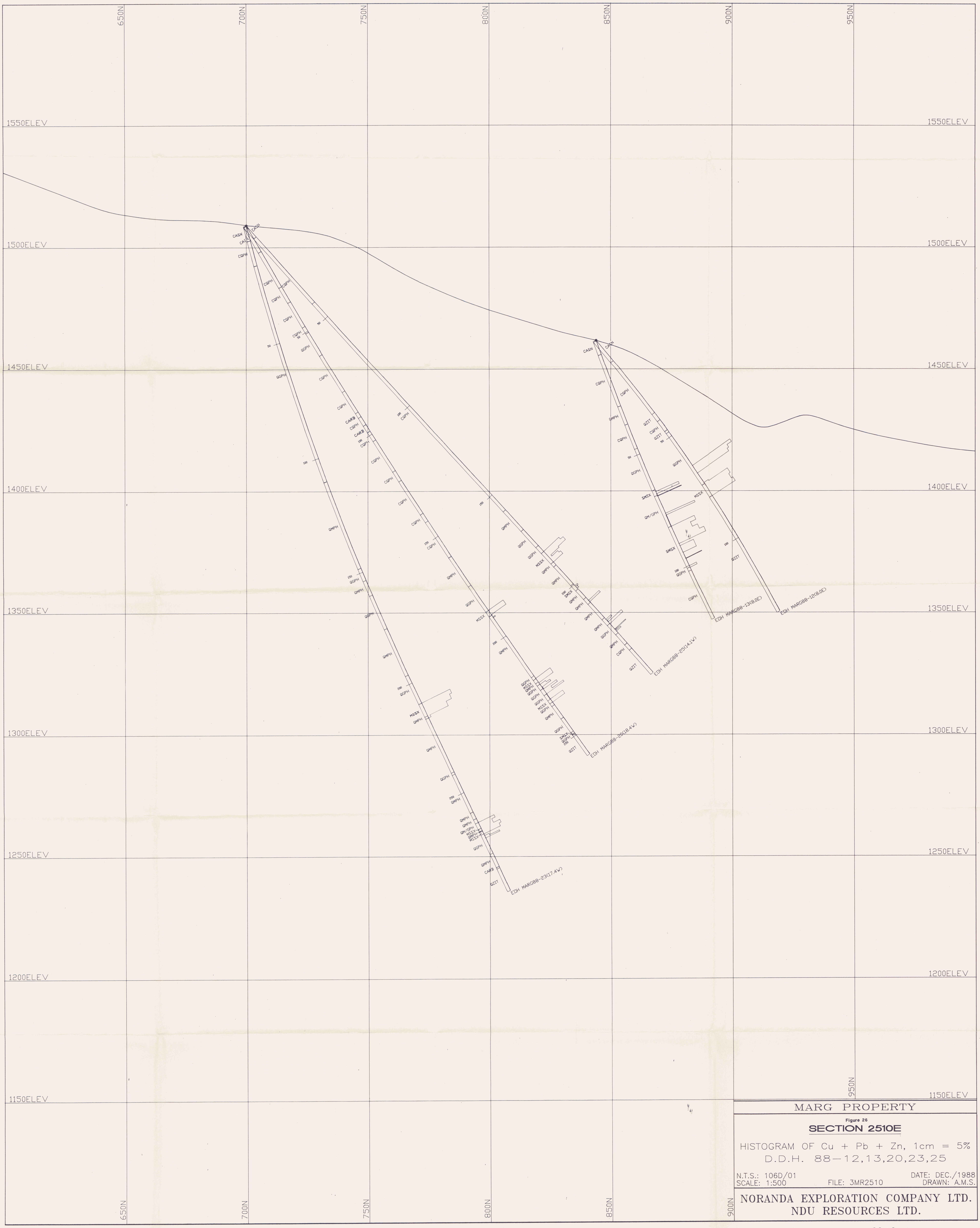


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EDH MARG88-23(17.4W)
EDH MARG88-20(18.4W)
EDH MARG88-25(14.1W)
EDH MARG88-13(8.0E)
EDH MARG88-12(8.0E)
Cu(%)+Pb(%)+Zn(%)
<4
4-9
>9
MARG PROPERTY
Figure 24
SECTION 2510E
COPPER, LEAD, & ZINC ASSAYS
D.D.H. 88-12,13,20,23,25
N.T.S.: 106D/01
SCALE: 1:500
FILE: 1MR2510
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682


LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EOH MARG88-12(8.0E)
EOH MARG88-13(8.0E)
EOH MARG88-25(14.1W)
EOH MARG88-20(18.4W)
EOH MARG88-23(17.4W)
MARG PROPERTY
Figure 25
SECTION 2510E
GOLD & SILVER ASSAYS
D.D.H. 88-12,13,20,23,25
N.T.S.: 106D/01
SCALE: 1:500
FILE: 2MR2510
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 26

SECTION 2510E

HISTOGRAM OF Cu + Pb + Zn, 1cm = 5%
D.D.H. 88−12,13,20,23,25

N.T.S.: 106D/01 DATE: DEC./1988
SCALE: 1:500 FILE: 3MR2510 DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
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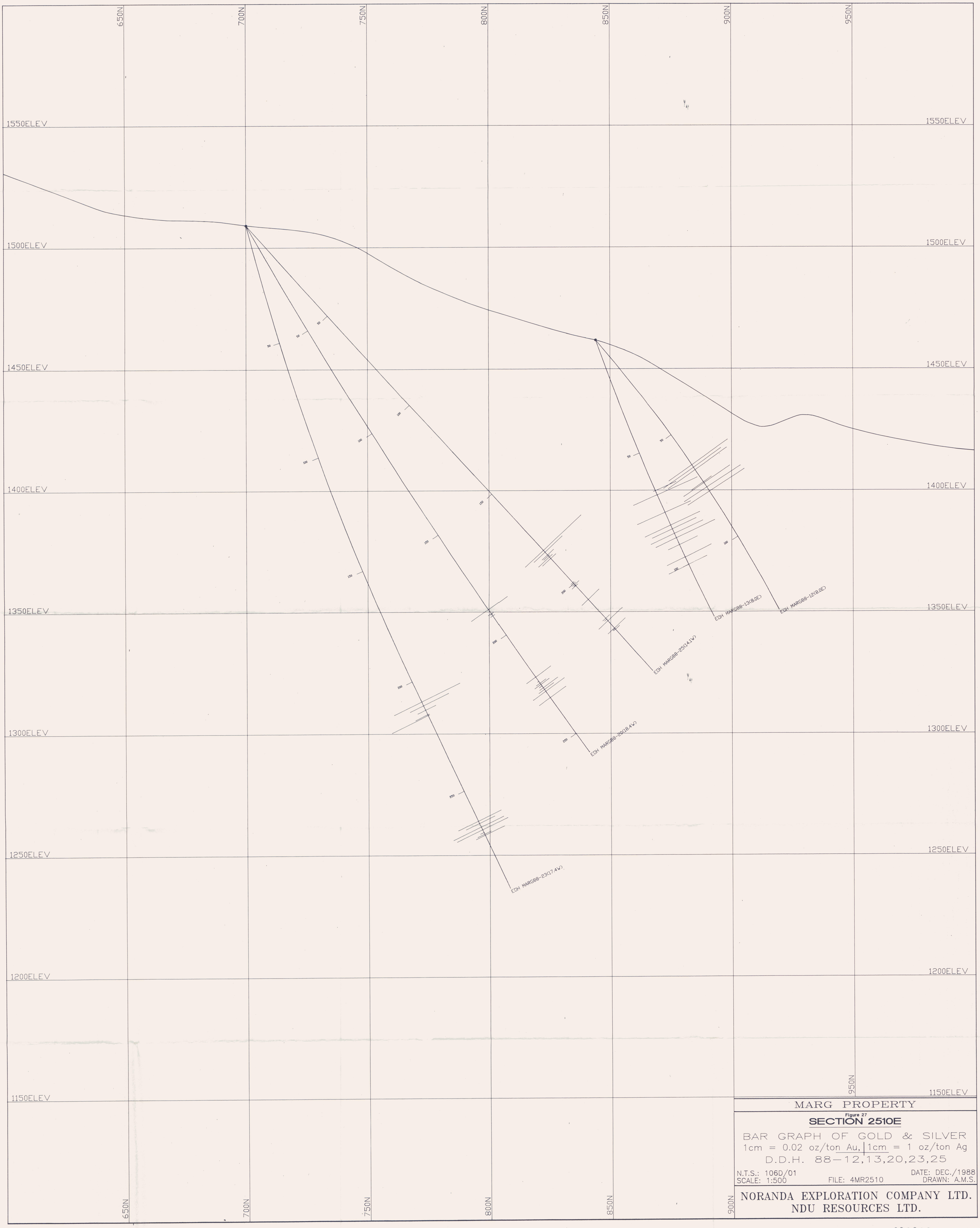


MARG PROPERTY

Figure 27

SECTION 2510E

BAR GRAPH OF GOLD & SILVER

1cm = 0.02 oz/ton Au, | 1cm = 1 oz/ton Ag

D.D.H. 88-12,13,20,23,25

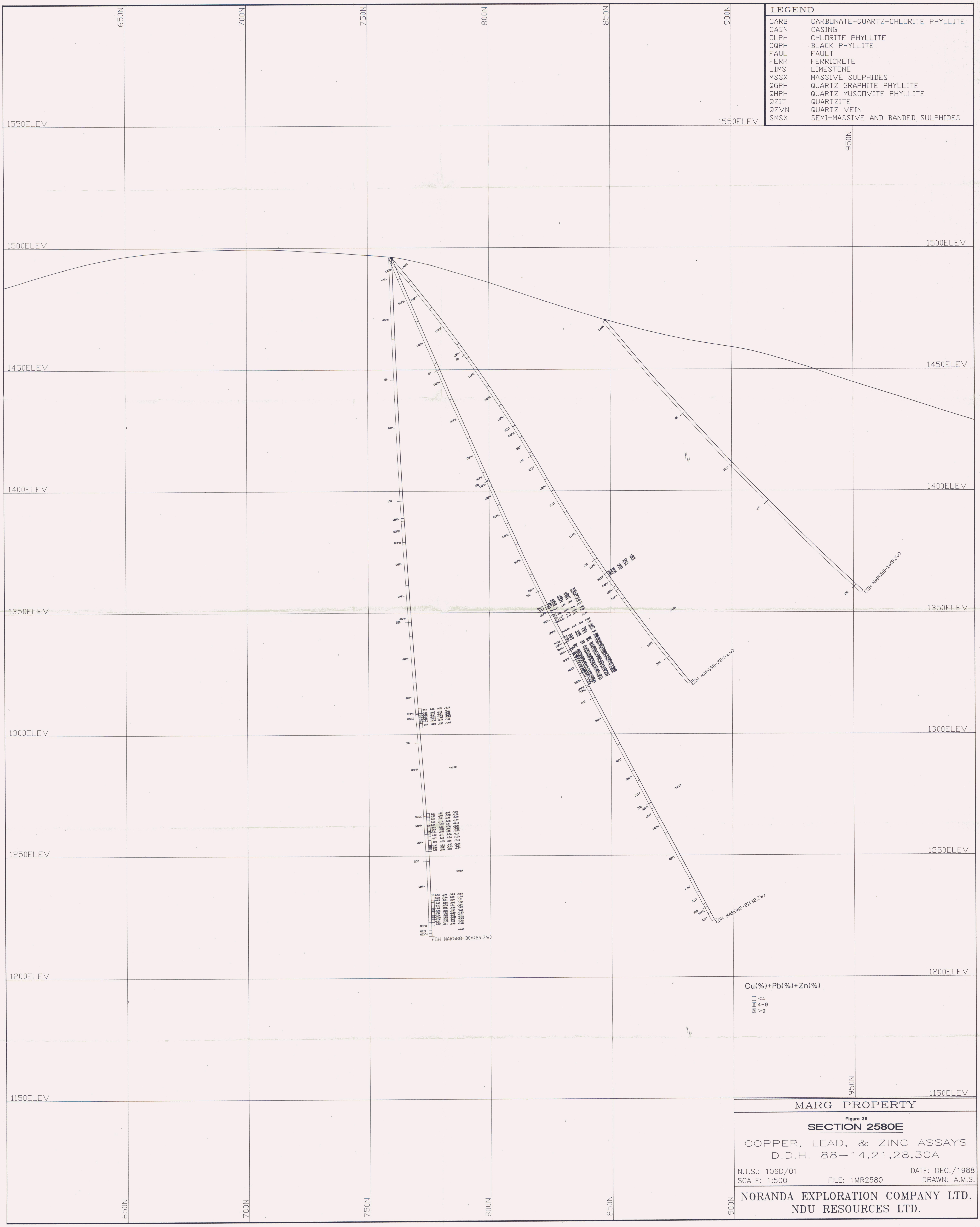
N.T.S.: 106D/01 DATE: DEC./1988

SCALE: 1:500 FILE: 4MR2510 DRAWN: A.M.S.

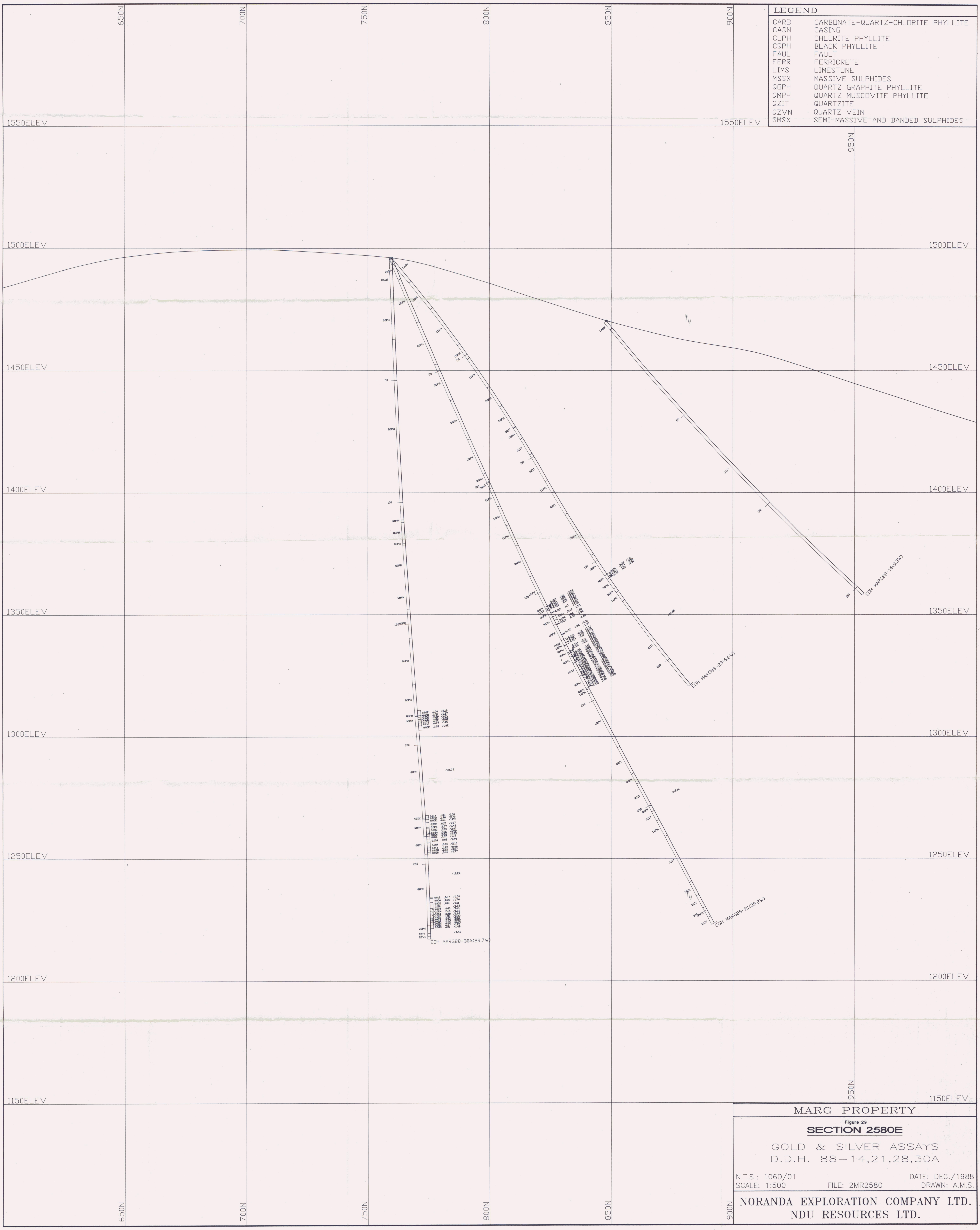
NORANDA EXPLORATION COMPANY LTD.

NDU RESOURCES LTD.

092682

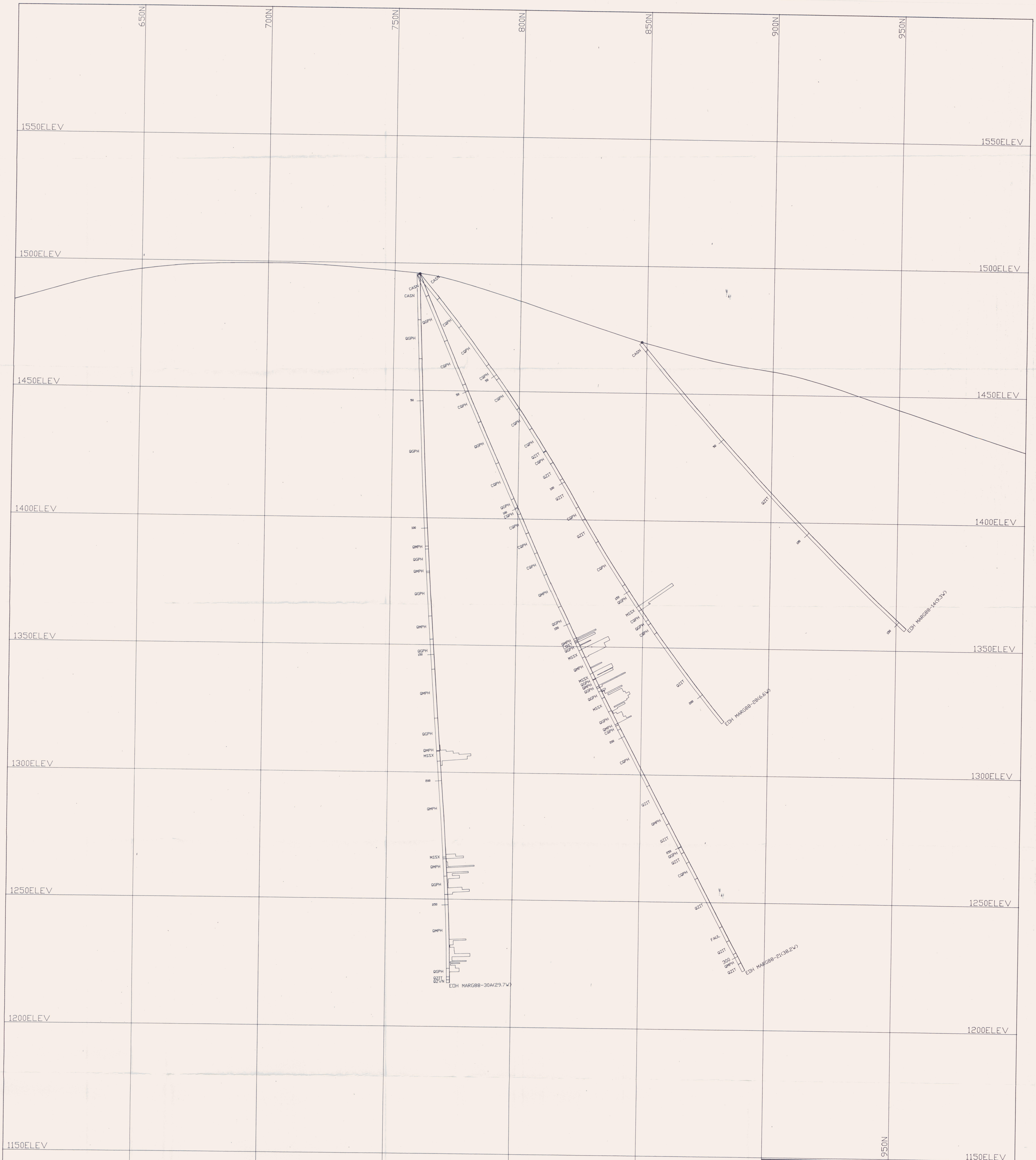

LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EDH MARG88-30A(29.7W)
EDH MARG88-21(38.2W)
EDH MARG88-28(6.6W)
EDH MARG88-14(9.3W)
Cu(%)+Pb(%)+Zn(%)
<4
4-9
>9
MARG PROPERTY
Figure 28
SECTION 2580E
COPPER, LEAD, & ZINC ASSAYS
D.D.H. 88-14,21,28,30A
N.T.S.: 106D/01
SCALE: 1:500
FILE: 1MR2580
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



LEGEND
CARB CARBONATE-QUARTZ-CHLORITE PHYLLITE
CASN CASING
CLPH CHLORITE PHYLLITE
CQPH BLACK PHYLLITE
FAUL FAULT
FERR FERRICRETE
LIMS LIMESTONE
MSSX MASSIVE SULPHIDES
QGPH QUARTZ GRAPHITE PHYLLITE
QMPH QUARTZ MUSCOVITE PHYLLITE
QZIT QUARTZITE
QZVN QUARTZ VEIN
SMSX SEMI-MASSIVE AND BANDED SULPHIDES
650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EDH MARG88-14(9.3W)
EDH MARG88-28(6.6W)
EDH MARG88-21(38.2W)
EDH MARG88-30A(29.7W)
MARG PROPERTY
Figure 29
SECTION 2580E
GOLD & SILVER ASSAYS
D.D.H. 88-14,21,28,30A
N.T.S.: 106D/01
SCALE: 1:500
FILE: 2MR2580
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



MARG PROPERTY

Figure 30

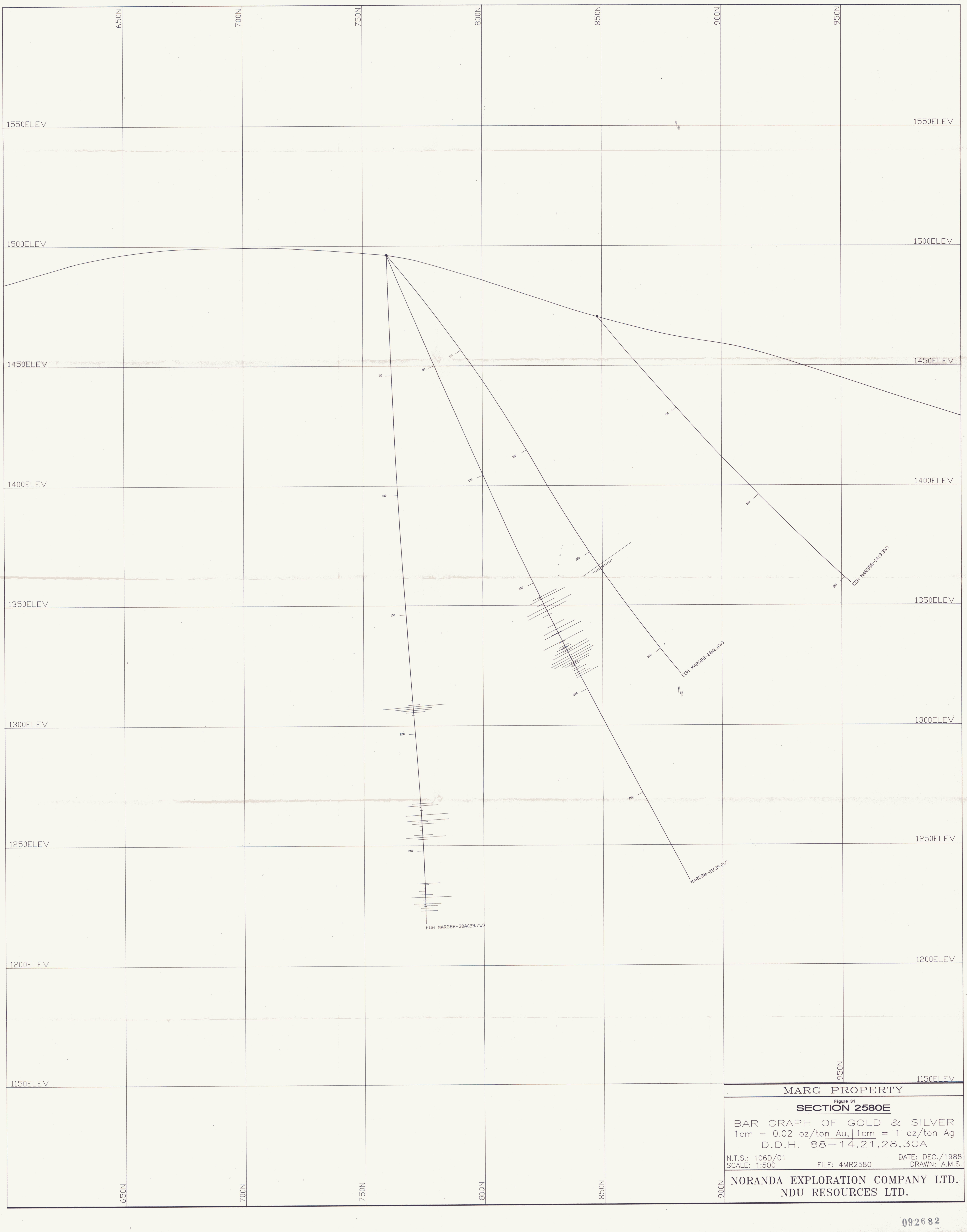
SECTION 2580E

HISTOGRAM OF Cu + Pb + Zn, 1cm = 5%
D.D.H. 88–14,21,28,30A

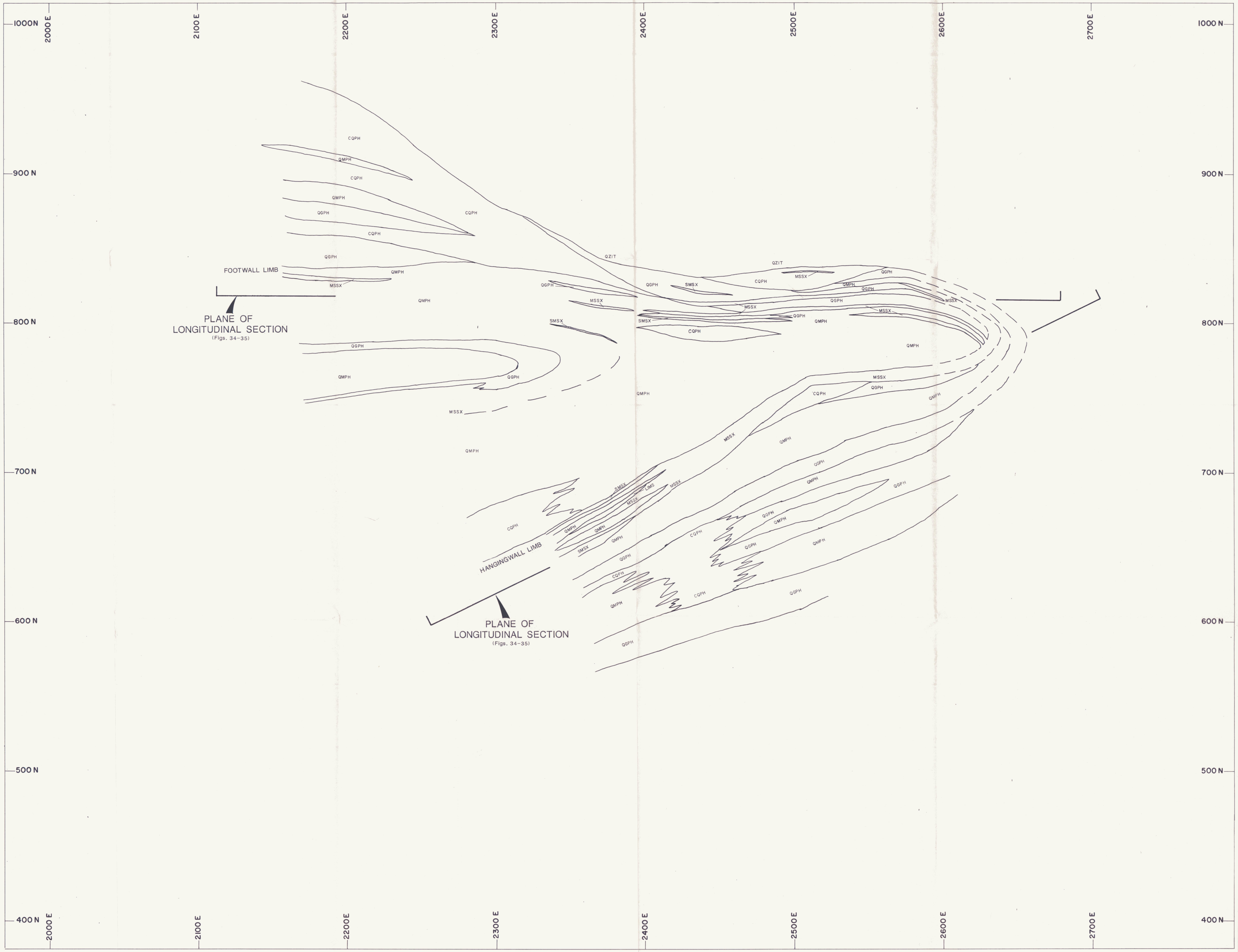
N.T.S.: 106D/01
SCALE: 1:500
FILE: 3MR2580
DATE: DEC./1988
DRAWN: A.M.S.

NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.

092682



650N
700N
750N
800N
850N
900N
950N
1550ELEV
1500ELEV
1450ELEV
1400ELEV
1350ELEV
1300ELEV
1250ELEV
1200ELEV
1150ELEV
EDH MARG88-30A(29.7W)
MARG88-21(35.0W)
EDH MARG88-28(6.6W)
EDH MARG88-14(9.3W)
MARG PROPERTY
Figure 31
SECTION 2580E
BAR GRAPH OF GOLD & SILVER
1cm = 0.02 oz/ton Au, 1cm = 1 oz/ton Ag
D.D.H. 88-14,21,28,30A
N.T.S.: 106D/01
SCALE: 1:500
FILE: 4MR2580
DATE: DEC./1988
DRAWN: A.M.S.
NORANDA EXPLORATION COMPANY LTD.
NDU RESOURCES LTD.
092682



LEGEND

QZIT	Quartzite
CQPH	Black phyllite
QGPH	Quartz-graphite phyllite
QMPH	Quartz-muscovite phyllite
LIMS	Limestone
CARB	Carbonate-quartz-chlorite phyllite
SMSX	Semi-massive sulphides
MSSX	Massive sulphides

Figure 32

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

GEOLOGY 1300 LEVEL PLAN

MARG PROPERTY, YUKON

NDU RESOURCES LTD./ CAMECO

SCALE 1:1000

0 10 20 30 40 50 100 Metres

0 50 100 200 300 Feet

To accompany report dated

092682

Figure 36

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

COPPER SOIL GEOCHEMISTRY

MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

MAYO MINING DISTRICT, YUKON

SCALE 1:2500

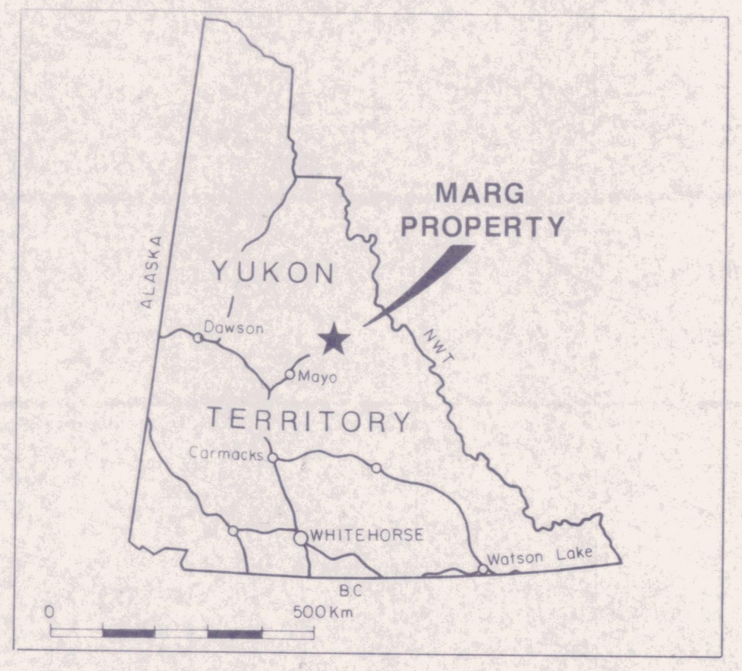
0 50 100 150 200 Metres

092682

To accompany a report by R.J. Cathro dated December, 1988

MARG PROPERTY
YUKON
TERRITORY
ALASKA
N.W.T.
B.C.
Dawson
Mayo
Carmacks
WHITEHORSE
Watson Lake
0
500 Km
COPP CREEK
CANSUP CREEK
CAMP
LINEAMENT
BASELINE 1000N
BASELINE 600N
1988 SOIL SAMPLE WITH ASSAY IN PPM
1988 SILT SAMPLE WITH ASSAY IN PPM
SUBCROP LOCATION OF SULPHIDE MINERALIZATION
INFERRED LOCATION OF SULPHIDE MINERALIZATION
500 ppm Pb
100 ppm Pb
samples at 50m spacing
Figure 37
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
LEAD SOIL GEOCHEMISTRY
MARG PROPERTY
NDU RESOURCES LTD / CAMECO
MAYO MINING DISTRICT, YUKON
SCALE 1:2500
0 50 100 150 200 Metres
092682
To accompany a report by R.J. Cathro dated December, 1988

MARG PROPERTY
YUKON
TERRITORY
ALASKA
N.W.T.
Dawson
Mayo
Carmacks
WHITEHORSE
Watson Lake
B.C.
500 Km
BASELINE 1000N
BASELINE 600N
COPP CREEK
CANSUP CREEK
CAMP
LINEAMENT
Gully
• 67 1988 SOIL SAMPLE WITH ASSAY IN PPM
X 195 1988 SILT SAMPLE WITH ASSAY IN PPM
SUBCROP LOCATION OF SULPHIDE MINERALIZATION
INFERRED LOCATION OF SULPHIDE MINERALIZATION
1000 ppm Zn
250 ppm Zn
samples at 50m spacing
Figure 38
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
ZINC SOIL GEOCHEMISTRY
MARG PROPERTY
NDU RESOURCES LTD / CAMECO
MAYO MINING DISTRICT, YUKON
SCALE 1:2500
0 50 100 150 200 Metres
092682
To accompany a report by R.J. Cathro dated December, 1988



• 1988 SOIL SAMPLE LOCATION

x 1988 SILT SAMPLE LOCATION

SEE FIGURES TO FOR COPPER, LEAD, AND ZINC VALUES RESPECTIVELY

ASSAYS FOR AN ADDITIONAL 29 ELEMENTS ARE FILED IN APPENDIX

0926 82

Figure 39

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

1988 SOIL SAMPLE NUMBERS

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

MAYO MINING DISTRICT, YUKON

SCALE 1:2500

0 50 100 150 200 Metres

To accompany a report by R.J. Cathro dated December, 1988

Figure 40

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

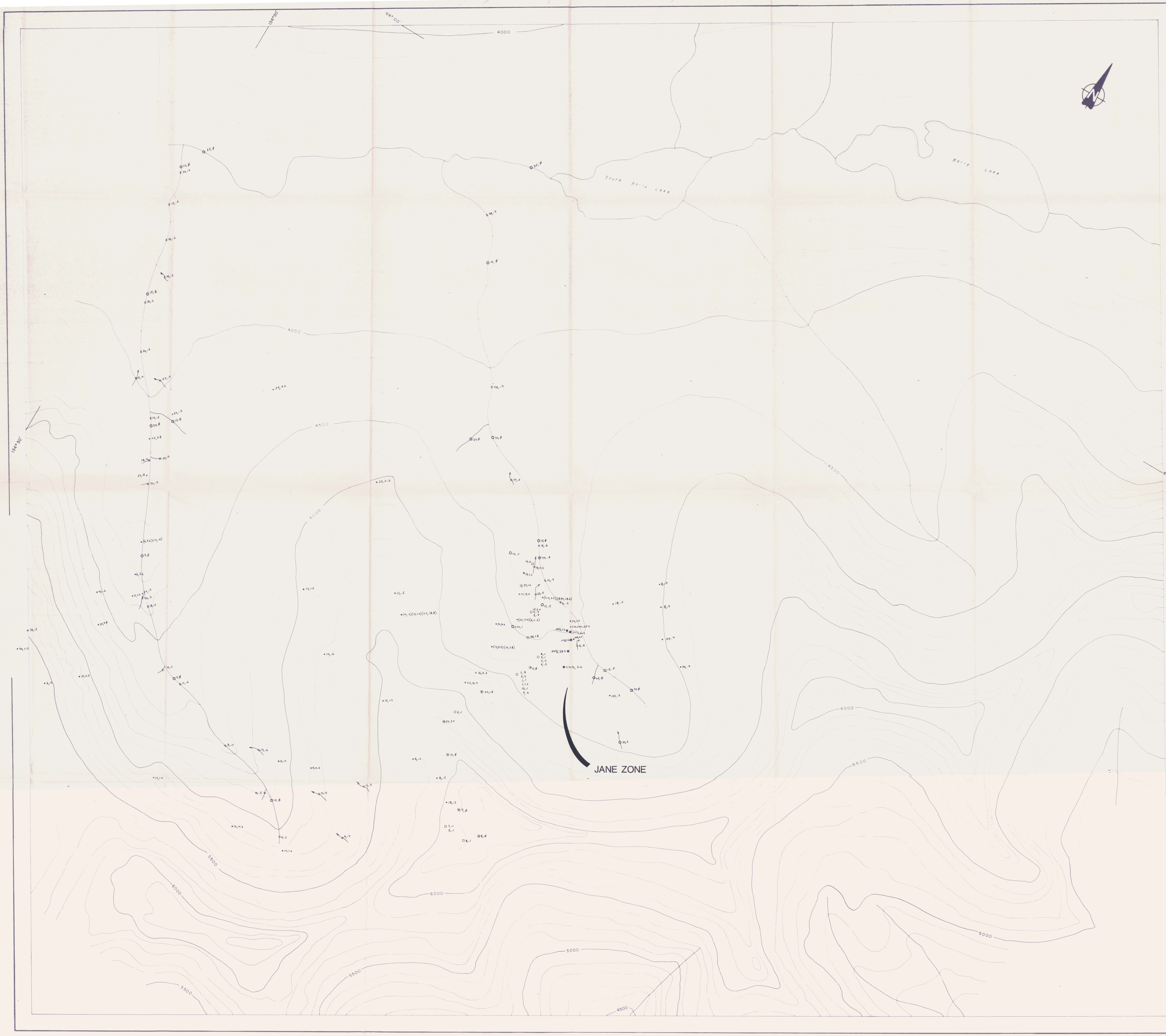
SAMPLE LOCATIONS

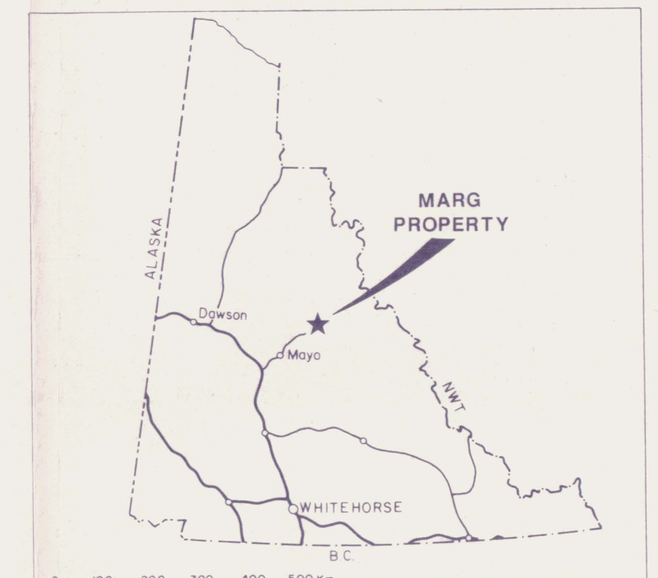
JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

092682





LOCATION MAP

LEGEND

- ○ GSC stream sediment sample
- ⊗ 1982 stream sediment sample
- x 1988 stream sediment sample
- ◉ 1982 soil sample
- • 1988 soil sample
- □ 1982 rock sample
- ■ 1988 rock sample

All 1982 and 1988 assays in ppm (except for gold which is in ppb) by Chemex Labs Ltd, North Vancouver.

Figure 41

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

Pb AND Ag GEOCHEMISTRY

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

To accompany report by R.J. Cathro dated December, 1988

Figure 42

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

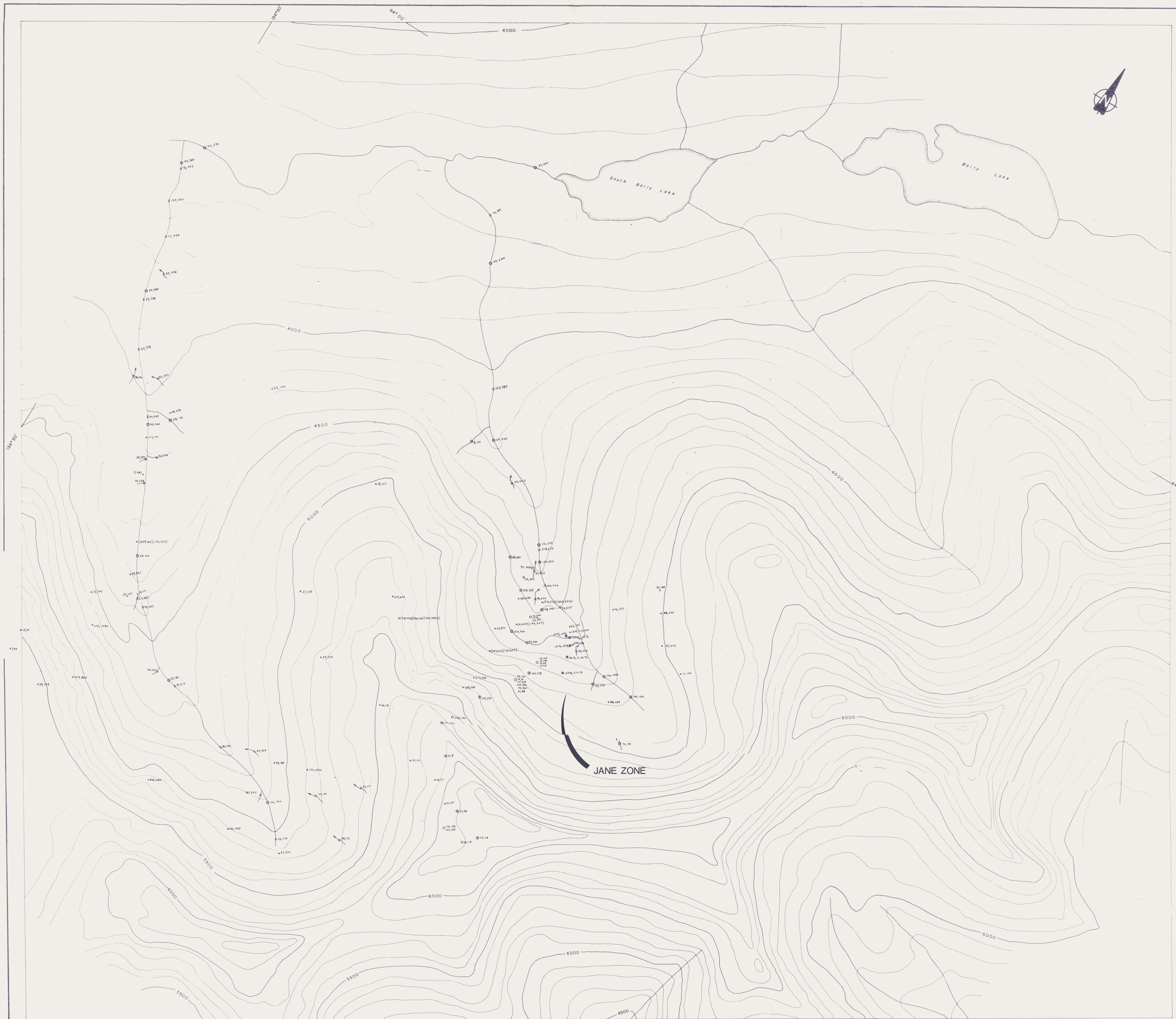
As AND Au GEOCHEMISTRY

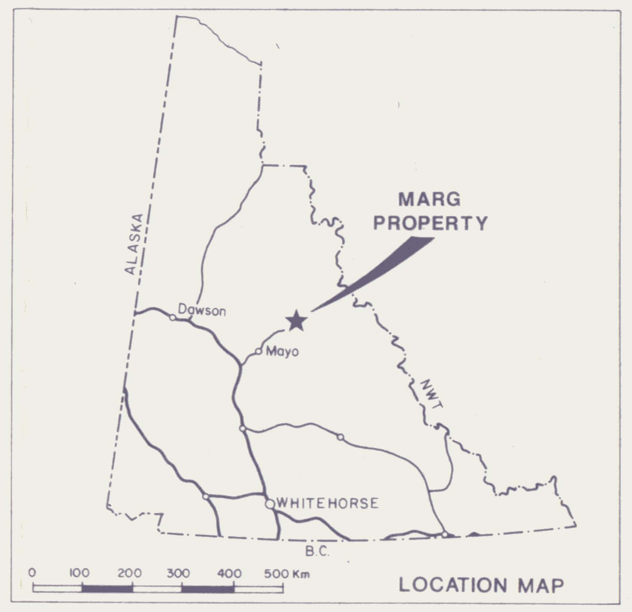
JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

To accompany report by R.J. Cathro dated December, 1988





LEGEND

- o GSC stream sediment sample
- ⊗ 1982 stream sediment sample
- x 1988 stream sediment sample
- ◉ 1982 soil sample
- • 1988 soil sample
- □ 1982 rock sample
- ■ 1988 rock sample

All 1982 and 1988 assays in ppm (except for gold which is in ppb) by Chemex Labs Ltd, North Vancouver.

Figure 43

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

Cu AND Zn GEOCHEMISTRY

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092682

To accompany report by R.J. Cathro dated December, 1988

092682

APPENDIX A

AUTHOR'S STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Robert J. Cathro, with business addresses in Whitehorse, Yukon Territory and Vancouver, British Columbia, and residential address in West Vancouver, British Columbia, do hereby declare:

1. I am a 1959 graduate of the University of British Columbia in geological engineering.
2. I have been engaged in geological engineering for over 25 years, of which the past 20 have been as a consultant.
3. I am a registered professional engineer in British Columbia and in Yukon Territory.
4. I have supervised the work described in this report.

Robert J. Cathro, B.A.Sc., P.Eng.

APPENDIX B

LIST OF ARCHER, CATHRO PERSONNEL

EMPLOYED ON MARG PROPERTY IN 1988

ARCHER, CATHRO PERSONNEL ON
1988 PROGRAM, MARG PROPERTY, YUKON

NAME	POSITION	DAYS ON PROPERTY	PERIOD
Bob Cathro	Project Manager	22	June 6 - October 18
Doug Eaton	Senior Geologist	2	September 18 - 19
Rob Carne	Senior Geologist	2	July 26, September 14
Lasha Cymbalisty	Field Manager/ Geologist	104	June 6 - October 28
Ian Talbot	Field Manager/ Geologist	48	June 6 - September 2
Mike Phillips	Geologist	78	July 23 - October 28
Mary MacLellan	Geologist	38	August 10 - October 28
Mike Gazetas	Assistant	52	June 6 - August 25
Hilary Wilkinson	Assistant	100	June 24 - October 28
Pete Radler	Assistant	7	June 6 - 19
Gord MacIntosh	Assistant	14	July 19 - August 1
Tom Becker	Assistant	5	July 19 - 25
Bill Wengzynowski	Assistant	10	July 27 - August 26
Kevin Garus	Assistant	45	August 24 - October 12
Farrell Anderson	Assistant	14	September 13 - 30
Gord Cockell	Assistant	28	October 1 - 28
Rob Hancox	Assistant	26	October 3 - 28
Leslie Leroux	Surveyor	7	July 27 - September 28
Paul Gilchrist	Cook	61	June 6 - August 31
Deborah Weatherby	Cook	30	September 1 - 30
Alice Wychopen	Cook	36	September 23 - October 28
Sonja Pedersen	Cook	24	October 3 - 26

APPENDIX C

LETTER BY C.A. MAIN TO CANADIAN SUPERIOR

April 18, 1969

April 18, 1969

Mr. Ray DuJardin,
Canadian Superior Exploration,
1111West Hastings Street,
Vancouver 1, B.C.

Dear Mr. DuJardin:

Earlier in the year I requested the use of some information on your Patterson Range property for my seminar paper "Silver Deposits in Yukon". I have since felt it more prudent to refrain from comment on this property other than to note briefly the position of the showing. My change in attitude comes after considerable deliberation on the general geology of the area. I will finish my paper in several weeks at which time I will send you a copy.

After considering the regional geological trends and studying the Anvil deposit I am struck by the many similar characteristics between the Patterson Range property and the Anvil replacement deposits. (Note the enclosed portion of Dr. Aho's paper).

1) I feel the "greenstones" which occur as discontinuous lenses within the Lower Cambrian phyllites and quartzites, both at Keno Hill and in the Patterson Range, are remnants of a submarine extrusive event which is connected with the metallic sulphide content of these formations. Similar greenstones are found in the schists near the Anvil deposit. This evidence is circumstantial but leads me to suspect that the Keno Hill deposits are possibly remobilized mineralization from an ancient massive body in the schist and further that such bodies still exist in less strongly deformed parts of this formation.

2) The McQuestern anticline is an important factor. It is possible the older phyllites and quartzites exposed to the north are even more favourable for deposition.

3) The doming of the Patterson Range is especially evident by the anomalous radial drainage and should be studied by aerial photogrammetry.

4) The geochem patterns are grossly linear (parallel to bedding) across the hillside. Limonite forms abruptly in the creek below this lineation although the country rock does not change in geology or pyrite content.

I have only recently felt that there was anything more than a theoretical possibility of a massive body on your property. Certainly we have shown that a vein deposit such as Keno Hill does not exist. I happened to re-examine a piece of pyrite in our files which was the only mineralization found on the property other than common pseudo-cubic pyrite found disseminated in the country rock. This specimen (sample 3, trench L) about 1/4 inch by 1/4 inch, was very fine grained and appeared to be pyrite in the hand specimen. In a polish section a modal count gave:

pyrite	20%	
chalcopyrite	20%	
sphalerite.	40%	
gangue	20%	(carbonate)

Only a poor polish could be attained since the sample was fine grained and crumbly. Covellite, chalcocite, pyragarite, and tetrahedrite were suspected. This sample ran 3940 ppm Pb and 62 ppm Ag. (And 1650 ppb Au). C—

I do not discount that the geochemical anomalies may be a facter of such mineralization only poorly concentrated in the schists. More evidence of an alteration envelope (eg - sericite schist?) or some evidence of float would make evaluation much simpler.

I feel you should be aware of the possibility of such a deposit. I now feel that the property warrants at least a cursory investigation in this regard.

Yours truly,

ARCHER, CATHRO & ASSOCIATES LTD.

Charles A. Main

C.A. Main

CAM:sh

APPENDIX D

REPORT ON ORE MICROSCOPY

October 14, 1988

by Elizabeth Clemson (Noranda)

MEMO TO: BILL MERCER October 14, 1988.

FROM: ELIZABETH CLEMSON

RE: <u>ORE MICROSCOPY - MARG PROPERTY, YUKON</u>

SUMMARY

- The mineralized rocks are fine-grained and pyritic.
- There will be some losses of Cu and Pb (and to a lesser extent Zn) to the tails due to fine inclusions of chalcopyrite, galena and sphalerite locked within pyrite and also due to rejection of pyrite middlings.
- Sphalerite is free of fine micron-sized chalcopyrite inclusions (chalcopyrite disease) suggesting there is unlikely to be activation of sphalerite into the CuPb concentrate due to chalcopyrite disease.
- Both the CuPb and Zn concentrates may contain middlings of pyrite due to the pyritic nature of the ore and the intergrowth of pyrite with chalcopyrite, sphalerite and galena.
- Some Zn may report to the CuPb concentrate due to inclusions of sphalerite in chalcopyrite and sphalerite-chalcopyrite middlings.
- Minor amounts of Pb may report to the Zn concentrate due to minor inclusions of galena in sphalerite.
- The samples could be comparable to "good" Brunswick ore or to Grum ore (D.J.T. Carson, per. comm., Sept., 1988).
- The fine-grained nature of these samples suggests a fine grind will be required.
- Estimated recoveries (based only on the examination of two samples) might be in the order of 75 % Pb and 85 to 90 % Cu and Zn.
- It should be stressed that it will be very important to carefully and systematically examine mineralized samples throughtout the deposit before predications on the behaviour of the sulfides can confidently be made.

Two samples of diamond drill core from NDU's MARG property were submitted by you for mineralogical examination. The sulfide mineralogy, textural features and metallurgical implications of each sample are described below.

SAMPLE M-88-5-227.5

Mineralogy

Pyrite	55 %
Gangue	35 %
Sphalerite	9 %
Galena	1 %
Chalcopyrite	<1 %

Textural Features

The sample contains approximately 65 % fine-grained sulfides. The sulfides (mainly pyrite) occur as disseminated grains and aggregates in gangue which consists of quartz plus minor carbonate and muscovite (talc?). The rock is weakly foliated and is not characterized by any compositional layering or banding. In comparison to sample 88-5-230.5, this sample is finer grained and contains less chalcopyrite and galena.

Pyrite is fine-grained, subhedral, fractured, slightly poikilitic and has a maximum grain size of 1 mm. Pyrite commonly contains fine inclusions of sphalerite plus minor galena. Disseminated grains of pyrite are intergrown with sphalerite and more rarely chalcopyrite.

Sphalerite is abundant and occurs in grains ranging from 30 to 150 microns in size which are intergrown with pyrite and galena (Photo 1). Trace amounts of chalcopyrite occur as inclusions within sphalerite.

Fine 70 to 150 micron grains of galena are intergrown with pyrite, gangue and sphalerite. Numerous inclusions of galena are locked within fine pyrite and galena also occurs along pyrite grain boundaries (Photo 2).

Chalcopyrite is minor. Much of the chalcopyrite occurs as inclusions locked within pyrite, but locally chalcopyrite may be coarser and interstitial to pyrite (Photo 2).

Metallurgical Considerations

The ore is fine-grained (finer than sample 88-5-230.5) and contains only minor chalcopyrite and galena, much of which will be lost to the tails as inclusions locked within pyrite. The intergrowth of pyrite with sphalerite will probably result in some losses of Zn to the tail due to pyrite-sphalerite middlings grains. The sample contains abundant quartz gangue and therefore, may have a high grinding work index.

SAMPLE 88-5-230.5

Mineralogy

Pyrite	52 %
Gangue	20 %
Chalcopyrite	13 %
Sphalerite	10 %
Galena	5 %

Textural Features

The sample is composed of 80 % semi-massive sulfides. The sulfides are intergrown with minor gangue which consists of carbonate, plus minor muscovite (talc?). The sample is pyritic and contains small clots of chalcopyrite and sphalerite intergrown with the disseminated pyrite.

Pyrite is fine- to medium-grained, ranging from 10 microns to 3 mm in size. Pyrite occurs as both euhedral grains and as irregular relict grains due to replacement by other sulfides. The euhedral grains of pyrite are generally clean, containing only minor inclusions of galena and rare inclusions of sphalerite. Chalcopyrite locally replaces pyrite which can result in islands of pyrite in chalcopyrite (Photo 3) or very fine irregular intergrowths of pyrite with chalcopyrite (Photo 4).

Chalcopyrite is medium-grained and occurs interstitial to pyrite and as minor inclusions in pyrite. Grains of galena and sphalerite 30 to 70 microns in size occur intergrown with chalcopyrite or as fine inclusions within chalcopyrite.

Sphalerite occurs interstitial to disseminated pyrite (Photo 5) and is also intergrown with chalcopyrite and less frequently galena. Sphalerite is free of chalcopyrite disease (fine chalcopyrite inclusions). In places sphalerite forms coarser masses (Photo 6).

Galena occurs as small inclusions within pyrite and as coarser patches intergrown with pyrite, sphalerite and chalcopyrite (Photos 5 and 6). Rare inclusions of galena within sphalerite were also noted.

Metallurgical Considerations

The sample is fine-grained with local coarser patches and is rich in pyrite. Because of the high pyrite content and the intergrowth of chalcopyrite and sphalerite with pyrite, there will likely be abundant pyrite middling grains produced upon grinding and losses of Cu, Zn and Pb to the tails due to the rejection of pyrite middlings, plus pyrite contamination of the concentrates due to the flotation of pyrite middlings. Fine inclusions of chalcopyrite, sphalerite and galena in pyrite and middlings will also result in losses of Cu, Zn and Pb to the tails. There may be some Zn reporting to the CuPb concentrate due to inclusions of sphalerite in chalcopyrite and sphalerite-chalcopyrite middlings. Similarily there may be minor amounts of Pb reporting to the Zn concentrate due to minor inclusions of galena in sphalerite.

Abbreviations Used in Photomicrographs

cp	chalcopyrite
sp	sphalerite
py	pyrite
ga	galena
gn	gangue

<u>PHOTOMICROGRAPHS</u>

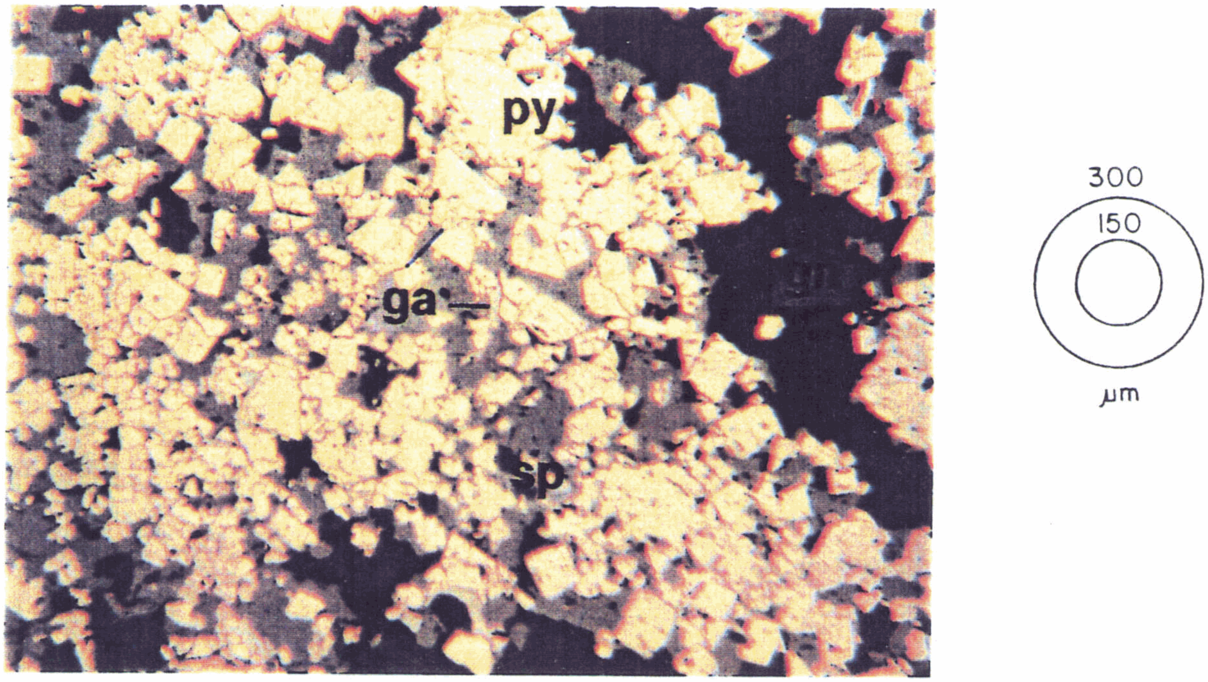


Photo 1 Fine-grained disseminations of subhedral pyrite contain fine inclusions of sphalerite and galena. The pyrite is intergrown with sphalerite and minor galena. Sample 88-5-227.5, reflected light.

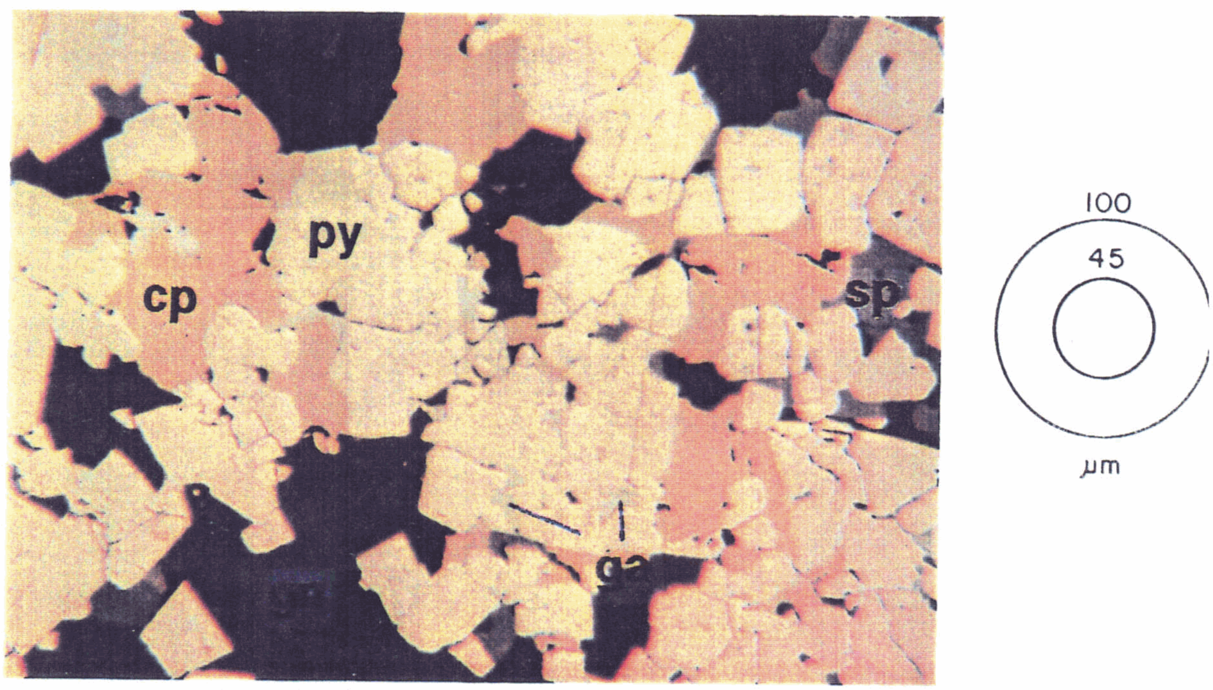


Photo 2 Locally pyrite is intergrown with some patches of coarser chalcopyrite. Galena occurs along pyrite grain boundaries, intergrown with chalcopyrite, and locked within pyrite. Sample 88-5-227.5, reflected light.

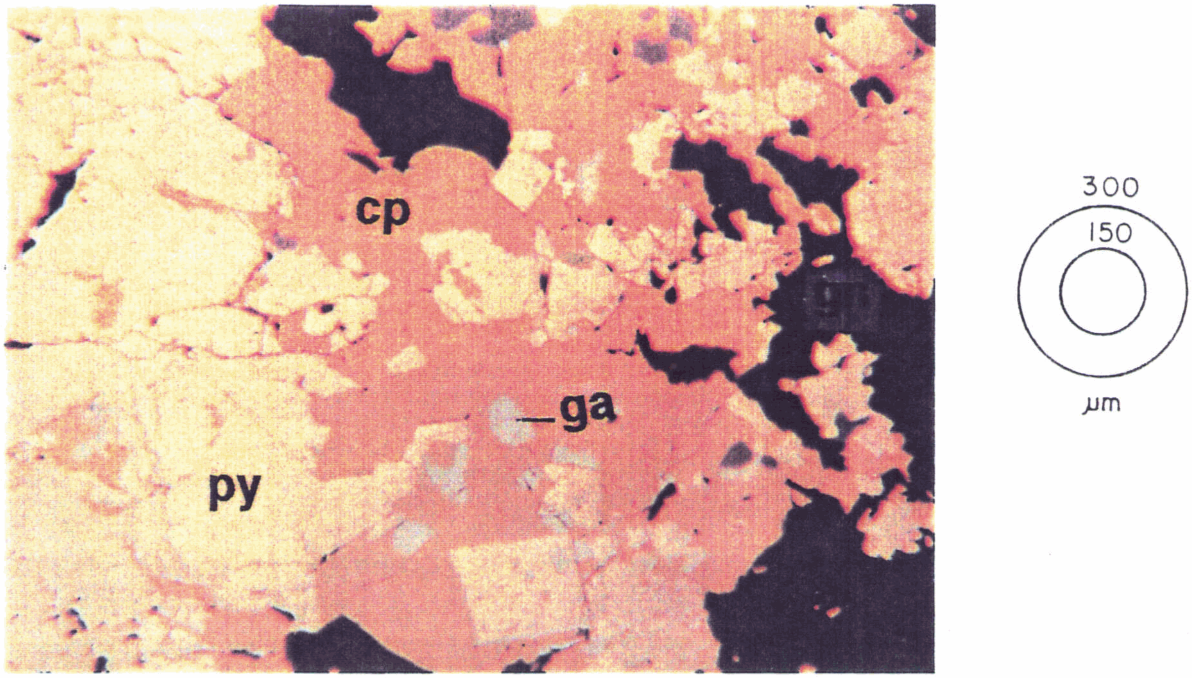


Photo 3 Coarse chalcopyrite partly replaces pyrite resulting in anhedral "islands" of pyrite within chalcpyrite. Pyrite contains minor inclusions of chalcopyrite and galena. Minor galena and sphalerite are intergrown with chalcopyrite. Sample 88-5-230.5, reflected light.

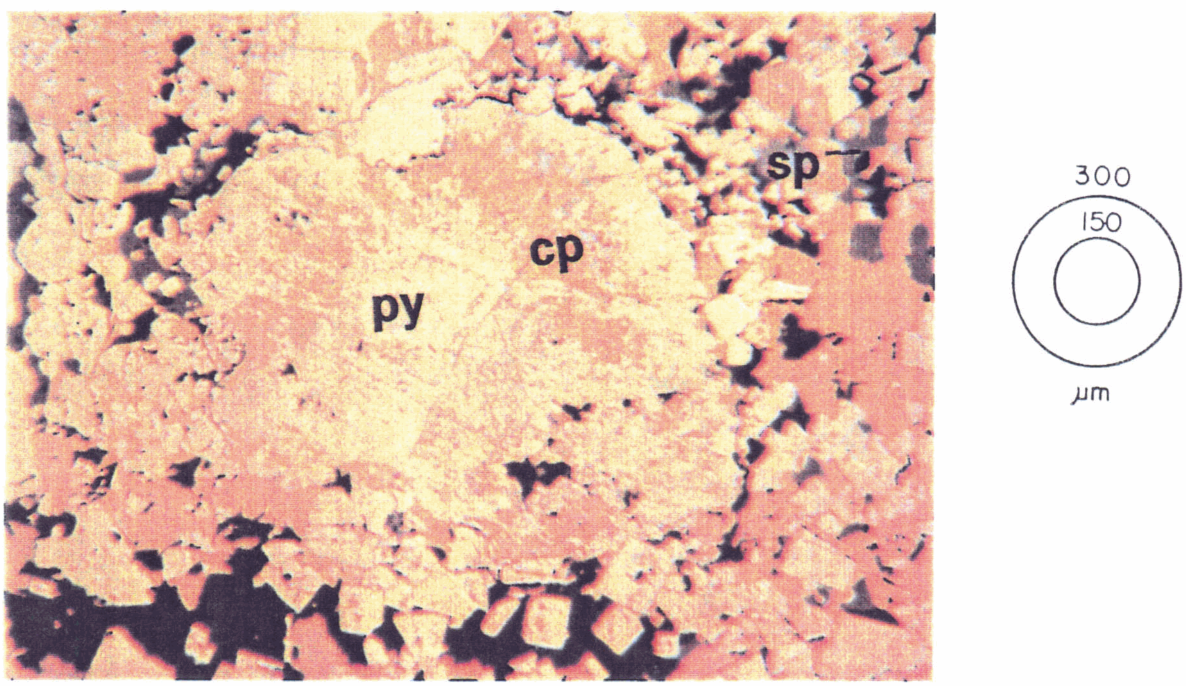


Photo 4 Chalcopyrite replacement of pyrite resulting in a very fine intergrowth of pyrite and chalcopyrite. Sample 88-5-230.5, reflected light.

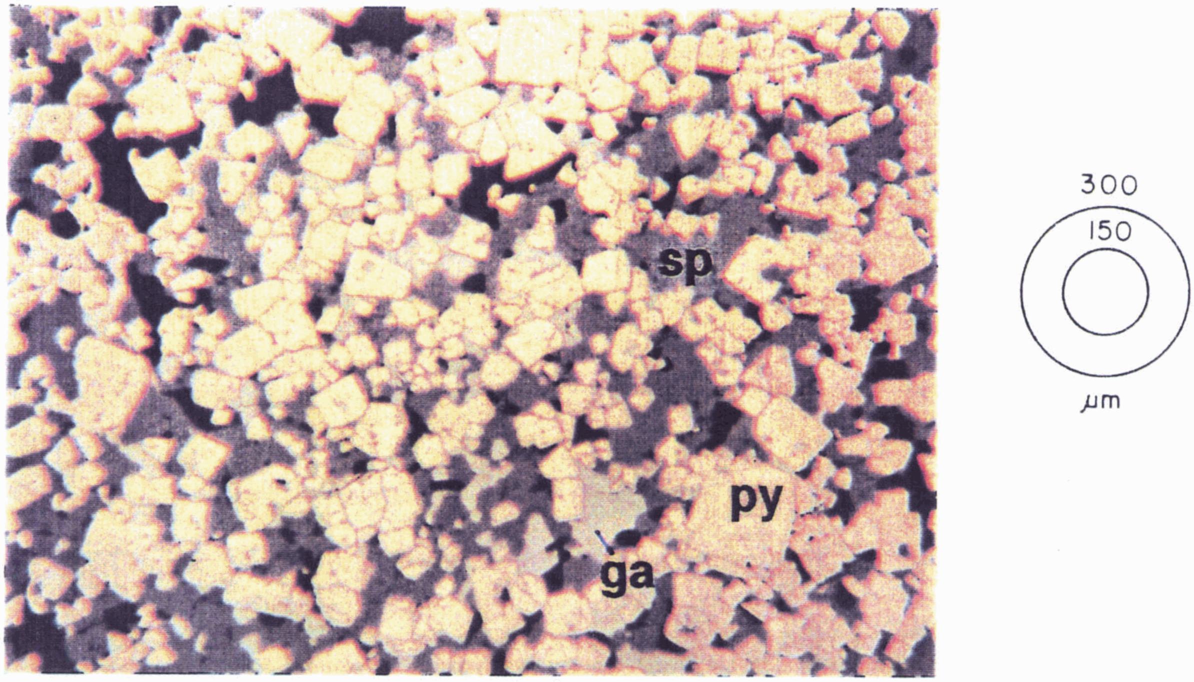


Photo 5 Within the ore sample there is variation in the sulfide grain size. This photo shows the intergrowth of fine subhedral pyrite with sphalerite and galena. Sample 88-5-230.5, reflected light.

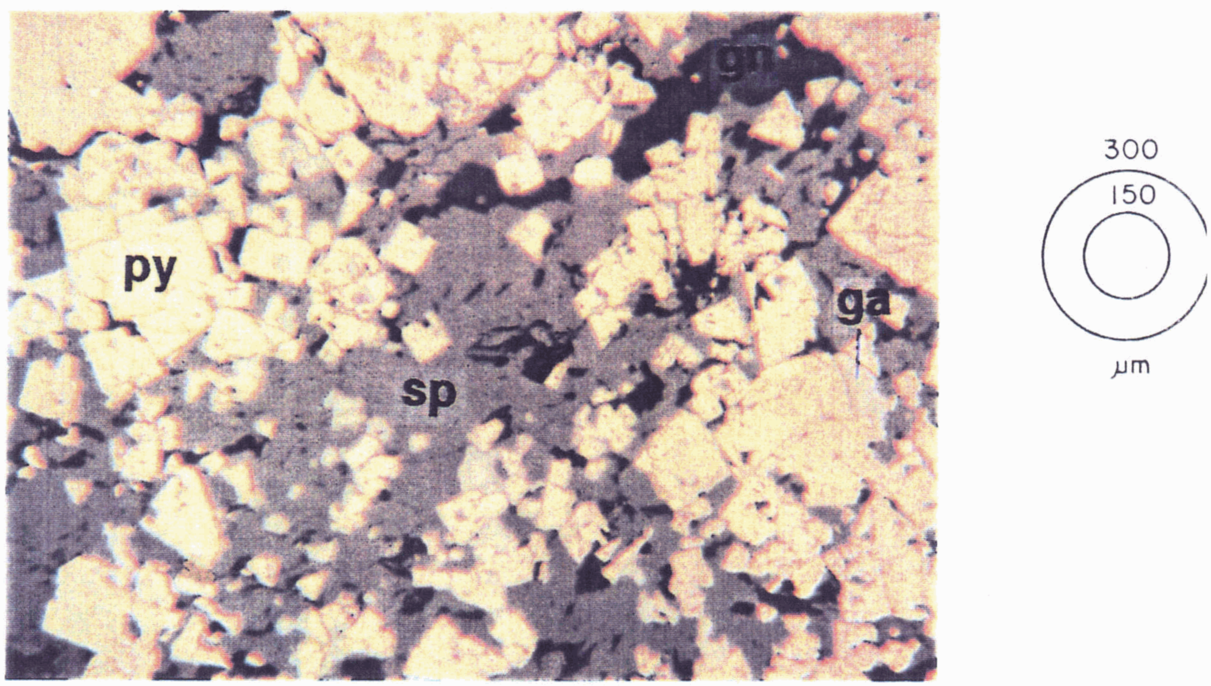


Photo 6 Locally the sulfides are coarser than shown above in Photo 5. Fine pyrite occurs within interstitial coarser sphalerite. Not the inclusions of galena and sphalerite in pyrite. Sample 88-5-230.5, reflected light.

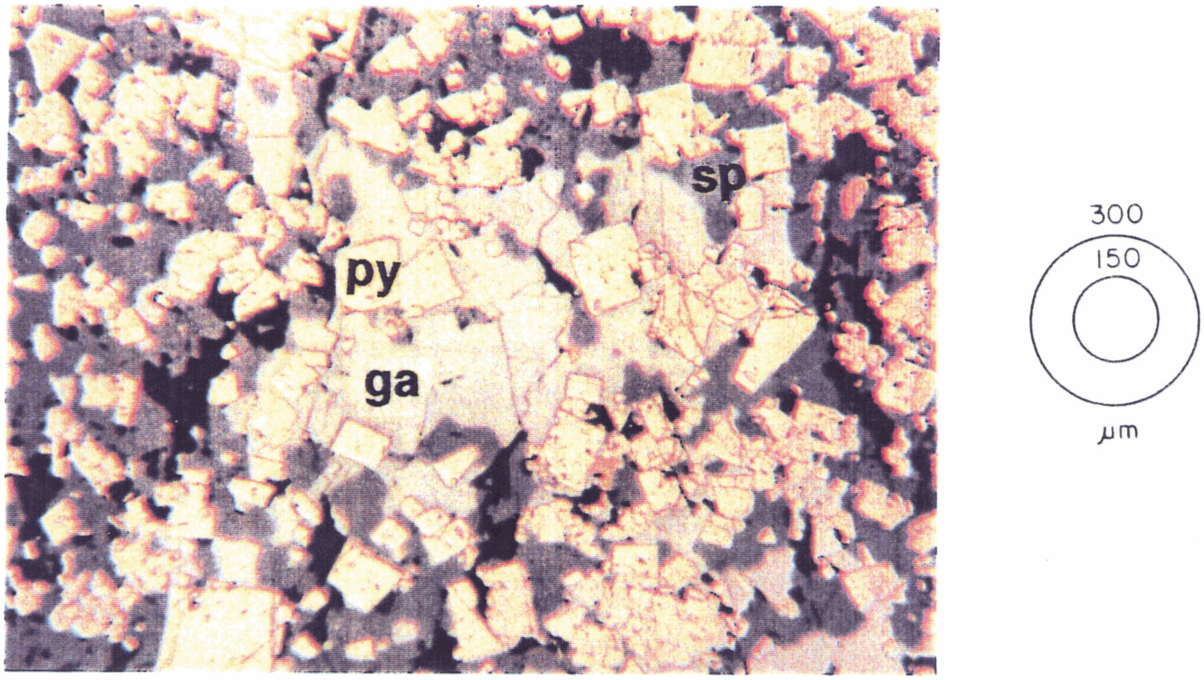


Photo 7 Coarse patch of galena intergrown with fine subhedral grains of pyrite and grains of sphalerite. Galena contains some finer inclusions of sphalerite and pyrite. Sample 88-5-230.5, reflected light.

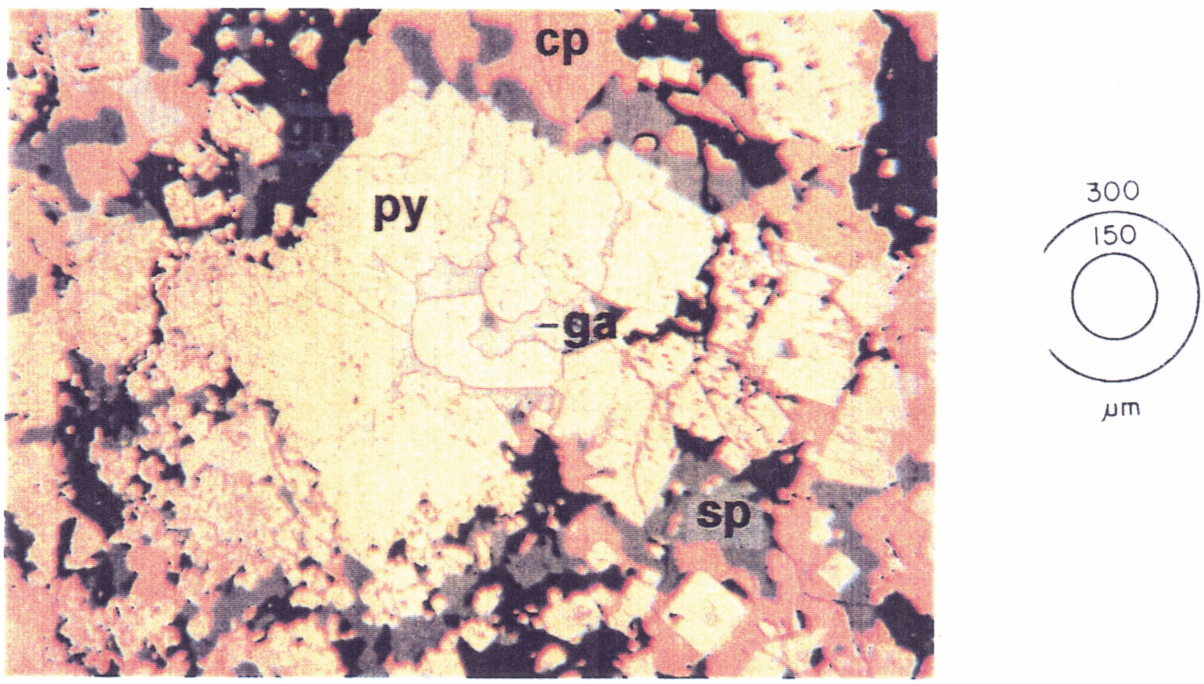


Photo 8 Galena occurs as fine inclusions within coarse pyrite, along pyrite grain boundaries and intergrown with chalcopyrite. Pyrite exhibits considerable variation in grain size. Chalcopyrite is intergrown with sphalerite. Sample 88-5-230.5, reflected light.

APPENDIX E

REPORT ON MINERAL RESERVES

November 18 and December 12, 1988

by J.P. Franzen, P.Eng.

ADDENDUM

NOVEMBER 18, 1988
MINERAL RESERVE ASSESSMENT
MARG PROPERTY

FOR

NDU RESOURCES LTD.
VANCOUVER, B.C.

BY

FRANZEN MINERAL ENGINEERING LTD.
J.P. FRANZEN, P.ENG.

North Vancouver, B.C. December 12, 1988

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INTRODUCTION

This addendum considers tonnage - grade relationships for the undiluted mineral reserve described in the writer's report of November 18, 1988

PROCEDURE

Section line files for undiluted drill indicated and inferred mineral reserve blocks were combined into a Lotus 123 master file. The master file was then sorted according to Cu+Pb+Zn (%) grade (Table I). Incremental cutoff grades were applied to the sorted master site to determine tonnage - grade relationships for the undiluted mineral reserve (Table II).

Lotus 123 data base files are contained on two IBM-PC compatible floppy diskettes - dated December 10, 1988. The diskettes accompany this addendum.

DISCUSSION

Figure 1 illustrates the relationship between undiluted reserve tons and Cu+Pb+Zn (%) cutoff grade. There is little change in total reserve tons below the 5% cutoff. The reserve estimate includes one block in this category (Table I). Between cutoff grades of 5% and 12%, reserve tons above cutoff grade decrease on average by 300,000 tons for each 1% increase in cutoff grade; in percentage terms, reserve tons above cutoff grade decreased by 90% (Figure 1) while average reserve grade increased by only 43% (Figure 2). Approximately 40% of this increase in grade can be attributed to the large decrease in reserve tons between the 11% and 12% cutoff grades (Table II).

TABLE I

MARG PROJECT

UNDILUTED MINERAL RESERVE BLOCKS

Drill Indicated and Inferred

Block	Drill Hole	Tons	Cu %	Pb %	Zn %	Cu + Pb + Zn %	Ag opt	Au opt
12A	88-12	39,815	3.14	4.84	9.21	17.19	3.18	0.053
3A	88-3	7,116	5.41	3.05	6.72	15.18	2.97	0.010
5A	88-5	77,196	3.32	3.68	6.59	13.59	2.08	0.030
10B	88-10	8,854	2.92	3.33	5.80	12.05	1.81	0.048
10A	88-10	85,001	2.92	3.33	5.80	12.05	1.81	0.048
19A	88-19	249,236	2.55	2.71	6.26	11.52	1.86	0.022
19B	88-19	49,847	2.55	2.71	6.26	11.52	1.86	0.022
19C	88-19	39,166	2.55	2.71	6.26	11.52	1.86	0.022
23A	88-23	91,822	1.91	3.07	6.49	11.47	2.20	0.028
23B	88-23	57,388	1.91	3.07	6.49	11.47	2.20	0.028
17A	88-17	33,114	2.15	2.98	6.14	11.27	1.80	0.024
12B	88-12	84,877	2.03	3.31	5.85	11.19	3.09	0.042
11B	88-11	12,127	2.24	3.05	5.87	11.16	1.16	0.027
11A	88-11	77,311	2.24	3.05	5.87	11.16	1.16	0.027
15A	88-15	16,016	3.35	2.52	4.64	10.51	2.36	0.033
16A	88-16	75,550	2.54	2.48	5.31	10.33	1.76	0.022
21A	88-21	49,429	2.56	2.48	5.25	10.29	2.11	0.034
11C	88-11	41,484	1.52	3.17	5.57	10.26	2.47	0.050
15B	88-15	37,500	1.65	2.66	5.20	9.51	2.22	0.032
2B	88-2	19,882	3.99	1.74	3.44	9.17	1.66	0.029
30A	88-30	67,084	1.05	2.85	5.21	9.11	1.70	0.027
30B	88-30	51,042	1.05	2.85	5.21	9.11	1.70	0.027
21C	88-21	59,111	1.50	2.32	4.84	8.66	1.97	0.031
13A	88-13	113,857	1.41	2.52	4.45	8.38	2.25	0.031
10C	88-10	126,390	1.32	2.50	4.45	8.27	1.91	0.047
33C	88-33	46,424	1.57	2.19	4.29	8.05	1.36	0.016
33A	88-33	92,848	1.57	2.19	4.29	8.05	1.36	0.016
33B	88-33	18,570	1.57	2.19	4.29	8.05	1.36	0.016
21B	88-21	37,778	1.46	2.10	4.10	7.66	1.78	0.022
20A	88-20	21,486	1.74	1.87	3.97	7.58	1.91	0.034
20B	88-20	27,577	1.26	2.10	4.04	7.40	1.55	0.018
23C	88-23	98,797	1.24	2.07	3.95	7.26	1.94	0.038
23D	88-23	52,392	1.24	2.07	3.95	7.26	1.94	0.038
28A	88-28	36,200	1.39	1.81	3.46	6.66	1.49	0.015
25A	88-25	77,917	1.98	1.22	3.40	6.60	1.47	0.023
4A	88-4	28,178	0.14	6.18	0.02	6.34	2.81	0.027
2A	88-2	10,151	0.26	5.77	0.02	6.05	9.30	0.050
20C	88-20	32,311	0.93	1.77	3.23	5.93	1.41	0.014
18A	88-18	77,334	1.20	1.21	2.79	5.20	0.72	0.010
18B	88-18	56,389	1.20	1.21	2.79	5.20	0.72	0.010
17B	88-17	26,953	1.18	0.83	2.08	4.09	0.52	0.014
TOTAL		2,311,521	1.90	2.60	4.99	9.49	1.87	0.028

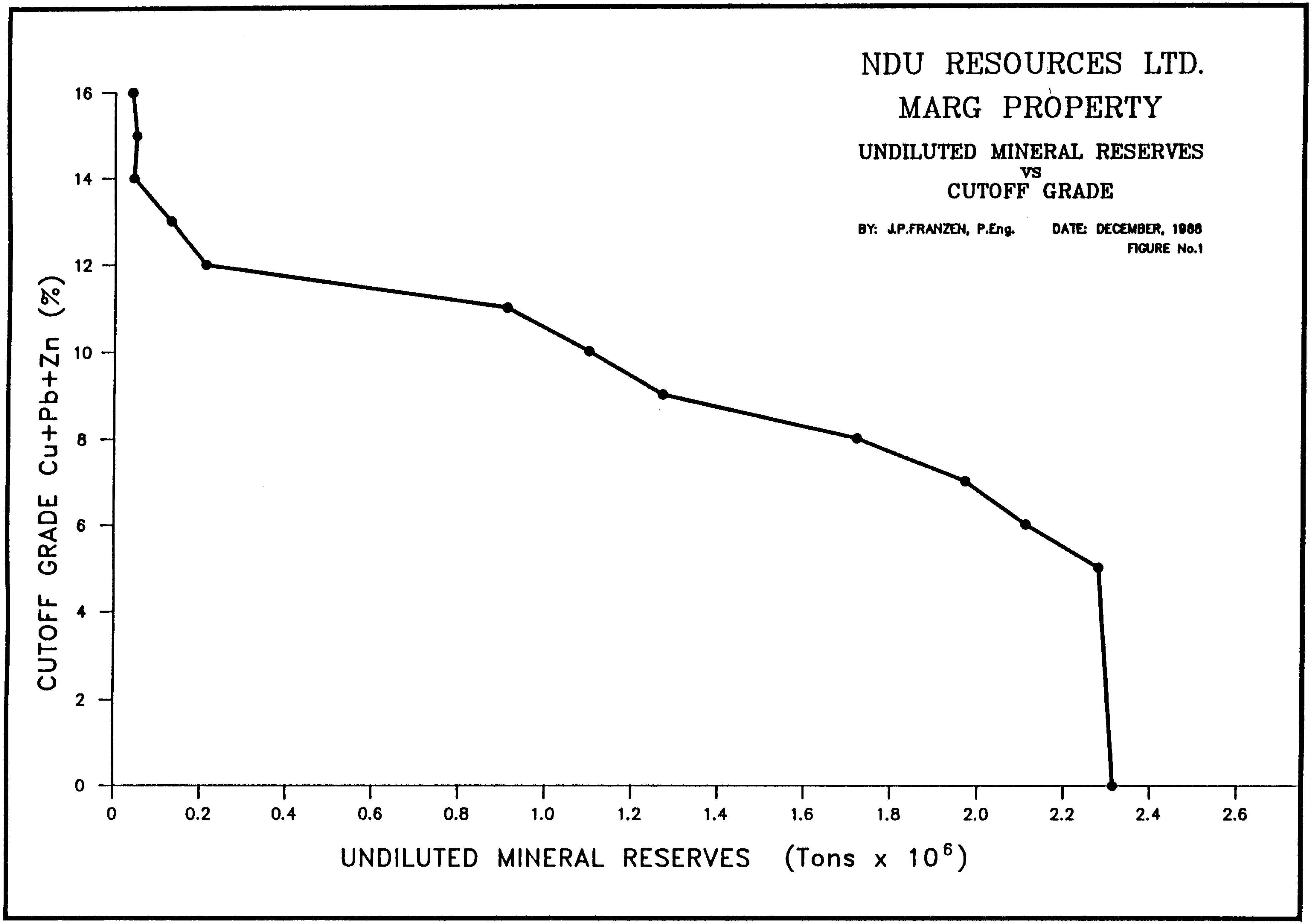
TABLE II

MARG PROJECT

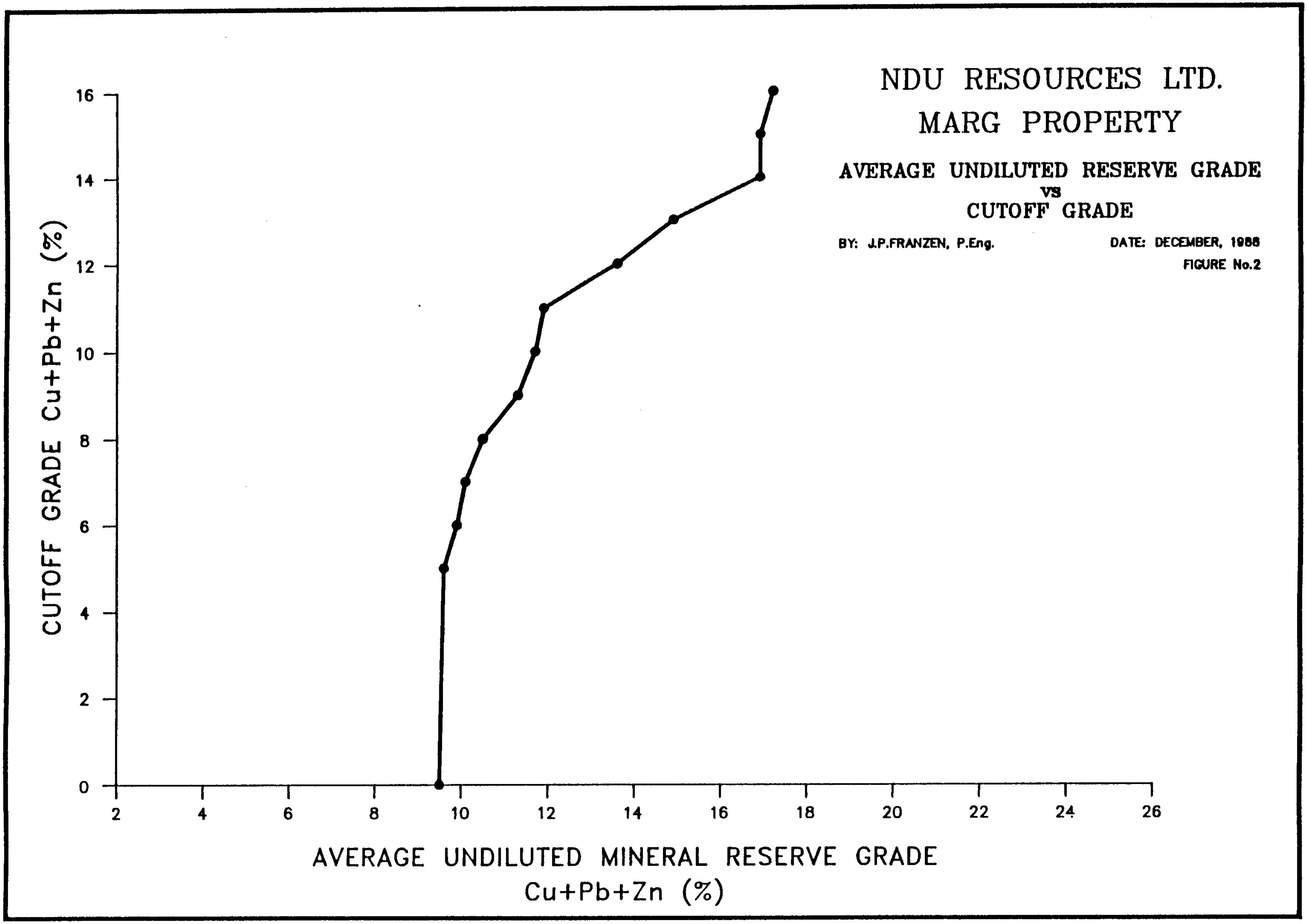
TONNAGE - GRADE RELATIONSHIP

Undiluted Mineral Reserves

Cutoff Grade Cu + Pb + Zn	Tons	Cu %	Pb %	Zn %	Cu + Pb + Zn %	Ag opt	Au opt
0	2,311,521	1.90	2.60	4.99	9.49	1.87	0.028
5%	2,284,568	1.91	2.62	5.02	9.55	1.89	0.029
6%	2,118,534	1.97	2.72	5.19	9.88	1.97	0.030
7%	1,966,087	2.02	2.73	5.39	10.14	1.95	0.030
8%	1,728,057	2.11	2.82	5.59	10.52	1.96	0.030
9%	1,270,857	2.35	2.98	6.00	11.33	2.01	0.030
10%	1,095,350	2.48	3.03	6.16	11.67	2.04	0.030
11%	912,871	2.50	3.11	6.33	11.94	2.04	0.030
12%	217,892	3.18	3.72	6.73	13.63	2.19	0.041
13%	124,127	3.38	4.02	7.44	14.84	2.48	0.036
14%	46,931	3.48	4.57	8.83	16.88	3.15	0.046
15%	46,931	3.48	4.57	8.83	16.88	3.15	0.046
16%	39,815	3.14	4.84	9.21	17.19	3.18	0.053



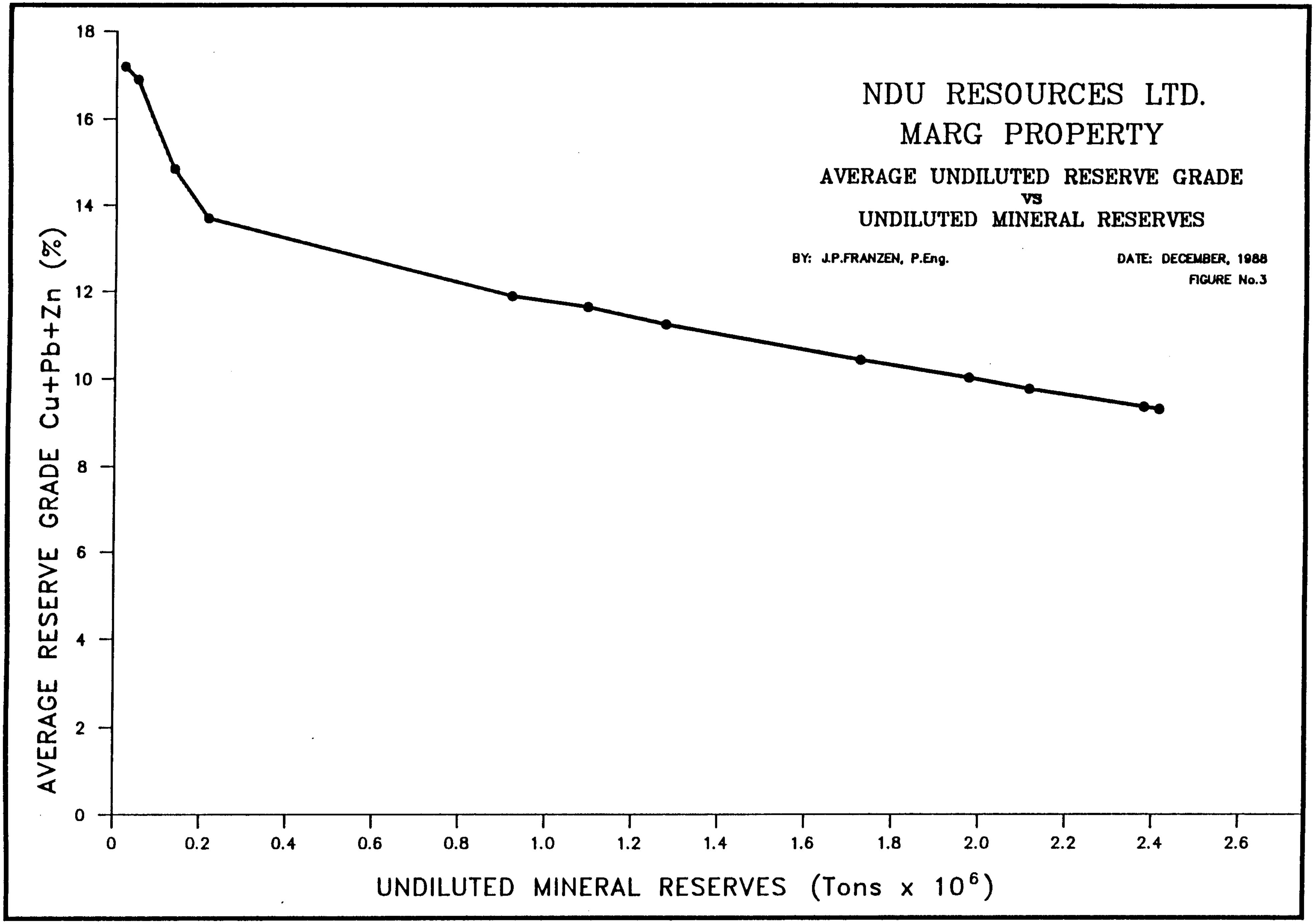
NDU RESOURCES LTD.
MARG PROPERTY
UNDILUTED MINERAL RESERVES
vs
CUTOFF GRADE
BY: J.P.FRANZEN, P.Eng.
DATE: DECEMBER, 1988
FIGURE No.1
CUTOFF GRADE Cu+Pb+Zn (%)
0
2
4
6
8
10
12
14
16
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
UNDILUTED MINERAL RESERVES (Tons x 10^6)
Prepared by: RWR MINERAL GRAPHICS LTD.

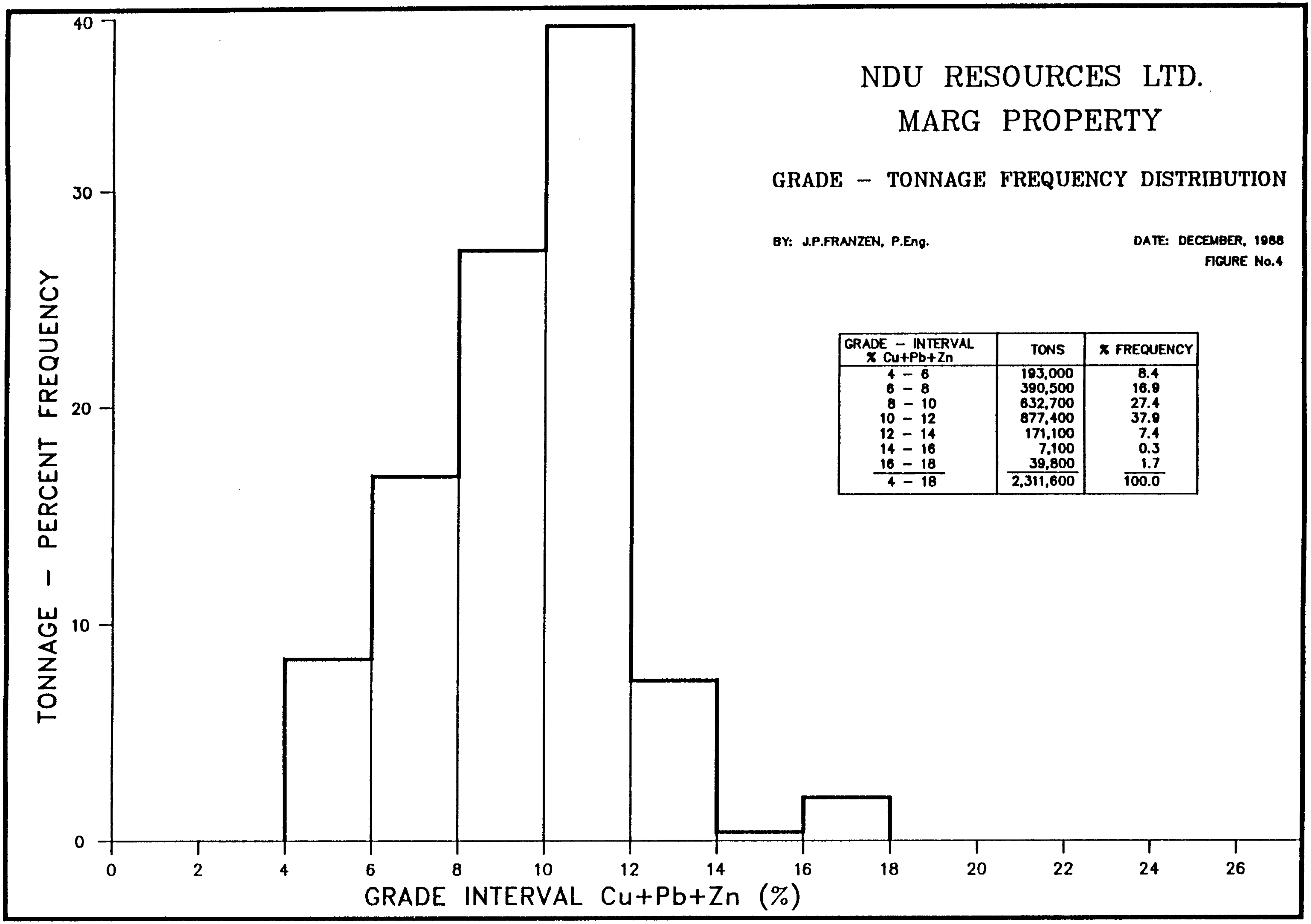


Prepared by: RWR MINERAL GRAPHICS LTD.

The increase in average grade of reserve tons above cutoff is gradual and constant (Figure 3) and is due to the fact that sixty-five percent of the total reserve tons lie within the 8% to 12% average grade interval (Figure 4). This 65% reserve effectively buffers incremental tonnage-induced changes in grade as reserve blocks are progressively dropped below the 12% cutoff grade. At a 12% cutoff the influence of the 65% reserve disappears (Figure 4) and average reserve grade shows a marked increase (Figure 2 and 3). To date, identified reserve tons above a 12% cutoff grade are limited (Figures 1 and 4).

Franzen Mineral Engineering Ltd.
J.P. Franzen, P.Eng.
December 12, 1988


NDU RESOURCES LTD.
MARG PROPERTY
AVERAGE UNDILUTED RESERVE GRADE
VS
UNDILUTED MINERAL RESERVES
BY: J.P.FRANZEN, P.Eng.
DATE: DECEMBER, 1988
FIGURE No.3
AVERAGE RESERVE GRADE Cu+Pb+Zn (%)
0
2
4
6
8
10
12
14
16
18
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
UNDILUTED MINERAL RESERVES (Tons x 10⁶)
Prepared by: RWR MINERAL GRAPHICS LTD.



GRADE – INTERVAL % Cu+Pb+Zn	TONS	% FREQUENCY
4 – 6	193,000	8.4
6 – 8	390,500	16.9
8 – 10	632,700	27.4
10 – 12	877,400	37.9
12 – 14	171,100	7.4
14 – 16	7,100	0.3
16 – 18	39,800	1.7
4 – 18	2,311,600	100.0

Prepared by: RWR MINERAL GRAPHICS LTD.

VPL

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist
A.L. LITTLEJOHN, M.Sc. Geologist
JEFF HARRIS, Ph.D. Geologist

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FORT LANGLEY, B.C.
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PHONE (604) 888-1323

Report for: R.J. Cathro,
Archer Cathro & Assoc. Ltd.,
Box 4127,
3125 Third Avenue,
WHITEHORSE, Y.T.
Y1A 3S9

Invoice 7578

September 19th, 1988

Summary:

Marg Property: The two samples from the Marg Property are pyritic massive sulfides consisting of intimate, fine-grained intergrowths with gangue. The latter is predominantly quartz in the sample from 226', and carbonate (dolomite or ankerite) at 231'.

Valuable constituents are sphalerite with minor galena and chalcopyrite in the first sample, and chalcopyrite with lesser sphalerite and galena in the second.

Textures are typical of volcanogenic massive sulfides, consisting of the valuable base metal sulfides, intergrown with gangue, as an interstitial/matrix component to an aggregate of pyrite cubes. The scale of intergrowth of the valuable constituents is mainly in the range 10 - 100 microns, with a proportion of the chalcopyrite in the second sample being a little coarser.

The textural attributes of this ore suggest that it will present a challenge from the metallurgical processing standpoint.

No specific examples of Au or Ag minerals were seen in the portions sectioned. The absence of tetrahedrite - the usual Ag carrier in ores of this type - is notable. No source of Bi values was seen. Arsenic is present as arsenopyrite.

J.F. Harris Ph.D.

(phone: (604) 929-5867)

PHOTOMICROGRAPHS

All photos are by reflected light at the same scale, 1cm = 85 microns, to provide a visual comparison of the sulfide grain size and associations in the different sample groups.

MARG PROPERTY

Sample M88-5 226'

Neg. 132-8 Shows aggregate of pyrite cubes (cream colour) with interstitial sphalerite (grey). Darkest grey areas are intergrown quartz. Accessory constituents are galena (light bluish-grey, centre; and adjacent brownish grey, tarnished areas) and chalcopyrite (yellow). Note predominant particle size is 25 - 60 microns, with sphalerite and pyrite partially up to 100 microns.

Neg. 132-9 Illustrates very fine-grained (5 - 30 microns) sulfides (sphalerite, grey; galena, light bluish-grey and tarnished, with dark rims) in compact massive pyrite (lower centre). Darkest grey areas are quartz gangue (e.g. bottom left; top), mainly as relatively coarse segregations.

Sample M88-5 231'

Neg. 132-11 Shows pyrite (buff colour) as islands in matrix of chalcopyrite (yellow). Light bluish-grey is galena, as fine intergrowths in the peripheries of the pyrite islands. Darker grey (e.g. centre) is sphalerite, as grains 50 - 180 microns in chalcopyrite. Black areas are gangue.

Neg. 132-12 Another common textural style, with chalcopyrite, sphalerite, galena and gangue interstitial to an aggregate of euhedral pyrite (colour key as before). Note very fine inclusions of base metal sulfides in some of the pyrite cubes.

Neg. 132-13 Illustrates small scale textural variability. Photo includes rather coarse-grained, 4-component intergrowth at right, and area of coalescent fine-grained pyrite at left, with minutely interstitial (physically inseparable) chalcopyrite and galena.

Sample M88-5 226'

Estimated mode

Quartz	37
Carbonate	1
Sericite	trace
Scorodite(?)	2
Pyrite	46
Sphalerite	10
Galena	2
Chalcopyrite	2
Arsenopyrite	trace

This sample is a fine-grained, intimate intergrowth of sulfides and gangue, showing a distinct banded texture.

Sulfides are estimated to make up about 60% of the rock. They are a typical polymetallic volcanogenic assemblage in which pyrite is the predominant constituent. No pyrrhotite is present.

The gangue is almost entirely quartz. Randomly disseminated flecks of sericite and carbonate are very minor accessories.

In a few areas of the slide the quartz shows intergranular and microfracture-controlled impregnation by a yellowish-brown, high-relief mineral which has the properties of scorodite (Fe arsenate, normally formed by breakdown of the arsenopyrite). It could also be a secondary Pb or Zn mineral or a mixture. Sulfides themselves appear totally fresh, and this material presumably represents local redistribution from a nearby area of active weathering.

The quartz and sulfides form an even intergrowth on the scale 50 - 500 microns, with the gangue occurring as small inclusions, grading to coarser, semi-connected pockets, within a matrix of compact sulfides. The banded texture is produced by variations in the relative proportions of sulfides and gangue.

The sulfides consist of a more or less compact aggregate of euhedral pyrite, as individual cubes, 20 - 200 microns in size, within which the Cu-Pb-Zn sulfides form an interstitial or cementing phase - as individual tiny flecks and coarser, semi-connected, pockety networks, principally on the scale 10 - 100 microns.

A small proportion of the sulfides - especially galena - occur as minutely fine-grained inclusions and impregnations in patches of compact pyrite. These intergrowths grade down to 5 microns or so in scale.

Sample M88-5 226' cont.

Within the interstitial/cementing phase, the Zn, Cu and Pb sulfides are generally fairly well segregated. Thus a grind to a size range capable of separating them from the pyrite will also provide liberation of the individual species.

Unfortunately the scale of the intergrowth will necessitate a very fine grind. A particle size of 100% -200 mesh will be required to liberate bulk sulfides from quartz. However, even at a grind of 100% -400 mesh (37 microns) liberation of Cu, Pb and Zn sulfides from pyrite and from each other may be no better than about 60%.

No Bi or Sb minerals were distinguishable in this sample. Arsenic is in the form of arsenopyrite, as scattered grains 10 - 100 microns in size, intimately intergrown with the pyrite aggregate.

Sample M88-5 231'

Estimated mode

Carbonate	17
Quartz	1
Sericite	1
Pyrite	60
Chalcopyrite	10
Sphalerite	6
Galena	5
Arsenopyrite	trace

This is a massive sulfide ore showing some differences from the sample at 225'.

It is non-banded and contains a lower proportion of gangue - consisting 80% or more of sulfides. The gangue is almost entirely carbonate rather than quartz, and the predominant base metal sulfide is chalcopyrite rather than sphalerite.

The general textural character of the sulfides is similar to the previous sample - except that a proportion of the principal valuable constituent, chalcopyrite, is in relatively more coarsely segregated form.

Pyrite is the main constituent. It occurs as a more or less close-packed aggregate of cubic euhedra, exhibiting a wide size range, from about 500 microns down to 10 microns or less. In part the aggregate texture grades to patches of dense, compact, massive pyrite.

The Cu, Pb and Zn sulfides form an interstitial or pockety cementing phase throughout the pyrite matrix. In areas of compact massive pyrite, they occur as minute (low micron size) inclusions or network impregnations.

Gangue (mosaic carbonate with scattered intergrown quartz and local areas of fine-grained flaky sericite) forms a rather even intergrowth throughout the sulfide aggregate, as small inclusions grading to semi-connected pockets, on the scale 30 - 500 microns.

Of the valuable constituents, chalcopyrite shows a wide size range, similar to the pyrite, from 500 microns down to 5 microns or so. It is estimated that 80% of the chalcopyrite in this sample is in the form of relatively coarse segregations 100 microns in size.

Sphalerite and galena both typically occur as angular interstitial networks cementing pyrite grains, and exhibit a predominant size range of 10 - 150 microns.

Sample M88-5 231' cont.

The slide shows patchy compositional variations, from areas where chalcopyrite predominates (with accessory galena and sphalerite) to others where sphalerite and/or galena (with accessory chalcopyrite) are the main valuable components.

As in 88-5 226', no pyrrhotite or Sb and Bi minerals were seen. Arsenopyrite is a trace associate of the pyrite.

Considerations of grain size/liberation are similar to the previous sample, except that the majority of the chalcopyrite would be liberated at, say, 150 mesh. Sphalerite and galena are much finer grained.

ASSESSMENT

OF

MINERAL RESERVES

AT THE

MARG Cu-Zn-Pb-Ag-Au PROPERTY

FOR

NDU RESOURCES LTD.

MAYO MINING DISTRICT

YUKON TERRITORY

BY

FRANZEN MINERAL ENGINEERING LTD.

J.P. FRANZEN, P.ENG.

North Vancouver, B.C. November 18, 1988

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SUMMARY

An assessment of mineral reserves at the MARG volcanogenic massive sulphide deposit is based on 4 drill sections containing 21 diamond drill holes. The mineral reserve area measures 650 feet along-strike and up to 1100 feet down-dip; average width is 15.7 feet.

Undiluted mineral reserves are as follows:

		%			ounces/ton	
Category	Tons	Cu	Pb	Zn	Ag	Au
Drill Indicated	1,919,300	1.94	2.63	4.99	1.92	0.029
Drill Inferred	392,200	1.73	2.42	5.00	1.63	0.024
TOTAL	2,311,500	1.90	2.59	4.99	1.87	0.028

Economic constraints have not been applied to the reserve estimate.

INTRODUCTION

NDU Resources Ltd. and joint venture partner CAMECO are exploring the MARG volcanogenic massive sulphide deposit near Keno Hill, Yukon Territory. NDU Resources Ltd. retained the writer to prepare an assessment of mineral reserves at the MARG property. A preliminary assessment was completed on October 17, 1988; this report updates the earlier report.

This letter report is based on a visit to the subject property on August 22 and 23, 1988 and on the writer's evaluation of geologic data supplied by NDU Resources Ltd.

Detailed plans, sections and computer files assembled by the writer in the preparation of this report are available at the offices of NDU Resources Ltd. in Vancouver.

MINERAL RESERVE ASSESSMENT PROCEDURE

The mineral reserve assessment is based on the writer's site visit and evaluation of summary diamond drill logs and assay results for 21 drill holes totalling 13,443 feet. These holes are located on drill sections spaced on 230 foot (70 metre) intervals and tested the mineralized zone for 690 feet along-strike and up to 1100 feet down-dip. Drill holes 88-28, 88-30A, 88-33 and an extension to 88-19 were added to the October 17th report data base. These holes did not significantly change the earlier geological interpretation as seen in 1:1000 geological cross sections and level plans.

MINERAL RESERVE DATA BASE DRILL HOLES

Drill Section	Hole Number	Length (feet)
2370 E	88-4	299
	88-5	289
	88-15	318
	88-16	702
	88-17	525
	88-18	430
	Total	2,563
2440E	88-2	371
	88-3	266
	88-10	512
	88-11	567
	88-19	946
	88-33	1,001
	Total	4,609
2510 E	88-12	443
	88-13	407
	88-20	859
	88-23	968
	88-25	817
	Total	3,494
2580 E	88-14	505
	88-21	646
	88-28	701
	88-30A	925
	Total	2,777
GRAND TOTAL	21 HOLES	13,443 feet

Appendices A and B list detailed tonnage and grade calculations for mineral reserve blocks shown in Appendix C. A listing of the more significant Lotus 123 spreadsheet files used in the calculation of the mineral inventory is given in Appendix D. These files are contained on three IBM-PC compatible floppy diskettes which accompany this report.

As in the October 17, 1988 report, calculated tons for each reserve block are based on volume and a lithologic-interval weighted specific gravity values for each block. Lithologic units within the reserve blocks are assigned specific gravity values as follows:

Sulphide Lithology	Specific Gravity
Massive	4.25
Laminated	3.75
Disseminated	3.25
Barren	2.80

Use of this method weights tons - but not grade - by specific gravity. In order to assess the influence of specific gravity on grade, the writer examined assay-specific gravity relationships for drill holes 88-16 and 88-18 (Table A)

Mineral reserves in this report are based on the 1. Lithology -Composite specific gravity weighting method (see Table A). Because lithologic breaks are not always coincident with assay intervals, the writer re-calculated a composite specific gravity value based on the length of assay intervals. This is the 2. Assay - Composite method (see Table A). As with 1. this method weights tons but not grade. Inspection of Table A shows that with the exception of the calculated specific gravity value for Hole 88-18 (undiluted), there are no significant differences between methods 1. and 2.

Method 3. Assay - Interval weights each assay interval according to length and specific gravity. This method influences both tons and grade. Table A shows that the specific gravity value for each block remains unchanged; however, in each case the grade has increased over that seen in methods 1. and 2. The average increase in grade for all metals is 2.8% in an undiluted block and 11.0% in a diluted block. Diluted blocks are more sensitive to specific gravity weighting since they include more material (wall rock) at a specific gravity lower than that of the mineralized zone.

TABLE A

MARG PROPERTY

COMPARISON OF ASSAY VALUES AND SPECIFIC GRAVITY WEIGHTING METHODS

Drill Hole	Reserve Category	Specific Gravity Weighting Method	Interval (m) From	To	Width (m)	Specific Gravity	% Cu	Pb	Zn	ounces/ton Ag	Au
88-16	Undiluted	1. Lithology-Composite	104.1	114.9	10.9	3.73	2.54	2.48	5.31	1.76	0.022
		2. Assay-Composite			10.8	3.73	2.54	2.48	5.33	1.76	0.021
		3. Assay-Interval			**10.8**	**3.73**	**2.64**	**2.54**	**5.40**	**1.82**	**0.220**
88-16	Diluted	1. Lithology-Composite	101.7	115.6	13.9	3.52	1.97	1.92	4.16	1.36	0.017
		2. Assay-Composite			13.8	3.52	1.97	1.92	4.14	1.37	0.017
		3. Assay-Interval			**13.8**	**3.52**	**2.17**	**2.09**	**4.44**	**1.50**	**0.018**
88-18	Undiluted	1. Lithology-Composite	114.3	120.7	6.4	3.48	1.20	1.21	2.79	0.72	0.010
		2. Assay-Composite			6.4	3.63	1.21	1.22	2.81	0.73	0.010
		3. Assay-Interval			**6.4**	**3.63**	**1.26**	**1.26**	**2.90**	**0.74**	**0.010**
88-18	Diluted	1. Lithology-Composite	111.0	123.5	12.5	3.32	0.68	0.63	1.47	0.39	0.007
		2. Assay-Composite			12.5	3.31	0.69	0.64	1.49	0.39	0.006
		3. Assay-Interval			**12.5**	**3.31**	**0.78**	**0.72**	**1.68**	**0.44**	**0.007**

This limited study demonstrates the importance of recognizing specific gravity variations in a massive sulphide deposit. In the writer's opinion, it is reasonable to anticipate a 10% to 15% increase in grade in the diluted mineral reserve inventory. Detailed specific gravity measurements should be obtained to confirm this opinion.

Mineral reserves were calculated by the section method. Two categories of mineral reserves were considered:

Drill Indicated: Tonnage and grade are computed partly from specific drill holes values and partly from projection of these values for a distance of up to 115 feet (35 metres) from the drill hole values. Sampling is inappropriately spaced to outline the material completely or to establish its grade throughout.

Inferred: Tonnage and grade estimates are based on an assumed continuity of values 115 feet (35 metres) to 230 feet (70 metres) from a drill hole sample. These estimates are based on overall geological character of the deposit, as seen in level plans and for which there are no local samples or measurements.

MINERAL RESERVES

Table B lists results for undiluted reserves; Table C lists results for diluted reserves. In both cases, assay results are not weighted by specific gravity.

Mining dilution considered the following factors:

1. A minimum 0.75 metre dilution on hanging-wall and 0.75 metre dilution on foot-wall, regardless of zone width. The 0.75 metre intervals were parallel to drill hole inclination and approximate true width.

TABLE B

MARG PROPERTY

UNDILUTED TONS AND GRADE SUMMARY - NOVEMBER 18, 1988

	Cross Section 2370 E	Cross Section 2440 E	Cross Section 2510 E	Cross Section 2580 E	TOTAL ALL SECTIONS
DRILL INDICATED					
Average Width (feet)	15.5	19.0	15.1	10.2	15.4
Tons	371,800	709,400	588,500	249,600	1,919,300
Grade % Cu Pb Zn	2.05 2.69 4.45	2.19 2.76 5.38	1.72 2.54 4.97	1.57 2.39 4.71	1.94 2.63 4.99
oz/ton Ag Au	1.68 0.023	1.87 0.031	2.18 0.032	1.83 0.027	1.92 0.029
DRILL INFERRED					
Average Width (feet)	21.0	21.3	16.4	9.8	17.7
Tons	56,400	175,000	109,800	51,000	392,200
Grade % Cu Pb Zn	1.20 1.20 2.79	2.18 2.57 5.48	1.59 2.59 5.28	1.05 2.85 5.21	1.73 2.42 5.00
oz/ton Ag Au	0.72 0.010	1.62 0.021	2.08 0.033	1.70 0.027	1.63 0.024
TOTAL DRILL INDICATED AND INFERRED					
Average Width (feet)	16.0	19.7	15.4	10.2	15.7
Tons	428,200	884,400	698,300	300,600	2,311,500
Grade % Cu Pb Zn	1.94 2.49 4.23	2.19 2.72 5.40	1.70 2.55 5.02	1.48 2.47 4.79	1.90 2.59 4.99
oz/ton Ag Au	1.55 0.021	1.82 0.029	2.16 0.032	1.81 0.027	1.87 0.028

TABLE C

MARG PROPERTY

DILUTED TONS AND GRADE SUMMARY - NOVEMBER 18, 1988

	Cross Section 2370 E	Cross Section 2440 E	Cross Section 2510 E	Cross Section 2580 E	TOTAL ALL SECTIONS
DRILL INDICATED					
Average Width (feet)	25.7	28.5	27.2	20.7	26.0
Tons	543,300	974,100	862,000	440,700	2,820,100
Grade % Cu Pb Zn	1.32 1.72 2.85	1.59 2.05 3.97	1.15 1.70 3.32	0.99 1.50 2.96	1.31 1.79 3.40
oz/ton Ag Au	1.08 0.015	1.41 0.024	1.46 0.022	1.17 0.017	1.32 0.021
DRILL INFERRED					
Average Width (feet)	38.4	26.9	26.9	14.1	26.7
Tons	104,900	206,100	160,700	66,400	538,100
Grade % Cu Pb Zn	0.68 0.63 1.47	1.79 2.09 4.46	1.06 1.71 3.52	0.81 2.14 3.95	1.23 1.70 3.53
oz/ton Ag Au	0.39 0.007	1.33 0.018	1.37 0.024	1.30 0.021	1.15 0.018
TOTAL DRILL INDICATED AND INFERRED					
Average Width (feet)	27.3	28.3	27.2	19.7	26.1
Tons	648,200	1,180,200	1,022,700	507,100	3,358,200
Grade % Cu Pb Zn	1.22 1.54 2.63	1.62 2.06 4.06	1.14 1.70 3.35	0.97 1.58 3.09	1.30 1.78 3.42
oz/ton Ag Au	0.97 0.014	1.40 0.023	1.45 0.022	1.19 0.018	1.29 0.021

2. 1. was extended to include the full width of fault zones, if present, on the immediate hanging-wall of the undiluted reserve block.

3. 1. was extended to include lower grade mineralization, if present, on both walls of the block. This material may prove to be economic if lower mining costs are realized at larger mining widths.

DISCUSSION

Dilution of the mineral reserve increased tons by 45.3% and decreased grade by 31.3%. A block by block economic evaluation of the diluted mineral reserve is warranted to optimize grade.

Specific gravity weighting of the diluted mineral reserve could significantly increase the average grade. Preliminary results are listed below:

DILUTED MINERAL RESERVE

Reserve Category	% Cu	% Pb	% Zn	ounces/ton Ag	ounces/ton Au
SG Weighted	1.43	1.96	3.76	1.42	0.023
Current	1.30	1.78	3.42	1.29	0.021

REFERENCES

FRANZEN, J.P. (1988) Preliminary Assessment of Mineral Reserves at the MARG Cu-Zn-Pb-Ag-Au Property. Report for NDU Resources Ltd.

CERTIFICATE

I, Jeffrey Paul Franzen, P.Eng., of 4990 Cedarcrest Avenue, North Vancouver, B.C. do hereby certify that:

1. I am a Consulting Mining Geologist registered with the Association of Professional Engineers of British Columbia since 1982.

2. I am a graduate of the University of British Columbia with B.Sc. (1972) and Carleton University with M.Sc. (1974).

3. I have practiced my profession continuously since 1974. In Yukon: as Mine Geologist, Research Geologist and Chief Geologist, United Keno Hill Mines Limited, and Exploration Geologist, Cyprus Anvil Mining Corp. In British Columbia: Regional Geologist - Western Canada, Billiton Canada Ltd., Consultant - Franzen Mineral Engineering Ltd.

4. This report is based on a visit to the subject property on August 22 and 23, 1988 and on the writer's evaluation of maps and data supplied by NDU Resources Ltd.

5. I have no interest, direct or indirect, in the MARG property or NDU Resources Ltd.

6. Permission is hereby granted to NDU Resources Ltd. to use this report in support of any Prospectus, Statement of Material Facts or Filing Statement to be submitted to the Superintendent of Brokers and the Vancouver Stock Exchange.

FRANZEN MINERAL ENGINEERING LTD.
J.P. Franzen, P. Eng.

North Vancouver, B.C.
November 18, 1988

APPENDIX A

UNDILUTED TONNAGE AND GRADE CALCULATIONS
CROSS SECTIONS 2370 E, 2440 E, 2510 E, 2580 E

MARG PROPERTY
UNDILUTED MINERAL RESERVES
Cross Section 2370 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
4A	88-4	65.2	68.3	3.1	3.1	38	70	8246	3.10	28178	0.14	6.18	0.02	2.81	0.027
5A	88-5	64.1	74.8	10.7	10.7	22	70	16478	4.25	77196	3.32	3.68	6.59	2.08	0.030
15A	88-15	39.5	41.2	1.7	1.7	30	70	3570	4.07	16016	3.35	2.52	4.64	2.36	0.033
15B	88-15	58.8	61.2	2.4	2.4	50	70	8400	4.05	37500	1.65	2.66	5.20	2.22	0.032
16A	88-16	104.0	114.9	10.9	10.5	25	70	18375	3.73	75550	2.54	2.48	5.31	1.76	0.022
17A	88-17	108.0	111.9	3.9	3.9	28	70	7644	3.93	33114	2.15	2.98	6.14	1.80	0.024
17B	88-17	115.0	118.3	3.3	3.3	29	70	6699	3.65	26953	1.18	0.83	2.08	0.52	0.014
18A	88-18	114.3	120.7	6.4	6.0	48	70	20160	3.48	77334	1.20	1.21	2.79	0.72	0.010
TOTAL DRILL INDICATED					4.7	34	70	89572	3.77	**371841**	2.05	2.69	4.45	1.68	0.023
DRILL INFERRED															
18B	88-18	114.3	120.7	6.4	6.0	35	70	14700	3.48	56389	1.20	1.20	2.79	0.72	0.010
TOTAL DRILL INFERRED					6.0	35	70	14700	3.48	**56389**	1.20	1.20	2.79	0.72	0.010
GRAND TOTAL DRILL INDICATED AND INFERRED										**428200**	1.94	2.49	4.23	1.55	0.021

MARG PROPERTY
UNDILUTED MINERAL RESERVES
Cross Section 2440 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
2A	88-2	18.9	25.1	6.2	4.0	11	70	3080	2.99	10151	0.26	5.77	0.02	9.30	0.050
2B	88-2	28.2	32.6	4.4	4.4	16	70	4928	3.66	19882	3.99	1.74	3.44	1.66	0.029
3A	88-3	28.3	29.4	1.1	0.7	31	70	1519	4.25	7116	5.41	3.05	6.72	2.97	0.010
10A	88-10	62.7	68.6	5.9	5.4	48	70	18144	4.25	85001	2.92	3.33	5.80	1.81	0.048
10C	88-10	123.3	133.6	10.3	10.0	42	70	29400	3.90	126390	1.32	2.50	4.45	1.91	0.047
11A	88-11	82.2	87.8	5.6	4.7	51	70	16779	4.18	77311	2.24	3.05	5.87	1.16	0.027
11C	88-11	150.0	152.9	2.9	2.3	55	70	8855	4.25	41484	1.52	3.17	5.57	2.47	0.050
19A	88-19	203.7	214.9	11.2	11.2	70	70	54880	4.12	249236	2.55	2.71	6.26	1.86	0.022
33A	88-33	222.5	227.2	4.7	4.5	70	70	22050	3.82	92848	1.57	2.19	4.29	1.36	0.016
TOTAL DRILL INDICATED					5.8	44	70	159635	4.03	**709418**	2.19	2.76	5.38	1.87	0.031
DRILL INFERRED															
10B	88-10	62.7	68.6	5.9	5.4	5	70	1890	4.25	8854	2.92	3.33	5.80	1.81	0.048
11B	88-11	82.2	87.8	5.6	4.7	8	70	2632	4.18	12127	2.24	3.05	5.87	1.16	0.027
19B	88-19	203.7	214.9	11.2	11.2	14	70	10976	4.12	49847	2.55	2.71	6.26	1.86	0.022
19C	88-19	203.7	214.9	11.2	11.2	11	70	8624	4.12	39166	2.55	2.71	6.26	1.86	0.022
33B	88-33	222.5	227.2	4.7	4.5	14	70	4410	3.82	18570	1.57	2.19	4.29	1.36	0.016
33C	88-33	222.5	227.2	4.7	4.5	35	70	11025	3.82	46424	1.57	2.19	4.29	1.36	0.016
TOTAL DRILL INFERRED					6.5	14	70	39557	4.01	**174988**	2.18	2.57	5.48	1.62	0.021
GRAND TOTAL DRILL INDICATED AND INFERRED										**884400**	2.19	2.72	5.40	1.82	0.029

MARG PROPERTY
UNDILUTED MINERAL RESERVES
Cross Section 2510 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
12A	88-12	65.0	68.7	3.7	3.0	43	70	9030	4.00	39815	3.14	4.84	9.21	3.18	0.053
12B	88-12	73.9	79.8	6.0	5.5	50	70	19250	4.00	84877	2.03	3.31	5.85	3.09	0.042
13A	88-13	82.3	94.0	11.7	10.3	38	70	27398	3.77	113857	1.41	2.52	4.45	2.25	0.031
20A	88-20A	187.2	189.3	2.1	2.1	39	70	5733	3.40	21486	1.74	1.87	3.97	1.91	0.034
20B	88-20B	221.3	223.5	2.2	2.2	45	70	6930	3.61	27577	1.26	2.10	4.04	1.55	0.018
20C	88-20C	226.7	229.2	2.5	2.5	50	70	8750	3.35	32311	0.93	1.77	3.23	1.41	0.014
23A	88-23A	209.2	215.1	5.9	5.0	56	70	19600	4.25	91822	1.91	3.07	6.49	2.20	0.028
23C	88-23C	263.8	269.2	5.3	5.0	66	70	23100	3.88	98797	1.24	2.07	3.95	1.94	0.038
25A	88-25A	181.5	187.5	6.0	6.0	45	70	18900	3.74	77917	1.98	1.22	3.40	1.47	0.023
TOTAL DRILL INDICATED					4.6	48	70	138691	3.85	**588459**	1.72	2.54	4.97	2.18	0.032
DRILL INFERRED															
23B	88-23	209.2	215.1	5.9	5.0	35	70	12250	4.25	57388	1.91	3.07	6.49	2.20	0.028
23D	88-23	263.8	269.2	5.4	5.0	35	70	12250	3.88	52392	1.24	2.07	3.95	1.94	0.038
TOTAL DRILL INFERRED					5.0	35	70	24500	4.07	**109781**	1.59	2.59	5.28	2.08	0.033
GRAND TOTAL DRILL INDICATED AND INFERRED										**698300**	1.70	2.55	5.02	2.16	0.032

MARG PROPERTY
UNDILUTED MINERAL RESERVES
Cross Section 2580 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
21A	88-21	161.5	164.8	3.3	3.3	46	70	10626	4.22	49429	2.56	2.48	5.25	2.11	0.034
21B	88-21	171.7	174.2	2.5	2.4	48	70	8064	4.25	37778	1.46	2.10	4.10	1.78	0.022
21C	88-21	182.4	187.5	5.1	3.8	48	70	12768	4.20	59111	1.50	2.32	4.84	1.97	0.031
28A	88-28	156.9	160.0	3.1	3.1	46	70	9982	3.29	36200	1.39	1.81	3.46	1.49	0.015
30A	88-30	188.6	192.2	3.6	3.0	69	70	14490	4.20	67084	1.05	2.85	5.21	1.70	0.027
TOTAL DRILL INDICATED					3.1	51	70	55930	4.05	**249603**	1.57	2.39	4.71	1.83	0.027
DRILL INFERRED															
30B	88-30	188.6	192.2	3.6	3.0	35	105	11025	4.20	51042	1.05	2.85	5.21	1.70	0.027
TOTAL DRILL INFERRED					3.0	35	105	11025	4.20	**51042**	1.05	2.85	5.21	1.70	0.027
GRAND TOTAL DRILL INDICATED AND INFERRED										**300600**	1.48	2.47	4.79	1.81	0.027

APPENDIX B

DILUTED TONNAGE AND GRADE CALCULATIONS
CROSS SECTIONS 2370 E, 2440 E, 2510 E, 2580 E

MARG PROPERTY

DILUTED MINERAL RESERVES

Cross Section 2370 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
4A	88-4	64.5	69.1	4.6	4.6	38	70	12236	3.00	40463	0.09	4.16	0.01	1.89	0.018
5A	88-5	63.4	75.6	12.2	11.6	22	70	17864	4.07	80144	2.91	3.23	5.78	1.82	0.026
15A	88-15	38.5	41.9	3.4	3.4	30	70	7140	3.40	26759	1.57	1.18	2.18	1.11	0.016
15B	88-15	58.0	61.9	3.9	3.9	50	70	13650	3.80	57176	1.15	1.78	3.49	1.56	0.023
16A	88-16	101.7	115.6	13.9	13.4	25	70	23450	3.52	90988	1.97	1.92	4.16	1.36	0.017
17A	88-17	105.2	112.1	6.9	6.9	28	70	13524	3.46	51580	1.23	1.69	3.48	1.03	0.014
17B	88-17	112.1	118.7	6.6	6.6	29	70	13398	3.54	52281	0.62	0.42	1.10	0.27	0.008
18A	88-18	111.0	123.5	12.5	11.7	48	70	39312	3.32	143868	0.68	0.63	1.47	0.39	0.007
TOTAL DRILL INDICATED					7.8	32	70	140574	3.51	**543260**	1.32	1.72	2.85	1.08	0.015
DRILL INFERRED															
18B	88-18	111.0	123.5	12.5	11.7	35	70	28665	3.32	104903	0.68	0.63	1.47	0.39	0.007
TOTAL DRILL INFERRED					11.7	35	70	28665	3.32	**104903**	0.68	0.63	1.47	0.39	0.007
GRAND TOTAL DRILL INDICATED AND INFERRED										**648200**	1.22	1.54	2.63	0.97	0.014

MARG PROPERTY
DILUTED MINERAL RESERVES
Cross Section 2440 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
2A	88-2	18.2	25.9	7.7	5.0	11	70	3850	2.95	12519	0.21	4.65	0.02	7.49	0.040
2B	88-2	27.5	33.4	5.9	5.9	16	70	6608	3.44	25057	2.98	1.30	2.57	1.24	0.022
3A	88-3	27.6	30.2	2.6	1.7	31	70	3689	3.41	13866	2.29	1.29	2.84	1.26	0.004
10A	88-10	61.9	71.3	9.4	8.6	48	70	28896	3.71	118171	1.84	2.10	3.65	1.14	0.030
10C	88-10	110.7	134.4	23.7	23.0	42	70	67620	3.50	260881	0.91	1.73	3.08	1.33	0.030
11A	88-11	80.9	88.6	7.7	6.5	51	70	23205	3.80	97200	1.68	2.23	4.30	0.85	0.023
11C	88-11	149.2	153.7	4.5	3.6	55	70	13860	3.75	57292	0.99	2.06	3.63	1.61	0.033
19A	88-19	202.9	215.7	12.8	12.8	70	70	62720	3.96	273780	2.28	2.41	5.57	1.66	0.020
33A	88-13	221.7	228.0	6.3	6.0	70	70	29400	3.56	115371	1.21	1.67	3.28	1.05	0.013
TOTAL DRILL INDICATED					8.7	44	70	239848	3.68	**974138**	1.59	2.05	3.97	1.41	0.024
DRILL INFERRED															
10B	88-10	61.9	71.3	9.4	8.6	5	70	3010	3.71	12309	1.84	2.10	3.65	1.14	0.030
11B	88-11	80.9	88.6	7.7	6.5	8	70	3640	3.80	15247	1.68	2.23	4.30	0.85	0.023
19B	88-19	202.9	215.7	12.8	12.8	14	70	12544	3.96	54756	2.28	2.41	5.57	1.66	0.020
19C	88-19	202.9	215.7	12.8	12.8	11	70	9856	3.96	43023	2.28	2.41	5.57	1.66	0.020
33B	88-33	221.7	228.0	6.3	6.0	14	70	5880	3.56	23074	1.21	1.67	3.28	1.05	0.013
33C	88-33	221.7	228.0	6.3	6.0	35	70	14700	3.56	57686	1.21	1.67	3.28	1.05	0.013
TOTAL DRILL INFERRED					8.2	14	70	49630	3.77	**206095**	1.79	2.09	4.46	1.33	0.018
GRAND TOTAL DRILL INDICATED AND INFERRED										**1180200**	1.62	2.06	4.06	1.40	0.023

MARG PROPERTY

DILUTED MINERAL RESERVES

Cross Section 2510 E

Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
12A	88-12	64.2	69.5	5.3	4.3	43	70	12943	3.64	51932	2.19	3.38	6.43	2.22	0.037
12B	88-12	72.6	80.6	8.0	7.3	50	70	25550	3.75	105896	1.52	2.50	4.41	2.34	0.033
13A	88-13	81.5	94.8	13.3	11.7	38	70	31122	3.65	125216	1.24	2.22	3.92	1.98	0.027
20A	88-20	186.4	190.4	4.0	4.0	39	70	10920	3.15	37917	0.93	1.00	2.12	1.04	0.019
20B&C	88-20	220.5	234.1	13.6	13.6	45	70	42840	3.22	152057	0.59	0.98	1.85	0.77	0.010
23A	88-23	208.4	216.8	8.4	7.1	56	70	27832	3.87	118729	1.36	2.19	4.64	1.56	0.025
23C	88-23	262.0	271.7	9.7	9.2	66	70	42504	3.48	163046	0.80	1.29	2.56	1.21	0.023
25A	88-25	179.3	188.3	9.0	9.0	45	70	28350	3.43	107188	1.32	0.81	2.27	0.98	0.015
TOTAL DRILL INDICATED					8.3	48	70	222061	3.52	**861980**	1.15	1.70	3.32	1.46	0.022
DRILL INFERRED															
23B	88-23	208.4	216.8	8.4	7.1	35	70	17395	3.87	74205	1.36	2.19	4.64	1.56	0.025
23D	88-23	262.20	271.7	9.7	9.2	35	70	22540	3.48	86464	0.80	1.29	2.56	1.21	0.023
TOTAL DRILL INFERRED					8.2	35	70	39935	3.65	**160669**	1.06	1.71	3.52	1.37	0.024
GRAND TOTAL DRILL INDICATED AND INFERRED										**1022700**	1.14	1.70	3.35	1.45	0.022

MARG PROPERTY

DILUTED MINERAL RESERVES

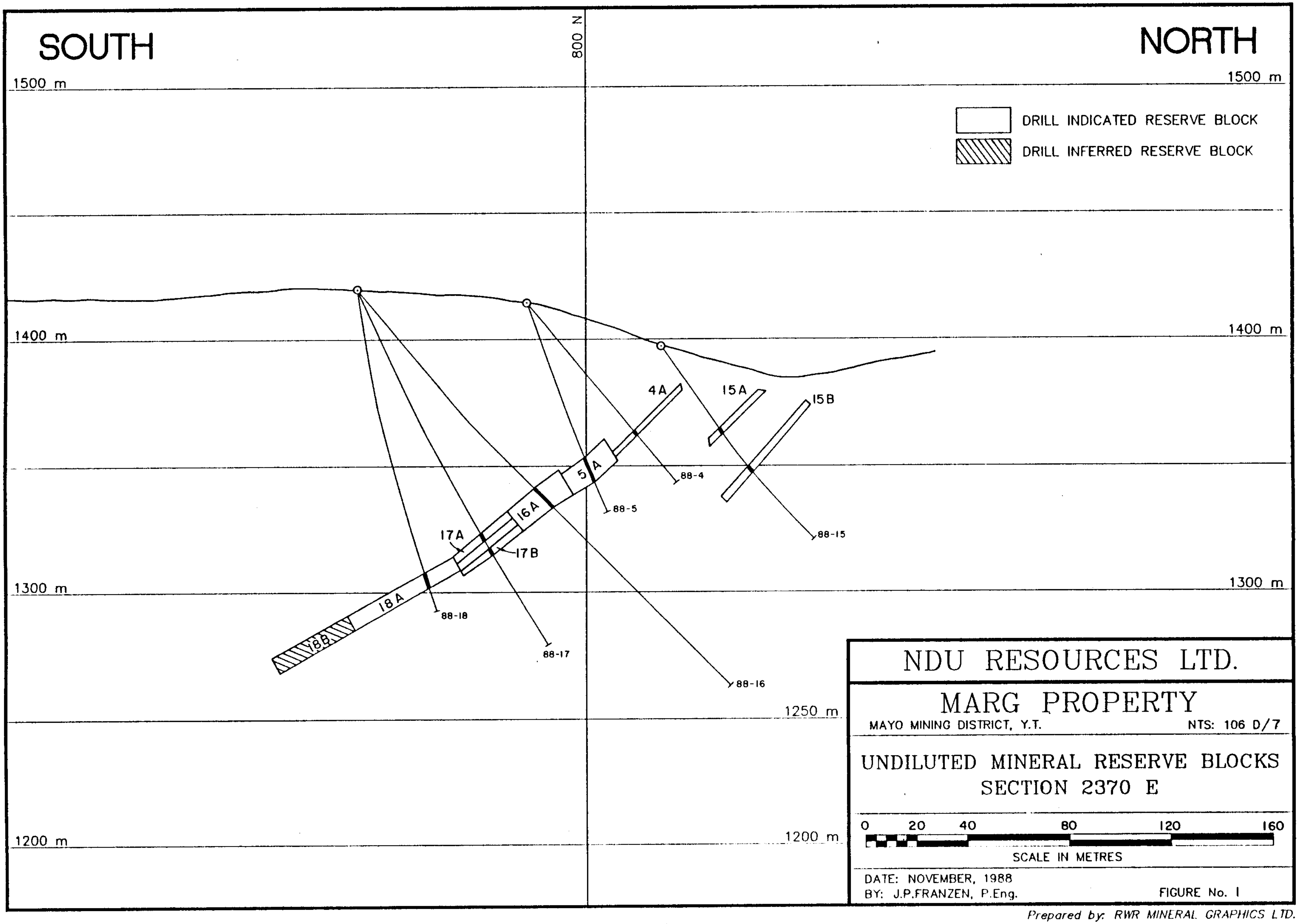
Cross Section 2580 E

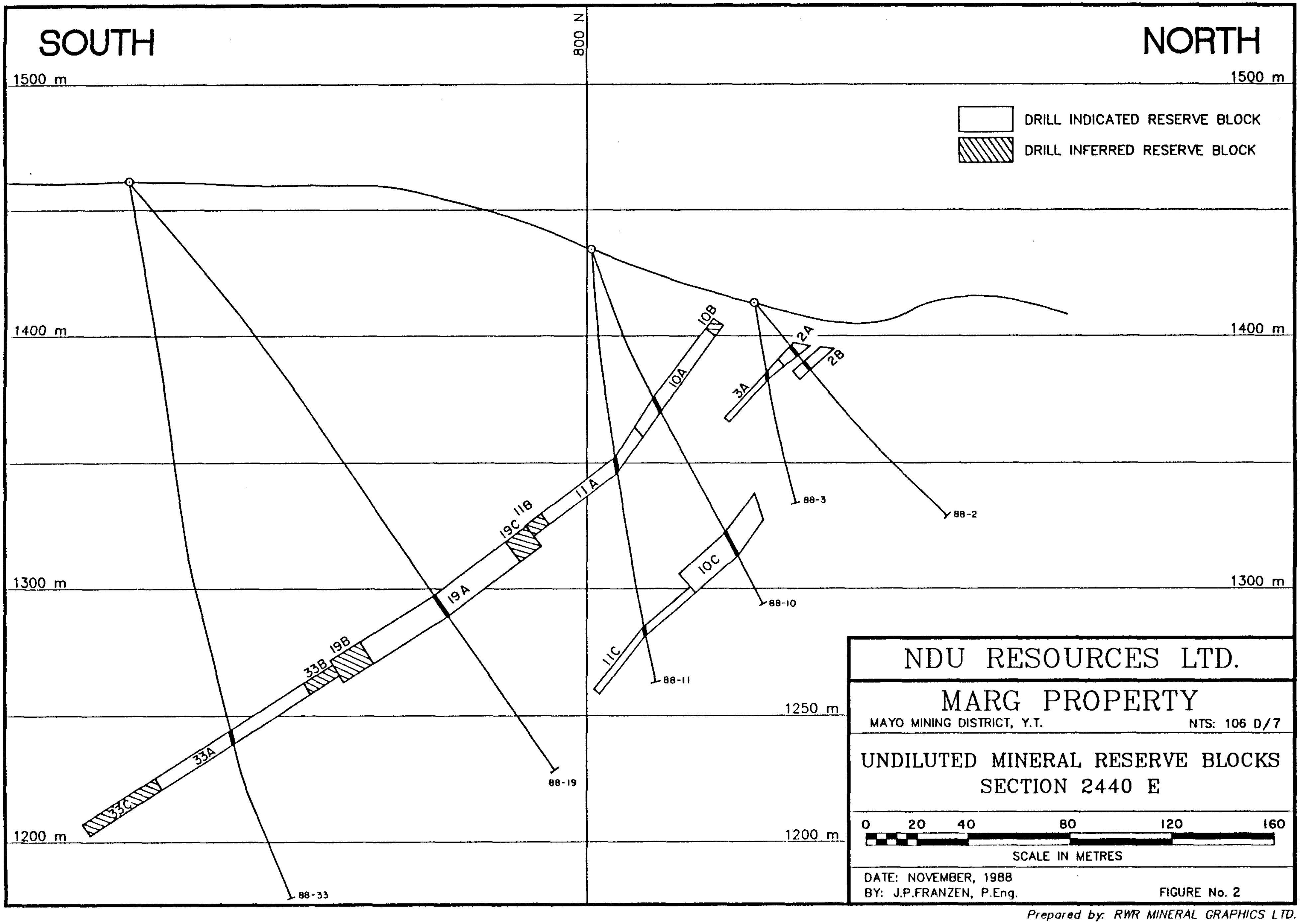
Block	Drill Hole	Interval (m) From	Interval (m) To	Width (m)	True Width (m)	Length (m)	Infl (m)	Volume (m^3)	Specific Gravity	Tons	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
DRILL INDICATED															
21A	88-21	155.8	165.6	9.8	9.8	46	70	31556	3.35	116527	1.11	1.11	2.27	0.95	0.014
21B	88-21	169.5	175.0	5.5	5.3	48	70	17808	3.50	68704	0.70	1.05	2.00	0.86	0.010
21C	88-21	181.3	188.8	7.5	7.5	48	70	25200	3.97	110279	1.30	1.93	3.98	1.66	0.025
28A	88-28	156.2	161.5	5.3	5.3	46	70	17066	3.08	57941	0.81	1.06	2.02	0.87	0.009
30A	88-30	187.8	193.0	5.2	4.3	69	70	20769	3.81	87225	0.81	2.14	3.95	1.30	0.021
TOTAL DRILL INDICATED					6.3	51	70	112399	3.56	**440675**	0.99	1.50	2.96	1.17	0.017
DRILL INFERRED															
30B	88-33	187.8	193.0	5.2	4.3	35	105	15803	3.81	66367	0.81	2.14	3.95	1.30	0.021
TOTAL DRILL INFERRED					4.3	35	105	15803	3.81	**66367**	0.81	2.14	3.95	1.30	0.021
GRAND TOTAL DRILL INDICATED AND INFERRED										**507100**	0.97	1.58	3.09	1.19	0.018

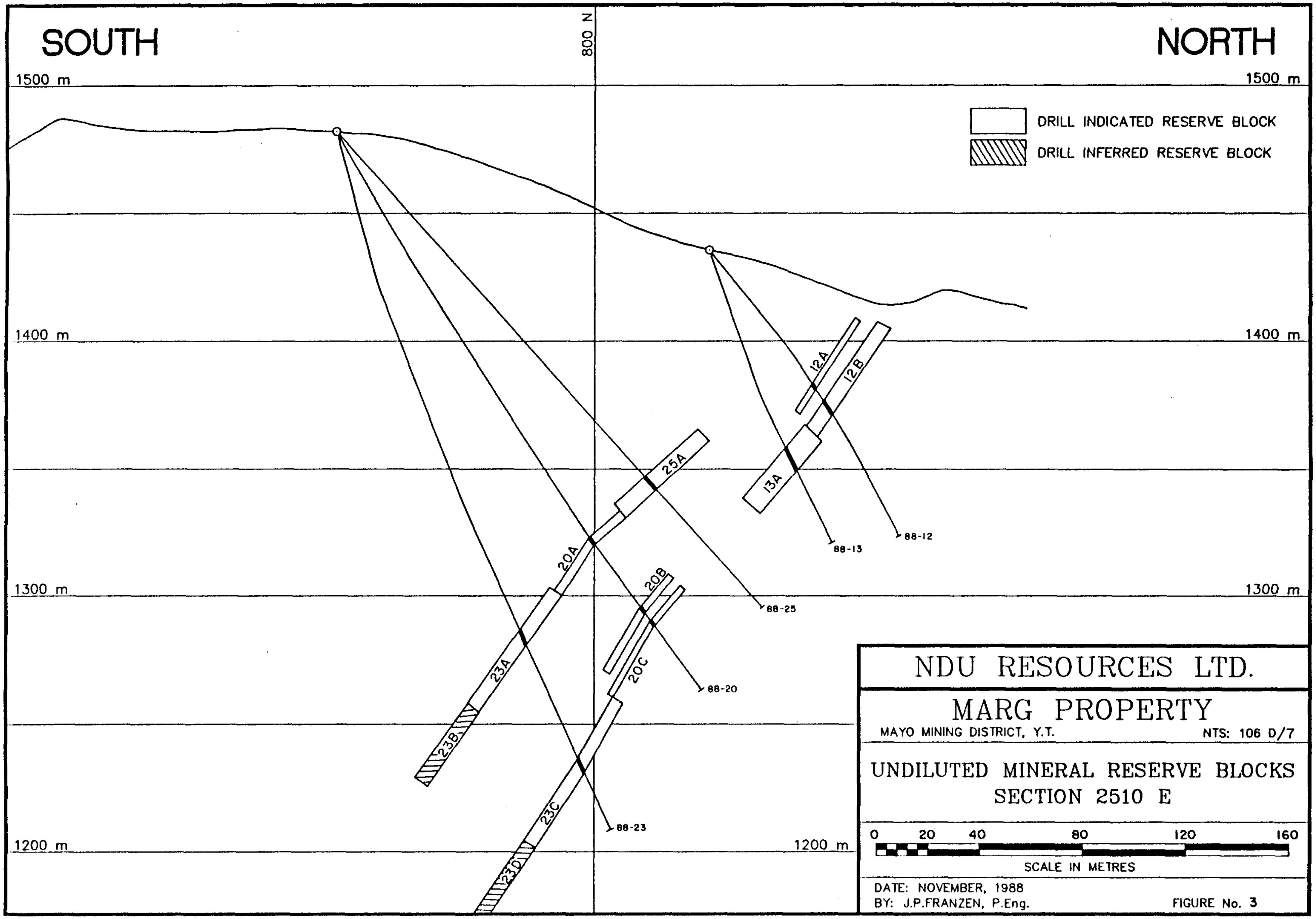
APPENDIX C

UNDILUTED MINERAL RESERVE BLOCKS

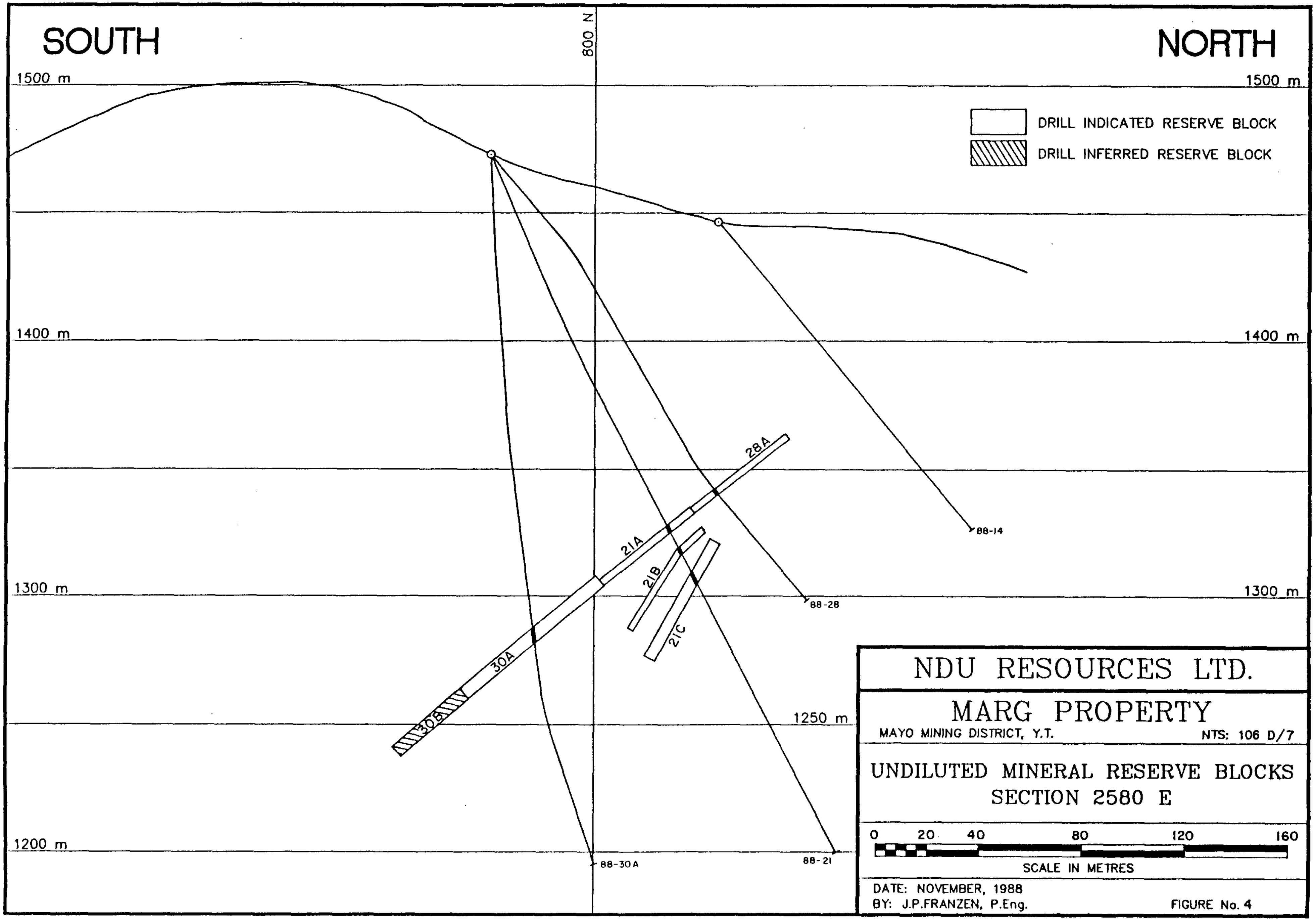
CROSS SECTIONS 2370E, 2440E, 2510E, 2580E


SOUTH
NORTH
800 N
1500 m
1400 m
1300 m
1250 m
1200 m
DRILL INDICATED RESERVE BLOCK
DRILL INFERRED RESERVE BLOCK
4 A
15 A
15 B
5 A
16 A
17 A
17 B
18 A
18 B
88-4
88-5
88-15
88-16
88-17
88-18
NDU RESOURCES LTD.
MARG PROPERTY
MAYO MINING DISTRICT, Y.T.
NTS: 106 D/7
UNDILUTED MINERAL RESERVE BLOCKS
SECTION 2370 E
0 20 40 80 120 160
SCALE IN METRES
DATE: NOVEMBER, 1988
BY: J.P.FRANZEN, P.Eng.
FIGURE No. 1
Prepared by: RWR MINERAL GRAPHICS LTD.


SOUTH
NORTH
800 N
1500 m
1400 m
1300 m
1250 m
1200 m
DRILL INDICATED RESERVE BLOCK
DRILL INFERRED RESERVE BLOCK
10B
10A
2A
2B
3A
11A
11B
19C
19A
19B
33B
33A
33C
10C
11C
88-3
88-2
88-10
88-11
88-19
88-33
NDU RESOURCES LTD.
MARG PROPERTY
MAYO MINING DISTRICT, Y.T.
NTS: 106 D/7
UNDILUTED MINERAL RESERVE BLOCKS
SECTION 2440 E
0 20 40 80 120 160
SCALE IN METRES
DATE: NOVEMBER, 1988
BY: J.P.FRANZEN, P.Eng.
FIGURE No. 2
Prepared by: RWR MINERAL GRAPHICS LTD.



Prepared by: RWR MINERAL GRAPHICS LTD.



Prepared by: RWR MINERAL GRAPHICS LTD.

APPENDIX D

LISTING OF LOTUS 123 SPREADSHEET FILES

UNDILUTED TONS AND GRADE

DRILL INDICATED RESERVES

Cross Section	File
2370E	E2370DDH.WK1
2440E	E2440DDH.WK1
2510E	E2510DDH.WK1
2580E	E2580DDH.WK1

DRILL INFERRED RESERVES

Cross Section	File
2370E	E2370I.WK1
2440E	E2440I.WK1
2510E	E2510I.WK1
2580E	E2580I.WK1

TOTAL DRILL INDICATED AND INFERRED RESERVES

Cross Section	File
2370E	E2370TOT.WK1
2440E	E2440TOT.WK1
2510E	E2510TOT.WK1
2580E	E2580TOT.WK1

DILUTED TONS AND GRADE

DRILL INDICATED RESERVES

Cross Section	File
2370E	E2370DD.WK1
2440E	E2440DD.WK1
2510E	E2510DD.WK1
2580E	E2580DD.WK1

DRILL INFERRED RESERVES

Cross Section	File
2370E	E2370ID.WK1
2440E	E2440ID.WK1
2510E	E2510ID.WK1
2580E	E2580ID.WK1

TOTAL DRILL INDICATED AND INFERRED RESERVES

Cross Section	File
2370E	E2370TOD.WK1
2440E	E2440TOD.WK1
2510E	E2510TOD.WK1
2580E	E2580TOD.WK1

UNDILUTED TONS AND GRADE

TOTAL DRILL INDICATED

Cross Section	File
ALL	DDHTOTAL.WK1

TOTAL DRILL INFERRED

Cross Section	File
ALL	ITOTAL.WK1

DILUTED TONS AND GRADE

TOTAL DRILL INDICATED

Cross Section	File
ALL	DDTOTAL.WK1

TOTAL DRILL INFERRED

Cross Section	File
ALL	IDTOTAL.WK1

APPENDIX F

GEOCHEMICAL ASSAY CERTIFICATES

CHEMEX LABS LTD.

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1

PHONE (604) 984-0221

T :CHER CATHRO & ASSOC. (1981) LTD.

BOX 4127, 3125 3RD AVE.
WHITEHORSE, Y.T.
Y1A 3S9

Project : MARG
Comments:

Date : 22-JUL-88
Invoice # : I-8819020
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8819020

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S 09162	203	217	15	1.43	< 0.2	5	210	< 0.5	< 2	0.38	1.0	13	53	57	3.72	< 10	< 1	0.10	40	0.48	331
S 09163	203	217	20	1.55	< 0.2	15	220	< 0.5	< 2	0.39	0.5	13	76	66	3.61	< 10	< 1	0.11	40	0.48	401
S 09164	203	217	< 5	1.44	< 0.2	5	160	< 0.5	< 2	0.31	0.5	20	86	52	4.58	< 10	2	0.16	40	0.55	893
S 09165	203	217	< 5	1.56	< 0.2	15	370	< 0.5	< 2	0.36	< 0.5	9	85	38	2.88	< 10	< 1	0.10	30	0.45	318
S 09166	203	217	< 5	1.59	< 0.2	40	390	< 0.5	< 2	0.42	< 0.5	10	68	46	3.14	< 10	< 1	0.09	30	0.48	297
S 09167	203	217	< 5	1.55	< 0.2	20	280	< 0.5	< 2	0.30	0.5	11	91	61	3.06	< 10	< 1	0.07	30	0.39	344
S 09168	203	217	< 5	2.16	< 0.2	5	270	< 0.5	< 2	0.61	< 0.5	12	68	27	3.31	< 10	< 1	0.10	20	0.48	216
S 09169	203	217	< 5	2.04	< 0.2	< 5	270	< 0.5	< 2	0.36	< 0.5	10	95	27	2.95	< 10	< 1	0.10	20	0.38	208
S 09536	203	217	45	1.36	< 0.2	10	120	< 0.5	< 2	0.46	< 0.5	18	57	34	4.15	< 10	1	0.10	30	0.50	545
S 09537	203	217	5	1.17	< 0.2	< 5	90	< 0.5	< 2	0.21	0.5	18	72	31	3.80	< 10	< 1	0.10	30	0.47	617
S 09538	203	217	30	1.50	0.2	35	110	< 0.5	< 2	0.10	< 0.5	11	68	53	3.37	< 10	< 1	0.07	20	0.38	276
S 09539	203	217	15	1.24	0.2	30	130	< 0.5	< 2	0.07	< 0.5	12	96	40	3.82	< 10	< 1	0.08	20	0.30	461
S 09540	203	217	< 5	0.97	< 0.2	15	320	< 0.5	< 2	0.10	< 0.5	12	67	55	3.34	< 10	2	0.07	30	0.32	705
S 09541	203	217	20	0.84	0.2	15	340	< 0.5	< 2	0.24	< 0.5	21	79	90	3.33	< 10	< 1	0.08	30	0.31	1915
S 09542	203	217	10	1.22	0.4	10	210	< 0.5	< 2	0.15	< 0.5	28	67	85	5.13	< 10	< 1	0.07	30	0.31	1495
S 09543	203	217	25	1.16	0.2	< 5	550	< 0.5	< 2	0.24	< 0.5	20	95	101	3.80	< 10	< 1	0.09	30	0.33	1990

CERTIFICATION : ______________________

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1
PHONE (604) 984-0221

T ICHER CATHRO & ASSOC. (1981) LTD.

BOX 4127, 3125 3RD AVE.
WHITEHORSE, Y.T.
Y1A 3S9
Project : MARG
Comments:

Page N 1-B
Tot. Pages: 1
Date : 22-JUL-88
Invoice # : I-8819020
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8819020

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S 09162	203	217	2	0.01	37	740	80	< 5	2	21	< 0.01	< 10	< 10	22	10	164
S 09163	203	217	2	0.02	32	780	66	< 5	3	24	0.02	< 10	< 10	35	10	160
S 09164	203	217	3	0.02	47	540	26	< 5	3	19	< 0.01	< 10	< 10	23	20	176
S 09165	203	217	2	0.02	24	880	38	< 5	4	27	0.05	< 10	< 10	47	10	104
S 09166	203	217	2	0.02	29	920	50	< 5	4	28	0.04	< 10	< 10	46	10	136
S 09167	203	217	3	0.02	34	920	32	< 5	3	20	0.04	< 10	< 10	38	5	181
S 09168	203	217	2	0.02	33	920	24	< 5	4	25	0.03	< 10	< 10	51	10	134
S 09169	203	217	2	0.03	30	950	10	< 5	4	21	0.02	< 10	< 10	41	10	119
S 09536	203	217	2	0.01	45	920	12	< 5	3	24	< 0.01	< 10	< 10	18	15	155
S 09537	203	217	2	0.01	36	610	10	< 5	2	12	< 0.01	< 10	< 10	15	10	119
S 09538	203	217	1	0.01	24	800	90	< 5	2	10	0.02	< 10	< 10	42	10	96
S 09539	203	217	4	0.02	27	1510	34	< 5	2	11	0.01	< 10	< 10	32	10	98
S 09540	203	217	3	0.01	26	950	18	< 5	2	14	< 0.01	< 10	< 10	17	10	86
S 09541	203	217	5	0.01	55	1200	6	< 5	2	21	< 0.01	< 10	< 10	12	10	105
S 09542	203	217	4	0.02	77	1280	28	< 5	3	16	< 0.01	< 10	< 10	19	20	144
S 09543	203	217	4	0.02	42	1310	20	< 5	3	23	< 0.01	< 10	< 10	18	10	79

CERTIFICATION : ____________________

Chemex Labs Ltd.

Analytical Chemists • Geochemists • Registered Assayers

212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1

PHONE (604) 984-0221

To: ARCHER CATHRO & ASSOC. (1981) LTD.

BOX 4127, 3125 3RD AVE.
WHITEHORSE, Y.T.
Y1A 3S9

Project : MARG
Comments:

Date : 15-JUL-88
Invoice # : I-8818447
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8818447

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S 09101	203	238	< 5	2.38	0.2	20	650	< 0.5	< 2	0.34	< 0.5	8	150	38	3.23	< 10	< 1	0.23	30	0.51	240
S 09102	203	238	< 5	1.61	< 0.2	25	140	< 0.5	< 2	0.11	< 0.5	8	120	36	4.03	< 10	< 1	0.09	20	0.35	275
S 09103	203	238	< 5	2.05	< 0.2	10	330	< 0.5	< 2	0.18	0.5	12	147	47	3.62	< 10	< 1	0.18	30	0.43	436
S 09104	203	238	< 5	1.87	< 0.2	10	480	< 0.5	< 2	0.27	0.5	8	118	54	3.32	< 10	1	0.12	30	0.41	331
S 09105	203	238	< 5	1.34	0.2	30	210	< 0.5	< 2	0.25	< 0.5	9	121	34	3.01	< 10	3	0.11	40	0.33	334
S 09106	203	238	< 5	1.50	5.0	25	450	< 0.5	< 2	0.28	2.0	9	99	2620	3.10	< 10	< 1	0.09	20	0.41	272
S 09107	203	238	< 5	1.69	17.6	15	530	< 0.5	< 2	0.26	1.0	14	103	1855	2.68	< 10	< 1	0.14	20	0.41	872
S 09108	203	238	< 5	1.27	0.6	15	930	< 0.5	< 2	0.77	4.0	7	199	396	2.09	< 10	1	0.14	20	0.32	295
S 09109	203	238	< 5	1.40	2.2	10	1360	< 0.5	< 2	1.12	4.0	7	243	666	1.85	< 10	< 1	0.18	30	0.33	280
S 09110	203	238	< 5	1.39	0.2	20	290	< 0.5	2	0.18	< 0.5	6	104	32	2.81	< 10	< 1	0.10	20	0.35	220
S 09111	203	238	< 5	1.87	0.4	20	520	< 0.5	< 2	0.67	3.0	9	286	49	2.92	< 10	1	0.23	30	0.43	349
S 09112	203	238	10	1.57	0.6	25	500	0.5	< 2	0.45	2.0	8	137	108	2.89	< 10	< 1	0.12	30	0.43	307
S 09113	203	238	< 5	2.06	0.2	35	510	< 0.5	< 2	0.35	1.0	11	235	61	3.73	< 10	< 1	0.18	40	0.44	326
S 09114	203	238	< 5	1.53	0.6	30	490	< 0.5	2	0.38	1.0	8	111	671	2.97	< 10	< 1	0.10	20	0.43	339
S 09115	203	238	< 5	0.98	< 0.2	1280	330	< 0.5	< 2	0.10	< 0.5	5	33	2630	>15.00	< 10	< 1	0.07	10	0.13	295
S 09116	203	238	< 5	1.24	0.2	15	400	< 0.5	< 2	0.20	1.5	8	100	505	3.23	< 10	< 1	0.09	20	0.32	208
S 09117	203	238	< 5	1.71	4.2	30	350	0.5	< 2	0.25	0.5	13	307	1075	3.44	< 10	< 1	0.17	30	0.43	464
S 09118	203	238	< 5	1.72	3.6	15	390	< 0.5	< 2	0.24	1.0	8	173	1375	3.11	< 10	1	0.16	20	0.42	303
S 09119	203	238	< 5	1.23	0.8	35	210	< 0.5	< 2	0.22	< 0.5	10	104	208	2.78	< 10	< 1	0.09	20	0.37	409
S 09120	203	238	10	1.65	< 0.2	20	260	< 0.5	< 2	0.15	< 0.5	6	153	28	3.14	< 10	< 1	0.10	20	0.39	203
S 09121	203	238	< 5	1.44	< 0.2	20	270	< 0.5	< 2	0.10	< 0.5	6	95	25	2.70	< 10	1	0.08	20	0.31	201
S 09122	203	238	< 5	1.73	1.0	5	1000	< 0.5	< 2	0.72	2.5	8	199	163	2.24	< 10	< 1	0.19	30	0.38	376
S 09123	203	238	15	1.90	< 0.2	15	310	< 0.5	2	0.27	0.5	11	106	39	3.34	< 10	< 1	0.13	20	0.50	380
S 09124	203	238	10	2.09	0.2	10	820	< 0.5	2	0.34	1.0	8	242	111	3.10	< 10	< 1	0.24	20	0.40	217
S 09125	203	238	< 5	1.43	0.2	25	210	< 0.5	< 2	0.09	< 0.5	8	202	35	3.49	< 10	1	0.12	20	0.28	234
S 09126	203	238	15	1.87	0.6	30	320	0.5	2	0.14	< 0.5	8	136	186	2.87	< 10	< 1	0.14	30	0.58	273
S 09507	203	238	20	1.58	< 0.2	10	140	< 0.5	< 2	0.26	< 0.5	13	94	37	3.34	< 10	< 1	0.10	30	0.43	494
S 09508	203	238	5	1.83	0.6	15	240	< 0.5	< 2	0.07	< 0.5	4	94	20	3.20	< 10	< 1	0.17	10	0.20	96
S 09509	203	238	15	1.32	< 0.2	10	170	< 0.5	2	0.08	< 0.5	8	198	31	3.77	< 10	< 1	0.13	20	0.21	307
S 09510	203	238	5	1.95	< 0.2	10	220	< 0.5	< 2	0.12	< 0.5	8	119	31	3.96	< 10	1	0.17	20	0.33	324
S 09511	203	238	10	1.69	< 0.2	25	200	< 0.5	2	0.11	< 0.5	14	150	36	3.85	< 10	< 1	0.14	20	0.39	720
S 09512	203	238	10	1.77	< 0.2	20	250	< 0.5	< 2	0.19	< 0.5	11	164	41	3.90	< 10	< 1	0.17	20	0.37	455
S 09513	203	238	5	2.09	1.6	25	200	0.5	< 2	0.08	< 0.5	16	111	22	3.36	< 10	< 1	0.11	10	0.31	1045
S 09514	203	238	15	1.64	< 0.2	15	190	< 0.5	< 2	0.15	< 0.5	12	122	29	3.85	< 10	< 1	0.17	20	0.41	539
S 09515	203	238	10	1.30	0.4	30	190	< 0.5	< 2	0.06	< 0.5	4	112	19	2.68	< 10	< 1	0.16	10	0.18	113
S 09516	203	238	5	2.04	0.4	25	250	< 0.5	< 2	0.13	< 0.5	8	104	20	3.78	< 10	2	0.20	20	0.41	241
S 09517	203	238	15	1.94	0.6	10	260	< 0.5	< 2	0.09	< 0.5	9	134	29	3.77	< 10	< 1	0.22	20	0.37	327
S 09518	203	238	10	1.56	< 0.2	25	200	< 0.5	< 2	0.13	< 0.5	9	138	38	3.44	< 10	< 1	0.14	30	0.30	304
S 09519	203	238	15	1.14	0.6	20	210	< 0.5	< 2	0.19	0.5	14	145	52	4.77	< 10	< 1	0.19	30	0.29	557
S 09520	203	238	10	1.37	0.2	15	290	< 0.5	< 2	0.21	0.5	11	147	35	3.85	< 10	< 1	0.21	30	0.29	382

CERTIFICATION : ____________________

Chemex Labs Ltd.
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To: ARCHER CATHRO & ASSOC. (1981) LTD.

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WHITEHORSE, Y.T.
Y1A 3S9

Project : MARG
Comments:

Date : 15-JUL-88
Invoice # : I-8818447
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8818447

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S 09101	203	238	2	0.04	25	920	62	< 5	3	34	0.05	< 10	< 10	66	< 5	124
S 09102	203	238	2	0.01	25	820	70	< 5	2	16	0.03	< 10	< 10	47	< 5	107
S 09103	203	238	3	0.03	33	720	32	< 5	4	25	0.04	< 10	< 10	51	< 5	162
S 09104	203	238	2	0.02	27	1040	30	5	3	24	0.03	< 10	< 10	50	< 5	182
S 09105	203	238	2	0.02	28	840	32	< 5	3	22	0.06	< 10	< 10	41	< 5	106
S 09106	203	238	3	0.01	33	1180	>10000	< 5	3	25	0.03	< 10	< 10	40	< 5	589
S 09107	203	238	2	0.02	22	1150	>10000	< 5	2	26	0.02	< 10	< 10	46	< 5	295
S 09108	203	238	1	0.02	33	1400	310	< 5	2	44	0.01	< 10	< 10	27	< 5	190
S 09109	203	238	1	0.03	37	1880	228	< 5	3	66	0.01	< 10	< 10	28	< 5	173
S 09110	203	238	3	0.01	25	960	74	< 5	1	19	0.02	< 10	< 10	39	< 5	98
S 09111	203	238	2	0.05	37	1410	126	5	3	43	0.04	< 10	< 10	46	5	534
S 09112	203	238	3	0.02	33	920	146	< 5	3	31	0.04	< 10	< 10	41	< 5	748
S 09113	203	238	3	0.03	34	890	100	< 5	4	33	0.07	< 10	< 10	53	< 5	209
S 09114	203	238	2	0.01	30	1010	6440	< 5	3	28	0.04	< 10	< 10	43	< 5	590
S 09115	203	238	8	0.01	9	1180	1660	5	3	19	0.02	20	20	31	< 5	552
S 09116	203	238	3	0.01	23	820	4560	5	2	20	0.04	< 10	< 10	41	< 5	253
S 09117	203	238	2	0.03	37	970	7810	5	4	26	0.05	< 10	< 10	47	< 5	405
S 09118	203	238	2	0.03	28	960	9950	< 5	3	24	0.04	< 10	< 10	47	< 5	388
S 09119	203	238	3	0.01	27	830	1690	< 5	3	19	0.04	< 10	< 10	37	< 5	241
S 09120	203	238	1	0.02	18	480	56	< 5	2	16	0.05	< 10	< 10	48	< 5	86
S 09121	203	238	1	0.01	16	760	34	< 5	1	13	0.02	< 10	< 10	39	< 5	96
S 09122	203	238	1	0.03	33	1350	42	< 5	2	48	0.02	< 10	< 10	40	< 5	195
S 09123	203	238	2	0.02	39	930	48	< 5	3	24	0.04	< 10	< 10	47	< 5	228
S 09124	203	238	2	0.05	31	990	34	< 5	4	37	0.02	< 10	< 10	49	< 5	181
S 09125	203	238	3	0.02	28	880	48	< 5	2	16	0.01	< 10	< 10	40	< 5	120
S 09126	203	238	3	0.04	20	720	186	< 5	2	20	0.03	< 10	< 10	41	< 5	285
S 09507	203	238	4	0.02	38	930	16	< 5	3	22	0.07	< 10	< 10	50	< 5	118
S 09508	203	238	7	0.02	15	1750	20	< 5	1	15	0.02	< 10	< 10	55	< 5	57
S 09509	203	238	3	0.02	29	720	20	< 5	1	18	0.02	< 10	< 10	46	< 5	80
S 09510	203	238	3	0.02	21	900	18	< 5	2	18	0.06	< 10	< 10	81	< 5	70
S 09511	203	238	3	0.02	32	760	14	< 5	2	18	0.04	< 10	< 10	57	< 5	91
S 09512	203	238	3	0.04	42	880	24	< 5	3	28	0.04	< 10	< 10	50	< 5	109
S 09513	203	238	3	0.02	23	2200	24	< 5	< 1	18	0.01	< 10	< 10	49	< 5	89
S 09514	203	238	4	0.02	28	780	22	< 5	3	20	0.06	< 10	< 10	58	< 5	114
S 09515	203	238	7	0.02	18	1520	12	< 5	< 1	14	0.01	< 10	< 10	69	< 5	103
S 09516	203	238	6	0.02	22	1070	22	< 5	3	21	0.05	< 10	< 10	80	< 5	126
S 09517	203	238	8	0.02	25	1310	18	5	2	21	0.03	< 10	< 10	83	< 5	109
S 09518	203	238	2	0.03	34	780	16	5	3	22	0.04	< 10	< 10	46	< 5	86
S 09519	203	238	3	0.03	50	800	30	< 5	5	19	< 0.01	< 10	< 10	36	< 5	146
S 09520	203	238	4	0.03	37	810	24	< 5	3	23	0.02	< 10	< 10	45	< 5	135

CERTIFICATION : ______________________

Chemex Labs Ltd.
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BOX 4127, 3125 3RD AVE.
WHITEHORSE, Y.T.
Y1A 3S9
Project : MARG
Comments:

Page No. -A
Tot. Pages: 2
Date : 15-JUL-88
Invoice # : I-8818447
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8818447

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S 09521	203	238	5	1.53	< 0.2	10	220	< 0.5	< 2	0.12	< 0.5	4	149	15	2.61	< 10	2	0.18	20	0.25	113
S 09522	203	238	< 5	2.19	< 0.2	10	360	0.5	< 2	0.20	< 0.5	7	194	24	3.50	< 10	< 1	0.29	20	0.38	224
S 09523	203	238	< 5	2.06	< 0.2	25	200	0.5	< 2	0.13	< 0.5	8	149	26	3.86	< 10	1	0.17	20	0.40	330
S 09524	203	238	5	2.14	< 0.2	15	220	< 0.5	< 2	0.20	< 0.5	8	139	31	3.24	< 10	2	0.18	20	0.41	176
S 09525	217	238	5	2.20	< 0.2	15	280	< 0.5	< 2	0.10	< 0.5	8	316	25	3.70	< 10	< 1	0.20	30	0.32	194
S 09526	203	238	< 5	1.68	< 0.2	20	180	< 0.5	< 2	0.08	< 0.5	8	190	19	3.57	< 10	< 1	0.14	20	0.29	162
S 09527	203	238	< 5	1.63	< 0.2	25	140	< 0.5	< 2	0.11	< 0.5	6	110	21	3.05	< 10	< 1	0.09	20	0.27	138
S 09528	203	238	5	1.91	< 0.2	20	330	0.5	< 2	0.22	< 0.5	7	155	21	3.03	< 10	< 1	0.24	30	0.42	195
S 09529	203	238	< 5	1.18	< 0.2	15	260	< 0.5	< 2	0.13	< 0.5	11	124	38	4.16	< 10	< 1	0.19	20	0.24	370
S 09530	203	238	5	1.45	0.6	20	370	< 0.5	< 2	0.13	< 0.5	11	99	40	3.93	< 10	< 1	0.20	20	0.29	274

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Project : MARG
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Date : 15-JUL-88
Invoice # : I-8818447
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8818447

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S 09521	203	238	6	0.03	16	700	16	< 5	1	23	0.03	< 10	< 10	75	< 5	59
S 09522	203	238	5	0.06	25	900	8	< 5	3	35	0.05	< 10	< 10	89	< 5	102
S 09523	203	238	3	0.02	19	780	6	< 5	3	18	0.05	< 10	< 10	80	< 5	66
S 09524	203	238	3	0.03	27	810	18	< 5	3	27	0.05	< 10	< 10	64	< 5	92
S 09525	217	238	4	0.04	29	620	20	5	3	26	0.03	< 10	< 10	58	5	102
S 09526	203	238	2	0.03	22	470	12	< 5	2	18	0.03	< 10	< 10	47	< 5	80
S 09527	203	238	3	0.02	24	560	24	< 5	2	17	0.04	< 10	< 10	47	< 5	86
S 09528	203	238	4	0.05	25	720	20	< 5	2	33	0.05	< 10	< 10	70	< 5	90
S 09529	203	238	3	0.03	35	1090	32	< 5	2	19	0.01	< 10	< 10	42	< 5	111
S 09530	203	238	9	0.03	37	1180	28	< 5	3	37	0.02	< 10	< 10	64	< 5	187

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Date   : 1-SEP-88
Invoice # : I-8821822
P.O. #   : NONE

CERTIFICATE OF ANALYSIS A8821822

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S-08401	203	238	< 5	1.75	0.6	40	240	< 0.5	< 2	0.29	0.5	13	64	107	3.38	10	1	0.12	20	0.27	1455
S-08402	203	238	< 5	1.13	0.4	50	100	< 0.5	< 2	0.05	< 0.5	4	64	21	2.70	10	< 1	0.09	10	0.14	232
S-08403	203	238	< 5	1.54	0.6	30	160	< 0.5	< 2	0.08	< 0.5	3	83	15	2.22	10	< 1	0.12	10	0.21	156
S-08404	203	238	< 5	1.09	0.6	20	90	< 0.5	< 2	0.09	< 0.5	3	98	19	2.59	10	< 1	0.09	10	0.19	148
S-08405	203	238	< 5	1.84	0.4	25	110	< 0.5	< 2	0.30	< 0.5	9	123	119	3.30	10	< 1	0.10	20	0.54	244
S-08406	203	238	< 5	1.46	0.6	30	260	< 0.5	< 2	0.08	< 0.5	4	62	136	3.94	10	< 1	0.09	20	0.31	169
S-08407	203	238	< 5	1.84	0.6	25	200	< 0.5	2	0.19	< 0.5	8	108	54	3.11	10	< 1	0.13	10	0.57	284
S-08408	203	238	< 5	1.29	0.4	30	110	< 0.5	< 2	0.13	< 0.5	5	79	28	2.54	< 10	< 1	0.07	20	0.35	153
S-08409	203	238	< 5	1.47	0.2	25	160	< 0.5	< 2	0.21	< 0.5	6	182	33	2.96	< 10	< 1	0.11	20	0.40	168
S-08410	203	238	< 5	1.10	0.6	10	90	< 0.5	< 2	0.06	< 0.5	3	89	9	2.31	10	< 1	0.07	10	0.21	130
S-08411	203	238	< 5	1.31	0.8	20	230	< 0.5	2	0.16	< 0.5	4	188	28	2.41	10	< 1	0.13	20	0.32	112
S-08412	203	238	< 5	1.40	0.4	15	160	< 0.5	2	0.14	< 0.5	5	96	26	2.45	10	< 1	0.08	10	0.40	157
S-08413	203	238	< 5	1.48	0.6	25	370	< 0.5	2	0.50	< 0.5	9	157	29	2.67	10	< 1	0.16	30	0.43	455
S-08416	203	238	< 5	2.12	1.2	30	420	< 0.5	< 2	0.19	< 0.5	14	75	152	3.51	10	< 1	0.11	20	0.48	825
S-08417	203	238	< 5	2.18	0.8	30	540	0.5	2	0.19	< 0.5	10	114	61	3.43	10	1	0.19	20	0.50	439
S-08418	203	238	< 5	1.60	0.6	25	350	< 0.5	< 2	0.15	< 0.5	6	82	23	2.87	10	< 1	0.12	10	0.35	230
S-08419	203	238	< 5	1.48	0.6	30	190	0.5	2	0.16	< 0.5	6	165	27	3.28	10	< 1	0.11	20	0.37	175
S-08420	203	238	< 5	1.07	0.6	25	110	< 0.5	< 2	0.11	< 0.5	5	83	25	2.89	< 10	< 1	0.05	20	0.32	152
S-08421	203	238	< 5	1.89	0.2	40	190	0.5	< 2	0.17	< 0.5	10	195	23	4.15	< 10	< 1	0.12	30	0.51	376
S-08422	203	238	< 5	1.37	0.4	20	80	1.0	2	0.08	< 0.5	5	70	11	3.86	10	1	0.06	10	0.35	228
S-08423	203	238	< 5	1.99	< 0.2	35	210	< 0.5	< 2	0.16	< 0.5	9	186	22	4.24	< 10	< 1	0.19	20	0.44	513
S-08424	203	238	< 5	2.27	< 0.2	35	260	< 0.5	< 2	0.19	< 0.5	9	76	44	3.89	< 10	2	0.18	20	0.65	421
S-08425	203	238	< 5	2.38	< 0.2	30	310	< 0.5	< 2	0.23	< 0.5	9	119	44	3.60	< 10	< 1	0.24	20	0.64	348
S-08426	203	238	< 5	2.05	< 0.2	25	240	< 0.5	< 2	0.16	< 0.5	11	57	40	3.60	< 10	1	0.14	20	0.61	472

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Chemex Labs Ltd.

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Project : MARG
Comments :

Page : 1-B
Tot. Pages: 1
Date : 1-SEP-88
Invoice # : I-8821822
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8821822

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S-08401	203	238	6	0.02	31	1650	30	5	1	24	0.01	< 10	< 10	45	10	546
S-08402	203	238	2	0.01	17	570	14	< 5	1	10	0.04	< 10	< 10	64	5	74
S-08403	203	238	2	0.02	12	620	14	< 5	1	14	0.03	< 10	< 10	64	5	51
S-08404	203	238	2	0.01	13	570	8	< 5	1	10	0.05	10	< 10	66	5	60
S-08405	203	238	1	0.02	25	520	14	< 5	3	16	0.15	< 10	< 10	72	5	89
S-08406	203	238	5	0.01	18	990	22	< 5	2	12	0.07	< 10	< 10	71	10	82
S-08407	203	238	2	0.02	26	600	10	< 5	3	15	0.08	< 10	< 10	61	5	82
S-08408	203	238	1	0.02	21	590	14	5	2	11	0.05	< 10	< 10	38	< 5	70
S-08409	203	238	1	0.03	28	780	20	5	3	18	0.06	< 10	< 10	41	5	93
S-08410	203	238	1	0.01	11	420	12	< 5	1	8	0.03	< 10	< 10	46	5	48
S-08411	203	238	1	0.03	18	580	24	< 5	2	15	0.04	< 10	< 10	35	< 5	88
S-08412	203	238	1	0.02	22	540	16	< 5	2	13	0.05	< 10	< 10	43	5	77
S-08413	203	238	< 1	0.03	27	990	16	< 5	4	30	0.06	< 10	< 10	43	5	117
S-08416	203	238	2	0.02	41	1230	20	< 5	5	20	0.02	< 10	< 10	43	5	152
S-08417	203	238	2	0.03	36	870	14	< 5	4	24	0.03	< 10	< 10	53	5	131
S-08418	203	238	2	0.02	25	840	10	< 5	1	16	0.02	< 10	< 10	48	< 5	95
S-08419	203	238	1	0.03	25	730	18	< 5	3	16	0.05	10	< 10	42	< 5	93
S-08420	203	238	2	0.01	22	680	14	5	2	9	0.03	< 10	< 10	33	5	88
S-08421	203	238	2	0.03	31	870	20	< 5	3	18	0.06	< 10	< 10	48	5	112
S-08422	203	238	2	0.01	19	530	16	< 5	2	9	0.06	< 10	< 10	54	5	64
S-08423	203	238	1	0.04	24	790	8	< 5	3	21	0.07	< 10	< 10	78	< 5	87
S-08424	203	238	2	0.02	29	780	18	< 5	4	22	0.06	< 10	< 10	67	< 5	118
S-08425	203	238	2	0.04	35	750	12	< 5	5	26	0.07	< 10	< 10	65	< 5	110
S-08426	203	238	2	0.02	31	700	14	< 5	4	19	0.05	< 10	< 10	60	< 5	116

CERTIFICATION : ____________________

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Tot. F 1
Date :19-SEP-88
Invoice # :I-8823192
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8823192

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S-08433	203	238	< 5	1.27	< 0.2	15	100	< 0.5	2	0.08	< 0.5	8	77	21	3.30	< 10	< 1	0.09	20	0.24	459
S-08434	203	238	< 5	1.20	0.2	15	80	< 0.5	< 2	0.05	< 0.5	5	46	13	3.15	10	< 1	0.05	20	0.14	172
S-08435	203	238	< 5	1.68	0.2	20	110	< 0.5	2	0.07	< 0.5	7	102	21	4.32	< 10	< 1	0.08	20	0.24	339
S-08436	203	238	< 5	0.88	0.2	20	50	< 0.5	4	0.02	< 0.5	6	46	45	3.25	< 10	< 1	0.03	10	0.05	139
S-08437	203	238	< 5	1.57	0.6	20	100	< 0.5	2	0.06	< 0.5	6	63	17	3.14	< 10	< 1	0.05	10	0.18	233
S-08438	203	238	< 5	1.39	< 0.2	10	70	< 0.5	2	0.06	< 0.5	7	41	19	3.33	< 10	< 1	0.06	10	0.32	370
S-08439	203	238	< 5	0.94	0.4	5	160	< 0.5	2	0.03	< 0.5	4	138	46	2.63	< 10	< 1	0.10	20	0.07	96
S-08440	203	238	< 5	1.78	< 0.2	15	100	< 0.5	2	0.08	< 0.5	8	41	18	3.51	< 10	< 1	0.06	20	0.39	258
S-08441	203	238	< 5	1.03	< 0.2	20	100	< 0.5	< 2	0.05	< 0.5	7	95	25	3.26	< 10	< 1	0.08	20	0.16	200
S-08442	203	238	5	1.23	< 0.2	20	60	< 0.5	2	0.05	< 0.5	6	45	19	2.91	< 10	< 1	0.05	20	0.18	216
S-08443	203	238	< 5	1.34	0.4	15	120	< 0.5	< 2	0.19	< 0.5	12	92	38	3.31	< 10	< 1	0.09	30	0.31	459
S-08474	203	238	< 5	1.80	< 0.2	25	140	< 0.5	2	0.13	< 0.5	11	42	25	3.09	< 10	< 1	0.08	20	0.46	437
S-08475	203	238	< 5	2.07	< 0.2	10	120	< 0.5	< 2	0.06	0.5	8	86	28	3.57	< 10	< 1	0.09	10	0.23	322
S-08476	203	238	< 5	1.42	< 0.2	20	90	< 0.5	< 2	0.06	< 0.5	12	57	24	3.50	< 10	< 1	0.09	10	0.25	624
S-08477	203	238	< 5	1.29	< 0.2	10	160	< 0.5	< 2	0.05	0.5	11	162	21	4.08	< 10	< 1	0.13	20	0.14	889
S-08478	203	238	< 5	1.65	0.6	15	90	< 0.5	< 2	0.15	< 0.5	14	41	22	3.27	< 10	< 1	0.05	10	0.34	565
S-08479	203	238	10	1.10	0.4	20	80	< 0.5	< 2	0.03	< 0.5	15	112	26	3.71	< 10	< 1	0.08	30	0.06	127
S-08480	203	238	5	1.32	< 0.2	40	120	< 0.5	< 2	0.06	< 0.5	18	65	76	5.01	< 10	< 1	0.07	10	0.16	1335
S-08481	203	238	5	2.05	0.6	20	150	< 0.5	2	0.11	< 0.5	12	86	44	3.64	< 10	< 1	0.07	20	0.25	314
S-08482	203	238	< 5	1.60	< 0.2	5	140	< 0.5	2	0.13	< 0.5	9	75	23	3.08	< 10	< 1	0.10	20	0.38	415
S-08483	203	238	< 5	1.62	0.2	15	110	0.5	2	0.11	< 0.5	11	66	38	3.08	< 10	< 1	0.07	20	0.29	322
S-08484	203	238	< 5	1.47	< 0.2	15	90	< 0.5	2	0.07	< 0.5	8	41	16	3.26	< 10	< 1	0.06	10	0.26	378

CERTIFICATION : ____________________

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1
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RCHER CATHRO & ASSOC. (1981) LTD.

BOX 4127
WHITEHORSE, Y.T.
Y1A 3S9
Project : MARG
Comments:

Date : 19-SEP-88
Invoice # : I-8823192
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8823192

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S-08433	203	238	3	0.01	18	560	12	< 5	1	13	0.03	< 10	< 10	65	< 5	67
S-08434	203	238	2	0.01	15	340	16	< 5	2	9	0.08	< 10	< 10	82	< 5	51
S-08435	203	238	2	0.03	26	870	12	< 5	2	22	0.03	10	< 10	55	< 5	81
S-08436	203	238	3	0.01	27	940	18	< 5	2	20	< 0.01	< 10	< 10	40	< 5	79
S-08437	203	238	2	0.01	21	820	14	< 5	2	20	0.03	< 10	< 10	52	< 5	67
S-08438	203	238	2	0.01	20	950	10	< 5	1	9	0.03	< 10	< 10	55	< 5	75
S-08439	203	238	16	0.02	25	720	6	< 5	1	16	0.01	10	< 10	31	< 5	88
S-08440	203	238	3	0.01	23	950	14	< 5	1	12	0.03	< 10	< 10	60	< 5	85
S-08441	203	238	3	0.01	25	740	8	< 5	1	10	0.02	< 10	< 10	54	< 5	77
S-08442	203	238	2	0.01	21	720	8	< 5	1	8	0.03	< 10	< 10	58	< 5	67
S-08443	203	238	2	0.01	38	1130	8	< 5	3	16	0.03	10	< 10	39	< 5	109
S-08474	203	238	2	0.01	24	790	14	5	2	13	0.04	10	< 10	56	< 5	87
S-08475	203	238	2	0.01	17	1070	8	< 5	1	12	0.03	10	< 10	66	< 5	71
S-08476	203	238	1	0.01	21	1220	14	5	1	10	0.03	10	< 10	57	< 5	81
S-08477	203	238	1	0.02	23	1020	18	< 5	1	13	0.02	10	< 10	61	< 5	87
S-08478	203	238	2	0.01	28	1120	12	< 5	2	11	0.03	10	< 10	44	< 5	85
S-08479	203	238	3	0.02	53	760	14	5	2	14	< 0.01	20	< 10	28	< 5	141
S-08480	203	238	5	0.01	52	1120	24	5	2	15	0.02	10	< 10	51	< 5	131
S-08481	203	238	2	0.02	42	950	10	5	3	20	0.02	10	< 10	46	< 5	101
S-08482	203	238	1	0.02	24	930	12	< 5	2	16	0.05	10	< 10	57	< 5	78
S-08483	203	238	< 1	0.01	26	630	10	< 5	3	14	0.04	< 10	< 10	43	< 5	78
S-08484	203	238	2	0.01	17	570	14	5	1	10	0.03	< 10	< 10	64	< 5	69

CERTIFICATION : ____________________

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To: CHER CATHRO & ASSOC. (1981) LTD.
BOX 4127
WHITEHORSE, Y.T.
Y1A 3S9
Project : MARG
Comments:

Page No -A
Tot. Pag
Date :05-OCT-88
Invoice # : I-8824686
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8824686

SAMPLE DESCRIPTION	PREP CODE	Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
08444	203 238	< 5	1.44	0.4	20	150	< 0.5	2	0.32	< 0.5	11	79	17	2.78	< 10	< 1	0.13	20	0.43	385
08445	203 238	< 5	1.62	0.6	25	140	< 0.5	2	0.26	< 0.5	10	66	20	3.59	< 10	< 1	0.13	30	0.42	345
08446	203 238	< 5	1.63	0.2	25	170	0.5	6	0.31	< 0.5	13	78	36	3.38	< 10	< 1	0.15	40	0.49	359
08447	203 238	< 5	1.07	0.4	20	90	< 0.5	< 2	0.05	< 0.5	8	75	21	3.31	< 10	1	0.12	30	0.20	272
08448	203 238	< 5	1.53	0.4	5	130	0.5	< 2	0.15	< 0.5	16	82	28	3.52	< 10	< 1	0.15	30	0.43	704
08449	203 238	< 5	1.53	0.2	25	160	0.5	< 2	0.14	< 0.5	14	79	25	3.51	< 10	1	0.14	30	0.39	752
08450	203 238	< 5	1.13	0.4	15	140	0.5	< 2	0.23	< 0.5	13	66	21	3.08	< 10	< 1	0.12	40	0.33	485
08451	203 238	5	1.71	0.6	35	160	0.5	2	0.22	< 0.5	12	83	29	3.21	< 10	< 1	0.14	40	0.42	363
08452	203 238	< 5	1.25	0.4	25	130	< 0.5	2	0.25	< 0.5	10	75	16	2.90	< 10	< 1	0.13	40	0.37	302
08453	203 238	< 5	1.58	< 0.2	10	190	0.5	< 2	0.42	< 0.5	14	126	18	3.44	< 10	< 1	0.20	30	0.45	769
08454	203 238	< 5	1.60	< 0.2	15	330	0.5	< 2	1.19	< 0.5	11	110	21	2.70	< 10	1	0.15	30	0.44	507
08455	203 238	< 5	1.93	0.2	30	330	0.5	< 2	0.70	< 0.5	12	107	19	3.46	< 10	< 1	0.13	30	0.54	437
08456	203 238	< 5	2.36	0.2	20	680	0.5	6	0.31	< 0.5	8	74	13	2.86	10	< 1	0.14	20	0.47	574
08457	203 238	< 5	2.53	0.6	20	760	0.5	< 2	0.53	< 0.5	12	61	30	3.34	10	< 1	0.13	30	0.55	505
08458	203 238	< 5	1.90	0.2	10	240	0.5	6	0.87	< 0.5	15	59	29	3.61	10	< 1	0.16	30	0.53	728
08459	203 238	< 5	1.65	0.2	25	890	0.5	< 2	0.46	0.5	25	48	28	3.74	10	< 1	0.20	20	0.28	2360
08460	203 238	< 5	2.00	< 0.2	15	260	< 0.5	2	0.23	< 0.5	12	57	9	3.29	10	1	0.13	20	0.42	1070
08461	203 238	< 5	1.42	0.2	25	170	< 0.5	< 2	0.11	< 0.5	9	74	29	3.32	< 10	1	0.13	20	0.31	347
08462	203 238	< 5	1.67	0.2	25	160	< 0.5	< 2	0.10	< 0.5	6	62	10	3.02	10	< 1	0.12	20	0.30	300
08463	203 238	< 5	1.52	0.6	15	210	< 0.5	4	0.14	< 0.5	9	64	15	2.99	< 10	< 1	0.15	20	0.25	658
08464	203 238	< 5	1.08	0.2	30	140	0.5	< 2	0.09	< 0.5	13	76	40	4.06	< 10	< 1	0.10	20	0.20	618
08465	203 238	< 5	2.00	0.4	25	350	0.5	2	0.09	< 0.5	16	105	36	4.18	< 10	< 1	0.21	20	0.30	839
08466	203 238	< 5	1.66	0.2	25	230	0.5	< 2	0.05	< 0.5	10	133	25	3.72	< 10	< 1	0.13	20	0.17	352
08467	203 238	< 5	1.02	0.6	10	140	0.5	< 2	0.08	< 0.5	10	65	23	3.21	< 10	< 1	0.12	20	0.17	335
08468	203 238	< 5	1.01	0.2	15	150	0.5	< 2	0.09	< 0.5	10	74	20	3.25	< 10	< 1	0.09	20	0.22	636
08469	203 238	< 5	1.61	0.2	10	100	0.5	< 2	0.09	< 0.5	12	62	31	3.52	< 10	< 1	0.07	20	0.21	291
08470	203 238	< 5	1.69	< 0.2	20	150	0.5	< 2	0.08	< 0.5	12	87	30	3.24	< 10	< 1	0.08	20	0.29	649
08471	203 238	< 5	1.69	< 0.2	30	170	0.5	< 2	0.09	< 0.5	13	83	24	3.74	< 10	< 1	0.11	20	0.33	479
08472	203 238	5	0.89	0.6	10	140	0.5	< 2	0.47	1.0	22	93	41	4.48	< 10	< 1	0.17	40	0.30	689
08473	203 238	< 5	1.29	0.6	40	230	0.5	< 2	0.36	1.0	24	93	68	5.32	10	< 1	0.18	50	0.35	778
08501	203 238	< 5	2.30	0.4	15	180	0.5	< 2	0.15	< 0.5	14	87	32	3.96	10	< 1	0.13	30	0.50	488
08502	203 238	< 5	1.17	0.4	5	160	< 0.5	< 2	0.08	< 0.5	6	73	19	2.64	10	< 1	0.08	20	0.14	134
08503	203 238	< 5	2.00	0.4	25	170	0.5	4	0.14	< 0.5	8	78	13	4.31	10	< 1	0.13	20	0.35	369
08504	203 238	< 5	1.81	0.2	10	140	0.5	< 2	0.08	< 0.5	12	74	24	4.26	< 10	1	0.11	20	0.33	630
08505	203 238	< 5	1.36	0.2	< 5	140	< 0.5	< 2	0.06	< 0.5	6	59	20	3.38	< 10	1	0.08	10	0.20	409
08506	203 238	< 5	1.12	0.2	5	110	< 0.5	4	0.08	< 0.5	10	56	18	3.47	< 10	< 1	0.08	20	0.16	506
08507	203 238	< 5	1.28	0.4	15	120	0.5	< 2	0.07	< 0.5	12	78	38	3.46	< 10	< 1	0.08	20	0.23	918
08508	203 238	< 5	1.04	0.4	10	100	< 0.5	< 2	0.04	< 0.5	8	76	27	3.08	< 10	1	0.07	20	0.11	493
08509	203 238	< 5	1.62	0.2	20	200	0.5	< 2	0.20	< 0.5	12	76	42	3.80	< 10	1	0.09	20	0.40	449
08510	203 238	< 5	1.41	0.4	15	120	0.5	< 2	0.16	< 0.5	13	76	58	3.75	< 10	< 1	0.07	20	0.26	338

CERTIFICATION : ____________________

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WHITEHORSE, Y.T.
Y1A 3S9

Project : MARG
Comments:

Date :05-OCT-88
Invoice # :I-8824686
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8824686

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
08444	203	238	1	0.02	22	1260	18	< 5	< 1	19	0.02	< 10	< 10	41	< 5	79
08445	203	238	< 1	0.01	29	650	10	< 5	2	17	0.02	< 10	< 10	40	< 5	88
08446	203	238	1	0.02	43	730	10	< 5	4	24	0.04	< 10	< 10	47	< 5	129
08447	203	238	< 1	0.01	21	850	10	< 5	1	11	0.01	< 10	< 10	34	< 5	81
08448	203	238	< 1	0.01	32	1010	10	< 5	2	15	0.03	< 10	< 10	39	< 5	106
08449	203	238	< 1	0.01	30	1020	10	< 5	2	15	0.02	< 10	< 10	41	< 5	97
08450	203	238	< 1	0.01	30	730	< 2	< 5	2	16	0.01	< 10	< 10	25	< 5	93
08451	203	238	< 1	0.01	28	1090	96	< 5	2	20	0.04	< 10	< 10	51	< 5	101
08452	203	238	< 1	0.01	21	830	10	< 5	1	17	0.02	< 10	< 10	32	< 5	80
08453	203	238	< 1	0.02	27	1090	8	< 5	2	27	0.02	< 10	< 10	36	< 5	95
08454	203	238	< 1	0.02	26	1510	20	< 5	2	60	0.03	< 10	< 10	38	< 5	70
08455	203	238	< 1	0.02	24	1420	36	< 5	4	41	0.04	< 10	< 10	49	< 5	114
08456	203	238	< 1	0.02	18	2310	< 2	< 5	1	26	0.02	< 10	< 10	69	< 5	74
08457	203	238	1	0.02	42	2130	4	5	3	37	0.03	< 10	< 10	56	< 5	182
08458	203	238	< 1	0.02	37	1350	12	< 5	4	48	0.03	< 10	< 10	42	< 5	151
08459	203	238	1	0.03	31	1740	26	< 5	< 1	46	0.02	< 10	< 10	63	< 5	109
08460	203	238	1	0.01	16	880	6	< 5	2	21	0.06	< 10	< 10	87	< 5	66
08461	203	238	< 1	0.02	27	1000	66	< 5	1	17	0.02	< 10	< 10	53	5	100
08462	203	238	< 1	0.01	17	850	4	< 5	1	16	0.04	< 10	< 10	77	< 5	66
08463	203	238	< 1	0.03	22	1160	4	< 5	< 1	18	0.02	< 10	< 10	51	< 5	70
08464	203	238	1	0.02	43	1080	2	< 5	2	15	0.02	< 10	< 10	33	< 5	116
08465	203	238	< 1	0.05	42	1550	10	< 5	2	30	0.02	< 10	< 10	58	< 5	111
08466	203	238	1	0.05	29	1210	16	< 5	2	20	0.01	< 10	< 10	55	< 5	93
08467	203	238	2	0.02	30	1610	12	< 5	< 1	11	< 0.01	< 10	< 10	29	< 5	84
08468	203	238	2	0.01	19	1340	6	< 5	< 1	10	0.01	< 10	< 10	34	< 5	75
08469	203	238	< 1	0.02	41	1050	24	< 5	2	15	0.01	< 10	< 10	43	< 5	111
08470	203	238	< 1	0.01	32	670	14	< 5	2	13	0.03	< 10	< 10	55	< 5	92
08471	203	238	2	0.02	28	880	14	< 5	1	19	0.04	< 10	< 10	66	< 5	94
08472	203	238	9	0.02	53	2440	22	< 5	3	18	< 0.01	< 10	< 10	12	< 5	156
08473	203	238	13	0.02	59	2110	36	< 5	3	21	0.02	< 10	< 10	33	< 5	196
08501	203	238	< 1	0.02	40	820	16	< 5	3	21	0.05	< 10	< 10	65	< 5	113
08502	203	238	< 1	0.02	17	620	12	< 5	< 1	14	0.04	< 10	< 10	63	< 5	53
08503	203	238	< 1	0.01	22	780	16	< 5	4	18	0.09	< 10	< 10	101	< 5	71
08504	203	238	< 1	0.02	39	1300	16	< 5	< 1	20	0.02	< 10	< 10	53	< 5	107
08505	203	238	< 1	0.01	19	600	26	< 5	1	9	0.04	< 10	< 10	66	< 5	70
08506	203	238	< 1	0.01	24	960	18	< 5	< 1	16	0.02	< 10	< 10	53	< 5	89
08507	203	238	< 1	0.01	32	780	22	< 5	1	14	0.02	< 10	< 10	40	< 5	105
08508	203	238	< 1	0.01	24	970	24	< 5	< 1	19	0.01	< 10	< 10	46	< 5	79
08509	203	238	< 1	0.02	40	860	18	< 5	4	19	0.05	< 10	< 10	55	< 5	102
08510	203	238	< 1	0.01	52	960	< 2	< 5	3	18	0.04	< 10	< 10	40	< 5	118

CERTIFICATION : ____________________

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To `CHER CATHRO & ASSOC. (1981) LTD.

ᴗOX 4127
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Y1A 3S9

Project : MARG
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Date :05-OCT-88
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CERTIFICATE OF ANALYSIS A8824686

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
08511	203	238	< 5	1.77	0.2	10	110	< 0.5	< 2	0.09	< 0.5	9	77	22	3.62	< 10	< 1	0.08	20	0.33	454
08512	203	238	5	1.50	0.2	< 5	200	< 0.5	< 2	0.09	< 0.5	10	72	26	2.97	< 10	< 1	0.10	20	0.34	259
08513	203	238	< 5	1.37	0.2	25	150	0.5	< 2	0.13	< 0.5	11	100	29	3.27	< 10	< 1	0.10	30	0.28	299
08514	203	238	< 5	1.10	0.2	10	140	< 0.5	< 2	0.06	< 0.5	7	88	17	2.89	< 10	< 1	0.11	20	0.14	219
08515	203	238	< 5	1.57	0.2	15	130	< 0.5	< 2	0.11	< 0.5	8	106	18	4.40	< 10	< 1	0.13	20	0.31	340
08516	203	238	< 5	1.35	0.2	5	110	< 0.5	< 2	0.07	< 0.5	6	78	14	2.95	< 10	< 1	0.08	20	0.19	163
08517	203	238	< 5	0.80	0.4	20	180	< 0.5	< 2	0.04	< 0.5	6	129	28	3.41	< 10	< 1	0.11	20	0.10	134
08518	203	238	< 5	1.45	0.6	45	210	0.5	< 2	0.12	< 0.5	11	66	43	3.96	< 10	< 1	0.14	20	0.31	356
08519	203	238	< 5	1.98	0.8	15	240	< 0.5	< 2	0.25	0.5	25	100	92	5.84	< 10	< 1	0.14	20	0.79	627
08520	203	238	< 5	2.04	0.4	15	230	< 0.5	< 2	0.16	1.0	18	84	52	4.79	< 10	< 1	0.15	20	0.46	574
08521	203	238	< 5	0.72	0.2	15	200	< 0.5	< 2	0.33	0.5	11	74	26	3.79	< 10	< 1	0.14	50	0.09	535
08522	203	238	5	0.86	0.6	20	160	< 0.5	< 2	0.13	< 0.5	11	104	35	3.50	< 10	< 1	0.13	30	0.22	467
08523	203	238	< 5	1.26	0.2	10	340	< 0.5	< 2	0.45	1.5	8	90	79	2.40	< 10	< 1	0.07	20	0.40	265
08524	203	238	< 5	1.64	0.4	15	420	< 0.5	< 2	0.44	1.5	11	100	79	3.08	< 10	< 1	0.09	20	0.49	313
08525	203	238	< 5	1.86	0.4	25	620	0.5	< 2	0.57	1.0	10	107	43	2.79	< 10	< 1	0.11	20	0.51	272
08526	203	238	< 5	1.91	0.4	25	630	< 0.5	< 2	0.59	1.5	11	65	64	3.28	< 10	2	0.10	20	0.54	464
08527	203	238	< 5	1.80	0.2	10	480	< 0.5	< 2	0.41	1.0	10	68	54	3.03	< 10	1	0.09	20	0.50	303
08528	203	238	< 5	1.46	0.2	15	250	< 0.5	< 2	0.30	0.5	11	85	28	2.83	< 10	< 1	0.07	30	0.38	330
08529	203	238	< 5	1.55	0.2	5	140	< 0.5	< 2	0.17	0.5	9	91	28	2.62	< 10	< 1	0.07	20	0.39	192
08530	203	238	< 5	3.08	0.2	50	400	< 0.5	< 2	0.23	< 0.5	18	79	157	5.30	< 10	< 1	0.15	20	0.72	481
08531	203	238	< 5	2.25	0.2	10	150	< 0.5	< 2	0.10	< 0.5	9	62	30	3.76	< 10	< 1	0.10	20	0.46	287
08532	203	238	< 5	1.69	0.2	15	140	< 0.5	< 2	0.10	< 0.5	6	67	23	2.32	< 10	< 1	0.11	20	0.29	168
08533	203	238	< 5	1.01	0.2	5	110	< 0.5	< 2	0.05	< 0.5	2	51	3	1.57	< 10	< 1	0.09	10	0.10	91
08534	203	238	< 5	1.52	0.2	10	100	< 0.5	< 2	0.07	< 0.5	7	57	16	3.80	< 10	< 1	0.08	10	0.32	204
08535	203	238	< 5	2.72	3.2	20	940	0.5	2	1.54	3.5	19	74	123	4.56	< 10	< 1	0.19	30	0.46	1815
08536	203	238	< 5	1.86	0.2	10	280	< 0.5	< 2	0.19	< 0.5	9	50	21	3.23	< 10	< 1	0.12	20	0.51	354
08537	203	238	< 5	1.57	0.4	20	270	< 0.5	< 2	0.31	< 0.5	7	70	42	2.37	< 10	< 1	0.08	20	0.44	172
08538	203	238	< 5	2.10	0.2	20	440	< 0.5	2	0.38	0.5	24	60	69	3.54	< 10	1	0.11	20	0.51	958
08539	203	238	< 5	2.17	0.2	10	450	< 0.5	< 2	0.40	0.5	11	91	110	3.43	< 10	< 1	0.12	20	0.56	413
08540	203	238	< 5	1.12	0.2	5	100	< 0.5	< 2	0.13	0.5	9	73	26	2.88	< 10	1	0.05	20	0.36	347
08541	203	238	< 5	1.82	0.2	20	250	< 0.5	< 2	0.26	< 0.5	9	56	38	2.79	< 10	< 1	0.09	20	0.49	280
08542	203	238	< 5	1.59	0.2	15	200	< 0.5	< 2	0.13	0.5	7	63	55	2.91	< 10	1	0.11	20	0.34	206
08543	203	238	< 5	1.48	0.2	15	100	< 0.5	< 2	0.07	< 0.5	7	52	14	3.71	< 10	1	0.06	10	0.36	245
08544	203	238	< 5	0.88	0.2	10	110	< 0.5	< 2	0.06	< 0.5	< 1	43	7	0.84	< 10	1	0.12	20	0.07	39
08545	203	238	5	1.41	0.2	40	230	< 0.5	< 2	0.89	8.0	33	65	532	4.45	< 10	< 1	0.09	20	0.35	1185
08546	203	238	< 5	2.02	0.4	60	190	< 0.5	< 2	0.20	1.0	10	55	822	4.05	< 10	< 1	0.10	20	0.42	208
08572	203	238	< 5	0.63	1.0	70	1060	< 0.5	< 2	0.07	0.5	6	164	35	2.51	< 10	2	0.28	20	0.06	130
08573	203	238	10	1.12	0.2	25	120	< 0.5	< 2	0.04	< 0.5	8	116	42	3.27	< 10	< 1	0.07	20	0.11	214
08574	203	238	< 5	1.45	0.2	30	110	< 0.5	< 2	0.05	< 0.5	6	83	49	4.05	< 10	2	0.08	20	0.23	222
08575	203	238	< 5	0.99	0.2	45	100	< 0.5	< 2	0.03	< 0.5	5	62	78	3.14	< 10	2	0.05	20	0.16	91

CERTIFICATION : ______________________

Chemex Labs Ltd.

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212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1

PHONE (604) 984-0221

T RCHER CATHRO & ASSOC. (1981) LTD.

BOX 4127
WHITEHORSE, Y.T.
Y1A 3S9

Project : MARG
Comments:

Date :05-OCT-88
Invoice # :I-8824686
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8824686

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
08511	203	238	< 1	0.01	22	790	22	< 5	1	12	0.04	< 10	< 10	53	< 5	86
08512	203	238	< 1	0.02	26	700	14	< 5	2	16	0.03	< 10	< 10	41	< 5	84
08513	203	238	1	0.02	42	660	18	5	2	18	0.03	< 10	< 10	39	< 5	111
08514	203	238	< 1	0.02	19	520	6	< 5	1	13	0.05	< 10	< 10	72	< 5	65
08515	203	238	< 1	0.02	19	700	20	< 5	2	16	0.05	< 10	< 10	57	< 5	72
08516	203	238	1	0.01	15	770	14	< 5	1	11	0.04	< 10	< 10	78	< 5	61
08517	203	238	1	0.04	25	820	20	< 5	2	25	< 0.01	< 10	< 10	27	< 5	77
08518	203	238	10	0.01	30	1520	22	5	2	37	0.03	< 10	< 10	61	< 5	189
08519	203	238	< 1	0.03	67	920	18	< 5	10	22	< 0.01	< 10	< 10	71	< 5	173
08520	203	238	3	0.02	46	1540	20	< 5	3	24	0.03	< 10	< 10	53	< 5	227
08521	203	238	6	0.02	30	2200	14	5	1	19	0.01	< 10	< 10	19	< 5	107
08522	203	238	5	0.01	30	1570	18	< 5	1	12	0.01	< 10	< 10	23	< 5	93
08523	203	238	< 1	0.01	30	920	16	< 5	3	28	0.03	< 10	< 10	35	< 5	502
08524	203	238	1	0.01	36	860	18	< 5	4	27	0.04	< 10	< 10	44	< 5	891
08525	203	238	< 1	0.02	35	1060	18	< 5	4	34	0.03	< 10	< 10	46	< 5	668
08526	203	238	< 1	0.01	45	1120	24	< 5	4	33	0.03	< 10	< 10	46	< 5	1025
08527	203	238	< 1	0.01	37	930	24	< 5	4	25	0.03	< 10	< 10	44	< 5	798
08528	203	238	< 1	0.01	26	730	30	< 5	3	18	0.06	< 10	< 10	43	< 5	343
08529	203	238	< 1	0.01	26	590	20	< 5	3	14	0.06	< 10	< 10	48	< 5	171
08530	203	238	< 1	0.03	56	1080	48	5	5	26	0.06	< 10	< 10	107	< 5	479
08531	203	238	1	0.01	23	630	18	< 5	3	14	0.06	< 10	< 10	69	< 5	144
08532	203	238	1	0.02	13	710	14	< 5	1	16	0.04	< 10	< 10	61	< 5	67
08533	203	238	1	0.01	4	270	12	< 5	1	10	0.07	< 10	< 10	59	< 5	31
08534	203	238	1	0.01	15	620	16	< 5	1	11	0.05	< 10	< 10	74	< 5	136
08535	203	238	3	0.02	63	2310	38	5	7	65	0.02	< 10	< 10	56	< 5	291
08536	203	238	1	0.01	23	930	12	< 5	3	18	0.04	< 10	< 10	70	< 5	123
08537	203	238	< 1	0.01	22	1030	14	< 5	3	23	0.04	< 10	< 10	47	< 5	131
08538	203	238	1	0.02	33	1050	30	< 5	4	27	0.04	< 10	< 10	63	< 5	223
08539	203	238	1	0.02	34	970	8	< 5	4	28	0.06	< 10	< 10	66	< 5	277
08540	203	238	1	0.01	18	440	16	< 5	2	11	0.08	< 10	< 10	50	< 5	117
08541	203	238	< 1	0.01	27	710	2	< 5	3	21	0.05	< 10	< 10	56	< 5	134
08542	203	238	< 1	0.01	15	540	< 2	< 5	2	15	0.07	< 10	< 10	72	< 5	101
08543	203	238	< 1	0.01	14	480	6	< 5	1	10	0.07	< 10	< 10	66	< 5	62
08544	203	238	< 1	0.01	2	330	2	< 5	< 1	10	0.03	< 10	< 10	41	< 5	25
08545	203	238	< 1	0.02	89	1080	28	< 5	4	43	0.04	< 10	< 10	43	< 5	3640
08546	203	238	1	0.01	32	970	1195	< 5	4	19	0.04	< 10	< 10	52	< 5	674
08572	203	238	34	0.01	20	1690	24	< 5	2	34	0.01	< 10	< 10	141	< 5	290
08573	203	238	1	0.02	17	580	16	< 5	2	12	0.04	< 10	< 10	76	< 5	82
08574	203	238	2	0.01	16	860	22	< 5	1	12	0.05	< 10	< 10	84	< 5	105
08575	203	238	1	0.01	17	600	22	< 5	1	13	0.02	< 10	< 10	39	< 5	164

CERTIFICATION : ____________________

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
212 BROOKSBANK AVE., NORTH VANCOUVER, BRITISH COLUMBIA, CANADA V7J-2C1
PHONE (604) 984-0221

T ?CHER CATHRO & ASSOC. (1981) LTD.

BOX 4127
WHITEHORSE, Y.T.
Y1A 3S9

Project : MARG
Comments:

Date :05-OCT-88
Invoice # :I-8824686
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8824686

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
08576	203	238	< 5	1.18	0.4	20	80	< 0.5	< 2	0.04	< 0.5	4	60	31	2.08	< 10	< 1	0.05	10	0.19	89
08577	203	238	< 5	1.17	0.6	10	90	< 0.5	< 2	0.06	< 0.5	6	69	16	3.00	< 10	< 1	0.07	10	0.25	148
08578	203	238	< 5	1.93	0.2	20	80	< 0.5	< 2	0.10	< 0.5	8	50	18	3.72	< 10	2	0.06	10	0.42	252
08579	203	238	< 5	2.09	0.4	10	110	< 0.5	< 2	0.09	< 0.5	7	51	17	3.55	< 10	2	0.07	10	0.40	189
08581	203	238	< 5	1.16	0.8	5	110	< 0.5	< 2	0.04	< 0.5	4	45	13	2.23	< 10	< 1	0.08	10	0.13	102
08582	203	238	< 5	1.86	0.6	10	120	< 0.5	< 2	0.07	< 0.5	9	49	12	5.15	< 10	< 1	0.09	10	0.35	292
08583	203	238	< 5	1.47	0.4	15	130	< 0.5	< 2	0.06	< 0.5	5	41	11	2.49	< 10	< 1	0.10	20	0.19	196
08584	203	238	< 5	1.11	0.4	10	130	< 0.5	< 2	0.04	< 0.5	6	69	15	2.47	< 10	< 1	0.10	20	0.10	243
08585	203	238	< 5	1.56	0.2	10	100	< 0.5	< 2	0.11	< 0.5	7	58	90	3.28	< 10	< 1	0.07	10	0.32	200
08586	203	238	< 5	1.17	0.4	10	100	< 0.5	< 2	0.08	< 0.5	7	69	38	3.10	< 10	< 1	0.08	10	0.26	256
08587	203	238	5	1.20	0.4	10	140	< 0.5	< 2	0.14	< 0.5	11	110	30	3.60	< 10	< 1	0.11	10	0.29	430
08588	203	238	5	1.69	0.4	10	130	< 0.5	< 2	0.08	< 0.5	9	71	29	3.44	< 10	< 1	0.07	10	0.36	194
08589	203	238	< 5	1.68	0.2	25	110	< 0.5	< 2	0.07	< 0.5	9	76	35	3.35	< 10	< 1	0.07	10	0.30	219
08590	203	238	< 5	1.83	0.6	20	110	< 0.5	< 2	0.07	< 0.5	7	61	29	3.13	< 10	< 1	0.09	10	0.33	152
08591	203	238	< 5	1.50	0.4	10	120	< 0.5	< 2	0.05	< 0.5	7	87	22	2.96	< 10	< 1	0.07	10	0.21	171
08592	203	238	< 5	1.56	0.4	10	100	< 0.5	< 2	0.06	< 0.5	8	61	17	3.01	< 10	< 1	0.06	10	0.30	217
08593	203	238	< 5	1.31	0.2	15	220	< 0.5	< 2	0.07	0.5	25	52	17	2.77	< 10	3	0.06	10	0.30	1275
08594	203	238	< 5	1.32	0.2	20	150	< 0.5	< 2	0.15	< 0.5	9	55	20	2.59	< 10	< 1	0.06	10	0.37	243
08595	203	238	< 5	1.50	0.4	20	290	< 0.5	< 2	0.17	< 0.5	8	65	18	2.83	< 10	< 1	0.06	10	0.44	176

CERTIFICATION : ____________________

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
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T RCHER CATHRO & ASSOC. (1981) LTD.

BOX 4127
WHITEHORSE, Y.T.
Y1A 3S9
Project : MARG
Comments:

Date :05-OCT-88
Invoice # : I-8824686
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8824686

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
08576	203	238	< 1	0.01	11	740	16	< 5	< 1	13	0.02	< 10	< 10	40	< 5	77
08577	203	238	< 1	0.01	12	840	20	< 5	1	12	0.03	< 10	< 10	66	< 5	53
08578	203	238	< 1	0.01	18	750	10	< 5	2	11	0.05	< 10	< 10	58	< 5	68
08579	203	238	< 1	0.01	16	610	18	< 5	2	12	0.05	< 10	< 10	61	< 5	62
08581	203	238	< 1	0.01	7	690	8	< 5	< 1	9	0.03	< 10	< 10	64	< 5	33
08582	203	238	< 1	0.01	12	720	12	< 5	2	12	0.07	< 10	< 10	89	< 5	65
08583	203	238	< 1	0.01	7	590	14	< 5	1	12	0.06	< 10	< 10	73	< 5	44
08584	203	238	2	0.01	16	550	12	< 5	1	10	0.05	< 10	< 10	85	< 5	63
08585	203	238	1	0.01	20	810	18	< 5	2	13	0.05	< 10	< 10	56	< 5	84
08586	203	238	1	0.01	17	920	10	< 5	1	11	0.04	< 10	< 10	54	< 5	74
08587	203	238	1	0.01	19	1100	18	< 5	1	14	0.03	< 10	< 10	46	< 5	83
08588	203	238	1	0.01	26	780	16	< 5	2	13	0.03	< 10	< 10	46	< 5	89
08589	203	238	< 1	0.01	24	890	14	< 5	2	14	0.02	< 10	< 10	48	< 5	80
08590	203	238	1	0.02	22	1300	18	< 5	2	15	0.02	< 10	< 10	45	< 5	73
08591	203	238	< 1	0.02	21	1220	12	< 5	1	13	0.01	< 10	< 10	43	< 5	69
08592	203	238	1	0.01	20	950	14	< 5	1	11	0.02	< 10	< 10	46	< 5	74
08593	203	238	< 1	0.01	17	1020	8	< 5	1	10	0.02	< 10	< 10	44	< 5	88
08594	203	238	< 1	0.01	21	920	8	< 5	1	12	0.02	< 10	< 10	37	< 5	94
08595	203	238	1	0.01	18	930	12	< 5	1	15	0.03	< 10	< 10	43	< 5	75

CERTIFICATION : ______________________

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Project : NDU(JANE)
Comments:

Page N 1-A
Tot. Pa[illegible] 1
Date :07-SEP-88
Invoice # :I-8822115
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8822115

SAMPLE DESCRIPTION	PREP CODE		Au oz/T	Ag oz/T	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %
S 8427	208	238	< 0.002	0.04	0.28	< 0.2	< 5	20	0.5	< 2	>15.00	1.5	5	23	170	2.87	20	< 1	0.04	< 10	7.67
S 8428	208	238	0.006	0.18	8.44	6.2	< 5	10	2.5	< 2	0.58	2.5	27	48	>10000	11.85	10	< 1	0.03	60	8.25
S 8429	208	238	< 0.002	0.01	0.11	< 0.2	< 5	20	0.5	4	12.95	3.0	4	27	163	2.46	20	< 1	0.05	< 10	6.57
S 8430	208	238	0.002	1.02	0.35	28.4	935	10	2.0	46	0.26	41.0	77	49	2440	>15.00	< 10	< 1	0.12	10	0.27
S 8431	208	238	0.008	1.12	0.11	31.6	>10000	20	2.0	24	1.91	>99.9	28	50	2590	>15.00	< 10	< 1	0.03	20	0.58

ALL ASSAY DETERMINATIONS ARE PERFORMED OR SUPERVISED BY B.C. CERTIFIED ASSAYERS

CERTIFICATION : ____________________

Chemex Labs Ltd.
Analytical Chemists • Geochemists • Registered Assayers
212 BROOKSBANK AVE., NORTH VANCOUVER,
BRITISH COLUMBIA, CANADA V7J-2C1
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RCHER CATHRO & ASSOC. (1981) LTD.

1016 - 510 W. HASTINGS ST.
VANCOUVER, BC
V6B 1L8
Project : NDU(JANE)
Comments:

Date :07-SEP-88
Invoice #: I-8822115
P.O. # :NONE

CERTIFICATE OF ANALYSIS A8822115

SAMPLE DESCRIPTION	PREP CODE		Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm	Cu %	Pb %	Zn %
S 8427	208	238	3160	1	< 0.01	4	450	628	5	1	213	< 0.01	< 10	< 10	5	5	648	0.01	0.08	0.07
S 8428	208	238	914	< 1	< 0.01	13	1610	274	< 5	15	22	0.01	< 10	< 10	66	< 5	1180	1.64	0.03	0.12
S 8429	208	238	4630	1	< 0.01	< 1	300	122	< 5	1	264	< 0.01	< 10	< 10	2	5	1860	0.01	0.01	0.23
S 8430	208	238	180	< 1	< 0.01	24	230	7790	10	2	11	< 0.01	< 10	< 10	23	< 5	>10000	0.26	0.94	2.26
S 8431	208	238	802	< 1	< 0.01	39	380	>10000	390	1	44	< 0.01	< 10	< 10	20	25	>10000	0.29	4.34	5.14

ALL ASSAY DETERMINATIONS ARE PERFORMED OR SUPERVISED BY B.C. CERTIFIED ASSAYERS

CERTIFICATION : ____________________

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

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BRITISH COLUMBIA, CANADA V7J-2C1

PHONE (604) 984-0221

T …RCHER CATHRO & ASSOC. (1981) LTD.

1016 - 510 W. HASTINGS ST.
VANCOUVER, BC
V6B 1L8

Project : NDU-MARG-JANE
Comments:

Page No : 1-A
Tot. Pages : 1
Date : 22-AUG-88
Invoice # : I-8820455
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8820455

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S 09702	203	238	< 5	0.28	0.2	45	1230	< 0.5	< 2	0.02	< 0.5	< 1	17	15	3.73	< 10	< 1	0.16	60	0.01	22
S 09704	203	238	< 5	0.42	0.4	25	160	< 0.5	< 2	0.11	< 0.5	6	25	35	5.89	< 10	< 1	0.05	40	0.10	285
S 09705	203	238	< 5	4.07	2.2	10	50	< 0.5	< 2	0.04	2.0	64	167	479	>15.00	< 10	< 1	0.01	10	2.24	931
S 09707	203	238	< 5	0.24	0.2	10	640	< 0.5	< 2	0.08	0.5	4	14	15	4.46	< 10	< 1	0.15	30	0.05	153
S 09710	203	238	< 5	0.70	0.4	70	540	< 0.5	< 2	0.16	< 0.5	7	24	12	10.30	< 10	1	0.20	30	0.19	342
S 09712	203	238	< 5	1.50	0.6	30	160	< 0.5	2	0.12	3.5	27	64	120	5.87	10	< 1	0.04	40	0.83	679
S 09714	203	238	< 5	0.97	1.6	45	160	< 0.5	< 2	0.09	1.0	10	42	97	5.79	< 10	< 1	0.06	30	0.37	255
S 09716	203	238	10	3.52	1.2	40	150	< 0.5	< 2	0.14	16.5	108	57	326	12.50	10	< 1	0.04	120	0.87	856
S 09718	203	238	< 5	0.41	0.4	40	290	< 0.5	< 2	0.01	< 0.5	5	25	22	8.55	< 10	< 1	0.06	20	0.09	173
S 09720	203	238	20	0.89	0.2	40	90	< 0.5	< 2	0.02	5.5	31	56	272	8.47	< 10	< 1	0.03	10	0.27	803
S 09721	203	238	10	3.23	0.2	10	460	< 0.5	< 2	0.77	0.5	57	28	518	8.83	< 10	< 1	0.03	20	1.76	1380
S 09725	203	238	< 5	0.67	2.6	< 5	70	< 0.5	< 2	1.22	31.5	90	31	277	9.41	< 10	< 1	0.01	10	0.66	1860
S 09728	203	238	< 5	1.31	4.6	100	220	< 0.5	< 2	0.11	< 0.5	1	55	53	>15.00	< 10	< 1	0.08	30	0.27	94
S 09732	203	238	15	1.49	1.2	55	170	< 0.5	4	0.15	1.0	15	69	110	6.76	< 10	< 1	0.06	30	0.86	338
S 09733	203	238	40	1.41	4.2	155	170	< 0.5	8	0.17	2.0	15	65	476	5.43	< 10	< 1	0.06	30	0.94	360
S 09735	203	238	15	1.50	2.0	65	190	< 0.5	4	0.21	3.0	19	92	648	5.97	< 10	< 1	0.06	40	0.97	493
S 09736	203	238	< 5	0.94	0.2	40	100	< 0.5	4	0.14	< 0.5	12	26	88	4.52	< 10	< 1	0.09	50	0.55	400

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1016 - 510 W. HASTINGS ST.
VANCOUVER, BC
V6B 1L8

Project : NDU-MARG-JANE
Comments:

Page N 1-B
Tot. Pa[illegible] 1
Date : 22-AUG-88
Invoice # : I-8820455
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8820455

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S 09702	203	238	1	0.06	< 1	940	38	< 5	1	38	< 0.01	< 10	< 10	3	< 5	34
S 09704	203	238	4	0.01	25	670	6	< 5	1	15	< 0.01	< 10	< 10	16	< 5	103
S 09705	203	238	1	0.01	258	2290	10	< 5	16	6	< 0.01	< 10	< 10	88	25	865
S 09707	203	238	3	0.03	15	760	40	< 5	1	59	< 0.01	< 10	< 10	4	5	144
S 09710	203	238	2	0.01	16	2180	54	< 5	3	24	0.04	< 10	< 10	23	10	177
S 09712	203	238	7	0.01	79	1270	12	< 5	6	18	0.01	< 10	< 10	62	5	437
S 09714	203	238	12	0.02	47	1690	14	< 5	3	19	< 0.01	< 10	< 10	45	5	347
S 09716	203	238	14	0.01	284	1120	12	< 5	7	7	0.01	< 10	< 10	53	15	1680
S 09718	203	238	3	0.01	7	1320	72	< 5	3	12	0.02	< 10	< 10	8	10	185
S 09720	203	238	4	0.01	87	1100	12	< 5	6	12	< 0.01	10	< 10	85	5	602
S 09721	203	238	2	0.01	57	1060	14	< 5	12	21	0.29	< 10	< 10	163	10	446
S 09725	203	238	1	0.03	345	1110	16	< 5	9	24	< 0.01	< 10	< 10	25	15	940
S 09728	203	238	32	0.02	20	9580	52	5	6	32	< 0.01	< 10	< 10	99	25	870
S 09732	203	238	10	0.01	41	2090	18	5	4	27	0.05	< 10	< 10	71	5	325
S 09733	203	238	8	0.01	43	1350	1110	10	4	20	0.02	< 10	< 10	60	5	570
S 09735	203	238	9	0.01	76	1700	318	< 5	4	24	0.01	< 10	< 10	58	10	686
S 09736	203	238	2	0.01	27	810	122	< 5	2	13	0.01	< 10	< 10	6	< 5	289

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RCHER CATHRO & ASSOC. (1981) LTD.

1016 - 510 W. HASTINGS ST.
VANCOUVER, BC
V6B 1L8

Project : NDU MARG (JANE)
Comments:

Date : 20-AUG-88
Invoice # : I-8820473
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8820473

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Al %	Ag ppm	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
S 09701	205	238	50	0.96	11.2	645	490	< 0.5	< 2	0.08	8.0	6	230	96	>15.00	< 100	< 1	0.15	20	0.07	505
S 09703	205	238	< 5	0.15	< 0.2	20	480	< 0.5	< 2	0.02	< 0.5	< 1	76	7	1.46	< 100	< 1	0.04	< 10	0.02	37
S 09706	205	238	< 5	2.24	9.8	25	120	< 0.5	< 2	0.31	3.5	64	59	232	>15.00	< 100	< 1	0.05	< 10	0.13	2470
S 09708	205	238	< 5	0.13	< 0.2	15	50	< 0.5	< 2	0.53	1.0	< 1	77	25	2.28	< 100	1	0.01	< 10	0.21	258
S 09709	205	238	< 5	2.23	5.6	50	200	< 0.5	< 2	0.22	< 0.5	7	119	39	>15.00	< 100	< 1	0.09	< 10	1.44	306
S 09711	205	238	< 5	0.94	5.2	530	120	< 0.5	< 2	0.04	< 0.5	7	88	239	>15.00	< 100	< 1	0.04	< 10	0.12	213
S 09713	205	238	< 5	1.16	6.2	60	100	< 0.5	< 2	0.04	3.5	16	98	170	>15.00	< 100	< 1	0.03	< 10	0.03	1245
S 09715	205	238	< 5	1.77	10.6	40	70	< 0.5	< 2	0.12	1.5	53	158	156	>15.00	< 100	< 1	0.02	< 10	0.09	1535
S 09717	205	238	< 5	0.52	0.8	215	240	< 0.5	< 2	0.03	< 0.5	3	98	51	8.47	< 100	< 1	0.09	< 10	0.05	183
S 09719	205	238	< 5	0.99	< 0.2	145	510	< 0.5	< 2	0.04	< 0.5	1	330	44	6.84	< 100	< 1	0.21	< 10	0.05	74
S 09722	205	238	< 5	3.33	1.0	< 5	90	< 0.5	< 2	1.70	< 0.5	33	12	366	8.35	< 100	< 1	0.04	< 10	1.73	1020
S 09723	205	238	< 5	3.01	18.8	40	470	< 0.5	< 2	0.79	7.0	46	20	260	>15.00	< 100	< 1	0.02	60	0.98	1835
S 09724	205	238	< 5	2.78	16.4	25	570	< 0.5	< 2	0.10	13.0	23	164	399	>15.00	< 100	< 1	0.21	20	0.14	176
S 09726	205	238	< 5	3.82	5.4	65	40	< 0.5	< 2	0.35	5.0	41	173	349	14.20	< 100	< 1	0.03	20	0.91	556
S 09727	205	238	< 5	2.84	2.8	25	370	< 0.5	< 2	0.19	7.0	13	163	130	11.30	< 100	< 1	0.19	20	0.28	172
S 09729	205	238	< 5	2.14	7.4	40	360	< 0.5	< 2	0.38	< 0.5	< 1	73	41	>15.00	< 100	< 1	0.10	< 10	0.21	42
S 09730	205	238	< 5	4.49	< 0.2	< 5	10	< 0.5	< 2	2.13	4.5	51	138	194	7.62	< 100	< 1	< 0.01	20	3.25	1075
S 09731	205	238	< 5	4.36	13.0	< 5	60	< 0.5	4	1.67	< 0.5	75	25	1320	13.25	< 100	< 1	< 0.01	20	2.76	1105
S 09734	205	238	30	1.12	18.2	540	180	< 0.5	6	0.14	2.5	10	142	1665	>15.00	< 100	< 1	0.09	10	0.42	165
S 09746	205	238	460	0.32	65.0	>10000	30	< 0.5	32	0.29	88.0	60	147	1205	14.95	< 100	< 1	0.05	10	0.08	134
S 09747	205	238	< 5	0.28	1.0	20	70	< 0.5	2	0.55	< 0.5	< 1	117	22	1.70	< 100	< 1	0.04	10	0.18	282
JANE DYKE ROCK	205	238	10	2.12	0.4	20	10	< 0.5	2	1.18	< 0.5	24	56	370	3.80	< 100	< 1	< 0.01	< 10	1.40	460

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1016 - 510 W. HASTINGS ST.
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Project : NDU MARG (JANE)
Comments:

Date : 20-AUG-88
Invoice # : I-8820473
P.O. # : NONE

CERTIFICATE OF ANALYSIS A8820473

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S 09701	205	238	19	0.02	69	2950	1265	5	2	23	< 0.01	< 10	< 10	55	5	936
S 09703	205	238	1	0.03	2	390	40	< 5	< 1	12	< 0.01	< 10	20	2	< 5	43
S 09706	205	238	8	0.02	249	1410	20	30	24	14	< 0.01	< 10	< 10	211	5	1080
S 09708	205	238	< 1	0.01	12	280	12	< 5	< 1	24	< 0.01	< 10	40	4	< 5	124
S 09709	205	238	6	0.02	41	1690	6	< 5	6	13	0.02	< 10	< 10	123	< 5	267
S 09711	205	238	3	0.02	30	1190	6	< 5	13	6	< 0.01	< 10	< 10	136	< 5	402
S 09713	205	238	3	0.03	120	1700	6	< 5	9	18	< 0.01	< 10	10	144	< 5	1240
S 09715	205	238	< 1	0.02	178	590	10	< 5	52	4	0.02	< 10	< 10	251	< 5	1095
S 09717	205	238	35	0.02	59	4960	24	5	3	45	< 0.01	< 10	< 10	139	< 5	487
S 09719	205	238	34	0.04	18	7620	22	5	5	16	< 0.01	< 10	20	274	< 5	99
S 09722	205	238	1	0.08	17	1390	10	< 5	6	46	0.71	< 10	10	202	< 5	126
S 09723	205	238	2	0.01	162	410	< 2	5	13	52	0.34	< 10	< 10	144	< 5	4850
S 09724	205	238	32	0.05	101	>10000	< 2	10	4	89	0.01	< 10	40	239	< 5	580
S 09726	205	238	< 1	0.02	173	1230	14	25	17	16	< 0.01	< 10	< 10	305	< 5	1115
S 09727	205	238	7	0.05	91	3210	10	< 5	13	26	< 0.01	< 10	< 10	159	< 5	697
S 09729	205	238	8	0.03	22	>10000	22	5	5	21	< 0.01	< 10	10	79	< 5	649
S 09730	205	238	< 1	0.02	146	860	6	< 5	10	32	0.46	< 10	< 10	176	< 5	624
S 09731	205	238	1	0.02	25	1690	14	5	8	32	0.88	< 10	< 10	151	5	283
S 09734	205	238	3	0.03	21	830	1830	15	4	8	0.09	< 10	< 10	80	5	2070
S 09746	205	238	< 1	0.02	24	550	>10000	120	2	10	< 0.01	< 10	< 10	8	120	>10000
S 09747	205	238	< 1	0.01	8	270	24	< 5	1	34	< 0.01	< 10	< 10	4	< 5	105
JANE DYKE ROCK	205	238	< 1	0.03	36	740	23	< 5	4	29	0.50	< 10	< 10	84	< 5	80

CERTIFICATION : ____________________

APPENDIX G

GEOPHYSICAL SUMMARY

December 8, 1988

by Lyndon Bradish (Noranda)

(Plans and profiles in pockets 23 - 31)

NORANDA EXPLORATION INC.
VANCOUVER B.C.

MEMO TO : H. Copland cc [redacted]
FROM : L. Bradish
DATE : December 8, 1988
SUBJECT : MARG - Geophysical summary (Norex) 1988

During October 1988 Geophysical surveys consisting of inline Pulse EM and gravity were completed by Noranda and Delta Geosciences personnel. The PEM and previous magnetic surveys were completed over an extensive portion of the MARG grid whereas the gravity work was carried out under a 'test' basis over three selected areas.

INSTRUMENTATION

The Pulse EM survey employed an inline configuration with an Rx-Tx spacing of 80 meters and readings recorded at 20 meter intervals. The equipment is manufactured by Crone Geophysics of Ontario and consists of the standard analogue 8 channel receiver and a 500 watt transmitter (10 mS timebase) coupled to a 30 ft. diameter transmitting loop.

The Gravity survey employed a Sodin prospector gravimeter with readings recorded at both 20 and 10 meter (detail) intervals. The station elevations were obtained by optical transit and rod.

The Total Field magnetometer survey was completed by Delta Geosciences. All applicable corrections are reported to have been applied to the field data.

DISCUSSION OF RESULTS

The gravity survey failed to define any anomalous feature on the six lines that were surveyed. Some topographic influence is seen on the profiles however this 'noise' is not excessive. The lack of a gravity anomaly does not indicate the lack of mineralization and this absence of anomalous response should not be used in a negative manner.

The PEM survey was used to map in detail the bedrock conductors that had previously been defined by an HLEM survey. The PEM system was chosen in order to eliminate terrain effects and unknown chainage accuracy. The data is presented in profile form at a scale of 1:2,500 with the interpreted conductor axes as indicated. This interpretation has been transferred to the plan contoured magnetic survey map and the assumed conductor axes are as illustrated. Those EM anomalies that show the source to be of above average conductivity and are of particular interest are marked with an asterisk (*). Specific values of conductivity-thickness have not been calculated for this survey.

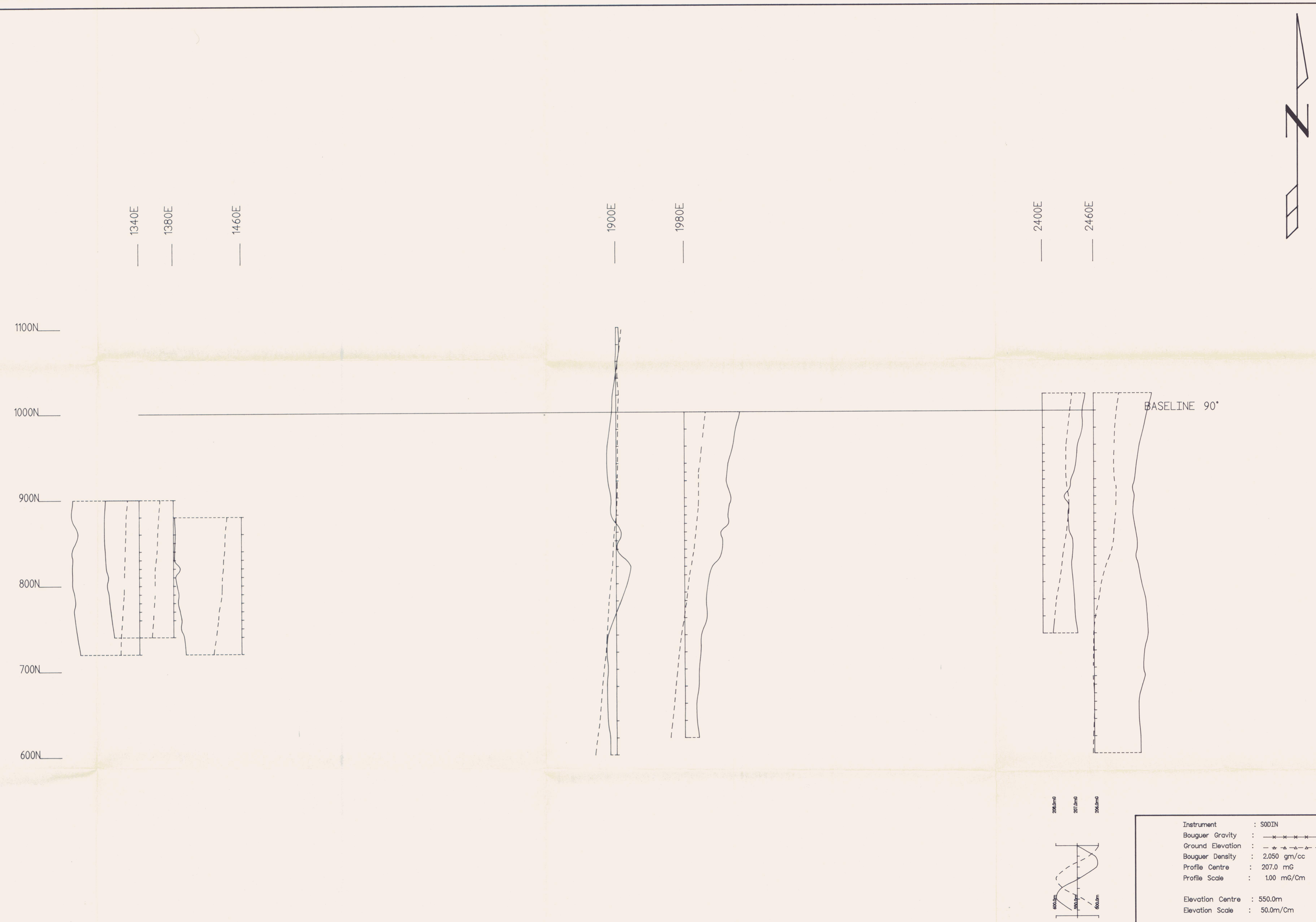
The magnetometer survey has been contoured at a 5.0 nT interval in order to show subtle features within this data set. Several prominent magnetic anomalies are evident such as those located at (approximately) 1300E/950N, 1850E/1130N which appear to be sourced by small intrusive plugs. A second signature of interest is a band of higher magnetics centred along an imaginary line between L.2500E/780N and L.1900E/500N. The east end of this feature is magnetically active and is flanked by zones of conductivity to the south and conductivity and mineralization to the north.

A general bias of 070° has been applied to the magnetic data as this appears to be the best estimate for the overall magnetic strike particularly east of L.2000E. This same bias is also observed in the PEM data particularly east of Line 2100E. To the west the PEM conductors trend in a more east-west direction.

RECOMMENDATIONS

Those areas that are flagged with an asterisk are PEM conductor axes that exhibit high conductivity and as the known mineralization also has a significantly higher conductivity than most of the PEM conductors, these would represent targets that warrant drill testing. Specifically the areas to test (or have already been tested) are those conductors at L.1600E/990N - L.1680E/995N, L.1900E/995N, L.1980E/920N, L.2400E/640N and the zone between L.2300E/805N to L.2400E/860N.

Additional exploration should continue along the 070° direction indicated by the PEM and Magnetics, particularly along the imaginary line/trend mentioned above and towards the southwest.



Instrument	:	SODIN
Bouguer Gravity	:	—×—×—×—×—
Ground Elevation	:	—△—△—△—△— —
Bouguer Density	:	2.050 gm/cc
Profile Centre	:	207.0 mG
Profile Scale	:	1.00 mG/Cm
Elevation Centre	:	550.0m
Elevation Scale	:	50.0m/Cm

50m 25m 0m 50m 100m

MARG

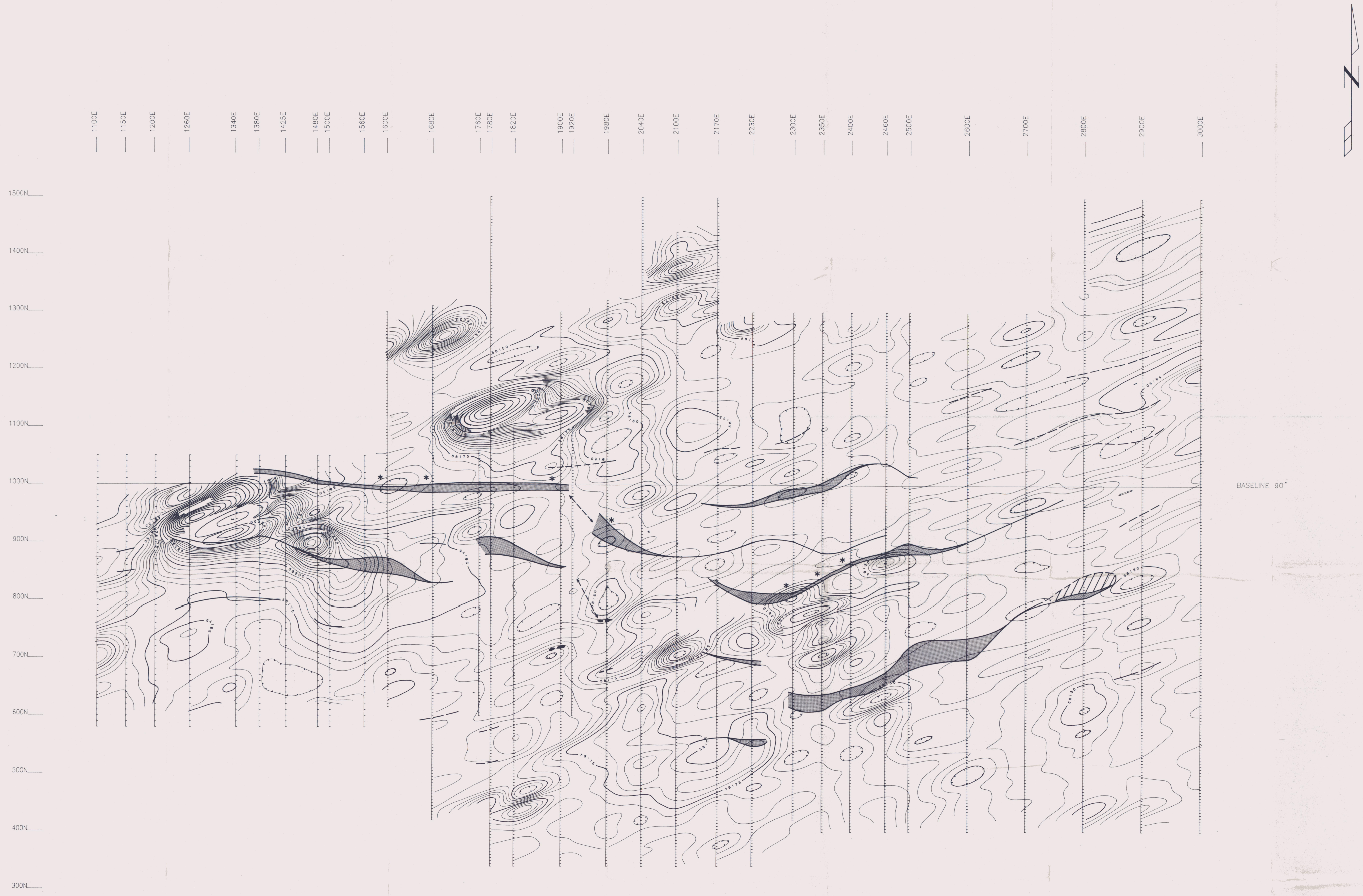
GRAVITY SURVEY

PROJECT: MARG PROJECT # : 000
BASELINE AZIMUTH : 90 Deg.

SCALE = 1: 2500 DATE : 9/ 9/88
SURVEY BY : LB NTS :
FILE: GOOOMAR
NORANDA EXPLORATION

ers. 4.20 Thu 1 Dec 1988 at 14:20 Normal Profile centred on 207.0, Elevation profile centred on 550.0 Grid centre at 1900.0E / 850.0N Serial # G88140, Registered User : NORANDA EXPLORATION

092682



Instrument : IGS
Field : TOTAL
Datum : 0.0 nT

Contour Interval : 5.0 nT

Conductor Axis :

50m 25m 0m 50m 100m

MARG

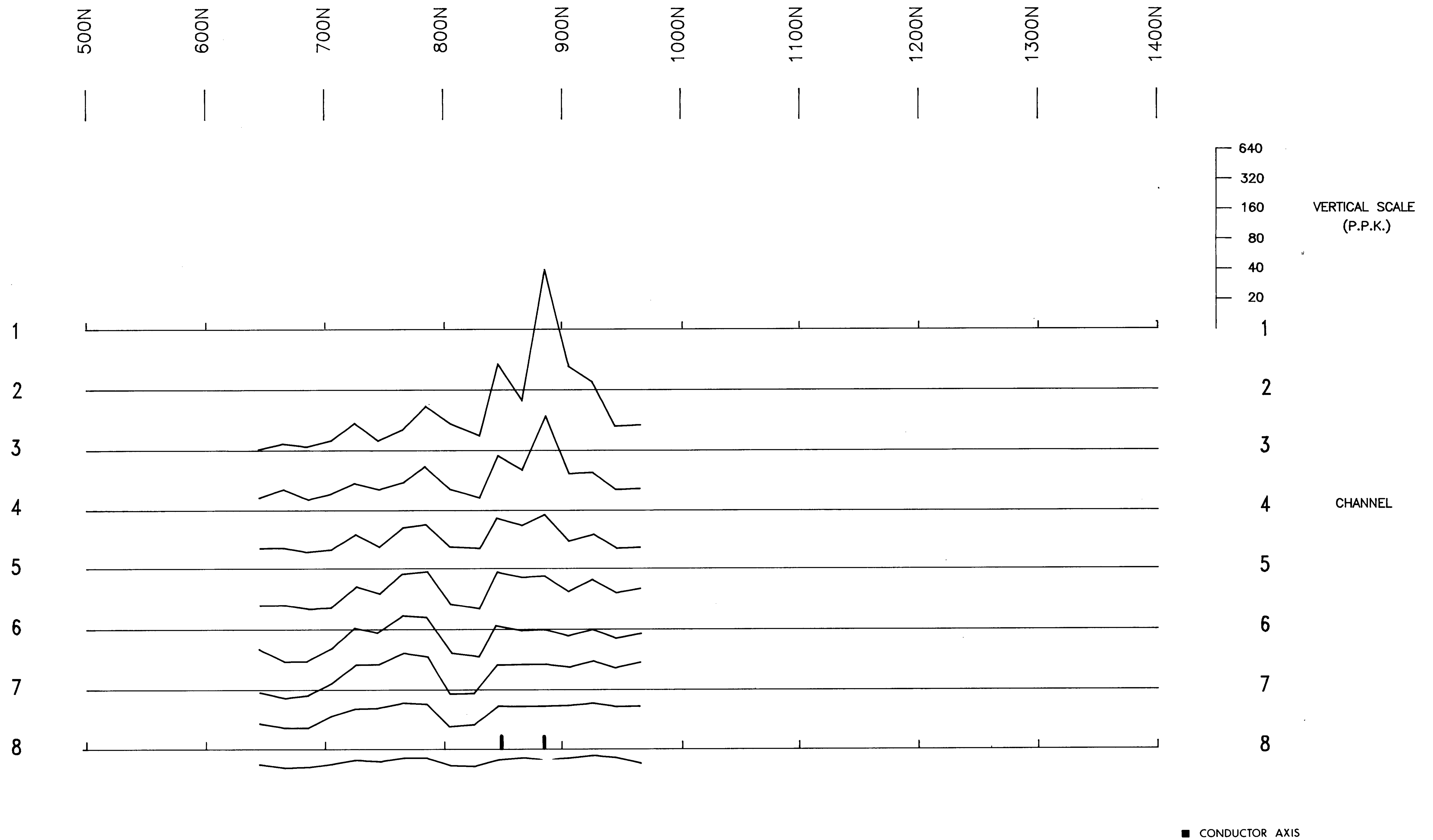
MAGNETOMETER SURVEY

PROJECT: MARG PROJECT # : 000
BASELINE AZIMUTH : 90 Deg.

SCALE = 1 : 2500 DATE : 9/ 9/88
SURVEY BY : DELTA NTS :
FILE: M000MAR
NORANDA EXPLORATION

Vers. 4.20 Fri 7 Oct 1988 at 14:29 Centre of plot at 2050.0E/920.0N Serial # M88140 Registered User : NORANDA EXPLORATION

092682



MARG PROPERTY

P.E.M. SURVEY

L1150E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

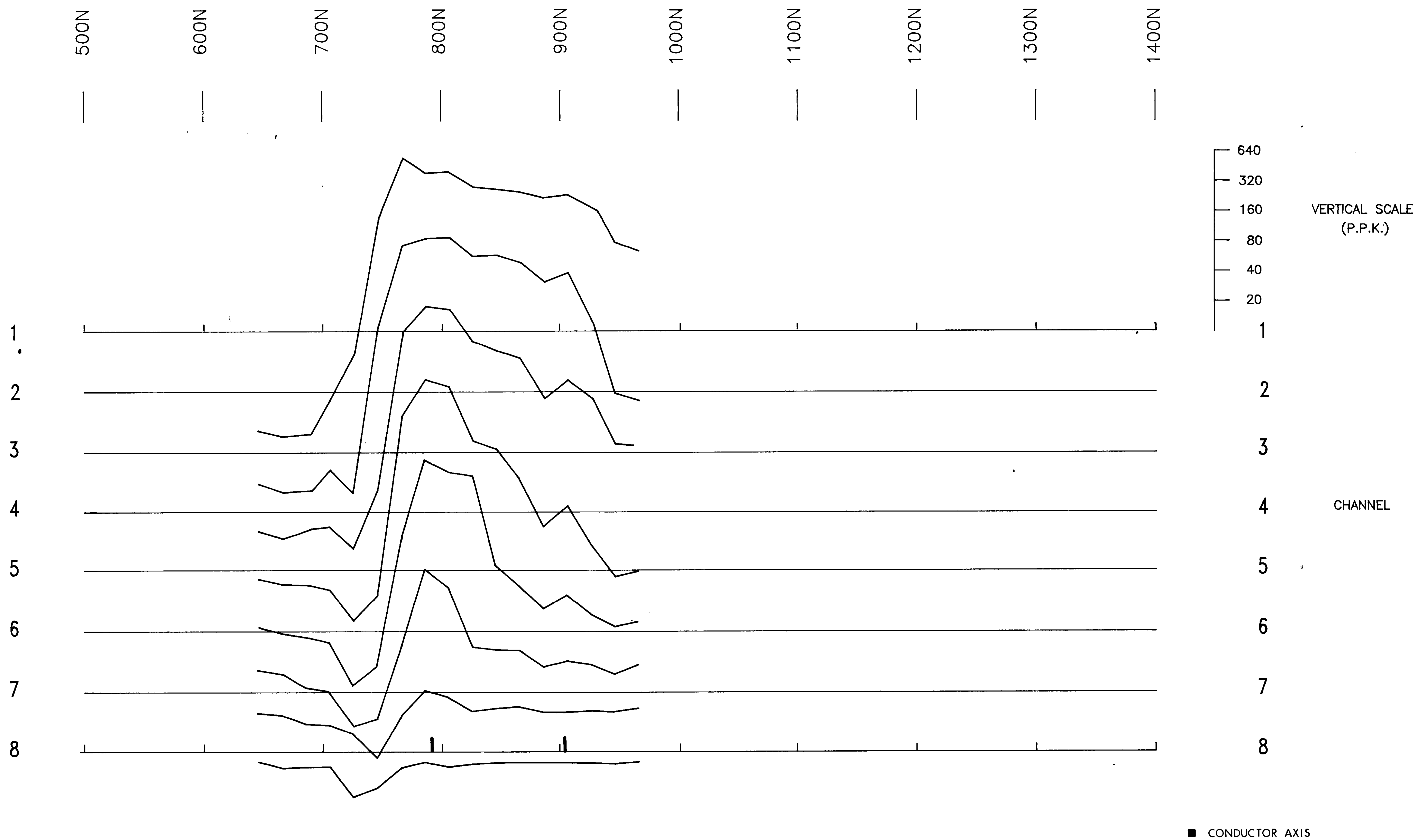
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L1260E

YUKON TERRITORY

SCALE 1:2500 | DATE 10/88

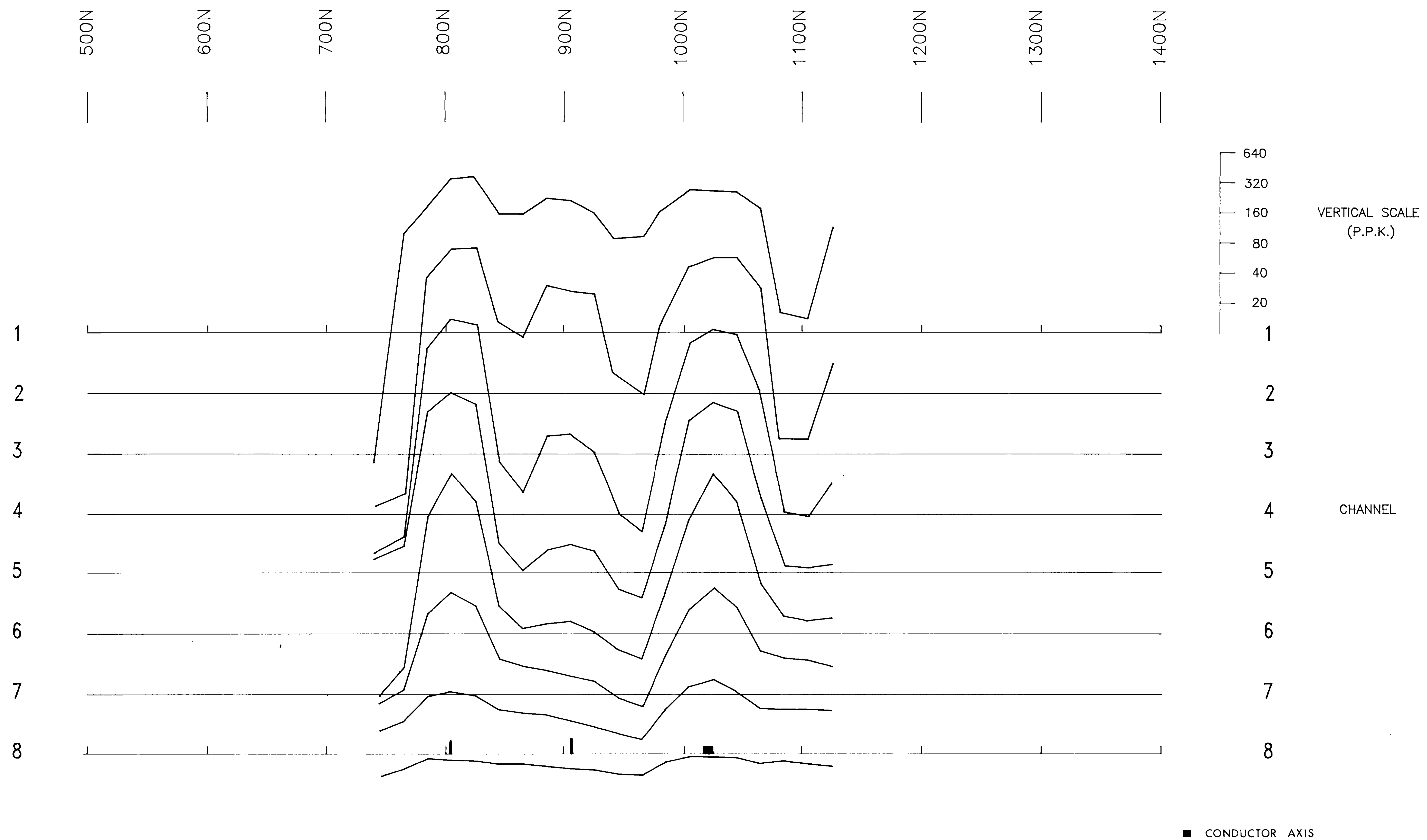
COIL SEP. 80m | TIME BASE 10ms

SURVEY BY WK/SK | BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



noranda

MARG PROPERTY

P.E.M. SURVEY

L1380E

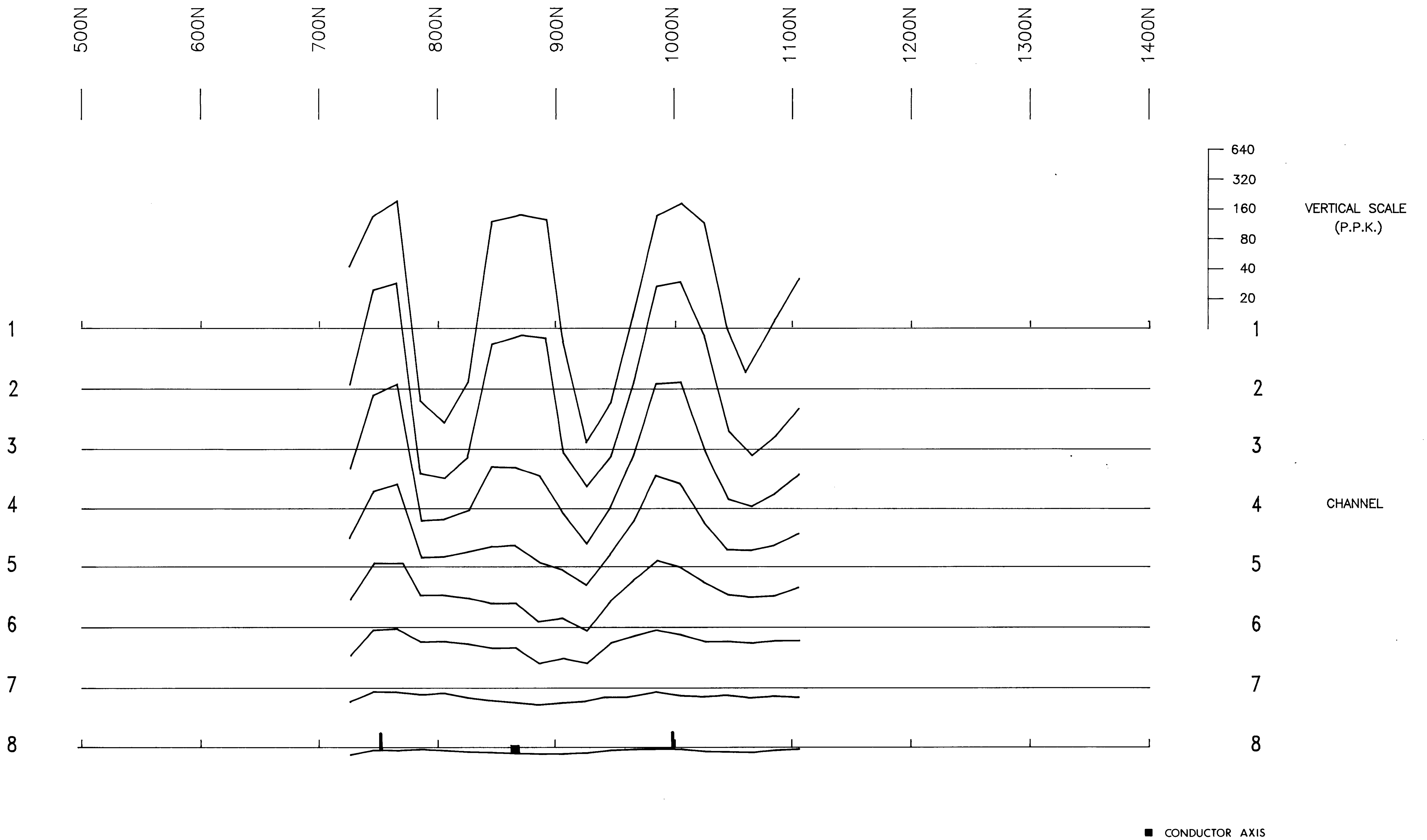
YUKON TERRITORY

SCALE 1:2500 DATE 10/88

COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION



noranda

MARG PROPERTY

P.E.M. SURVEY

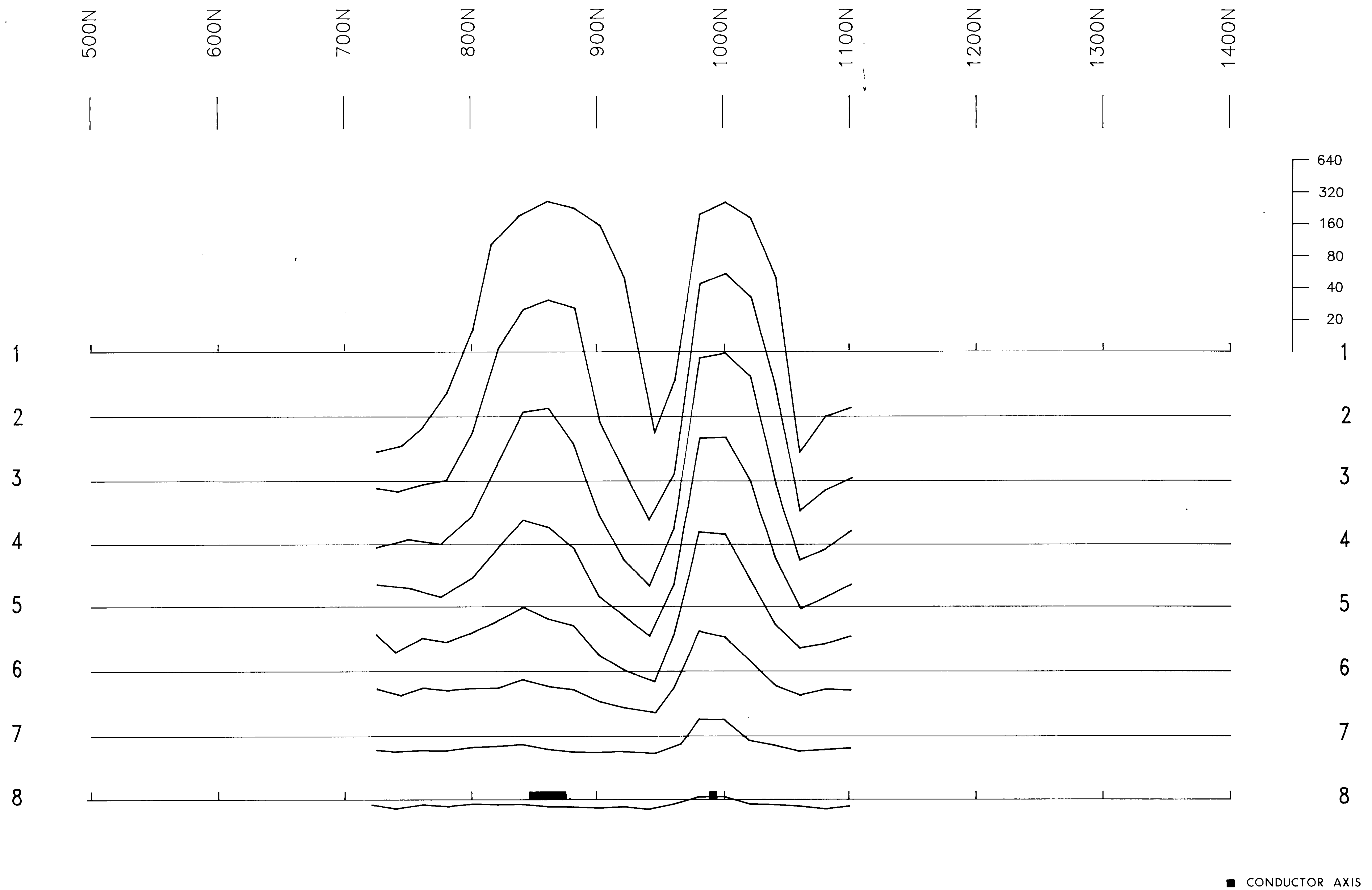
L1500E

YUKON TERRITORY

SCALE 1:2500
DATE 10/88
COIL SEP. 80m
TIME BASE 10ms
SURVEY BY WK/SK
BASELINE 90° Az.

NORANDA EXPLORATION

092682



MARG PROPERTY

P.E.M. SURVEY

L1600E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

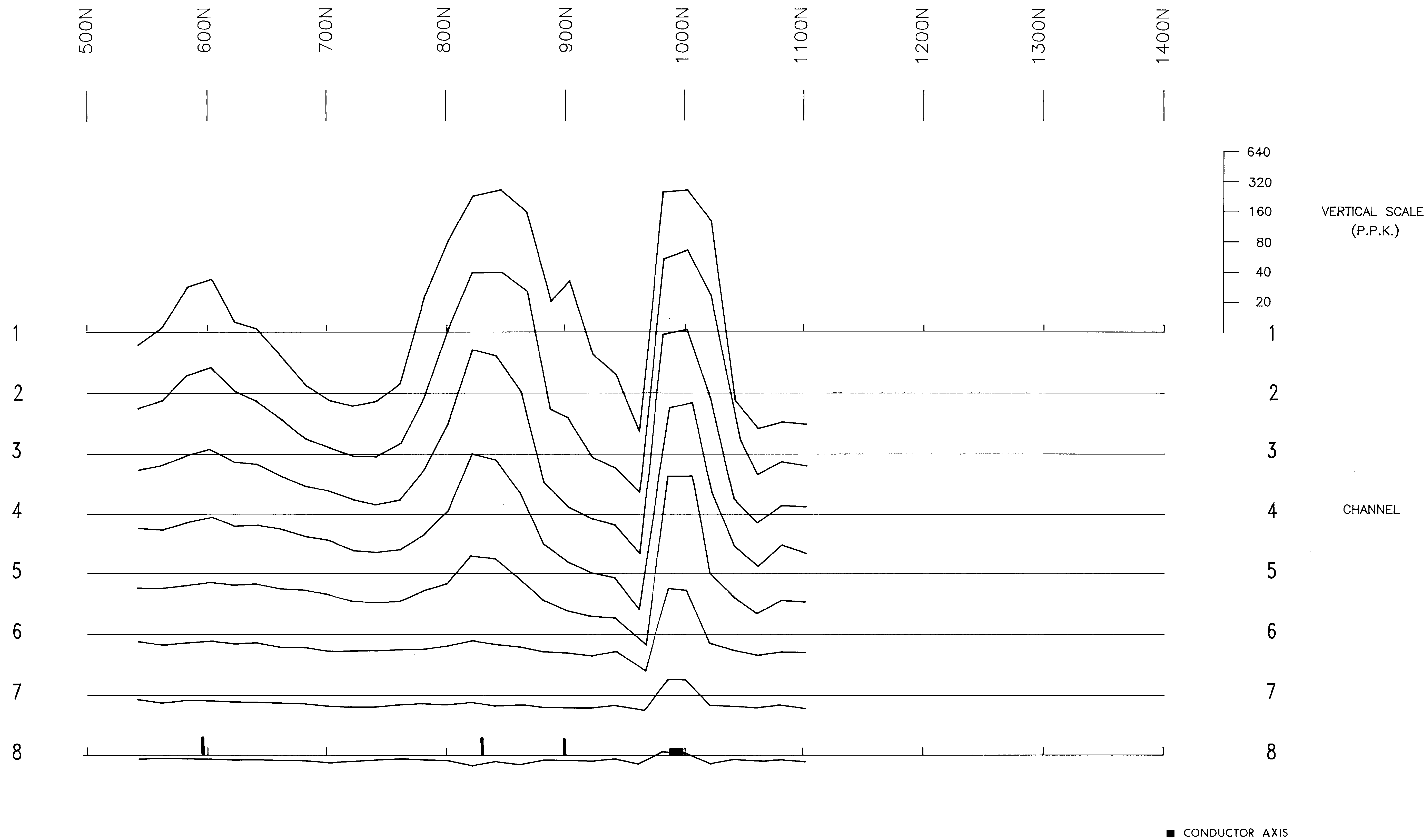
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L1680E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

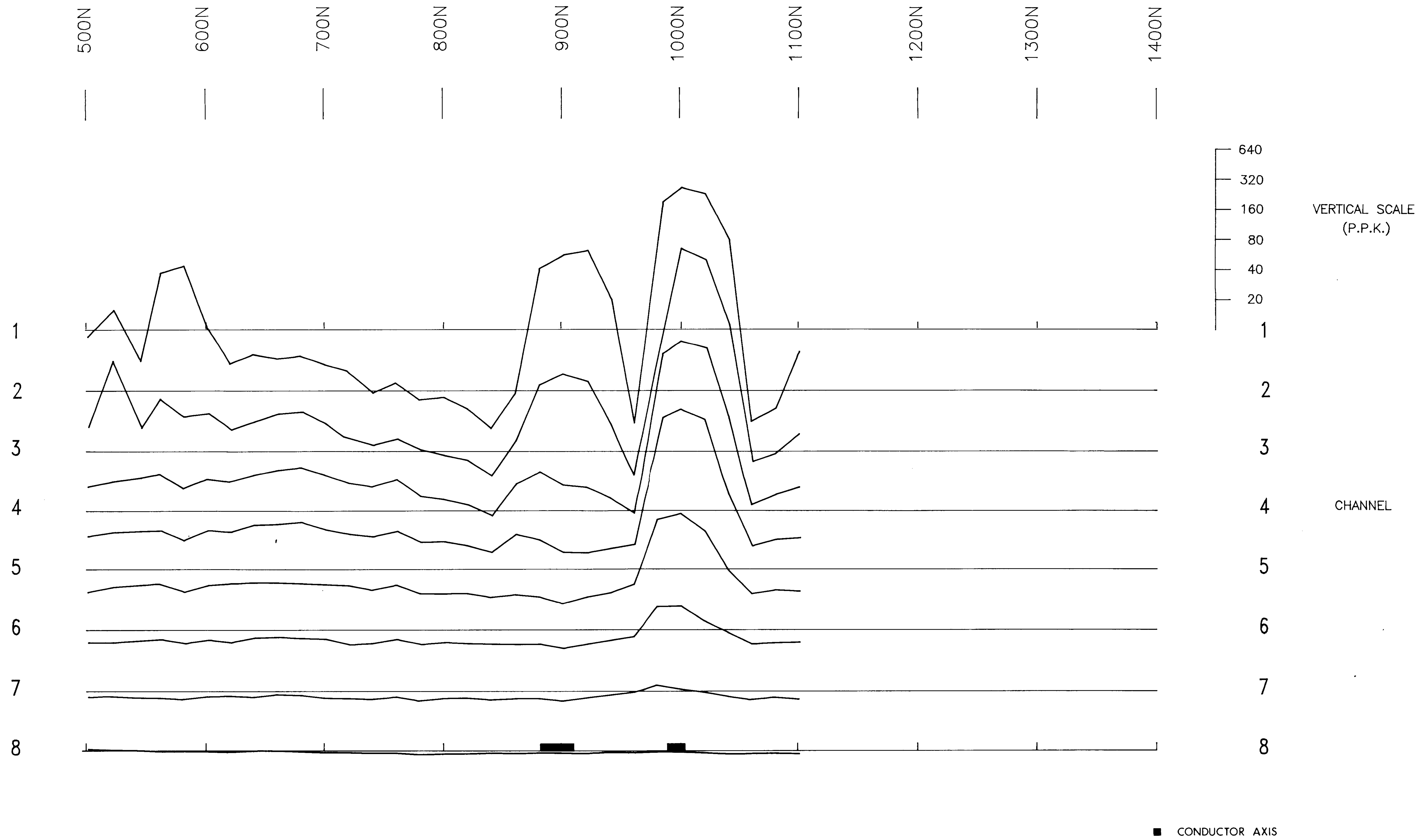
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L1780E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

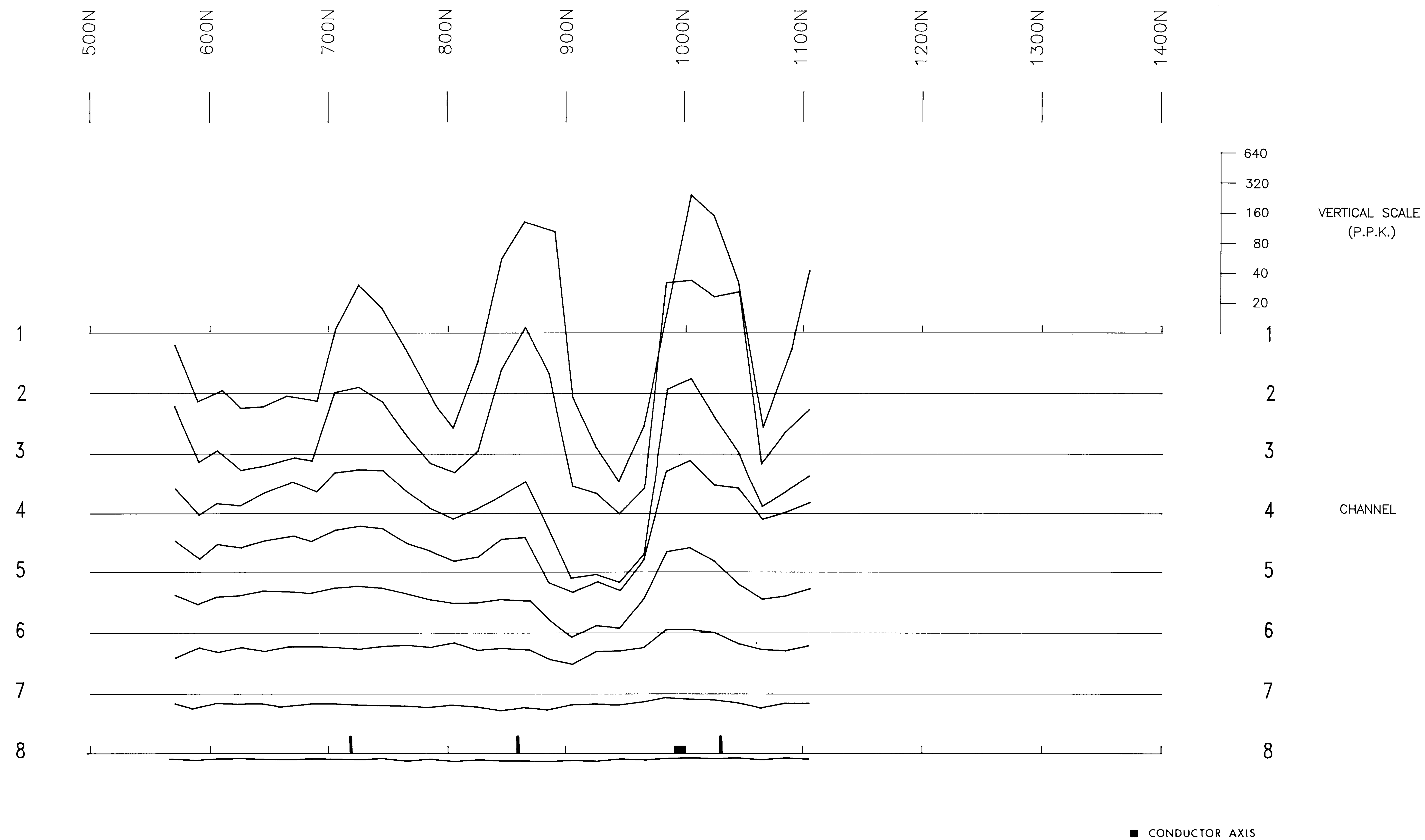
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L1900E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

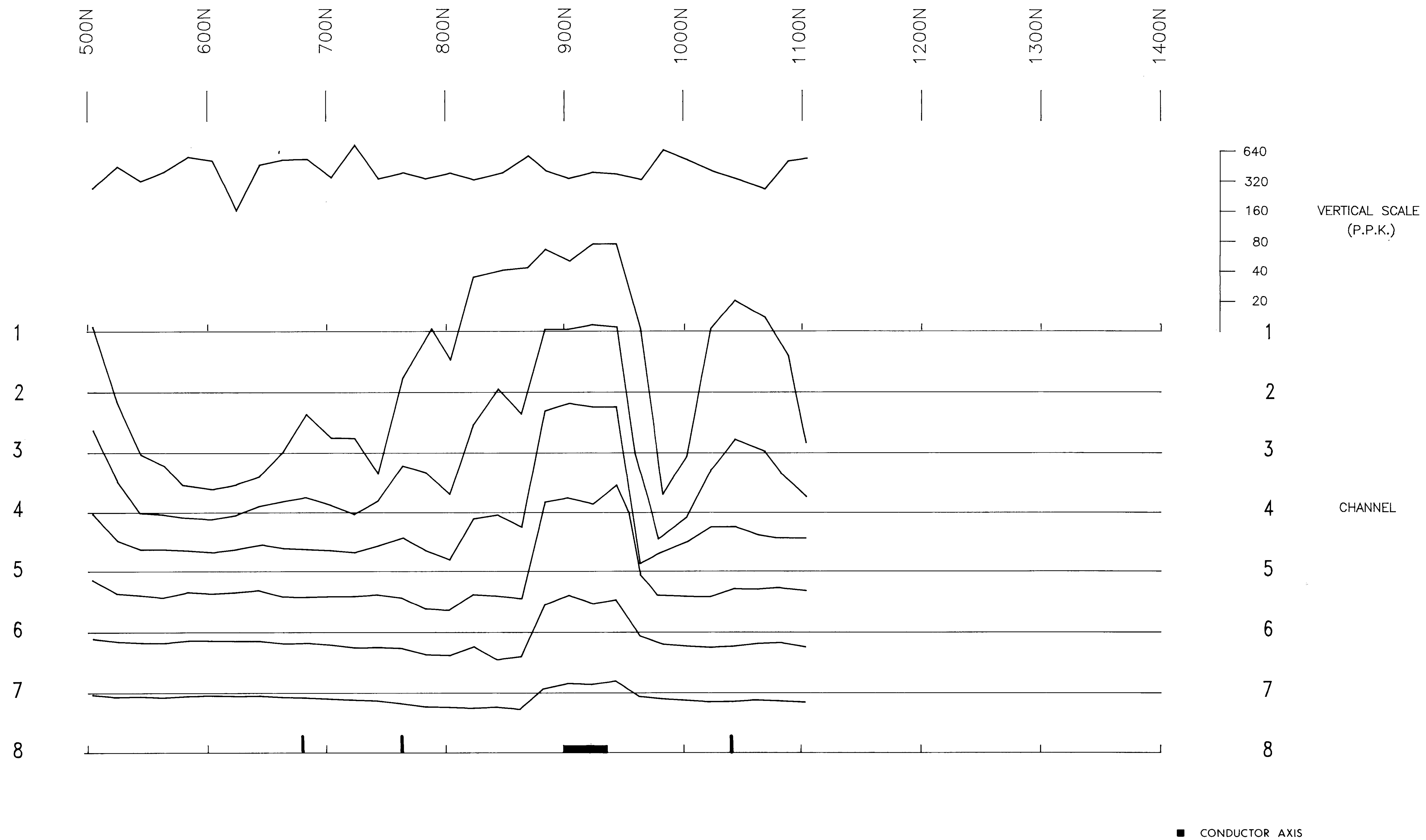
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L1980E

YUKON TERRITORY

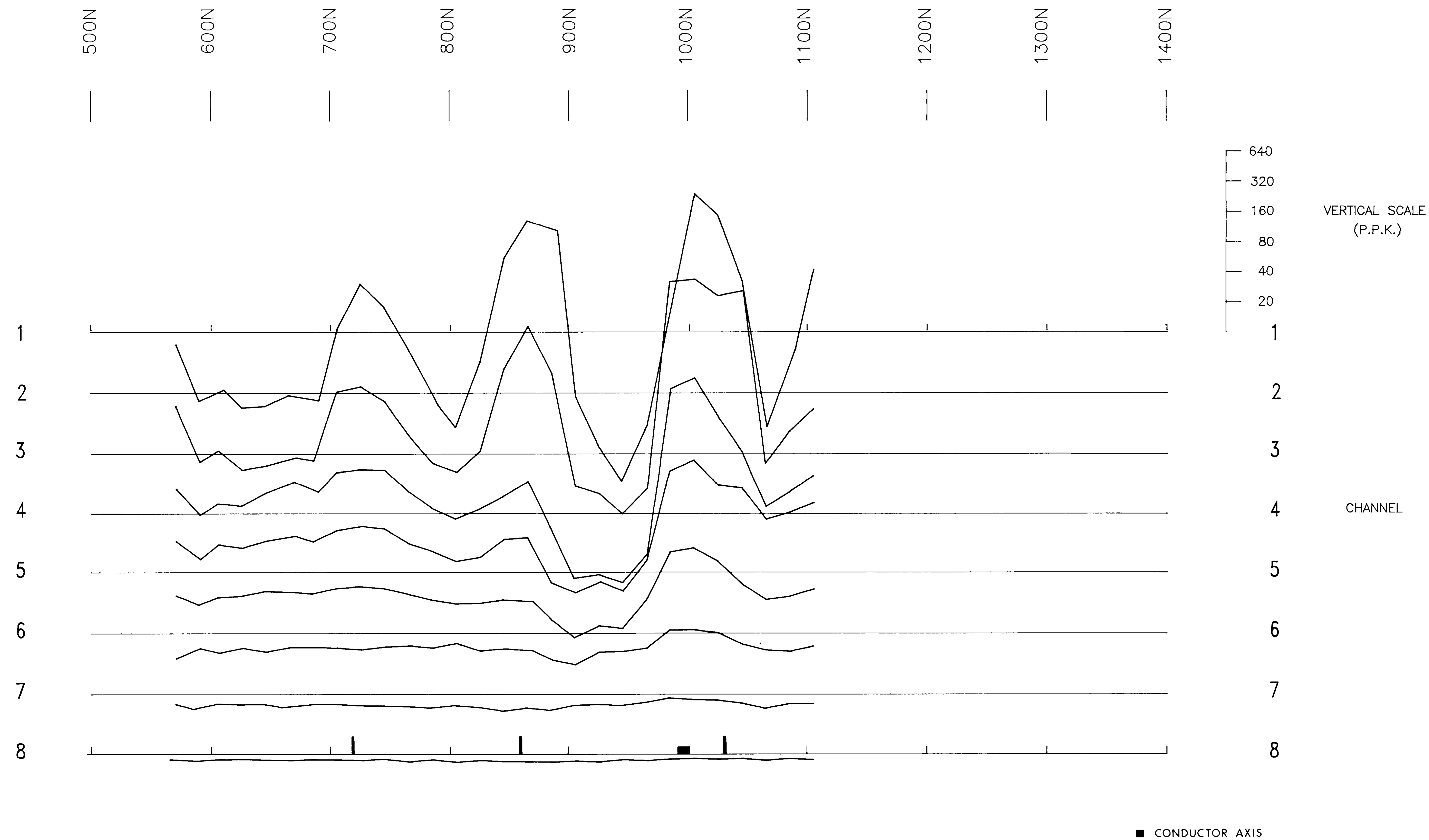
SCALE 1:2500 DATE 10/88

COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda



MARG PROPERTY

P.E.M. SURVEY

L1900E

YUKON TERRITORY

SCALE 1:2500 | DATE 10/88

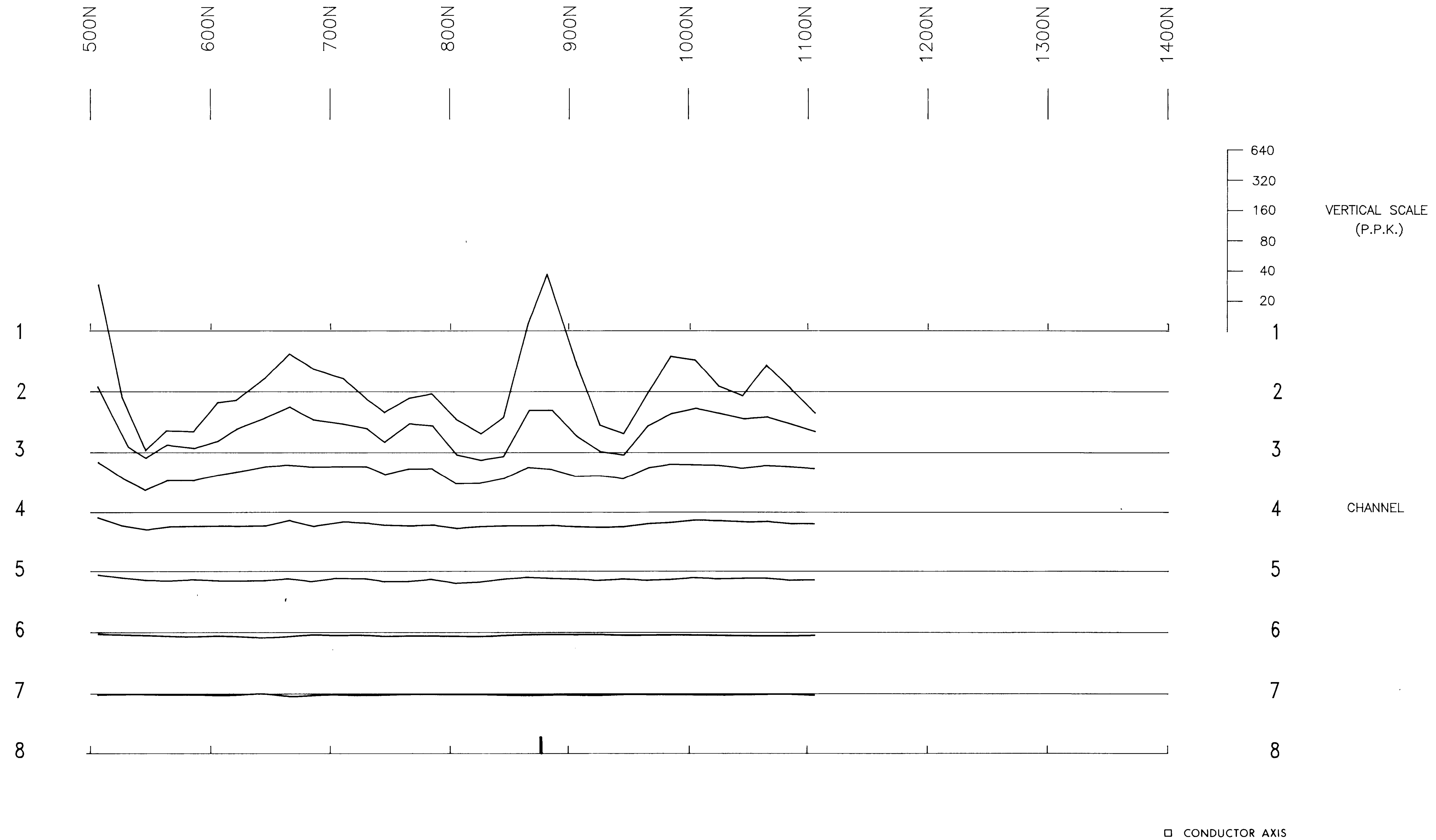
COIL SEP. 80m | TIME BASE 10ms

SURVEY BY WK/SK | BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2100E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

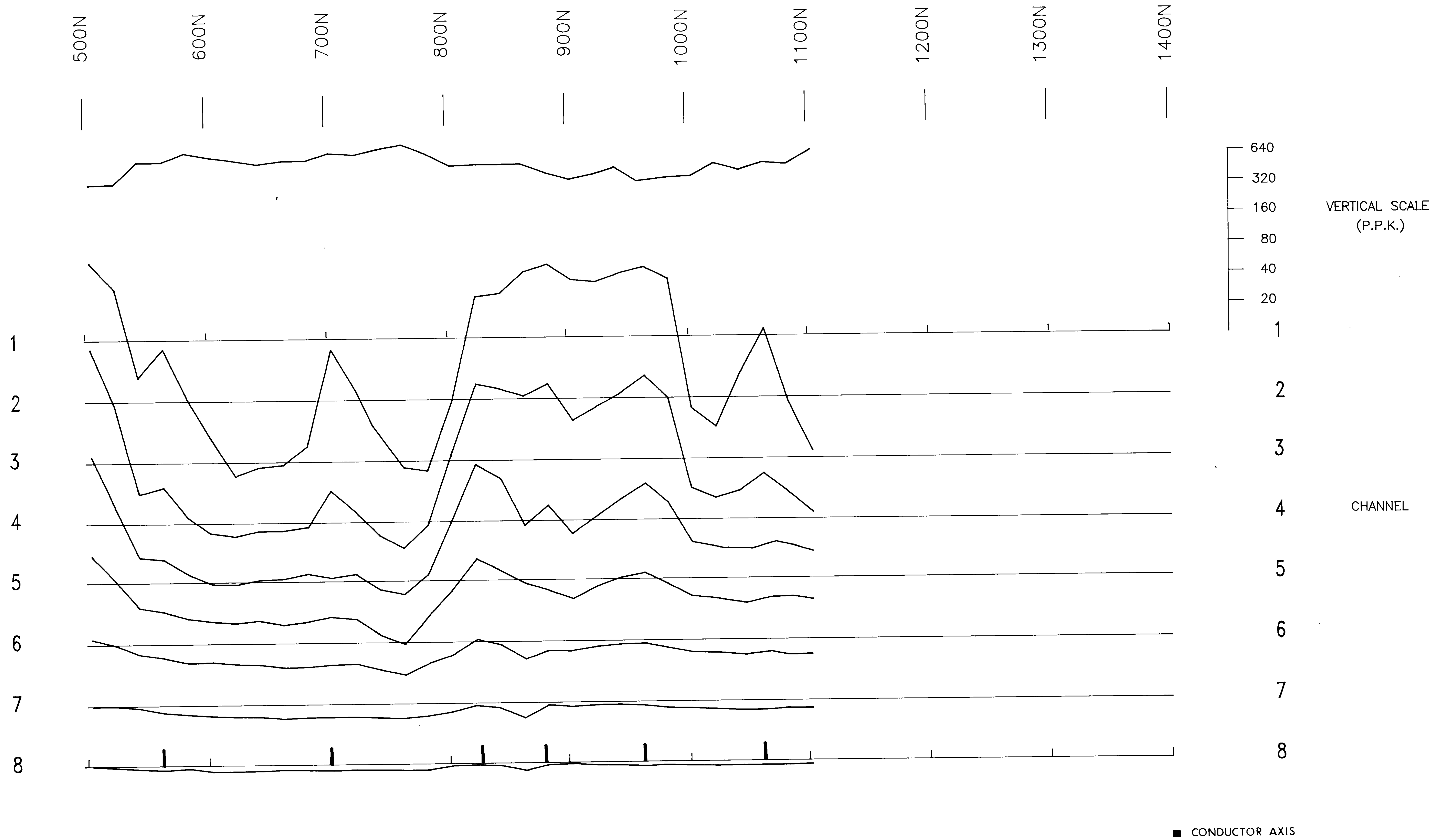
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2170E

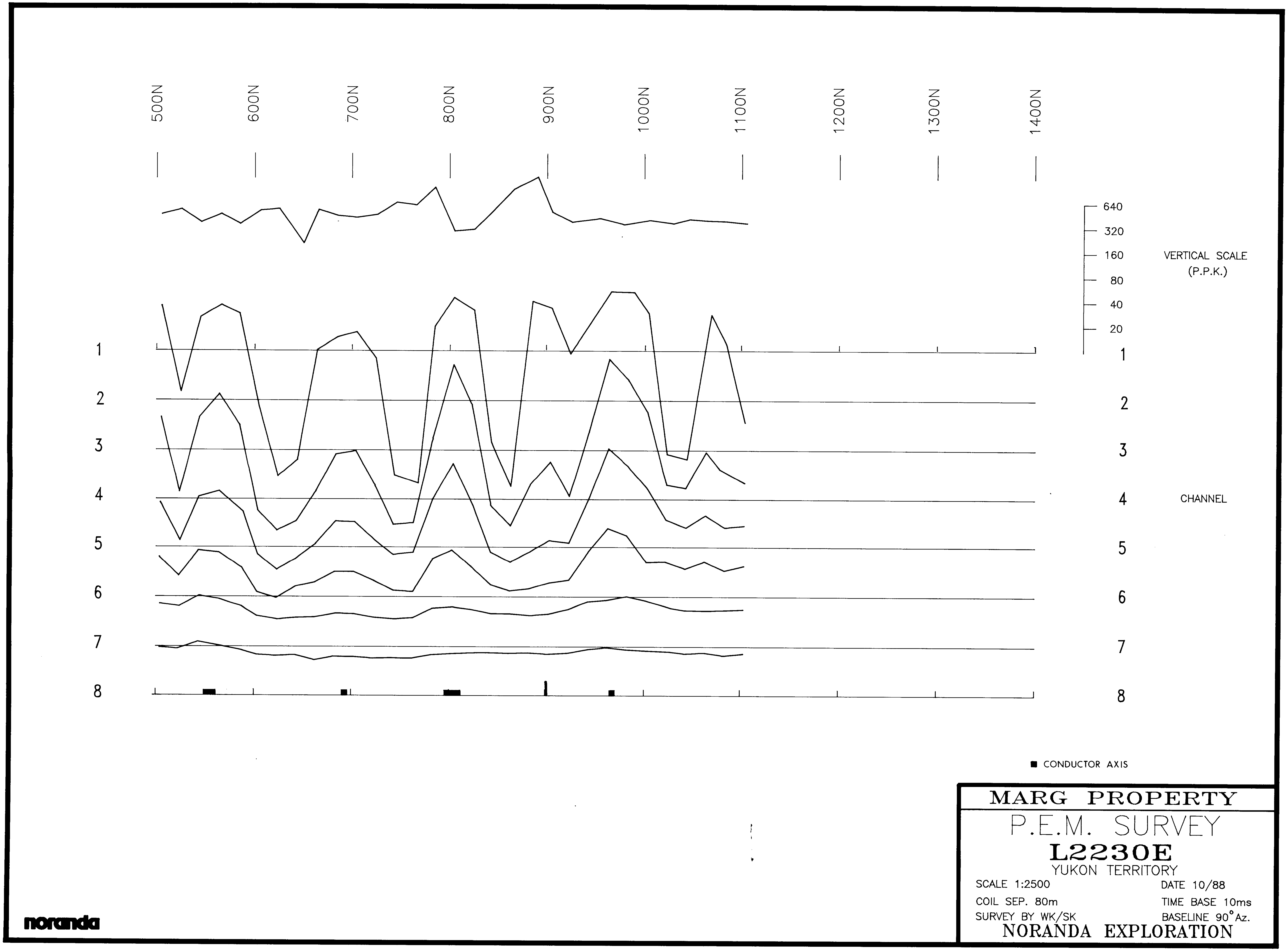
YUKON TERRITORY

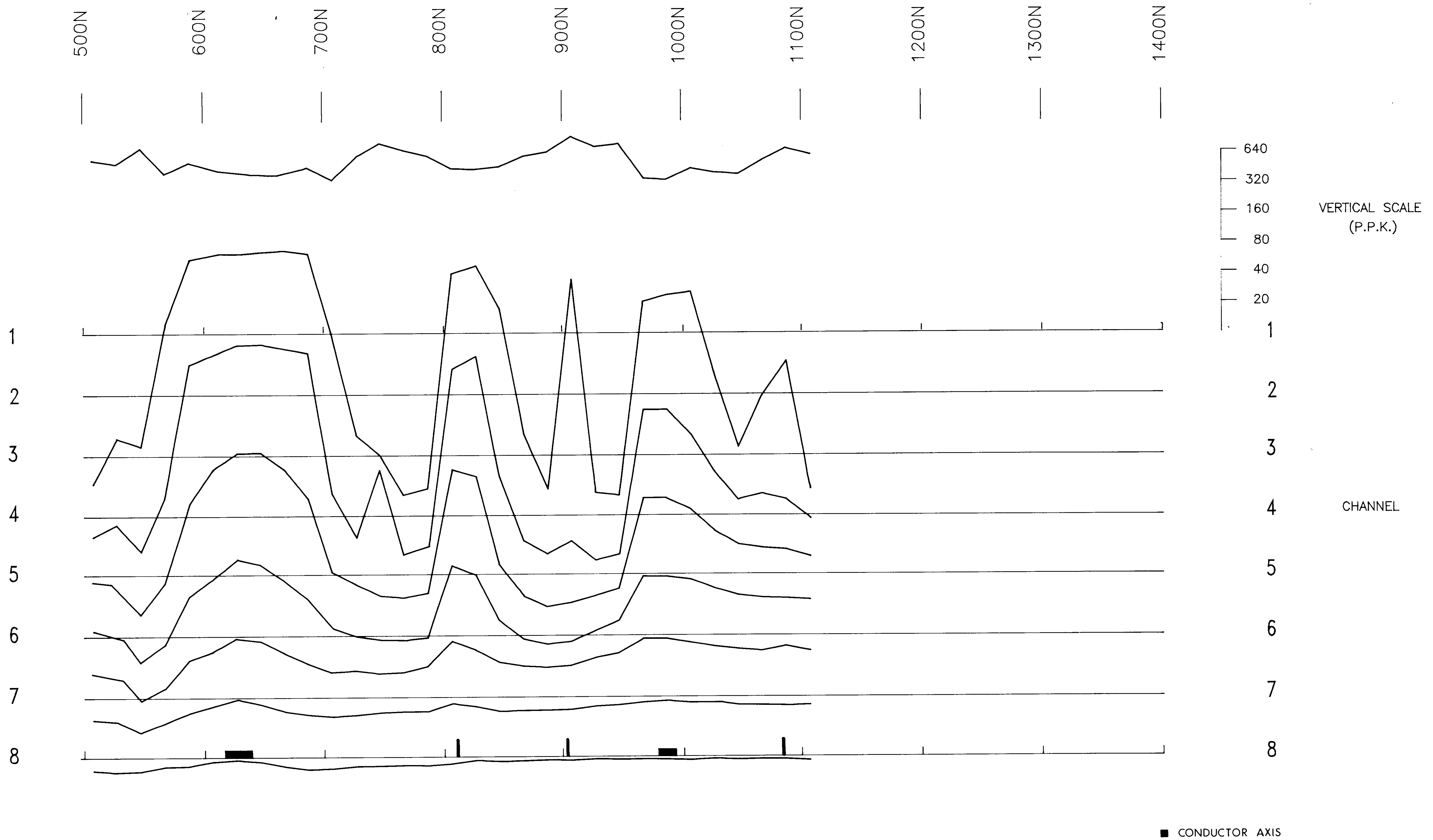
SCALE 1:2500
DATE 10/88
COIL SEP. 80m
TIME BASE 10ms
SURVEY BY WK/SK
BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682


500N
600N
700N
800N
900N
1000N
1100N
1200N
1300N
1400N
640
320
160
80
40
20
VERTICAL SCALE
(P.P.K.)
CHANNEL
1
2
3
4
5
6
7
8
■ CONDUCTOR AXIS
MARG PROPERTY
P.E.M. SURVEY
L2230E
YUKON TERRITORY
SCALE 1:2500
DATE 10/88
COIL SEP. 80m
TIME BASE 10ms
SURVEY BY WK/SK
BASELINE 90° Az.
NORANDA EXPLORATION
noranda



MARG PROPERTY

P.E.M. SURVEY

L2300E

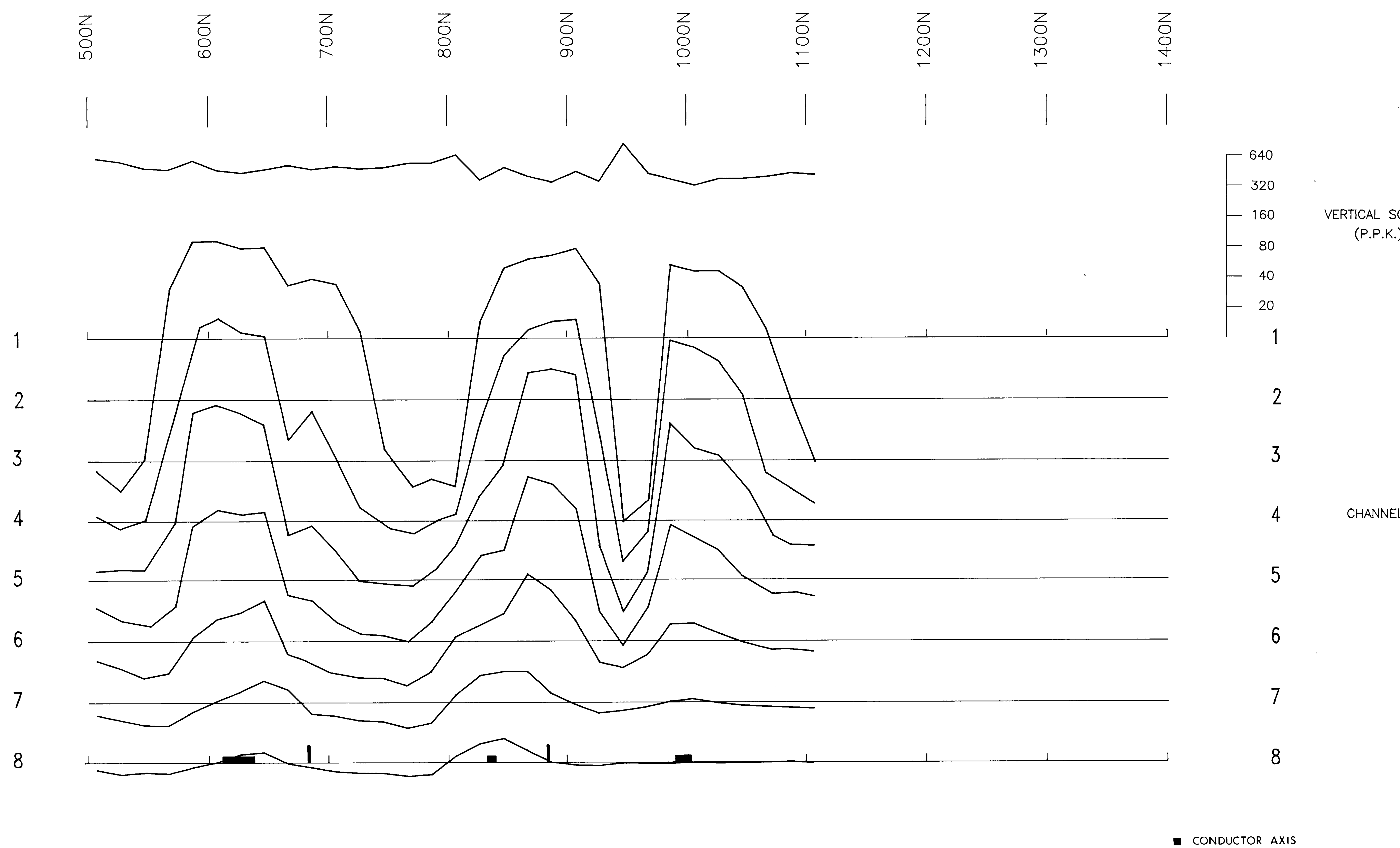
YUKON TERRITORY

SCALE 1:2500 DATE 10/88
COIL SEP. 80m TIME BASE 10ms
SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2350E

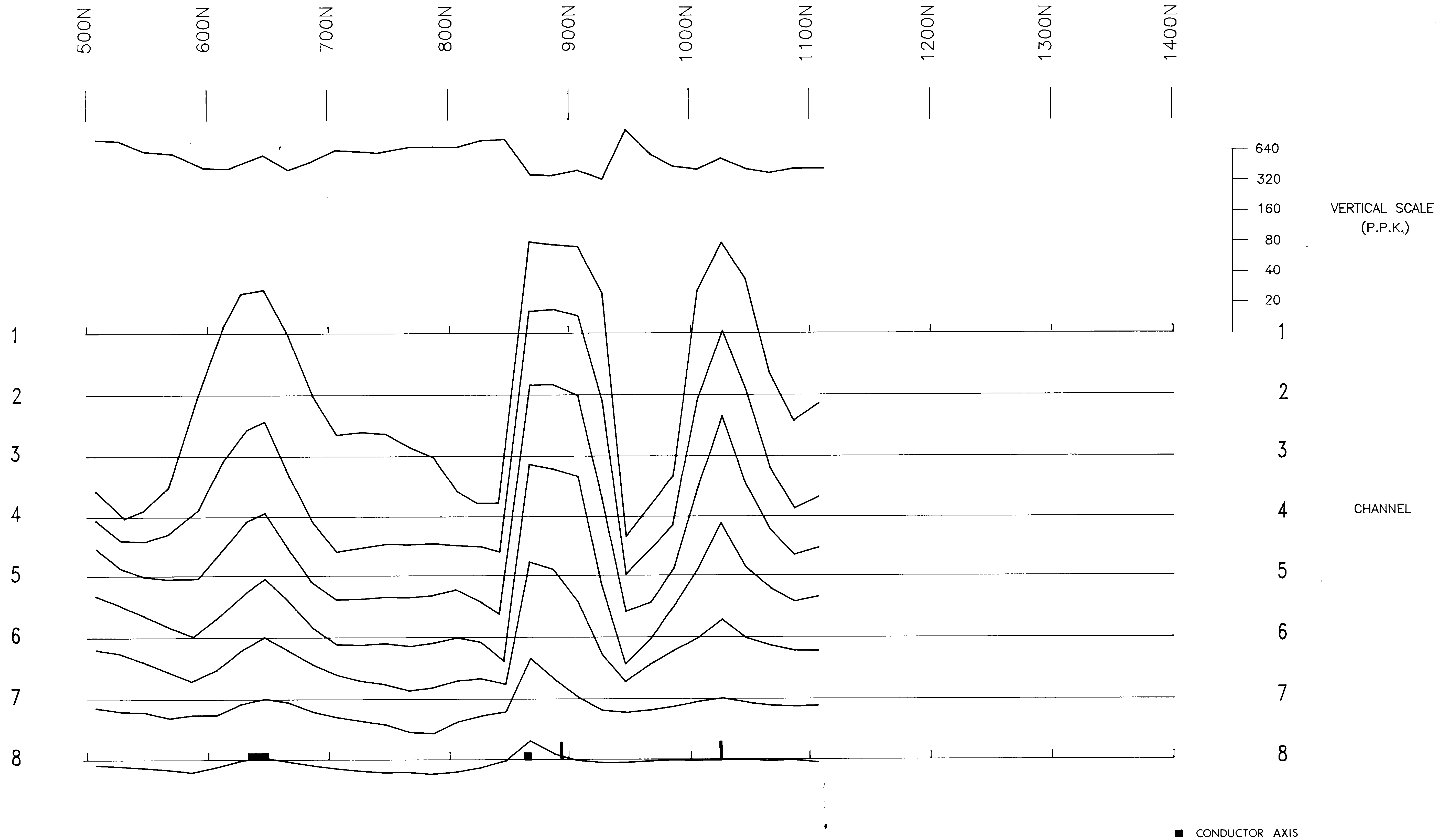
YUKON TERRITORY

SCALE 1:2500
DATE 10/88
COIL SEP. 80m
TIME BASE 10ms
SURVEY BY WK/SK
BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2400E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

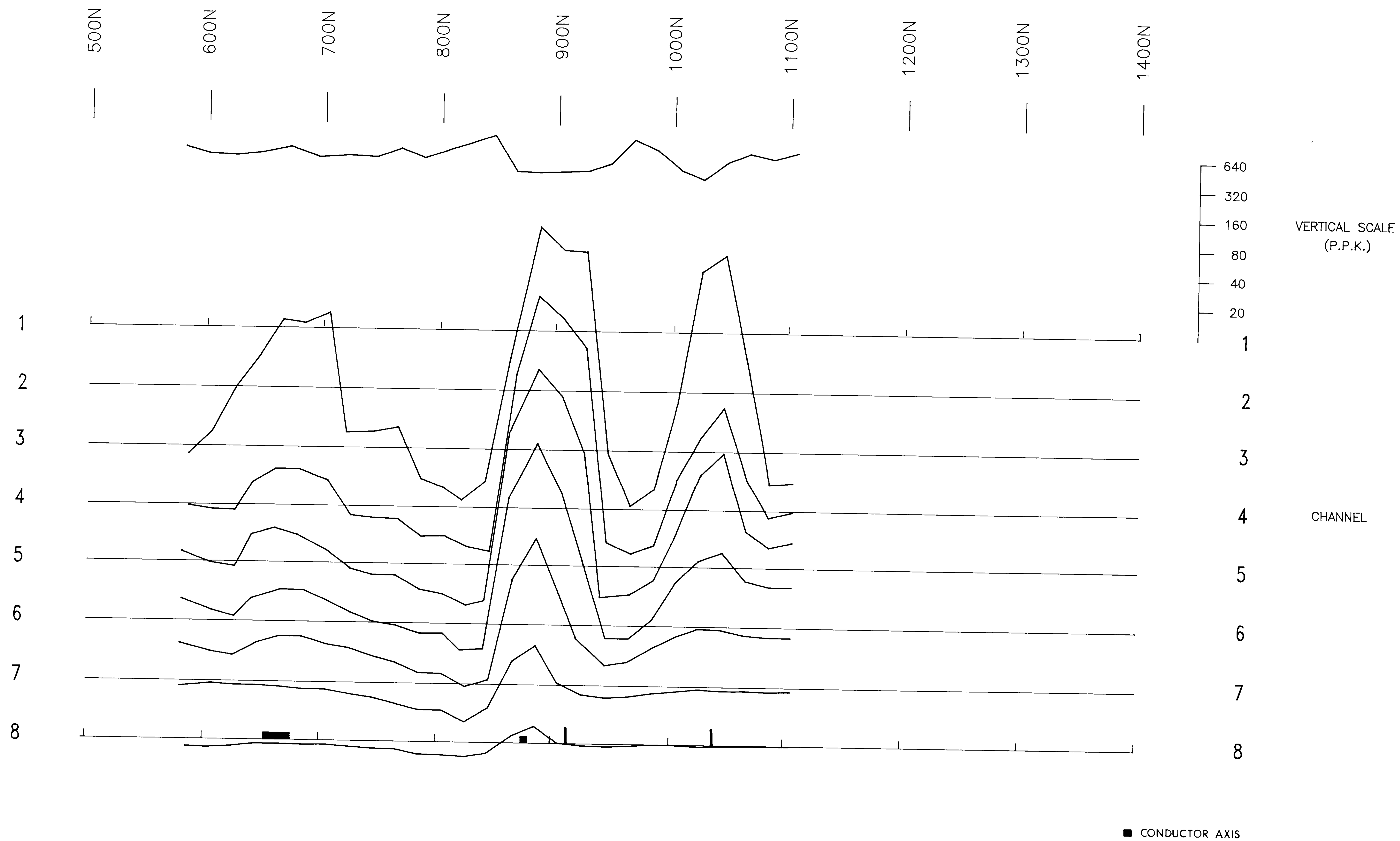
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2460E

YUKON TERRITORY

SCALE 1:2500 | DATE 10/88

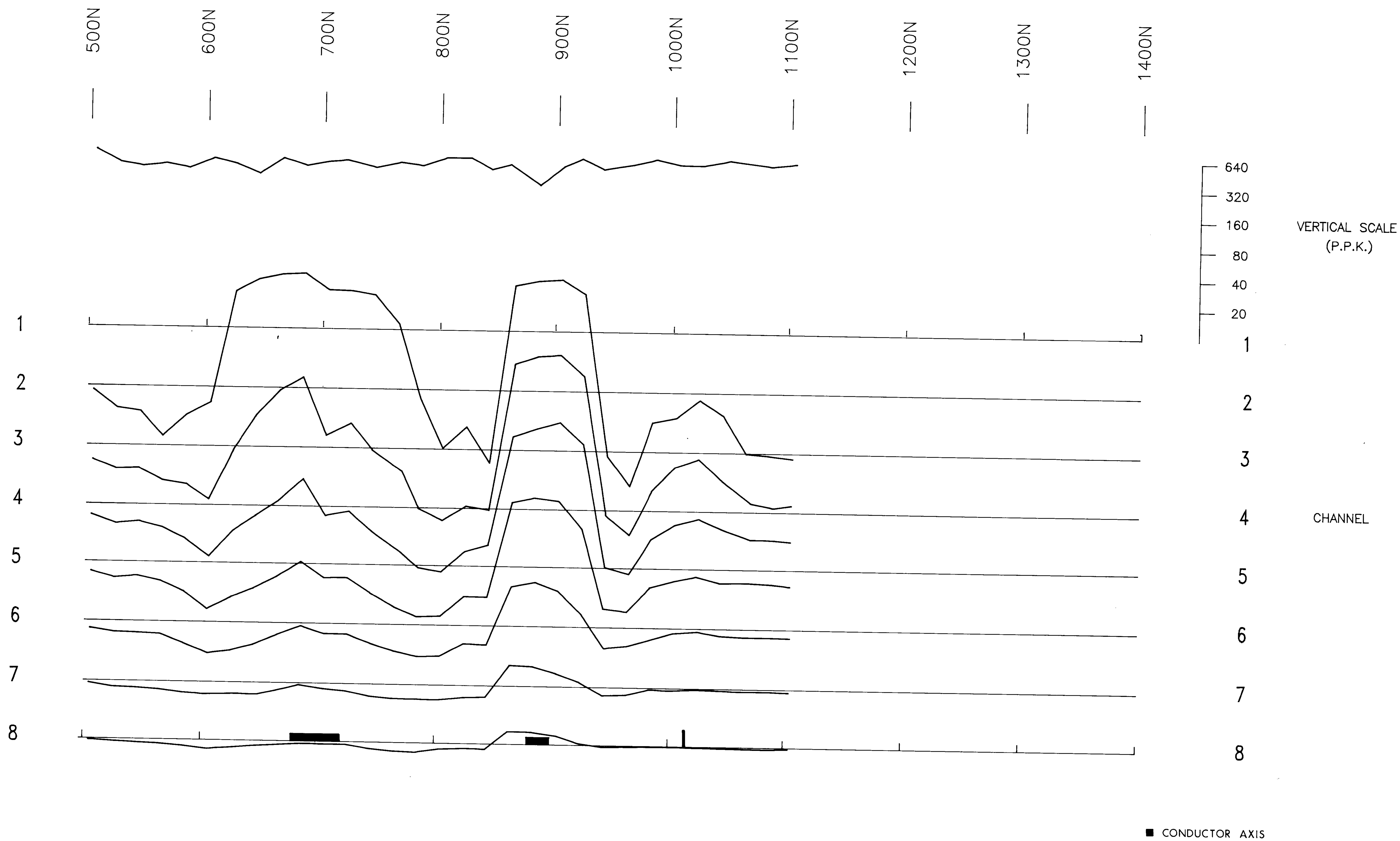
COIL SEP. 80m | TIME BASE 10ms

SURVEY BY WK/SK | BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2500E

YUKON TERRITORY

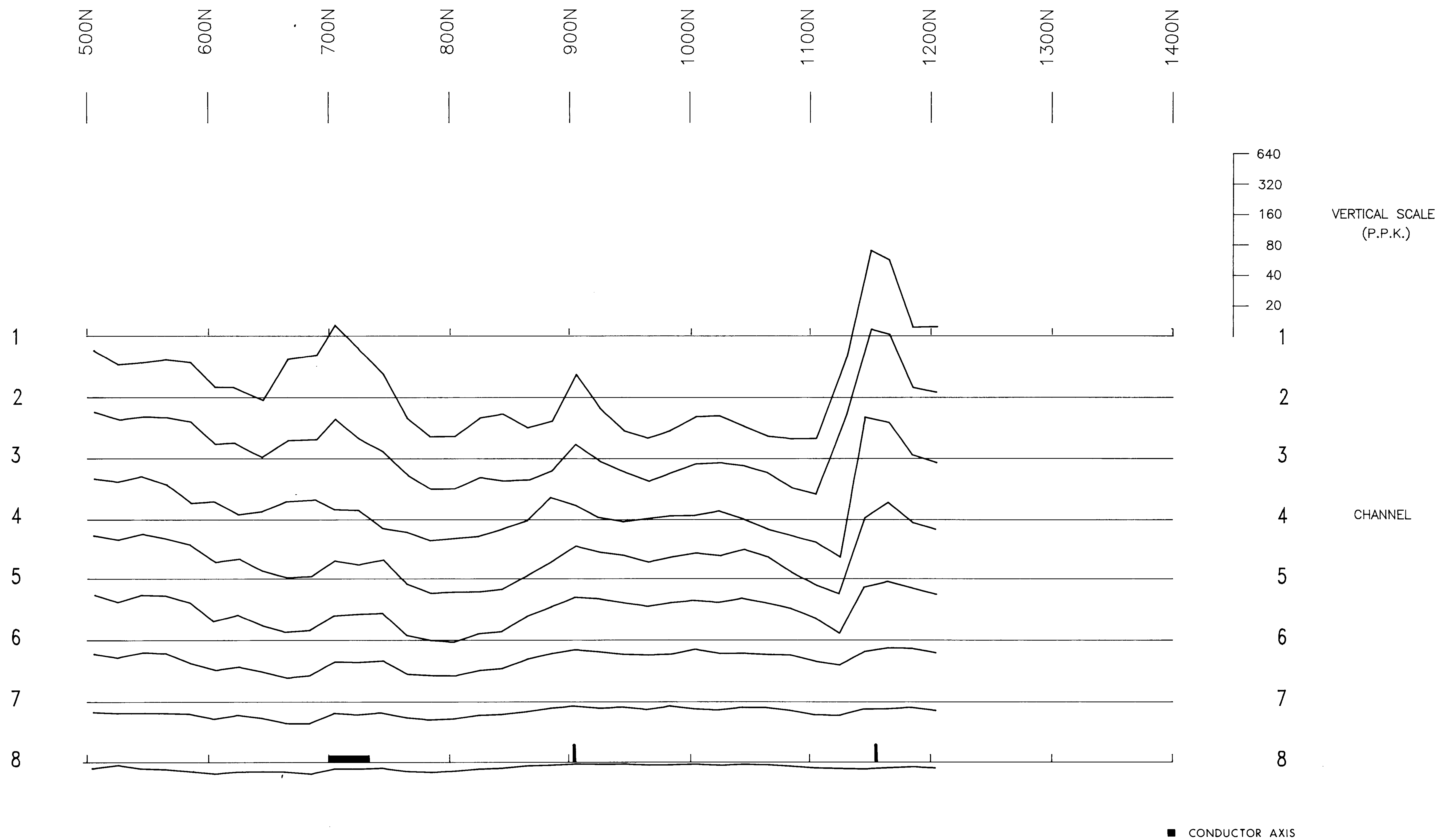
SCALE 1:2500 | DATE 10/88

COIL SEP. 80m | TIME BASE 10ms

SURVEY BY WK/SK | BASELINE 90° Az.

NORANDA EXPLORATION

092682



MARG PROPERTY

P.E.M. SURVEY

L2600E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

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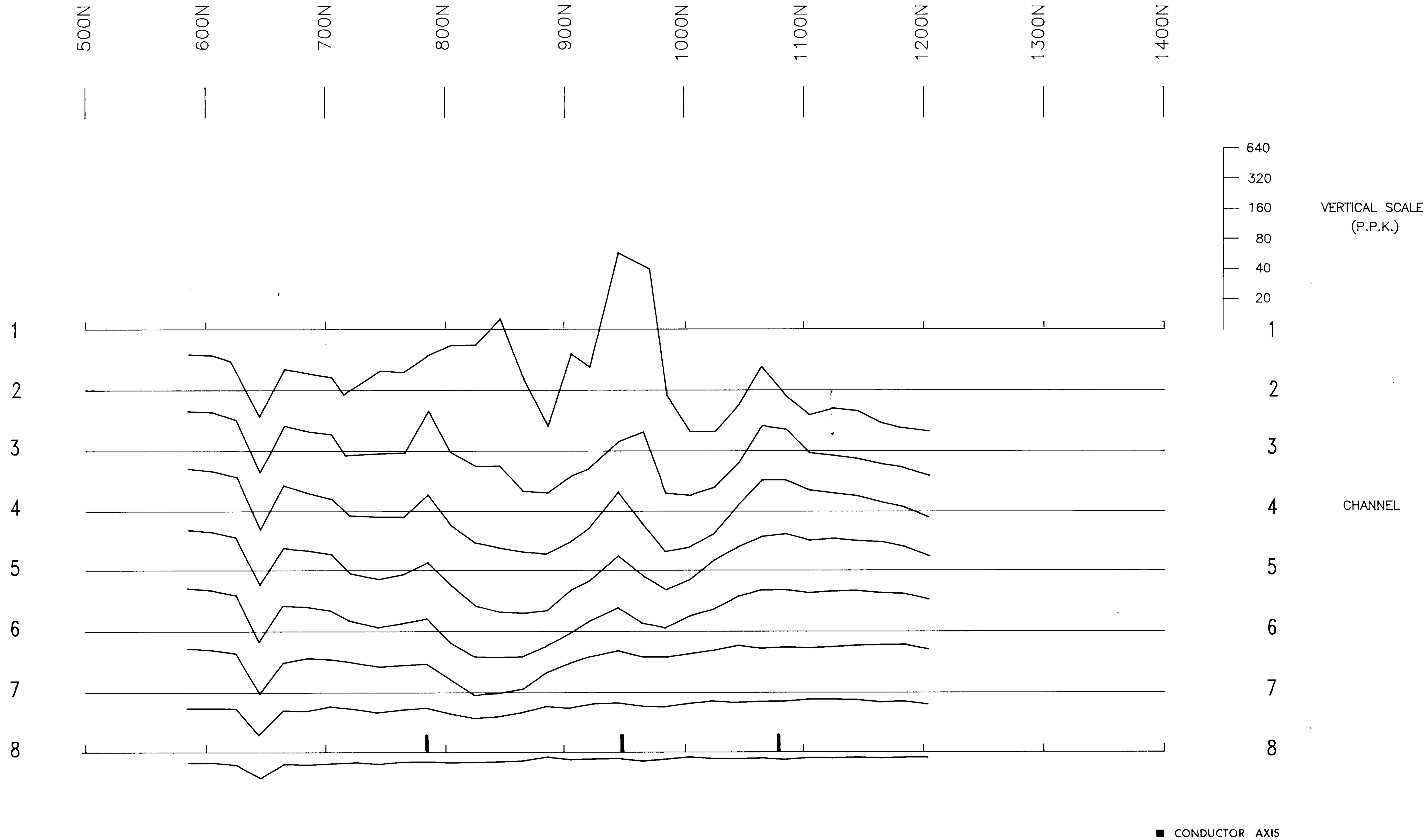


MARG PROPERTY

P.E.M. SURVEY

L2700E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

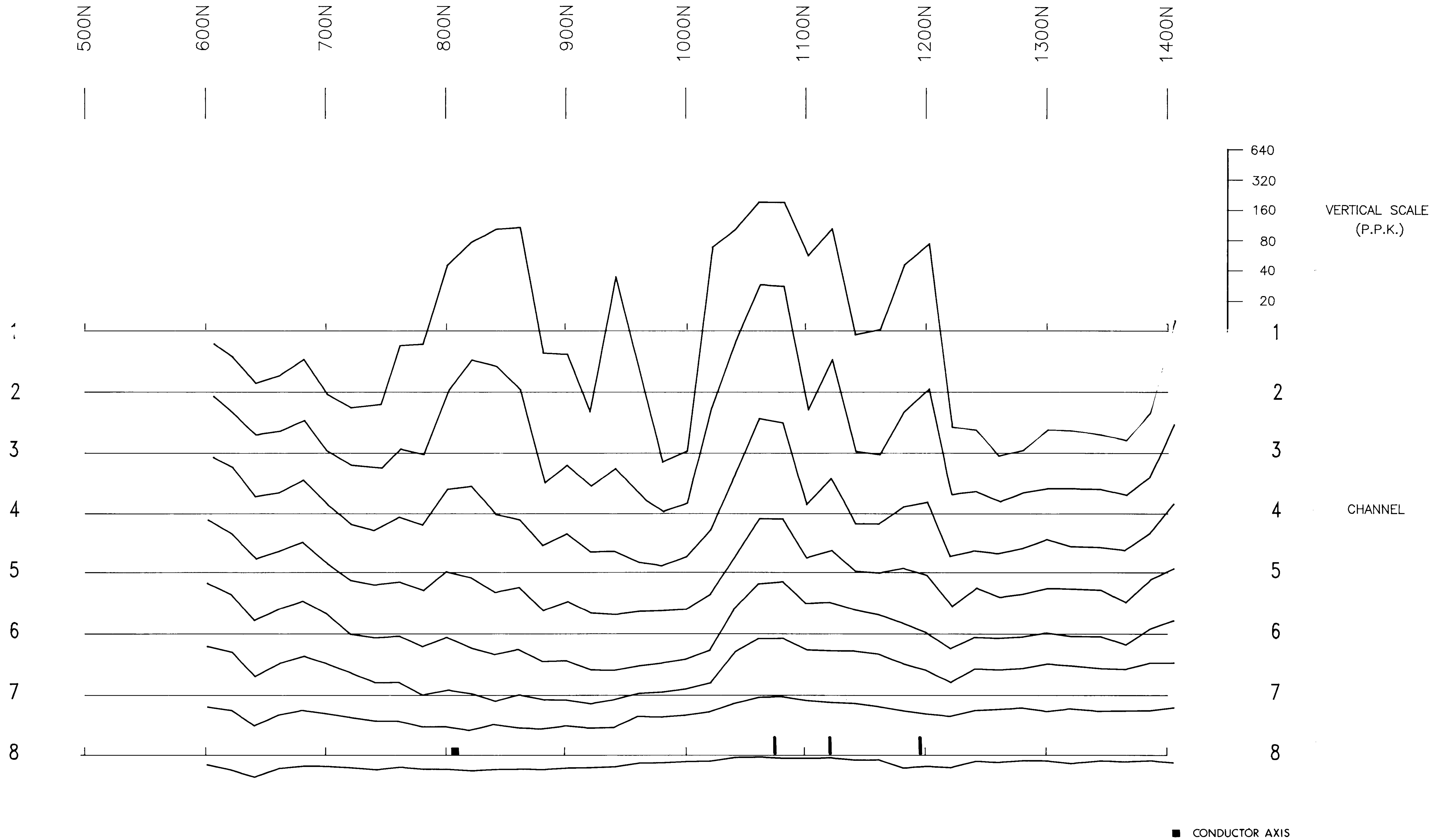
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2800E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

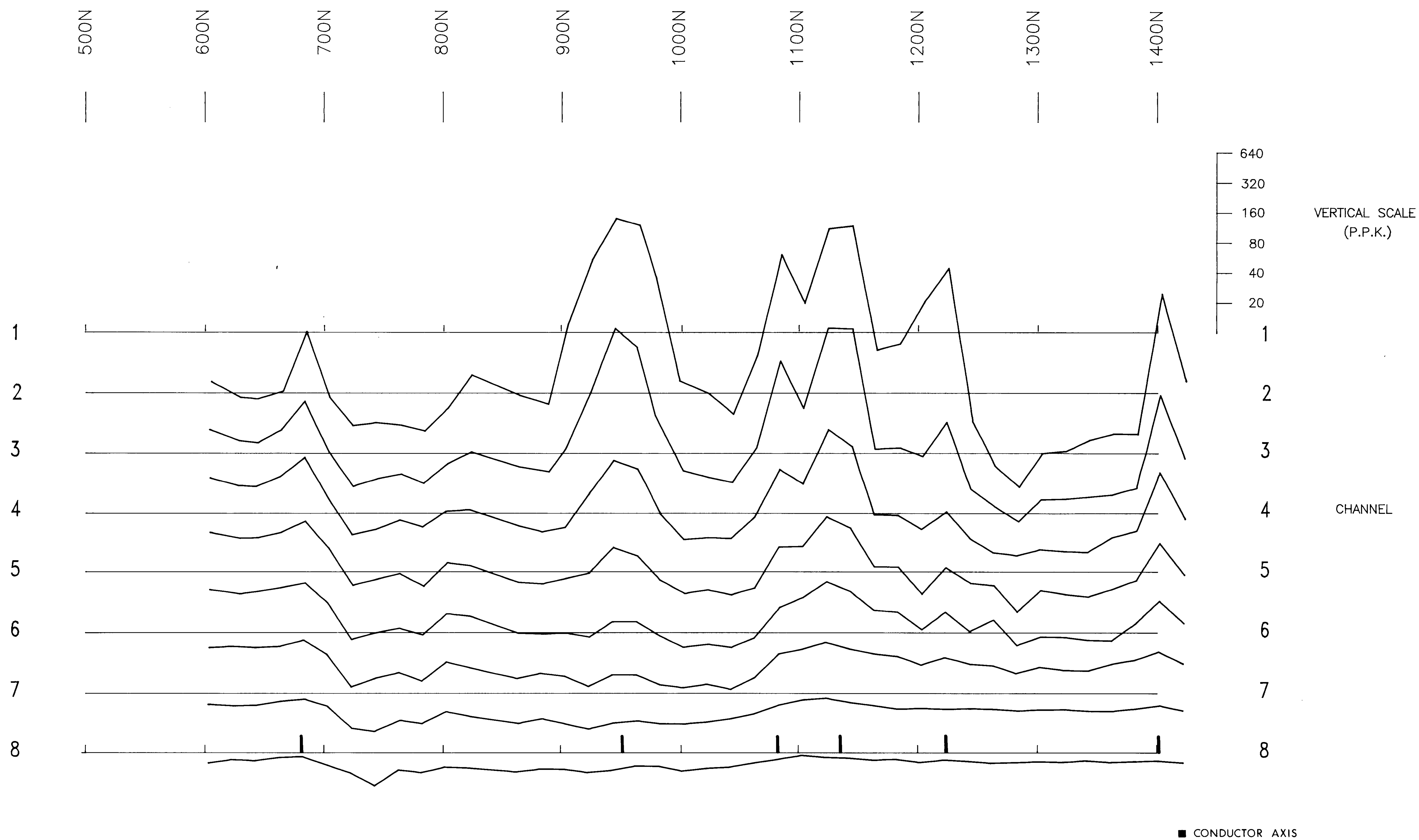
COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682



MARG PROPERTY

P.E.M. SURVEY

L2900E

YUKON TERRITORY

SCALE 1:2500 DATE 10/88

COIL SEP. 80m TIME BASE 10ms

SURVEY BY WK/SK BASELINE 90° Az.

NORANDA EXPLORATION

noranda

092682

APPENDIX H

PRELIMINARY ENVIRONMENTAL STUDIES

December 7, 1988

by W.E. Dunford,

Norecol Environmental Consultants Ltd.

NORECOL
ENVIRONMENTAL CONSULTANTS LTD.
Suite 600, 1281 West Georgia Street
Vancouver, British Columbia
Canada V6E 3J7
Telephone: (604) 682-2291
Fax: (604) 682-8323

December 7, 1988
File: 1-081-03.01

Mr. R. Cathro
Archer Cathro and Associates Ltd.
#1016 - 510 West Hastings Street
Vancouver, B.C.
V6B 1L8

Dear Mr. Cathro,

RE: PRELIMINARY ENVIRONMENTAL STUDIES AT THE MARG PROPERTY, YUKON

As per our proposal dated September 12, 1988, Norecol Environmental Consultants visited the Marg Property on September 14 to 15, to collect water samples, identify environmental concerns, and to examine the hydrology of the area. This letter summarizes our findings of that trip, and includes the complete analytical results from the collected water quality samples.

Trip Summary

Mr. Bill Dunford of Norecol drove from Whitehorse to Keno City on Wednesday, September 14, and was picked up by Dave Reid (Trans North Air) at 17:10. I previewed the sampling locations on the way into the camp. Staff at the camp were interviewed with regard to wildlife and fisheries that evening. Water quality samples and hydrologic measurements were collected at five sites on Thursday, September 15. After returning to camp to pack up the gear, I was flown back to Keno City, arriving about 17:00. I then drove back to Whitehorse, checking into the Regina Hotel at 22:00. Water samples were then filtered and acidified and prepared for shipping. I returned to Vancouver with the water samples on Friday, September 16.

Water Quality and Hydrology

Five locations were sampled for water quality, as shown on the attached Figure 1. The sites are listed as follows, along with the estimated flow at each location:

	Site	Estimated Discharge (September 15)
CA-1	Cansup Creek, near camp	0.004 m^3/s
M-1	Marg Creek	0.027 m^3/s
CO-2	Copp Creek, near mouth	0.224 m^3/s
KLT-1	Keno Ladue Tributary #1	0.092 m^3/s
KLT-2	Keno Ladue Tributary #2	0.032 m^3/s

Cansup Creek and Marg Creek both originate on the northwest slope of the Marg property, and drain into Copp Creek. Copp Creek flows into an unnamed creek that we are calling Lasha Creek, and this creek is a tributary of the Keno Ladue River. Flows in Cansup Creek were reduced, due to drill water being pumped out of the creek about 500 m upstream of the sampling site.

On the southeasterly slope of the Marg property, two small creeks originate on the steep slopes and flow into the flat valley bottom of the Keno Ladue River. These two creeks (KLT-1 and KLT-2) were sampled upstream of where they enter small ponds. These ponds are common in the valley bottom, and generally intercept slope drainage prior to entry to the Keno Ladue River. The Keno Ladue is a tributary of the Stewart River.

The water quality results from the analysis of samples collected at the five sites are shown on the attached tables. In general, the water quality was quite good with respect to standards for the protection of aquatic life, since none of the metal levels exceeded the guidelines. Total metal levels and dissolved metal levels were low in all five water samples, possibly reflecting the low levels of suspended solids in the runoff at this time of year. The runoff from the south slope of the Patterson range, as indicated by samples KLT-1 and KLT-2, was moderately hard water, with a higher buffering capacity (total alkalinity 108 to 141 mg/l). The Copp Creek drainage (CA-1, M-1, and CO-2) has softer water with lower alkalinity (20 to 55 mg/l $CaCO_3$) and thus lower buffering capacity. No anaomalous values were identified for any of the water quality parameters.

Wildlife and Fisheries Considerations

Fur bearing mammals observed in the area of the Marg property include marmots, wolverines, ermine, grizzly bear, black bear, and moose. The larger mammals have been observed primarily at elevations lower than the camp (4500 ft). The area is not known for sheep, although one ram was observed by the helicopter pilot in 1988 (Dave Reid, personal communication). Four bull moose were observed near Barry Lake throughout the summer, although two were reportedly shot by hunters in early September. Moose and grizzly sign was common along Lasha Creek and in the Keno Ladue valley.

Fisheries values are generally unknown for the area. It is unlikely that there are fish present in Cansup Creek and Marg Creek due to the high gradient. Grayling could occur in Lasha Creek. There are no known salmon spawning or rearing areas in the Keno Ladue River, but chinook salmon are reported to spawn in the Beaver River, which is the next drainage upstream of the Keno Ladue on the Stewart River system. The Department of Fisheries and Oceans has no fisheries information on the Keno Ladue, although they expect whitefish, lake trout, and grayling to be resident in the system.

Summary

Overall, our first observations of the Marg Property, along with a single set of water quality data, do NOT indicate that there are significant or unusual environmental sensitivities associated with the Marg property. Obviously, the potential of acid generation of the tailings will need to be addressed, should the development proceed. The location of the mine on the north or south side of the property will determine the sensitivity of the receiving water body, with the south side possibly providing a greater buffering capacity with respect to acid generation. The fisheries values of the Keno Ladue are presently unknown, and will need to be studied during the next phase of work.

NORECOL

Norecol Environmental Consultants is pleased to be conducting the environmental work for Archer Cathro on this very interesting property. I was also very pleased with the cooperation and assistance of the camp manager, staff, and helicopter pilot during this brief visit to the Marg camp site. Should you have any questions concerning this report, do not hesitate to call.

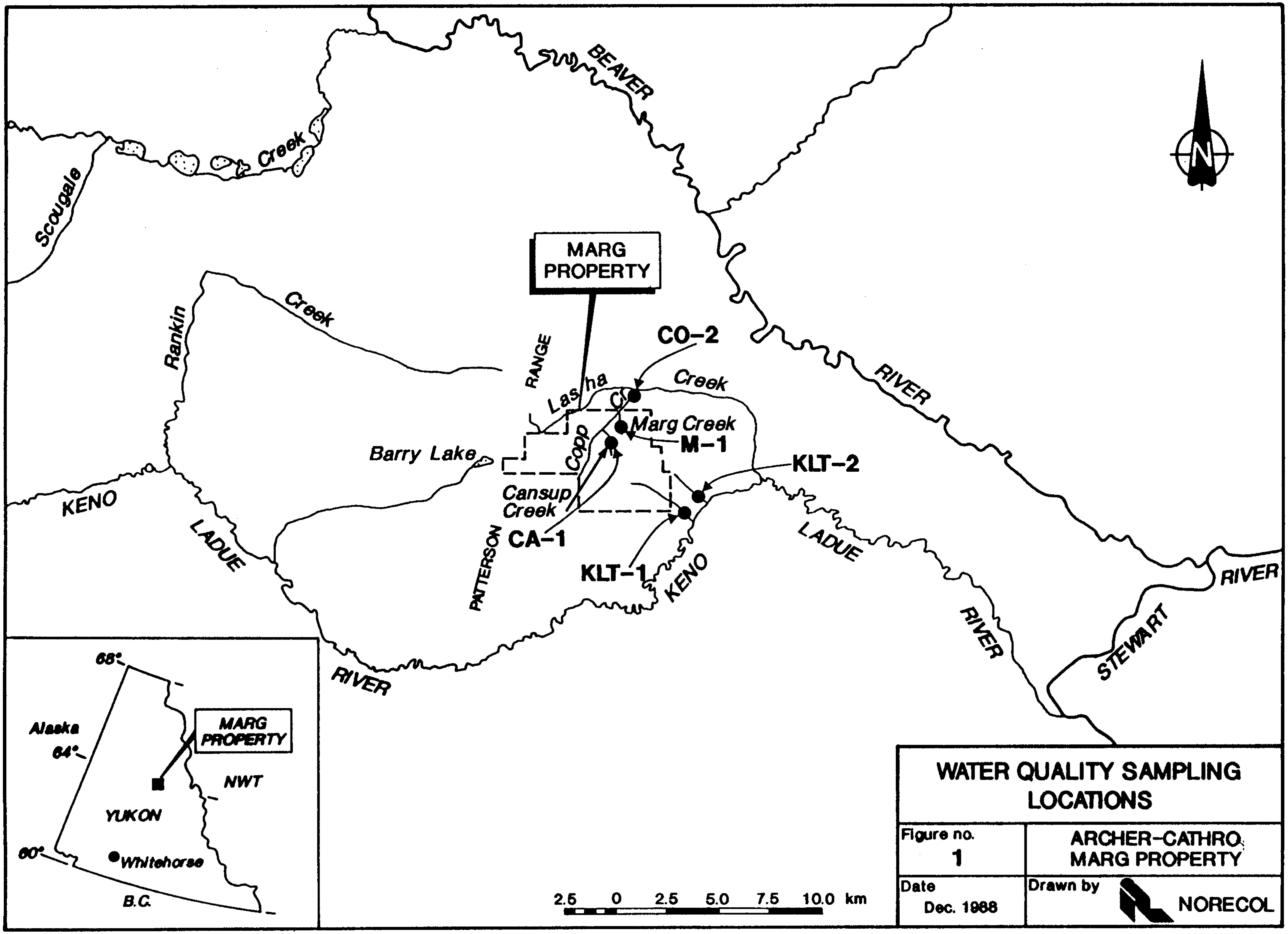
Yours truly,

NORECOL ENVIRONMENTAL CONSULTANTS LTD.

W. E. Dunford

W.E. Dunford
Senior Project Manager

Attachments



WATER QUALITY SAMPLING LOCATIONS

Figure no. 1	ARCHER-CATHRO MARG PROPERTY
Date Dec. 1988	Drawn by NORECOL

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: M1

ANALYTICAL PARAMETER	SEPT.15/88
pH	7.4
Alkalinity (mg $CaCO_3$/L)	20
Turbidity (NTU)	0.4
Conductance (µmhos/cm)	50
Total Solids (mg/L)	44
Suspended Solids (mg/L)	<1
EDTA-Hardness (mg $CaCO_3$/L)	28
Sulfate (mg/L)	11
Ammonia (mg N/L)	<0.005
Nitrate (mg N/L)	0.041
Nitrite (mg N/L)	<0.002
Total Phosphorus (mg P/L)	0.015
Total Cyanide (mg/L)	<0.001
TOTAL METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.046
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	0.0005
Fe	0.014
Hg (µg/L)	<0.05
Mn	0.0012
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0011
DISSOLVED METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.030
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	<0.0005
Fe	0.010
Mn	0.0012
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0011

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: CA-1

ANALYTICAL PARAMETER	SEPT.15/88
pH	7.8
Alkalinity (mg $CaCO_3$/L)	55
Turbidity (NTU)	0.4
Conductance (µmhos/cm)	114
Total Solids (mg/L)	86
Suspended Solids (mg/L)	<1
EDTA-Hardness (mg $CaCO_3$/L)	71
Sulfate (mg/L)	14
Ammonia (mg N/L)	<0.005
Nitrate (mg N/L)	<0.005
Nitrite (mg N/L)	<0.002
Total Phosphorus (mg P/L)	0.005
Total Cyanide (mg/L)	<0.001
TOTAL METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.042
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	<0.0005
Fe	0.006
Hg (µg/L)	<0.05
Mn	<0.001
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0006
DISSOLVED METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.034
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	<0.0005
Fe	0.006
Mn	<0.001
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0006

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: CO-2

ANALYTICAL PARAMETER	SEPT.15/88
pH	7.4
Alkalinity (mg $CaCO_3$/L)	43
Turbidity (NTU)	0.4
Conductance (µmhos/cm)	143
Total Solids (mg/L)	124
Suspended Solids (mg/L)	<1
EDTA-Hardness (mg $CaCO_3$/L)	88
Sulfate (mg/L)	41
Ammonia (mg N/L)	<0.005
Nitrate (mg N/L)	0.039
Nitrite (mg N/L)	<0.002
Total Phosphorus (mg P/L)	0.008
Total Cyanide (mg/L)	<0.001
TOTAL METALS: (mg/L)	
Ag	<0.0002
Al	0.017
As	<0.001
Ba	0.027
Cd	0.0003
Co	<0.001
Cr	<0.001
Cu	0.0019
Fe	0.037
Hg (µg/L)	<0.05
Mn	0.0089
Mo	<0.005
Ni	0.003
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.015
DISSOLVED METALS: (mg/L)	
Ag	<0.0002
Al	0.013
As	<0.001
Ba	0.024
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	0.0015
Fe	0.027
Mn	0.0087
Mo	<0.005
Ni	0.003
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.015

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: KLT-1

ANALYTICAL PARAMETER	SEPT.15/88
pH	7.8
Alkalinity (mg $CaCO_3$/L)	108
Turbidity (NTU)	0.6
Conductance (µmhos/cm)	241
Total Solids (mg/L)	194
Suspended Solids (mg/L)	<1
EDTA-Hardness (mg $CaCO_3$/L)	154
Sulfate (mg/L)	41
Ammonia (mg N/L)	<0.005
Nitrate (mg N/L)	0.100
Nitrite (mg N/L)	<0.002
Total Phosphorus (mg P/L)	0.020
Total Cyanide (mg/L)	<0.001
TOTAL METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.026
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	0.0007
Fe	0.09
Hg (µg/L)	<0.05
Mn	0.0092
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0010
DISSOLVED METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.023
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	<0.0005
Fe	0.05
Mn	0.0084
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0009

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: KLT-2

ANALYTICAL PARAMETER	SEPT.15/88
pH	8.0
Alkalinity (mg $CaCO_3$/L)	141
Turbidity (NTU)	1.6
Conductance (μmhos/cm)	288
Total Solids (mg/L)	223
Suspended Solids (mg/L)	4
EDTA-Hardness (mg $CaCO_3$/L)	193
Sulfate (mg/L)	45
Ammonia (mg N/L)	<0.005
Nitrate (mg N/L)	0.061
Nitrite (mg N/L)	<0.002
Total Phosphorus (mg P/L)	0.017
Total Cyanide (mg/L)	<0.001
TOTAL METALS: (mg/L)	
Ag	<0.0002
Al	0.05
As	<0.001
Ba	0.07
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	0.0009
Fe	0.10
Hg (μg/L)	<0.05
Mn	0.0039
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0011
DISSOLVED METALS: (mg/L)	
Ag	<0.0002
Al	<0.01
As	<0.001
Ba	0.06
Cd	<0.0002
Co	<0.001
Cr	<0.001
Cu	0.0005
Fe	0.021
Mn	<0.001
Mo	<0.005
Ni	<0.002
Pb	<0.001
Sb	<0.002
Se	<0.001
Zn	0.0009

APPENDIX I

PETROGRAPHIC REPORT AND DRILL CORE SPECIMENS,

December 19 and 30, 1988

by Dr. J.F. Harris

Vancouver Petrographics Ltd.

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph. D. Geologist

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Report for: M.P. Phillips,
Archer Cathro & Associates Ltd.,
P.O. Box 4127,
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WHITE HORSE, Y.T.,
Y1A 3S9

Invoice 7804

December 19th, 1988

Samples:

16 core samples (host rocks) from the Marg Property, for thin sectioning and petrographic descriptions.

Samples are numbered as follows:

Sample No	Hole No	Depth (m.)
1	88-3	31.5
2	88-3	49.35
3	88-3	53.0
4	88-3	71.5
5	88-5	12.9
6	88-5	15.2
7	88-5	37.15
8	88-5	43.1
9	88-5	49.6
10	88-5	52.9
11	88-5	60.55
12	88-5	85.55
13	88-6	18.55
14	88-6	50.2
15	88-11	136.9
16	88-11	160.0

Summary:

This is a suite of fine-grained rocks of metasedimentary aspect.

Where undisturbed their textures are strongly laminated and, when rich in micas, distinctly schistose. Some samples show various degrees of deformation and disruption of the laminar texture.

The mineralogy of these rocks is notably simple. They are composed of various proportions of quartz, sericite, chlorite, carbonate, and a black opaque component which is probably carbonaceous.

This assemblage is consistent with greenschist facies metamorphism. The high degree of recrystallization of quartz throughout, and the strongly foliaceous character of the white mica in the more argillaceous members of the suite favours their classification as schists rather than phyllites. However, in deference to exisiting field usage, the terminology 'phyllite' has been retained. For the same reason the white mica is referred to as 'muscovite' in the rock names; this is synonymous with sericite in the descriptions.

The black pigmentation is referred to generally as 'carbon'. It consistently shows minutely microgranular rather than flaky form, and may not be sufficiently crystalline to merit the name graphite. It possibly includes some micron-sized sulfides. Improved characterization of this component could be obtained by chemical analyses, X-ray diffraction, and reflected light microscopy on polished thin sections.

The rocks of the suite can be classified in the following, somewhat gradational, compositional groups:

a) Carbonaceous

i)	Quartz-carbon (minor sericite):	Samples 2, 4, 7, 16
ii)	Quartz-sericite-carbon:	Sample 8
iii)	Sericite-carbon (minor quartz):	Sample 6

b) Chloritic

i)	Quartz-sericite-chlorite-carbon:	Sample 5
ii)	Quartz-chlorite:	Sample 10
iii)	Quartz-chlorite-carbonate:	Sample 12

c) Dolomitic

i)	Carbonate (minor quartz, sericite):	Samples 13, 14

d) Muscovitic

i)	Quartz-sericite (minor carbonate):	Samples 1, 3, 9, 11
ii)	Sericite (minor quartz):	Sample 15

The degree of deformation ranges from essentially undisturbed laminar, through micro-crenulation of micaceous/carbonaceous laminae, to lensy phyllonitic shear structures, to granulated sub-mylonitic. This is indicated in the individual descriptions.

Some of the rocks contain disseminated pyrite (and traces of sphalerite). This shows a concordant, syngenetic/diagenetic mode.

The origin of these rocks is not definitively established by the present study. The notable lack of albite or epidote suggests a lack of volcanic-pyroclastic influences. The abundance of quartz in intimate juxtaposition with argillaceous and carbonaceous (euxinic?) material suggests that it may be derived from the recrystallization of chemically sedimented chert, rather than being a silty/sandy component. No remnant clastic textures are ever seen in the quartz.

Individual petrographic descriptions are attached.

J.F. Harris Ph.D.

(phone: (604) 929-5867)

SAMPLE 1: (88-3 31.5m)

MUSCOVITE-QUARTZ PHYLLITE

Estimated mode

Quartz	38
Sericite	52
Carbonate	7
Chlorite	trace
Monazite(?)	trace
Pyrite	3
Sphalerite	trace

This sample shows a strong, somewhat lensy, but apparently undeformed laminar texture.

In thin section it is found to be of simple mineralogy, consisting of strongly foliated, compact sericite, alternating sharply, on a scale of 0.5 - 5.0mm, with laminae of granular quartz with accessory carbonate.

The sericite bands commonly contain disseminated pyrite as concordant trains of minute euhedra and tiny clumps, 5 - 30 microns in size, emphasizing the strong schistose foliation.

The quartzose laminae are mosaics of polygonal to somewhat flattened grains, 0.05 - 0.2mm in size. Some of them have evenly scattered clumps of intergrown carbonate of similar grain size. The carbonate is unreactive to dilute acid, and is probably dolomite.

Some quartz laminae contain relatively abundant pyrite as grains to 0.2mm or more and aggregated clumps, notably coarser than in the sericite. The pyrite is most strongly developed in thin intercalated lenses of quartz within predominantly sericitic zones. Most of the thicker quartz laminae appear to be devoid of pyrite.

Rare traces of dark sphalerite and of chlorite are associated with the coarser pyrite grains. Occasional individual disseminated granules of a high relief, high birefringent mineral (monazite?) are also seen.

The present fabric of this rock is totally recrystallized and of metamorphic origin. It probably developed from an original argillaceous sediment with cherty intercalations.

SAMPLE 2: 88-3 49.35m.
CARBONACEOUS QUARTZ LAMINITE (META-CHERT?)

Estimated mode

Quartz	54
Sericite	4
Chlorite	trace
Carbon	40
Pyrite	2

This rock shows a marked lensy lamination.

In thin section it is seen to consist predominantly of a recrystallized aggregate of quartz, of grain size 30 - 200 microns. This fabric ranges from polygonal mosaics to strings of strongly flattened grains. These two forms, and variants of different grain size, occur as intimately intercalated, en-echelon laminae and lenses, 0.2 - 2.0mm in thickness.

The other principal component is minutely fine-grained (sub-micron sized) black opaque material - presumably of carbonaceous composition. This occurs as anastomosing wisps, 10 - 30 microns thick, concentrating to form more or less compact laminae, 0.5 - 2.0mm in thickness.

The carbonaceous zones alternate with predominantly quartzose laminae throughout the rock, the proportion of the two components being approximately 50/50. The quartzose zones generally contain more or less sparsely dispersed threads of carbon, and the carbonaceous zones commonly include intergrown minute flakes of sericite.

Pyrite occurs as individual, disseminated euhedra, 10 - 100 microns (rarely to 200 microns) in size. It tends to concentrate in, and on the contacts of, certain carbonaceous laminae, but is also seen (generally as relatively coarser grains) sporadically distributed in some of the quartzose zones. (see cut-off block).

This rock is probably the product of strong compaction and metamorphic recrystallization of sedimentary chert with strongly carbonaceous, argillic intercalations.

SAMPLE 3: 88-3 53.0m.

QUARTZ-MUSCOVITE PHYLLITE

Estimated mode

Quartz	54
Sericite	34
Carbonate	7
Carbon	1
Monazite	trace
Apatite	trace
Pyrite	4
Sphalerite	trace

This is a rock of very similar type to Sample 1, but with quartz predominant over sericite.

It consists principally of quartz, as polygonal to locally flattened mosaics, of grain size 20 - 200 microns. Scattered, coarser augen-like grains, 1 - 2mm in size, are also seen, as well as occasional elongate masses showing diffuse grain structure and clearly derived by accretive recrystallization.

Carbonate (probably of dolomitic composition) is a common accessory, as sporadic patches and lenticular network aggregates of grains, 50 - 300 microns in size, intergrown with the quartz mosaic.

Sericite forms intermittent, compact, strongly foliaceous/schistose laminae, 0.5 - 2.0mm in thickness, as well as more diffuse, anastomosing wisps, 10 - 30 microns thick, within the predominantly quartzose zones. The segregation of quartzose and sericitic laminae is less perfect than in Sample 1.

The sericitic laminae commonly contain sparse, en-echelon wisps and trains of cryptocrystalline carbonaceous matter.

Disseminated pyrite, as individual euhedra, 10 - 200 microns in size and often clumped, is relatively abundant. It shows a strong preferential association with the wispy intercalations of sericite. It is also seen, as scattered rather coarse clumps, in quartz, though the majority of the more homogenous quartz laminae - especially those with substantial intergrown dolomite - are devoid of pyrite.

Rare traces of sphalerite are seen associated with the coarser pyrite. Occasional, randomly disseminated granules of monazite and apatite are also seen.

SAMPLE 4: 88-3 71.5m.

CARBONACEOUS QUARTZ-MUSCOVITE PHYLLITE

Estimated mode

Quartz	60
Sericite	12
Carbon	23
Carbonate	1
Chlorite	1
Pyrite	3

This is another rock of similar general type to the previous samples, but distinguished by crenulate deformation, micro-structural disruption and local discordant intermingling.

It is similar in composition to Sample 2, but has a somewhat higher sericite content, is predominantly finer-grained, and shows much more intimate, small-scale filmy interlamination of the quartz and carbonaceous/sericitic components, resulting in the overall dark appearance.

The quartz with abundant wisps of sericite and carbon, tends to be fine-grained (in the range 10 - 100 microns). Coarser quartz (grains to 200 microns) occurs as a few discrete lenses and laminae, sometimes showing strongly flattened, platy grain structure.

Disseminated pyrite shows no apparent preference for the carbonaceous wisps but, rather, occurs as randomly scattered, relatively coarse, individual euhedra up to 0.5mm in size. These commonly show the development of pressure-shadow patches of fibrous chert and flaky chlorite.

It is unclear to what extent the deformation in this rock is a relict soft sediment feature, as opposed to tectonic in nature. The crude parallelism of microfold axes and microshears possibly represents a wide-spaced, incipient cleavage development.

SAMPLE 5: 88-5 12.9m.

CARBONACEOUS MUSCOVITE-CHLORITE PHYLLITE

Estimated mode

Quartz	17
Sericite	37
Chlorite	30
Carbon	10
Dolomite	5
Siderite	1
Pyrite	trace

This is another finely laminated, strongly foliated rock of metasedimentary aspect.

It differs from previous samples of the suite in containing major proportions of chlorite. It is made up largely of thin (20 - 200 micron) intercalations of sericite and compact, fine-grained, foliaceous chlorite, with abundant, intergranular, concordant films or wisps of opaque carbonaceous matter.

This assemblage shows sinuous deformation and local crenulation. Some discordant, porphyroblastic recrystallization of chlorite is also seen.

Quartz forms a few, clearly segregated, mosaic-textured pods and laminae, sometimes with intergrown accessory dolomite. There are also some zones of intimately interlaminated quartz and chlorite.

A brown, notably high-relief form of carbonate (believed to be siderite) occurs as a few thin, discrete laminae in the argillaceous zones.

This rock is notably lacking in disseminated pyrite.

The genetic significance of the chlorite in this rock is uncertain. It appears to exist in equilibrium with the intercalated sericite, and probably reflects a primary compositional differentiation. Possibly it originated as interlayers of Mg-Fe smectite (of exhalative affinities: note also the siderite), in accumulating muds and minor chert.

There is no textural evidence to relate the chlorite to a direct volcanic or tuffaceous protolith.

SAMPLE 6: 88-5 15.2m.

CARBONACEOUS MUSCOVITE PHYLLITE

Estimated mode

Quartz	12
Sericite	45
Carbon	40
Pyrite	1
Limonite	2

This sample is a variant of the quartz-sericite-carbon assemblages typifying some previous rocks of the suite. This one consists predominantly of minutely interleaved foliae of very fine-grained sericite with abundant films of carbonaceous matter from a few microns to 100 microns or so in thickness.

Quartz occurs, in very fine-grained form, as minor accessory wisps in the carbonaceous argillite, and is also seen as a few discrete lenses and laminae of granular mosaic (grain size 20 - 100 microns).

One of these quartzose laminae contains rather abundant clusters of euhedral pyrite, partly altered to limonite.

Strong crenulate deformation and apparent isoclinal microfolding is recognizable throughout.

Certain thin, concordant laminae (of more ferruginous original composition?) in the sericitic matrix show impregnation by translucent brown limonite. Crumpling of these distinctive zones further delineates the strong internal microdeformation.

This rock appears devoid of accessory carbonate.

SAMPLE 7: 88-5 37.15m.

CARBONACEOUS QUARTZ PHYLLONITE

Estimated mode

Quartz	52
Sericite	3
Carbon	44
Chlorite	1
Pyrite	trace

This is a rock of similar composition to Samples 2 and 4.

It consists essentially of quartz, with minutely fine-grained, opaque, carbonaceous material in intimate, wispy/laminar intergrowth.

The quartz occurs mainly as mosaic aggregates of anhedral, sub-polygonal to locally flattened grains, 20 - 100 microns in size. There are also a few, more massive, carbon-free, lensy segregations of quartz of coarser average grain size (50 - 300 microns).

Very minor accessory sericite occurs as slender, well-oriented flakes in the quartz, and intergrown with some of the carbonaceous streaks. Traces of chlorite are also seen in the latter mode.

The rock shows strong, small-scale deformation throughout. Though partially obscured by recrystallization of the quartz, the microfolding - often of a crenulate to isoclinal character - is clearly delineated by the carbonaceous wisps. The resultant structure is of phyllonitic aspect, with remobilized/recrystallized lenses of quartz outlined by carbon-coated microshear surfaces.

SAMPLE 8: 88-5 43.1m.
CARBONACEOUS QUARTZ-MUSCOVITE PHYLLITE

Estimated mode

Quartz	50
Sericite	26
Carbon	22
Pyrite	2

Though similar in general appearance to Sample 7, this rock has a higher content of sericite. It resembles Sample 4 in composition and in microstructural style, showing small-scale crumpling of otherwise relatively undisturbed laminae.

It consists of rapid alternations, on the scale 0.5 - 2.0mm, of quartzose laminae composed of flattened quartz mosaics, and laminae made up of close-spaced, crenulate wisps of intergrown carbon and foliaceous sericite - sometimes with minor interlaminar quartz.

The quartz in this rock is relatively equigranular, in the range 20 - 100 microns.

The texture gives the impression of recrystallization under conditions of strong compaction, in which minor lateral stress was taken up by the less competent carbonaceous/argillaceous interlayers.

Disseminated pyrite occurs as sporadic, randomly distributed, relatively coarse, individual euhedra, 0.2 - 1.0mm in size. These appear superimposed on the host rock fabric, which shows no divergence of foliation around them.

SAMPLE 9: 88-5 49.6m.

QUARTZ-MUSCOVITE PHYLLITE

Estimated mode

Quartz	67
Sericite	29
Carbonate	3
Carbonaceous dust	1
Pyrite	trace
Limonite	trace

This is a quartz-sericite rock of somewhat heterogenous texture.

It consists predominantly of quartz, as a granoblastic aggregate of polygonal form (not showing notable flattening) in the grain size range 30 - 150 microns.

Sericite forms irregular, streaky zones and rather diffuse sub-parallel wisps through the dominant quartz matrix. Traces of micron-sized opaque (carbonaceous?) dust are associated with the sericitic schlieren. This very minor dispersed component of opaque material causes the sericitic wisps to appear quite dark - hence, presumably, prompting your field naming of this rock as 'carbonaceous'. In fact it is one of the less carbonaceous rocks of the suite.

The present distribution of the sericite appears to be defined largely by a wide-spaced, fracture-type or axial plane cleavage. No trace of this deformation is recognizable in the evenly recrystallized quartz.

Dolomitic carbonate is a minor associate of the quartz, as sporadic elongate clumps of poikiloblastic grains sieved with quartz inclusions.

Scattered traces of fine-grained disseminated pyrite (grains 10 - 100 microns in size) occur in the sericitic zones. Some of these show diffuse limonitic staining, and it is possible that the micron-sized opaque dust - assumed to be carbonaceous - could, in fact, be sulfidic in nature.

SAMPLE 10: 88-5 52.9m.

QUARTZ-CHLORITE PHYLLITE

Estimated mode

Quartz	58
Sericite	4
Chlorite	36
Carbonate	1
Monazite	trace
Rutile	trace
Pyrite	1

This rock is of distinctively striped appearance on the macro scale. It consists of close-spaced, somewhat sinuous, light and dark laminae, on a scale of 0.5 - 1.0mm.

Quartz is the principal constituent, as a recrystallized, sub-polygonal to locally flattened mosaic of grain size 20 - 200 microns. Lenses and strings of relatively coarser grains are concordantly intergrown with the predominant finer aggregate.

The main accessory component (making up the darker streaks) is chlorite. This partly forms discrete foliaceous schlieren, 0.1 - 1.0mm in thickness, but also occurs in more dispersed form as semi-continuous wisps and oriented intergranular flakes in the quartzose mosaic.

Towards one end of the slide the micaceous laminae change, gradationally, to being composed predominantly of sericite.

A little accessory carbonate (often brownish, Fe-stained and probably ankeritic in composition) occurs as sporadic clumps in some of the purer quartzose laminae. For some reason, this appears more abundant (buff-coloured flecks) in the cut-off block than in the thin section.

Carbonaceous material is absent in this sample, and disseminated pyrite is minor. It occurs mainly as a single string of discrete euhedra in a lamina of coarser quartz with porphyroblastic chlorite flakes.

Tiny granules of high relief monazite (or zircon?) and rutile are seen, sometimes with the development of pleochroic halos in the surrounding chlorite.

SAMPLE 11: 88-5 60.55m.

QUARTZ-SERICITE CATACLASITE

Estimated mode

Quartz	50
Sericite	37
Carbonate	10
Biotite	trace
Pyrite	3

This is a rock of distinctively different appearance to previous samples of the suite. It is non-laminated and exhibits a heterogenous micro-gneissic or sub-mylonitic fabric of compact, augen-like masses mantled by foliaceous schlieren.

Compositionally it resembles Samples 1 and 3, being composed predominantly of quartz and sericite, with accessory dolomite. It is probably a strongly granulated variant of the non-carbonaceous sericite (or muscovite) phyllites.

Quartz shows a similar recrystallized mosaic texture and grain size range (30 - 200 microns) as in the other samples.

Sericite occurs in irregular and often dispersed form, ranging from complexly crumpled schlieren to swarms of vari-directional slender flakes in quartz. Another common mode is as very fine-grained intergranular networks to patches and streaks of quartz; the constituent quartz grains in this association are partially sub-rounded. These appear to be zones of microgranulation.

The more concentrated sericite schlieren also commonly include small granules of quartz which look like cataclastic remnants in zones of shearing.

The augen-like bodies or cataclasts (ranging from about 3mm down to about 0.2mm in size) are composed of granular quartz mosaics; they are outlined by, or set in a matrix of, sinuous zones of the sericite-cemented granulated quartz and foliaceous sericite schlieren.

Carbonate is a randomly scattered accessory, as small clumps in the quartz - sometimes incorporated as fragment-like inclusions in the sheared and granulated areas and micaceous shears.

Pyrite is relatively abundant (another similarity to Samples 1 and 3). It occurs as relatively coarse clumps of tiny euhedra in some of the quartzose pods, and as dense disseminations of finer euhedra and granules (down to a few microns in size) in some of the micaceous schlieren.

Sample 11: 88-5 60.55m. cont.

The 'altered', possibly talcose nature indicated in the field description is a function of the prevalence of physically weak zones of sericite-cemented fine granulation.

SAMPLE 12: 88-5 85-55m.

QUARTZ-CHLORITE-DOLOMITE ROCK

Estimated mode

Quartz	26
Sericite	3
Chlorite	53
Carbonate	18

This sample lacks the finely laminated character of most of the suite. It consists, rather, of coarsely interfingering segregations of a white and a dark component.

The latter consists essentially of compact, foliaceous, monomineralic chlorite, showing strong crenulate deformation.

The white phase is composed of quartz with accessory buff-coloured carbonate (dolomite or ankerite).

The texture of the quartzose component is totally different from the fine mosaics seen in the phyllitic rocks. It is predominantly a coarse anhedral aggregate of somewhat crenulate-margined, strongly strain-polarized grains, up to 5mm or so in size.

The intergrown carbonate is of similar textural mode.

Localized gradational development of finer mosaic clumps is seen within the coarse quartz-carbonate aggregate - especially near the contacts with the chlorite segregations.

Some intermingling of the two phases is seen, in the form of occasional included clumps of quartz and/or carbonate within the massive chlorite, and an area of randomly oriented, rosette-form chlorite within coarsely granular quartz.

The textural aspect of this rock is that of vein material. The name phyllite does not seem appropriate, though it may be derived from such rocks as a local development of remobilized (metamorphic sweat-out) origin. Alternatively it may have originated as a specialized, ferruginous clay-chert intercalation in the sediments.

SAMPLE 13: 88-6 18.55m.

CARBONATE-SERICITE-QUARTZ LAMINITE

Estimated mode

Quartz	15
Sericite	27
Carbonate	57
Pyrite	trace
Opaque wisps	1

This is another rock of distinctive appearance, having a well-foliated macroscopic texture consisting of a combination of fine, undisturbed micaceous laminations and trains of clast-like brown material.

Thin section examination reveals that it is not of chloritic composition (as suggested in the field name), but is predominantly a carbonate rock.

The carbonate is of strong relief, has a slightly brownish body colour and shows incipient limonitic staining. It is non-reactive to dilute acid, and is probably a somewhat ferruginous dolomite (ankerite).

The carbonate occurs as sub-oriented, anhedral to subhedral grains, 0.1 - 0.5mm in size, forming close-spaced strings and partial coalescent lenses or discontinuous laminae.

It is intimately intergrown with parallel-oriented schlieren of sericite, and a relatively minor interstitial component of microgranular mosaic quartz.

To some degree, the sericite and quartz also occur as inclusions within the grains of carbonate, and the whole assemblage appears, at least partially, to be a product of recrystallization and foliar metamorphic segregation.

Diffuse, concordant wisps and local tiny clumps of micron-sized opaque material occur within the sericite schlieren. This shows a distinct acicular mode (hematite?), and appears distinct from the carbonaceous opaque dust of some earlier samples.

Rare, discrete, rather coarse, subhedral grains of pyrite contain inclusions of the silicate-carbonate matrix.

SAMPLE 14: 88-6 50.2m.

DISRUPTED CARBONATE-SERICITE LAMINITE

Estimated mode

Quartz	15
Sericite	32
Carbonate	50
Carbon	3

Although of very similar composition to the previous sample (#13), this rock has a distinctly different appearance. This results from its content of intergranular opaque material (of carbonaceous aspect) and its heterogenous, deformed texture.

In thin section it is seen to consist of an aggregate of sub-angular to sub-rounded carbonate grains, 30 - 150 microns in size, intergranularly cemented by flakes and contorted wisps of sericite.

Micron-sized opaque dust partially rims the carbonate grains (of cataclastic aspect) and/or delineates small-scale crumpling in the intergranular sericite.

Finely granular quartz is a minor interstitial component throughout the carbonate/sericite aggregate.

Some relatively extensive, irregular areas consist largely of sericite, having a complex crenulate fabric delineated by wisps of opaques, and containing sparse, small, rounded granules of quartz and carbonate.

The carbonate - and, to a lesser degree, the quartz - also form irregular, augen-like, microgranular masses, up to several mm in size.

One end of the slide retains a relatively undisturbed appearance, but the majority of it is strongly deformed.

The rock would appear to represent a contorted and disrupted variant of the quartz-poor carbonate-sericite laminite exemplified by Sample 13.

SAMPLE 15: 88-11 136.9m.

MUSCOVITE PHYLLITE

Estimated mode

Quartz	12
Sericite	85
Carbonate	1
Monazite(?)	trace
Pyrite	2
Sphalerite	trace

This is a strongly foliated, essentially undeformed rock of simple composition, made up predominantly of sericite.

The sericite forms a compact, parallel-oriented, foliaceous aggregate within which microgranular quartz occurs as numerous thin, sharply-defined, parallel, slightly sinuous wisps, laminae or discontinuous lenses, 0.02 - 0.2mm thick.

Locally the quartz shows increased abundance, resulting in bands of predominantly quartzose composition up to 1mm thick.

Pyrite is a notable minor constituent. Much of it is very fine-grained (individual euhedra and tiny clumps 2 - 50 microns in size) and occurs as numerous parallel trains within the sericite; this is the cause of the rather dark overall appearance of the rock (which is not carbonaceous). Pyrite also occurs in some of the quartzose laminae, where it tends to be somewhat coarser, and has rare associated sphalerite.

The quartz mainly shows a fine polygonal mosaic texture, but some thin trains and laminae are of strongly flattened grains. Others, of discoid lenticular form within sericite, show accretive recrystallization.

The slide includes a single, irregular, interfingered patch of laminar-structured, high relief carbonate - probably siderite.

This rock is an argillitic variant of related type to Samples 1 and 3, but with relatively lower quartz and carbonate content.

SAMPLE 16: 88-11 160.0m.

CARBONACEOUS QUARTZ LAMINITE

Estimated mode

Quartz	47
Sericite	6
Carbonate	3
Carbon	40
Siderite veinlets	trace
Pyrite	4
Sphalerite	trace

This is another of the sericite-poor, carbonaceous quartz phyllites - very similar in type to Sample 2.

It consists of a rather even, recrystallized, mosaic aggregate of quartz, of grain size 30 - 150 microns, traversed by abundant, thin, somewhat sinuous wisps of cryptocrystalline opaque material - presumably of carbonaceous composition.

The carbonaceous wisps commonly concentrate in such close proximity as to constitute compact laminae up to 0.5mm in thickness, sometimes occurring close-spaced and separated by thin intercalations of strongly flattened quartz grains.

Other laminar zones show all gradations from compact carbon to lenses of essentially monomineralic quartz.

The carbonaceous laminae commonly show intergrown, fine-grained, oriented flakes and wisps of sericite. The quartzose laminae occasionally contain scattered clumps of accessory dolomite, as elongate, anhedral, poikilitic grains.

Pyrite is abundant, as disseminated individual euhedra, 20 - 200 microns in size, often clumped. These occur in concordant linear trains, most commonly associated with thin intercalations of quartz in predominantly carbonaceous zones. The pyrite grains often show fringes of fibrous chert. Traces of sphalerite are sometimes associated.

The thicker, carbon-free quartz laminae, especially with carbonate, are generally devoid of sulfides.

The rock is cut by rare, discordant, hairline veinlets of siderite.

Vancouver Petrographics Ltd.

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Invoice 7805

December 30th, 1988

Samples:

9 core samples of massive sulfides from the Marg property, for sectioning and petrographic examination.

The samples were prepared as polished thin sections; they are numbered as follows:

Sample No.	Drill Hole	Depth
1	88-11	139.40
2	88-11	151.55
3	88-15	58.95
4	88-15	61.00
5	88-21	162.13
6	88-21	164.45
7	88-21	172.65
8	88-21	179.80
9	88-33	226.90

Summary:

These samples all show generally similar mineralogy and textural style. The differences in total sulfides and relative proportions of sulfide species probably reflect small-scale variations within a bedded sulfide sequence and may not necessarily represent distinct ore types.

Of the material sectioned, 3 samples (#s 2, 4 and 5) have a very high sulfide/gangue ratios; 3 more (#s 1, 3 and 6) have a somewhat lower ration; and the remaining 3 (#s 7, 8 and 9) have gangue $\gg$ sulfides.

Sample 8 is distinctive in that it contains intercalated laminae of pyritic graphitic material. All the other samples have a gangue of

microgranular quartz (probably recrystallized chert) and carbonate in various proportions. Sericite is commonly present in trace to minor accessory amounts.

The principal sulfide in all the samples is pyrite. In the more massive sections the pyrite is in the form of a compact aggregate of tiny euhedra. Interstices in this aggregate are occupied by the Zn-Cu-Pb sulfides, intergrown with gangue.

Some samples include clumpy growths of extremely fine-grained pyrite which may have originated as gels. These sometimes contain minutely dispersed or colloform-textured base metal sulfides, especially galena or chalcopyrite.

In some cases the gangue tends to be segregated within the massive pyrite as small clumps. The base metal sulfides sometimes show crudely laminar concentrations of particular species - most commonly sphalerite, with or without galena, and chalcopyrite.

In the samples with a higher relative content of gangue, the sulfides tend to occur intergrown as small clumps scattered through or in laminar zones in, a matrix of quartzose gangue. Carbonate is essentially absent from these more disseminated ores.

Tetrahedrite is a minor constituent throughout the suite, occurring in association with galena or with chalcopyrite; it probably represents the chief site of Ag values in the ore. In some samples it shows a tendency towards coarser grain size than the other components.

Minor arsenopyrite is sporadically distributed as intimate intergrowths with the pyrite in some samples. Base metal sulfide intergrowths involving this mineral are always extremely fine-grained.

Overall the textural mode of the valuable constituents in this ore must be classed as very fine-grained. By far the greatest proportion of the sphalerite, galena and chalcopyrite occur as intergrowths with pyrite and gangue, on the scale 10 -100 microns. Occasional coarser segregations (in the range 100 - 500 microns) are seen, especially in the case of chalcopyrite in the 'clumpy' disseminated ore type exemplified by samples 7 and 9.

Individual petrographic descriptions are attached, together with a set of illustrative photomicrographs.

J.F. Harris Ph.D.

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SAMPLE #1: 88-11 139.40m.

Estimated mode

Quartz	9
Carbonate	12
Sericite	trace
Pyrite	63
Arsenopyrite	1
Sphalerite	7
Galena	3
Tetrahedrite	4
Chalcopyrite	1

This sample is a massive sulfide rock, showing a weakly banded texture of relatively less sulfidic streaks.

The gangue consists of patchily intergrown quartz and carbonate, principally as an anhedral mosaic of grain size 0.05 - 0.2mm. The quartz shows local development of lamellar texture marginal to segregated clumps of sulfides.

Traces of sericite occur as randomly oriented, individual flakes, intergranular to quartz or carbonate and in intimate intergrowth with compact sulfides.

The gangue occurs as streaks and patches in which it acts as a matrix to disseminated sulfides, and as small interstitial flecks and clumps throughout the compact, massive sulfides.

Pyrite is the predominant sulfide. It occurs as more or less tightly aggregated individual euhedra, 10 - 300 microns in size.

The base metal sulfides occur mutually intergrown and intimately associated with gangue, the total assemblage forming a matrix/interstitial phase to the pyrite.

Minor development of sphalerite and galena as irregular inclusions, 5 - 30 microns in size, within pyrite cubes is seen.

Tetrahedrite is notably abundant in this sample. It tends, moreover, to be noticeably coarser than the other base metal sulfides - not infrequently occurring as pockets in the size range 0.1 - 0.5mm.

The general grain size of the overall sulfide intergrowth is extremely fine - mainly in the range 5 - 100 microns. It would appear that grinding even to 100% -400 mesh would not achieve complete liberation.

SAMPLE #2: 88-11 151.55m.

Estimated mode

Quartz	8
Carbonate	4
Sericite	trace
Pyrite	60
Arsenopyrite	4
Sphalerite	15
Tetrahedrite	3
Galena	5
Chalcopyrite	1

This sample consists largely of compact massive sulfides. A weak, diffuse banding of relatively more and less sulfide-rich material is recognizable macroscopically.

The gangue consists of quartz with minor, randomly intergrown carbonate and traces of fine-grained sericite. The quartz is mainly in the form of small clumps of lamellar-textured chert, or as a fine-grained anhedral mosaic. It occurs as irregular small clumps and networks and tiny interstitial pockets (20 - 500 microns in size) throughout the massive sulfide.

The weak banded fabric, barely recognizable on the microscopic scale, is defined by linear zones of relatively more abundant gangue clumps.

As in the previous sample, pyrite is the dominant constituent, in the form of more or less tightly aggregated tiny euhedra, 10 - 200 microns in size. Accessory arsenopyrite is notably more abundant, as sporadically distributed patches of minutely fine-grained intergrowth within compact pyrite. In a few localized areas arsenopyrite shows a ratio as high as 1:3 with pyrite, whereas in much of the slide it is scarcely seen.

Sphalerite is by far the most abundant of the accessory base metal sulfide constituents. It forms a rather evenly distributed interstitial phase of tiny, semi-connected, angular pockets, 10 - 100 microns in size, throughout the compact pyrite.

Sphalerite occurs as minute flecks, 2 - 30 microns in size, in the diffuse arsenopyrite-rich patches.

Galena and tetrahedrite occur sporadically in similar mode to the sphalerite, and intergrown with it: they locally form relatively coarser pockets in the grain size range 100 - 500 microns or more.

Chalcopyrite is very minor, as scattered tiny flecks throughout the polymetallic sulfide intergrowth.

Sample #2 cont.

It is estimated that a grind to 45 microns (325 mesh) would liberate 60 - 70% of the valuable constituents. The overall grain size seems marginally coarser than Sample #1 - correlating with the somewhat higher ratio of base metal sulfides to pyrite.

SAMPLE #3: 88-15 58.95m.

Estimated mode

Quartz	14
Carbonate	24
Sericite	2
Pyrite	46
Arsenopyrite	2
Sphalerite	7
Chalcopyrite	4
Galena	1
Tetrahedrite	trace

This sample shows a similar, weakly banded/streaky texture to the previous samples. However, the thin section reveals a relatively higher proportion of intimately intergrown gangue - and some diffuse, essentially sulfide-free zones.

The gangue is similar to the other samples of the suite in consisting essentially of quartz and carbonate, the latter being predominant in this case. These constituents occur patchily intergrown as anhedral mosaics and (in the case of the quartz) fibro-lamellar pockets, having a grain size principally in the range 50 - 200 microns. Accessory sericite is relatively abundant in this sample, as scattered areas of intimate, sub-oriented intergrowth with carbonate, interstitial to fine-grained sulfides.

The sulfides are, in part, texturally similar to those in the previous samples - consisting of more or less compact aggregates of tiny euhedral pyrite grains, with the base metals - sometimes with intergrown gangue - as an interstitial phase.

In other parts of the slide the pyrite is more dispersed and occurs as more or less densely disseminated individual euhedra in a gangue matrix. It locally coalesces as rounded/irregular clumps to 1mm - sometimes with inclusions of minutely fine-grained galena. Base metal sulfides occur in this association, as scattered pockets and intergrowths with gangue.

Chalcopyrite is notably abundant relative to galena and tetrahedrite in this sample.

Grain size of the principal valuable constituents, sphalerite and chalcopyrite, is mainly in the range 20 - 100 microns. Galena is notably finer, and will mostly not be physically liberatable by grinding.

SAMPLE #4: 88-15 61.0m.

Estimated mode

Quartz	6
Carbonate	2
Sericite	1
Pyrite	70
Arsenopyrite	trace
Sphalerite	9
Chalcopyrite	10
Galena	1
Tetrahedrite	1

This sample is composed of essentially massive sulfides. An evenly laminated texture is macroscopically recognizable - distinct from the diffuse, irregularly streaky fabric of previous samples. The laminae are defined by local relatively increased contents of gangue, and by variations in the proportions and grain size of the accessory sulfides, sphalerite and chalcopyrite.

The gangue is of similar general mineralogy to other samples of the suite. It consists principally of fine-grained quartz mosaics or fibrous cherty aggregates. These form semi-connected interstitial pockets and irregular segregations, 100 - 500 microns in size. Carbonate is locally abundant, principally as very fine-grained interstitial flecks in massive sulfides.

The sample is predominantly a compact aggregate of pyrite, consisting of coalescent euhedra, 20 - 300 microns in size.

Base metal sulfides form an intimately intergrown interstitial phase, as semi-connected, angular pockets, 10 - 70 microns in size, evenly distributed through the pyrite matrix.

In some areas of the slide chalcopyrite is the strongly dominant accessory; in others sphalerite, sometimes with associated minor galena, is virtually free of chalcopyrite. All intermediate combinations are also seen, defining the subtle laminar structure (not sharply demarked on the microscopic scale).

Gangue occasionally occurs in similar interstitial mode to the finest-grained sulfides, but is chiefly segregated as laminar zones of small clumps. Sulfides - especially chalcopyrite - occasionally form similar clumpy segregations.

An estimated 50% of the total valuable sulfides in this sample are in a size range of $\lesssim$50 microns.

SAMPLE #5: 88-21 162.13m.

Estimated mode

Quartz	trace
Carbonate	8
Sericite	trace
Pyrite	67
Sphalerite	22
Galena	2
Chalcopyrite	1
Tetrahedrite	trace

This is another sample composed essentially of minutely fine-grained massive sulfides.

Gangue is minor and, in comparison with other samples of the suite, is notably enriched in carbonate vs quartz. The carbonate occurs as a sparsely and rather evenly disseminated interstitial phase, consisting of tiny pockets, 20 - 100 microns in size. At one end of the slide carbonate forms a few coarser clusters, to 0.5mm or more in size.

This sample is also notable for its high concentration of sphalerite and the relative paucity of the other base metal sulfides.

The sphalerite is unzoned and a transparent amber colour in transmitted light - suggesting a low to moderate Fe content.

The massive pyrite matrix is formed, as in the other samples, by the compact aggregation of myriad tiny individual cubic euhedra from 10 - 300 microns in size. The abundant, tiny, semi-connected, angular interstices in this aggregate are filled by sphalerite, which shows a resultant grain size of 10 - 100 (occasionally to 200) microns.

Carbonate gangue is often intimately intergrown with the sphalerite as, occasionally, is galena and, rarely, chalcopyrite. These minor constituents thus exhibit a similar grain size range to the sphalerite.

Notable features of this sample include the paucity of arsenopyrite and tetrahedrite, the homogeneity of the pyrite aggregate, and the abundance and even distribution of sphalerite.

It is estimated that grinding to 45 microns would liberate about 70 - 80% of the sphalerite and other valuable constituents.

SAMPLE #6: 88-21 164.45m.

Estimated mode

Quartz	18
Carbonate	6
Pyrite	60
Arsenopyrite	1
Chalcopyrite	10
Sphalerite	4
Galena	1

This sample is composed predominantly of massive pyrite with fine-grained interstitial gangue and accessory sulfides, of similar textural mode to the others of the suite. The gangue in this association is predominantly carbonate.

The sample differs from previous examples in containing several patchy concentrations of quartzose gangue. These pass gradationally to the massive pyrite via local zones of relatively coarse, segregated sulfides. The largest of these quartzose patches has a core of coarse-grained, strained quartz, of grain size 1 - 7mm, of vein or recrystallized aspect; the others are of finer mosaic and fibro-lamellar cherty quartz.

Chalcopyrite is the predominant accessory sulfide, occurring sporadically throughout the massive pyrite as semi-connected interstitial pockets, 10 - 200 microns in size. Marginal to the quartzose patches, it segregates as coarser pockets to 0.5mm, or rarely 1.0mm, cementing pyrite grains of comparable size.

Sphalerite is essentially confined to a few localized patches, where it exhibits similar textural mode to that described for the chalcopyrite.

Galena is minor and generally very fine-grained. Tetrahedrite is notably absent.

The relatively heterogenous spatial distribution and grain size of both base metal sulfides and gangue within the massive pyrite matrix of this sample are distinctive. As a result, the mean grain size of the valuable constituents is somewhat greater than in other samples, and percentage liberation at a given grind will be correspondingly better in ore of this textural type.

SAMPLE #7: 88-21 172.65m.

Estimated mode

Quartz	68
Carbonate	2
Sericite	trace
Pyrite	18
Arsenopyrite	2
Sphalerite	5
Chalcopyrite	4
Galena	1
Tetrahedrite	trace

This sample differs from previous samples of the suite in consisting of disseminated rather than massive sulfides.

The distribution of sulfides shows a somewhat irregular, laminar form, with the laminae consisting of sub-parallel lines of small sulfide clumps.

The matrix - and dominant constituent of the rock - is quartz, as a fairly regular, anhedral mosaic of grain size 20 - 200 microns. Minor development of lamellar cherty textures with intergrown sericite is seen marginal and interstitial to some sulfide clumps. Carbonate is a minor accessory, as sporadic small intergrown patches in the quartz matrix.

The sulfide clumps consist principally of compact aggregates of fine-grained euhedral pyrite as in previous samples. Some coarser cubes, to 0.5mm or more, are sometimes distinguishable, whilst many of the sulfide clumps appear to be aggregates of extremely fine-grained, framboidal/colloform pyrite, of probable gel origin.

Minutely intergrown arsenopyrite is a relatively abundant associate of the gel-type pyrite.

The accessory base metal sulfides show a wide size range. This is particularly true of chalcopyrite, which occurs partly as segregated pockets, 100 - 400 microns in size, in gangue, but is also seen as an interstitial phase to compact pyrite, as a host to clusters of minutely fine-grained pyrite and as an intimate impregnation (on the scale 5 - 30 microns) in gel-type pyrite.

Galena is almost entirely in the latter form, intimately intergrown - sometimes in colloform patterns - within gel pyrite and arsenopyrite.

Sphalerite is intermediate in its textural distribution, seldom occurring in the super fine-grained form but, on the other hand, seldom forming pockets of more than 100 microns in size.

Sample #7 cont.

The sulfide intergrowths in the partially recrystallized chert matrix form clumps, 100 microns to 1 or 2mm in size, sometimes partially coalescent.

Much of the sulfides in ore of this textural type will be incapable of liberation by grinding to a practicable size.

SAMPLE #8: 88-21 179.80m.

Estimated mode

Quartz	35
Sericite	5
Carbonate	trace
Graphite	24
Pyrite	27
Arsenopyrite	2
Sphalerite	3
Galena	1
Chalcopyrite	3

This is another variant of the laminated, non-massive ore type. It is distinctive in containing an additional component, in the form of intercalations of cryptocrystalline graphitic material. The latter forms discrete wisps and bands, 0.5 - 3.0mm in thickness.

The graphitic laminae contain more or less abundant disseminated pyrite as minute framboids and euhedra, 2 - 50 microns in size, as well as occasional small pockets of other sulfides. They are sometimes flecked with small inclusions of chert and/or sericite. In one case, a discrete shaly band, composed almost entirely of sericite, occurs adjacent to a graphitic zone.

Local small-scale deformation is often recognizable in the graphitic/argillaceous wisps, and some of the thicker zones incorporate thin layers of chalcopyrite, and fragment-like lenses of chert and clasts of sulfide which appear to be the product of soft sediment disruption (slumping).

The non-graphitic interbeds range from semi-massive sulfide (as seen in many of the other samples and consisting of an aggregate of euhedral pyrite grains, 20 - 300 microns in size, interstitially cemented by gangue, sphalerite, and minor chalcopyrite and galena) to dispersed 'blobs' or clumps of fine-grained sulfides in a quartzose (recrystallized chert) matrix, as described for Sample #7.

Both textural styles include a component of extremely fine-grained gel-type pyrite, often with minutely interstitial or colloform intergrowths of galena or chalcopyrite.

Sphalerite and galena in this sample seldom exceed 100 microns in grain size. Chalcopyrite forms a few coarser segregations, but all the sulfides include a proportion of super fine-grained intergrowths which are beyond the reach of grinding.

SAMPLE #9: 88-33 226.9m.

Estimated mode

Quartz	42
Sericite	3
Carbonate	trace
Pyrite	36
Arsenopyrite	trace
Sphalerite	6
Chalcopyrite	13
Galena	trace

This is another sample showing the distinctive macroscopic textural style seen in #7. It consists of abundant, partially coalescent clusters of 'islands' of sulfides in a matrix of mosaic-textured (locally lamellar) recrystallized chert, of grain size 30 - 200 microns. The linear distribution of the sulfide clumps defines a distinct, parallel laminar structure on the macro scale; this is not recognizable under the microscope, where sulfide islands are of irregular shape, and no oriented fabric is apparent.

Sericite is relatively abundant, forming sporadic zones of sinuous, oriented wisps through the chert, without particular reference to the sulfide distribution. Carbonate is notable rare.

Although macroscopically similar to #7, this sample differs in that the intergrowths of sulfides making up the lines of 'islands' are on a perceptibly coarser scale.

Pyrite is, as always, the predominant sulfide. It occurs as individual grains and compact homogenous microgranular masses, ranging from 20 microns up to 1mm or more in size. The strikingly euhedral form exhibited by the pyrite in other samples is much less apparent, and many of the grains are equant, sub-rounded, and often resemble clasts (see photos).

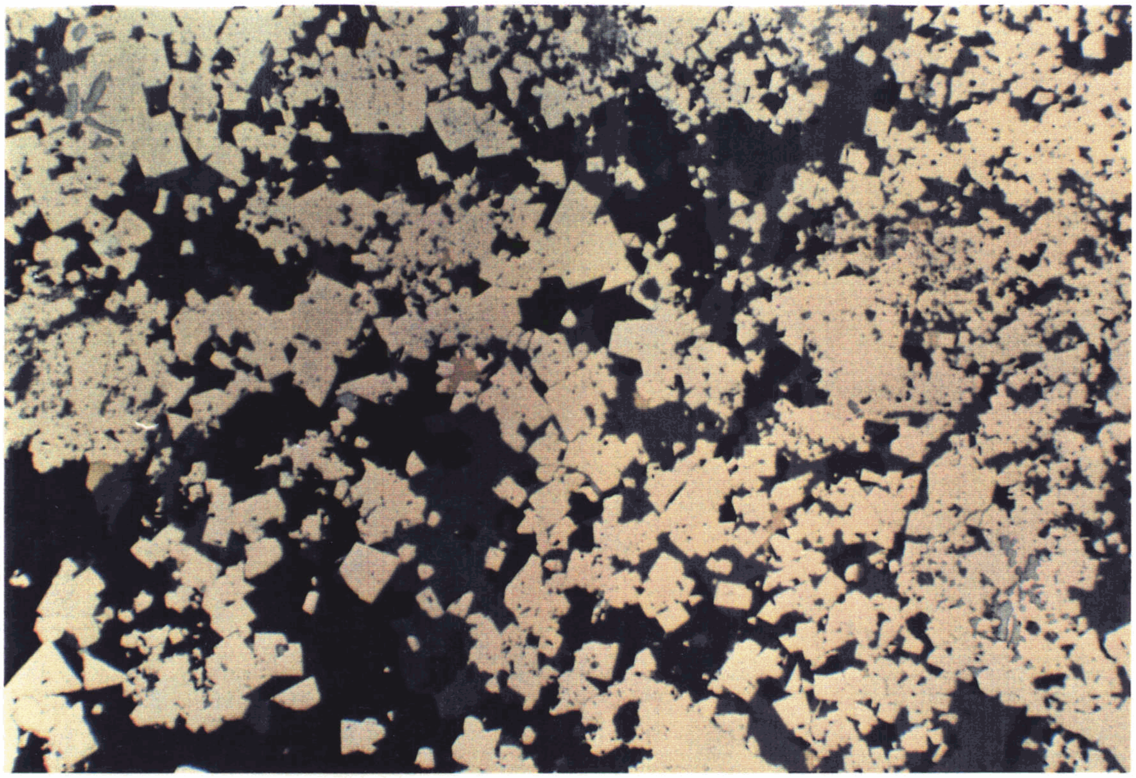
Chalcopyrite is the dominant base metal accessory, and is notably abundant. It occurs as a cementing or matrix phase to included clusters of pyrite grains and minor sphalerite, often forming relatively coarsely segregated patches in the size range 50 - 500 microns. To a minor degree the chalcopyrite shows apparent marginal and core replacement of pyrite.

The laminar structure of the rock is partly defined by variations in the proportions of the accessory sulfides. In some zones the 'islands' are predominantly pyrite, with only minor interstitial or adhering chalcopyrite and sphalerite; in others (as described) chalcopyrite is abundant and strongly predominant over sphalerite; and, in others, sphalerite assumes the role of the chalcopyrite - but seldom displays so coarsely segregated a mode.

Sample #9 cont.

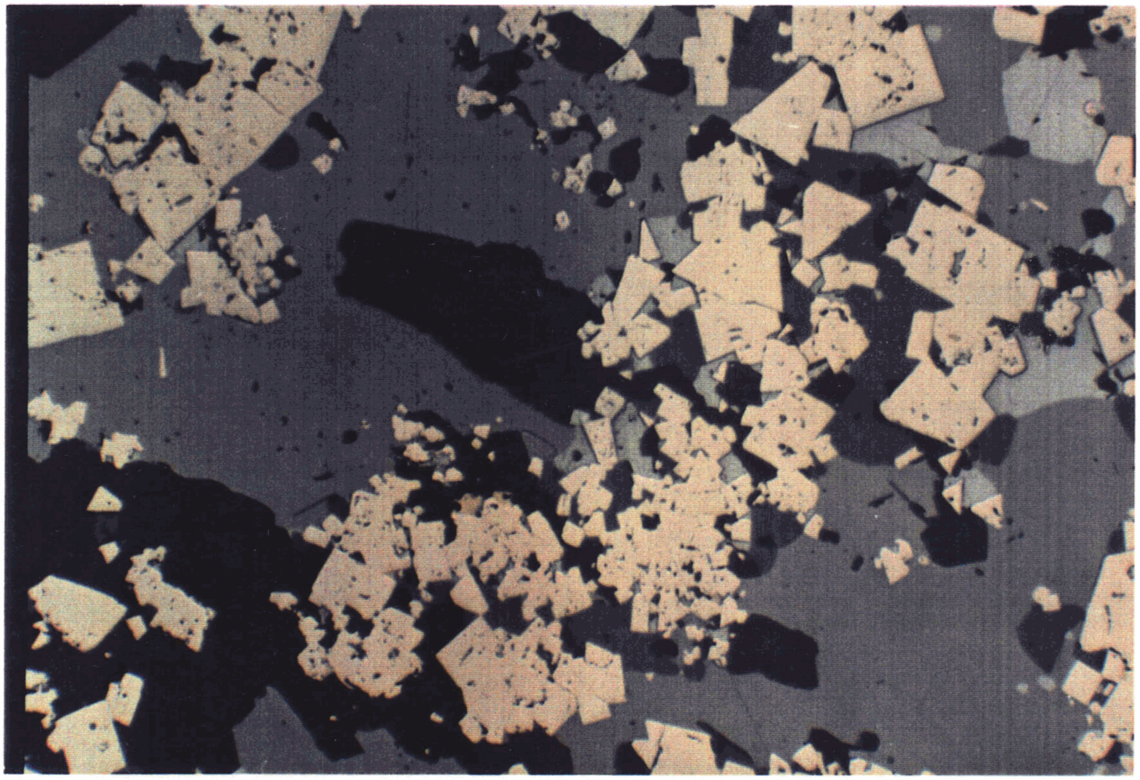
Arsenopyrite, galena and tetrahedrite are notably minor in this sample.

Grinding of this ore type to -325 mesh would result in >90% liberation of chalcopyrite and sphalerite.

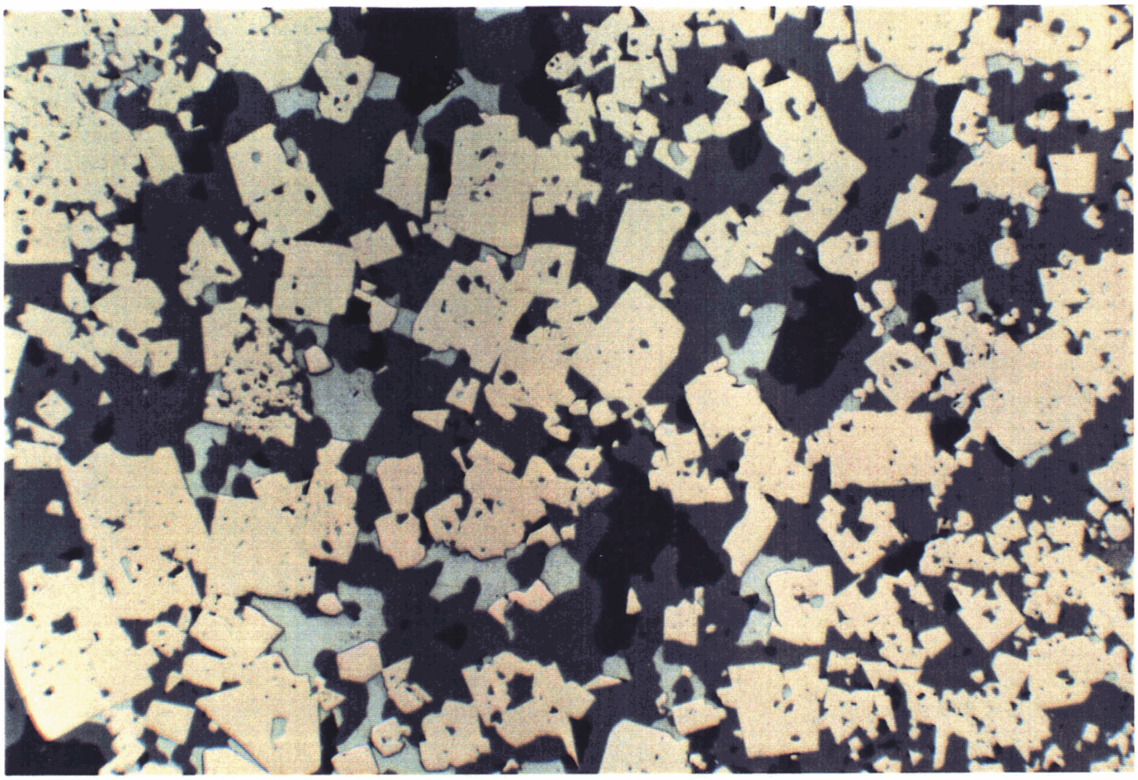


SAMPLE 1

Neg. 140-18: Typical field. Fine-grained aggregate of euhedral pyrite (cream colour) cemented interstitially by sphalerite (dark grey) and gangue (black). Minor components are chalcopyrite (yellow) and galena (light bluish grey, e.g. as inclusions in pyrite: bottom right, top left).

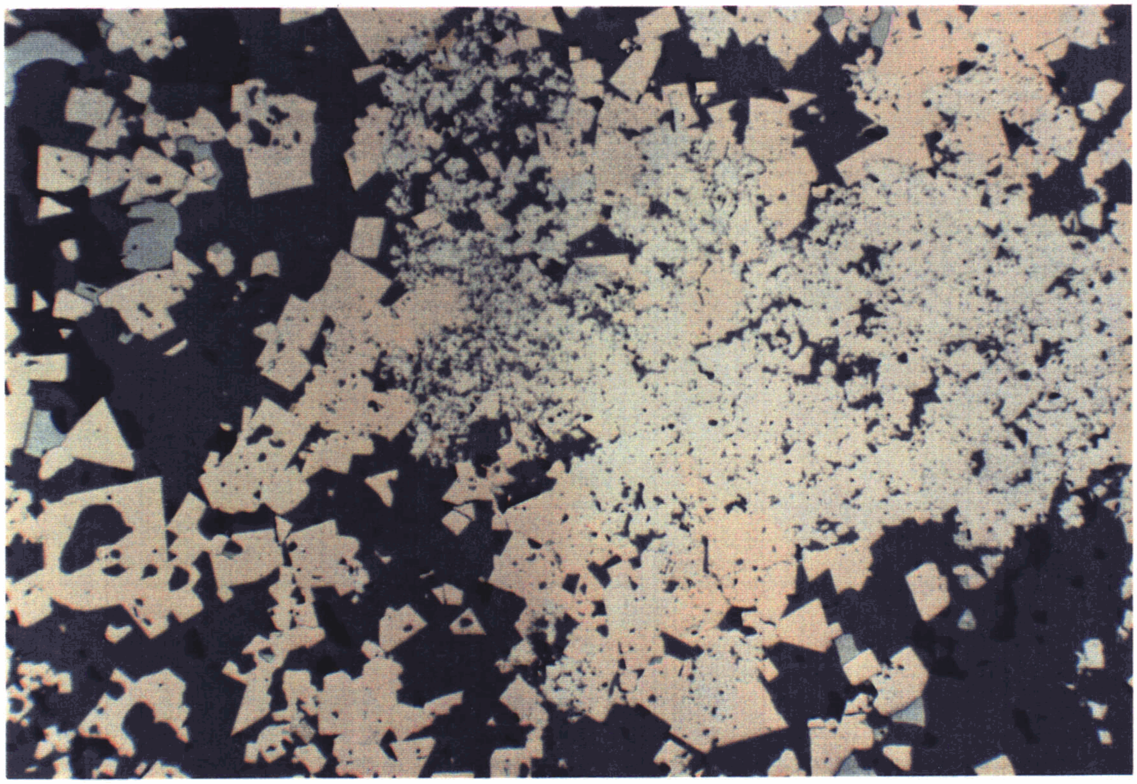


Neg. 140-17: Shows tetrahedrite (medium grey, major constituent) as relatively coarse patches, with intergrown gangue (black), sphalerite (dark grey) and galena (light bluish grey: top right). Pyrite as included euhedral clusters (cream colour) in the base metal sulfides.

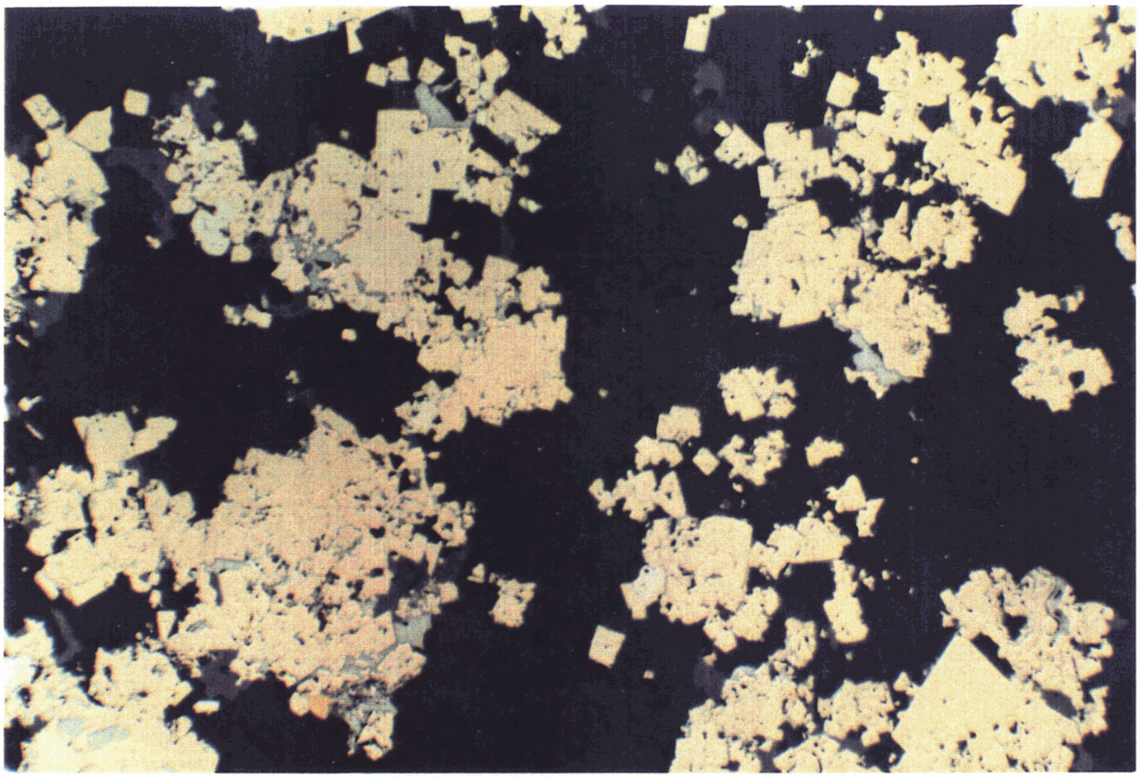


SAMPLE 2

Neg. 140-21: Typical field. Cemented aggregate texture. Colour key as for previous photos. Galena (light bluish grey) is a relatively abundant accessory, intergrown with the sphalerite, and as occasional blebs within pyrite grains. Note slightly coarser overall grain size than in Sample 1.

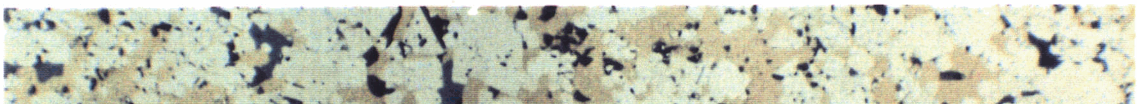


Neg. 140-19: Shows area of arsenopyrite (whiter) within pyrite aggregate. Note minutely fine-grained interstitial fillings of sphalerite (grey) in the arsenopyrite. Sphalerite, cementing (and locally replacing) the pyrite around the fringes of the As-rich patch, is relatively much coarser.

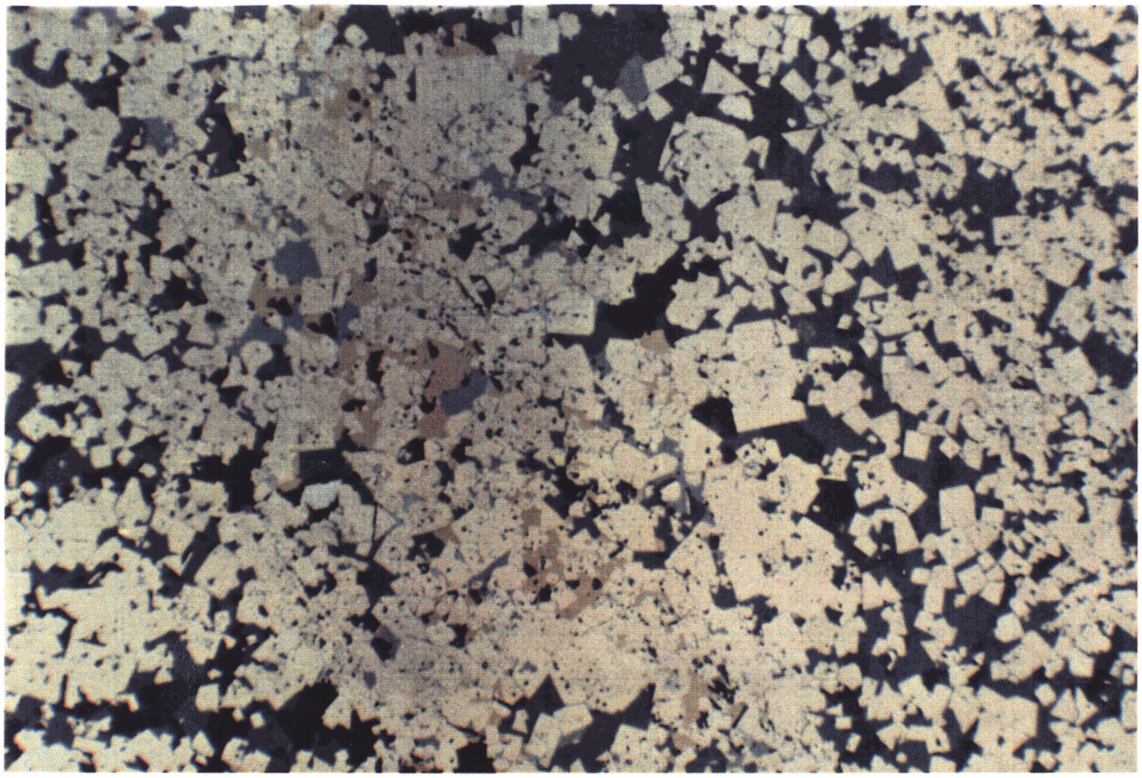


SAMPLE 3

Neg. 140-22: Shows clumpy habit of sulfides in the less massive type of ore. Dark background is quartz/carbonate gangue. Sulfide clumps are predominantly pyrite, with finely interstitial and included accessory galena (light blue grey). Rare sphalerite (dark grey, just a little lighter than the background) occurs in gangue and on the peripheries of the pyritic clumps. Field includes traces of chalcopyrite (yellow) and arsenopyrite (whiter than pyrite).

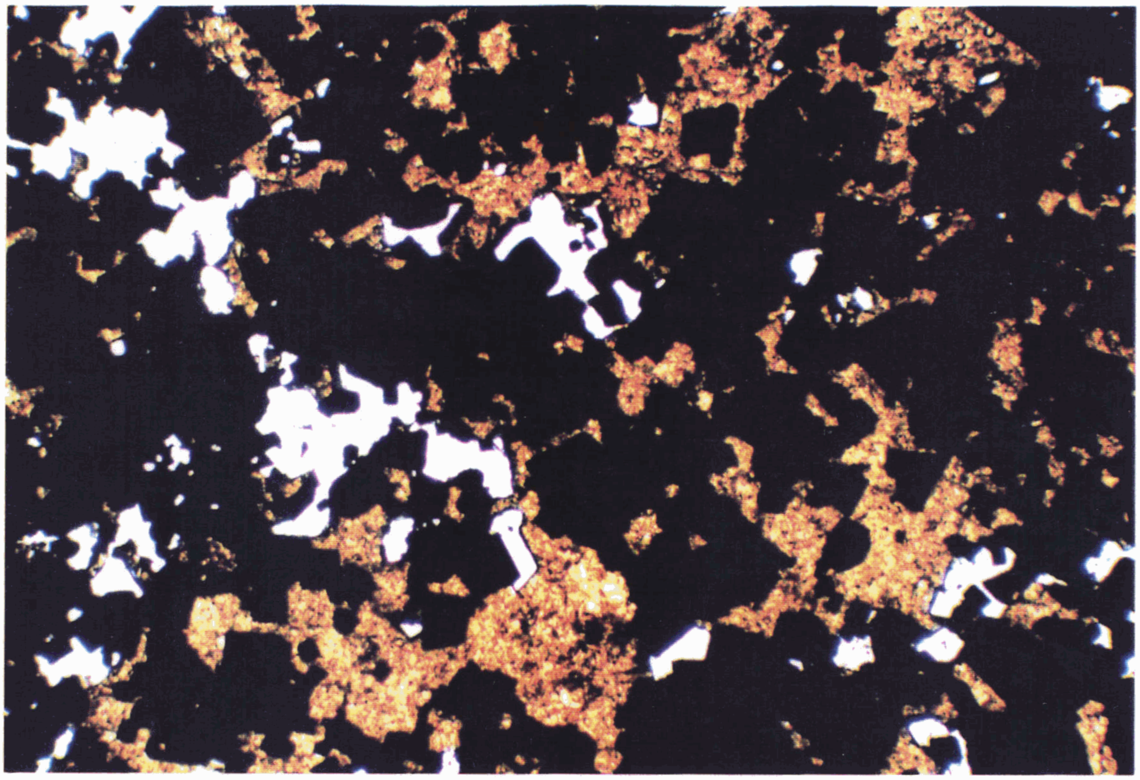


Neg. 140-23: Typical example of cemented aggregate texture. In this case pyrite (buff colour) is interstitially filled by chalcopyrite and minor sphalerite (dark grey). Note very fine scale of much of the intergrowth.



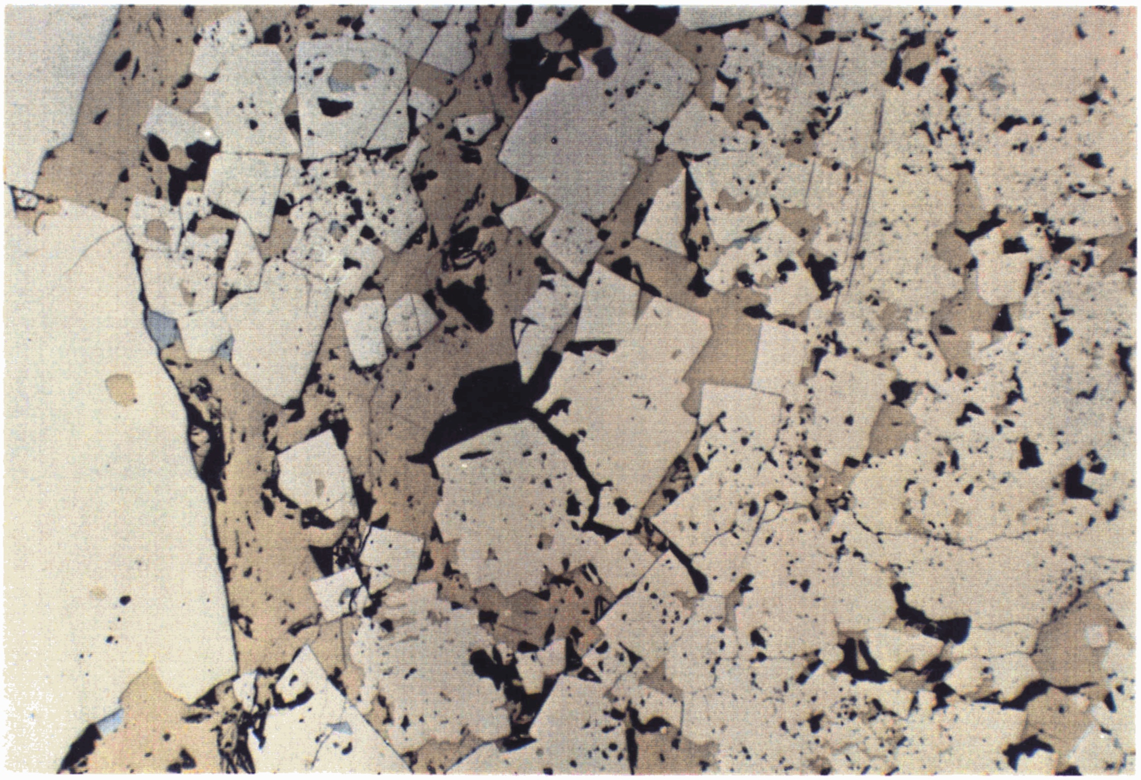
SAMPLE 4

Neg. 140-24: Shows microscopic expression of compositionally laminated texture. Area at right has sphalerite (dark grey) cementing the pyrite. In the central zone the interstitial components are chalcopyrite (yellow) and tetrahedrite (medium grey). Part of another sphalerite-rich band is seen at far left. Note increased concentration of gangue (black) associated with the sphalerite marginal to the central Cu-rich band.



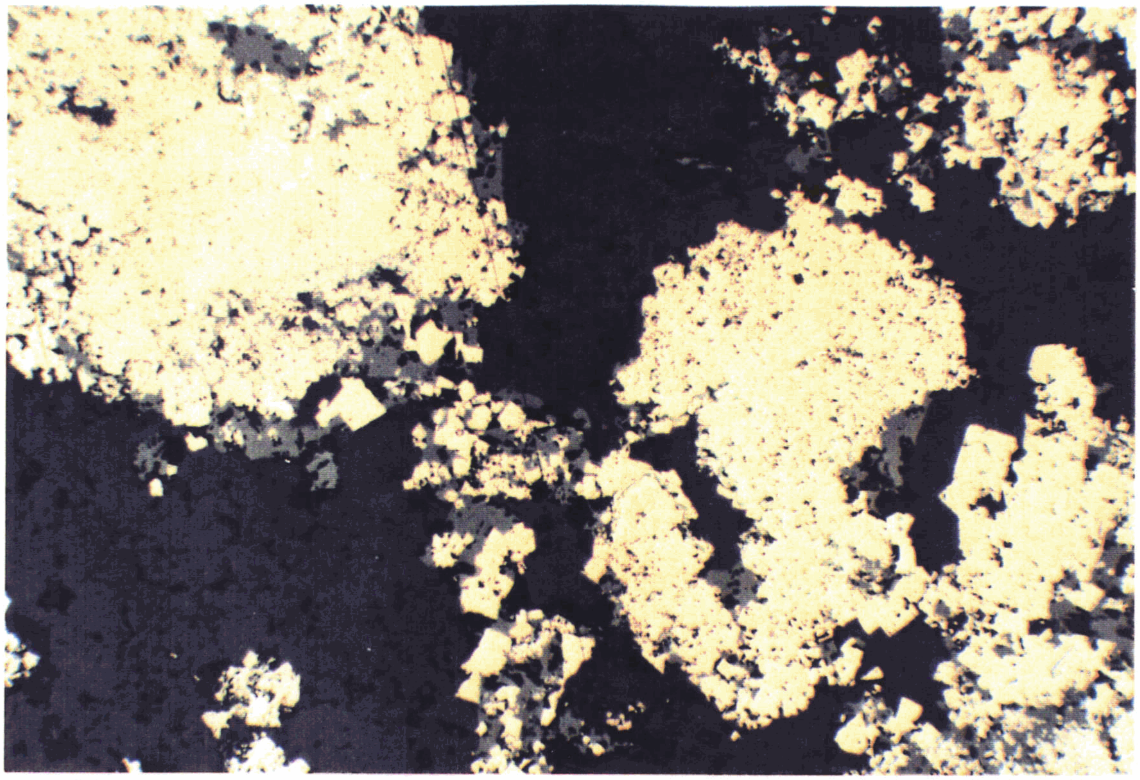
SAMPLE 5

Neg. 140-25: Transmitted light. Shows relationship of sphalerite (light brown) and gangue (white) to pyrite (opaque, black) in a relatively coarse-grained, Zn-rich variant of the ore type.



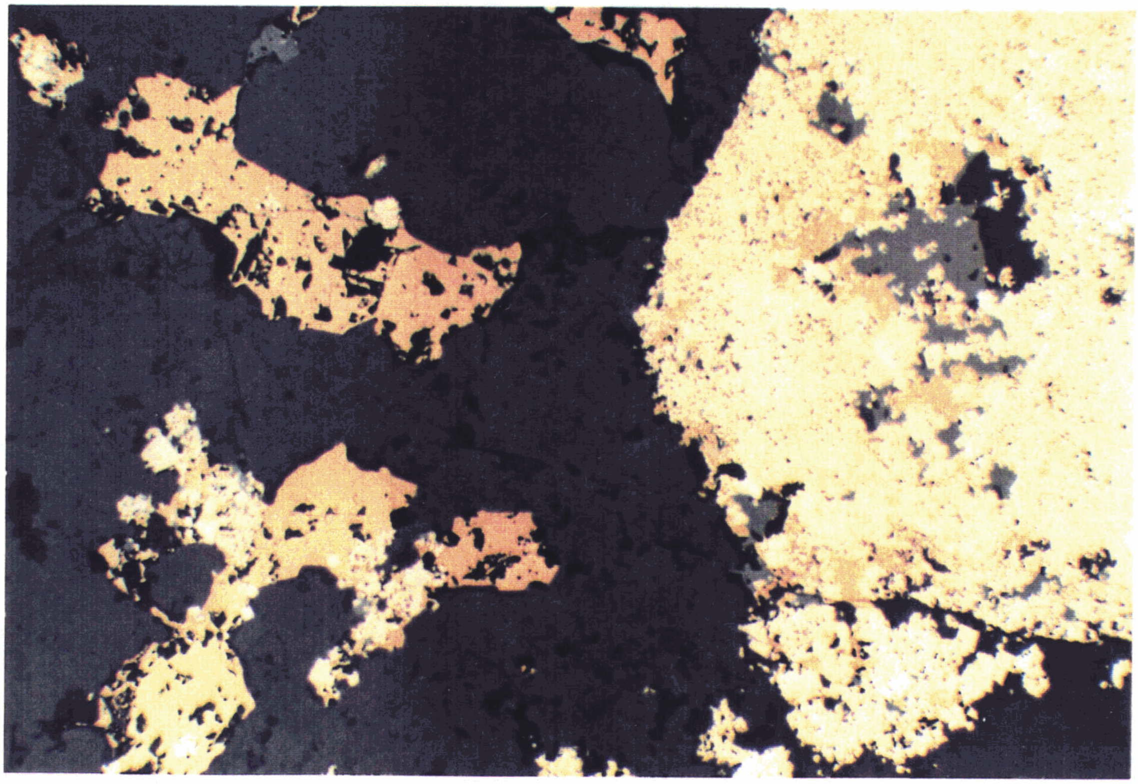
SAMPLE 6

Neg. 142-1: Shows coarsened grain size of pyrite and interstitial chalcopyrite marginal to a pocket of coarse quartz (outside the photo to left). Grain size starts to fall off to more typical massive sulfide scale at right hand side of photo.

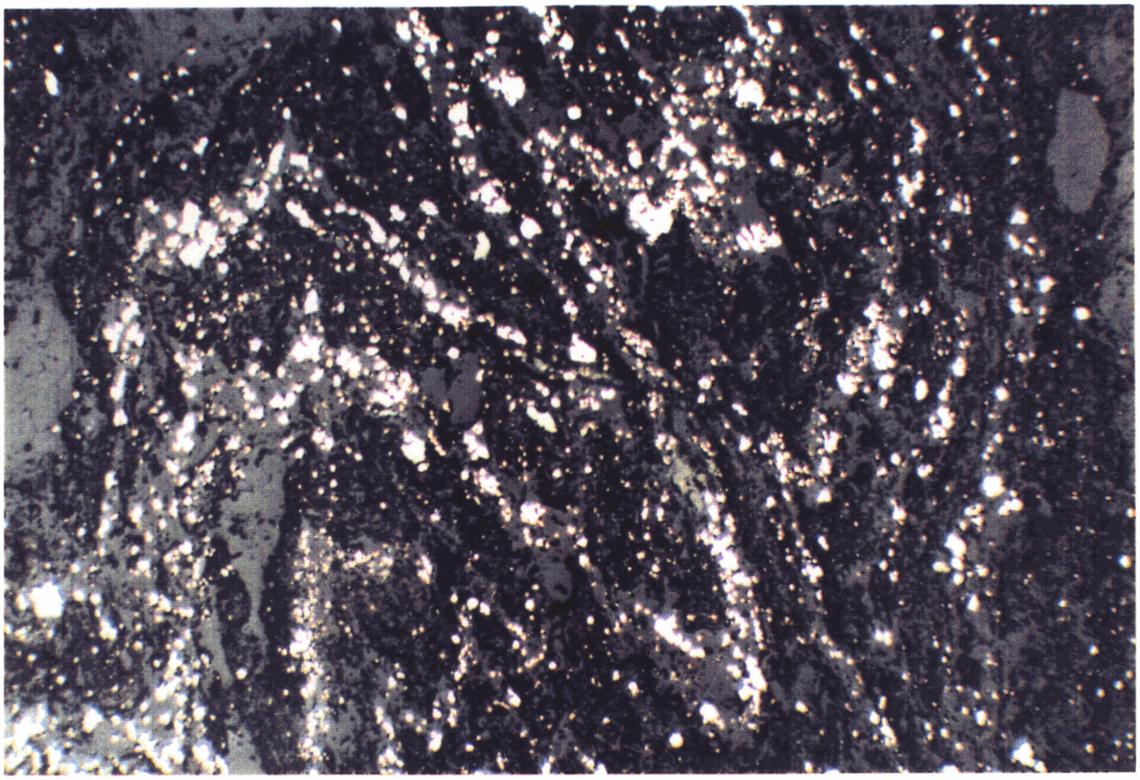


SAMPLE 7

Neg. 142-2: Shows clumpy texture of sulfides in gangue matrix (dark background). Note intimate intergrowths of galena (light bluish grey) in the very fine-grained pyrite (possible gel origin). Clump at centre right has intergrown arsenopyrite (whitish) as well as galena. Sphalerite (medium grey) tends to concentrate in the fringes of the clumps.

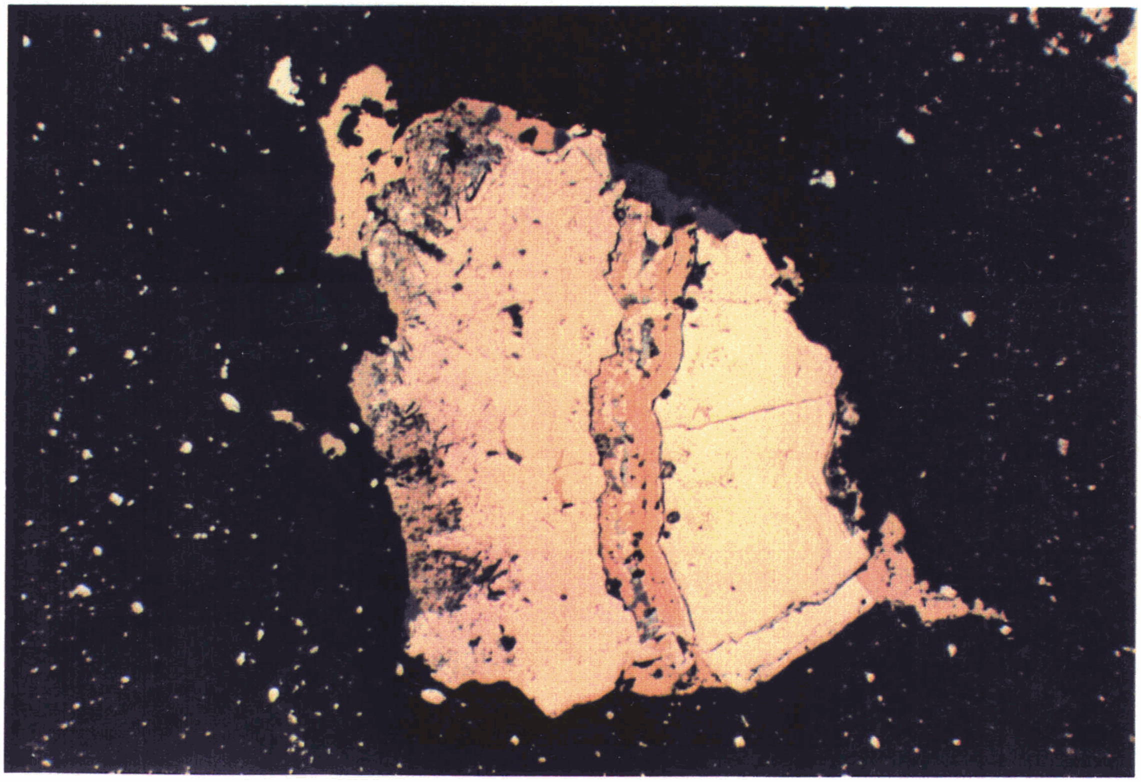


Neg. 142-4: Shows two textural styles of chalcopyrite: coarse pockets in gangue (left), and minutely interstitial intergrowths (with grey sphalerite) in gel-type clump at right. Chalcopyrite segregation at bottom left has inclusions of fine-grained pyrite.

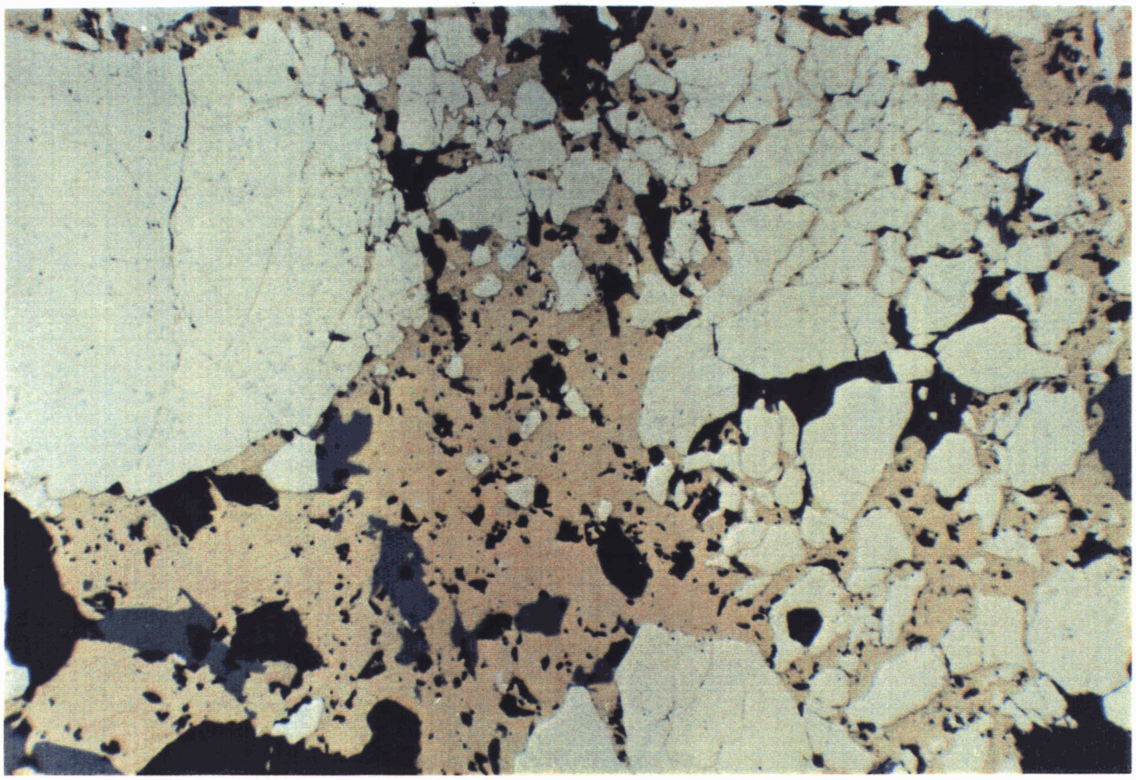


SAMPLE 8

Neg. 142-5: Shows microfolding delineated by fine-grained disseminated pyrite (white) in graphitic band. Darker scaly component is the graphite with traces of sericite; intimately intergrown lighter grey is cherty quartz.

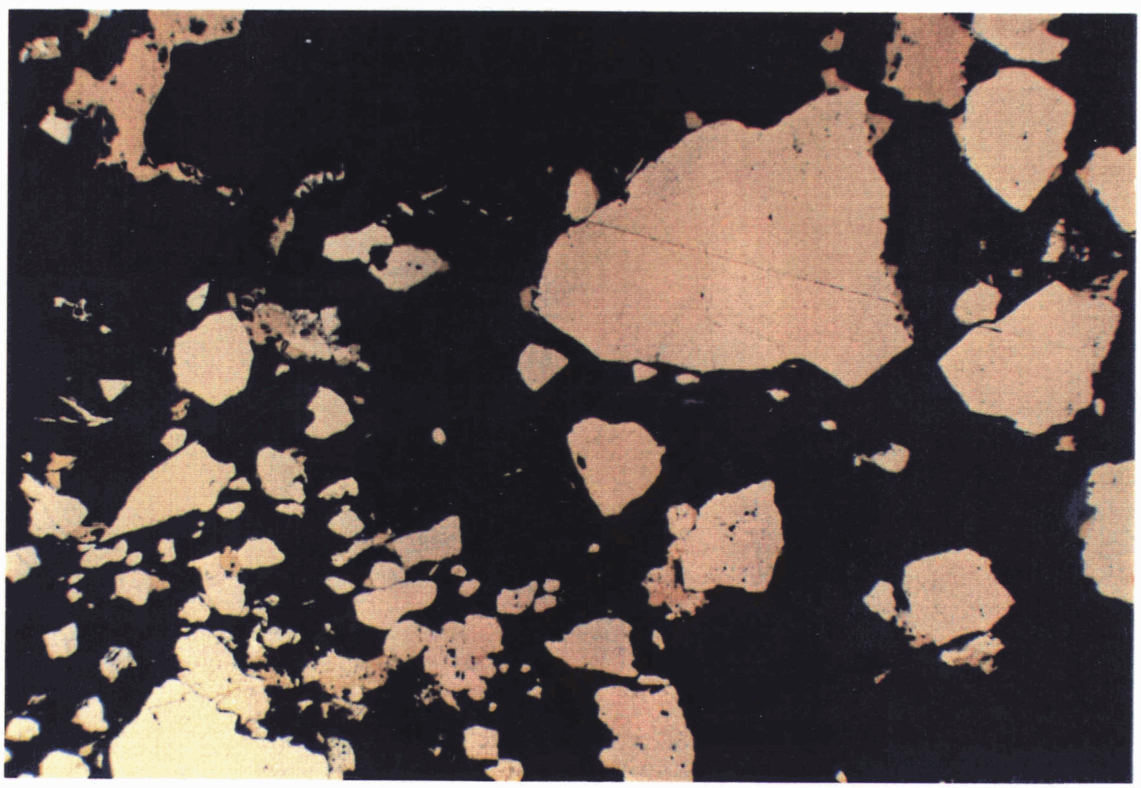


Neg. 142-6: Clast of pyrite with colloform bands of chalcopyrite. Dark background with pyrite flecks is the hosting graphitic material.

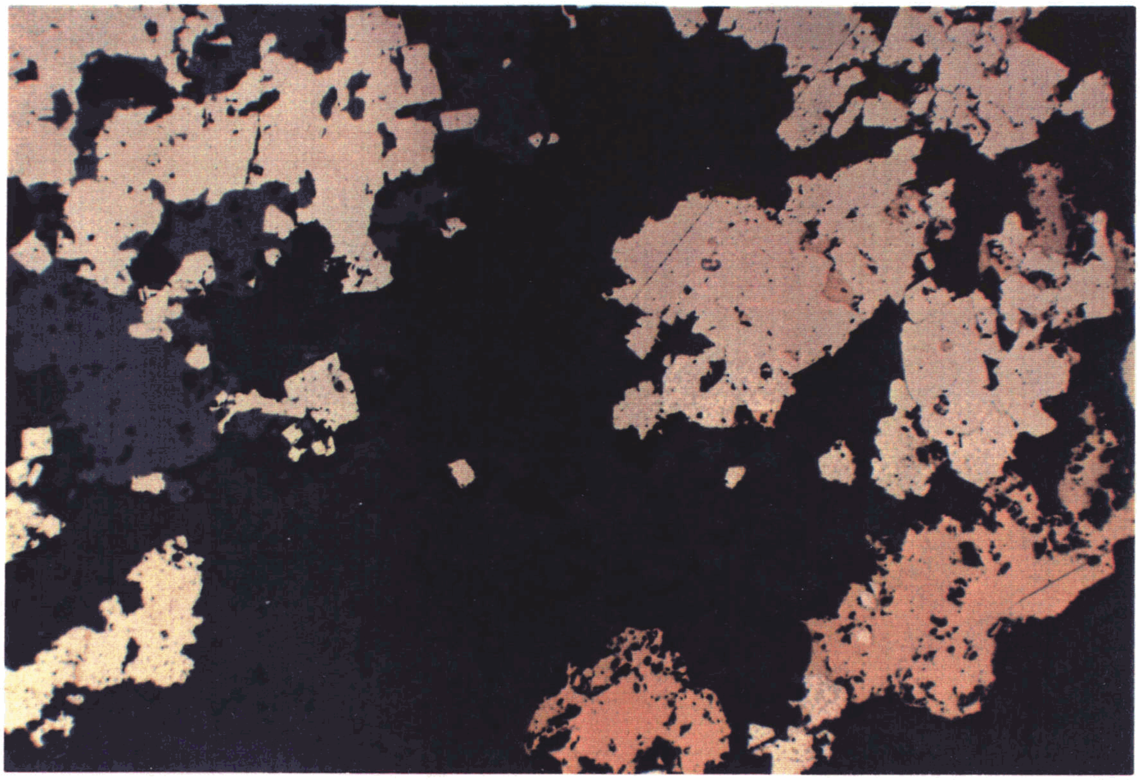


SAMPLE 9

Neg. 142-8: Shows different textural mode of pyrite (buff colour) in this sample. Pyrite forms fragmented masses, veined and cemented by the chalcopyrite matrix (yellow) and accessory gangue (black). Field includes disseminated irregular patches of sphalerite (grey) in the chalcopyrite.



Neg. 142-9: Shows clast-like form of sub-angular anhedral pyrite grains in gangue matrix (dark background). Minor chalcopyrite (yellow) and sphalerite (grey) form pockets in gangue or mould onto pyrite.



Neg. 142-10: Illustrates lack of sharp contacts on microscopic scale in macroscopically laminated ore. Field includes edge of sphalerite-pyrite zone (upper left) separated by central sulfide-poor zone of chert (dark) from a zone of clumpy-textured pyrite and chalcopyrite in chert (at right).