

3991

REPORT ON THE

GEOPHYSICAL, GEOLOGICAL & GEOCHEMICAL

SURVEYS

104J/4W

on the

GRIZZLY PROSPECT

SHESLAY RIVER AREA, B. C.

Long.: 131°53'W

Lat. : 58°14'N

Atlin Mining Division - N.T.S. 104J-4

on behalf of

COBRE EXPLORATION LTD.

Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

by

NO

3991

M.P.

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and

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ATLED EXPLORATION MANAGEMENT LTD.

Vancouver, B. C.

October 20, 1972

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION.....	1
LOCATION AND ACCESS.....	2
CLAIMS.....	2
GEOLOGY.....	3
Regional.....	3
Local.....	3
Mineralization.....	5
MAGNETOMETER SURVEY EXTENSION.....	6
Method.....	6
Instrumentation.....	7
DATA SOURCE AND PREVIOUS WORK.....	8
DISCUSSION OF SURVEY RESULTS.....	8
Magnetometer Survey.....	8
Induced Polarization Survey.....	10
- Pseudo - Sections.....	12
CONCLUSIONS AND RECOMMENDATIONS.....	14
Estimated Costs of Proposed I.P.Survey.....	16
ILLUSTRATIONS	
Location Maps	
#1 Scale: 1" = 136 miles)	
#2 1" = 4 miles)	After Page 1
#3 Magnetometer Survey Contour Map.....	In Map Pocket
#4 Compilation - Interpretation Map.....	In Map Pocket

TABLE OF CONTENTS - con't...

APPENDICES

- I - Personnel
- II - Statement of Costs
- III - Statutory Declaration
- IV - Statement of Author's Qualifications
- V - Engineers Certificate

INTRODUCTION

During August 1972, Atled Exploration Management was asked to study all existing data on the Grizzly prospect and to make recommendations for possible further work.

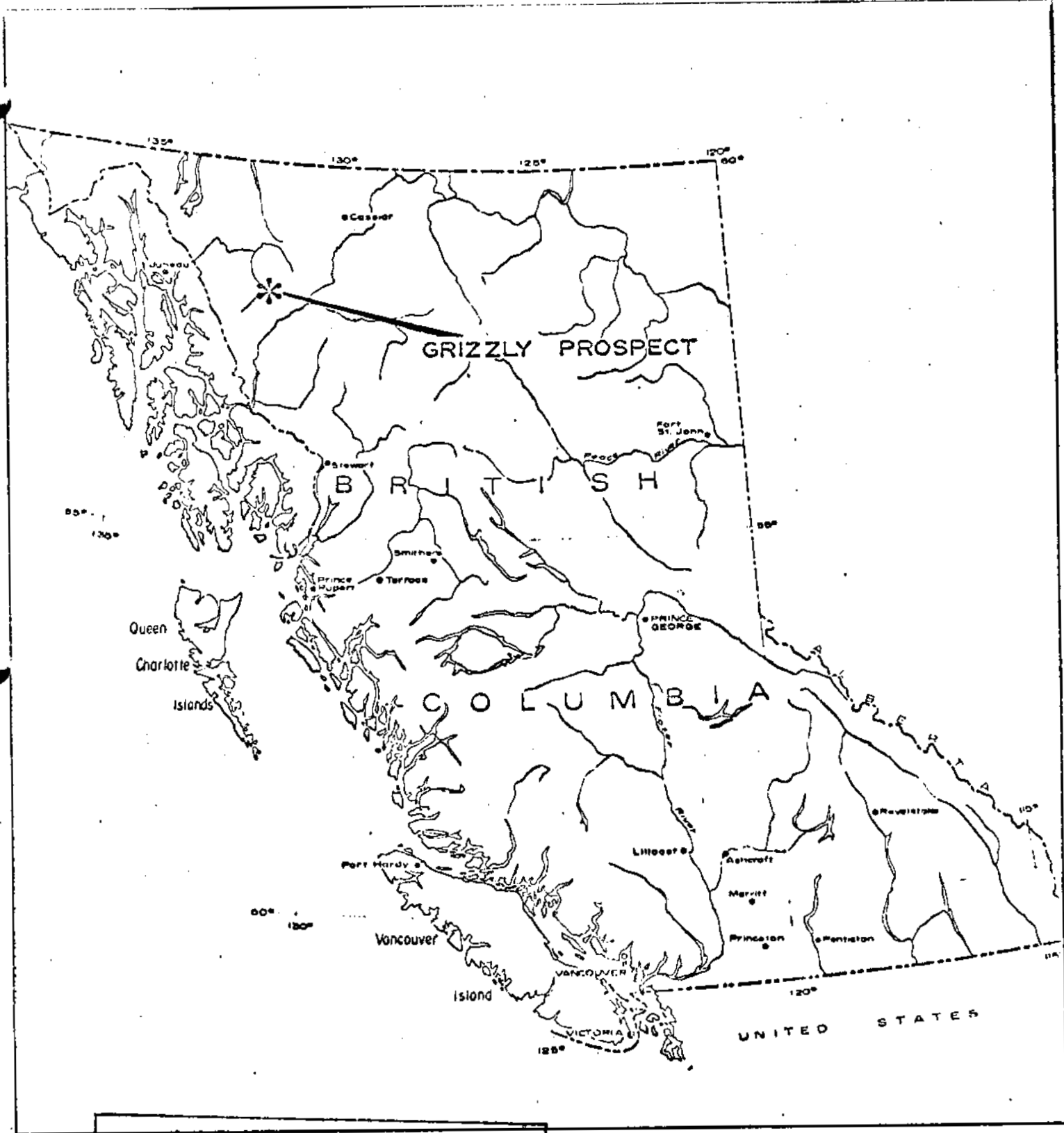
It was initially decided that additional geochemical soil sampling, ground magnetometer and geological investigations should be carried out on extended lines to the Southwest and to the North of the old Kennco grid.

This work would greatly enhance the knowledge of the property leading to an intelligent decision regarding the optimum parameters of a proposed Induced Polarization survey which would hopefully lead to drilling.

The program was completed by September 20, 1972 under the personal supervision of Mr. M. Fitzgerald.

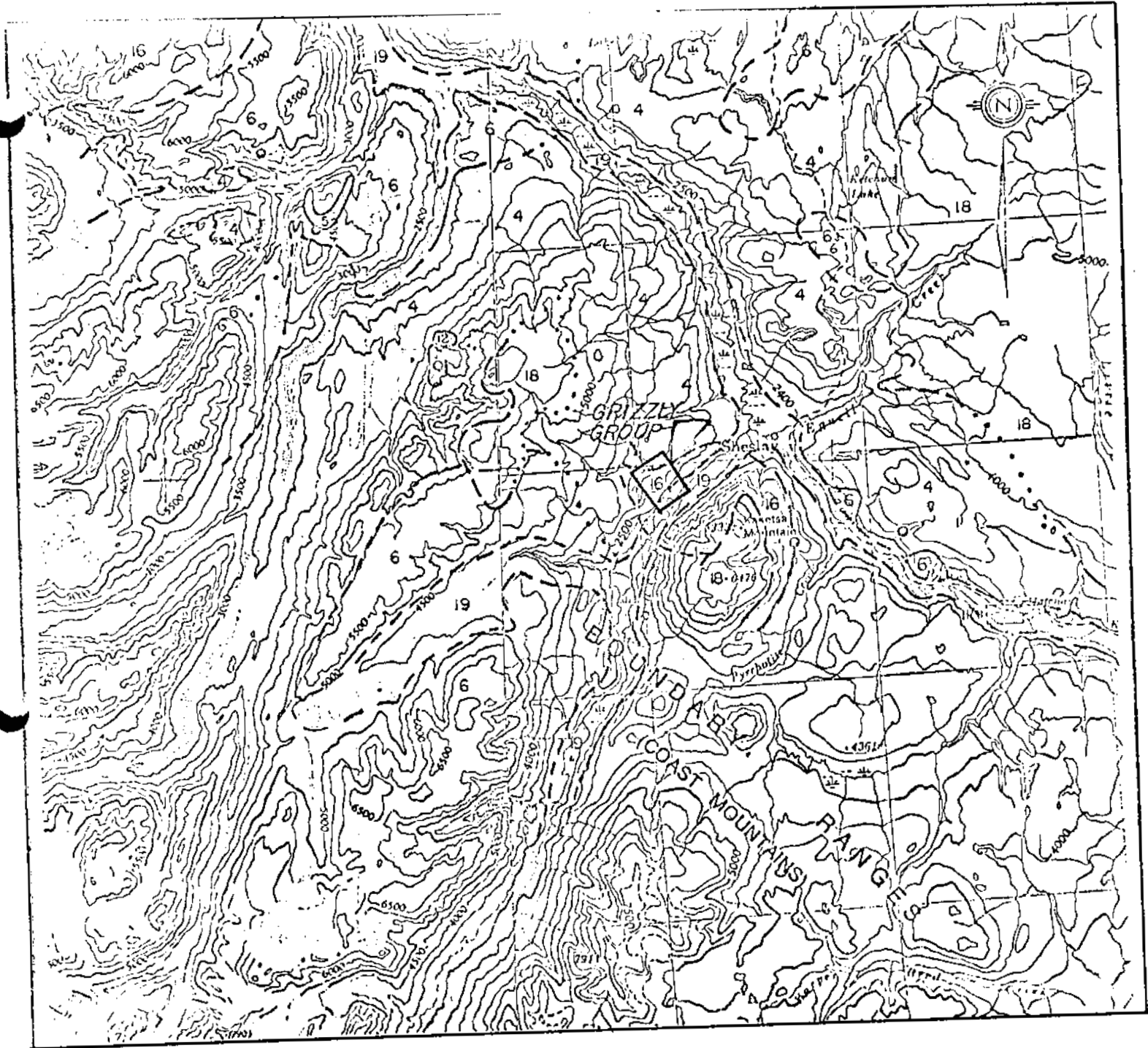
In October, 1972 all data was again reviewed and correlated forming the basis for this report.

For a more complete understanding of the property and for a background of previous work, the reader is referred to a report by Mr. Fitzgerald dated June 28, 1972.



Department of
 Mines and Technical Surveys
 LOCATION MAP
 ASSESSMENT REPORT
 No. **3991** #1

Scale: 1"=136 miles



LOCATION MAP

Scale: 1" = 4 miles

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3991 MAP #2

LOCATION AND ACCESS

The Grizzly Prospect consists of 43 mineral claims located in the Atlin Mining Division, north of the Stikine River in Northern British Columbia. Approximate co-ordinates are latitude 58°14'N, longitude 131°53'W and elevations on the property range from 1,900 to 3,600 feet. Telegraph Creek lies 35 miles to the southeast of the property and access is by helicopter from Telegraph Creek or by plane to the new landing strip at the junction of the Hackett and Sheslay rivers and then by helicopter 5 miles to the property. The new landing strip will accommodate aircraft of the DC-3 class. The area lies within the dry belt which extends along the east side of the Coast Range and, although undeveloped, presents fewer access problems than nearly any other area in the Stikine.

The claim group starts on the north side of the Sheslay River and extends up slope to the northwest. Timber and water are available on the property and both are abundant in the Sheslay River Valley. Road access could be provided with no great problems from Telegraph Creek or along the Tahltan-Hackett and Sheslay Rivers from the point where the Dease Lake-Telegraph Creek road crosses the Tahltan River.

CLAIMS

The property consists of the following mineral claims:

<u>Claim</u>	<u>Record Number</u>	<u>Recording Date</u>	<u>Owner</u>
Grizzly 1 - 20	13951-13970N	October 20, 1969	E. F. Asp
Kid 1	4146K	August 5, 1960	G. Davies
Red 41 - 62	17810-17831	February 24, 1972	Cobre Exploration Ltd.

Cobre Exploration Ltd., optioned the property in February, 1972.

GEOLOGY

Regional

This portion of the Sheslay River area is underlain principally by Triassic volcanics lying 20-40 miles east from the east flank of the main mass of the Coast Range. A deviation from the northwesterly regional trend occurs in the vicinity of the Sheslay River where several batholiths protrude from the main Coast Range mass in a north-easterly direction. Smaller satellitic bodies are also present and the stock which forms the core of Kaketsa Mountain southeast of the claim area is one of these.

A tongue-like extension of the stock projects across the Sheslay River to the northwest and is moderately well exposed on a lightly drift covered slope having an average relief of 2,000 feet in one mile. The Grizzly Prospect consists of copper showings associated with this extension of the stock.

Local

In the area of the Grizzly claims, the northwestern extension of the Kaketsa stock is composed of medium grained material ranging from monzonite to quartz diorite in composition. Included within the main boundaries of the stock are several northeasterly trending belts of Triassic volcanic rocks, 400 feet or more wide, in which the observed flow trends are also northeasterly. The contact between the stock and the intruded volcanics is very irregular and throughout the prospect area the roof of the intrusion is cut at a very low angle by the topo-

graphy. It is probable that these belts of volcanic rocks represent thin remnants of the roof above the northwestern extension of the stock which have been nearly isolated by erosion.

The volcanics have been subjected to rather intense contact metamorphism and some of the copper mineralization in the prospect, together with magnetite, epidote, and carbonate gangue occur in the areas of the volcanic roof rocks.

The intrusive and, to some extent, the volcanics have been subjected to extensive pink-feldspar flooding and a large portion of the intrusive material called syenite may represent a combination of syenitized monzonite-quartz diorite and later stage syenite intrusion.

Copper mineralization is closely associated with the syenite intrusion. Chalcopyrite observed is finely disseminated in the stock and is also as fractured fillings along the syenite-volcanic contact.

Structure on the prospect is quite complex, notably in the contact zone of the major intrusive. Many faults of relatively small size and variable attitude have been mapped. Several major faults, striking north-northwest and north, are suspected from indirect evidence.

Overburden cover is fairly extensive in the central portion of the property and no outcrops are present in much of the portion which is indicated by geochemical and geophysical surveys to have the greatest potential. Evaluation of known copper showings and the surveys indicates that the distribution of better mineralized areas appears to be roughly coincident with two major inferred north-northwest-trending fault zones and these may perhaps constitute the fundamental control of mineralization.

Mineralization

Two main areas of copper showings are known on the claims; these are termed the North Area and South Area showings and lie on either end of the apparent linear zone of strong pink-feldspar flooding and copper mineralization. In the South Area, the Triassic volcanics are intruded by sheared, fractured, and mineralized syenite to monzonite dikes. A number of fracture and shear zones are present within the dikes and volcanics which locally contain several percent copper. Most of this mineralization is restricted to widths of only a few feet, however, and the portion of the monzonite stock present in this area is only locally mineralized.

The North Area showings consist of disseminated chalcopyrite in syenitic intrusive material. The exposure of the intrusive here is approximately 600 feet long by 400 feet wide and all portions contain at least low grade mineralization. Unoxidized sulfides in this area are all finely disseminated in the fractured intrusive and consist of small grains and nests of chalcopyrite and lesser pyrite which replace chloritized hornblende and biotite. Examination of the mineralized material reveals the presence of limonite relicts after chalcopyrite along occasional oxidized fractures indicating that small amounts of additional chalcopyrite were present in the rocks prior to oxidation.

Seven large grab samples have been taken from the North Area showing which returned assays ranging from 0.13% to 0.39% copper. Most of the samples range between 0.15% and 0.25% copper and it is estimated that overall grade in the showings area probably averages approximately 0.2% copper. The North Area showings are open in all directions and the long induced polarization and geochemical anomalies, discussed in following sections of this report, which occupy the extensive covered area

to the east, southeast, and south of the mineralized exposures suggest that higher grade mineralization of substantial extent may be present adjacent to the exposures.

MAGNETOMETER SURVEY EXTENSION

Between September 17 - 20, 1972 a total of 2.6 line miles of magnetometer survey was added to the existing survey which was carried out by Hudson Bay Oil and Gas Ltd. in 1972.

Method

The survey was executed using a Sharpe MF-1 magnetometer which is hand held and levelled using a bubble-level on the face of the instrument.

Readings were taken at a constant height above ground facing one direction using the most sensitive scale possible.

The new lines to the northwest of the old grid were tied into this grid by means of an extended Baseline as noted on the contour map. The line extensions at the southwest corner of the grid were tied into the end station readings with sufficient overlap.

A nearby base-station was read at the beginning and end of each day for the day-to-day correlation and to monitor any possible magnetic storms.

Instrumentation

The Sharpe MF-1 magnetometer measures the vertical force variations of the earth's natural magnetic field and displays them in gammas on a meter having 5 ranges for a total of $\pm 100,000$ gammas.

The unit is light in weight, is fully portable, has excellent temperature stability, has negligible drift or orientation error and is of rugged construction.

DATA SOURCE AND PREVIOUS WORK

Considerable information has been acquired on the property including the following:

1. Ground Magnetometer Survey by Hudson Bay Oil and Gas Ltd. (1972) extended by Atled Exploration Management Ltd. (Sept, 1972)
2. Induced Polarization survey by McPhar Geophysics on behalf of Kennco Explorations (Western) Ltd. (June, 1962)
3. Geochemical Soil survey on some Kid claims by Kennco in 1961 which was later detailed and extended by Colo Corp. in 1970 and by Cobre Exploration Inc. in 1972.
4. Geological Mapping by W. Rehrig, Colo Corp., in 1970 and other geological observations by Kennco, H.B.O. & G. and M. Fitzgerald.

DISCUSSION OF SURVEY RESULTS

1. Magnetometer Survey

The ground magnetometer coverage appears to have been well executed with the necessary corrections and tying in having been adequately carried out. Some contours parallelling the baseline and between crosslines are believed to be valid and caused by strong lineaments (structures) observed both on the ground and on aerial photographs.

The 750 gamma contour roughly divides the survey area into two areas for further discussion.

Areas less than 750 gammas are generally interpreted as being caused by increased alteration and fracturing of the bedrock by dike intrusion, shearing and cross-faulting. Areas of increased overburden thicknesses cause a reduction in the magnetic level as well.

A fault is interpreted along the Kennco baseline from Line 28N to the NW edge of the grid.

Cross-faults are also postulated along Lines 36N and 24N Northeast of a Northerly striking fault cutting across the center of the grid.

A dike is interpreted trending approximately parallel and to the east of the Kennco baseline. It is represented by a narrow, elongated magnetic high.

The other wider magnetic high feature with a greater local magnetic relief could be caused by the same environment observed in the South Showing area. High concentrations of magnetite in dioritic float and outcrops near the northeastern ends of Lines 40N and 48N have been observed.

The magnetic survey extensions executed by Atled have indicated an area of low susceptibility rocks to the southwest of the old grid. The northwesterly striking contours are probably related to the fault plotted on the SW end of L24N on the Geology map. This whole area is likely underlain by barren porphyritic andesites (green) covered by thick overburden.

The northern extensions (i.e. Lines 105N, 110N and 115N) use a different grid numbering system whereby Line 105N is parallel to and 500 feet NW of Line 48 N. The magnetic pattern is virtually a

continuation from the older survey with an indicated embayment at the NE end of Line 105N. The interpreted dike is thought to continue NW but is not expressed as clearly magnetically possibly due to increased overburden thickness in this direction.

2. Induced Polarization Survey

The I.P. traverses were spaced 1,000 feet apart on a separate but coincident grid.

The standard McPhar method was incorporated whereby the dipole - dipole configuration was used with $x = 200$ feet and $N = 1, 2, 3, \text{ and } 4$.

Apparent resistivity ($\rho_a / 2\pi$) and apparent Metal Factor (M.F.)_a values were plotted in the "pseudo" - section manner with solid and dashed bars showing anomalous and possibly anomalous M.F. zones respectively along the survey lines. Frequency effect readings (analogous to chargeability in pulse or time domain I.P.) have been omitted in the McPhar report.

There has been a long-standing discussion amongst geophysicists concerning the merits of Metal factor presentation of the data. Metal factor is actually a combination of the two field measurements, $\rho_a / 2\pi$ and F.E. and is given by the relationship:

$$M.F. = \frac{F.E. \times 10^5}{\rho_a / 2\pi}$$

One can see that M. F. anomalies will only result from an F. E. (M_a) high and a $\rho_a/2\pi$ low. An F.E. high and a $\rho_a/2\pi$ high would cause no appreciable M.F. anomalies even though there are many examples of mineral deposits and ore-bodies occurring under the latter conditions. It is, therefore, quite misleading to consider M.F. values while totally ignoring frequency effect or chargeability.

The writer, feels that both forms of data should be presented, studied and any resulting anomalous conditions investigated.

The frequency effects were calculated from all M.F. and $\rho_a/2\pi$ values, plotted as "pseudo" - sections, and contoured using the F.E. values for the $n = 3$ level. The 2.00 F.E. contour was then compared with the 50 M.F. contour for $n = 3$ as it was felt that this level was likely the most representative of large-scale, bedrock conditions while maintaining good resolution.

Although the I.P. lines are very widely spaced apart the contours show a good correlation west of the main (NE) baseline suggesting that in this area, low resistivities are related to high frequency effects and, hence, high metal factors result.

East of the baseline, however, the opposite situation is observed whereby there is an anomalous F.E. (above 2.00) zone in an area of higher resistivities and high magnetic susceptibility.

Pseudo - Sections

Line 100N

On this line it is quite possible that the higher F.E. response is due to an increase in magnetite content of the underlying rocks. However, this area has yielded copper geochemical values greater than 200 ppm. and should therefore be investigated further. The F.E. "pseudo" - section of Line 100N indicates no anomalous condition on the west where McPhar has shown a possible anomalous zone but clearly shows a wide, shallow source of polarized material coincident with the 1000 gamma and greater contours. The F. E. anomaly diminishes in width with depth giving a "mushroom" type pattern. There is a strong indication of a dike-like polarized body at stn. 12E dipping easterly on this line.

Line 90N

The F.E. plot has more clearly defined a dike-like body at 2+50E dipping westerly and suggests the possibility of small, local polarized material as outlined by the 2.0 F.E. contours. One larger area is indicated at the extreme east of the line and is still open in that direction. McPhar's "possibly anomalous zone" at 21E - 25E does not show at all on the F.E. plot.

Line 80N

There is close agreement between F.E. and M.F. on this line. The 2.00 F.E. contour outlines a broad, homogenous zone of metallicly

conducting rocks which, unlike the eastern half of line 100N, coincides with a magnetic low. A large Cu geochemical anomaly of ≥ 200 ppm peaking to 1350 ppm is also coincident with the I.P. anomalies.

The F.E. plot has extended the M.F. anomaly slightly to the west and added another 400 feet to the east.

Line 70N

The F.E. plots suggest that the line-segment from stn. 7W to 11E is of interest. The highest F.E. values conform to the higher M.F. values but the lower F.E. readings above 2.0 are still worthy of consideration. It is felt, though, that there is a contact or demarcation line at 1 + 50E dipping steeply easterly which separates two or more causative sources. The F.E. highs at 4E (n = 1) and at 7E (n = 2) are probably due to veins or shoots while the westerly F.E. zone could be caused by disseminated sulphides with higher concentrations beneath 4W - 6W.

Line 60N

The F.E. response is quite low on this line except for a local feature centered at 4W. Some Cu-bearing veins are mapped southerly of this point. No large disseminated sulphide target is envisaged existing on or near this line.

CONCLUSIONS AND RECOMMENDATIONS

From the above study it is concluded that the Grizzly property is one of complex geology consisting of various rock-types, considerable faulting, diking and veining and overlain by variations in thickness, conductivity and lateral extent of overburden.

The mineralization observed testifies to the economic potential of the claims and indeed of the entire area.

Geophysically, there appears to be two environments worth further investigation. Both are coincident with Cu geochemical anomalies greater than 150 ppm.

One area of interest is the correlative high M.F., low $\rho_a/2\pi$, high F.E. and low magnetic region between the North and South showings and to the west of the south showings but north of Line 16N.

This zone is along or adjacent to an interpreted fault and pronounced lineament cut by a postulated sub-parallel dike represented by an elongated magnetic high. As shown on the accompanying compilation -interpretation map, the area covered by the 100 M.F. and 2.0 F.E. contours are considered to be worthy of further exploration. The observed low sulphide content (especially pyrite) of the showings suggest that even sub-anomalous I.P. responses should be investigated particularly in areas of changing overburden conditions.

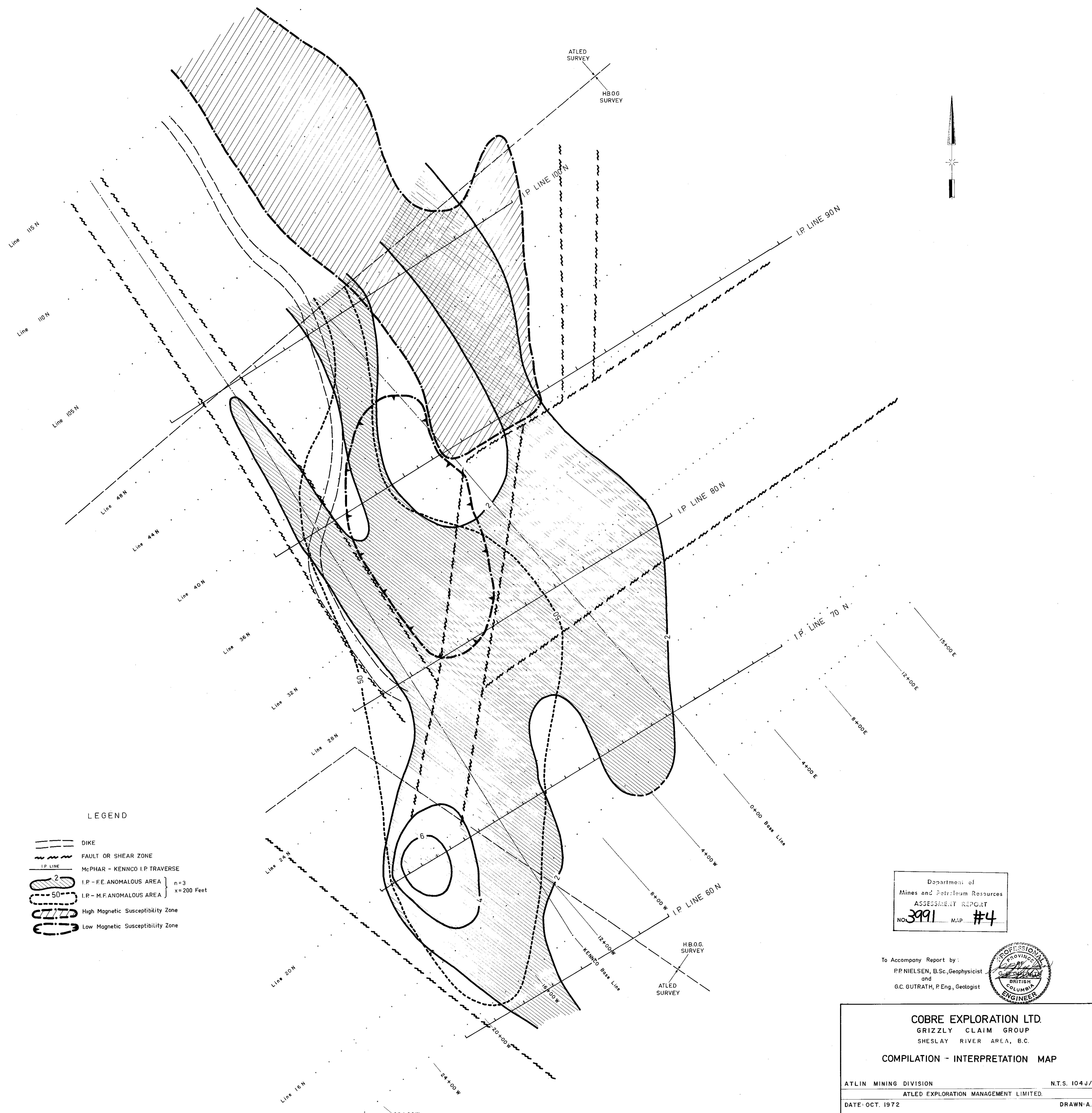
The other main area of interest located north-east of and parallel to the main baseline consists of a long, narrow coincident F.E. and magnetic high feature thought to be primarily due to a dike-like causative source containing appreciable amounts of magnetite and

possibly copper-bearing sulphides. It occurs in an area of few outcrops and the overburden thickness appears to increase to the north and northwest. This is supported by the copper geochemical values which peak to 770 ppm on Line 48N and decrease in amplitude along the magnetic high axis to the north. The recent geochemical soil survey extension yielded strong Cu values along the Kennco baseline northwest of line 48N which should be investigated as this trend indicates further potential in this area and along the interpreted fault.

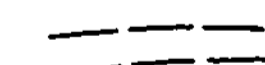
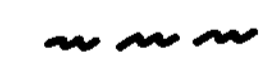
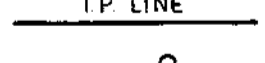

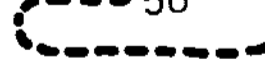



It is recommended that further Induced Polarization coverage should be carried out on the property using recently developed instrumentation capable of high-resolution, deep penetration and excellent estimations of type of mineralization, particle-size and geometry of body. Initially it is recommended that intermediate lines be run between the McPhar traverses in the areas discussed above and along the new lines to the northwest. Should anomalous responses be encountered on Line 115N then additional step-out lines should be installed and surveyed (I.P.) until the anomaly is closed off.

No further coverage south of Line 16N is recommended at this time.

Two short orientation traverses should be made along McPhar lines such as Line 90N at the north showings and possibly along the western half of the 70N Line.



LEGEND

-  DIKE
-  FAULT OR SHEAR ZONE
-  I.P. LINE
-  McPHAR - KENCO I.P. TRAVERSE
-  I.P. - F.E. ANOMALOUS AREA } n=3
-  I.P. - M.F. ANOMALOUS AREA } x=200 Feet
-  High Magnetic Susceptibility Zone
-  Low Magnetic Susceptibility Zone

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NO. 3991 MAP #4

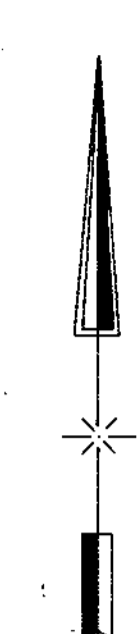
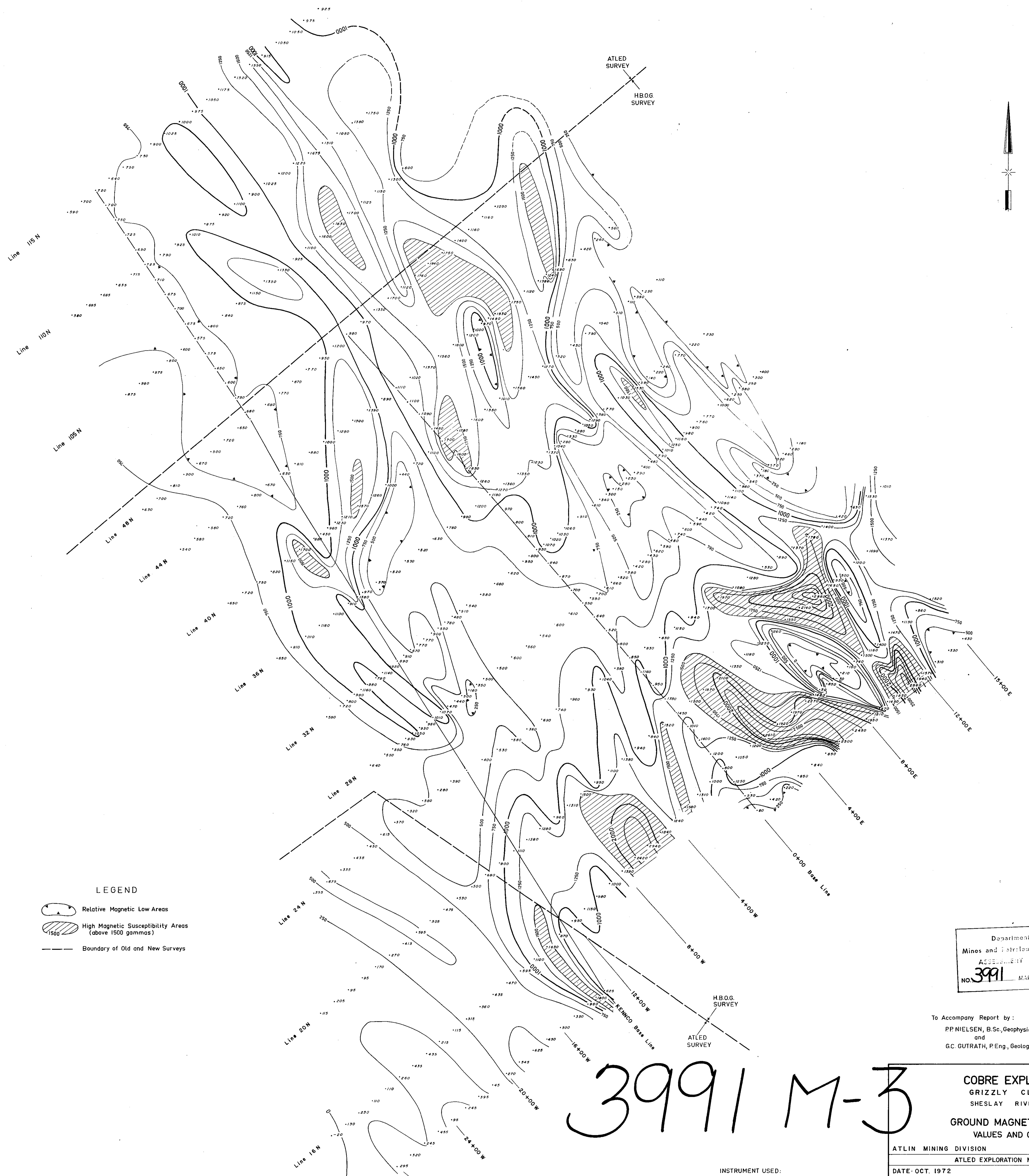
To Accompany Report by:
P.P. NIELSEN, B.Sc., Geophysicist
and
G.C. GUTRATH, P.Eng., Geologist



COBRE EXPLORATION LTD.
GRIZZLY CLAIM GROUP
SHESLAY RIVER AREA, B.C.
COMPILATION - INTERPRETATION MAP

ATLIN MINING DIVISION N.T.S. 104J/4W
ATLED EXPLORATION MANAGEMENT LIMITED.
DATE: OCT. 1972 DRAWN: A.N.S.



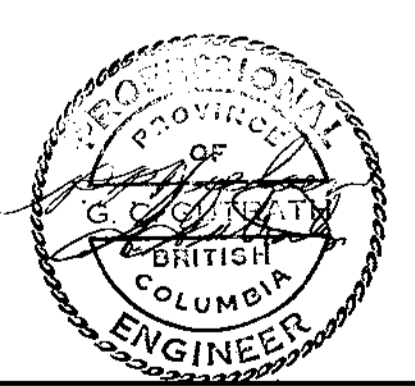


LEGEND

- Relative Magnetic Low Areas
- High Magnetic Susceptibility Areas (above 1500 gammas)
- Boundary of Old and New Surveys

Department of
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ASSESSMENT REPORT
NO. 3991 MAP #3

To Accompany Report by:
PP NIELSEN, B.Sc., Geophysicist
and
GC. GUTRATH, P.Eng., Geologist



3991 M-3

COBRE EXPLORATION LTD.
GRIZZLY CLAIM GROUP
SHESLAY RIVER AREA, B.C.
GROUND MAGNETOMETER SURVEY
VALUES AND CONTOUR MAP

ATLIN MINING DIVISION N.T.S. 104 J/4 W
ATLED EXPLORATION MANAGEMENT LIMITED.

DATE: OCT. 1972 DRAWN: A.N.S.

INSTRUMENT USED:
SHARPE MF-1 FLUXGATE MAGNETOMETER
VALUES IN GAMMAS
CONTOUR INTERVAL = 250 GAMMAS

