85-446-13751

Geological, Geochemical, and Geophysical Report

on the

HAWKINS LAKE - ALCLARE RESOURCES OPTION

Located at Coordinates:
51 deg.53°N, 120 deg.56°W
In the Clinton Mining Division
of British Columbia

by

Thomas D. Lewis, P. Eng., and Lyndon Bradish

Noranda Exploration Company, Limited
(No Personal Liability)

January 1985

Table of Contents

APPENDICES

LIST OF FIGURES

SUMMARY:

The Hawkins Lake Property is located in south central British Columbia, within the Quesnel Trough greenstone belt. The belt is interpreted as an island arc setting, deposited during Triassic time.

Interest in the property stems from copper-gold mineralization within the volcanics. This mineralization is associated with propyllitic alteration proximal to a small monzonite to diorite stock. To date, copper-gold values ranging from .56 to 2.2% copper, and .01 to .16 oz/ton gold, have been recorded within a zone of brecciated volcanics measuring 25 X 50 meters.

The property was discovered in 1978, by prospectors Alfred and Clay Robinson. Following trenching and prospecting by the original owners, Alclare Resources Inc. was formed to manage and explore the area. In 1982, following rock geochem and limited EM and magnetometer surveys, Alclare completed 11 diamond drill holes totalling 424 meters.

In 1984, the property was optioned to Noranda Exploration Company, Limited. To date Noranda has completed soil sampling, detailed geological mapping, trenching, magnetometer and Induced Polarization surveys. The results of these surveys is a zone extending 500 meters south of the main showings, and is defined by a coincident IP chargeability anomaly and a gold anomaly in soils. Furthermore, a similar subparallel zone exists west of this main zone.

INTRODUCTION:

The Hawkins Lake property was discovered by prospectors Alfred and Clay Robinson in 1978. Subsequently, a junior mining company named Alclare Resources was formed to explore and manage the property.

In June 1984, Noranda Exploration Company, Limited, optioned the Hawkins Lake Property from Alclare Resources. Noranda initiated exploration programs consisting of geological mapping, soil geochemistry, trenching, magnetometer and Induced Polarization surveys. This report describes the results of those surveys, and summarizes work previously completed by Alclare Resources.

LOCATION AND ACCESS:

The property is located approximately 40 km northeast of 100 Mile House, in south central British Columbia. The property is also 5 km at 290 degrees (true) from the village of Eagle Creek, located just north of Canim Lake.

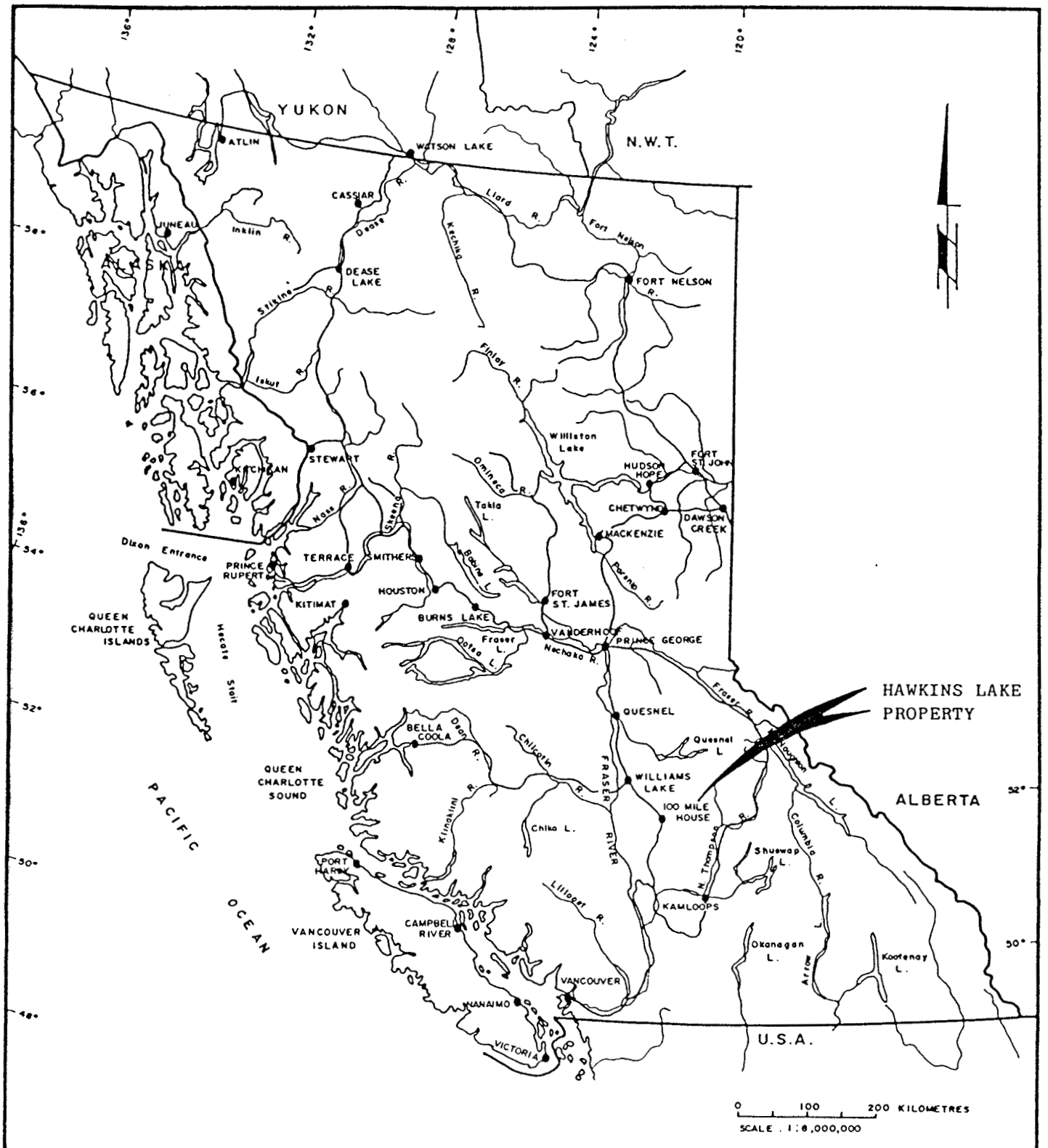
Access to the property from 100 Mile House is via the all-weather mine haulage road from Noranda's Boss Mountain Mine. At Eagle Creek, a good gravel road leads to the north shore of Hawkins Lake. From Hawkins Lake, a rough 4 X 4 truck road leads onto the property, a distance of 4 km.

CLAIM STATISTICS:

The Hawkins Lake Property contains the following mineral claims, located in the Clinton Mining District.

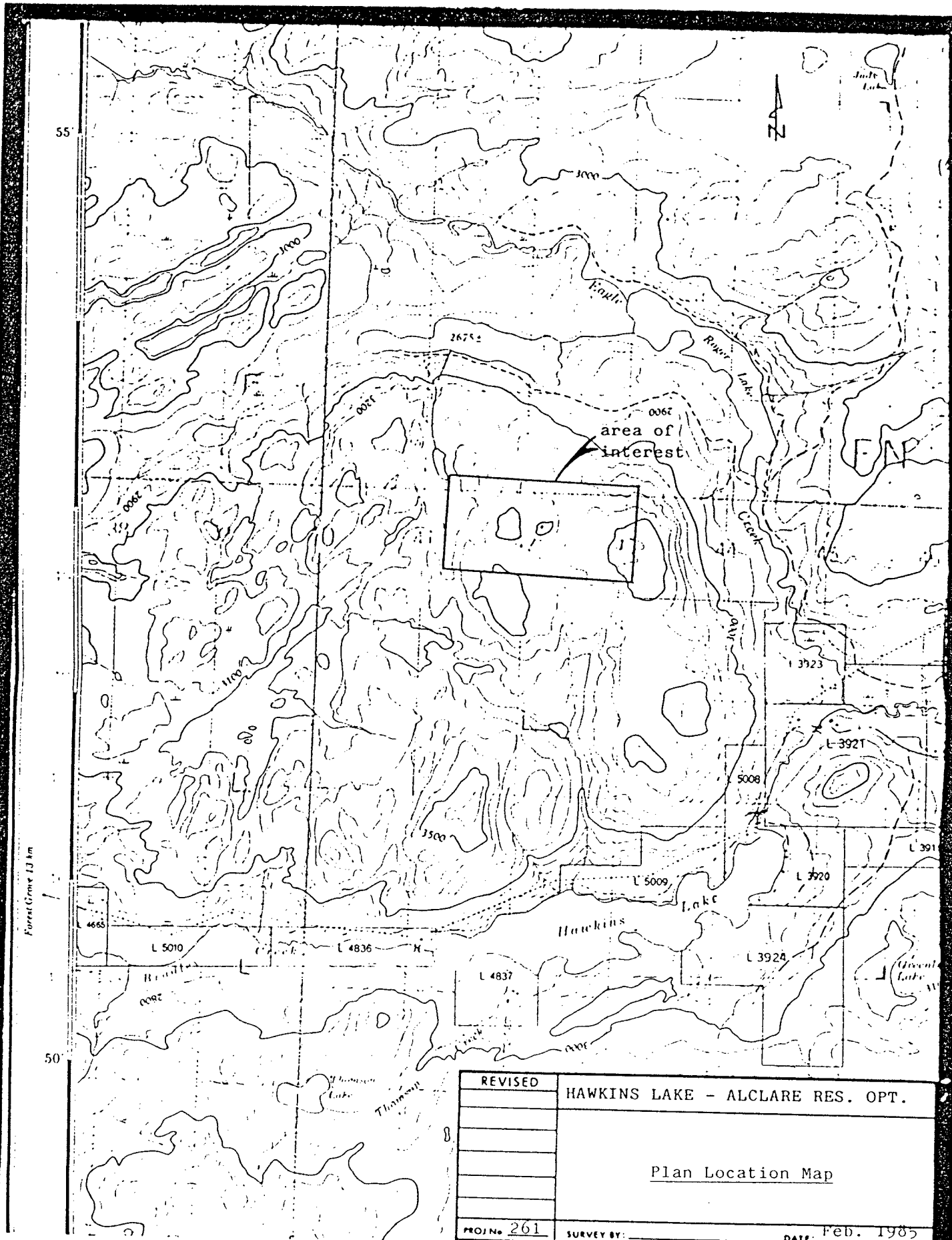
Claim Name	# Units	Record #	Record Date	Type of Claim
North	12	000286	Feb. 23, 1987	MGS
Cab 1	6	1815	Aug. 21, 1988	MGS
Cab 2	14	1816	Aug. 21, 1988	MGS
Ski 1	16	1817	Aug. 21, 1988	MGS
After	10	001115	Sept. 29, 1987	MGS
Clay 1-8 incl.	8	208-215	May 31, 1988	two-post
Hunter 1-8 incl.	8	927,958-964	Feb. 3, 1987	two-post
Trapper 1-8 incl.	8	853-860	Aug. 18, 1987	two-post
TOTAL	**82**			

The claims are owned by Alclare Resources, but are presently under option to Noranda Exploration Company, Limited.



REVISED	HAWKINS LAKE - ALCLARE RES. OPT.
	LOCATION MAP
PROJ. No 261	SURVEY BY: _____ DATE: Feb. 1985
N.T.S. 92P/15	DRAWN BY: S.K.B. SCALE: 1:8,000,000
DWG. No. 1	NORANDA EXPLORATION
	OFFICE: PRINCE GEORGE, B.C.

VANCAL 11927



REVISED	HAWKINS LAKE - ALCLARE RES. OPT.
	Plan Location Map
PROJ No. 261	SURVEY BY: DATE: Feb. 1985
N.T.S. 92P/15	DRAWN BY: SCALE: 1:50,000
DWG. No. 2	NORANDA EXPLORATION
	OFFICE: Prince George

PREVIOUS WORK:

The Hawkins Lake property was discovered by Alfred and Clay Robinson in 1978. The prospectors trenched and explored the vicinity of the main showing.

In 1981, a grid was established for the purposes of geological mapping, rock-chip geochemistry, magnetometer and VLF-EM surveys (Werner, 1981). Rock geochem identified anomalous populations in copper, silver and gold over the original discovery. Gold values indicated the zone to extend northerly and easterly. However, no additional mineralization was discovered.

The results of the magnetometer and VLF-EM surveys failed to identify a signature over the known mineralization.

In 1982, Alclare Resources Inc. initiated a program of diamond drilling over the original discovery zone. A total of 1391 feet (424 meters) of BQ drilling was completed in 11 holes. The drilling failed to intersect economic mineralization, and the property lay dormant until being optioned to Noranda in 1984.

REGIONAL GEOLOGY:

Geological mapping by Campbell and Tipper (Memoir 363, 1971) of the Geological Survey of Canada, is the most recent mapping in the area. They conclude the region is underlain by Nicola volcanic and sedimentary rocks of Triassic-Jurassic age.

These rocks consist mainly of greenstones, and greenstone tuffs and breccias. In the Hawkins Lake area, interbedded grey limestone is common.

Intruding the volcanic sequence, is the Takomkane batholith of Cretaceous age. It consists mainly of hornblende-biotite granodiorite.

PROPERTY GEOLOGY:

The Hawkins Lake property is underlain by greenstones, tuffs, breccias, and limestones of the Nicola Group. These rocks generally trend northerly with near vertical dip attitudes. Geological mapping by the author on a 1:5000 scale, has determined the following lithologies: unit 1 - dark green, chlorite schist; unit 2 - dark green hornblende basalt; unit 3 - monolithic, hornblende basalt and tuff; unit 4 - buff felsic schist; unit 5 - grey skarnified limestone; and unit 6 - quartz-feldspar chlorite schist. It is postulated these rocks were deposited in a submarine island arc setting during Triassic time.

Furthermore, during the waning stages of volcanism, the assemblage was intruded by a monzonite stock (unit 8). At this time, sulphuric hydrothermal solutions bearing base and precious metals were deposited in the open spaces of the hornblende basalt breccia, and near the contact with the limestone.

Subsequently during the Cretaceous, the entire assemblage was further intruded by the Takomkane granodiorite (unit 7) and associated syenite dykes (unit 9).

MINERALIZATION:

Of economic interest on the property is the presence of copper and gold mineralization. This mineralization occurs as blebs and fracture coatings hosted in the hornblende basalt breccia (unit 2). This unit is proximal to the monzonite stock and in contact with the skarnified limestone (unit 4) and the quartz-feldspar chlorite schist (unit 6). The zone of mineralization is approximately 25 meters in width, and subcrops for 50 meters along strike.

Thin and polished section studies by D.J.T. Carson (1984) identified the following copper-bearing minerals: bornite (Cu5 FeS4), chalcocite-digenite (Cu2S), covellite replacing bornite and chalcocite-digenite, minor chalcopyrite (CuFeS2), and malachite.

In addition, gold mineralization was observed. According to Carson, 76.6% of the observed gold occurs on grain boundaries between (silicate-carbonate) gangue minerals, and 21.2% of the gold is locked within silicate or carbonate grains. Only 2.2% of the gold is in contact with a copper mineral (digenite).

Furthermore, trace amounts of silver and mercury tellurides hessite and coloradoite are associated with bornite (Carson, 1984).

ALTERATION:

Intimately associated with the sulphide mineralization, is a zone of prophyllitic alteration related to the monzonite stock. Gangue minerals identified in the banded dark to light green rocks are abundant pyroxene, epidote, and amphibole, with moderate to minor quartz, calcite, K-feldspar, and plagioclase, and 0.5 to 3% magnetite, hematite and rutile (Carson, 1984).

1984 EXPLORATION PROGRAM:

RESAMPLING OF DRILL CORE

Upon signing the agreement with Alclare Resources Inc., Noranda performed more sampling of core drilled by Alclare in 1982. The results of this further sampling are tabled on the next page.

DDH	Sample # (interval)	Cu (ppm)	Au (ppb)	Type	Notes
DDH#1	31°-37°	5	<5	chip samples	monolithic, basalt breccia, epidote matrix
	45°-52°	4	5	chip samples	basalt breccia, 50% epidote in matrix
	63°-100°	3	5	chip samples	basalt, intruded by diorite dykes, some epidote
	124°-127°	5	10	split core	basalt, 50% epidote
DDH#2	260°-263°	2	<5	split core	pyroxene basalt, with up to 20% epidote
DDH#3	90°-93°	40	5	split core	pyroxene basalt, with 50% epidote, and 5% calcite
	158°-161°	1370	460	split core	pyroxene basalt, 50% epidote and minor malachite
DDH#3A	5°-37°	10	5	composite	epidote, calcite skarn
DDH#5	46°-49°	245	55	split core	altered volcanics, 60% epidote, 10% calcite
DDH#8	60°-66°	8	<5	split core	altered basalt, epidote and calcite
	86°-105°	9	<5	composite	altered basalt, sampled epidote rich zones
DDH#11	26°-29°	2	<5	split core	altered volcanics
	79°-82°	2	25	split core	carbonate-quartz vein in volcanics

GRID

Noranda crews initially cut a 1.2 km baseline at an azimuth of 020 degrees (true). A total of 13.0 km of flagged crosslines were established at 100 meter spacings perpendicular to the baseline. Stations were marked at 25 meter intervals using white teflon cards marked with indelible ink. Subsequently, the baseline was extended 500 meters further northward.

GEOCHEM SURVEY

(i) Method:

Soil sampling was performed along the crosslines at 50 meter intervals. Due to the variable layer of volcanic ash below the A horizon, and the presence of angular volcanic fragments in the soil, standard soil sampling techniques were not used. Instead, pits were dug at each site to a depth of between 0.5 and 1.0 meter. Further penetration was obtained using mattocks and augers. Samples were placed in "Hi" Wet Strength Kraft envelopes, and the sample number marked on the envelope with indelible ink. The samples were dried, shipped, screened and sifted to obtain the -80 mesh fraction.

A total of 351 soil samples were analyzed by Noranda Exploration in Vancouver. The determination procedure for copper, gold, and arsenic is described in Appendix III. Furthermore, operation of a Varian Techtron Model AA-5 Atomic Absorption Spectrophotometer is fully outlined in the literature and will not be described in this report.

(ii) Presentation of Results:

Results of the survey are presented on plan maps at a scale of 1:5000 (in pocket).

(iii) Discussion of Results:

Copper

Copper values ranged from a low of 8 ppm to a high of 1100 ppm. Three distinct zones with copper concentration of greater than 100 ppm copper in soils were defined. Each of the zones trend northerly and are described below:

1. The most westerly anomaly occurs near station 4500E, extending from Line 4800N to Line 5600N. The zone is best defined by the greater than 100 ppm copper contour, but also contains two samples containing 210 and 260 ppm copper. This anomaly appears to cover the contact between the volcanics and the Takomkane granodiorite. Rocks in the area are rich in epidote, and have been locally intruded by syenitic dykes.

2. The central copper anomaly extends intermittently from Line 5000N, 5000E to Line 5500N, 4850E. It appears to be an extension of the copper mineralization detected on the "Knob Showings". However, trenching failed to detect significant copper mineralization.

3. The eastern anomaly extends from Line 5100N to Line 5800N and beyond. Again, this anomaly corresponds with the contact between the Takomkane and the Volcanics. A rock sample from a trench on Line 5800N yielded 12000 ppm Cu, and 1300 ppb Au.

Gold

Gold values ranged from a low of 10 ppb to 50 ppb. Three weak anomalies were detected at the southern limit of the previously described copper soil anomalies. The western anomaly remains untested, while the central and eastern anomalies have been trenched. The central anomaly corresponds with the Knob Showing and a coincident IP chargeability high. The eastern anomaly has been trenched, and minor copper mineralization was found in volcanics.

Arsenic

Arsenic yielded values of <2 ppm to 6 ppm. No trends or anomalies were detected.

TRENCHING

During November, 1984, a trenching program was initiated on the Hawkins Property to test copper-gold soil anomalies. A 1973 JCB-5C excavator was hired from Judson Sawmills for the work.

A total of five trenches were completed. Each trench was channel sampled where rock was exposed, or soil profile samples taken where bedrock was not reached (see soil profile diagrams). The results from each trench is described below:

TRENCH 1 - (Line 5200N, 4850E): No source for the anomalous concentrations of copper were identified.

TRENCH 2 - (Line 5400N, 4950E): Minor gold (350 ppb) and copper (1300 ppm) were detected in a fractured, malachite-bearing basalt sample (#39364). The results of the soil profiles were inconclusive.

TRENCH 3 - (Line 5800N, 5100E): A rock chip sample of malachite bearing basalt assayed 12000 ppm copper, and 1300 ppb gold. Although this sample is uneconomic, it does indicate the presence of precious metals, and further trenching is suggested.

TRENCH 4 - (Line 5000N, 5200E): The purpose of this trench was to test a gold anomaly in soils. Exposed rock in the trench consisted of basalt, which assayed between 60 to 360 ppm copper, and 10 to 60 ppb gold.

TRENCH 5 - (Line 5300N, 5100E): The purpose of this trench was to test the eastern copper soil anomaly. No samples returned significant results.

GEOPHYSICAL SURVEYS:

INSTRUMENTATION

MAGNETOMETER SURVEY

"UNIMAG" G.836 Proton Precession magnetometers manufactured by Exploranium Geometrics of Ontario were utilized on this program. The Total Field measurment is read with a resolution of 10 gammas and all values recorded on grids were corrected for diurnal and day to day variations. Correction values were determined from repeat readings taken at control stations which were established at the intersection of wing lines and the Baseline. The magnetic datum was 57,400 gammas and all readings were recorded at 25 metre intervals.

INDUCED POLARIZATION SURVEY

The I.P. Survey measurments were recorded with a dipole - dipole configuration employing a dipole length of 50 metres (25 metres for Lines 4950N and 5050N) and recording at three separations. The transmitter used was a Phoenix IPT-1 in the Time Domain (50% duty cycle, 2 second on/off) mode and the receiver was a Huntec MK IV.

INDUCED POLARIZATION AND MAGNETOMETER SURVEYS

The Hawkins Lake I.P. and Magnetic surveys have identified a number of anomalous responses that warrant drill testing as proposed at the end of this report.

The I.P. survey as discussed line by line below has mapped alternating low and high resistivity signatures striking in a general north-south direction. The two main chargeability anomalies are colinear with the resistivity pattern but are of less strike extent. Background chargeability values are typically 2-4 while the highest reading recorded on the property was 20. Anomalous readings are considered to be greater than 5 ms.

The contoured magnetic map shows a pronounced north-south bias with what appears to be a minimum of three identifiable magnetic packages.

They are as follows:

1. West of an approximate line joining the points L.5500N/4350E and L.4300N/5025E defined by the 1000 gamma contour.

2. East of an approximate line joining the points L.5800N/4850E and L.4300N/5450E defined by the 1250 gamma contour.

3. The magnetic package sandwiched between units 1 and 2 above.

These divisions are only an eyeball approximation and undoubtably within these packages further magnetic divisions could be determined.

L.5500N

No anomalous response of interest is seen in the chargeability data. A change in the background resistivities is seen at approximately 5000E where the magnetic profile also records a change in the magnetic susceptibility of the bedrock.

L.5400N

No anomalous chargeability response of interest is seen, however, subtle changes in the background can be correllated with similiar changes seen in the magnetic profile.

Several resistivity features are evident as follows (coordinate station do not reflect or indicate the width of the response).

1. 4500E : low resistivity source with a complex geometry.

2. 5000E : low resistivity source extending to depth.

3. 5275E : a resistivity high of limited depth extent and coincident with a magnetic high.

L.5300N

Weak chargeability anomalies have developed at both ends of the line. Several features are evident from the three data sets as follows:

1. 4475E : A narrow low resistivity source at depth.

2. 4950E : A sharp resistivity contrast probable representing a geological contact. A possible second contact at 5050E is suggested by the magnetics and less so by the resistivity. Note the subtle change in the chargeability in this location.

L.5200N

As for L.5300N above, anomalous chargeability values are recorded at the ends of the line. A low chargeability zone of limited depth extent is evident at 4675N where two "pant legs" emanate from the small source. The resistivity shows a narrow low resistivity zone at 4600E and may be related to a geological contact as suggested by the magnetic data. The high resistivity zone between 4750E - 5000E represents a significant change in the geology and is also reflected by a small change in the magnetic signature.

L.5100N

No significant chargeability response was recorded on this line. The resistivity has mapped the high resistivity unit (4774N-5050N) from L.5200N. A wide, low resistivity surficial zone of limited depth extent is recorded at 5100N.

L.5050N

This line was surveyed employing 25 metre dipoles which reveals a low amplitude anomaly whose response in 100 metres wide as indicated on the map. The anomaly is coincident with the high resistivity package which has been traced from Line 5200N. A low resistivity zone is recorded on the east flank of the anomaly.

L.5000N

The chargeability data has defined the extension of the anomaly recorded on L. 5050N. This anomaly centered at 5025E also occurs in a high resistivity package. The east flanking low resistivity zone is traced to his line but it has limited depth extent as seen by the well developed "pant Leg" pattern.

L.4950N

THis line, as for Line 5050N was surveyed using 25 metre dipoles. Anomaly definition on this line is poor at best due to the high chargeability background.

The resistivity data shows good continuity from its northern neighbours as the high resistivity package, somewhat wider, and its east flanking low resistivity surficial source is evident. This resistivity signature suggests the chargeability anomaly evident on the northern lines, is detected at 5075E with a somewhat ill defined second source occurring 100 to 200 metres to the west.

L.4900N

Two chargeability anomalies have been defined on this line as indicated on the pseudo-section. The "east" zone is the continuation of the anomaly initially detected on L. 5000N and associated with the high resistivity zone. A high frequency magnetic high of 1000-1500nT appears to be associated with this zone.

The "west" zone is poorly defined, however, it is clearly evident the source is a wide surficial zone.

The resistivity pattern associated with the east zone maintains its signature to this line. A surficial zone of moderate depth extent is recorded at 4850E.

L.4800N

The "east" anomaly extends through to this line and a substantial improvement is noted. A narrow magnetic high is recorded at 5025E which is within 25 metres of the centre of the I.P. anomaly. As on previous lines this anomaly is sourced within a high resistivity unit. The flanking low resistivity unit to the east has degraded somewhat.

The "west" anomaly has degraded somewhat and is poorly defined. These two chargeability anomalies are separated by a low resistivity zone.

L.4700N

The "east" anomaly continues to this line as shown on the pseudo-section. The source is associated with the same resistivity signature as first observed at the north end of the grid. This east anomaly amplitude is less than on L.4800N and appears to be deeper. There is no magnetic response of interest.

The west anomaly appears as a broad source within a high resistivity environment. This zone is separate form the east zone by what appears to be a surficial zone of low resistivity and this may in part cause the low chargeability between the east and west anomalies.

Within the west anomaly zoning is evident e.g. at 4800E/n=2 there is a concentration of polarizable material but of limited depth extent. Similarly at 4850E/n=1 a second zone of similar dimension is evident.

L.4600N

Both the east and west zones have merged together within a high chargeability background. Some zoning is evident particularly at 4800E/n=2 and 5100E/n=2. A third anomaly at the extreme east end of the line indicates the source to have a moderate depth extent.

The break between the west and east zones (indicated by the broken anomaly bar) may be caused by the surficial low resistivity source at 5000E rather than by a significant decrease in the polarizable source i.e. the west and east zones have probably merged together.

L.4500N

The east and west anomalies have separate and distinct responses on this line and both exhibit the characteristics due to a source with limited depth extent.

The superficial low resistivity zone which to the north separated the two zones is now located at the west side of the east anomaly. This resistivity feature has distorted the shape of the chargeability anomaly.

L.4400N

The east zone has not been defined on this line although the resistivity signature is still evident.

The west anomaly is in evidence but the data indicates the source to be either at depth or the end of the zone occurs between Lines 4500N and 4400N.

The low resistivity surficial zone separating the two anomalies continues to this line and is indicated to have some moderate depth extent.

A shallow surficial source is being detected at the east end of this line.

L.4300N

A weak anomaly not indentifiable as either the west or east zone is indicated on the pseudo-section. The resistivity signature associated with the east anomaly is defined on this line.

CONCLUSIONS:

The Hawkins Property exhibits several similarities with Dome's QR deposit. Some of these similarities are listed below:

(i) Both deposits are hosted within Triassic volcanics of the Quesnel Trough.

(ii) The gold-sulphide mineralizing event is associated with a comagmatic monzonite (?) stock.

(iii) Gold-sulphide mineralization is within a zone of propyllitic alteration.

(iv) Gold-sulphide mineralization was deposited in a calcareous environment - calcareous tuff (QR); limestone-volcanic contact (Hawkins).

Exploration on the Hawkins Property has been hindered by soil contamination by recent volcanic ash and deep drift cover. For these reasons, soil geochem and geological mapping have had limited applications. However, IP and magnetometer have aided in geological interpretation, and in defining drill targets.

RECOMMENDATIONS:

A diamond drill program of 4 holes (5 optional) totalling 1500' (457.2 meters) has been recommended for the property. The purpose of the drilling is to test IP anomalies along strike with known mineralized rocks. Hole location and description is tabled below:

	Coordinates				
DDH	Northing	Easting	ANGLE	BEARING	DEPTH m. (feet)
NH 85-1	L4800N	5112E	-50 deg.	290 deg.	122 m (400 ft.)
NH 85-2	L4600N	4840E	-50 deg.	290 deg.	106 m (350 ft.)
NH 85-3	L4600N	5140E	-50 deg.	290 deg.	106 m (350 ft.)
NH 85-4	L4400N	4933E	-50 deg.	290 deg.	122 m (400 ft.)
NH 85-5 - (optional)	L4900N	4646E	-50 deg.	110 deg.	106 m (350 ft.)

Experience from this and similar gold properties, indicates a varied and sometimes unexpected environment for gold deposition. For this reason, it is recommended the entire drill section be carefully mapped and sampled.

REFERENCES

Burton, Alex, P. Eng. — Report for Alclare Resources Ltd., on the North and Clay Mineral Claims, 1980.

Carson, D.J.T. — Mineralogy and Occurrence of Gold in the Hawkins Cu-Au Samples, 1984 (unpublished Noranda Report).

Tipper, H.W., & Campbell, R.B. — Geology of the Bonaparte Map-Area, British Columbia; Memoir 363, 1971.

Werner, L.J. — Diamond Drill Report, 1982.

Werner, L.J. — Geological, Geochemical, and Geophysical Report, 1981.

APPENDIX I

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

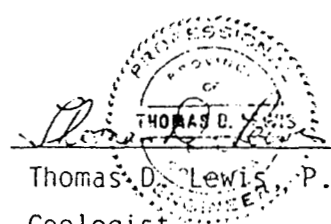
I, Thomas D. Lewis of the City of Prince George, Province of British Columbia, do certify that:

1. I have been employed as a geologist by Noranda Exploration Company, Limited since April, 1979.

2. I am a graduate of Queen's University with a Bachelor of Applied Science (Engineering) in Geology (1975).

3. I am a member of the Association of Professional Engineers of the Province of British Columbia.

4. I am a member of the Canadian Institute of Mining and Metallurgy.



Thomas D. Lewis, P. Eng.,
Geologist
Noranda Exploration Company, Limited
(No Personal Liability)

STATEMENT OF QUALIFICATIONS
****

I, Lyndon Bradish of Vancouver, Province of British Columbia, do hereby certify that:

1. I am a Geophysicist residing at 1826 Trutch Street, Vancouver British Columbia.

2. I am a graduate of the University of British Columbia with a B.Sc. (geophysics).

3. I am a member in good standing of the Society of Exploration Geophysicists, Canadian Institute of Mining and the Prospector's and Developer's Association.

4. I presently hold the position of Division Geophysicist with Noranda Exploration Company, Limited and have been in their employ since 1973.

L. Bradish.

APPENDIX II

STATEMENT OF COSTS

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT Hawkins Lake - Alclare DATE May 1985

TYPE OF REPORT Geology, Geochem & Geophysics

a) Wages:

No. of Days 90

Rate per Day $141.03

Dates From: August 84 - March 85

Total Wages 90 x $141.03 12,693.10

b) Food and Accomodation:

No of days 90

Rate per day $ 45.00

Dates From: August 84 - March 85

Total Cost 90 x $141.03 4,050.00

c) Transportation:

No of days 90

Rate per day $25.00

Dates From: August 84 - March 85

Total Cost 90 X $25.00 2,250.00

d) Instrument Rental:

Type of Instrument

No of days

Rate per day $

Dates From:

Total Cost X $

Type of Instrument

No of days

Rate per day $

Dates From:

Total Cost X $

f)	Analysis (See attached schedule)	2,316.60
g)	Cost of preparation of Report	
	Author	300.00
	Drafting	300.00
	Typing	300.00
h)	Other: Contractor	15,553.86
	Total Cost	40,080.16

e) Unit costs for Geology

No of days 51

No of units

Unit costs 256.88 / day

Total Cost 51 x 256.88 = 13,100.98

Unit costs for Geochem

No of days

No of units 351

Unit costs 27.02 / sample

Total Cost 351 x 27.02 = 9,483.17

Unit costs for Geophysics

No of days

No of units 29.9 LKm

Unit costs 585.15 / Km

Total costs 29.9 x 585.15 = 17,496.01

40,080.16

NORANDA EXPLORATION COMPANY, LIMITED

(WESTERN DIVISION)

DETAILS OF ANALYSES COSTS

PROJECT: Hawkins Lake - Alclare

ELEMENT	NO. OF DETERMINATIONS	COST PER DETERMINATION	TOTAL
Cu	351	1.60	561.60
Au	351	3.50	1,228.50
As	351	1.50	526.50
			2,316.60

APPENDIX III

ANALYTICAL PROCEDURE

Method

All samples were obtained by digging holes with a mattock to a depth of between 15 cm and 40 cm, whether the visible "B" horizon, whenever possible was exposed. The samples were placed in "Hi" Wet Strength Kraft envelopes, the sample number was marked on the envelope with indelible ink and the station marked using coloured flagging. The samples were dried, shipped, screened and sifted to obtain the -80 mesh fraction.

The determination procedure for total copper, lead, zinc, silver, and molybdenum is as follows:

0.200 gram s of the -80 mesh material is digested in 2 ml of $JC10_4$ and 0.5 ml of HNO_3 for approximately 4 hours. Following digestion, each sample is diluted to 5 ml with demineralized H_2O. A Varian Techtron Model AA-5 Atomic Absorption Spectophotometer is fully outlined in the literature and will not be described in this report.

ANALYTICAL METHOD DESCRIPTIONS FOR GEOCHEMICAL ASSESSMENT REPORTS

The methods listed are presently applied to analyze geological materials by the Noranda Geochemical Laboratory at Vancouver.

Preparation of Samples

Sediments and soils are dried at approximately 80° and sieved with a 80 mesh nylon screen. The -80 (0.18 mm) fraction is used for geochemical analysis.

Rock specimens are pulverized to -120 mesh (0.13 mm). Heavy material fractions (planned samples * from constant volume), are analyzed in its entirety, when it is to be determined for gold without further sample preparation.

Analysis of Samples

Decomposition of 0.200 g sample is done with concentrated perchloric and nitric acid (3:1), digested for 5 hours at reflux temperature. Pulps of rock or core are weighed out at 0.4 g and chemical quantities are doubled relative to the above noted method for digestion.

The concentrations of Ag, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, V and Zn can be determined directly from the digest (dissolution) with a conventional atomic absorption spectrometric procedure. A Varian Techtron Model AA-5 or Model AA-475 is used to measure elemental concentrations.

Elements Requiring Specific Decomposition Method:

Antimony - Sb: 0.2 g sample is attacked with 3.3 ml of 6% tartaric acid, 1.5 ml conc. hydrochloric acid and 0.5 ml of conc. nitric acid, then heated in a water bath for 3 hours at 95°C. Sb is determined directly from the dissolution with an AA-475 equipped with electrodeless discharge lamp (EDL).

Arsenic - As: 0.2 - 0.3 g sample is digested with 1.5 ml of perchloric 70% and 0.5 ml of conc. nitric acid. A Varian AA-475 equipped with an As-EDL is used to measure arsenic content in the digest.

Barium - Ba: 0.1 g sample digested overnight with conc. perchloric, nitric and hydrofluoric acid; Potassium chloride added to prevent ionization. Atomic absorption using a nitrous oxide-acetylene flame determines Ba from the aqueous solution.

Bismuth - Bi: 0.2 g - 0.3 g is digested with 2.0 ml of perchloric 70% and 1.0 ml of conc. nitric acid. Bismuth is determined directly from the digest with an AA-475 complete with EDL.

Gold - Au: 10.0 g sample is digested with aqua regia (1 part nitric and 3 parts hydrochloric acid). Gold is extracted with MqBK from the aqueous solution. AA is used to determine Au.

Magnesium - Mg: 0.05 - 0.10 g sample is digested with 4 ml perchloric/nitric acid (3:1). An aliquot is taken to reduce the concentration to within the range of atomic absorption. The AA-475 with the use of a nitrous oxide flame determines Mg from the aqueous solution.

Tungsten - W: 1.0 g sample sintered with a carbonate flux and thereafter leached with water. The leachate is treated with potassium thiocyanate. The yellow tungsten thiocyanate is extracted into tri-n-butyl phopate. This permits colourimetric comparison with standards to measure tungsten concentration.

Uranium - U: An aliquot from a perchloric-nitric decomposition, usually from the multi-element digestion, is buffered. The aquaeous solution is exposed to laser light, and the luminescence of the uranyl ion is quantitatively measured on the UA-3 (Scintrex).

* N.B. If additional elemental determination are required on panned samples, state this at the time of sample submission. Requests after gold determinations would be futile.

LOWEST VALUES REPORTED IN PPM

Ag - 0.2	Mn - 20	Zn - 1	Au - 0.01
Cd - 0.2	Mo - 1	Sb - 1	W - 2
Co - 1	Ni - 1	As - 1	U - 0.1
Cu - 1	Pb - 1	Ba - 10	
Fe - 100	V - 10	Bi - 1	

4300E 4400E 4500E 4600E 4700E 4800E 4900E B/L 5000E Az 020° 5100E 5200E 5300E 5400E 5500E

120°54'

51°53'20"

Cabin

ROGER LAKE

NORTH

CAB 1

CAB 2

SOUTH

TRENCH 3 A B (Soil profile) 39369 39370

TRENCH 2 (Soil profiles) A B C D 39364

TRENCH 1 (Soil profiles) A B C D

TRENCH 5

TRENCH 4

CLAY 4 CLAY 2 CLAY 6 CLAY 8 CLAY 7 CLAY 3 CLAY 1 CLAY 5

30% epi.

50% epi

10% epi

epi, mal, bor

epi, mal

epi, mal. bor

"KNOB SHOWING"

CAMP

minor epi.

LCP

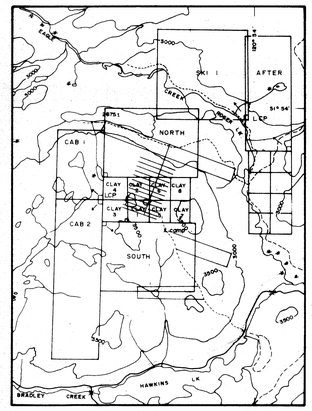
L 5800N L 5700N L 5600N L 5500N L 5400N L 5300N L 5200N L 5100N L 5000N L 4900N L 4800N L 4700N L 4600N L 4500N L 4400N L 4300N L 4200N L 4100N

3600 3500 3400 3300 3200 3100 3000 2900 2800 2700

51°51'35"

120°54'

LOCATION MAP



LEGEND

ROCK TYPES -

JURASSIC OR OLDER

1. Chlorite Schist, dark green with weakly developed foliation
2. Hornblende Basalt, hornblende phenocryts in a chlorite and /or epidote matrix
3. Hornblende Basalt Breccia, monolithic subangular hornblende basalt fragments in an epidote and/or chlorite matrix
4. Felsic Schist, buff coloured, fine grained rhyolite, with a weakly developed foliation
5. Altered Limestone, foliated, grey limestone, with epidote banding.
6. Quartz - feldspar chlorite schist

INTRUSIVES

7. Granodiorite , 7a Diorite
8. Monzonite, and Monzonite dykes
9. Feldspar Porphyry Dyke

SYMBOLS

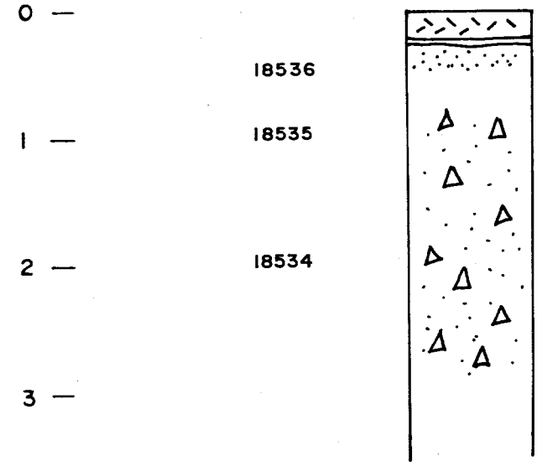
- Lake
- L.C.P and claim boundary
- Cat road
- Trench
- Diamond drill hole
- Copper Contoured p.p.m.
- Gold Contoured p.p.b.
- Outcrop
- Geological contact
- Fault
- 85° Bedding
- 85° Foliation
- epi, cal. Zone of epidote, calcite, alteration
- bor, cp, mal. Mineralization : Bornite, Chalcopyrite, Malachite
- a. Augite
- hb. Hornblende
- 39364 Rock sample
- A,B,C,D Soil profiles

0 100 200 300 400 500 m
SCALE 1 : 5,000

REVISED T. LEWIS NOV. / 84	HAWKINS LAKE - ALCLARE RES INC
	GEOLOGY PLAN
PROJ. No. 61	SURVEY BY: T. LEWIS DATE: AUG. 1984
N.T.S. 92 P/15	DRAWN BY: S.K.B. SCALE: 1: 5000
DWG No. Fig. 3	NORANDA EXPLORATION
	OFFICE PRINCE GEORGE B.C.

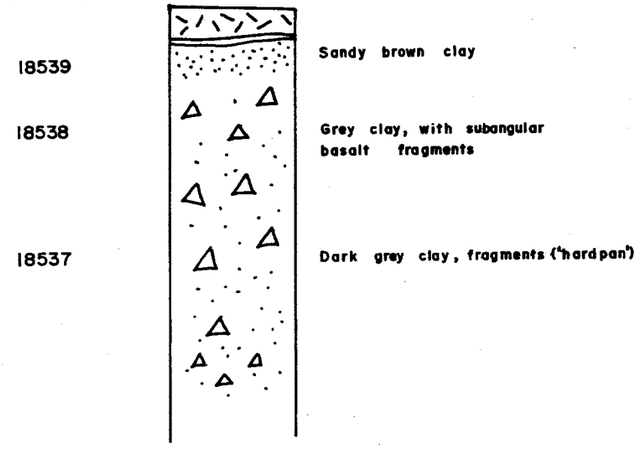
SOIL PROFILE A

LOCATION · TRENCH 1 ; 5200N.



SOIL PROFILE B

LOCATION · TRENCH 1 ; 5200N.



LEGEND

- Leaves, twigs, organic material
- Angular rock fragments
- Roots
- Clay
- Buff volcanic ash
- Bedrock - volcanics

TABLE OF GEOCHEM ASSAYS

SAMPLE Nº	Cu(ppm)	Au(ppb)	Ag(ppm)	As(ppm)
18534	86	10	0.2	< 2
18535	82	10	0.2	< 2
18536	44	10	0.2	< 2
18537	120	10	0.2	< 2
18538	82	10	0.2	< 2
18539	38	10	0.2	< 2

0 10 20 30 40 cm

SCALE : 1 : 5

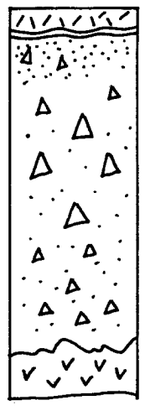
PROFESSIONAL ENGINEER · PROVINCE OF BRITISH COLUMBIA · THOMAS D. LEWIS

REVISED	HAWKINS LAKE PROPERTY ALCLARE RES. OPTION
	SOIL PROFILES : of Trench Nº 1 (Located on line 5200N.)
PROJ No 61	SURVEY BY T. LEWIS DATE NOV. 1984
NTS 92P/15	DRAWN BY S.K.B SCALE 1 : 5
DWG No Fig. 7	NORANDA EXPLORATION OFFICE PRINCE GEORGE B.C

PJA

SOIL PROFILE C

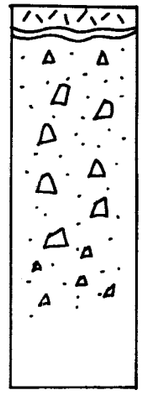
LOCATION TRENCH 1 ; 5200N.



SAMPLE Nº	DESCRIPTION
18529	Brown sandy clay, roots,
18528	Large angular basalt boulders in clay matrix
18527	Compact grey clay, angular float.
18530	

SOIL PROFILE D

LOCATION TRENCH 1 ; 5200N.



SAMPLE Nº	DESCRIPTION
18533	Brown sandy clay
18532	Chlorite shist fragments in a brown clay
18531	Blue - grey "hardpan" clay

LEGEND

- Leaves, twigs, organic material
- Angular rock fragments
- Roots
- Clay
- Buff volcanic ash
- Bedrock - volcanics

TABLE OF GEOCHEM ASSAYS

SAMPLE Nº	Cu(ppm)	Au(ppb)	Ag(ppm)	As(ppm)
18527	66	10	0.2	< 2
18528	160	10	0.2	< 2
18529	36	10	0.2	< 2
18530	72	10	0.4	< 2
18531	64	10	0.2	< 2
18532	58	10	0.2	< 2
18533	160	10	0.2	< 2

0 10 20 30 40 cm

SCALE 1 : 5

REVISED

HAWKINS LAKE PROPERTY
ALCLARE RES. OPTION

SOIL PROFILES : of Trench Nº 1
(Located on line 5200N.)

PROJ No 61
NTS 92P/15
DWG. No Fig. 7

SURVEY BY T. LEWIS DATE NOV. 1984
DRAWN BY S.K.B SCALE 1 : 5

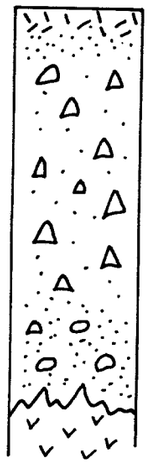
NORANDA EXPLORATION
OFFICE: PRINCE GEORGE B.C

JAN. A. M.P.

P.J.A

SOIL PROFILE B

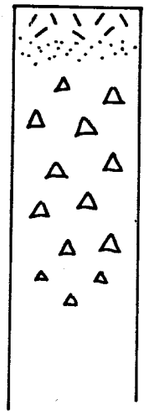
LOCATION TRENCH 2 ; 5400N.



SAMPLE Nº	DESCRIPTION
39359	Brown sandy clay
39358	Brownish - grey clay, with rounded boulders.
39357	Sandy clay
39364	Fine grained, green basalt, with malachite, chlorite and limonite on fracture surfaces.

SOIL PROFILE A

LOCATION TRENCH 2 ; 5400N.



SAMPLE Nº	DESCRIPTION
39363	Brown grey sandy clay
39362	Greyish brown clay, with subangular fragments
39361	Sandy clay, with smaller clasts.

LEGEND

- Leaves, twigs, organic material
- Angular rock fragments
- Roots
- Clay
- Buff volcanic ash
- Bedrock - volcanics

TABLE OF GEOCHEM ASSAYS

SAMPLE Nº	Cu(ppm)	Au(ppb)	Ag(ppm)	As(ppm)
39357	120	10	0.2	< 2
39358	88	10	0.2	< 2
39359	36	10	0.4	< 2
39360(rx)	98	20	0.4	< 2
39361	96	10	0.2	< 2
39362	120	10	0.4	< 2
39363	120	10	0.6	< 2
39364(rx)	1300	350	1.4	< 2

0 10 20 30 40 cm

SCALE 1:5

PROFESSIONAL ENGINEER
THOMAS D. LEWIS
BRITISH COLUMBIA

REVISED

HAWKINS LAKE PROPERTY
ALCLARE RES. OPTION

SOIL PROFILES : of Trench Nº 2
(Located on line 5400N.)

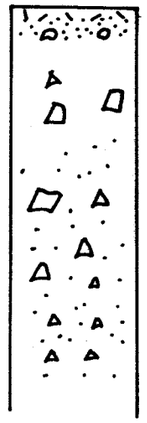
PROJ No 61
NTS 92P/15
DWG. No. Fig. 8

SURVEY BY T. LEWIS DATE NOV 1984
DRAWN BY S.K.B SCALE 1:5

NORANDA EXPLORATION
OFFICE PRINCE GEORGE B.C

SOIL PROFILE D

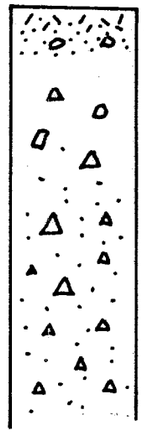
LOCATION: TRENCH 2; 5400N.



SAMPLE Nº	DESCRIPTION
18542	Brown clay, some cobble
18541	Brown clay, subangular boulders
18540	Grey clay, with fragments of basalt ('hardpan').

SOIL PROFILE C

LOCATION: TRENCH 2, 5400 N.



SAMPLE Nº	DESCRIPTION
18545	Brown clay, some cobbles
18544	Brown clay, subangular boulders.
18543	Grey clay, with fragments of basalt ('hardpan')

LEGEND

- Leaves, twigs, organic material
- Angular rock fragments
- Roots
- Clay
- Buff volcanic ash
- Bedrock - volcanics

TABLE OF GEOCHEM ASSAYS

SAMPLE Nº	Cu(ppm)	Au(ppb)	Ag(ppm)	As(ppm)
18540	96	0.4		< 2
18541	72	0.4		< 2
18542	64	0.2		< 2
18543	120	0.4		< 2
18544	74	0.2		< 2
18545	96	0.8		< 2

0 10 20 30 40 cm

SCALE 1:5

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — THOMAS D. LEWIS

REVISED

HAWKINS LAKE PROPERTY
ALCLARE RES. OPTION

SOIL PROFILES: of Trench Nº 2
(Located on line 5400N.)

PROJ No 61
NTS 92P/15
DWG. No. Fig. 8

SURVEY BY T. LEWIS DATE NOV. 1984
DRAWN BY S.K.B SCALE 1:5

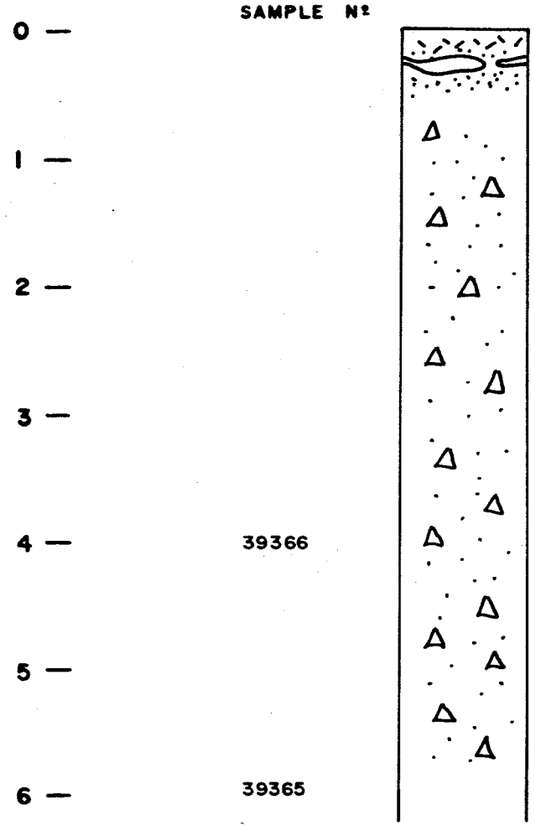
NORANDA EXPLORATION
OFFICE: PRINCE GEORGE B.C.

VANCAL 9581

P.J.A

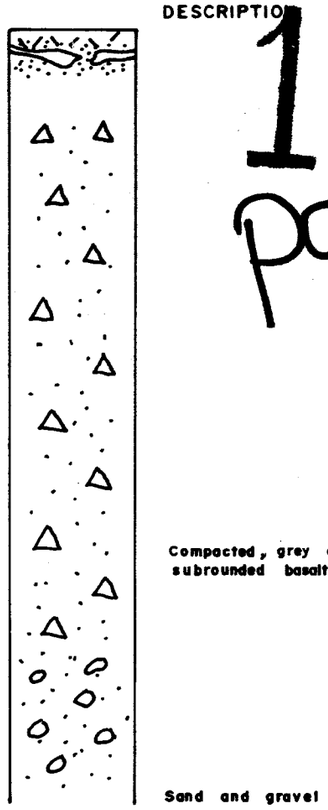
SOIL PROFILE A

LOCATION: TRENCH 3 ; 5800N.



SOIL PROFILE B

LOCATION: TRENCH 3 ; 5800N.



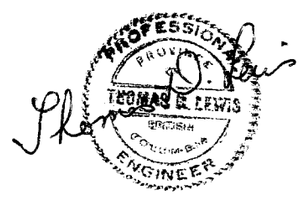
LEGEND

- Leaves, twigs, organic material
- Angular rock fragments
- Roots
- Clay
- Buff volcanic ash
- Bedrock - volcanics

TABLE OF GEOCHEM ASSAYS

SAMPLE Nº	Cu(ppm)	Au(ppb)	Ag(ppm)	As(ppm)
39365	56	10	0.2	< 2
39366	70	10	0.2	< 2
39367	54	10	0.2	< 2
39368	70	10	0.4	< 2
39369(rx)	260	10	0.8	< 2
39370(rx)	12,000	1300	6.2	< 2

0 10 20 30 40 cm
SCALE: 1:5



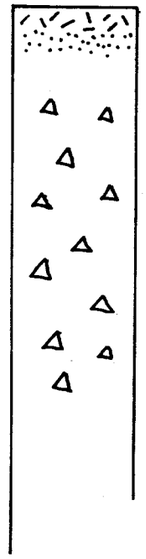
REVISED	HAWKINS LAKE PROPERTY ALCLARE RES. OPTION
	SOIL PROFILES: of Trench Nº 3 (Located on line 5400N.)
PROJ No 81	SURVEY BY T. LEWIS DATE NOV. 1984
NTS 92P/15	DRAWN BY S.K.B SCALE 1:5
DWG. No. Fig. 9	NORANDA EXPLORATION OFFICE PRINCE GEORGE B.C.

VANCAL 9881

PJA

SOIL PROFILE 5080E

LOCATION: TRENCH 5 ; 5300N.



SAMPLE Nº	DESCRIPTION
39286	Brown clay, some basalt fragments
39287	Angular fragments of altered basalt in a clay matrix
39288	

SOIL PROFILE

LOCATION:

SAMPLE Nº	DESCRIPTION

LEGEND

- Leaves, twigs, organic material
- Angular rock fragments
- Roots
- Clay
- Buff volcanic ash
- Bedrock - volcanics

TABLE OF GEOCHEM ASSAYS

SAMPLE Nº	Cu(ppm)	Au(ppb)	Ag(ppm)	As(ppm)
39286	110	10	0.2	< 2
39287	94	10	0.2	< 2
39288	62	10	0.2	< 2

0 10 20 30 40 cm

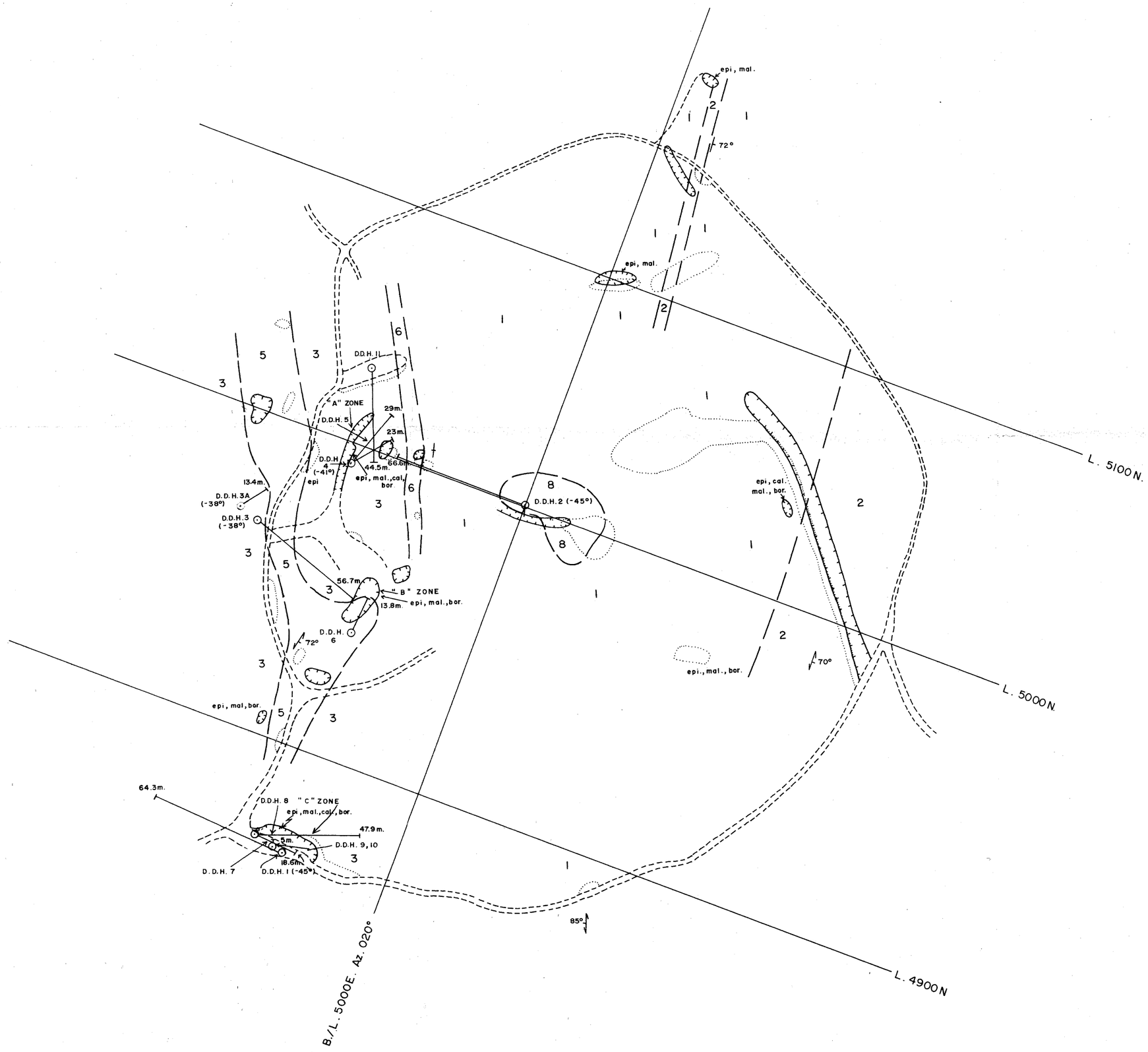
SCALE 1 : 5

PROFESSIONAL ENGINEER
THOMAS D. LEWIS
BRITISH COLUMBIA

REVISED	HAWKINS LAKE PROPERTY ALCLARE RES. OPTION
	SOIL PROFILES : of Trench Nº 5 (Located on line 5300N.)
PROJ. No. 61	SURVEY BY T LEWIS DATE NOV. 1984
N.T.S. 92P/15	DRAWN BY S.K.B SCALE 1:5
DWG No Fig. 10	NORANDA EXPLORATION OFFICE - PRINCE GEORGE B.C.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2



LEGEND

ROCK TYPES

1	Chlorite Schist
2	Hornblende Basalt
3	Hornblende Basalt Breccia
4	Felsic Schist
5	Altered Limestone
6	Quartz Feldspar Chlorite Schist
7	Granodiorite
8	Monzonite
9	Feldspar Porphyry Dykes

SYMBOLS

- Cat road
- Trench
- Diamond drill hole
- 100 Cu. contoured p.p.m.
- -100- Au. contoured p.p.b.
- Outcrop
- Geological contact
- Fault
- 85° Bedding
- 57° Foliation
- epi, cal. Zone of epidote, calcite, alteration
- bor., cp., mal. Mineralization: Bornite, Chalcopyrite, Malachite

PROFESSIONAL ENGINEER
Thomas D. Lewis
BRITISH COLUMBIA

0 10 20 30 40 50 60 70 metres
SCALE 1 : 1,000

REVISED

HAWKINS LAKE - ALCLARE OPTION

DETAIL GEOLOGY of the
KNOB SHOWINGS

PROJ. No. 61
N.T.S. 92 P/15
DWG. No.
Fig. 4

SURVEY BY: T. LEWIS DATE: AUG. 1984
DRAWN BY: S. K. B. SCALE: 1 : 1000

NORANDA EXPLORATION
OFFICE: PRINCE GEORGE, B.C.

VANCAL 11919

4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E

3000 nt

MAG.

2000 nt

1000 nt

0 nt

H.L.E.M.

CHARGEABILITY (a) (ms)

ρa (OHM-M)

MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	Nov./84
OPERATOR	V.S.

GEOLOGICAL BRANCH ASSESSMENT REPORT

13,751
part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ——— 337 Hz Med. —·— 1012 Hz High ---- 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ω.m.
SURVEY DATE	Dec./84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

LINE No. : 5500 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 12

SURVEY BY: P.E. Walcott & Assoc. DATE: Jan./85
DRAWN BY: (traced) W.M.R. SCALE: 1:2500

NORANDA EXPLORATION
OFFICE Vancouver

4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E | 5400 E | 5500 E

3000 nt
MAG.
2000 nt
1000 nt
0 nt

H.L.E.M.

CHARGEABILITY (a) (ms)

ρa
(OHM-M)

MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	Nov. /84
OPERATOR	V.S.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ----- 337 Hz Med ----- 1012 Hz High ----- 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ωm.
SURVEY DATE	Dec. /84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

LINE No. : 5400 N.

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG No. 13

SURVEY BY: P.E. Walcott & Assoc. DATE: Jan. /85
DRAWN BY: (traced) W.M.R. SCALE: 1:2500

NORANDA EXPLORATION
OFFICE Vancouver

4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E | 5400 E | 5500 E

3000 nt

MAG.

2000 nt

1000 nt

0 nt

H.L.E.M.

CHARGEABILITY (a) (ms)

ρa (OHM-M)

MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	Nov. /84
OPERATOR	V.S.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ——— 337 Hz Med - - - - 1012 Hz High ····· 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ω.m.
SURVEY DATE	Dec. /84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

LINE No. : 5300 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 14

SURVEY BY: P.E. Walcott & Assoc. DATE: Jan. /85
DRAWN BY: (traced) W.M.R SCALE: 1:2500

NORANDA EXPLORATION
OFFICE: Vancouver

4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E | 5400 E | 5500 E

3000 nt

MAG.

2000 nt

1000 nt

0 nt

H.L.E.M.

CHARGEABILITY (a) (ms)

ρa (OHM-M)

MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	Nov. /84
OPERATOR	V.S.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ---- 337 Hz Med. ---- 1012 Hz High ---- 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ωm.
SURVEY DATE	Dec. /84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

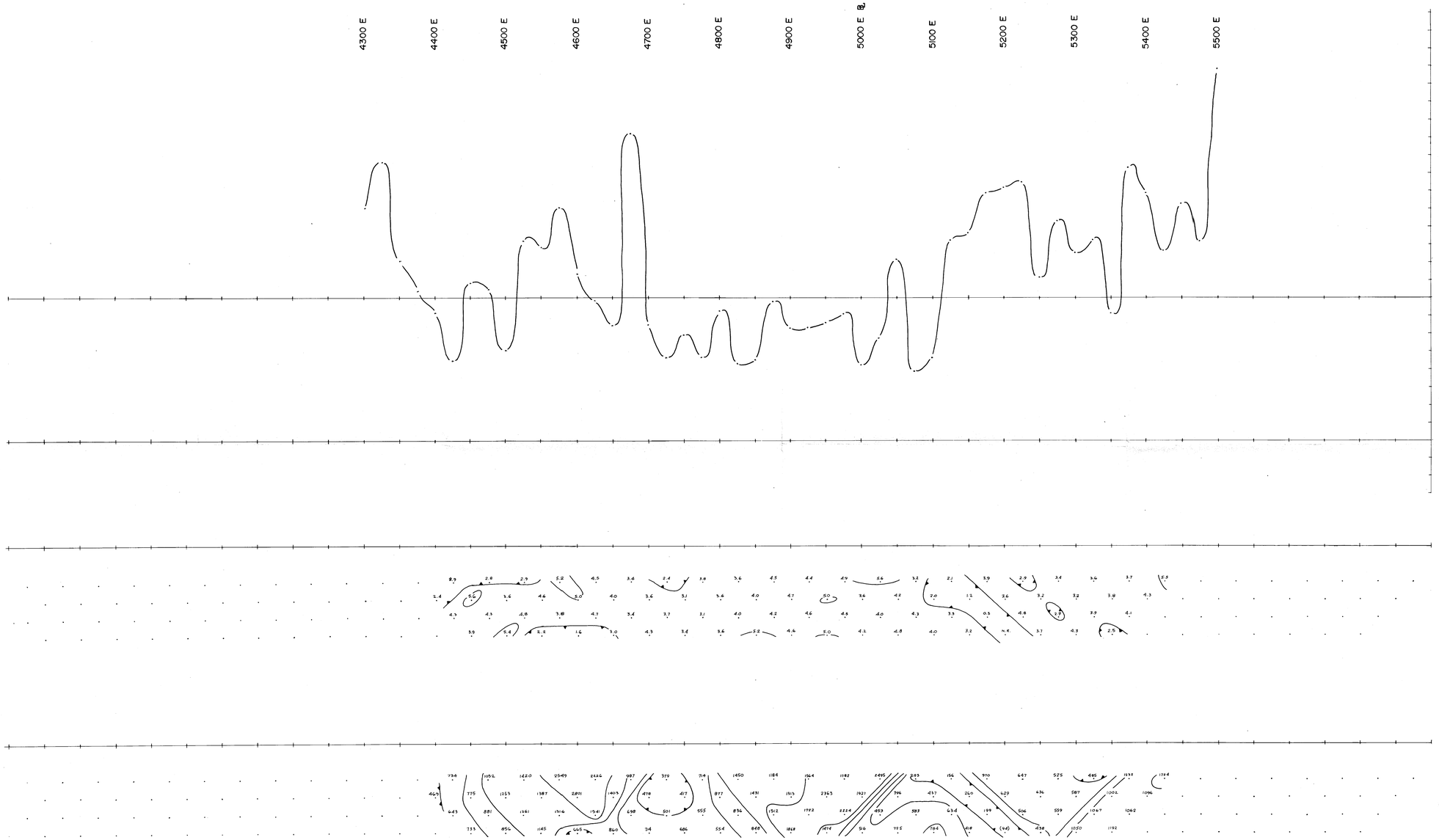
LINE No. : 5200 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 15

SURVEY BY P.E. Walcott & Assoc. DATE Jan. /85
DRAWN BY (traced) W.M.R. SCALE 1:2500

NORANDA EXPLORATION
OFFICE Vancouver



MAG. LEGEND

INSTRUMENT	: Unimag
FIELD MEASUREMENT	: Total
DATUM	: 57,000 nt
PROFILE SCALE	: 1 cm. = 200 nt
SURVEY DATE	: Nov. /84
OPERATOR	: V.S.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	: SE-88
COIL SPACING	:
FREQUENCY	: Low ——— 337 Hz Med. - - - - 1012 Hz High - - - - 3037 Hz
INTEGRATION TIME	: 16 sec.
REF FREQUENCY	: 112 Hz
PROFILE SCALE	: 1 cm. = %
SURVEY DATE	:
OPERATOR	:

I.P. LEGEND

ARRAY	: Dipole - Dipole
FREQUENCY	:
a	: 50 m
CONTOUR MULTIPLES	: 1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	: In units of Ωm.
SURVEY DATE	: Dec. /84
OPERATOR	: P.E. Walcott & Assoc.
Rx	: Huntec MK IV
Tx	: Phoenix
TIME DELAY	: 200 ms
SAMPLING TIME	: 1000 ms

REVISED

HAWKINS LAKE

LINE No.: 5100 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 16

SURVEY BY: P.E. Walcott & Assoc. DATE: Jan. /85
DRAWN BY: (traced) W.M.R. SCALE: 1:2500

NORANDA EXPLORATION
OFFICE: Vancouver

4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E (B) | 5100 E | 5200 E | 5300 E | 5400 E

MAG.

3000 nt
2000 nt
1000 nt
0 nt

-2080

H.L.E.M.

CHARGEABILITY (a) (ms)

n=1
n=2
n=3
n=4

ρa (OHM-M)

n=1
n=2
n=3
n=4

MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	Nov./84
OPERATOR	V.S.

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ——— 337 Hz Med ----- 1012 Hz High ----- 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ωm.
SURVEY DATE	Dec./84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

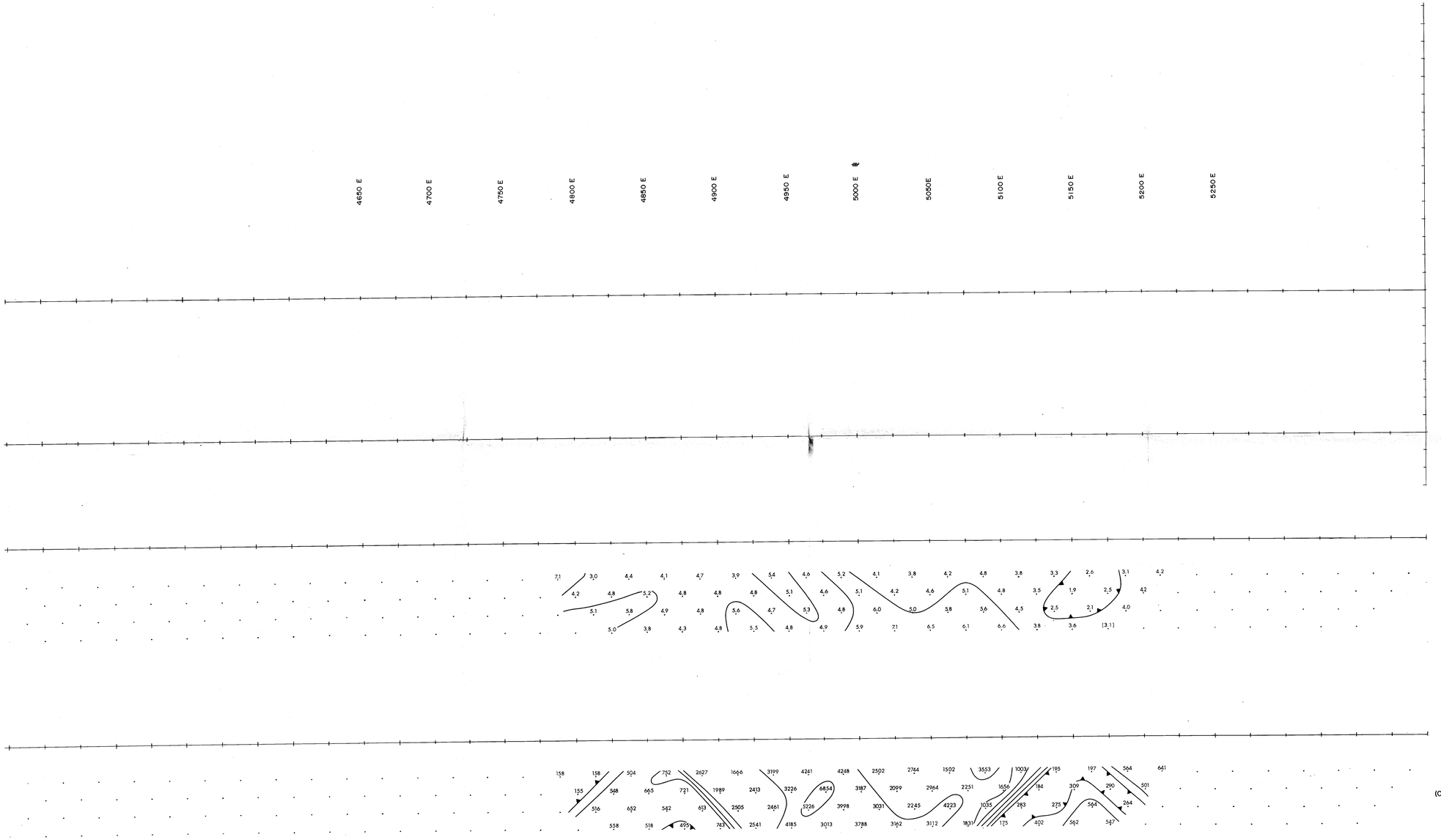
LINE No.: 5000 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 18

SURVEY BY P.E. Walcott & Assoc. DATE Jan./85
DRAWN BY (traced) W.M.R SCALE 1:2500

NORANDA EXPLORATION
OFFICE Vancouver



MAG. LEGEND

INSTRUMENT	:	Unimag
FIELD MEASUREMENT	:	Total
DATUM	:	
PROFILE SCALE	:	1 cm. =
SURVEY DATE	:	1984
OPERATOR	:	T.L.

H.L.E.M. LEGEND

INSTRUMENT	:	SE-88
COIL SPACING	:	
FREQUENCY	:	Low ------ 337 Hz Med. ------ 1012 Hz High ------ 3037 Hz
INTEGRATION TIME	:	16 sec.
REF FREQUENCY	:	112 Hz
PROFILE SCALE	:	1 cm. = %
SURVEY DATE	:	
OPERATOR	:	

I.P. LEGEND

ARRAY	:	Dipole - Dipole
FREQUENCY	:	Hz & Hz
a	:	25 m.
CONTOUR MULTIPLES	:	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	:	in units of Ωm.
SURVEY DATE	:	Dec./84
OPERATOR	:	P.E. Walcott & Assoc.
Rx	:	Huntec MK IX
Tx	:	Phoenix
TIME DELAY	:	200 ms
SAMPLING TIME	:	1000 ms

REVISED

PROJ. No. 61
N.T.S. 92P
DWG. No. 19

HAWKINS LAKE

LINE No.: 4950N

GEOCOMPILATION

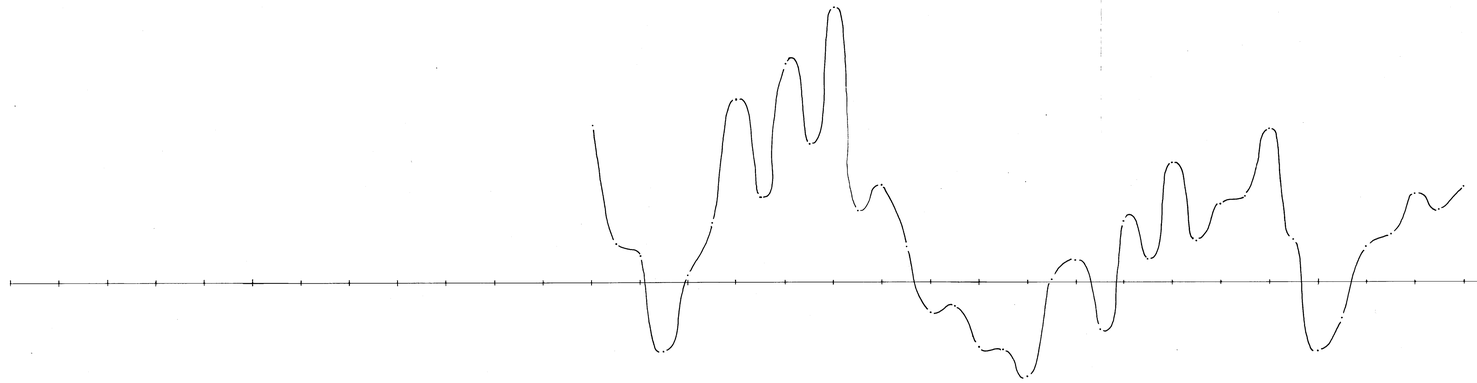
SURVEY BY: P.E. Walcott & Assoc. DATE: March/85
DRAWN BY: W.M.R. & P.J.A. SCALE: 1:1250

NORANDA EXPLORATION
OFFICE Vancouver

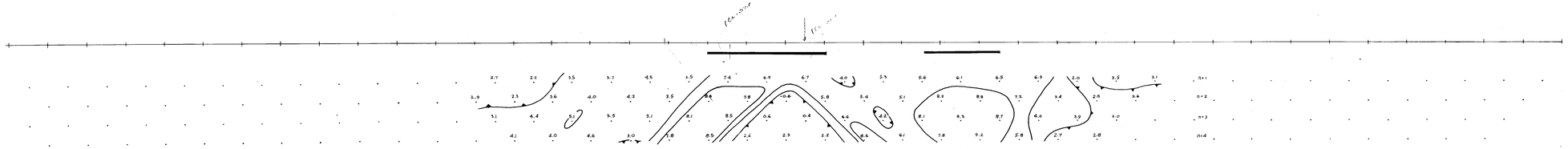
4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E

3000 nt
2000 nt
1000 nt
0 nt

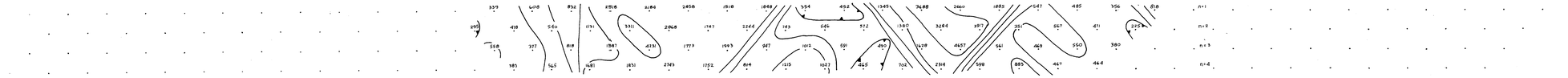
MAG.



H.L.E.M.



CHARGEABILITY (a) (ms)



ρa (OHM-M)

MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	Nov./84
OPERATOR	V.S.

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ——— 337 Hz Med - - - - 1012 Hz High - - - - 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ωm.
SURVEY DATE	Dec./84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

LINE No. : 4900 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 20

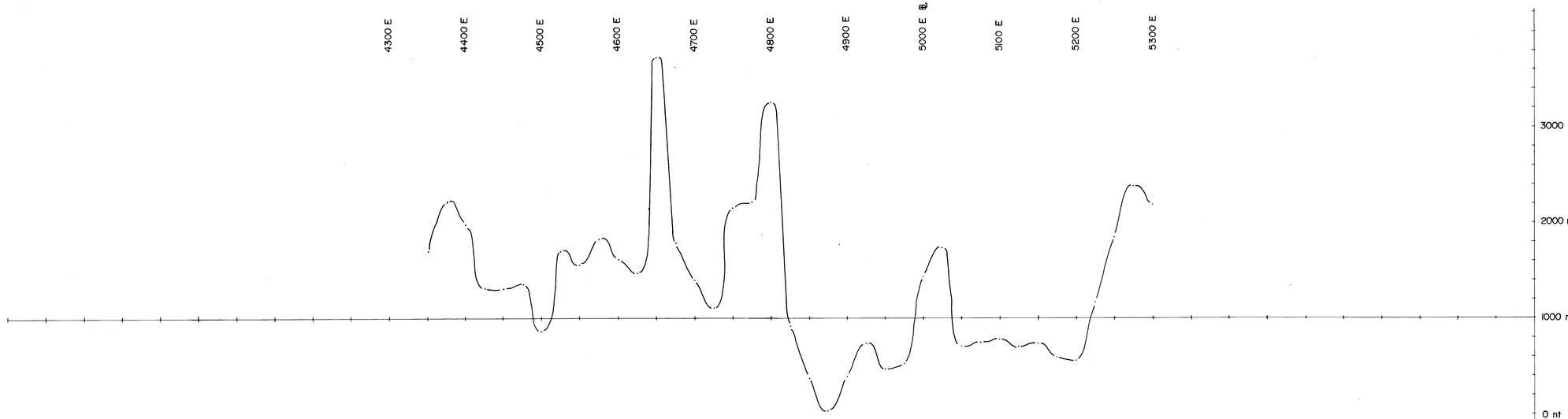
SURVEY BY: P.E. Walcott & Assoc. DATE: Jan./85
DRAWN BY: (traced) W.M.R. SCALE: 1:2500

NORANDA EXPLORATION
OFFICE Vancouver

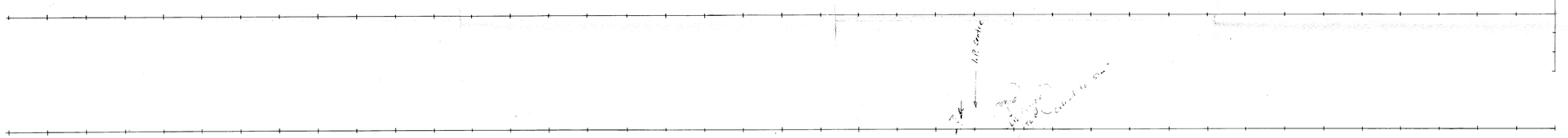
4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E

3000 nt
2000 nt
1000 nt
0 nt

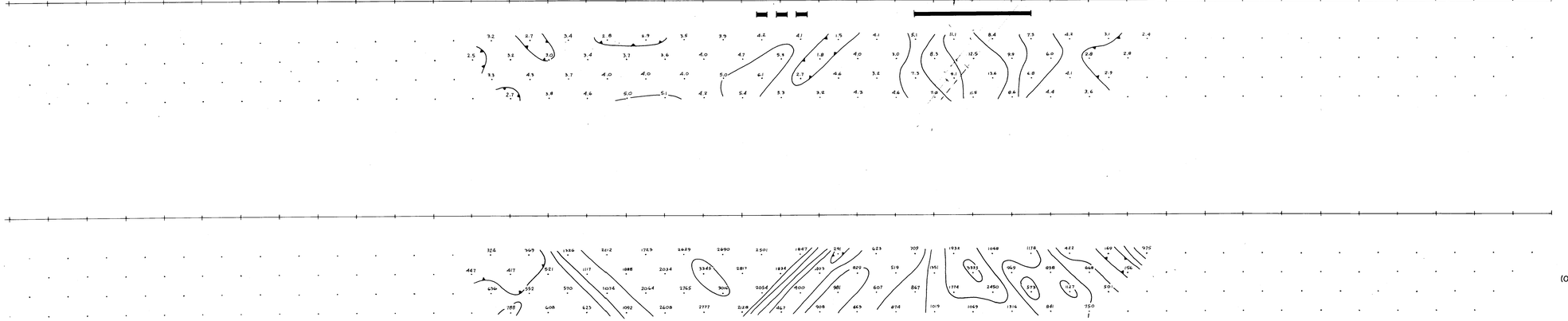
MAG.



H.L.E.M.



CHARGEABILITY (a) (ms)



ρa
(OHM-M)

MAG. LEGEND

INSTRUMENT	:	Unimag
FIELD MEASUREMENT	:	Total
DATUM	:	57,000 nt
PROFILE SCALE	:	1 cm. = 200 nt
SURVEY DATE	:	Nov./84
OPERATOR	:	V.S.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
Part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	:	SE-88
COIL SPACING	:	
FREQUENCY	:	Low ----- 337 Hz Med ----- 1012 Hz High ----- 3037 Hz
INTEGRATION TIME	:	16 sec.
REF FREQUENCY	:	112 Hz
PROFILE SCALE	:	1 cm. = %
SURVEY DATE	:	
OPERATOR	:	

I.P. LEGEND

ARRAY	:	Dipole - Dipole
FREQUENCY	:	
a	:	50 m
CONTOUR MULTIPLES	:	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	:	In units of Ωm.
SURVEY DATE	:	Dec./84
OPERATOR	:	P.E. Walcott & Assoc.
Rx	:	Huntec MK IV
Tx	:	Phoenix
TIME DELAY	:	200 ms
SAMPLING TIME	:	1000 ms

REVISED

HAWKINS LAKE

LINE No. : 4800 N

GEOCOMPILATION

PROJ. No. 61
N.T.S.
DWG. No. 21

SURVEY BY: P.E. Walcott & Assoc. DATE: Jan./85
DRAWN BY: (traced) W.M.R SCALE: 1:2500

NORANDA EXPLORATION
OFFICE Vancouver

4300 E | 4400 E | 4500 E | 4600 E | 4700 E | 4800 E | 4900 E | 5000 E | 5100 E | 5200 E | 5300 E

3000 nt
2000 nt
1000 nt
0 nt

MAG.

H.L.E.M.

CHARGEABILITY (a) (ms)

ρa (OHM-M)

MAG. LEGEND

INSTRUMENT	: Unimag
FIELD MEASUREMENT	: Total
DATUM	: 57,000 nt
PROFILE SCALE	: 1 cm. = 200 nt
SURVEY DATE	: Nov./84
OPERATOR	: V.S.

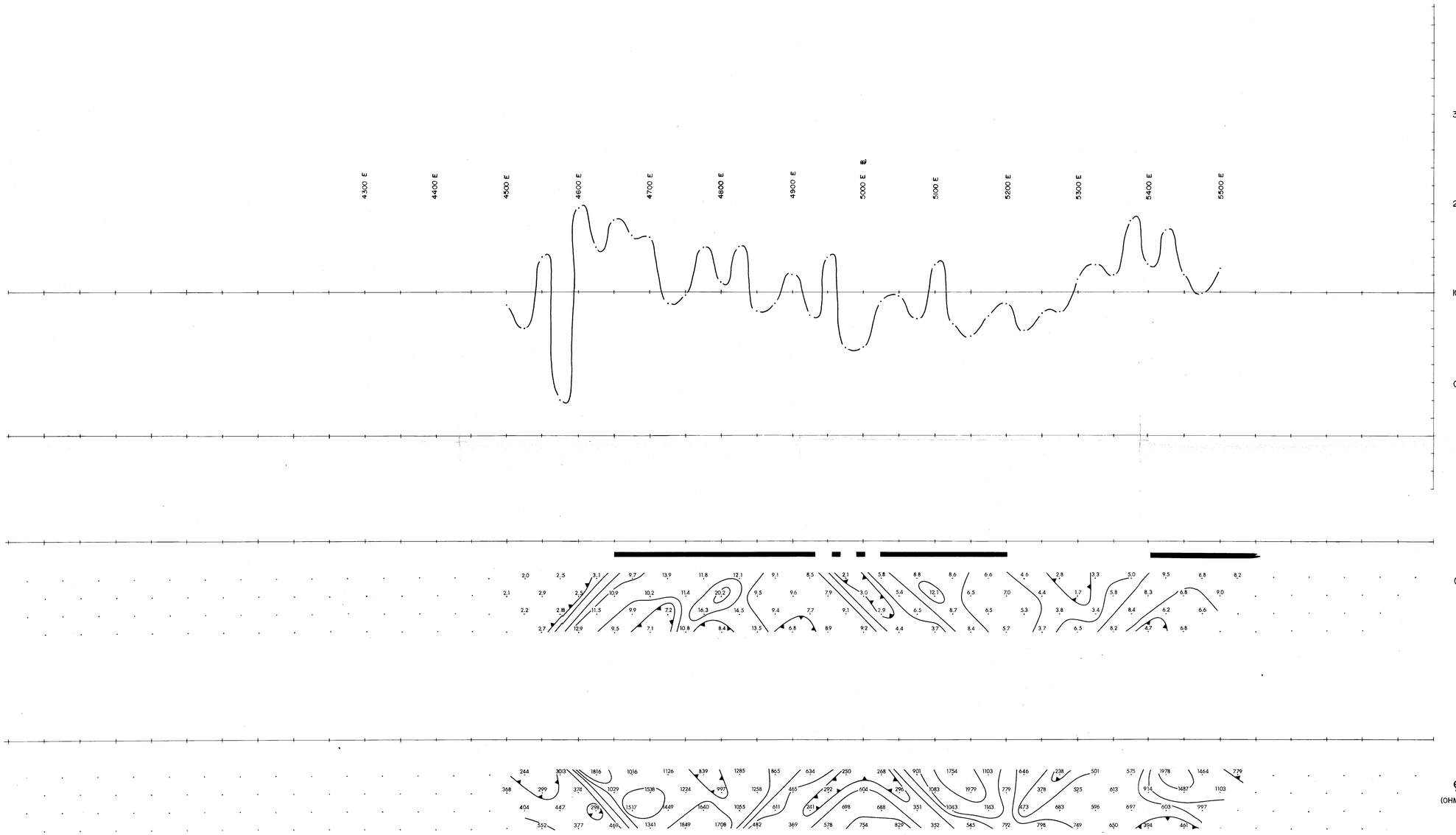
H.L.E.M. LEGEND

INSTRUMENT	: SE-88
COIL SPACING	:
FREQUENCY	: Low —— 337 Hz Medium ----- 1010 Hz High ----- 3057 Hz
INTEGRATION TIME	: 16 sec.
REF FREQUENCY	: 112 Hz
PROFILE SCALE	: 1 cm. = %
SURVEY DATE	:
OPERATOR	:

I.P. LEGEND

ARRAY	: Dipole - Dipole
FREQUENCY	:
a'	: 50 m
CONTOUR MULTIPLES	: 10, 1.5, 3.0, 5.0, 7.5
ρa/2π	: In units of Ω.m.
SURVEY DATE	: Dec./84
OPERATOR	: P.E. Walcott & Assoc.
Rx	: Huntec MK IV
Tx	: Phoenix
TIME DELAY	: 200 ms
SAMPLING TIME	: 1000 ms

REVISED	HAWKINS LAKE
	LINE No. : 4700 N
	GEOCOMPILATION
PROJ. No. 61	SURVEY BY: P.E. Walcott & Assoc. DATE: Jan./85
N.T.S. 92P	DRAWN BY: (traced) W.M.R SCALE: 1:2500
DWG. No. 22	NORANDA EXPLORATION
	OFFICE Vancouver



MAG. LEGEND

INSTRUMENT	Unimag
FIELD MEASUREMENT	Total
DATUM	57,000 nt
PROFILE SCALE	1 cm. = 200 nt
SURVEY DATE	1984
OPERATOR	T.L.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

H.L.E.M. LEGEND

INSTRUMENT	SE-88
COIL SPACING	
FREQUENCY	Low ——— 337 Hz Med ——— 1092 Hz High ——— 3037 Hz
INTEGRATION TIME	16 sec.
REF FREQUENCY	112 Hz
PROFILE SCALE	1 cm. = %
SURVEY DATE	
OPERATOR	

I.P. LEGEND

ARRAY	Dipole - Dipole
FREQUENCY	
a	50 m
CONTOUR MULTIPLES	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	In units of Ωm.
SURVEY DATE	Dec. /84
OPERATOR	P.E. Walcott & Assoc.
Rx	Huntec MK IV
Tx	Phoenix
TIME DELAY	200 ms
SAMPLING TIME	1000 ms

REVISED

HAWKINS LAKE

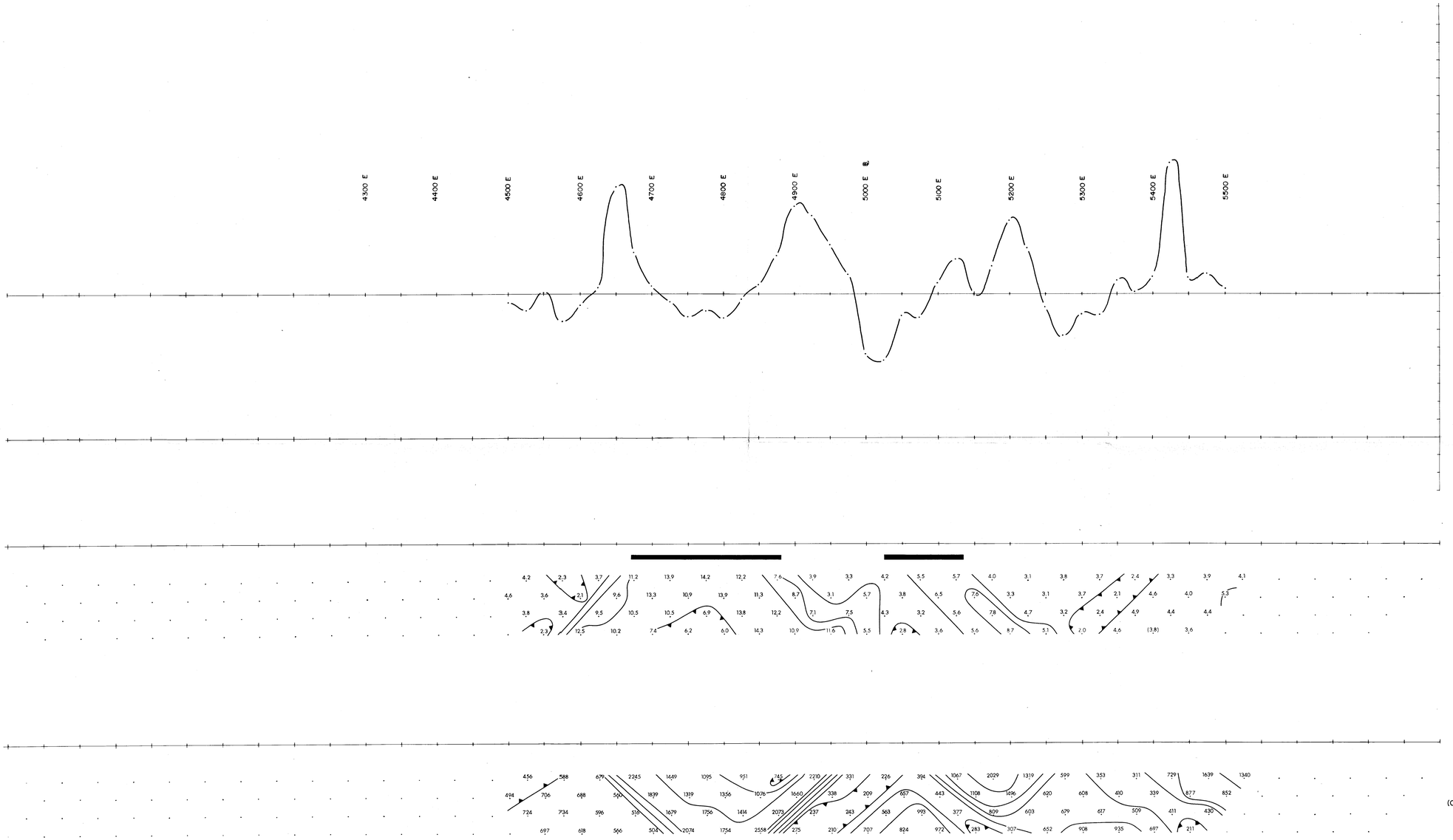
LINE No.: 4600N

GEOCOMPILATION

PROJ. No. 61
N.T.S. 92P
DWG. No. 23

SURVEY BY P.E. Walcott & Assoc. DATE Jan. /84
DRAWN BY (traced) W.M.R SCALE 1:2500

NORANDA EXPLORATION
OFFICE Vancouver



MAG. LEGEND

INSTRUMENT	:	Unimag
FIELD MEASUREMENT	:	Total
DATUM	:	57,000 nt
PROFILE SCALE	:	1 cm. = 200 nt
SURVEY DATE	:	1984
OPERATOR	:	T.L.

H.L.E.M. LEGEND

INSTRUMENT	:	SE-88
COIL SPACING	:	
FREQUENCY	:	Low ——— 337 Hz Med — — — 1012 Hz High - - - - 3037 Hz
INTEGRATION TIME	:	16 sec.
REF FREQUENCY	:	112 Hz
PROFILE SCALE	:	1 cm. = %
SURVEY DATE	:	
OPERATOR	:	

I.P. LEGEND

ARRAY	:	Dipole - Dipole
FREQUENCY	:	
a	:	50 m
CONTOUR MULTIPLES	:	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	:	In units of Ωm.
SURVEY DATE	:	Dec. /84
OPERATOR	:	P.E. Walcott & Assoc.
Rx	:	Huntec MK IV
Tx	:	Phoenix
TIME DELAY	:	200 ms
SAMPLING TIME	:	1000 ms

REVISED

HAWKINS LAKE

LINE No. : 4500N

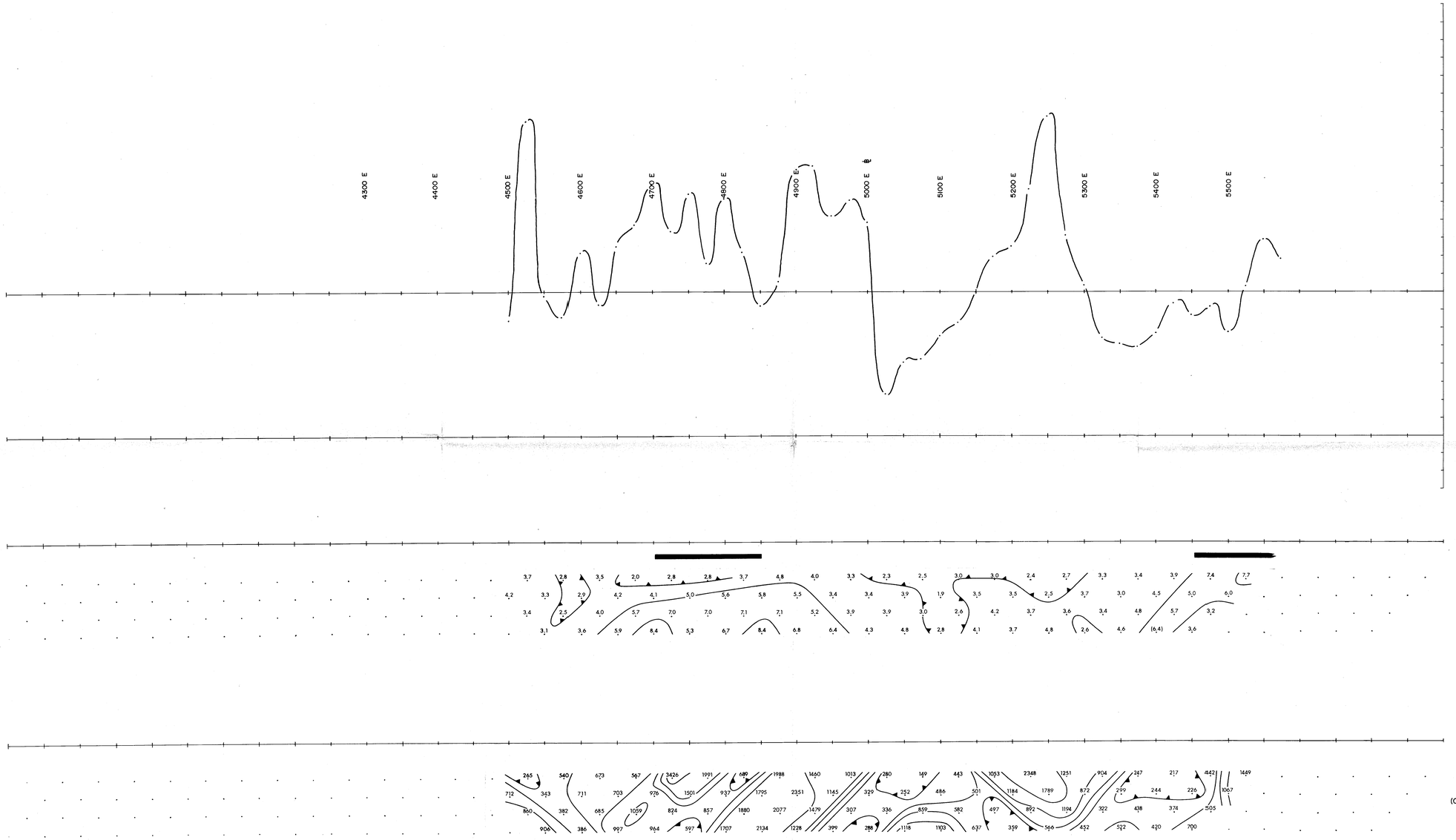
GEOCOMPILATION

PROJ. No. 61
N.T.S. 92P
DWG. No. 24

SURVEY BY P.E. Walcott & Assoc. DATE Jan. /84
DRAWN BY (traced) W.M.R SCALE 1: 2500

NORANDA EXPLORATION

OFFICE Vancouver



MAG. LEGEND

INSTRUMENT	:	Unimag
FIELD MEASUREMENT	:	Total
DATUM	:	57,000 nt
PROFILE SCALE	:	1 cm. = 200 nt
SURVEY DATE	:	1984
OPERATOR	:	T.L.

H.L.E.M. LEGEND

INSTRUMENT	:	SE-88
COIL SPACING	:	
FREQUENCY	:	Low ——— 337 Hz Mid ——— KHz Hz High ----- 3037 Hz
INTEGRATION TIME	:	16 sec.
REF FREQUENCY	:	112 Hz
PROFILE SCALE	:	1 cm. = %
SURVEY DATE	:	
OPERATOR	:	

13,751 part 2 of 2

I.P. LEGEND

ARRAY	:	Dipole - Dipole
FREQUENCY	:	Hz & Hz
a	:	50 m.
CONTOUR MULTIPLES	:	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	:	in units of Ωm.
SURVEY DATE	:	Dec. /84
OPERATOR	:	P.E. Walcott & Assoc.
Rx	:	Huntec MK II
Tx	:	Phoenix
TIME DELAY	:	200 ms
SAMPLING TIME	:	1000 ms

REVISED

HAWKINS LAKE

LINE No.: 4400N

GEOCOMPILATION

PROJ. No. 61
N.T.S. 92P
DWG. No. 25

SURVEY BY: P.E. Walcott & Assoc. DATE: March/85
DRAWN BY: W.M.R. & P.J.A. SCALE: 1:2500

NORANDA EXPLORATION
OFFICE: Vancouver

4300 E
4400 E
4500 E
4600 E
4700 E
4800 E
4900 E
B/L 5000 E Az. 020°
5100 E
5200 E
5300 E
5400 E
5500 E

Cabin

51° 53' 20"

NORTH

CAB 1

CLAY 4
CLAY 2
CLAY 6
CLAY 8

L.C.P.

L. 5800 N
L. 5700 N
L. 5600 N
L. 5500 N
L. 5400 N
L. 5300 N
L. 5200 N
L. 5100 N
L. 5000 N
L. 4900 N
L. 4800 N
L. 4700 N
L. 4600 N

CAB 2

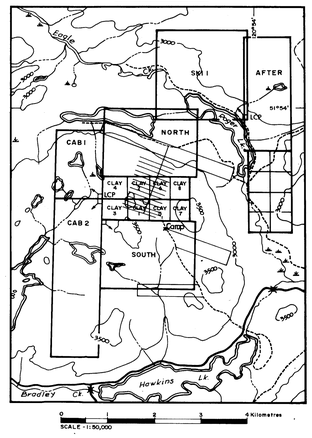
CLAY 3
CLAY 1
CLAY 5
CLAY 7

CAMP

SOUTH

51° 51' 35"

LOCATION MAP



GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

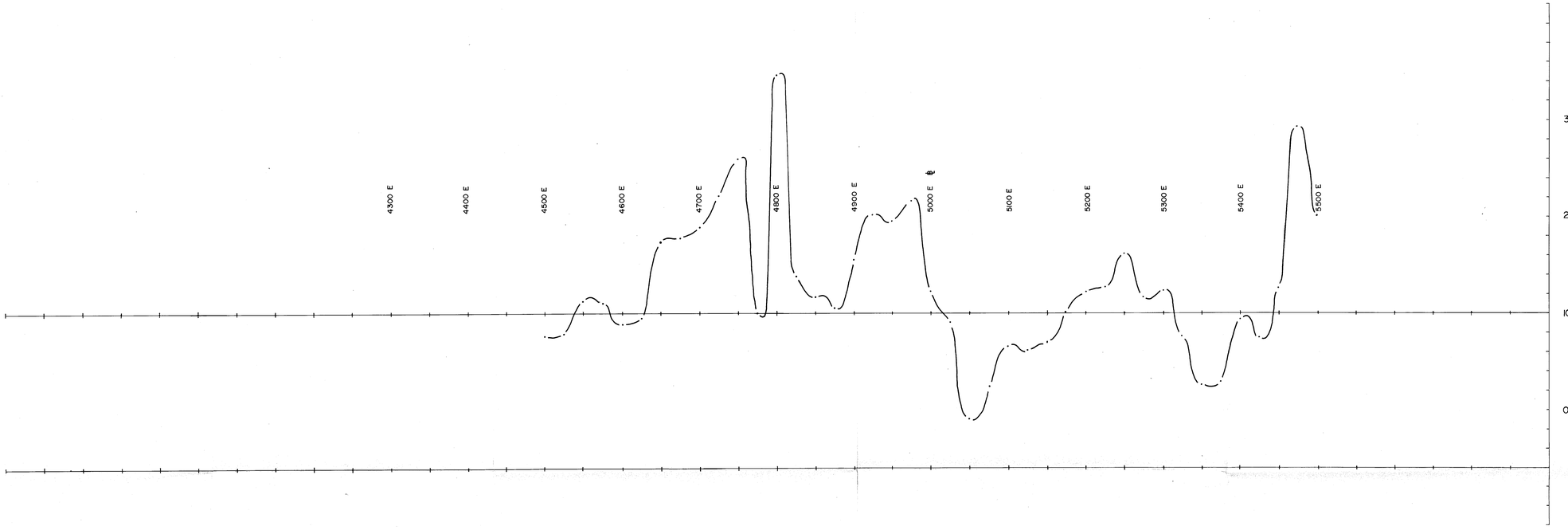
LEGEND

INSTRUMENT	:	G-836
FIELD MEASUREMENT	:	Total
DATUM	:	57400
CONTOURS	:	250nT
CONDUCTOR AXIS	:	
SURVEY DATE	:	Oct./84
OPERATOR	:	T.L.

0 100 200 300 400 500 m
SCALE 1:5000

REVISED	HAWKINS LAKE - ALCLARE RES. INC.
	MAGNETOMETER SURVEY
PROJ. No. 61	SURVEY BY: ..... DATE: .....
N.T.S. 92P/15	DRAWN BY: S.K.B. (traced) - W.M.Y. '90. SCALE: 1:5000
DWG. No. 11	NORANDA EXPLORATION
	OFFICE: Vancouver

51° 51' 35"



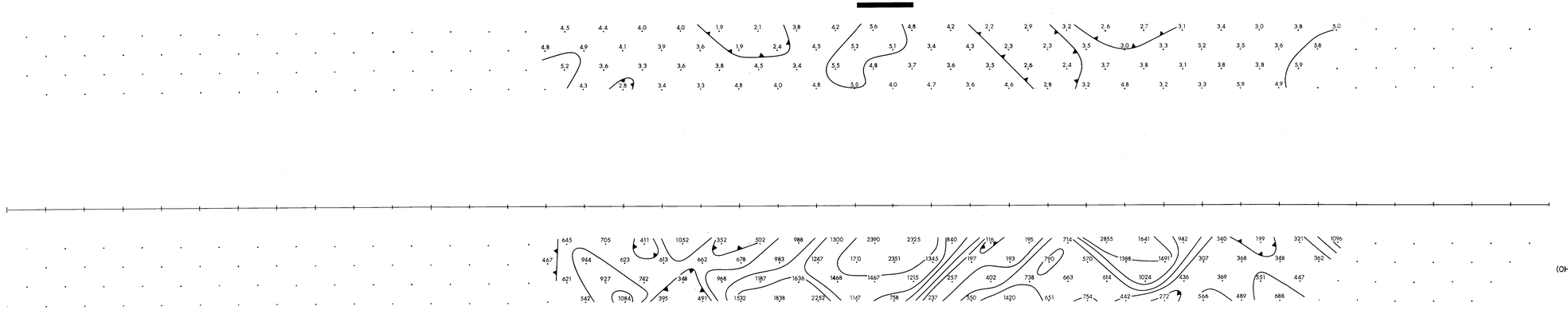
MAG. LEGEND

INSTRUMENT	:	Unimag
FIELD MEASUREMENT	:	Total
DATUM	:	57,000 nt
PROFILE SCALE	:	1 cm. = 200 nt
SURVEY DATE	:	1984
OPERATOR	:	T.L.

H.L.E.M.

H.L.E.M. LEGEND

INSTRUMENT	:	SE-88
COIL SPACING	:	
FREQUENCY	:	Low ------ 337 Hz Med. ------ 1012 Hz High ----- 3037 Hz
INTEGRATION TIME	:	16 sec.
REF FREQUENCY	:	112 Hz
PROFILE SCALE	:	1 cm. = %
SURVEY DATE	:	
OPERATOR	:	



CHARGEABILITY (a) (ms)

I.P. LEGEND

ARRAY	:	Dipole - Dipole
FREQUENCY	:	Hz & Hz
a	:	50 m.
CONTOUR MULTIPLES	:	1.0, 1.5, 3.0, 5.0, 7.5
ρa/2π	:	In units of Ω.m.
SURVEY DATE	:	Dec./84
OPERATOR	:	P.E. Walcott & Assoc.
Rx	:	Huntec MK IX
Tx	:	Phoenix
TIME DELAY	:	200 ms
SAMPLING TIME	:	1000 ms

ρa
(OHM-M)

REVISED	HAWKINS LAKE
	LINE No.: 4300N
	GEOCOMPILATION
PROJ. No. 61	SURVEY BY: P.E. Walcott & Assoc. DATE: March/85
N.T.S. 92P	DRAWN BY: W.M.R. & P.J.A. SCALE: 1:2500
DWG. No. 26	NORANDA EXPLORATION
	OFFICE Vancouver

NORTH

SOUTH

CAB 1

CAB 2

CLAY 1

CLAY 2

CLAY 3

CLAY 4

CLAY 5

CLAY 6

CLAY 7

CLAY 8

L.C.P

CAMP

Cabin

B/L 5000E Az 020°

ROGER LAKE

51°53'20"

51°51'35"

120°54'

L 5800N

L 5700N

L 5600N

L 5500N

L 5400N

L 5300N

L 5200N

L 5100N.

L 5000N.

L 4900N.

L 4800N.

L 4700N

L 4600N.

L 4500N.

L 4400N.

L 4300N.

L 4200N.

L 4100N.

4300E

4400E

4500E

4600E

4700E

4800E

4900E

5100E

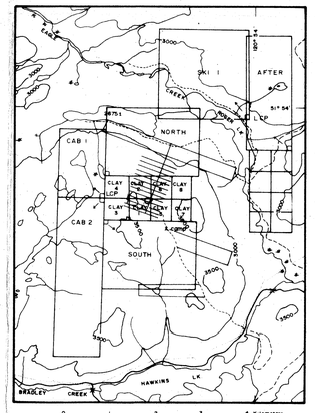
5200E

5300E

5400E

5500E

LOCATION MAP



LEGEND

Lake

L.C.P and claim boundary

Cat road

110, 2, 1 — Soil sample location, assays for Cu., As.(p.p.m.), Au.ppb.

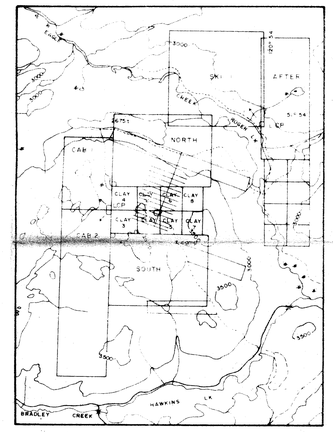
GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

0 100 200 300 400 500 m
SCALE 1:5,000

REVISED T.LEWIS NOV./84	HAWKINS LAKE - ALCLARE RES INC.
	SOIL SAMPLE GEOCHEM Cu., As.(p.p.m.), Au.(ppb.)
PROJ. No. 81	SURVEY BY: T.LEWIS DATE: AUG. 1984
N.T.S. 93 P/9 E	DRAWN BY: S.S.B. SCALE: 1:5000
DWG. No. Fig. 5	NORANDA EXPLORATION
	OFFICE: PRINCE GEORGE, B.C.

LOCATION MAP



LEGEND

ROCK TYPES

JURASSIC OR OLDER

1. Chlorite Schist, dark green with weakly developed foliation
2. Hornblende Basalt, hornblende phenocryts in a chlorite and /or epidote matrix
3. Hornblende Basalt Breccia, monolithic subangular hornblende basalt fragments in an epidote and /or chlorite matrix
4. Felsic Schist, buff coloured, fine grained rhyolite, with a weakly developed foliation
5. Altered Limestone, foliated, grey limestone, with epidote banding.
6. Quartz - feldspar chlorite schist

INTRUSIVES

7. Granodiorite, ?a Diorite
8. Monzonite, and Monzonite dykes
9. Feldspar Porphyry Dyke

SYMBOLS

- Lake
- L.C.P and claim boundary
- Cat road
- Trench
- Diamond drill hole
- Outcrop
- Geological contact
- Fault
- 85° Bedding
- 57° Foliation
- epi., cal. Zone of epidote, calcite, alteration
- bor.,cp.,mal. Mineralization: Bornite, Chalcopyrite, Malachite
- a. Augite
- hb. Hornblende
- 39364 Rock sample
- A,B,C,D Soil profiles
- 25 Soil Geochem Contour Gold (>25ppb.)
- 100 200 Soil Geochem Contour Copper (ppm)
- 450 500 550 Magnetometer Contour ✕ X10

GEOLOGICAL BRANCH
ASSESSMENT REPORT

13,751
part 2 of 2

THOMAS E. LEWIS
PROFESSIONAL ENGINEER

0 50 100 150 200 metres
SCALE 1:2,500

REVISED	HAWKINS LAKE - ALCLARE RES. INC.
	COMPILATION MAP
PROJ. No. 81	SURVEY BY: T. LEWIS DATE: JAN 1985
N.T.S. 92 P/ 13	DRAWN BY: S.K.B. SCALE: 1:2500
DWG. No. Fig. 6	NORANDA EXPLORATION
	OFFICE: PRINCE GEORGE B.C.