6210 Part 2

GEOCHEMICAL AND GEOPHYSICAL REPORT

KUTCHO 1 to 6 MINERAL CLAIM

58°12'N 128°30'W

1041/2 E&W

R.G. MacArthur
J.T. Walker

NORANDA EXPLORATION COMAPNY, LIMITED
(No Personal Liability)

LIARD MINING DIVISION

~~February 28~~ March 7, 1977

TABLE OF CONTENTS

CONT'D

Table of Contents cont'd

CONTENTS

Figures

INTRODUCTION

The "Kutcho Property" referred to in this report is located approximately 90km southeast of Dease Lake in northwestern B.C. Access to the area is via helicopter from Dease Lake. For larger loads the best route is via float plane to Rainbow lake, approx. 20 km north of the property, then via helicopter to the property.

The work described in this report covers the following claims:

CLAIM	UNITS	RECORD NUMBER	RECORD DATE	OWNER
Kutcho - 1	20	99	March 10, 1976	Noranda Exploratio Company, Limited (No Personal Liability)
Kutcho - 2	20	100	"	"
Kutcho - 3	20	101	"	"
Kutcho - 4	20	102	"	"
Kutcho - 5	20	103	"	"
Kutcho - 6	20	104	"	"

The Kutcho 1 - 6 claims were staked on the basis of favorable geology similar to that on the Sumac and Imperial claims to the east, where a significant Cu - Zn discovery has recently been made.

The linecutting and geochemical surveys were carried out under the supervision of G.E. Dirom.

The geophysical surveys were supervised by J.T. Walker both employed by Noranda. The work was carried out between June 1, 1976 and August 31, 1976.

GENERAL GEOLOGY

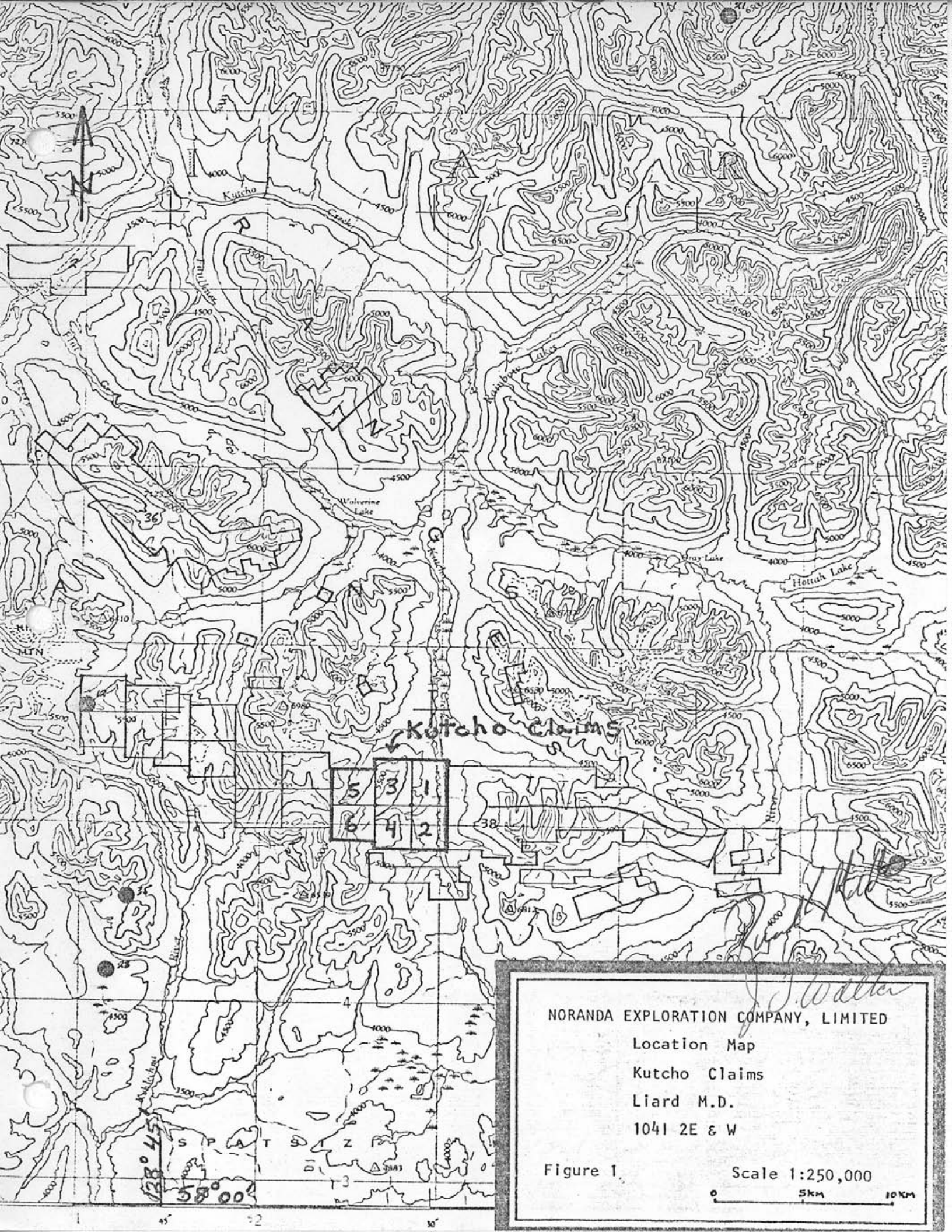
The area has been mapped regionally by the G.S.C. (Map #29 - 1962 1" = 4 miles). In addition, mapping by A. Panteleyeve of the B.C. Dept. of Mines (See Geological Fieldwork 1975, B.C. Dept. of Mines and Pet. Res.) provides some insight into the regional geology.

Regional mapping in the area indicates the claims are underlain by a sequence of schistose acid volcanics, pyroclastics, limestone and shale of probable Upper Paleozoic age. Strikes are generally east-west with steep dips to the north.

GRID PREPARATION

For control purposes a cut and chained grid was laid out on the Kutcho Property (Figure 2). An east-west base line (090°) was run and designated 100N. North-south grid lines were run of this base line every 200m. A total of 50.4km of line were laid out. 36.6 km were cut under contract by T. McCorory of Whitehorse Yukon Ten. The remainder were in alpine and were laid out by Noranda personnel.

.../2



NORANDA EXPLORATION COMPANY, LIMITED

Location Map

Kutcho Claims

Liard M.D.

1041 2E & W

Figure 1

Scale 1:250,000

0 5km 10KM

SOIL GEOCHEMISTRY

Sampling Method

Soil samples were collected at 50m intervals along the grid described above. Two samples were collected at each location where possible. One sample was from the "B" or upper horizon and one from the "C" or lower horizon. Where poor sampling conditions were encountered one sample of the best material available was collected. A total of 889 locations were sampled and 1609 samples were collected.

Samples were collected by digging holes with a mattock and shovel. The sample material was placed in "Hi Wet Strength Kraft 3½ x 6 1/8" Open End" envelopes, on which grid locations were marked.

Laboratory Determination Method

The samples are first dried in a drying cabinet for a period of 24 - 48 hours. They are then screened and sifted to obtain a -80 mesh fraction.

To determine the amount of total extractable copper, molybdenum, lead and zinc in each sample, the following procedure is employed:

> A small amount of the -80 mesh material, 0.200 grams, is digested in 2ml of $HC10_4$ and 0.5 ml of HNO_3 for approximately four hours. Following digestion, each sample is diluted to 5 ml with demineralized H_2O. A Varian Techtron Model AA-5 atomic absorption spectrophotometer is used to ascertain the content, in parts per million, of each element.

Presentation of Results

The results are presented in figs. 3 (Cu, Mo), 4(Zn), 5(Pb). Values are in parts per million. The following values are considered anomalous Cu ≥ 100 ppm ZN≥ 200 ppm Mo≥ 20 ppm Pb = not applicable. Because of the difficulty in indentifying the actual "B" and "C" horizons in the field, anomalous values in either the "B" or "C" horizons were contoured together

Discussion of Results

(i) Copper (Figure 3).

Values range from 4 ppm to 970 ppm. There are numerous small weak anomalies throughout the grid area, with the maximum concentration south of the base line 100N. There is a patchy anomalous zone trending west northwest from L108E to L74E. The highest values in this zone are in the south east quarter of the grid area where there are a number of values greater than 500 ppm Cu.

(ii) Molybdenum (Figure 3)

There are only three sample locations with values greater than 20 ppm and these are underlined on figure #3.

.../3

(iii) Zinc (Figure 4)

Values for zinc range from 22 ppm to 2800 ppm. The most prominant zinc anomaly is in the southeast quarter of the grid area L94E to 102E 93N to 98N. There are a number of values greater than 500 ppm zinc in this area. A second anomalous zone lies south of 93N on lines 104E to 108E with values of up to 2800 ppm zinc. This anomaly is open to the south. Both of these anomalies coincide well with Cu anomalies.

A number of other small one sample anomalies and larger, weakly anomalous zones occur in the grid area as shown in fig. #4.

(iv) Lead (Figure 5)

Values for lead are consistantly low. The highest value recorded was 110 ppm - L108E at 94N and this coincides with the highest value for Mo = 320 ppm. It is also within an area of anomalous Cu and Zn values.

STREAM SEDIMENT GEOCHEMISTRY

Where grid lines crossed streams, samples of the finest active sediment available were collected. The samples were later analyzed for Cu, Mo, Zn, Pb in the geochem lab of Noranda Exploration Company, Limited at 1050 Davie Street Vancouver, B.C. The analyst was R. Fenton.

Laboratory Determination Method

The samples are first hung in a dry cabinet for a period of 24 hours to 48 hours. They are then mechanically screened and sifted to obtain a -80 mesh fraction.

The determination method for soluable copper, soluable zinc and soluable lead is as follows: 0.200 grams of -80 mesh material is digested in 5 ml. of .5N HCL for 1/2 hour. Following digestion, a Varian Techtron Model AA-5 Atomic Absorption spectrophotometer was used to determine the parts per million Cu and Zn content in each sample.

The determination method for total molybdenum is as follows: 0.200 grams of the -80 mesh is digested in 2 ml. of $HC10_4$ and 0.5 ml. of HNO_3 for approximately four hours. Following digestion each sample is diluted to 10ml. with demineralization H_2O. A Varian Techtron Model AA-5 Atomic Absorption spectrophotometer was used to determine the parts per million copper content in each sample.

The theory of Atomic Absorption spectrophotometry is fully described in the literatures and will not be described in this report.

Presentation of Results

The results are presented in figs. 3, 4 and 5 where they are indicated by an X. Values are in ppm.

Discussion of Results

The higher values of the stream sediment samples seem to coincide well with areas outlined as anomalous by the soil geochemistry.

GEOPHYSICAL SURVEYS

Introduction

Three Electromagnetic surveys were carried out on all or part of the Kutcho property grid. The electromagnetic methods employed were (a) C.E.M. horizontal shootback, VLF-EM, and standard vertical loop E.M. The surveys were carried out by L. Bradish, G. Fenton, W. Woolverton and A. Dickenson under the supervision of J.T. Walker Geophysicist, all employees of Noranda Exploration Company,Limited.

C.E.M. transceivers, manufactured by Crone Geophysics Ltd. of Mississauga, Ontario were utilized for the C.E.M. shootback and standard vertical loop surveys. The VLF-EM receiver was manufactured by Sabre Electronic Instruments Ltd., Burnaby, B.C.

C.E.M. HORIZONTAL SHOOTBACK SURVEY

This survey was conducted over twenty-two lines for a total of 42.3 kilometers. Readings were taken at 25 meter intervals using a coil separation of 75 meters and a frequency of 1800 Hz.

Method

The two operators, in turn, transmit and receive at each 25 meter set up (coil separation 75 M.) To take a reading operator No. 1 transmits with his the coil in the horizontal plane while operator No. 2 detects the dip angle of null. The two operators reverse procedures (operator 2 transmits, operator 1 receives). The two dip angle of null readings are then added together with appropriate sign (±). This resultant dip angle constitutes a reading for the set up and this reading is plotted mid point between the two operator locations on the survey lines.

Presentation of Results

The C.E.M. results are plotted in profile form on a grid plan Map (Dwg. No.6) at a scale of 1:5000. The vertical scale of the profiles is 1 centimeter equals 20 degrees.

VLF-EM SURVEY

A VLF-EM survey was carried out on nine grid lines for a total of 16.4 kilometers. Dip angle of null readings were taken at 25 meter intervals along the survey lines. The signal from Cutler, Maine was utilized as the primary field for this survey.

Method

The dip angle of null readings are measured by rotating the receiver (coil axis)' in a vertical plane, at right angles to the direction the the transmitter. The orientation of this vertical plane is determined by rotating the receiver (coil axis) held in a horizontal position, the vertical plane is defined. (perpendicular to the coil axis and apparent transmitter direction).

The receiver is now rotated in this vertical plane (coil axis initially vertical) until a null is observed.

The dip angle with sign (I) is measured and recorded. The following sign convention is used:

Top of Coil axis tilted to operations right - sign (+)

Top of Coil axis tilted to operations left - sign (-)

Presentation of Results

The VLF-EM dip angle results are plotted in profile form on a grid plan map (Dwg. No. 7) at a scale of 1:5000. The vertical scale of the profiles is 1 centimeter equals 20 degrees.

VERTICAL LOOP E.M. SURVEY

Thirty-eight short lines of Vertical Loop E.M. Survey were conducted. A transmitter - receiver separation of 100 meters (line to line) was employed using a frequency of 2000 Hz. with several lines surveyed at 400 Hz and 5000 Hz. This survey was employed to delimit conductors which were weakly indicated by results of the C.E.M. Survey.

Method

The Standard vertical loop coil configuration was employed with transmitter operator and receiver operator located on adjacent lines spaced 100 meters. The transmitter remained fixed while the receiver traversed the lines taking dip angle of null readings at 25 meter intervals. When moving from line to line, the transmitter would be located at the crossover from the previously surveyed line to provide maximum coupling with the conductor being delimited.

Presentation of Results

The results of the Vertical Loop E.M. survey are plotted in profile form on a grid plan map (Dwg. No. 8) at a scale of 1:5000. The vertical scale of the profiles is 1 centimeter equals 20 degrees. The legend shows lives depicting the dip angle results at 5000 Hz, 2000 Hz and 400 Hz. The transmitter location and direction to the receiver line is indicated by a triangle.

Discussion of Results of the Electromagnetic Surveys

C.E.M. Survey results define two very conductive areas. One area lies in the north west corner of the grid extending from line 68E to line 80E.

16

This conductive zone is not "closed-off" on the north or west. A second conductive area extends from line 68E to line 96E. Graphitic slates have been observed within these zones and are at least partly the source of the conductivity. The VLF-EM method, being less sensitive to broad conductors has not defined these zones.

Centred on line 88E at 100N, a weak but interesting conductive pattern is apparent on both the C.E.M. and VLF-EM profile. The results of the vertical loop E.M. survey have defined two conductor axis in this area.

A moderate conductive zone is indicated approximately 100N on lines 74E, 76E. This zone is indicated by both C.E.M. and VLF-EM results and well defined by the crossover pattern on the results of the vertical loop E.M. detail. The VLF-EM station at Cutler Maine had an extensive shut down period preventing completion of this survey on the eastern half of the grid.

CONCLUSIONS AND RECOMMENDATIONS

The results of the soil geochemistry have indicated areas with anomalous Cu - Zn concentrations. The most prominent anomalies are in the southeast corner of the grid area.

The cause of these anomalies should be explained be detail prospecting if possible. If the anomalies cannot be explained by prospecting, then a limited progamr of Induced Polarization should be carried out.

The lines 84E to 108E should be extended and soil sampled to the south boundary of the claim group to determine the limits of the Cu - Zn anomaly in that area.

The cause of the conductive zone as defined by the Vertical Loop E.M. Survey should be investigated by diamond drilling.

J. T. Walker
Geophysicist

R. G. MacArthur
Geologist

STATEMENT OF QUALIFICATIONS

I, James T. Walker of the City of Vancouver, Province of British Columbia do certify that:

1. I have been an employee of Noranda Exploration Company, Limited since May, 1958.

2. I have held the position of Geophysicist for Noranda Exploration Company, Limited, British Columbia since June, 1965.

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

4. I am a member of the Canadian Exploration Geophysical Society.

5. I am a member of the British Columbia Geophysical Society.

March 10, 1977

J.T. Walker
Geophysicist
Noranda Exploration Company, Limited
(No Personal Liability)

STATEMENT OF QUALIFICATIONS

I, Ronald G. MacArthur of the town of Smithers, Province of British Columbia, do certify that:

1) I have been an employee of Noranda Exploration Company, Limited since May 1972

2) I am a graduate of Dalhousie University with a Bachelor of Science Degree in Geology.

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

March 10, 1977

R.G. MacArthur
Geologist
Noranda Exploration Company, Limited
(No Personal Liability)

JUL 16 1975 ①

AGREEMENT BETWEEN:

McCRORY HOLDING LTD
#6 2191 2ND AVE
WHITEHORSE, Y.T.

AND

NORANDA EXPLORATION COMPANY, LIMITED (No PERSONAL LIABILITY)
BOX 2380
VANCOUVER, B.C.
V6B 3T5

IT IS AGREED THAT McCRORY HOLDING LTD SHALL CUT LINE ON PROPERTIES HELD BY NORANDA EXPLORATION COMPANY, LIMITED (No PERSONAL LIABILITY) ~~ETC~~. UPON COMPLETION OF EACH PROJECT, McCRORY HOLDING LTD SHALL BE PAID AT A RATE OF $125 PER LINE-KILOMETER FOR A MINIMUM OF 32 LINE-KILOMETERS. LINE CUTTING WILL BE UNDER THE GENERAL SUPERVISION OF NORANDA AND SHALL CONFORM TO NORANDA'S SPECIFICATIONS.

McCRORY HOLDING LTD SHALL BE RESPONSIBLE FOR:

- TRANSPORTATION TO AND FROM DEASE LAKE ~~FROM DAWSON~~ WITH AN ALLOWANCE OF 21¢/MILE FOR TRAVEL EXPENSES.
- EQUIPMENT AND MATERIALS NECESSARY FOR LINE CUTTING
- CAMP AND FOOD
- WORKMAN'S COMPENSATION

NORANDA EXPLORATION COMPANY, LIMITED (No PERSONAL LIABILITY) SHALL BE RESPONSIBLE FOR:

- SUPPLYING TRANSPORTATION TO AND FROM NORANDA'S PROPERTIES
- STANDBY AFTER 2 DAYS, TO OR FROM NORANDA'S PROPERTY, AT A RATE OF $200 PER DAY

DATED THIS 12TH DAY OF JULY, 1976 (2)

PER McLEOD HOLDING LTD

Bill Preston PRESTON

WITNESS — J. C. McCrory

T. McCROR-I

WITNESS — Peter F Bland

PER NORANDA EXPLORATION COMPANY, LIMITED

(No PERSONAL LIABILITY)

Gary Bell

GARY BELL

— WITNESS Peter F Bland

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT: Kutcho

TYPE OF REPORT: Geophysics

(a) Employees: G. Belik, L. Bradish, J. Brady, A. Dickenson, G. Fenton, J. Walker, W. Woolverton

Number of days: 81

Dates worked: Between July 12 and Aug. 20/76

(b) Average cost per day $ 40.68

Total cost $ 40.68 X 81 — $ 3,295.08

(c) Cost of food & accomodation — $ 1,234.54

(d) Cost of transportation

i. During work period

type: Truck — 917.05

cost:

ii. To and from Claims from within B.C.

cost: — 800.65 — 1,717.70

(e) Cost of aircraft

i. Fixed wing: — 527.89

ii. Helicopter: — 3,330.10 — 3,857.99

(f) Cost of instruments

i. Rental: — 425.00

ii. Supplies — 42.50 — 467.50

(g) Cost of geochem analysis (details attached):

(h) Cost of report preparation: — 699.39

(i) Other: C.N. Telecommunications — 32.90

Miscellaneous Camp Supplies — 2.47 — 35.37

TOTAL — 11,307.57

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT: KUTCHO

TYPE OF REPORT: Line Preparation

(a)	Employees: J. Brady, S. Holland, G. Sivertz Number of days: 18 Dates worked: Between July 2 and July 13/76		
(b)	Average cost per day $ 30.61 Total cost $ 30.61 X 18		$ 550.98
(c)	Cost of food & accomodation		$ 105.33
(d)	Cost of transportation		
	i. During work period type: truck cost:	19.16	
	ii. To and from Claims from within B.C. cost:		19.16
(e)	Cost of aircraft		
	i. Fixed wing:	249.62	
	ii. Helicopter:	1,509.35	1,758.97
(f)	Cost of instruments		
	i. Rental:		
	ii. Supplies		
(g)	Cost of geochem analysis (details attached):		
(h)	Cost of report preparation:		
(i)	Other: Contractor:McCrory Holdings Ltd.		4,764.00
	TOTAL		7,098.44

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT: Kutcho

TYPE OF REPORT: Geochem

(a) Employees: J. Brady, Brownlee, A. Dickenson S. Holland, Koppe

Number of days: 75

Dates worked: Between July 1 and Aug. 5/76

(b) Average cost per day $ 27.67

Total cost $27.67 X 75 — $ 2,075.25

(c) Cost of food & accomodation — $ 568.96

(d) Cost of transportation

i. During work period

type: truck

cost: 95.95

ii. To and from Claims from within B.C.

cost: 184.75 — 280.70

(e) Cost of aircraft

i. Fixed wing: 108.64

ii. Helicopter: 1,467.30 — 1,575.94

(f) Cost of instruments

i. Rental: 1635 x .05 — 81.75

ii. Supplies

(g) Cost of geochem analysis (details attached): — 4,100.50

(h) Cost of report preparation: — 829.00

(i) Other:

TOTAL — 9,611.10

NORANDA EXPLORATION COMPANY, LIMITED

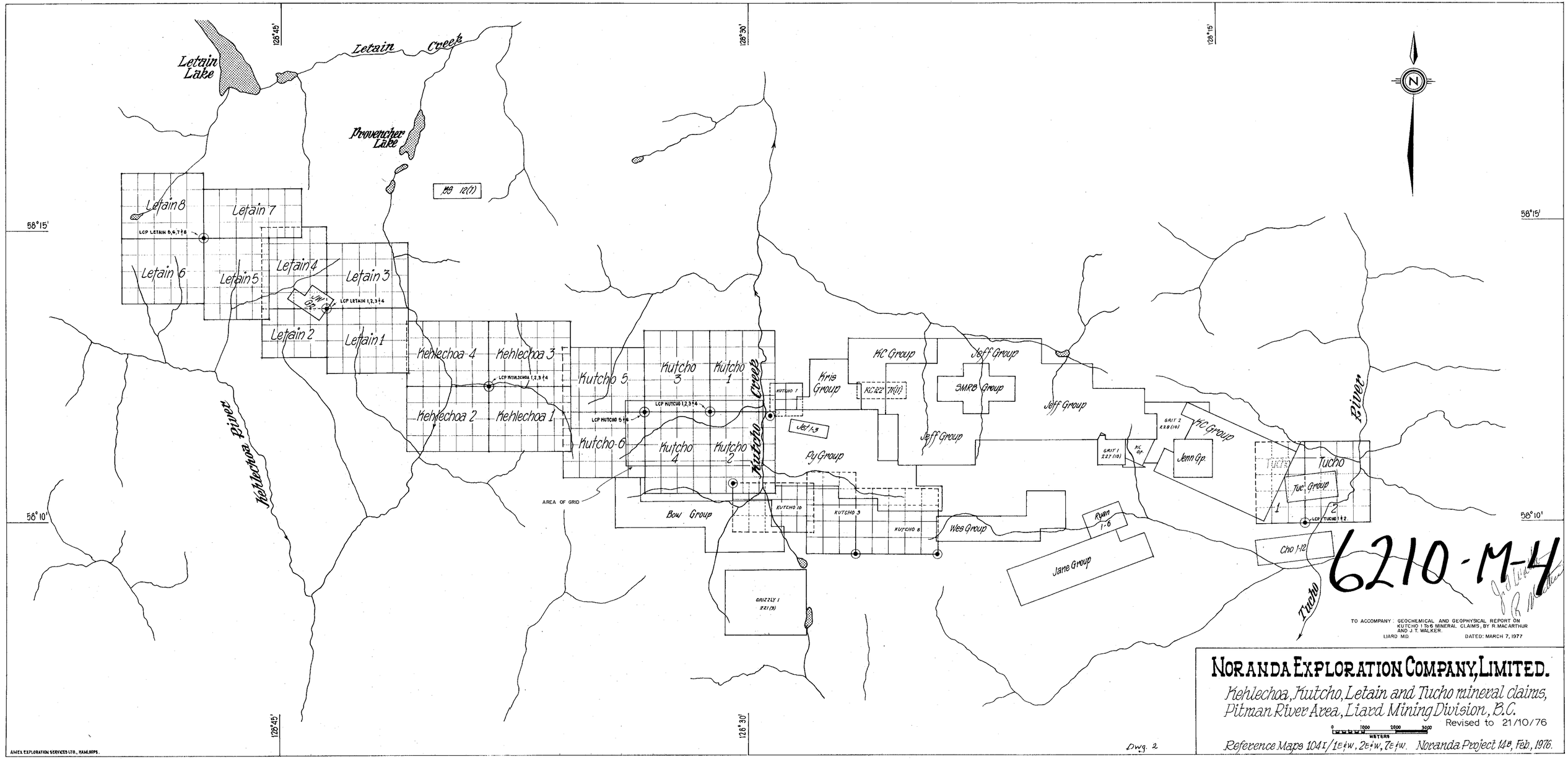
(WESTERN DIVISION)

DETAILS OF ANALYSES COSTS

PROJECT: KUTCHO

ELEMENT	NO. OF DETERMINATIONS	COST PER DETERMINATION	TOTAL
Cu	1635	1.00	1,635.00
Mo	26	1.00	26.00
Zn	1635	.50	817.50
Pb	1635	.50	817.50
Mo	1609	.50	804.50

4,100.50



6210-M-4

TO ACCOMPANY: GEOCHEMICAL AND GEOPHYSICAL REPORT ON KUTCHO 1 To 6 MINERAL CLAIMS, BY R. MACARTHUR AND J. T. WALKER.
LIARD M.D. DATED: MARCH 7, 1977

NORANDA EXPLORATION COMPANY, LIMITED.

Kehlechoa, Kutcho, Letain and Tucho mineral claims,
Pitman River Area, Liard Mining Division, B.C.

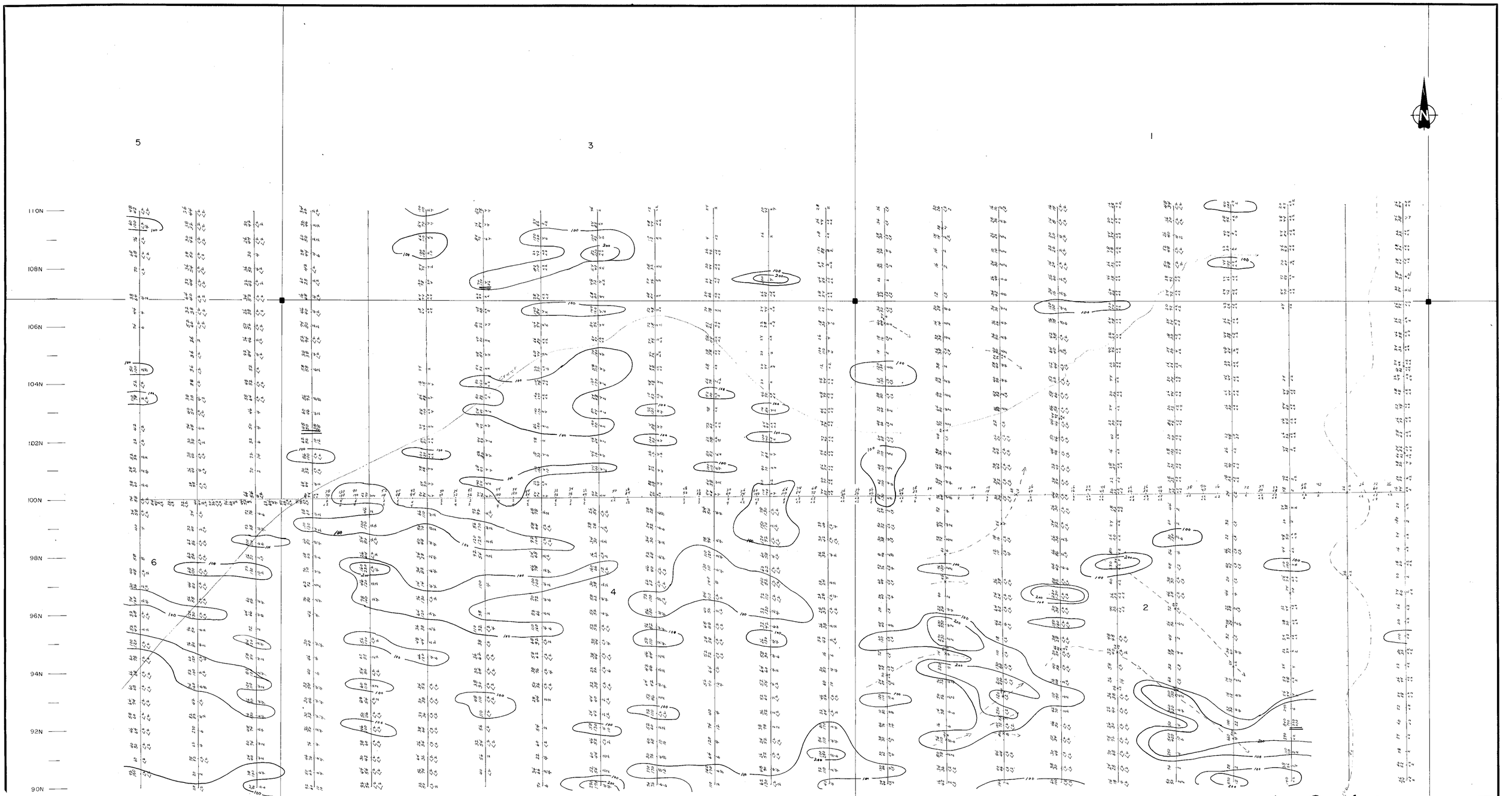
Revised to 21/10/76

0 1000 2000 3000 METERS

Reference Maps 1041/1E½W, 2E½W, 7E½W. Noranda Project 148, Feb, 1976.

Dwg. 2

AMEX EXPLORATION SERVICES LTD., KAMLOOPS.

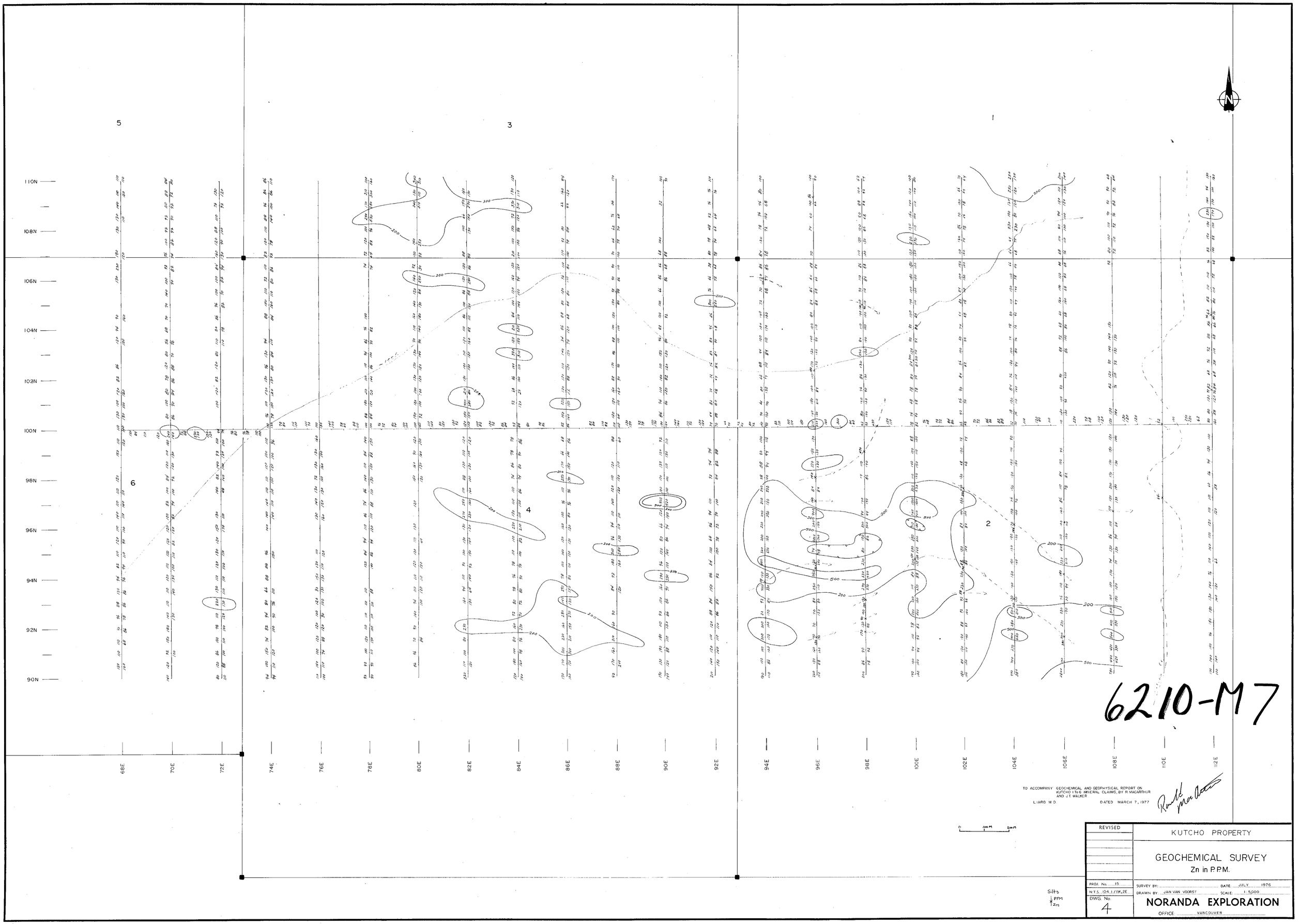


6210-M5

TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON
KUTCHO 1 To 6 MINERAL CLAIMS BY R.MACARTHUR
AND J.T WALKER
LIARD M.D. DATED: MARCH 7, 1977

REVISED	KUTCHO PROPERTY
	GEOCHEMICAL SURVEY Cu, Mo in PPM.
PROJ. No. 15	SURVEY BY: G. BELIK DATE: JULY 1976
N.T.S. 104 I/13W,2E	DRAWN BY: J. V VOORST SCALE: 1:5000
DWG. No. 3	NORANDA EXPLORATION
	OFFICE: VANCOUVER

VANCAL



6210-M7

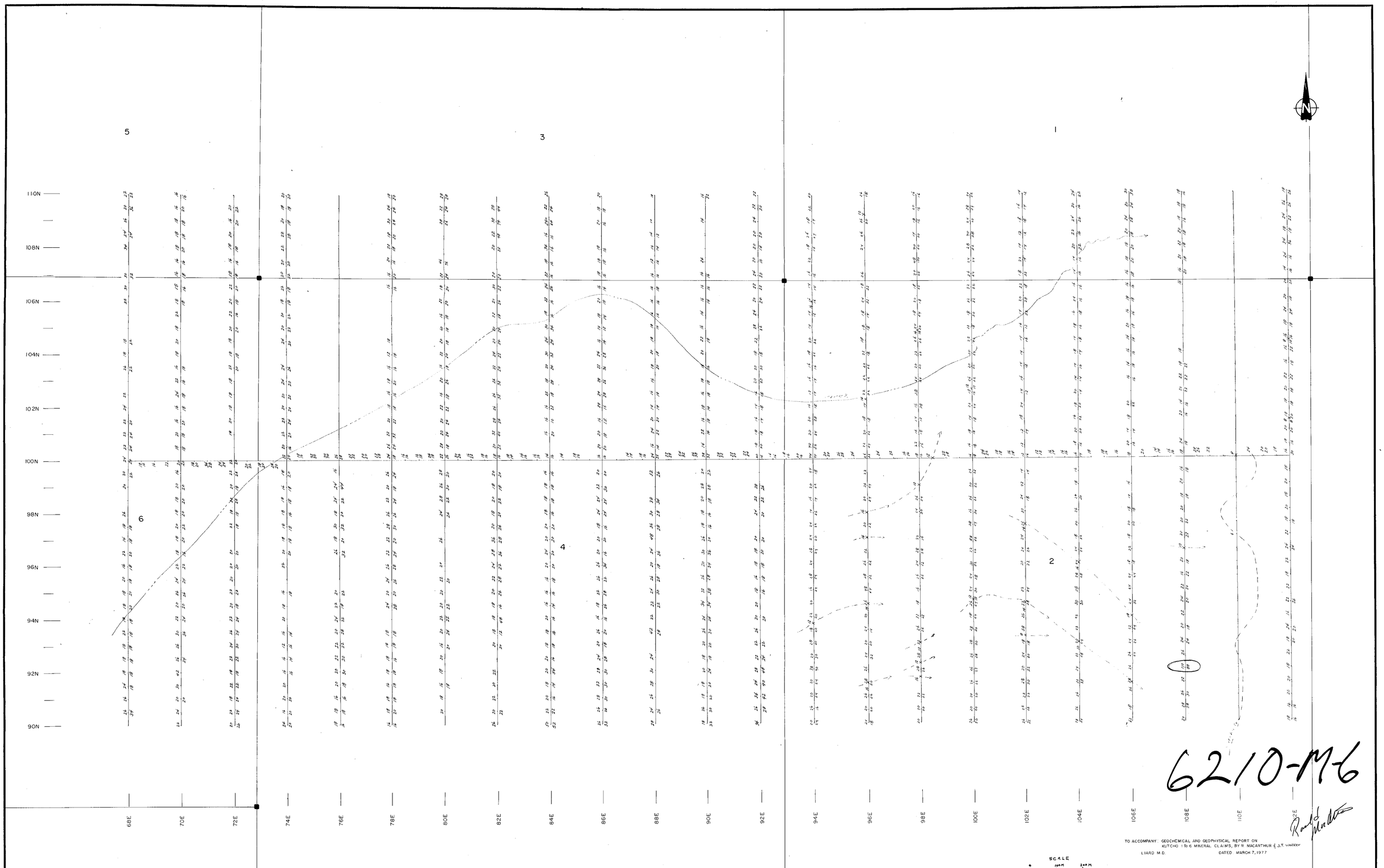
TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON KUTCHO I TO 6 MINERAL CLAIMS, BY R MACARTHUR AND J T WALKER

LIARD M.D. DATED MARCH 7, 1977

Silts
PPM
Zn

REVISED	KUTCHO PROPERTY
	GEOCHEMICAL SURVEY Zn in P.P.M.
PROJ. No. 15	SURVEY BY: DATE: JULY 1976
N.T.S. 104 J/1W,2E	DRAWN BY: JAN VAN VOORST SCALE: 1:5,000
DWG. No. 4	NORANDA EXPLORATION OFFICE VANCOUVER

VANCAL



6210-M6

TO ACCOMPANY: GEOCHEMICAL AND GEOPHYSICAL REPORT ON KUTCHO 1 To 6 MINERAL CLAIMS, BY R. MACARTHUR & J.T. Walker
LIARD M.D. DATED MARCH 7, 1977

REVISED	KUTCHO PROPERTY
	GEOCHEMICAL SURVEY Pb in P.P.M.
PROJ. No. 15	SURVEY BY: G. BELIK DATE: JULY 1976
N.T.S. 104 I/W,2E	DRAWN BY: J.V. VOORST SCALE: 1:5,000
DWG. No. 5	NORANDA EXPLORATION
	OFFICE: VANCOUVER

VANCAL

5

3

1

110N

108N

106N

104N

102N

100N

98N

96N

94N

92N

90N

6

4

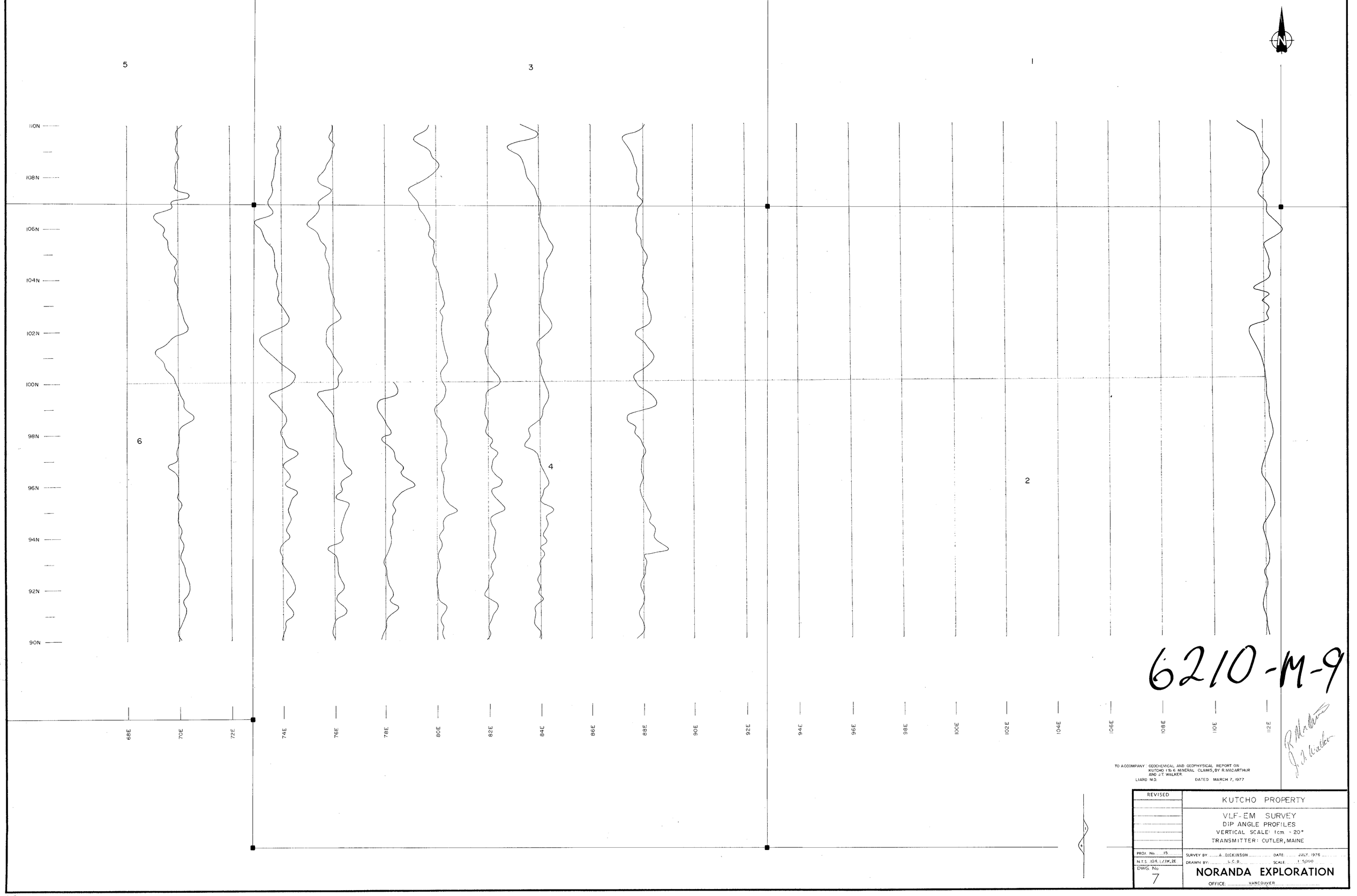
2

68E 70E 72E 74E 76E 78E 80E 82E 84E 86E 88E 90E 92E 94E 96E 98E 100E 102E 104E 106E 108E 110E 112E

6210-M8

TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON
KUTCHO 1 TO 6 MINERAL CLAIMS, BY R MACARTHUR
AND J.T. WALKER
LIARD M.D. DATED MARCH 7, 1977

REVISED	KUTCHO PROPERTY
	CEM SURVEY HORIZONTAL SHOOTBACK RESULTANT NULL ANGLE PROFILES VERTICAL SCALE 1 cm = 20° COIL SPACING 75m FREQUENCY 1800 Hz.
PROJ. No. 15	SURVEY BY G. FENTON DATE JULY 1976
N.T.S. 104 I / W, 2E	DRAWN BY L.C.B SCALE 1:5000
DWG. No. 6	NORANDA EXPLORATION
	OFFICE VANCOUVER

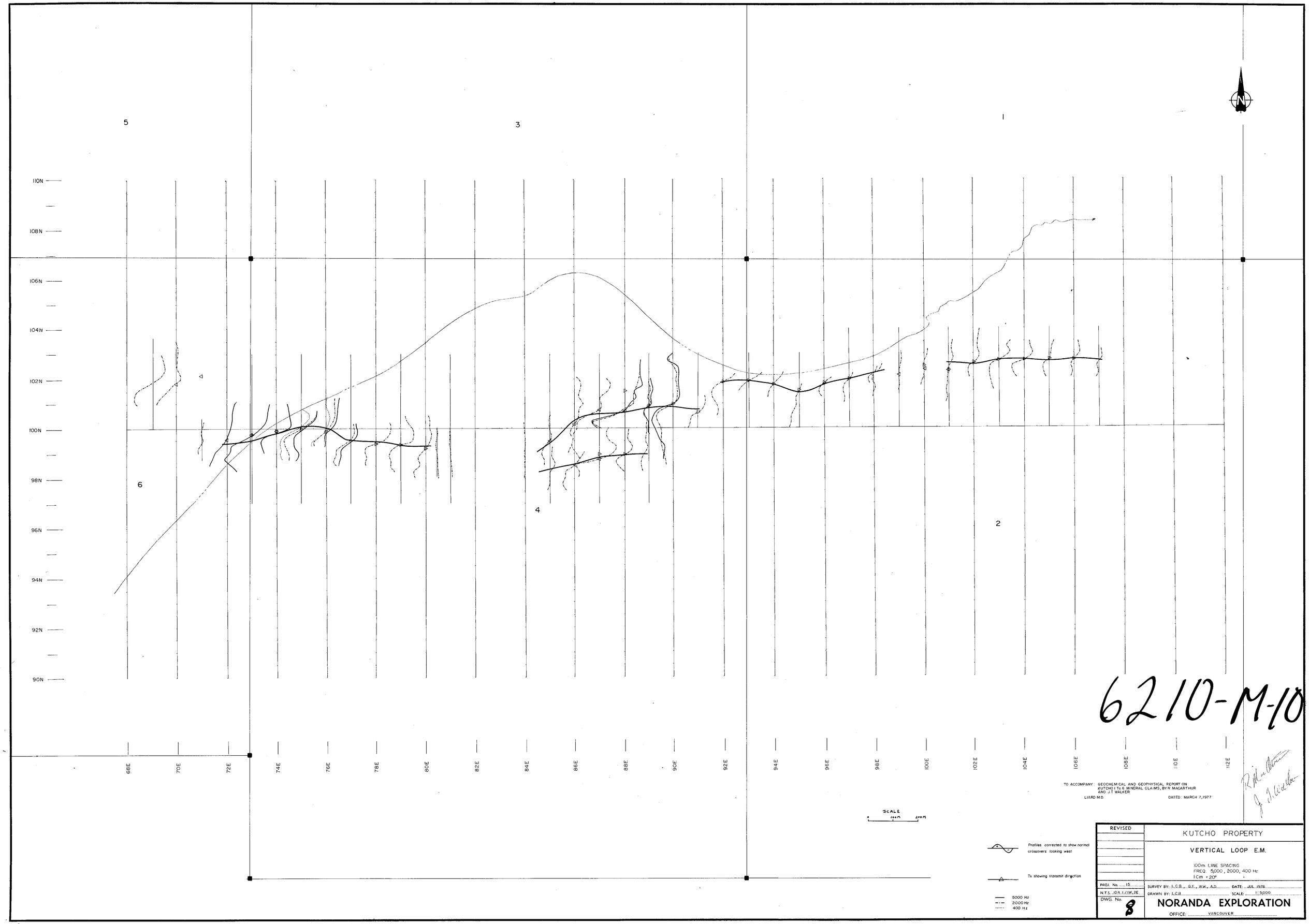


6210-M-9

TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON KUTCHO 1 to 6 MINERAL CLAIMS, BY R. MACARTHUR AND J.T. WALKER.
LIARD M.D. DATED MARCH 7, 1977

REVISED	KUTCHO PROPERTY
	VLF-EM SURVEY DIP ANGLE PROFILES VERTICAL SCALE: 1cm = 20° TRANSMITTER: CUTLER, MAINE
PROJ. No. 15	SURVEY BY A. DICKINSON DATE JULY, 1976
N.T.S. 104 L/1W,2E	DRAWN BY L.C.B. SCALE 1:5000
DWG. No. 7	NORANDA EXPLORATION
	OFFICE VANCOUVER

VANCAL



6210-M-10

TO ACCOMPANY: GEOCHEMICAL AND GEOPHYSICAL REPORT ON
KUTCHO I To 6 MINERAL CLAIMS, BY R. MACARTHUR
AND J.T WALKER
LIARD M.D.
DATED: MARCH 7, 1977

Profiles corrected to show normal crossovers looking west

Tx showing transmit direction

5000 Hz
2000 Hz
400 Hz

REVISED	KUTCHO PROPERTY
	VERTICAL LOOP E.M.
	100m. LINE SPACING FREQ. 5000, 2000, 400 Hz 1 Cm = 20°
PROJ. No. 15	SURVEY BY: I.C.B., G.E., W.W., A.D. DATE: JUL. 1976
N.T.S. 104 I/IW, 2E	DRAWN BY: I.C.B. SCALE: 1:5000
DWG. No. 8	NORANDA EXPLORATION
	OFFICE: VANCOUVER

VANCAL