GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 MINERAL CLAIM LOCATED IN THE NICOLA MINING DIVISION AT CO-ORDINATES 50° 11'N 121° 13'W

BY

N. A. MATHIESON
(KAMLOOPS)

NORANDA EXPLORATION COMPANY, LIMITED
(NO PERSONAL LIABILITY)

JUNE 1980

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INTRODUCTION

This particular area has been worked on since 1963, when extensive geochemical and geophysical work was carried out by the Hurly River Mines Company. At least two separate surveys have been carried out, each encompassing geophysics and geochemistry. At least 12 holes have been drilled on the east side of the main stream and an unknown number have been drilled on the west side, although no written record is known of the latter holes. At least one of the latter holes was an attempt to test the anomaly which was trenched in this survey.

This property was staked by Mr. T.D. Lewis on June 12th, 1979. The object of this study was to re-evaluate this property with a view to determining it's potential as a copper porphyry deposit.

LOCATION AND ACCESS

The Duke 1 mineral claim is 9 units in extent and was staked on June 12th, 1979. It is situated 450 metres east of Mimenuh Mountain at an elevation of 5580 feet at Latitude 50° 11' N and Longtitude 121° 13' W. The property is reached by the jeep trail up Nuaitch Creek from Carnford, which is situated on highway 8 west of Merritt.

CONTROL GRID

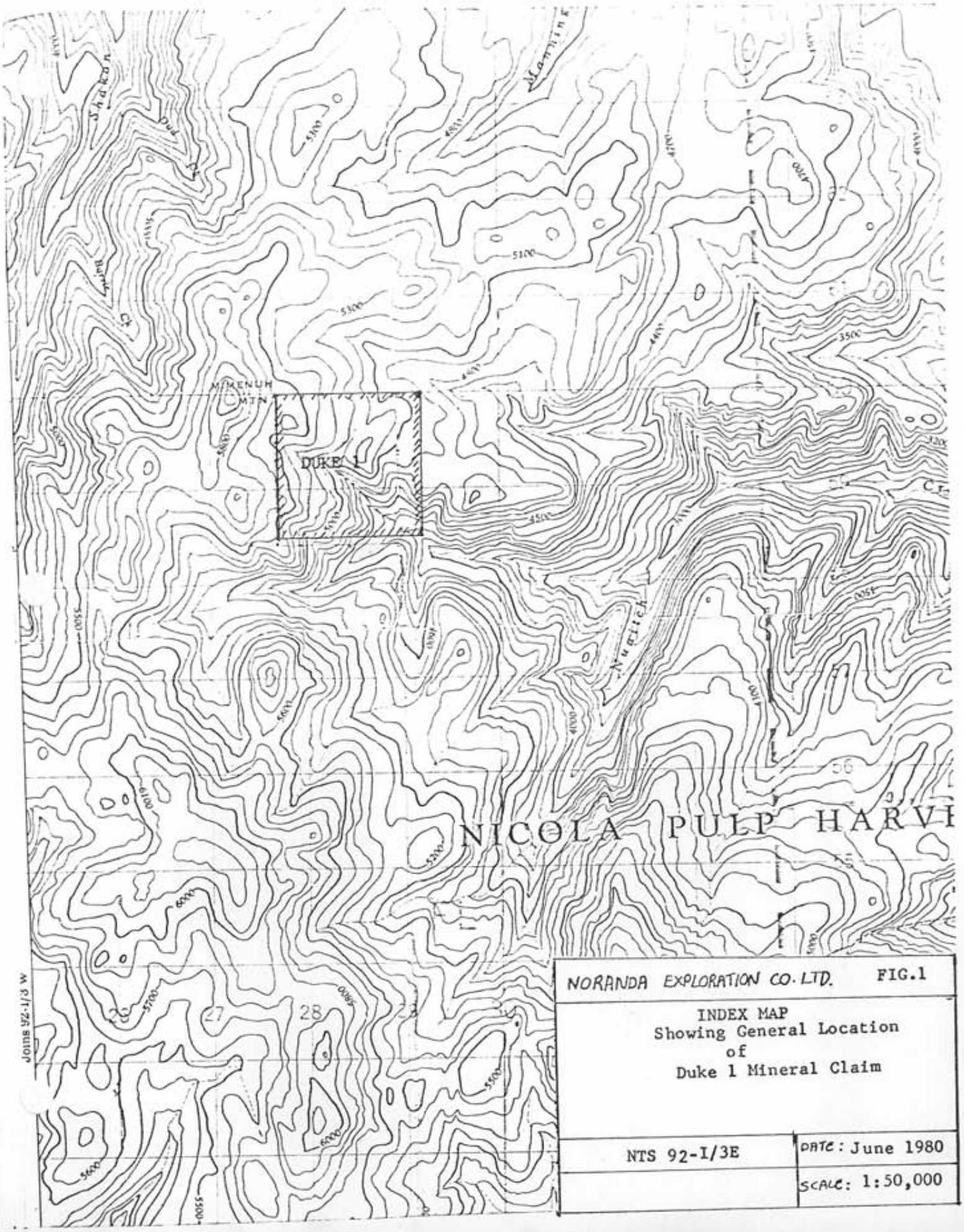
A grid was established in May 1980 by the Snake River Contracting Company using chain and compass, correcting for topography. Lines 1045 to 985 were set at 100 metre intervals with a 200 metre spacing to line 965, and south to lines 1065 and 1085. The base line, 104E, was set at N0°E and the grid lines at N90°E. The grid lines extend 500 metres west of the base line and 800-900 metres east. The lines were flagged and stations were established every 25 metres.

A total of 14.55km of line were flagged on the property.

GEOLOGICAL SURVEY

The regional geology consists essentially of Mesozoic and late Palaeozoic volcanics and metasediments which have been thrust and intruded by late Mesozoic intrusive rocks, which are granitic to dioritic. The area has a complex history of intrusion and tectonic thrusting, and shows a dominently NNW regional trend.

The Mimenuh Mountain property lies entirely within the Kingsvale group volcanics, which have been intruded by a feldspar porphyry intrusion. Mapping resulted in the recognition of two main rock types: feldspar porphyry intrusive and basic amygdaloidal volcanics.



NORANDA EXPLORATION CO. LTD.	FIG.1
INDEX MAP Showing General Location of Duke 1 Mineral Claim	
NTS 92-I/3E	DATE: June 1980
	SCALE: 1:50,000

Joins 92-I/3 W

The feldspar porphyry is a fine to medium grained rock containing zoned plagioclase phenocrysts up to 3mm in diameter, and large books (up to 3mm in diameter) of a dark green/black mica. Boulders found on the talus slope downslopeof the main showing, display feldspar phenocrysts, up to 2cm in length, in intrusive rock. This was not found in outcrop.

This rock type shows various forms of alteration. In the mineralized outcrop the rock may be highly silicified, has lost all original igneous texture and contains vein systems of quartz, chalcopurite and magnetite. The rock is only altered when associated with these vein systems and within 6cm of the veining, it will look unaltered. The porphyry also shows the effects of weathering, especially in the northern part of the area, which lies at the highest elevation. The rock appears pale green and the feldspars have been weathered partially to a chalky white clay mineral. The mafic mineral appears to be unaltered.

The other main rock type on the property is the volcanic rock of the Kingsvale group. These rocks show a variety of specific types but all are grouped here as basic volcanics. In the majority of outcrops the volcanics are amygduloidal, the amygdules being filled with banded agates. The rock is dark grey/black, very fine grained and may contain small (1mm diameter) feldspar phenocrysts. On the outcrop scale the rocks show a flow lamination which is considered to have been caused by flowage and slumping of the lava during extrusion. Amygdules are extended in the direction of the lamination, which trends at approximately 140° east of north.

As the intrusive is approached the volcanics become more indurated and close to the instrusion they contain veinlets of pyrite approximately 1mm thick with which small amounts of chalcopyrite are associated.

MINERALIZATION

Copper is the main commodity on this property and it occurs in the vein systems in the porphyry as primary chalcopyrite and secondary malachite. The latter occurs as a result of weathering. Small amounts of secondary azurite have been recognised, but this is very limited.

The vein systems in the porphyry consist of banded quartz veins which are subvertical and contain chalcopyrite, pyrite and magnetite. The individual veins are quite variable in thickness, cross cut each other, but all show the chalcopyrite mineralisation in the central portion of the vein. The quartz is extremely fine grained which is indicative that it may have been intruded as a gel along vertical fractures. The extent to which the chalcopyrite, pyrite and magnetite are genetically associated is not known at this time.

At a small trenched outcrop 50 metres north of the main showing magnetite occurs in the form of a matrix to an intrusion breccia. The breccia fragments consist of porphyry and volcanic rock and all are rounded by attrition effect of the magnetite rich fluid. The composition and shape of the fragments are indicative of fluid transport in a breccia pipe. This particular rock contains approximately 10% magnetite, which produced a

positive magnetic anomaly directly above it (Line 1015 Sta. 103 & 75E) - see magnetic map. No other anomaly was noted in the same area. This particular anomaly was drilled in the Hurley River Mines project in 1963, but the results are not known.

GEOPHYSICAL SURVEY

VLF EM
SABRE, MADE IN BURNABY, B.C., SEATTLE STATION, 18.6 KHZ
SCINTREX MS2 FLUXGATE, MADE IN CONCORD, ONT., VERTICAL COMP. &

The geophysical survey involved a magnetic survey and a VLF E.M. survey. After establishing the base line, the grid lines were run and the drift recorded on the magnetometerwas corrected on return to the base line. From the large variation in some of the results over a short time period at one station or over short distances it is suspected that some of the readings may have been affected by magnetic storms. Regardless of this, filtered magnetic data revealled significant anomalies. The VLF E.M. data was recorded in a west to east direction for the purposes of filtering.

The magnetic data was filtered, using a three-number window, prior to plotting, and was contoured to a 500 gamma interval (see magnetic map). The map shows a number of anomalous regions:

1) L101S/L103 & 75E - this is a pronounced magnetic high, recording as high as +2,800 gammas. Within 50 metres of the highest magnetic reading a trenched outcrop of the previously described intrusion breccia occurs. The intrusion breccia contains rounded fragments of porphyry and volcanics in a matrix rich in magnetite. Very little chalcopyrite was seen in the specimens from this outcrop, with the exception of one veinlet. The magnetic data suggest that the magnetite rich intrusion breccia may be more extensive and appears to be a sub-circular body. It is suspected that the magnetite may be more closely associated with chalocpyrite at depth, as is seen at all other mineralised localities. Further comment awaits the return of assays.

2) L106S/L104 - L102 & 00E - Traversing from west to east this anomaly reaches a peak of +3,200 gammas and sharply declines to -1,200 gammas over a distance of 100 metres.

This anomaly was trenched in two places because of the subsequent magnetic, copper, zinc, silver, molybdenum and VLF E.M. anomalies. One trench was dug at 106S/102 & 50E and bedrock was reached at ½ metre depth. The rock in the base of the trench is volcanics which contain small rust red shear zones (up to 5cm wide) trending approximately E-W. Small quartz and carbonate veins are also present in the trench. The volcanics in the trench are slightly indurated and show a larger amount of diseminated pyrite than is normally seen. A very poor soil profile was sampled and the rocks were also sampled for assay. A second trench was dug at locality L106S/103 & 15E, and extends 2.6 metres to the west. The trench is 1.2 metres deep and no bedrock was reached. A soil profile was developed and sampled. Comment awaits return of results.

3) L100S/L101 & 75E - A high positive anomaly is indicated, reaching 2,600 gammas and dying of steeply to the east. This cannot be explained by the geology.

The VLF E.M. data was filtered using the FRASER method and results are presented (see maps).

GEOCHEMICAL SURVEY

The geochenical survey involved soil sampling which was carried out by the Snake River Contracting Company. Soil samples were collected from beneath the Lumus layer at 50 metre intervals on all grid lines. 292 samples were collected in all. The samples were analysed by Rossbacher Laboratory in Burnaby, B.C. for molybdenum, copper, silver, lead and zinc. The plotted results show a number of anomalies, three of which are anomalous in at least three of the four elements. These are located:

1) L106S/103 & 00E
2) L106S/108 & 00E
3) L104-L103S/100 & 00E

Anomalies 1 and 2 are considered important from the point of view of geology, in that they may represent accumulations of metals at the contace of the porphyry intrusion and the volcanics.

Anomaly 1 is the most striking and a cross section of line 106S at the pertinent point shows a large magnetic, copper, zinc, molybdenum and silver anomaly, the borders of which are conductive (see diagram of cross section).

CONCLUSIONS

With respect to this property's potential as a copper porphyry there is little evidence from any of the separate surveys carried out, of metals in excess of background. Several anomalies present in both geophysics and geochemistry are present in the western part of the area but appear, from trenching, that they are not encouraging. Results from soil profiles are awaited.

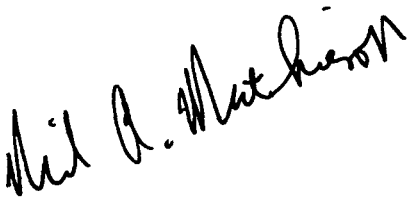
It is possible that in this property, the geology shows the very top of a porphyry system, shows the very top of a porphyry system, showing scattered stockwork zones at the top of the intrusion. With this in mind, copper may be present in larger quantities and diseminated within the intrusion at depth. The only test of such a hypothesis is a deep drill hole located in the centre of the intrusion.

APPENDIX 1
Statement of Qualifications

STATEMENT OF QUALIFICATIONS

I, Neil A. Mathieson of the City of Aberdeen, Scotland, do certify that:

1. I have been employed as a Senoir Field Geologist by Noranda Exploration Company, Limited since May 1980 as a summer employee.
2. I am a graduate of the University of Aberdeen, Scotland with a Bachelor of Science Degree with Honours in Geology(1979).
3. I am at presently studying for a Master of Science Degree at Queen's University, Kingston, Ontario.
4. I am a member of the Edinburgh Geological Society.



N. A. MATHIESON
Geologist
Noranda Exploration Company, Limited

(No Personal Liability)

APPENDIX II

Statement of Costs

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

PROJECT Mimenuh Mountain DATE June 1980

TYPE OF REPORT Geology, Geophysics and Geochemistry

a) Labor:

No. of Days 44

Rate per Day $ 56.50

Dates: from May 6 to May 18, 1980

Total Wages 44 x $ 56.50 2486.00

b) Accomodation:

No. of Days 44

Rate per Day $ 14.98

Dates: from May 6 to May 18, 1980

Total Cost 44 x $ 14.98 659.12

c) Transportation:

No. of Days 44

Rate per Day $ 14.00

Dates: from May 6 to May 18, 1980

Total Cost 44 x $ 14.00 616.00

d) Assays:

293 Soils @ $ 3.00	879.00		
10 Soils @ $ 3.40	34.00		
4 Rocks @ $ 18.50	74.00		
Total Cost	987.00		987.00

e) Snake River Contracting Company Geochem 589.02

Line Flagging 2201.24

f) Report Writing

Author 4 MD @ 66.50	266.00	
Drafting 5 MD @ $ 50.00	250.00	
Total Cost		516.00

TOTAL COST	8,054.38

g) Unit costs for Geology

No. of Days 4MD

Unit costs $ 85.48 / MD 341.92

h) Unit costs for Mag Survey

No. of Units 14.5 km

Unit costs $ 23.58069 / km 341.92

i) Unit costs for VLF EM Survey

No. of Units 14.5 km

Unit costs $ 23.58069 / km 341.92

j) Unit Cost for Geochemistry

No. of Samples 303(Soil) @ $ 13.984752 / sample

4(Rock) @ $ 18.50 / sample

Total cost 4311.38

k)	Unit Cost for Line Cutting	
	No. of Units 14.5 km	
	Unit cost $ 151.80966 / km	2201.24
l)	Report Preparation (see item f))	516.00
	TOTAL COST	8,054.38

APPENDIX 111

Claim Statistics

CLAIM STATISTICS

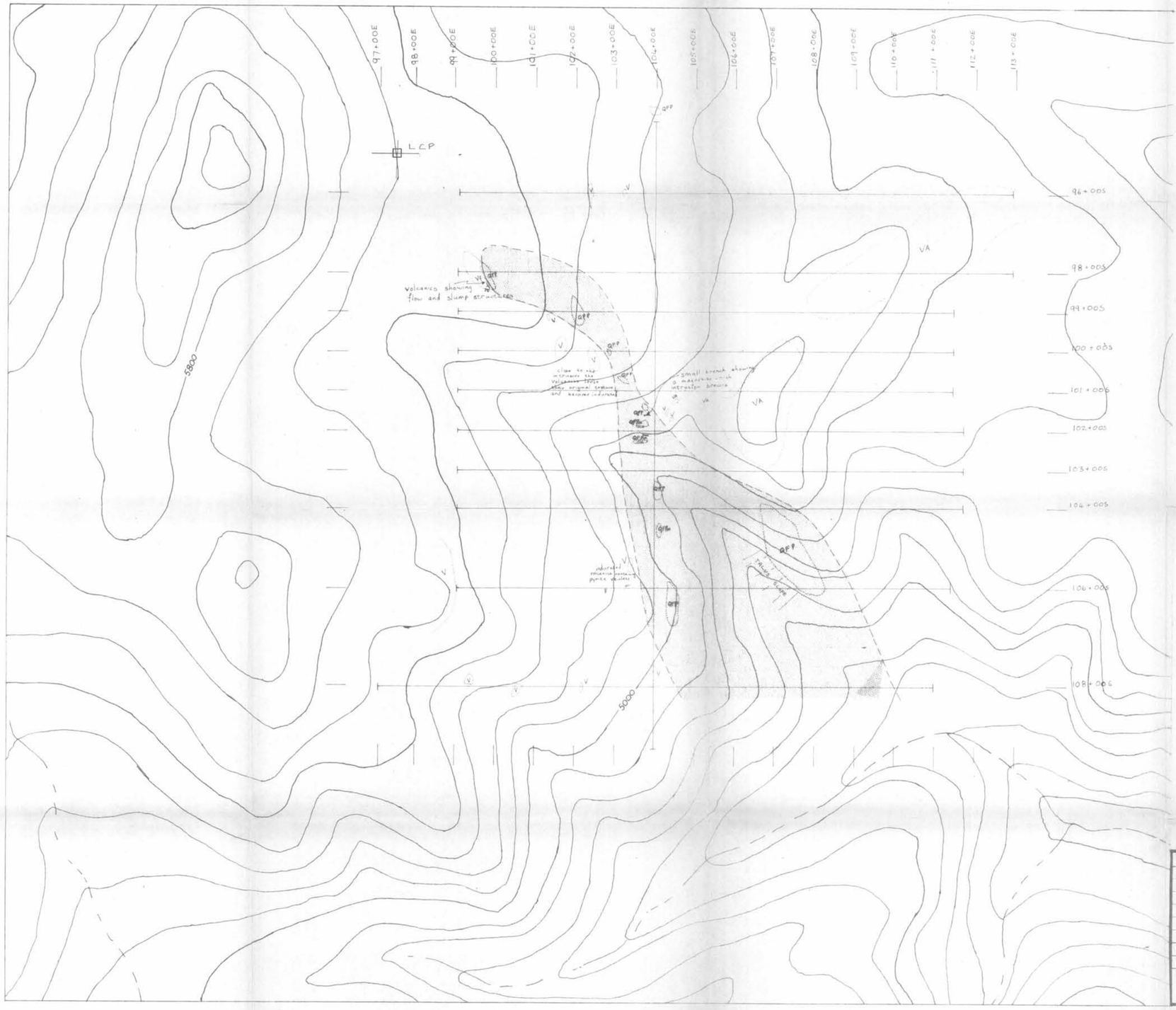
Claim Name	Record Number	Units	Record Date
Duke 1	659	9	July 3, 1979

APPENDIX 1V

Soil Profile Data

SOIL PROFILES

Location	Sample Number	Interval	Remarks
L106+00S	1	0cm-5cm	Upper A
103+15E	2	5cm-6cm	Caliche
"	3	6cm-60cm	Upper B
"	4	6cm-60cm	Middle B
"	5	6cm-60cm	Lower B
"	6	60cm-100cm	C- hard packed, purple/green clay
"	7	100cm-120cm	deep weathered volcanics
L106+00S	8	0cm-5cm	Forest litter
102+50E	9	5cm-40cm	B
"	10	40cm	Bedrock scraping



N

LEGEND

- QUARTZ FELDSPAR PORPHYRY
- KINGSVALE VOLCANICS
- Observed contact
- Inferred contact
- Strike and dip – volcanics
- Trenches

Outcrop Information

- Limit of outcrop
- QFP Porphyry
- QFP_m Mineralised porphyry
- V Volcanics
- VA Amygduloidal volcanics
- Vf Volcanics with flow structures

0 100 200 meters

TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M.D., B.C.
BY N.A.MATHIESON
DATED JUNE 1980

Neil A. Mathieson

REVISED	MIMENUH MOUNTAIN
	GEOLOGY
PROJ. No. 1A	SURVEY BY: N.A.M. DATE: JUNE 1980
N.T.S. 92I/3E	DRAWN BY: N.A.M. SCALE: 1:5000
DWG. No. 1	NORANDA EXPLORATION OFFICE: KAMLOOPS

MINERAL RESOURCES BRANCH ASSESSMENT REPORT NO. 8152

97+00E 98+00E 99+00E 100+00E 101+00E 102+00E 103+00E 104+00E 105+00E 106+00E 107+00E 108+00E 109+00E 110+00E 111+00E 112+00E 113+00E

94+00S 95+00S 96+00S 97+00S 98+00S 99+00S 100+00S 101+00S 102+00S 103+00S 104+00S 105+00S 106+00S 107+00S 108+00S 109+00S

N

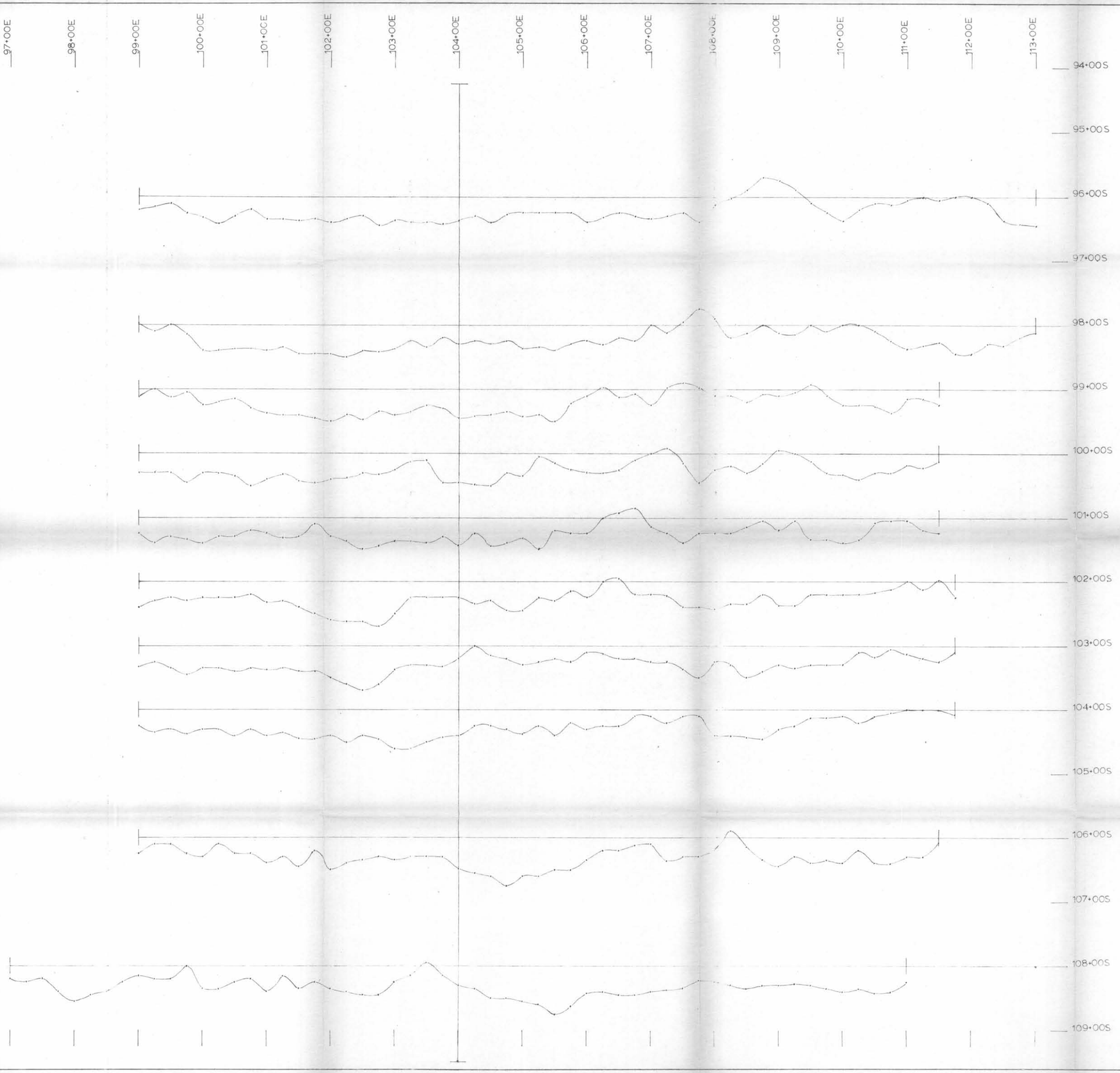
100 75 50 25 0 100 200

METERS

REVISED	MIMENUH MOUNTAIN
	MAGNETOMETER (FILTERED)
PROJ. No. 1A	SURVEY BY: B. FORMAN DATE: JUNE 1980
N.T.S. 92I/3E	DRAWN BY: N.A.M. SCALE: 1:2500
DWG. No. 2	NORANDA EXPLORATION
	OFFICE: KAMLOOPS

TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M. D., B.C. BY N.A. MATHIESON

DATED JUNE 1980



N

100 75 50 25 0 100 200

METERS

REVISED	MIMENUH MOUNTAIN
	VLF CURVE 1mm/°
PROJ. No. 1A N.T.S. 92I/3E DWG. No. 3	SURVEY BY N. MATHIESON DATE MAY 1980 DRAWN BY N. A. M. SCALE 1:2500 NORANDA EXPLORATION OFFICE KAMLOOPS

TO ACCOMPANY GEOLOGICAL GEOPHYSICAL AND GEOCHEMICAL REPORT ON DUKE 1 M.C., NICOLA M.D., B.C. BY N.A.MATHIESON DATED JUNE, 1980

Neil A. Mathieson

97+00E
98+00E
99+00E
100+00E
101+00E
102+00E
103+00E
104+00E
105+00E
106+00E
107+00E
108+00E
109+00E
110+00E
111+00E
112+00E
113+00E

94+00S
95+00S
96+00S
97+00S
98+00S
99+00S
100+00S
101+00S
102+00S
103+00S
104+00S
105+00S
106+00S
107+00S
108+00S
109+00S

N

100 75 50 25 0 100 200
METERS

REVISED	MIMENUH MOUNTAIN
	FILTERED VLF
PROJ. No. 1A N.T.S. 92I/3E DWG. No. 4	SURVEY BY N.A.MATHIESON DATE MAY 1980 DRAWN BY N.A.M. SCALE 1:2500 NORANDA EXPLORATION OFFICE: KAMLOOPS

TO ACCOMPANY GEOLOGICAL GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C. NICOLA M.D. BY N.A.MATHIESON
DATED JUNE, 1980

Neil A. Mathieson

97+00E 98+00E 99+00E 100+00E 101+00E 102+00E 103+00E 104+00E 105+00E 106+00E 107+00E 108+00E 109+00E 110+00E 111+00E 112+00E 113+00E

94+00S 95+00S 96+00S 97+00S 98+00S 99+00S 100+00S 101+00S 102+00S 103+00S 104+00S 105+00S 106+00S 107+00S 108+00S 109+00S

N

100 75 50 25 0 100 200
METERS

TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M.D., B.C. BY N.A. MATHIESON
DATED JUNE, 1980

Neil A. Mathieson

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 8152

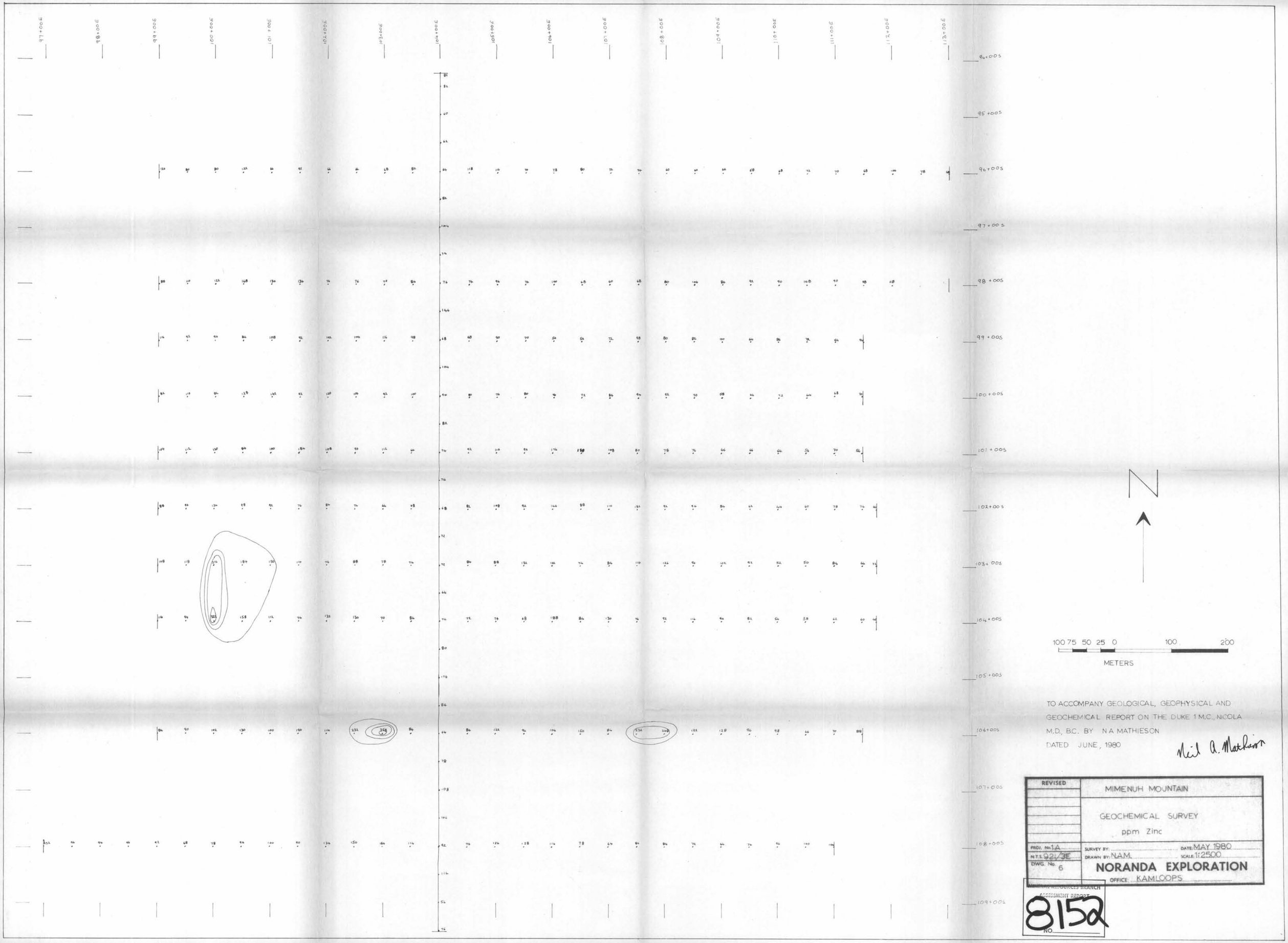
MIMENUH MOUNTAIN

GEOCHEMICAL SURVEY
ppm Copper

PROJ. No. 1A
N.T.S. 92I/3E
DWG. No. 5

SURVEY BY:
DRAWN BY: N.A.M.
DATE: MAY 1980
SCALE: 1:2500

NORANDA EXPLORATION
OFFICE: KAMLOOPS



TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M.D., B.C. BY N.A MATHIESON

DATED JUNE, 1980

Neil A. Mathieson

REVISED	MIMENUH MOUNTAIN
	GEOCHEMICAL SURVEY
	ppm Zinc
PROJ. No. 1A	SURVEY BY: DATE: MAY 1980
N.T.S. 92I/3E	DRAWN BY: N.A.M. SCALE: 1:2500
DWG. No. 6	NORANDA EXPLORATION
	OFFICE: KAMLOOPS

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 8152

97+00E
98+00E
99+00E
100+00E
101+00E
102+00E
103+00E
104+00E
105+00E
106+00E
107+00E
108+00E
109+00E
110+00E
111+00E
112+00E
113+00E

94+00S
95+00S
96+00S
97+00S
98+00S
99+00S
100+00S
101+00S
102+00S
103+00S
104+00S
105+00S
106+00S
107+00S
108+00S
109+00S

N

100 75 50 25 0 100 200
METERS

REVISED	MIMENUH MOUNTAIN
	GEOCHEMICAL SURVEY ppm Lead
PROJ. No: 1A N.T.S: 92I/3E DWG. No: 7	SURVEY BY: DRAWN BY: N.A.M. DATE: MAY 1980 SCALE: 1:2500 NORANDA EXPLORATION OFFICE KAMLOOPS

TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M.D., B.C. BY N.A. MATHIESON
DATED JUNE, 1980

Neil A. Mathieson

97+00E | 98+00E | 99+00E | 100+00E | 101+00E | 102+00E | 103+00E | 104+00E | 105+00E | 106+00E | 107+00E | 108+00E | 109+00E | 110+00E | 111+00E | 112+00E | 113+00E

94+00S
95+00S
96+00S
97+00S
98+00S
99+00S
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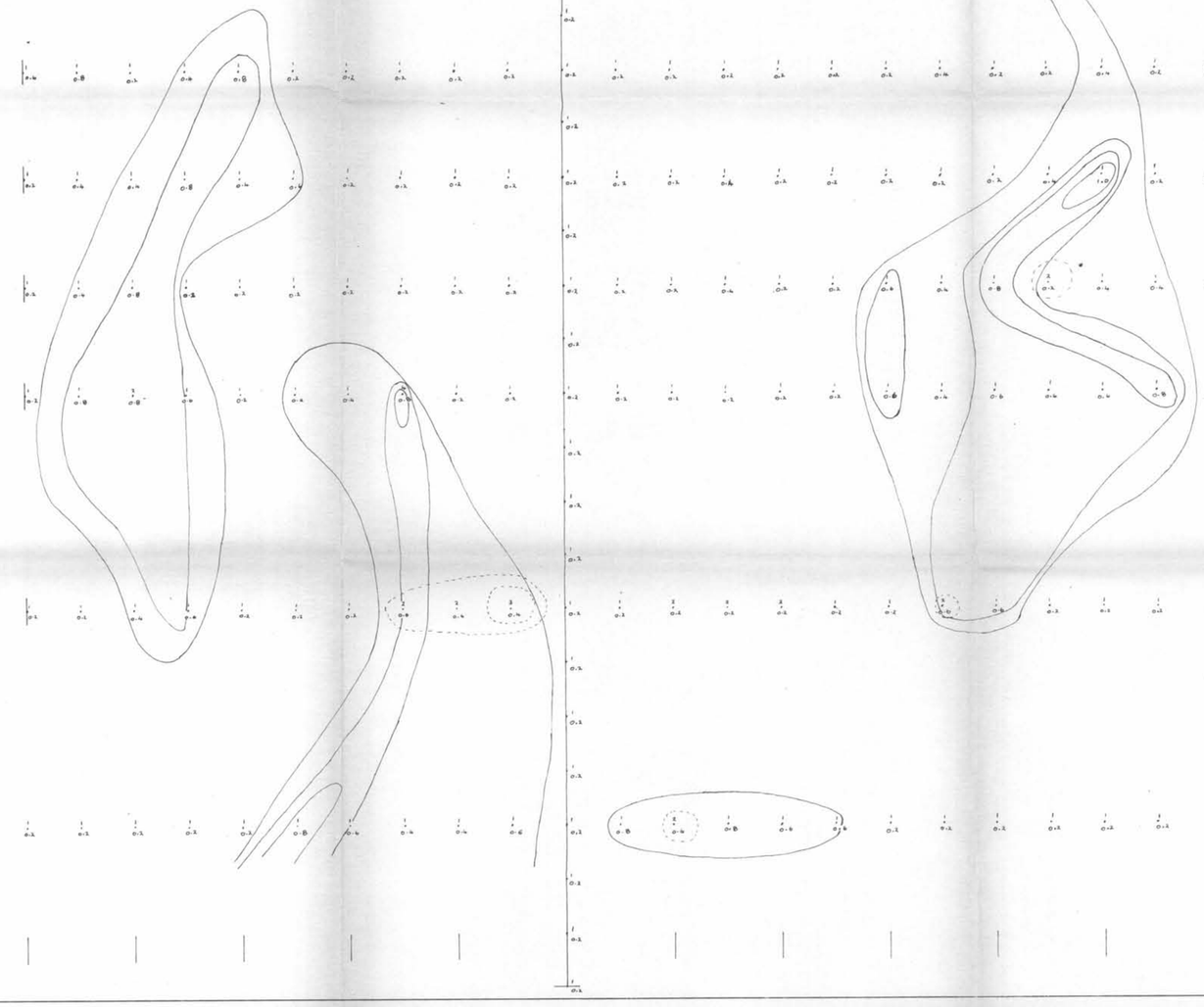

N

100 75 50 25 0 100 200

METERS

REVISED	MIMENUH MOUNTAIN
	GEOCHEMICAL SURVEY Contours ppm Molybdenum ppm Silver
PROJ. No. 1A N.T.S. 92I/3E DWG. No. 8	SURVEY BY: DATE: MAY 1980 DRAWN BY: N.A.M. SCALE: 1:2500 NORANDA EXPLORATION OFFICE: KAMLOOPS

TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M.D., B.C. BY N.A.MATHIESON

DATED JUNE, 1980

Neil A. Mathieson

REVISED	MIMENUH MOUNTAIN
	DRILL HOLE DATA (HURLEY RIVER MINES)
PROJ. No.	SURVEY BY: DATE: JUNE 1980
N.T.S. 92-I/3E	DRAWN BY: N.A.M. SCALE: 1:1190
DWG. No. 9	NORANDA EXPLORATION
	OFFICE: KAMLOOPS

TO ACCOMPANY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT ON THE DUKE 1 M.C., NICOLA M.D., B.C. BY N.A. MATHIESON

DATED JUNE 1980

N

50 25 0 25 50

METERS

Neil A. Mathieson

DRILL HOLE DATA

D.D.H.	DIP	LENGTH feet	metres
1	-30	265	80.77
2			
3	-30	510	155.45
4	-25	515	156.97
5	90	456	138.99
6	90	515	156.97
7	-45	454	138.38
8	90	309	94.18
9	-34	354	107.9
10	-61	320	97.54
11	-45	64	19.51
12			