COMINCO LTD.

EXPLORATION WESTERN DISTRICT

5354

ASSESSMENT REPORT

1974 GEOCHEMICAL AND GEOLOGICAL REPORT

ON

SOL

THE SOL 1 TO 40 MINERAL CLAIMS

MT. McQUILLAN AREA

ALBERNI MINING DIVISION, BRITISH COLUMBIA

LATITUDE: 49° 06'N - LONGITUDE: 124° 36'W

N.T.S. 92F/2

92F/2E

JANUARY 15, 1975

T.E. KALNINS, B. Sc.
D.L. COOKE, Ph.D., P.Eng.

Period of Work

June 3, 1975 to October 18, 1974

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SUMMARY AND CONCLUSIONS

1. The Sol #1-40 claims were staked on Mt. McQuillan, 12 miles southeast of Pt. Alberni, B.C. to cover the precious metal rights within a section of the E and N Railway grants.

2. Detailed mapping, prospecting, soil sampling was done on the property from July 29 to September 23, 1974.

3. This work located widespread low-grade copper mineralization in Paleozoic volcanics and associated Jurassic and Tertiary intrusions. The soil geochemistry is adequately explained by the mineralization located on the property.

4. The mineralization consists of pyrite and pyrrhotite disseminations and fracture fillings. Minor amounts of chalcopyrite and molybdenite occur mainly along northeast trending fractures and quartz veinlets within the iron sulphide zones.

5. Geochemical anomalies outline three zones of copper-molybdenum mineralization. The best anomaly is centered on line 8S and measures 1200' by 1200' laterally and 1000' vertically. The ruggedness of the terrain prevented thorough soil samplings in this area. Further work is warranted.

INTRODUCTION

This report describes a copper prospect at Mt. McQuillan, 12 miles southeast of the seaport of Alberni, B.C. The report is based on field investigation by T. Kalnins and assistant D. Cary from July 29, 1974, to September 23, 1974. The work was supervised by D.L. Cooke of Cominco Ltd.

This year's program included line cutting, soil sampling, detailed geological mapping and prospecting. The geological and geochemical data are presented on maps at a scale of 1" = 400 ft.

PROPERTY AND OWNERSHIP

The Mt. McQuillan property consists of approximately 5500 acres containing base metal rights on a portion of the Esquimalt and Nanaimo Railway grant. The Sol 1-40 claim group was located to protect the precious metal rights. Several Crown granted claims, not held by Coast Copper, also lie within the area. The designated rights of the area under investigation have been assigned to Coast Copper through an agreement with Can Pac Minerals and Pan Canadian Petroleum.

Claim Data:
Name: Sol #1-40; Record Nos: 20383-20422; Due Date: Jan. 16, 1975.

.../2

LOCATION AND ACCESS (Figure 1 MQ-74-1)

The property is located at 49°06' north latitude and 124°36' west longitude, 12 miles southeast of Alberni, B.C. The claims cover Mt. McQuillan and a short range extending northerly between China and McQuillan Creeks.

Access is by helicopter from Pt. Alberni. Two branches of a logging road from Pt. Alberni terminate on the northern end of the property, but the last few miles are washed out and overgrown.

PHYSIOGRAPHY

Rocks are well represented by many outcrops in the area.

The claims are situated in very rugged terrain that varies in elevation from 1900' A.S.L. at McQuillan and China Creeks, to 5280' A.S.L. at Mt. McQuillan. Most of the work was done between 4500' and 2500' from a base camp at 4200'.

The rugged terrain, with cliffs and 45 degree slopes caused traversing to be slow and difficult. Consequently, cutting of the control grid was reduced from the proposed 20 line-miles to 12 line-miles.

Weather was excellent during the months of August and September. However, due to a long and late winter there was much snow on the ground at higher elevations during August, and patches of snow remained in September.

Both slopes of the main ridge are drained by numerous small creeks, most of which become dry after the snow run-off.

HISTORY

Placer gold mining in the China Creek area dates back to the turn of the century. There are 7 old underground workings within 2.5 miles of Mt. McQuillan, of which 3 produced a combined total of 8,000 tons of ore prior to 1948. The ore contained 3,226 oz. gold, 3,628 oz. silver, 626,556 lbs. copper, 7,817 lbs lead, and 4,478 lbs. zinc. The main producer was the Thistle Mine with 6,867 tons of ore that contained 2,667 oz. Au, 1,667 oz. Ag, and 626,556 lbs. Cu.

In 1962 Hunting Surveys did a regional aeromagnetic survey over the area. High magnetic values closely coincided with the outline of intrusive rocks.

During 1963-65 Gunnex Ltd. examined the old workings and covered the area by silt sampling and prospecting.

In 1973 Cominco Ltd. summarily checked the anomalous area and proposed to implement an exploration program during the 1974 season.

GEOLOGY

Regional Geology

Rocks observed in the area belong to the following classification: (A) Sicker Group Volcanics; (B) Jurassic Island Intrusions; and (C) Tertiary Intrusions.

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Muller of the Geological Survey of Canada in Paper 68-50, describes the Sicker Group Volcanics as massive dark green, brownish to maroon greenstones, fine or coarse breccias or laminated tuffs, that weather light green to light brown. Development of epidote, actinolite, chlorite and sericite indicate low-grade metamorphism.

Detail Geology (Figure MQ 74-2)

(A) On the property these volcanic country rocks comprise most of the outcrops. In this report they have been arbitrarily sub-divided into three units. Unit 1 is exposed mainly on the east slope of the ridge, and it is a dark, massive felsitic andesite. In the northeast corner of the grid it includes unit 1a, a 400-foot wide band of purplish, fragmental volcanics. Probably banding of tuffaceous material occurs at 8N + 19E. The NE strike and vertical dip of this unit coincides roughly with the main set of fractures. Banding also occurs at 28N + 8W, where the attitude is $010^{\circ}/65^{\circ}$E.

Unit 2 which underlies mainly the ridge and the west and north parts of the grid system is a hybrid (migmatite) andesite-diorite member. It is often gradational between an andesite and medium grain mottled diorite. It is greener in colour than the andesite and contains more of the metamorphic minerals. This hybrid rock is occasionally in contact with younger intrusions of fresher-looking diorite and narrow andesite dikes.

(B) An intrusive unit underlies Mt. McQuillan peak and consists mainly of diorite. The rock is relatively unaltered, blocky, light grey and coarse grained. Isolated outcrops may be amphibolitic. Small areas of these intrusives are exposed at Mt. McQuillan and at about 42N + 6E. The Mt. McQuillan diorite exposed above 4300 ft. elevation is coarsely "brecciated" by a multitude of narrow aplitic dikes.

(C) Quartz-feldspar porphyry stocks, dikes and/or sills (Unit 4) outcrop about 4S/E, 12N/E and W, 20N/NE, and line 36N/E and W. They range in width from about 4' to a substantial body on line 36N which is more than 500 ft. wide. Unit 4 includes some finer-grained rhyolitic members (4R). These rocks commonly exhibit some kaolin and sericite alteration products.

STRUCTURE

The oldest structural elements in the area are northerly trending axial uplifts and folding that includes Sicker Group volcanics. The oldest set of steep faults strike 10° - 20° NNW and provided structural control for the island intrusions. On the property a set of fractures coincides with this trend, as do the diorite outcrops of Unit 3. The main Tertiary faulting trends northwesterly, but subsidiary faults strike northeasterly. The latter development is the main structural feature on the property. Steeply dipping faults and fractures strike from 020° to 070°, but the main set is at about $050^{\circ}/70^{\circ}$ SE.

MINERALIZATION

There are three zones of low-grade mineralization that are substantiated by geochemical results. These are centered at 8S, 16N, and 36N. Chalcopyrite occurs frequently in these areas, but in isolated and minute amounts together with abundant pyrite and pyrrhotite.

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The three zones are similar in most respects. The northeasterly trending fracture system appears to have controlled introduction of quartz-feldspar porphyry dikes, a few mineralized quartz veins, and many mineralized quartz veinlets and joints. The zones are conspicuous by their rusty appearance. The host rocks are andesite volcanics and porphyry dikes. Very little metallic mineralization was detected in the diorite and the purplish volcanics.

Total metallic sulphide mineralization may be up to 5% but most of it is pyrite and pyrrhotite. Some effects of leaching appear at the surface. The low copper in the two northern zones, may indicate that the chalcopyrite occurs mainly in thin fractures and quartz veinlets within the volcanics. In the porphyry dikes sulphides are disseminated in the matrix. Molybdenite is occasionaly visible, and minor gold and silver are also indicated.

GEOCHEMISTRY

A soil survey was carried out on 12 miles of lines which were laid out by compass and chain survey. Iron-enriched B-horizon soil was sampled from about 6-inch depth, at 200-ft. intervals on lines 400 ft. apart.

The soils were dug with a narrow iron shovel and placed directly into Kraft paper sample bags. A total of 287 samples were collected and sent for analysis to the laboratory of Bondar-Clegg & Co. Ltd., North Vancouver, B.C. where Cu, Mo and Zn content was determined by hot aqua regia extraction and atomic absorption measurement.

Results (Figures MQ 74-3,4 & 5)

Copper values range from 2 ppm to 2100 ppm, zinc from 2 ppm to 480 ppm, and molybdenum from 0 ppm to 18 ppm. From inspection of the respective frequency distribution plots for copper, zinc and molybdenum, the following significant levels were established:

	Cu	Zn	Mo
Background	50 ppm	40 ppm	2 ppm
Anomalous (threshold)	150 ppm	100 ppm	5 ppm
Highly anomalous	400 ppm	-	-

The geochemical anomalies reflect the dispersed nature of minor base metal mineralization. Most frequently the anomalies are directly related to visible mineralization, or in overburden that is bounded by unmineralized outcrops. The three main anomalous zones are generally coincident with known mineralization centered on Lines 36N, 16N, and 8S. The strongest anomalies obtained by Gunnex are based on high copper values in streams draining northeasterly from the property, particularly from the 8S zone. This suggests that some of the smaller and less intense soil anomalies, which appear open because of insufficient sampling, may be of isolated nature and low economic potential.

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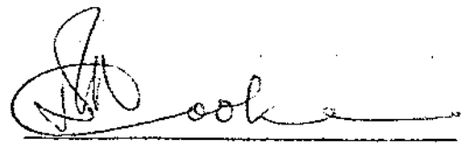
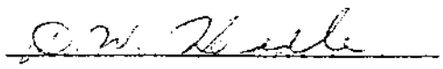
SIGNED BY: 

D.L. Cooke, Ph.D., P. Eng.

ENDORSED BY: 

D.W. Heddle, Chief Geologist

APPROVED FOR RELEASE: 

W.T. Irvine, Manager
Western District

REFERENCES

1. J.S. Stevenson, 1936: B.C. Minister of Mines Report, 1936, p. F30.

2. J.S. Stevenson, 1944: Geology and Ore Deposits of the China Creek Area, Vancouver Island, British Columbia. B.C. Minister of Mines Report, p. A142.

3. J.W. Muller and D.J.T. Carson, G.S.C. Paper, 68-50: Geology and Mineral Deposits of Alberni Map Area, British Columbia.

4. Gunnex Ltd. Files.

5. Cominco Ltd. Files.

ATTACHMENTS

1. Appendix "A": "Exhibit A" - Statement of Expenditures - Jan.1-Dec.31/74

2. Appendix "B": Statutory Declaration in Support of Expenditures.

3. Appendix "C": Statement of Qualifications.

4. Figure: MQ-74-1 Mt. McQuillan, Location Map 1 in. = 16 mi.

5. Figure: MQ-74-2 Mt. McQuillan, Geology 1 in. = 400 ft.

6. Figure: MQ-74-3 Mt. McQuillan, Geochemical Survey, Copper 1 in. = 400 ft.

7. Figure: MQ-74-4 Mt. McQuillan, Geochemical Survey, Molybdenum 1 in. = 400 ft.

8. Figure: MQ-74-5 Mt. McQuillan, Geochemical Survey, Zinc 1 in. = 400 ft.

APPENDIX "B"

IN THE MATTER OF THE

B.C. MINERAL ACT

AND

IN THE MATTER OF A GEOCHEMICAL AND GEOLOGICAL PROGRAMME CARRIED

OUT ON THE SOL #1-40 MINERAL CLAIMS

Located in the Alberni Mining Division

of the Province of British Columbia

More Particularly N.T.S. 92F/2

A F F I D A V I T

I, DAVID L. COOKE OF THE CITY OF VANCOUVER IN THE PROVINCE OF BRITISH COLUMBIA, MAKE OATH AND SAY:

1. THAT I AM EMPLOYED AS A PROJECT GEOLOGIST BY COMINCO LTD., AND AS SUCH HAVE A PERSONAL KNOWLEDGE OF THE FACTS TO WHICH I HEREINAFTER DEPOSE;

2. THAT ANNEXED HERETO AND MARKED AS "EXHIBIT A" TO THIS MY AFFIDAVIT IS A TRUE COPY OF EXPENDITURES ON A GEOCHEMICAL AND GEOLOGICAL PROGRAMME CARRIED OUT ON THE SOL #1-40 MINERAL CLAIMS;

3. THAT THE SAID EXPENDITURES WERE INCURRED BETWEEN THE THIRD DAY OF JUNE AND THE 18TH DAY OF OCTOBER, 1974 FOR THE PURPOSE OF MINERAL EXPLORATION ON THE ABOVE NOTED CLAIMS.

Sworn Before Me at the City of Vancouver in the Province of British Columbia this 29th day of January, 1975.

Maynard Brown

A NOTARY PUBLIC IN AND FOR THE PROVINCE OF BRITISH COLUMBIA

D L Cooke

DAVID L. COOKE

"EXHIBIT A"

APPENDIX "A"

STATEMENT OF EXPENDITURES

ON THE SOL #1-4 MINERAL CLAIMS

ALBERNI MINING DIVISION

JANUARY 1 TO DECEMBER 31, 1974

GEOLOGY AND GEOCHEMISTRY		
T. Elliott - Geologist Office: June 3 to July 5, 1975 - 25 days @ $75.00/day	$1,875.00	
T. Kalnins - Geologist Office: July 23 to July 26, 1974 and Sept. 24 to Oct.18, 1974 - 23 days Field: July 29 to Sept.23, 1974 - 57 days 80 days @ $75.00/day	$6,000.00	
D. Cary - Geological Assistant: Office: July 15 to July 26, 1974 and Sept. 24 to Oct. 25, 1975-34 days Field: July 29 to Sept.23, 1974 - 57 days 91 days @ $50.00/day	$4,550.00	
Analysis: 287 soil samples for Cu, Mo, Zn	$ 355.00	
Miscellaneous	$ 156.00	
		$12,936.00
LINE CUTTING		
Contract charges - Approximately 12 miles		2,142.00
TRANSPORTATION		
Rental, U-Drive, etc.	$ 493.00	
Helicopter - Bell 206	1,978.00	
Miscellaneous	59.00	
		2,530.00
DOMICILE AND CAMP SERVICES		
Tents, radio, food, etc.		1,943.00
DRAFTING		
Drafting, reproductions, etc.		190.00
SUPERVISION		
D.L. Cooke, Project Geologist: June 10 to Oct.18, 1975 - 27 days @ $100.00/day	$2,700.00	
J.M. Allen, Senior Geologist: Sept.10-13, 1974 - 4 days @ $125.00/day	400.00	
Miscellaneous	27.00	
		3,227.00
ADMINISTRATION		2,586.00
TOTAL EXPENDITURES		$25,554.00

Total Assessment Credits applied for = 120 years = $24,000.00

Signed: _____

D.L. Cooke, Ph.D., P.Eng.

This is "Exhibit A" to the Statutory Declaration of Expenditures relating to the geochemical and geological programme on the Sol #1-40 Mineral Claims declared before me on the 29th Day of January, 1975 A.D.

_____

A Notary Public in and for
the Province of British Columbia.

APPENDIX "C"

COMINCO LTD.

EXPLORATION WESTERN DISTRICT

STATEMENT OF QUALIFICATIONS

I, DAVID LAWRENCE COOKE, OF THE CITY OF VANCOUVER, BRITISH COLUMBIA, HEREBY CERTIFY:

1. THAT I AM A GEOLOGIST, RESIDING AT 16331 BELL ROAD, SURREY, B.C. WITH A BUSINESS ADDRESS AT 2200 - 200 GRANVILLE SQUARE, VANCOUVER, B.C.

2. THAT I GRADUATED WITH A B.SC. DEGREE IN GEOLOGY FROM THE UNIVERSITY OF NEW BRUNSWICK IN 1959, AND WITH M.A. AND PH.D. DEGREES IN GEOLOGY FROM THE UNIVERSITY OF TORONTO IN 1961 AND 1966 RESPECTIVELY.

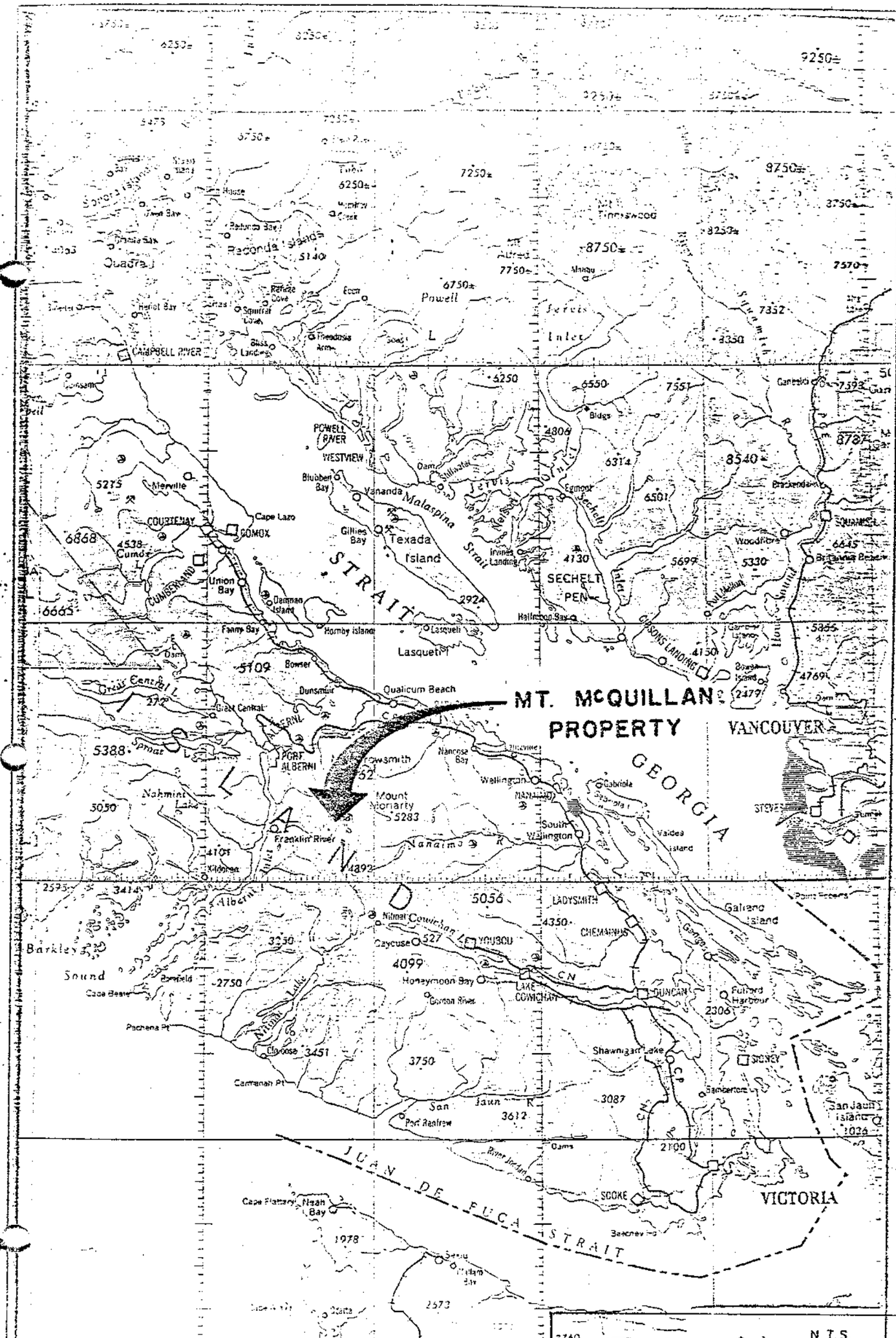
3. THAT I AM A MEMBER OF THE ASSOCIATION OF PROFESSIONAL ENGINEERS OF THE PROVINCE OF BRITISH COLUMBIA.

4. THAT THE GEOCHEMICAL AND GEOLOGICAL WORK ON THE SOL #1-40 CLAIMS WAS CARRIED OUT BY T. KALNINS, B.SC. (UNIVERSITY OF BRITISH COLUMBIA), UNDER MY SUPERVISION, AND THAT I CONSIDER HIM A COMPETENT GEOLOGIST.

DATED this 15th Day of January 1975, at Vancouver, British Columbia.

Signed: _____

D.L. Cooke, Ph.D., P.Eng.



Department of Mines and Petroleum Resources

ASSESSMENT REPORT

MT. MCQUILLAN

LOCATION MAP

NO. 5354

MAP #1

N.T.S. 92 F-2

Drawn by: D.S.C.

Traced by: D.S.C.

No.	File	Revised by	Date

Scale: 1" = 15 Miles

Date: October, 1974

Plate: MO 7341

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 5354 MAP #2

5354
Map 2

LEGEND

4 4R	TERTIARY QUARTZ FELDSPAR PORPHYRY DIKES. 4R - RHYOLITIC
3	JURASSIC ISLAND INTRUSIVES. LIGHT COLORED DIORITE, INCLUDES MINOR AMPHIBOLITIC DIORITE.
2	PALEOZOIC SICKER GROUP VOLCANICS. HYBRID ANDESITE / DIORITE
1 1a	PALEOZOIC SICKER GROUP VOLCANICS. ANDESITE. (MAY BE HORNFELSIC) 1a - PURPLISH VOLCANICS (MAINLY FRAGMENTAL)
∿∿	FAULT
	FRACTURES, ATTITUDE

	BEDDING, ATTITUDE
	CONTACT, OBSERVED, INFERRED, INDISTINCT
	OUTCROP, APPROXIMATE OUTLINE
	CLIFF
∿∿∿ ○	MINERALIZATION, ZONE, ISOLATED
	WORKINGS, ADIT, TRENCH
qtz. v.	QUARTZ VEIN
○ py cp. pyrr. mal. azur.	PYRITE, CHALCOPYRITE, PYRRHOTITE, MALACHITE, AZURITE
	OUTLINE OF CLAIMS, SOIL SURVEY GRID
	ABANDONED LOGGING ROAD, TRAIL

Cooke

To accompany 1974 Geochemical and Geological Report by D.L. Cooke, Ph.D., P.Eng., dated January 15, 1975.

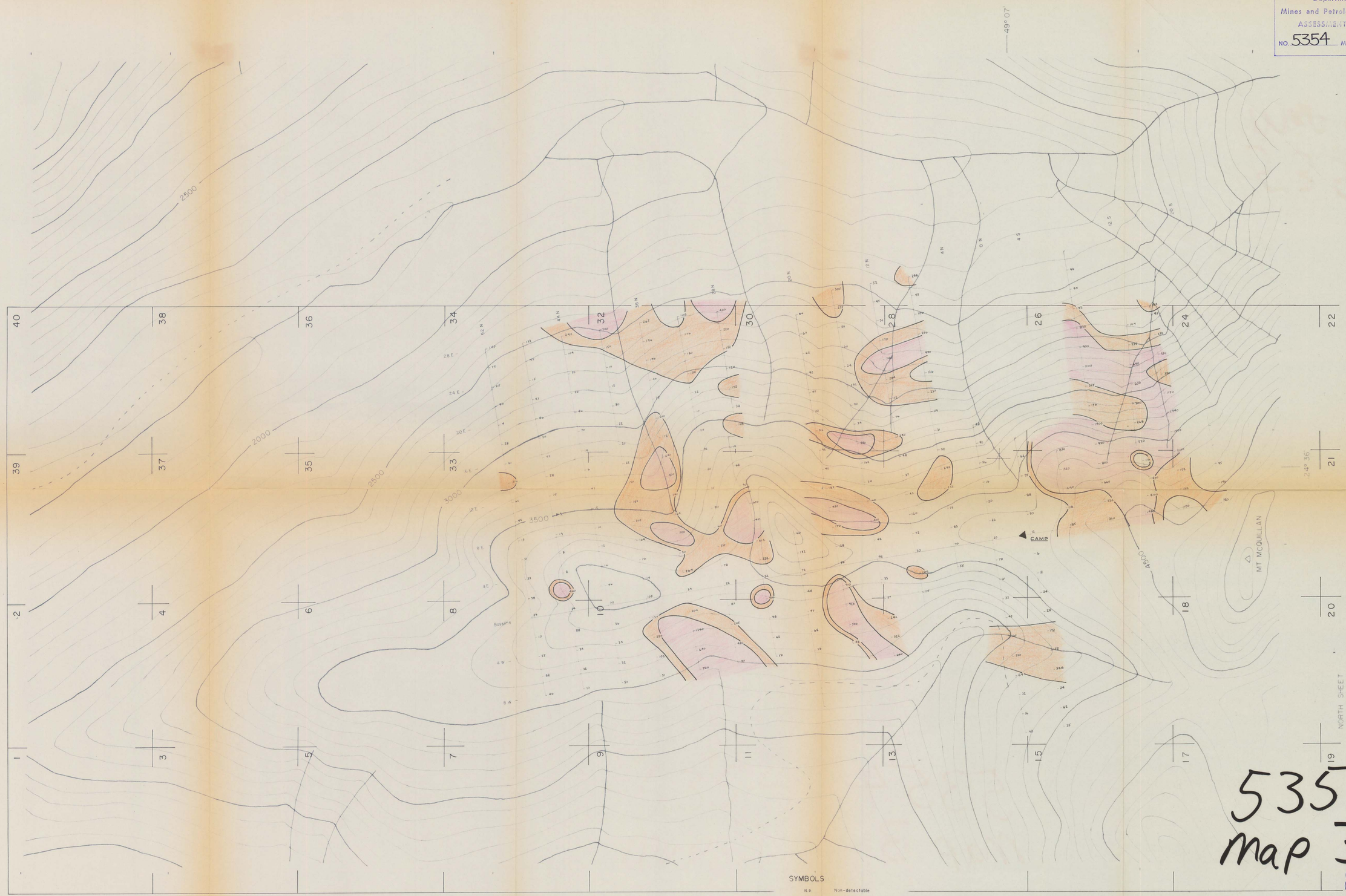
MT. MCQUILLAN
92F/2

Drawn by: T.E.K.	Traced by: T.E.K.
Revised by / Date	Revised by / Date

GEOLOGY
ALBERNI M. D. BRITISH COLUMBIA

Scale: 1" = 400 Feet
Date: OCTOBER 11, 1974
Plate: MQ-74-2

FORM 210-0670



5354
map 3

SYMBOLS

N.D. Non-detectable

N.S. No sample

Grid line & p.p.m. copper in soils

400 ppm / 150 ppm — Contour, 150ppm to 399 parts per million copper, anomalous; 400 or more ppm copper, strongly anomalous

Outline of claims (Sol Group)

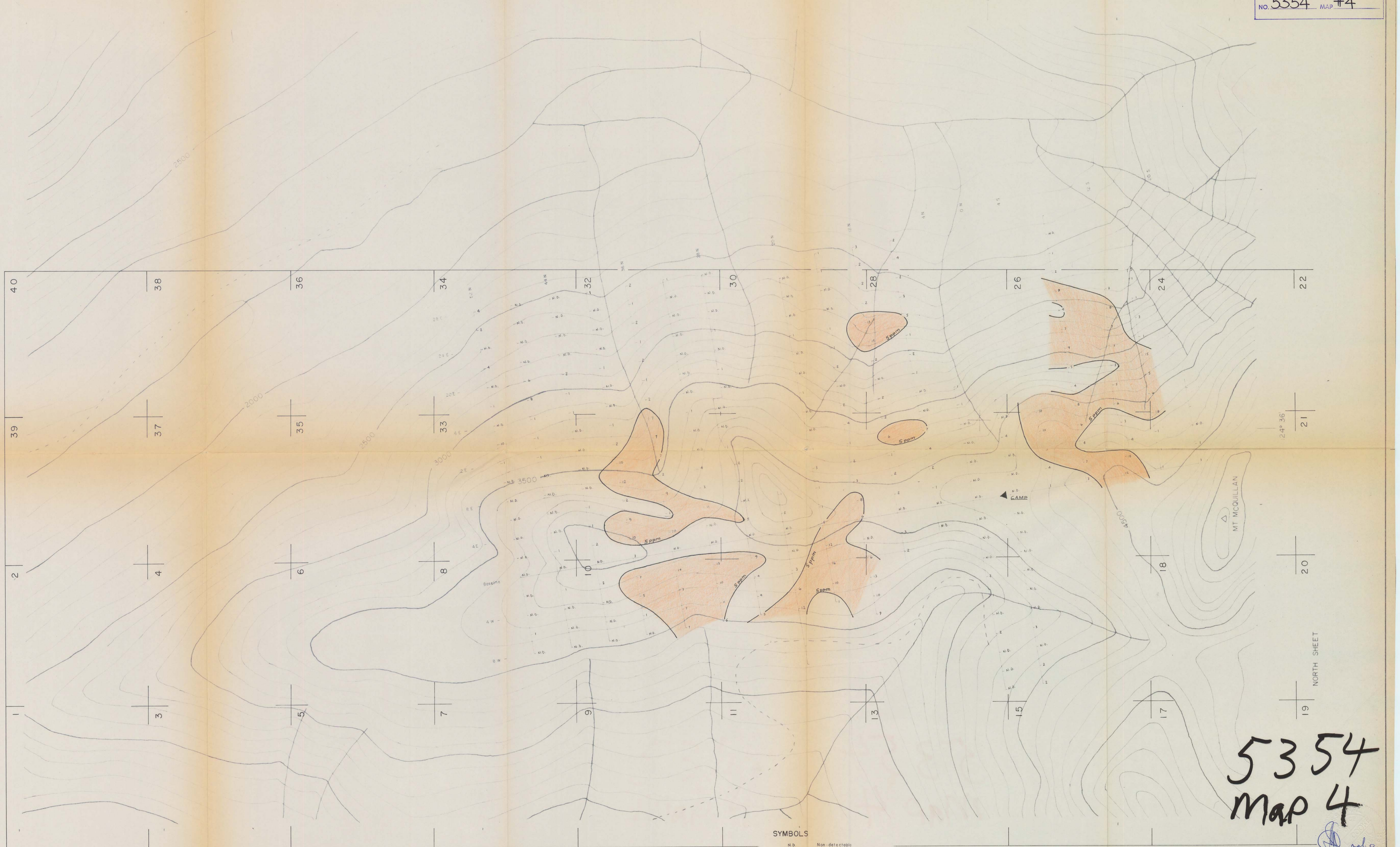
To accompany 1974 Geochemical and Geological Report by D. L. Cooke, Ph. D., P.Eng., dated January 15, 1975.

MT. MCQUILLAN ALBERNI M.D.

Drawn By: T.K. Traced By: D.S.C.

GEOCHEMICAL SURVEY
COPPER

Scale 400 Feet Date Oct., 1974 Plate MQ 74-3



5354
Map 4

SYMBOLS

N.D. Non-detectable

N.S. No sample

Grid line & p.p.m. molybdenum in soils

5ppm Contour, 5 or more parts per million molybdenum, anomalous

Outline of claims (Sol Group)

To accompany 1974 Geochemical and Geological Report by D.L. Cooke, Ph.D., P.Eng., dated January 15, 1975.

MT. MCQUILLAN ALBERNI M.D. 92F/2

Drawn by T.E.K. | Traced by D.S.C.

GEOCHEMICAL SURVEY

MOLYBDENUM

Scale: 400 Feet | Date: Oct., 1974 | Plate: MQ 74-4

FORM 210-0670

SYMBOLS

N.D.	Non-detectable
N.S.	No sample
10, 37	Grid line & p.p.m. zinc in soils
100 ppm	Contour, 100 or more parts per million zinc, anomalous
	Outline of claims (Sol Group)

To accompany 1974 Geochemical and Geological Report by D.L. Cooke, Ph.D., P.Eng., dated January 15, 1975.

Cooke

MT. MCQUILLAN	ALBERNI M.D. 92F/2
Drawn by T.E.K. Traced by D.S.C.	GEOCHEMICAL SURVEY ZINC
Scale 400 Feet	Date Oct., 1974 Plate MQ 74-5