

4325

GEOLOGICAL AND GEOCHEMICAL REPORT
ON THE QUILCHENA CREEK PROPERTY
OF TORONADO DEVELOPMENT CORPORATION

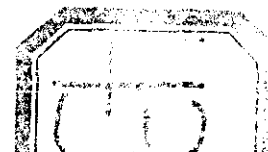
LTD. (NPL) AND CAROLIN MINES
LTD. (NPL) OPTION, NICOLA MINING
DIVISION, B.C. 921/2E

ME 1-8, TYE 1-20, YT 1-12.

SITUATED 11 MILES SE OF MERRITT, B.C.

50° 04' N; 120° 34' W

Submitted by: D.P. Taylor, Geologist
Endorsed by: R.H.D. Philp, P.Eng.
Owner: Toronado Development
Corp. Ltd. (NPL)
Work conducted by: Agilis Exploration
Services Ltd.



GEOLOGICAL AND GEOCHEMICAL REPORT ON THE
QUILCHENA CREEK PROPERTY OF
TORONADO DEVELOPMENT CORPORATION LTD. (NPL)
AND CAROLIN MINES LTD. (NPL) OPTION,
NICOLA MINING DIVISION, B.C.

April, 1973.

Vancouver, B.C.

<p>Department of Mines and Petroleum Resources ASSESSMENT REPORT NO. 4325 MAP</p>
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██████████	██████████
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GEOLOGICAL AND GEOCHEMICAL REPORT ON THE
QUILCHENA CREEK PROPERTY OF
TORONADO DEVELOPMENT CORPORATION LTD. (NPL)
AND CAROLIN MINES LTD. (NPL) OPTION
NICOLA MINING DIVISION, B.C.

INTRODUCTION

This Quilchena Creek property is owned by Carolin Mines Ltd. (NPL) and is under option to Toronado Development Corporation Ltd. (NPL). From agreement made in May, 1972, Toronado has the right to earn a 75% interest in the 40 contiguous ME, YT, and TYE claims that comprise the property.

Copper mineralization with minor molybdenum and silver has been exposed in old showings on the claim group.

In the late fall of 1972, a geochemical survey was conducted over the entire claim group and the geology was mapped by the author of this report.

LOCATION AND ACCESS

The claims are located on the west side of Quilchena Creek between Indian Reserve No.7 and Lundbom Lake, 11 miles east-southeast of Merritt, B.C.

The main showings on the property are located:

50°04'N; 120°34'W

Access to the property from Merritt is best via Highway 5, southeast 12 miles, then northeast along logging roads from Corbett Lake, 6 miles. Logging road access is available to various parts of the property.

PROPERTY

The property consists of the following 40 contiguous recorded mineral claims:

<u>Claim Number</u>	<u>Record Number</u>
ME 1-8	24324-31E
TYE 1-20	52564-83E
YT 1-12	56707-18

All claims are recorded in the Nicola Mining Division, B.C. The old workings on the property are on the ME claims.

PHYSIOGRAPHY

The property lies on relatively gentle upland country with local steep sections. Elevations on the property range between 3500 to 4000 feet above sea level.

Most of the property is covered by open grassland with light timber increasing toward the west,

Precipitation is very light in this area, with light snow cover in the winter. There is no running water on the property but water for exploration purposes is available in a small lake adjacent to the showings.

HISTORY

Some twenty years ago prospecting pits and a short inclined shaft were excavated on the property. Carolin Mines Ltd. acquired the property in the 1960's and geochemical surveying was followed by trenching and drilling. Four percussion holes and one diamond drill hole were drilled. The data from the geochemical survey has been lost.

The 1969 report of J.H. Montgomery, P.Eng. on this property, reports the diamond drill hole averaged 0.035% Cu and less than 0.01% MoS₂. The percussion holes were sampled in twenty foot sections and returned assays between trace and 0.40% Cu and trace to 0.056 MoS₂.

REGIONAL GEOLOGY

The property lies within the extensive Upper Triassic Nicola Group Volcanics of south central B.C., G.S.C. Geology map 886A (Nicola sheet). Intermediate to acidic intrusives of Jurassic-Cretaceous age occur 1 mile north of the property and 3 miles south of the property and a Mesozoic-Lower Tertiary intrusive has been mapped 2 miles southeast of the property. Outcrops of Tertiary volcanics are scattered around the property area. Glaciation has left a thin veneer of till over the general area, and has deposited assumedly deep over-burden in the valleys.

PROPERTY GEOLOGY

Nicola Group green andesite with rare undefined lenses of green tuff underlie most of the property, some areas of the andesite carry considerable epidote. Green argillite underlies the southwestern area of the claim group. The attitude of the argillite bedding is generally north north-easterly striking with steep southeasterly dips. The argillite is possibly a large lens, or maybe, by some indications, isoclinally folded. Isolated occurrences of agglomerate and conglomerate were noted at the extreme southern edge of the grid.

Intrusives on the property vary from monzonitic to dioritic in composition. At least one phase of the intrusive, around station 8S,20W, is separate from the others. This phase is monzonite with large ($\frac{1}{2}$ inch) phenocrysts of potassium feldspar in a plagioclase-biotite matrix. The remainder of the intrusives are generally homogeneous plagioclase-chlorite-biotite diorite.

The diorite is dispersed in the Nicola andesites. Extensive dike and stringer swarms are found around the glacial valley in the north-central part of the property. It is suspected that much of this till filled valley is underlain by intrusives which outcrop west of the basin and are seen as dykes and stringers south of the basin.

In the area of mineralization, the volcanics have been altered and are generally labelled hornfels. A strong, north-northeasterly linearity is notable in the distribution of diorite and hornfels through the showings northeast of the baseline +00 station.

The mineralized areas in the hornfels are characterized by stringers of quartz and calcite, not necessarily intimately associated with observed copper mineralization, but generally pervasive in its vicinity.

The entire property is heavily faulted. A possibly conjugate set of faults, striking N20-30E and N20-30W is most prominent on the property. These faults are generally steep to moderate dipping. An equally strong, but apparently more widely spaced set of north-south faults, also moderately to steeply dipping, is noted. This set of faults is possibly conjugate with minor east-west faults noted.

GEOCHEMICAL SURVEY

A geochemical survey was conducted over the entire property, on a grid established for the purpose. The grid was put in with chained and flagged east-west lines 400 feet apart with stations every 200 feet along the lines. The area around the showings was sampled in detail by closing the grid to 100 x 200 feet.

All soil samples were analysed for ppm copper content and selected areas were also analysed for molybdenum, and some for silver, ppm content.

SAMPLING PROCEDURE

Soil samples were taken at every station possible on the grid established. Samples were taken from poorly developed "B" horizon at 8-12 inches depth using mattocks. Samples were placed in kraft paper bags provided for the purpose by the laboratory.

ANALYSIS

All samples were shipped to Core Laboratories-Canada Ltd., 325 Howe Street, Vancouver, B.C. Samples were analysed for ppm copper content, some sections were analysed for molybdenum, and some for silver, ppm content. A minus 80 mesh fraction was taken from each sample, those samples analysed for copper and molybdenum were digested in hot acid for 2 hours. Silver samples were analysed on a separate minus 80 mesh fraction after hot acid digestion. Quantitative analysis was performed using atomic absorption techniques.

RESULTS

Copper

A total of 1154 samples were analysed from this survey for ppm copper content. Statistical analysis on a cumulative frequency graph indicates background value to be 50 ppm and the low anomalous threshold to be 82 ppm. The top 2.5% of the sample population, very highly anomalous, are those 29 samples >154 ppm. Results for copper range between 1 to >1000 ppm.

Molybdenum

Molybdenum values range from ≤ 1 to 25 ppm over 681 samples analysed. Statistical analysis, percent cumulative frequency, was conducted on 433 samples ≥ 1 ppm. Results of statistical analysis indicate a background of 4 ppm, and an anomalous threshold of 10 ppm. The top 2.5% highly anomalous fraction of the population are those 11(12) samples ≥ 15 ppm Mo.

Silver

Silver values were obtained from 391 soil samples. Values ranged from 0.2 to 5 ppm. Cumulative percent frequency statistical analysis indicate a background of 0.7 ppm and a low anomalous level of 1.0 ppm silver. The top 10(11) very highly anomalous values are those ≥ 1.6 ppm. The silver values of > 2.0 ppm, were noted in the laboratory to be from highly carbonaceous soils and may therefore be "contaminated" due to the close spectrum relationships of calcium and silver. However on consultation with the geochemist, it is believed any possible "contamination" should be low enough to allow the samples to remain classified as anomalous.

INTERPRETATION

The main anomalies for all of the metals analysed for are roughly coincidental over the area of earlier trenching and drilling.

Apart from spot value, no anomalies have developed on the remainder of the property except for weak anomalies for copper in the northeastern and southeastern areas of the grid. The weak anomaly to the northeast is expressed by 17 anomalous samples, only one of them very high, in an area of moderately good outcrop exposure. Quartz and some calcite veinlets and stringers were noted in this area during mapping.

The weak copper anomaly to the southeast is composed of 20 generally moderate to low anomalous samples underlain by green argillite. It is believed this anomaly is related to glacial redistribution of material from the main showing, although some copper anomalous values in this area are coincidental with

low anomalous silver values.

The main anomaly, generally covering the area of earlier trenching and drilling, is coincident in copper, molybdenum and silver. The anomalies are not entirely continuous but do fairly consistently cover the area from line 2N to 16N from stations 2E to 14E in the south and stations 12E to 16E on line 16N. The anomaly contains 73 copper, 26 molybdenum, and 19 silver anomalous samples. The anomalies tend to parallel the north-northeasterly striking intrusive and hornfels complex in this area and associated faulting.

CONCLUSIONS

The property is predominantly underlain by Nicola Group volcanics and argillites. The volcanics are predominantly green andesite and tuff, with areas of epidote alteration. No economic mineralization has been observed or indicated in these rocks.

The area of old workings on the claims has been intruded by a dioritic dyke-like feature that has caused hornfels alteration of the intruded volcanics. The intrusive generally strikes north-northeasterly.

Coincidental geochemical anomalies for copper, molybdenum, and silver occur apparently closely related to the area of hornfels and intrusive, also directly northerly from the hornfels and extending eastward into areas of overburden. Faulting is extensive on the property and generally is north-easterly or northwesterly striking. A strong north-south faulting is particularly notable in the areas of the geochemical anomalies.


The orientation of the intrusive (N30E) is sub-parallel to mapped fault orientations in the intrusive area and probably indicates a structural relationship between the intrusive and northeasterly striking faults.

RECOMMENDATIONS

The area of geochemical anomalies associated with intrusive and hornfels should be subject to further intensive exploration. Mapping should be conducted at a scale of 1" = 100' and a magnetometer survey should be conducted over the area of detailed gridding, which covers the apparent area of interest.

Induced polarization exploration should be conducted on at least 5 east west lines at least 2600 feet long centred on the copper geochemical anomaly. Electrode spacings should be set at three separations, 300, 600, and 900 feet to gain a profile of structural and/or mineralogical I.P. expression. Anomalies indicated of possible economic significance should be investigated by drilling. Rotary drilling is recommended to enable more footage to be drilled per expenditure than is possible by coring methods.

Respectfully submitted by:


D.P. Taylor, geologist
M.Sc. D.I.C.

Endorsed by:


R.H.D. Philp, P. Eng.

January 17, 1973

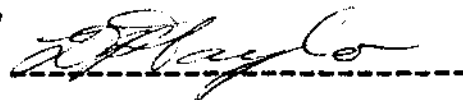
Vancouver, B.C.

CERTIFICATION

I, David Pelham Taylor, of Vancouver, B.C., do hereby certify that:

1. I am an exploration geologist, residing at 2097 West 6th Avenue, Vancouver, B.C.
2. I am a graduate of the Royal School of Mines, London University (M.Sc., D.I.C. 1971).
3. I have practised as an exploration geologist in B.C. for five years.
4. The work subject of this report was conducted by myself and a crew under my supervision in November, 1972.

Signed,



D.P. Taylor, M.Sc., D.I.C.

April, 1973.

Vancouver, B.C.

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
To Wit:

In the Matter of detailed gridding, geological and geochemical surveys conducted on the Toronado (Caroline option) Properties.

I, Valerie McKee

of c/o 107-325 Howe Street, Vancouver 1, B.C.

in the Province of British Columbia, do solemnly declare that the following personnel were employed and costs incurred in conducting the surveys during November, 1972.

Personnel:

R. Philp - Geologist	2 days	250.00
D. Taylor - "	13 days	1,300.00
D. Reinke - field	26 days @ 61.81/day	1,607.00
C. Nelson - "	26 days @ 44.32/day	1,152.32
B. Talbot - draughting	45 hours @ 8.50/hr	<u>386.75</u>
		4,696.13

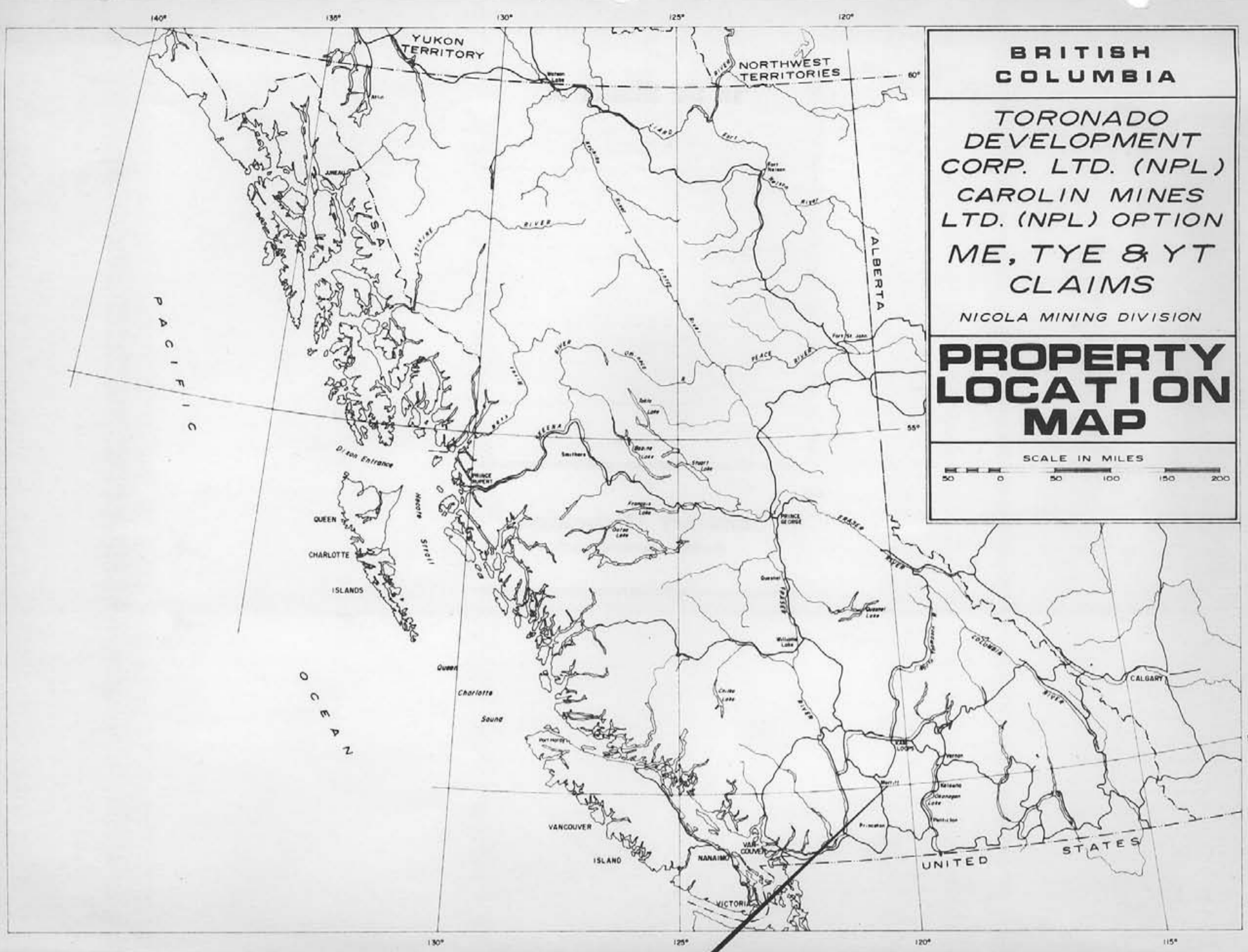
Disbursements:

Meals and accommodation	911.35	
Supplies, gas	302.80	
Truck rental	700.00	
Geochemical testing	1,541.50	
Misc. - prints, taxis, phone, etc	<u>137.82</u>	3,593.47
+10% service charge on disbursements		<u>359.35</u>
	TOTAL AMOUNT	<u><u>\$8,648.95</u></u>

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the *City*
of *Vancouver*, in the
Province of British Columbia, this *10th*
day of *May, 1973*, A.D. } *V. A. McKee*

Jan Paul Sub-mining Recorder
A Commissioner for taking Affidavits for British Columbia or
A Notary Public in and for the Province of British Columbia.



BRITISH COLUMBIA

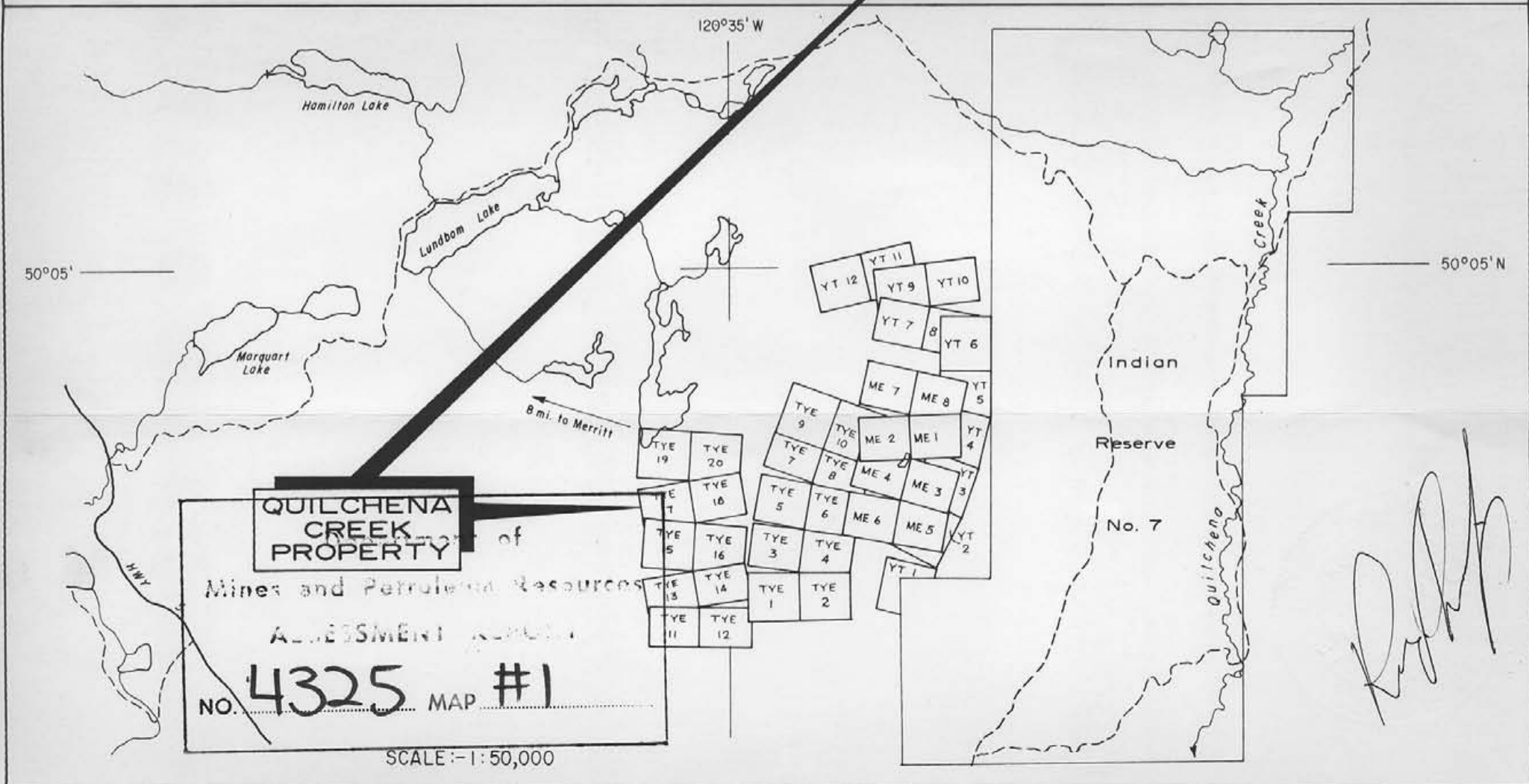
**TORONADO DEVELOPMENT CORP. LTD. (NPL)
CAROLIN MINES LTD. (NPL) OPTION
ME, TYE & YT CLAIMS**

NICOLA MINING DIVISION

PROPERTY LOCATION MAP

SCALE IN MILES

50 0 50 100 150 200



QUILCHENA CREEK PROPERTY of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. **4325** MAP **#1**

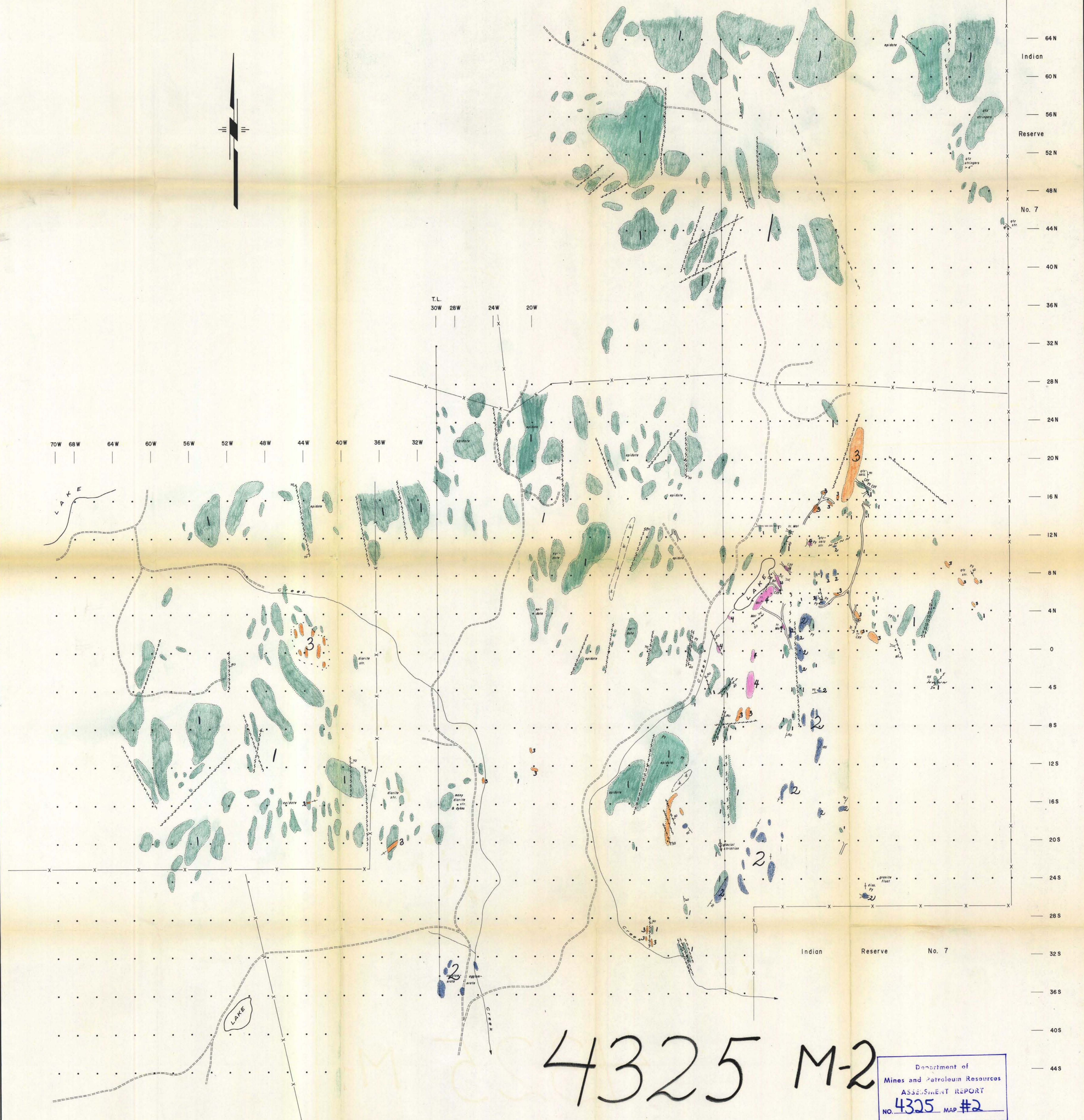
SCALE: -1: 50,000

16W 12W 8W 4W 0 4E 8E 12E 16E 20E 24E 28E 30E

64N
Indian
60N
56N
Reserve
52N
48N
No. 7
44N
40N
36N
32N
28N
24N
20N
16N
12N
8N
4N
0
4S
8S
12S
16S
20S
24S
28S
32S
36S
40S
44S

70W 68W 64W 60W 56W 52W 48W 44W 40W 36W 32W

T.L.
30W 28W 24W 20W



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Mines and Petroleum Resources
ASSESSMENT REPORT
No. 4325 MAP #2

LEGEND

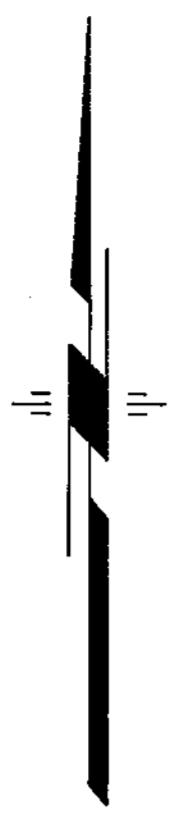
- Swamp
- Road
- Fence
- Rock outcrop and geologic contact
- Fault (defined, inferred)
- Strike and dip (vertical, other)
- Trench
- 1 NICOLA VOLCANICS - Andesite, generally green
- 2 NICOLA GROUP SEDIMENTS - Mainly green argillite
- 3 Diorite
- 4 Hornfels

TORONADO DEVELOPMENT CORPORATION LTD. (NPL)
CAROLIN MINES LTD. (NPL) OPTION
QUILCHENA CREEK PROJECT
NICOLA MINING DIVISION, B.C.

GEOLOGY

SCALE IN FEET
400 0 400 800 1200
AGLIS EXPLORATION SERVICES LTD. APR. 1973

16W 12W 8W 4W 0 4E 8E 12E 16E 20E 24E 28E 30E



64N
Indian
60N
56N
Reserve
52N
48N
No. 7
44N
40N
36N
32N
28N
24N
20N
16N
12N
8N
4N
0
4S
8S
12S
16S
20S
24S
28S
32S
36S
40S
44S

70W 68W 64W 60W 56W 52W 48W 44W 40W 36W 32W

T.L.
30W 28W 24W 20W



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4325 MAP #3

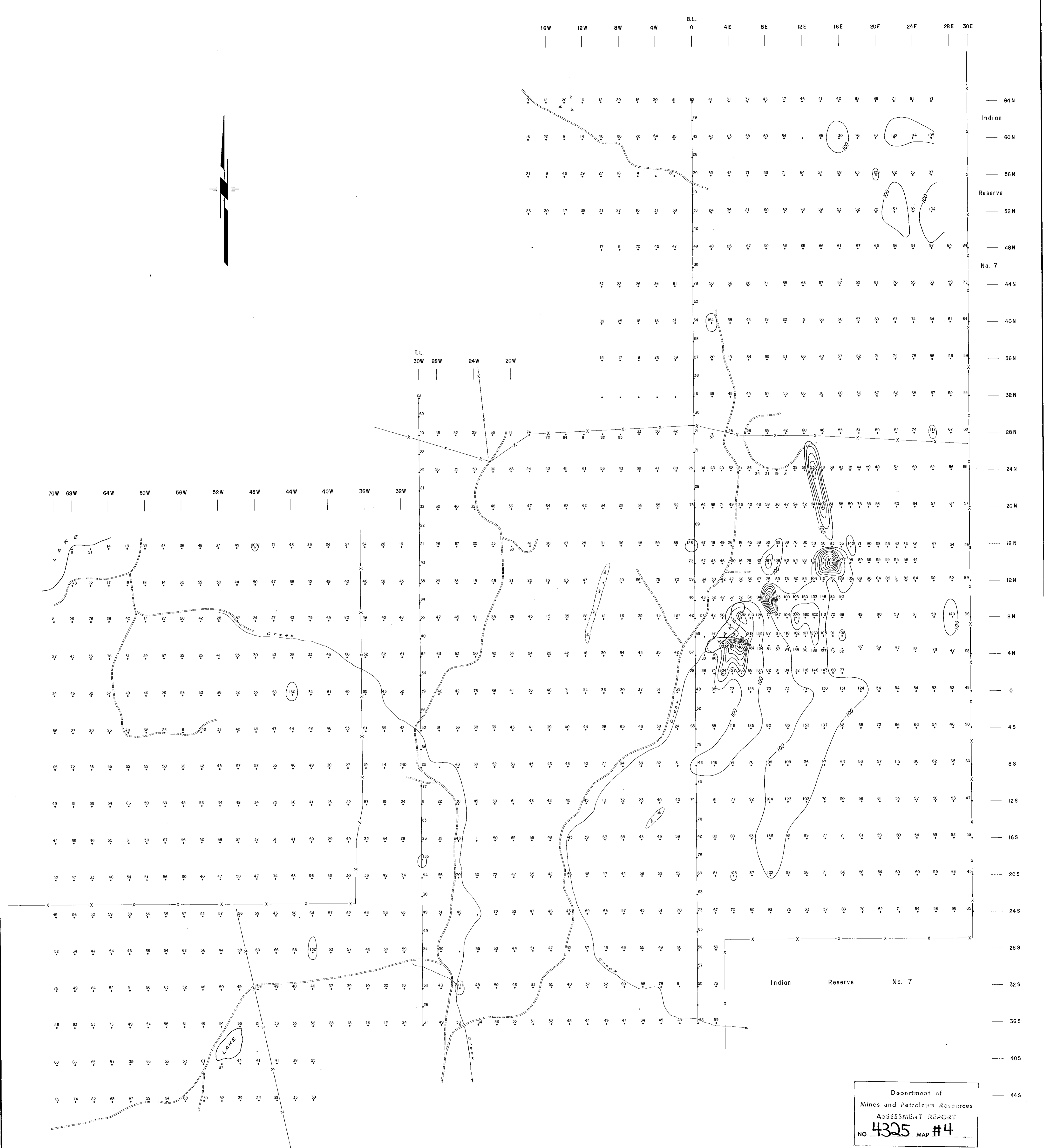
LEGEND

- Swamp
- Road
- Fence

TORONADO DEVELOPMENT CORPORATION LTD. (NPL)
CAROLIN MINES LTD. (NPL) OPTION
QUILCHENA CREEK PROJECT
NICOLA MINING DIVISION, B.C.

CLAIM MAP

SCALE IN FEET
400 0 400 800 1200
AGILIS EXPLORATION SERVICES LTD. APR. 1973



LEGEND

- Swamp
- Road
- Fence

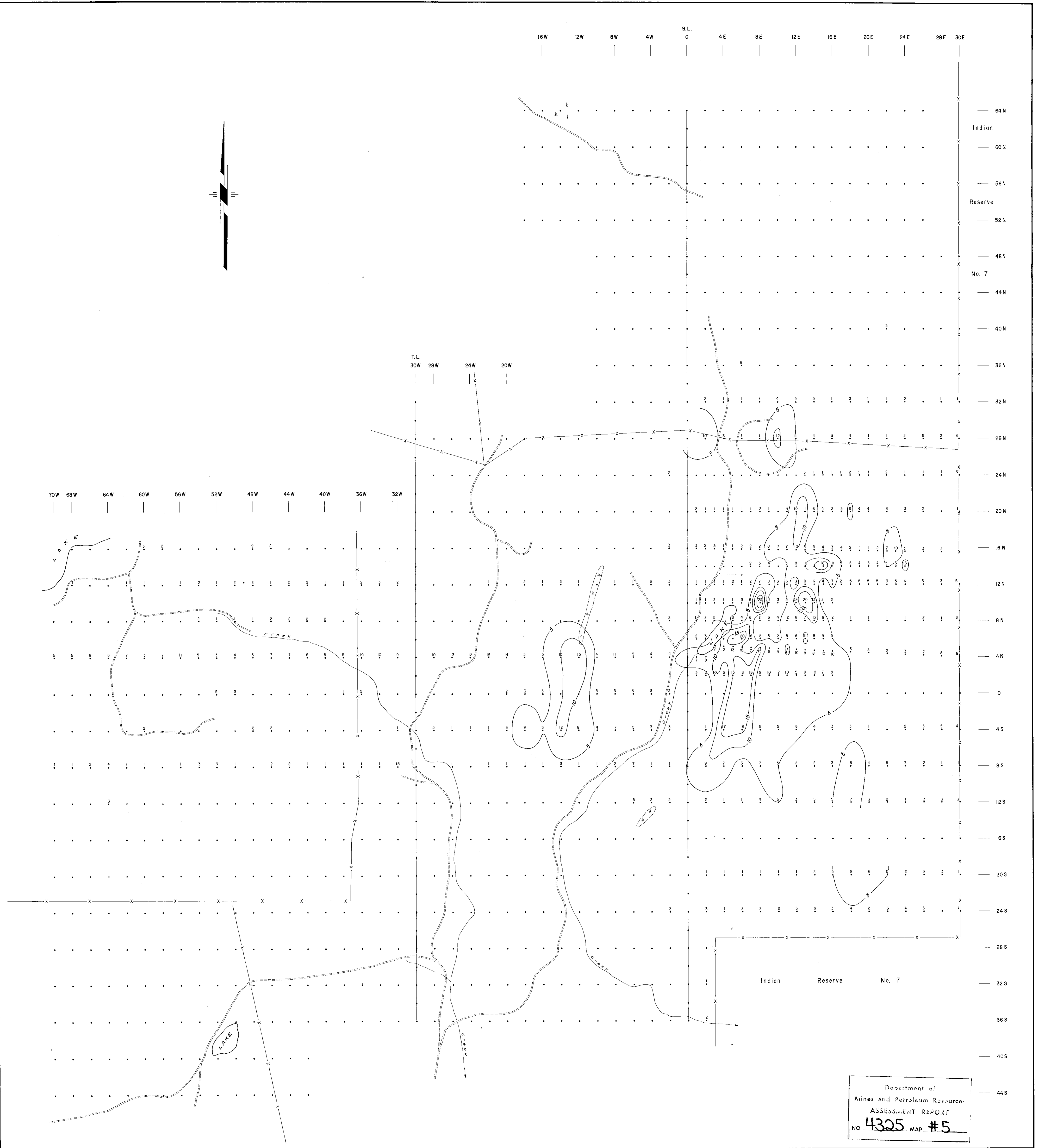
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Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4325 MAP #4

TORONADO DEVELOPMENT CORPORATION LTD. (NPL)
CAROLIN MINES LTD. (NPL) OPTION
QUILCHENA CREEK PROJECT
NICOLA MINING DIVISION, B.C.

GEOCHEMICAL SURVEY
COPPER (ppm)
CONTOUR INTERVAL - 100 PPM

SCALE IN FEET
0 400 800 1200

AGILIS EXPLORATION SERVICES LTD. APR, 1973



LEGEND

- Swamp
- Road
- Fence

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4325 MAP #5

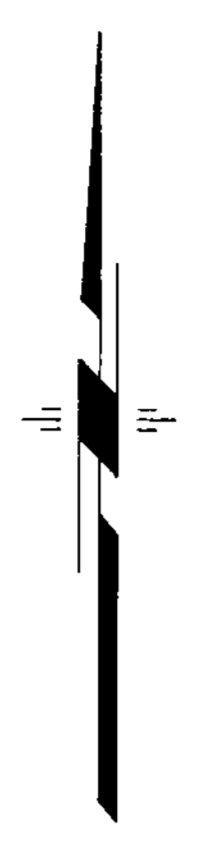
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CAROLIN MINES LTD. (NPL) OPTION
QUILCHENA CREEK PROJECT
NICOLA MINING DIVISION, B.C.

GEOCHEMICAL SURVEY
MOLYBDENUM (ppm)
CONTOUR INTERVAL: 5 PPM

SCALE IN FEET
0 400 800 1200

AGILIS EXPLORATION SERVICES LTD. APR., 1973

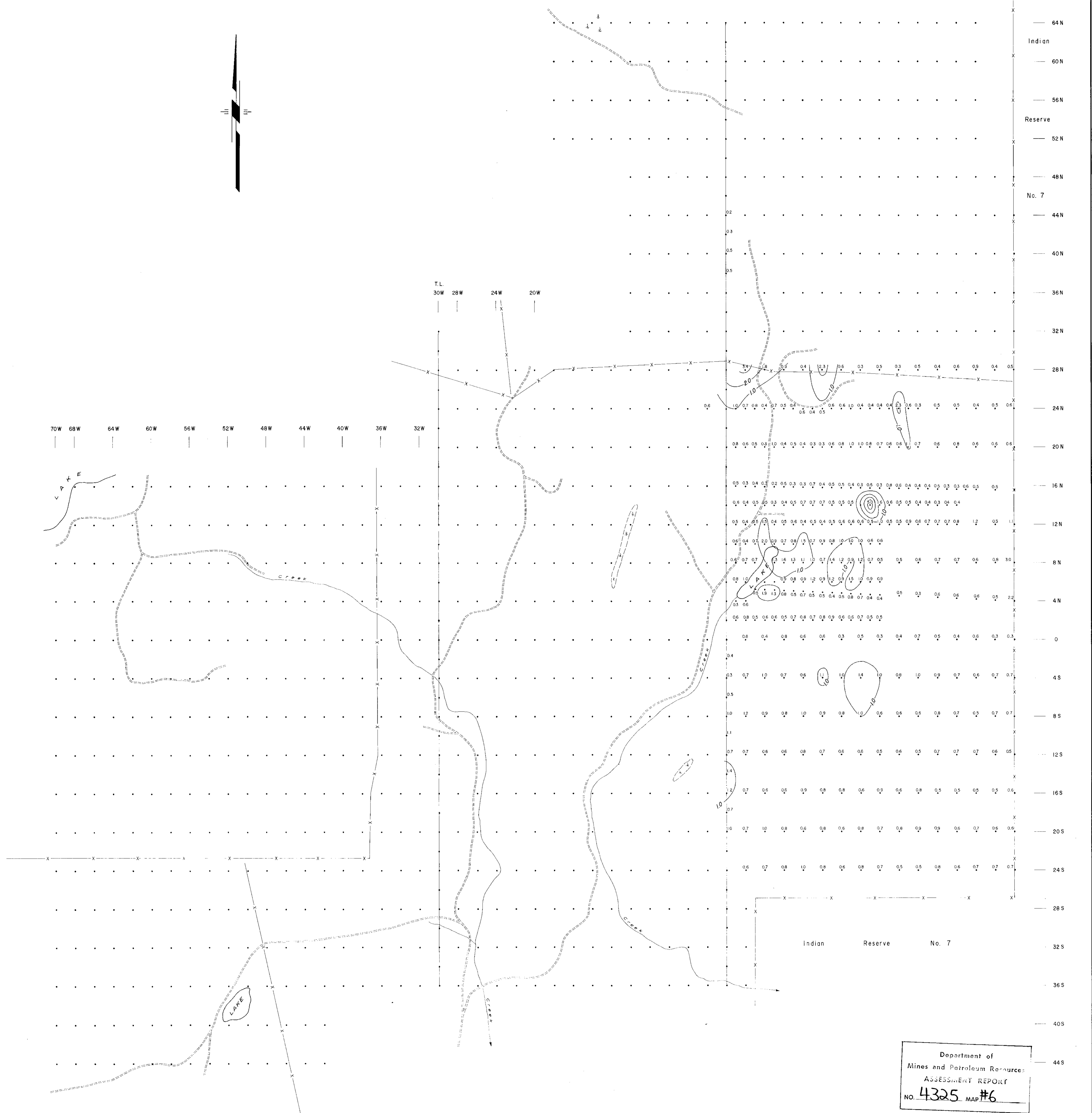
16W 12W 8W 4W B.L. 0 4E 8E 12E 16E 20E 24E 28E 30E



64 N
Indian
60 N
56 N
Reserve
52 N
48 N
No. 7
44 N
40 N
36 N
32 N
28 N
24 N
20 N
16 N
12 N
8 N
4 N
0
4 S
8 S
12 S
16 S
20 S
24 S
28 S
32 S
36 S
40 S
44 S

70W 68W 64W 60W 56W 52W 48W 44W 40W 36W 32W

T.L.
30W 28W 24W 20W



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
No. 4325 MAP #6

LEGEND
Swamp
Road
Fence

TORONADO DEVELOPMENT CORPORATION LTD. (NPL)
CAROLIN MINES LTD. (NPL) OPTION
QUILCHENA CREEK PROJECT
NICOLA MINING DIVISION, B.C.
GEOCHEMICAL SURVEY
SILVER (ppm)
CONTOUR INTERVAL - 1.0 PPM
SCALE IN FEET
400 0 400 800 1200
AGILIS EXPLORATION SERVICES LTD. APR., 1973