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3216

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 3216 MAP .....

GEOLOGICAL REPORT ON THE MEINDL CLAIMS

NOS. 9, 10, 11 AND 12 (RECORD NUMBERS

#9381 to #9384 INCL.), LIARD M.D.

LOCATION: TOAD RIVER AREA, 35 MILES SOUTH OF MUNCHO LAKE (58°N 125°W, S.W.)

BY: C. BANNINGER UNDER THE SUPERVISION OF R. A. DUJARDIN, P. ENG.

WORK DONE BY: CANADIAN SUPERIOR EXPLORATION LIMITED

CLAIMS OWNED BY: WINDERMERE EXPLORATION LTD.

PERIOD OF WORK: JULY 22 - 28, 1971

TABLE OF CONTENTS

MAPS AND DIAGRAMS

APPENDICES

SUMMARY

The Proterozoic sedimentary rocks which underlie the area of the claim group have undergone weak regional metamorphism accompanying broad anticlinal doming on a northwest axis which also produced a regional fracture cleavage parallel to the strike of the folding. Towards the end of the Precambrian, northerly striking basic dykes intruded the country rock producing only minor alteration. Faulting with associated shearing parallels the margins of the dykes, but also transects them in a northeast direction. Quartz-veins in the form of short, discontinuous lenses occur adjacent and in close proximity to the margins of a northeasterly trending dyke. Chalcopyrite is the principal economic mineral present in the form of vein-fillings. Fifteen chip samples were taken across various sections of the veins.

CONCLUSIONS

1. The dykes are structurally controlled as evidenced by the association with adjacent faults and shear zones.

2. The dykes were emplaced under quiet conditions as evidenced by the lack of contact alteration and wall-rock disturbance.

3. The quartz veining is closely associated with the dykes and the adjacent faults and shears. Structural control is therefore evident in both the vein emplacement and the localization of copper mineralization.

4. The lensoid nature of the veins seems to have resulted from movements along transverse, curved faults.

5. The copper mineralization shows a preference for those parts of the vein containing partially assimilated inclusions of the sedimentary rocks. The dolomitic nature of the inclusions may be of significance in this regard.

6. The copper mineralization is too erratic in tenor and extent to warrant mining.

RECOMMENDATIONS

Even though copper mineralization occurs over a strike distance of approximately 2,400 feet, the size and extent of the veins and the discontinuous nature of the copper mineralization appears to negate the likelihood of realizing an economic size orebody. The possibility of locating further extensions of economic interest within the claim group appears less than favourable judging from the nature of the mineral occurrences already mapped. Even taking into consideration that shear zone type deposits tend to have a relatively long vertical extent, there is no indication of a favourable change in conditions with depth. The property does not therefore warrant additional work.

INTRODUCTION

The purpose of the investigation of the Meindl claim group was to examine and evaluate the economic potential of the property in respect to the known mineral occurrences, and to locate possible extensions of these occurrences.

The examination took place between the 22nd and 28th of July, 1971 and consisted of geological mapping of the mineral showings and the associated rock types and structure in addition to obtaining samples for assay purposes.

Information pertaining to the regional and local geological setting of the claim group contained herein was derived from Dr. D.L. Cooke's report on the 'Churchill-Racing River Project - 1970' for Windermere Exploration Ltd. In addition to the author of this present report, two field assistants, D. Amor and D. Pluth, assisted in the mapping and sampling of the property.

LOCATION (See Map "A")

The property is located approximately 35 miles south of Muncho Lake (Alaska Highway) and 10 miles west of the Churchill Copper Corp. mine, and is situated on a northerly trending mountain ridge located on the western side of a tributary of the Toad River. A small cirque valley is situated in the central portion of the claim group. Access to the area is either by packhorse or by helicopter. Elevations in the immediate area vary from 3,200 feet for the river basin to over 8,000 feet for the tops of the ridges.

The showings on the west slope of the ridge occur at elevations from 6,200 to 7,000 feet and extend down to 6,400 feet on the east side. The claim group is situated above timberline with a stream draining the western portion of the property. Deeply cut gullies form the drainage channels on the eastern side, and both systems flow into the Toad River tributary.

Sedimentary outcrops are principally confined to the upper portions of the ridge and in the stream gullies, with sporadic occurrences along the lower parts of the slope faces. The greater part of the lower sections of the slopes are scree covered except where outcrops of dyke rock occur. The latter form prominent linear surface features along both the slopes and ridges.

GEOLOGY AND STRUCTURE

GEOLOGY (See Map "B")

The rock units in the region and those underlying the claim group are comprised of Palaeozoic and Proterozoic formations, the latter forming the geologic setting for the dyke and vein occurrences. The upper Proterozoic section is subdivided into two conformable units, the Gataga and Aida Formations, respectively. Each unit exhibits gentle to moderate dips to the west. The upper unit (Gataga) consists of dark grey, fracture-cleaved argillites. The lower unit (Aida) consists of interbedded light grey to brown, fracture-cleaved argillites and brown weathering siliceous and argillaceous dolomites. The Palaeozoic units (Lower Cambrian) unconformably overlie the late Precambrian rocks in the western and southern parts of the property.

The Proterozoic units are intruded by light grey to green basaltic to doleritic dykes, ranging in thickness from a few feet to over one hundred feet. The dykes occur in subparallel swarms with branching and coalescing between individual dykes being common. A majority of the dykes trend northerly and dip steeply to the west, although a few dykes strike northeast and dip to the northwest.

Alteration of the country rock by the dyke activity is confined to a narrow zone less than a few feet wide along the margins of the dykes. The alteration is a product of weak thermal metamorphism resulting in minor recrystallization, sericitization, and bleaching with associated silicification.

Alteration of the dykes themselves is composed essentially of chloritization and epidotization, principally along the margins and minor slickenside fractures. Iron-staining is also present along the dyke margins and fracture faces.

STRUCTURE

Rocks underlying the claims form a homoclinal structure dipping moderately to the west, and exhibit a pronounced regional cleavage trending to the north-northwest which is generally parallel to the trend of the northerly striking dykes.

A prominent north-south thrust fault occupies the cirque valley floor on the central portion of the claim group, and appears to have caused an upward movement of the western side.

Faulting with associated shearing is prevalent, and occurs either in conjunction with the margins of the dykes and veins, or as post dyke faulting trending principally in a northeasterly direction. The latter faulting appear to have affected the veins in only a few instances.

MINERALIZATION

The principal mode of emplacement of the copper mineralization is as vein-type deposits within the Proterozoic rocks of the Aida formation. The veins occur as discontinuous, lens-shaped pods of variable dimensions, with widths between 6 inches and 3 feet and lengths of less than 80 feet. They are situated primarily along the northwest margin of a steeply dipping, northeast-striking dyke which transects a number of north trending dykes. Less significant veins occur in proximity or adjacent to the southeast margin of the dyke. In a number of locations, thin selvages of country rock are positioned between the dyke wall and vein.

The veins vary in composition between almost entirely quartz, with minor sedimentary rock inclusions and/or carbonate material, to a complex combination of quartz and strongly altered sedimentary rock. The rock inclusions have been derived from the neighbouring sedimentary country rock and have in general taken on a modified lensoidal shape approximately conformable to the strike of the veins. The inclusions are mainly dolomitic and vary in form from streaks and thin slivers to oval shaped, large fragments which exhibit sharp to indistinct margins. The finer particles and gouge

material appear to have been partially to completely converted to quartz and/or chalcopyrite, whilst the larger fragments show only slight replacement. Vein wall contacts are sharp to indistinct or blended, and display in certain sections a distinct unmatching of corresponding walls. A certain degree of vugginess pervades through the quartz-veining with sporadic filling of the vugs and cavities with quartz crystals.

The mineralization consists principally of chalcopyrite with minor amounts of pyrite, bornite, malachite and erythrite, and occurs within the veins in association with quartz, carbonate (ankerite?), and sedimentary rock inclusions. Chalcopyrite appears as blebs, clusters, and pockets as well as small lenses within the veins, and primarily in association with the rock inclusions, either in close proximity to or along their borders. In many instances the chalcopyrite appears to have replaced, wholly or in part, the enclosed fragment.

The copper mineralization tends to show a preference for a narrow, restrictive zone parallel to the vein walls, and may exhibit repeated parallel layering across a section of the vein. Either the hanging wall and/or the footwall of a vein is a preferential locale for the deposition of chalcopyrite, and within these zones it shows preference for sections containing a greater proportion of rock inclusions.

Copper mineralization is erratic in continuity and grade. Small, isolated high-grade zones and pockets grade into much larger zones with weak to moderate chalcopyrite. The zones which show intense alteration, especially with respect to iron-oxidation, are generally the areas containing a high concentration of copper mineralization.

Malachite is present in association with chalcopyrite, but forms only a thin, superficial coating in the immediate vicinity of the copper sulphides.

Pyrite occurs sporadically and in minor amounts in association with the copper mineralization, and in one minor occurrence Erythrite was also noted.

Pyrite and malachite staining also occur to a very limited extent within the dyke margins and unaltered country rocks immediately adjacent to the mineralized veins. This mineralization is found primarily along the surface of fractures which pervade both rock types. In a few

locations on the dyke margins, chalcopyrite was found to be present within the dyke rock itself, but only to a depth of a few inches, and in very minor amounts.

Fifteen continuous chip samples were taken across various sections of the better grade mineralized veins, and their copper assay values, along with the sample widths, are given on the geological map which accompanies this report (Map "B"). A list of the assays is given below:

ASSAYS

Sample No.	Width	% Cu
ME- 1	4.4'	4.10
ME- 2	3.8'	2.40
ME- 3	0.5'	13.80
ME- 4	1.4'	7.40
ME- 5	1.0'	4.80
ME- 6	3.3'	8.20
ME- 7	2.0'	1.07
ME- 8	1.8'	5.45
ME- 9	2.8'	2.70
ME-10	0.6'	1.98
ME-11	2.0'	15.60
ME-12	3.7'	14.80
ME-13	1.0'	2.40
ME-14	1.0'	5.35
ME-15	2.2'	1.55

VEIN DYKE AGE RELATIONSHIP

The question is still open as to whether the veins are pre or post dyke intrusion, or possibly contemporaneous. The absence of a definite degree of cutting of one by the other or of enclosed fragments of either one in the other makes an answer to the question not readily apparent.

There is the situation where quartz vein fingering appears to be present for a short distance within the dyke rock, but the strong nature of alteration plus the high degree of broken rock at these localities makes it difficult to give a definite conclusion. In one instance a quartz vein appears to have been intersected by a finger of dyke rock, but as this occurs in only one small incidence, a conclusive answer cannot be stated.

There is also the situation where a few sections of the dyke margin contain minor pyrite and chalcopyrite, but as this exists only to a depth of a few inches it may be argued that a post-vein dyke intrusion could have "sweated" out the chalcopyrite from the adjoining mineralized vein instead of the copper having permeated through the dyke rock as a mineralized emanation from a post-dyke vein.

As both the dyke and quartz vein margins vary in degree of alteration from section to section, and with the common presence of a thin selvage of sedimentary rock located between the vein and dyke faces, plus the latters quiet nature of emplacement, the problem is further complicated.

A further difficulty lies in the problem of adequately explaining the occurrence of long, narrow veins in justaposition on either side of a wide, curving dyke if it is supposed that the dykes were post vein emplacement.

C Banninger

Signed: C. Banninger, Geologist

Supervised by: R. A. Dujardin, P. Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. A. DUJARDIN

Vancouver, British Columbia
15 September 1971

THE GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES
AND PETROLEUM RESOURCES

MINERAL ACT
(Section 51)
FORM B

SUB-MINING RECORDER
RECEIVED
AUG 27 1971
M.R. #..... $.....
VANCOUVER, B. C.

Affidavit on Application for Certificate of Work

1. I, R. A. DUJARDIN (Name.) Agent for WINDERMERE EXPLORATION LTD. (N.P.L.) (Name.)

2827 WEST 43 AVENUE (Address.)
VANCOUVER 13, B.C

Free miner's Certificate No. 102361
Date issued May 14, 1971

1418 - 355 BURRARD STREET (Address.)
VANCOUVER 1, B.C.

Free Miner's Certificate No. 102028
Date issued May 6, 1971

make oath and say:—

2. I have done, or caused to be done, work on the Meindl #9 & #12 Mineral Claim(s)

Record No.(s) 2 YR 49381 & 3 YR 49384

situate at 10 miles W of Mt. Roosevelt in the LIARD Mining Division,

to the value of at least $945 dollars. Work was done from the 22 day

of July, 1971, to the 9 day of August, 1971

3. The following is a detailed statement of such work:—

(Set out full particulars of the work done in the twelve months in which such work is required to be done. There are three types of work: (1) Physical (trenching, drilling, tunnelling, and overburden removal); (2) road or trail work; (3) geological, geochemical, geophysical (includes line-cutting). The *total value of each type* of work and the *number of years'* work and *type* to be applied to each claim *must* be shown below.)

GEOLOGICAL (Detailed) MAPPING & SAMPLING

Report not completed — will be filed in 30 days

Details of Expenditures (Salaries):—

C. Bannister [Geologist] July 22-28, Aug. 9, 8 days @ $53.75 = $431.36
T. Sharpe [Geologist-Supervisor] July 28 1 day @ $65.38 = $65.38
D. Plutte [Assistant] July 22-28 7 days @ $34.36 = $240.52
D. Thuon [Assistant] July 22-28 7 days @ $29.11 = $208.53
TOTAL $945.79

Apply. 2 certificates of work for Meindl 9, 10, 12 } Total = 9 claims
3 certificates of work for Meindl 11 }

4. That I have not and will not use the work declared herein in any way for the purposes of obtaining tax exemption on a Crown-granted mineral claim under the terms of the *Taxation Act*.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA R. A. DUJARDIN

SWORN and subscribed to at VANCOUVER, B. C.
this ..... day of .....
19 ..., before me— AUG 27 1971
* ..... Sub-Mining Recorder

* This affidavit may be taken by a person empowered to take affidavits by the *Evidence Act* of British Columbia.

APPENDIX II

I am a geologist employed with Canadian Superior Exploration Limited.

I graduated with a B. Sc. degree in Geology from the University of British Columbia, Vancouver, British Columbia in 1966.

I have worked in the mining industry since graduation in the Yukon, Northwest Territories and in the Province of British Columbia.

I am the author of this report.

C Banninger

ASSAY RESULTS

SAMPLE No.	WIDTH(Feet)	Cu.%
ME-1	4.4	4.10
ME-2	3.8	2.40
ME-3	0.5	13.80
ME-4	1.4	7.40
ME-5	1.0	4.80
ME-6	3.3	8.20
ME-7	2.0	1.07
ME-8	1.6	5.45
ME-9	1.8	2.70
ME-10	0.6	1.98
ME-11	2.0	15.60
ME-12	3.7	14.80
ME-13	1.0	2.40
ME-14	1.0	5.35
ME-15	2.2	1.55

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. A. DUJARDIN

To accompany geological report by C. Banninger
and R.A. Dujardin, P.Eng., on the MEINDL GROUP,
Toad River Area, Liard M.D., dated September 15, 1971

LEGEND

- Argillite and argillaceous dolomite
- Basaltic-doleritic dyke
- Attitude of quartz vein (showing dip)
- Broken vein material
- Fault
- Attitude of bedding
- Attitude of fracture cleavage
- Geological contact (observed, inferred)
- 6200' Contour interval (approximate): 200 feet
- Previous trenching
- •ME-2 Sample location
- 11|12 / 9|10 Claim line
- Ridge line
- Snow line
- 6180' Elevation point

N.T.S. 94K/3

SCALE
FEET 0 100 200 300 400 500 FEET

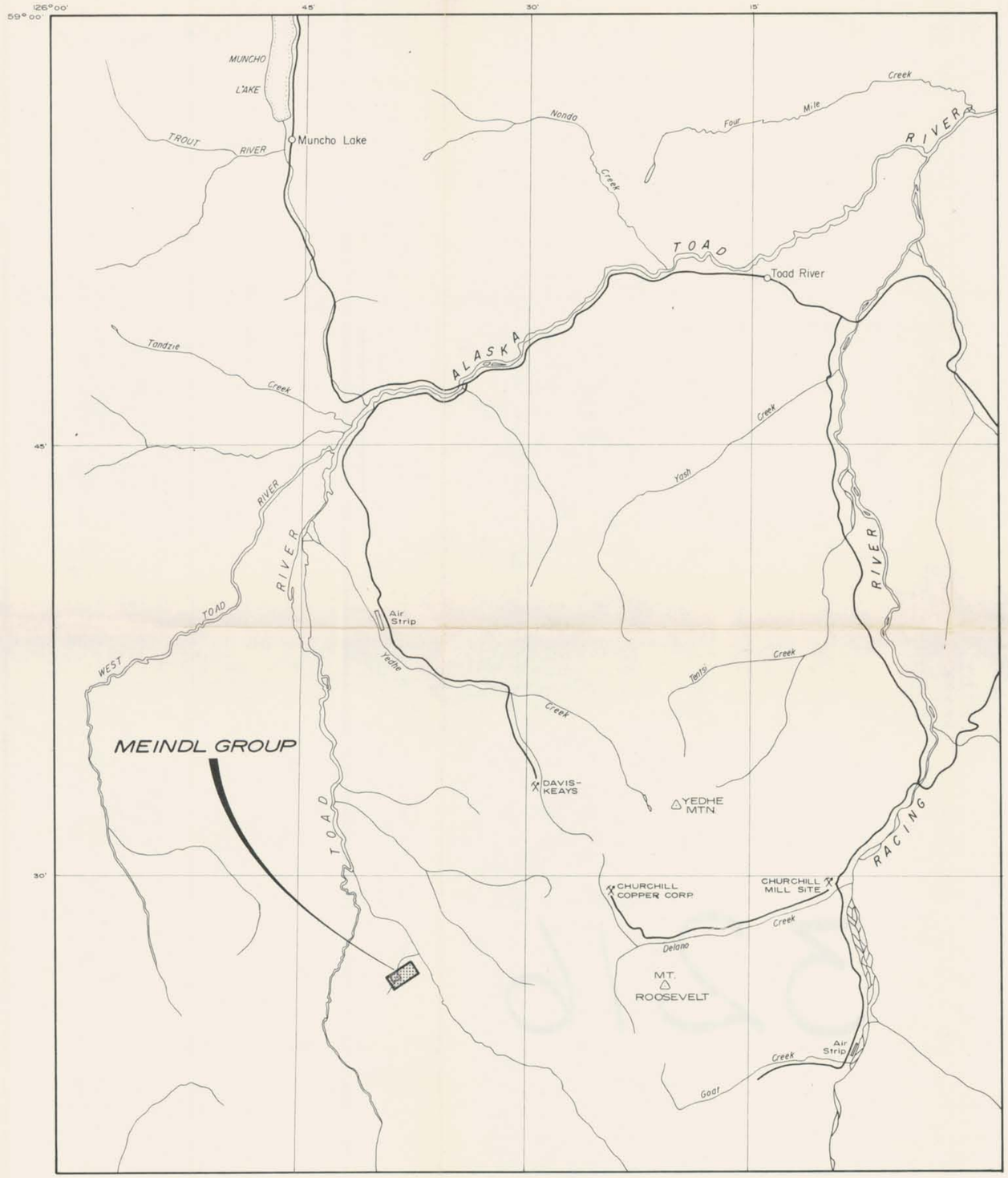
CANADIAN SUPERIOR EXPLORATION LIMITED

WINDERMERE EXPLORATION PROJECT

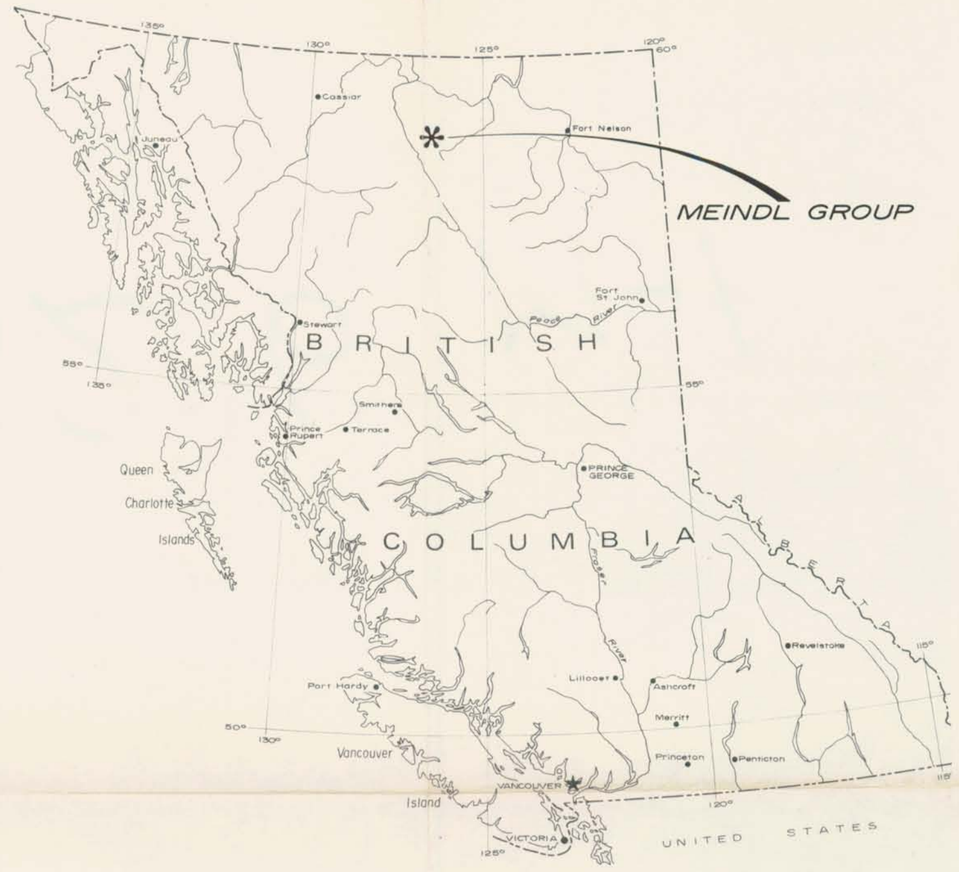
'MEINDL' CLAIM GROUP

GEOLOGY & ASSAY PLAN

MAP B. | DATE SEPTEMBER 15, 1971 | DWG. C. BANNINGER



SCALE 1"=4 MILES



SCALE 1"=136 MILES (APPROX.)

3216

M-1

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. A. DUJARDIN

To accompany geological report by C. Banninger and R.A. Dujardin, P. Eng., on the MEINDL GROUP, Toad River Area, Liard M.D., dated September 15, 1971

CANADIAN SUPERIOR EXPLORATION LIMITED.		
WINDERMERE EXPLORATION PROJECT		
'MEINDL' CLAIM GROUP LOCATION MAP		
MAP A.	DATE. SEPTEMBER 15, 1971	DWG. C. BANNINGER