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<p><u>LEAD-ZINC SILVER PROPERTIES</u> <u>COAL RIVER, YUKON; FLAT RIVER NWT</u></p> <p>By:</p> <p>J.C. Turner</p>
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013302

N.W.T. & YUKON

LEAD-ZINC

SILVER

PROPERTIES

COAL RIVER YUKON FLAT RIVER N.W.T.

JOHN C. TURNER

PROSPECTOR

## INTRODUCTION

This report has been compiled by the writer Mr. J.C. Turner to present to interested parties a comprehensive personal report on Lead-Zinc discoveries made by Mr. L.P. Duquette and himself in 1965 while employed as prospectors for the Norquest Joint Venture.

This report in general will attempt to explain the geological and topographical aspects of the area, the mineral occurrences as known, history of work on the showings in question, adjacent ground, suggestions for acquisition and work on the showings.

Where possible I have consulted my previous diaries, field reports, maps, etc., however much of the contents must of necessity come from memory, personal observations, and discussions with other personnel who have been in the area. Consequently I have written this report with a conservative view in regard to the physical nature and extent of the mineralization.

44 RAM-ROD  
 12 March due date  
 32 - 4 yrs assessment

<u>Name of Property</u>	<u>No. of Claims</u>	<u>Owner</u>	<u>Approx. Date Due</u>
* RAM-ROD	32	J.C. Turner	1970 ✓
* <del>RAM-ROD</del> ROD, NW 1	8-12	J.C. Turner	---to be staked--- STAKED
WEATHER YUKON	8	J.C. Turner -L.P. Duquette Held by Norquest subject to turn back July 1969	1969 → SHOULD BE RE-STAKED

KEY

Geophysical. 24  
 Done.  
 May. EM + Geochron

J.C. Turner-R. Schumacher  
 optioned to Wescan--option  
 terms not complied with;  
 action taken to get claims  
 back. *Columbi*  
*Albertson*  
*Avail for deal*

\* A further staking of a minimum of 16 claims adjacent to  
 the Key claims is applicable. Completed 16 FRED CLAIMS ✓

Terms of Reference

1. Geology- Flat River--Map 35-1964-- Paper 64-52
2. Topography- Francis Lake--Sheet 105-H  
 - Flat River--Sheet 95-E
3. Claim Sheets- 95\*E 11  
 95-E 12  
 95-E 5  
 95-E 6
4. Paper 67-36--Page 12  
 Paper 61-23--Page 46
5. Personal notes-diaries-maps and observations

## Work Program Suggestions:

1. Exploratory Diamond drilling on the three main mineralized zones on the RAM-ROD claims, using a suitable drill for to 300' holes.
2. Further exploratory drilling on other claims if feasible.
3. Have a competent structural geologist conversant with the area; Examine and write a geological report on the properties.
4. In conjunction, but separately have a mining engineer examine the properties-log the ~~course~~ <sup>core</sup> and write an economic engineering report. Again this engineer should be one conversant with lead-zinc replacement occurrences, and with the area.
5. I would suggest Dr. H. Gabrielse for the Geology if available, and Dr. P. Severusma for the Engineering Report.
6. Conversant on the results of the drill program and reports a road should be the next step taken prior to an expanded drill program.

IRON

Keno Hill  
SILVER

MAYO

YUKON  
TERRITORY

MACENZIE  
RIVER

X HUDSONS BAY  
MINING

VE FINGER  
POWER

PELLY POWER DEV.

ANVIL DEVELOPMENT

DANGORRA

Ross  
River

CANADA  
Tungsten

RAM-ROD

NORTHWEST  
TERRITORIES

X ATLAS

Frances

X ATLAS

POWER

NEW  
IMPERIAL

ARTIC  
MINES

WHITEHORSE

X PORQUEST

GLENNA  
LAKE  
SILVER

X COPRUS

NORTH-WEST  
MINERALS

X HYLAND  
RIVER  
MINES

X GRANDORA  
EXPLORATION

X ATLAS

X LIARD  
MINING

Oil  
Coal

HYDRO-POWER  
DEVELOPMENT

CARCROSS

TESLIN

GOLD.

ATLIN

ALASKA HIGHWAY

WATSON LAKE

ASBESTOS

Cassiar

Copper

POSSIBLE RAILWAY ROUTE - P.G.E.  
ROCKY MOUNTAIN TRENCH

LIARD  
RIVER

COPPER

DJUNEAU  
ASKA

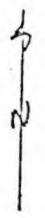
CANADA  
U.S.A.

Telegraph  
Creek

BRITISH  
COLUMBIA

Copper  
Molybdenite

Sifton  
Pass



\* Location and Access

The claims are situated in the Flat River map area approximately 125 air miles north-east of Watson Lake Y.T. Watson Lake is the transportation and supply centre for the area.

Access to the claims at present must be by helicopter chartered from Watson Lake.

Locally the all weather Canada-Tungsten road from Watson Lake to Cantung lies 24 air miles west of the claims, with a dirt airfield capable of handling D.C. 3's at that point.

Approximately 30 miles of road would be required to gain vehicle access to the claim area. No problems are foreseen in building a road in.

Estimated cost would be \$1,250.00 per mile for a four wheel drive road and estimated time using 2 D7E tractors with 1 front end loader and dump truck would be about 6 weeks.

Tote trail assistance would halve the cost.

Cost estimated at \$50,000.00

Roads construction equipment is available at Watson Lake.

## History

1. Mineralization was originally located in the general area by B. Groat, prospector for Northwestern Explorations Limited. in 1954. This mineralization lies approx. 5 miles east of the area in question, however it is on the same general granitic-sediment contact.
2. Mineralization was discovered by the writer, accompanied by Mr. L.P. Duquette, approx. 10 miles South-West of the before mentioned showings. This discovery was made while employed by Norquest Joint Venture. in 1965. Approx. three weeks were spent in the area prospecting and following the mineralization. Claims were staked in the Yukon called the Heather claims and in the adjacent Northwest Territories called the Grizzly claims.
3. Norquest did only a superficial mapping program the following year and certain claims were returned to the finders. 16 Heather clms.
4. The 16 Heather claims were sold to Northwest Minerals Ltd. and the writer with 2 helpers did some trenching work on the showings. Results are included further in the report. Northwest Minerals Ltd. due to lack of finances did no further work and the ground was allowed to lapse.
5. The writer and Mr. R. Schumacher of Vancouver arranged to restake the ground under a work-interest option. Claims were staked named the Key claims 1-24. The company who

History(con'd.)

5.--took up the option applied one years assessment work on the claims, apparently E.M. Mag and a Geo-chem survey was conducted late in the fall on the property with positive results. However due to failure of the company to live up to the terms of the option, we are now in litigation to recover the claims.

\* 6. Norquest returned some of the Grizzly claims to the writer and partner who allowed them to lapse and then restaked them under option to Ramid Resources. The claims in the Northwest Territories were called the Ram-1-16 and Rod-1-16 claims.

The writer, accompanied by Mr. M. Jacoby of Ramid and Mr. Arnold Frank examined and noted mineral outcrops prior to a geological crew from A.C.A. Howe International Field Chief Mr. J. Tilsly P. Eng. who arrived late in August 27th to map the property. Hand trenching was done by use of explosives no drill being available, until the closure of the job due to snow conditions which were prevalent throughout. The report on the property as published by Ramid is included in this report.

It is anticipated that due to other commitments of Ramid in Mexico that the option will be dropped. The writer was requested to extend the option payment for one year for minor financial consideration but did not desire to do this.

\* 7. Heather claims are being held by Norquest subject to turn back in July if work is not recorded. These claims will be, no doubt, returned to the writer and Mr. L.P. Duquette as Norquest have not done anything since 1966.

\* 8. Unstaked ground containing mineral outcrops and/or applicable geological, geophysical and geochemical bets is at this writing still available for staking.

9. Property Optioned to Monarch Metal Mines Ltd Underwriting do not come thru so they were forced to drop the option July 15 /69.

## Topography of Area

The topography of the area is mountainous, elevation in which the mineralized outcrops occur are from 4,500' in the South-West to 7,000' in the central portion of the zone. With one exception all the mineral zones lie above timberline. General accessibility is from easy rolling type country to cliff faces. However most zones can be readily landed on with a helicopter and all can be reached comfortably by foot.

Water is readily and amply available for drill purposes at all zones. Timber for drill scaffolding would have to be got below the 4000 elevation in the Coal River valley.

## Geology of Area

Mesozoic Intrusive is generally Quartz-Monzonite with a porphyry noted adjacent to the mineralized zones. Middle Cambrian Sediments consist of Wavy banded, silty limestone; platy impure limestone; siltstone, argillaceous limestone, Skarns. Strata is in excess of 4000' thick.

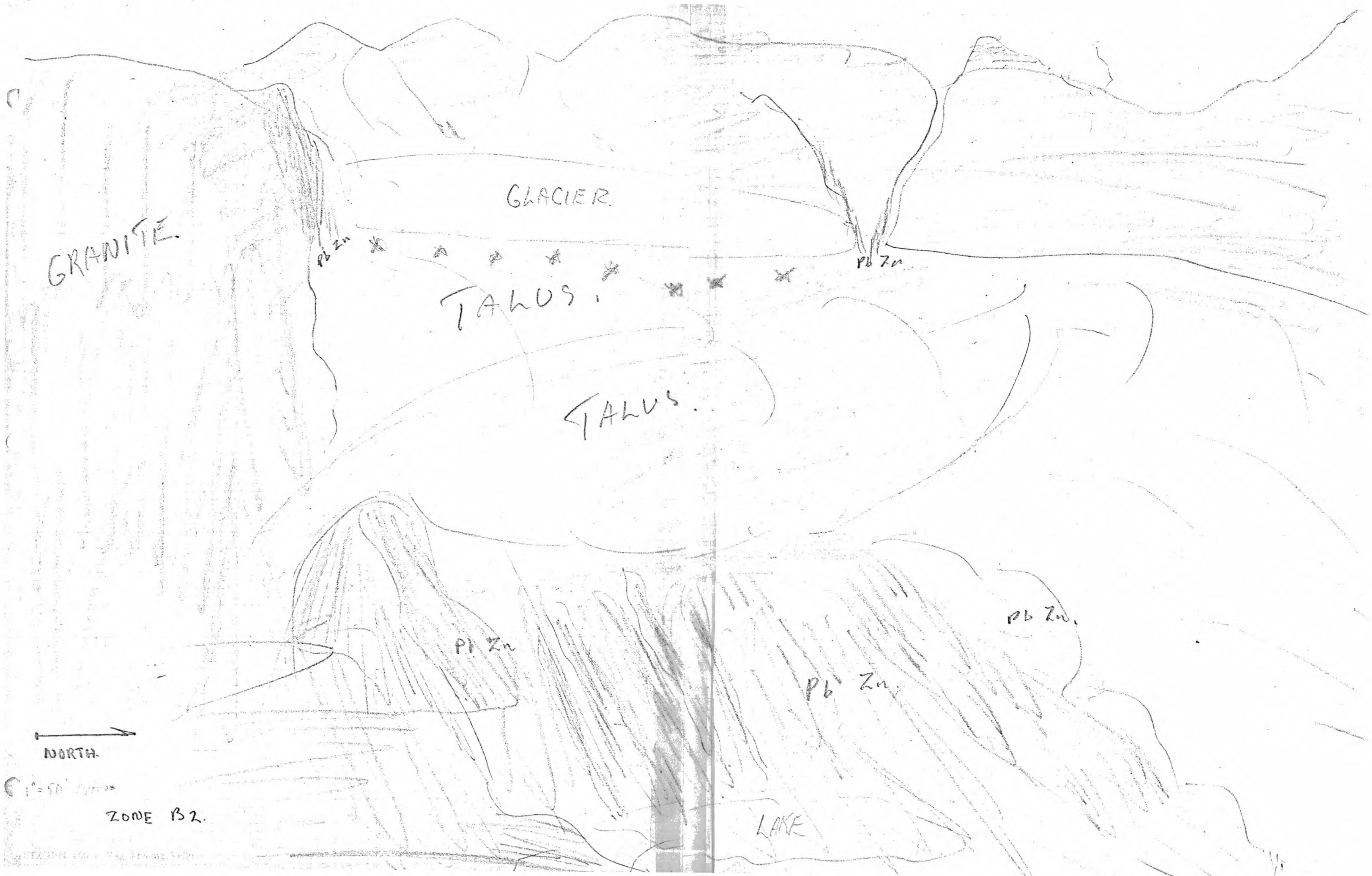
## Mineralization

The mineral consisting of Lead-Zinc-Silver with minor copper in places occurs within the sediments along the granitic contact and in fault zones up to 2,000' away from the contact. The mineral in skarn along the contact has been traced and linked up for a distance of 6 miles occurring in a series of pods and fault fractures of from 3'-150' in width, massive to disseminated. In one location galena was found in the adjacent intrusive.

## Mineralization (con'd)

Mineralization has been noted occurring within a 700' width in several areas, although not continuous over this width, blebs, stringers and replacements have been noted over this area. Pyrrhotite containing minor amounts of copper occur within the intrusive or what may be termed granitized sediments along and adjacent to the contact zone. Gossan is not pronounced in the area, and in most instances the rock must be broken to expose the mineral.

Silver values of up to 66 ozs. per ton have been found in float in the area, however the normal assays would be in the neighborhood of from 1 to 5 ozs. per ton with medium-8%-20% combined lead-zinc.



GRANITE

GLACIER

TALUS

TALUS

LAKE

Pb Zn

Pb Zn

Pb Zn

Pb Zn

Pb Zn

NORTH

1:50

ZONE B2.

FAULT ZONE

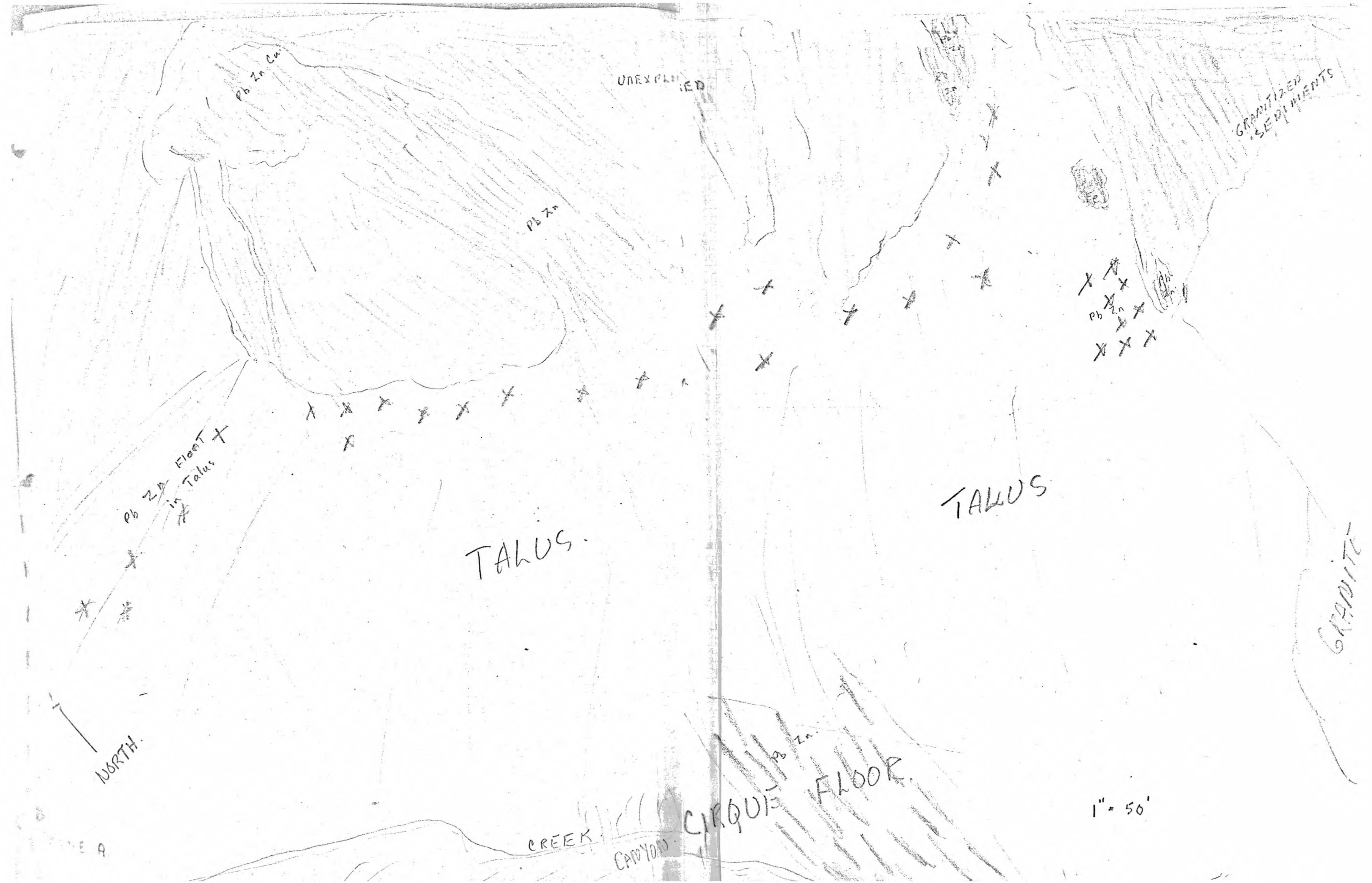
85°

Pb Zn Float.

TALUS

NORTH.

ZONE C



UNEXPLORED

GRANITIZED  
SEDIMENTS

Pb Zn Cu

Pb Zn

Pb Zn  
FLOOR  
in Talus

TALUS

TALUS

GRANITE

1" = 50'

CREEK

CANYON

CIRQUE

FLOOR

Pb Zn

NORTH

A

UNEXPLORED.

To Zone A  
↑

UNEXPLORED.

Granitized  
SED.

FAULT ZONE

Z<sub>1</sub> P<sub>3</sub>

TALUS

NORTH  
↑

ZONE B 1"

1" = 50'



# RAMID RESOURCES LTD.

617-789 WEST PENDER STREET  
VANCOUVER 1, B. C.

December 17, 1968

## President's Report at Extraordinary Meeting

This is the first report to be presented to the shareholders, on behalf of the Board of Directors.

The Company was incorporated as a private company on March 4, 1968, and was converted to a public company on July 19, 1968, for the purpose of developing natural resources in Canada. This meeting is to seek the shareholders' approval to allocate funds to expand the Company's exploration program into Mexico and Arizona, U.S.A.

In addition to your Directors, your Company is fortunate enough to have an outstanding founding group of shareholders consisting of leaders in the mining and industrial fields, which include:

Bernard O. Brynelsen  
John A. McLallen  
Patrick M. Reynolds  
Mervin E. Davis  
J. William Sharp

Members of the founding group who are presently serving as Directors of this Company, are:

Donald B. Carmichael - President  
Frederick W. Charlton - Secretary Treasurer  
Jacob Austin - Director  
Arthur B. Elworthy - Director

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The Directors are very optimistic about the proposed new properties and an exploration program is planned to start immediately the acquisition details are completed.

All work by the Company to date has been conducted under the supervision of C.J. Coveney, P. Eng., formerly chief geologist and production engineer of Bethlehem Copper Corp. and senior exploration geologist with American Smelting and Refining Co. Ltd. in Canada. Mr. Coveney has been working closely with James Glass, P. Eng., consulting geologist, Tucson, Arizona, whom we are fortunate enough to have with us today. Mr. Glass has been actively engaged in mining exploration in Southern U.S. and Mexico for several years. With Mr. Glass' assistance, we are investigating some interesting mining properties in Arizona and Mexico.

### Copper

#### Coppermine Claims - Northwest Territories

In January, 1968, the Company acquired 100 mineral claims known as the Bud Group. These claims were well positioned in the highly active exploration area of the Coppermine River. Exploration work on the group consisted of a geological mapping, an airborne magnetometer survey and 13 miles of ground magnetometer surveying and prospecting. A crew, under the supervision of Mr. Coveney, left Vancouver, July 2nd and remained in the area until August 9, 1968.

Results of the exploration program over the entire 100 claims proved disappointing as only a minor amount of copper float was found. The results, however, were not conclusive and the Company has applied for a certificate of work to keep the claims in good standing for another year, in order to await further results of the larger companies who are continuing development work in close proximity to our claims. In the meantime, your Directors do not propose any work on these claims in 1969.

Mush Lake Area, Yukon Territory

During 1968, your Company prospected and staked 40 claims located near Mush Lake, approximately 50 miles south of Haines Junction.

A prospecting program was successful in locating copper mineralization and assays on grab samples show 2.73% and 2.52% copper. In a previous report made out on the property, an exploration program was recommended by J.B.P. Sawyer, P. Eng., to determine a better assessment of the copper occurrences in the area. It is planned to conduct an exploration program under the supervision of Mr. Coveney in the spring of 1969, and further reports will be made available at that time.

Lead, Zinc, Silver

Flat River Area - Northwest Territories

*10 days*

During the months of ~~July~~ and August, 1968, your Company carried out geological mapping and prospecting on 32 claims

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situated in the Northwest Territories, 105 miles northeast of Watson Lake, Yukon. A recent report from A.C.A. Howe International Ltd., who conducted the exploration work on the property under the supervision of James E. Tilsley, F.G.A.C., P. Eng., discloses that the claims cover a portion of an important geological contact zone along which lead, zinc and silver mineralization has been discovered.

Geological mapping and prospecting of the contact zone has shown two types of mineralization. Immediately associated with the intrusive contact are zones of lead-zinc bearing lenses. Some 2,000 feet away from the exposed intrusive and lying parallel to it, is a zone of mineralization in a fault structure.

The most continuous mineralization in the fault structure has given samples averaging 7.3% lead, 9.21% zinc, and 0.58 oz. silver per ton. The average of samples from the contact zone over a 2,000 foot length is 1.70% lead, 5.62% zinc, and 1.38 oz. silver.

A follow-up program has been recommended for the property for the 1969 season. Ramid is proceeding with the plans for the further work which include detailed exploration of silver, lead and zinc zones indicated by areas of extensive, and good grade, float.

As a result of our exploration work, a major eastern mining company currently working in this area is showing interest in this group of claims.

Finance

Our prospectus dated July 19, 1968, offered 300,000 shares to net the treasury \$150,000. I am pleased to report that the shares were all sold and paid for and a market has now been called on an over the counter basis in the Vancouver Stock Exchange.

At the present time, the Company has \$9,982 cash and \$90,000 on short term deposit. In addition, we have filed a claim in the amount of \$14,374 with the Northern Mineral Exploration Program for 40% of the exploration costs incurred in the Coppermine and Flat River area.

The Company at present, has investments at costs, as follows:

2,500 shares of Ionarc Smelters Ltd.	\$1,250
5,000 shares Thermochem Industries Ltd.	5,371
1,900 shares of Magnum Consolidated Mining Co. Ltd.	3,534

Gain from the sale of securities to date amounts to \$9,222 so that these securities have in effect cost the Company nothing.

The Directors are of the opinion that the present market value of these securities is about \$100,000.

Major exploration costs to date are as follows:

Coppermine River area	\$19,081
Flat River area	17,128

Legal and administration expenses to date amount to \$7,434.

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Current liabilities of the Company, not including property acquisition payments, are \$1,460.

Further financing will not be required at this time to complete your Company's acquisition and exploration plans, but your Board needs your approval to spend money raised under the Prospectus to complete this program.

SUBMITTED ON BEHALF OF THE  
BOARD OF DIRECTORS

D. B. Carmichael,  
President.

December 17, 1968.



43 84 76

5 81 72

CONCRETE

LIMESTONE

1/2 mile

J.C. Turner  
P.O. Box 94  
Watson Lake, Y.T.  
Aug. 26, 1968

Progress Report  
Ram-Rod claims  
Attn.  
Mr. D. Carmical  
Ramid Resources  
617-789 West Pender St.  
Vancouver 1, B.C.

1. Object:

To establish a camp on claims, and familiarize crew with property. To establish mineral boundaries for geological mapping and tie in mineral zones, preparatory to the arrival of a geologist (A.C.A. Howe International) to map property.

2. Mobilization:

Mr. M. Jacoby and two(2) men mobilized from the Coppermine area. Both men quit and I arranged to hire a Mr. Arnold Frank Aug. 20, 1968 @ \$25.00 per day. Mr. Turner from Vancouver, 15 Aug., 1968. Camp gear and Mr. Frank proceeded by vehicle to the Hyland River flight strip (Mr. G. Rudyk was hired to take load up the road and return U Drive vehicle to Watson.) Mr. Jacoby and Mr. Turner went directly to the property by copter.

Copter lifted gear and man in from Hyland Flight Strip. Copter time for mobilization 5 hrs. and 50 minutes. Frontier Helicopters have supplied the camp with their best radio. Radio contact excellent.

3. Work Report:

Prospected East end of claim group, called Zone "A" Mineralization flagged and traced, crew acquainted with zone. Zone "B" extension of Zone "A" approx. centre of claim group. Zone "C" tied in with "A" and "B".

4. Geology(basic):

Intrusive, quartz monzonite with intrusions of Quartz Phosphry noted.

Sediments- limestone, silty calcareous limestone, quartzite, argillites, carbonaceous limestone, containing calcite stringers, minor schists.

5. Mineral:

The predominant mineral is ~~zinc~~ sphalerite and galena, minor calcopyrite.

Occurance:

The mineral occurs as replacements in the sediments with massive to sub-massive replacement of limestone most noted in an extensive and persistent (fault) fissure vein within the sediments, close to the contact zone.

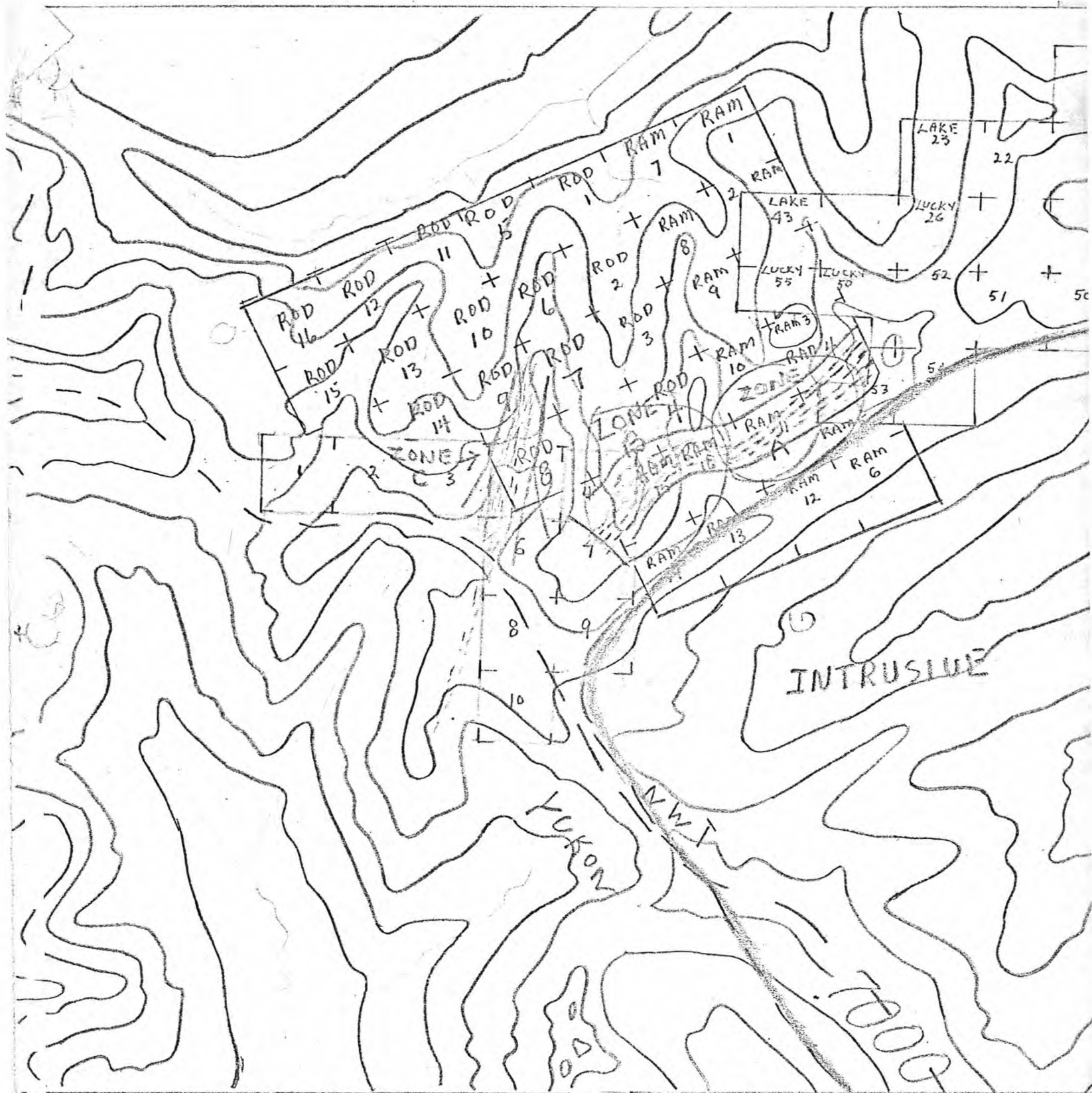
Other smaller faults containing mineral and wall rock replacement emanate off or in close proximity to this main fissure vein.

This fissure containing mineral has been traced and tied in for close to 5,000' within the claim group. Mineral ranges from massive to barren within the fissure. Replacement off the fissure are noted by talus and in place over several hundred feet across the zone.

The fissure is persistent in width through its length at from 10'-20' and over. Intrusive is noted within or close by the fissure. Attitude's taken show the strike as N30° E dip 80°W to N50°E 85°W and E90°. A band of white calcite

of from 3" to 3' is noted in the fissure zones. ~~This~~ *Another* fissure is in Zone "C" ~~another~~ fissure of the same tenor massive wall rock replacement was traced N50° E85° W. It is possible that these fissures join up at two intersections or through subsidiary faulting. Elevations are generally from 6,500' on ridges to 6000' in cirque floors. Outcrops of mineral and extensions of the fissure zone are readily observable in Cirque floor. Helicopter can land on outcrops in cirque's and there is ample water for drilling.

Trenching with a cobra on cirque floors or adjacent slopes is feasible.



↑  
NORTH

GRIZZLY

LUCKY LAKE

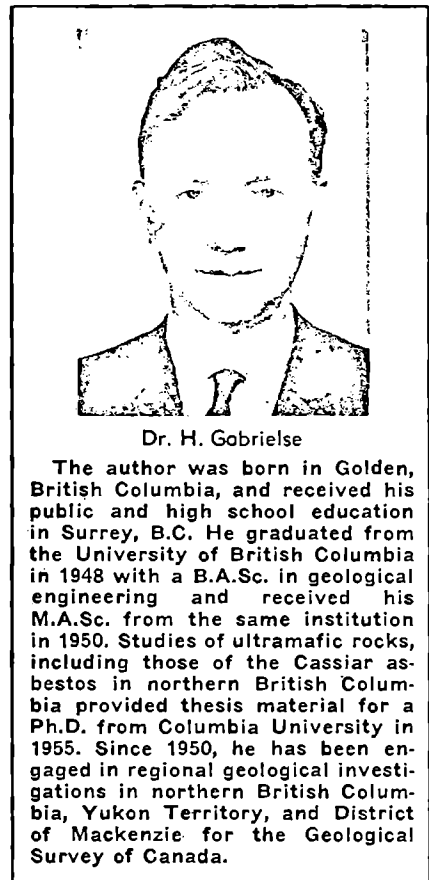
RAM ROD

MINERAL ZONE

J.P. 7

# LOWER CAMBRIAN STRATA AND BASE METALS

by H. GABRIELSE  
Geological Survey of Canada



## Introduction

The Western Cordillera of Canada presents the exploration geologist with a great diversity of rock types and structures. The selection of exploration targets within this heterogeneous terrain has been difficult, in part, because insufficient geological information has been available for large regions and, in part, because of the limited appreciation of the relationship between stratigraphy and mineral deposits.

It is now apparent that exploration programs must take cognizance not only of intrusive rocks but also of the age, lithology, and distribution of the stratified rocks. The importance of stratigraphy to mineral exploration is demonstrated by the numerous occurrences of copper minerals in volcanic rocks of Upper Triassic age (Souther, 1965; McKechnie, 1966; Ney, 1966; Souther and Armstrong, 1966) in contrast to the few occurrences known in volcanic-bearing Carboniferous and Permian strata. As another example, it has been evident for some time that Lower Cambrian (possibly including Eocambrian) strata are important host rocks for base-metal concentrations in the eastern part of the Western Cordilleran region. The purpose of this paper is to emphasize this aspect of metallogeny in part of the northern Cordillera.

## Acknowledgements

The writer is grateful for comments by A. M. Goodwin and G. B. Leech who kindly reviewed the manuscript. He is also indebted to S. L. Blusson, J. J. McDougall, W. N. Plumb, D. F. Sangster, and D. J. Tempelman-Kluit for stimulating discussions.

## Distribution of Base-Metal Deposits

The accompanying generalized map (Fig. 1) shows the distribution of significant lead-zinc occurrences in south-eastern Yukon Territory, southwestern District of Mackenzie, and adjacent British Columbia. All but one or possibly two deposits are in strata older than Mississippian. One base-metal deposit near the Yukon Territory-British Columbia boundary and about 30 miles east of Teslin Lake consists of veins in Mesozoic granitic rocks. The age of metamorphic host rocks at the silver-lead-zinc showings

just north-east of Teslin River is unknown. The remaining prospects in strata other than Lower Cambrian or Eocambrian appear to occur in rocks that are stratigraphically near the boundary between the Middle and Upper Devonian. The great majority of significant deposits, however, has been found in strata of Lower Cambrian and (?) Eocambrian age.

## Character of Mineral Deposits

Base-metal deposits in Lower Cambrian or Eocambrian rocks include the well known, large, massive sulphide bodies at Faro, Vangorda, and Swim Lakes in the Vangorda area and several other smaller but similar deposits east of Frances River and at Quartz Lake. These bodies are broadly concordant with enclosing strata and banding of sulphide minerals commonly reflects structures and bedding of the host rocks. All deposits appear to have been metamorphosed to some degree along with enclosing strata.

Tempelman-Kluit (1968) noted that the average grain size of sulphide minerals in the Faro, Vangorda, and Swim Lakes deposits bears a direct relationship to the grade of regional metamorphism. The Swim Lakes and Quartz Lake areas are characterized by low grade regional metamorphism whereas the Norquest area displays moderate regional metamorphism with widespread development of schist and gneiss (Green, 1966; Blusson, 1966). As a general rule, in the areas of highest grade regional metamorphism pyrrhotite content is relatively high.

According to Roots (1954), base-metal deposits of the Ferguson Group just south of Ingenika River in the Aiken Lake area occur in Lower Cambrian limestones. The mineralized zones are concordant with bedding and occupy the same stratigraphic intervals throughout. Original bedding structures of the limestone have been retained in the sulphides. This occurrence and those noted above may be referred to as strata-bound.

Many other lead-zinc occurrences are typical vein deposits in which galena and sphalerite are found with gangue minerals such as calc-silicates, dolomite, ankerite, barite, quartz, and siderite. Magnetite and manganese minerals are common in the McDame area in veins within the contact metamorphic aureole of the Cassiar Batholith. In most cases these deposits are characterized by well defined, local

structural controls including faults, fault zones, and contacts between rocks of contrasting lithologies.

A third type of deposit includes small bodies within contact metamorphic aureoles of large granitic plutons. They are commonly discontinuous and rarely exhibit any clear structural or stratigraphic control of mineral deposition.

### Local Controls for Mineralization

Local controls for the emplacement of sulphides in the Faro, Vangorda, and Swim Lakes deposits are not apparent (Tempelman-Kluit, 1968). The mineralized strata are fine-grained, in part possibly tuffaceous sediments which are relatively rich in quartz. In somewhat similar massive sulphide deposits at Norquest and Quartz Lake the sulphides are in limestones or dominantly calcareous strata within sequences of non-calcareous clastic rocks.

At the Tom Lake prospect about 30 miles north-northwest of Watson Lake galena and sphalerite occur in a coarse, calc-silicate skarn developed locally in lower Cambrian limestone (Gabrielse, 1966). The presence of the skarn is anomalous in this region of negligible regional metamorphism and suggests the possibility of nearby, underlying intrusive rock. Mineralization seems to be entirely confined to the thin, discontinuous Lower Cambrian limestone.

Near Coal River, galena and sphalerite occur with abundant barite in a major or fault zone cutting Lower Cambrian strata.

In Cassair Mountains the base-metal deposits are most commonly related to faults in carbonate strata of the Lower Cambrian Atan Group. Locally, on and near Mount Haskin in the McDame area, mineralized skarns containing abundant pyrrhotite and sphalerite occur along a major north-west-trending fault zone cutting Lower Cambrian strata.

In Cassiar Mountains the base-metal deposits are most commonly related to faults in carbonate strata of the Lower Cambrian Atan Group. Locally, on and near Mount Haskin in the McDame area, mineralized skarns containing abundant pyrrhotite and sphalerite occur along a major north-west-trending fault as well as along or near the contact between clastic and carbonate rocks (Gabrielse, 1963). To the southeast, in the canyon of McDame Creek, galena and sphalerite with pyrite, pyrrhotite, chalcocypite, and minor hematite and scheelite occur in a skarn of grossularite, diopside, and tremolite. Holland (1966)

notes that the mineralization forms massive lenticular replacements parallel with bedding, fills fractures that cross the bedding, and forms disseminations in the skarn zones. Another mineralized zone on the same property is localized by a strong fault that transects bedding in the host limestone.

Green (1968) describes the silver-lead showings in the Ketz River area as lacking a consistent pattern. They include veins, concordant lenses, and irregular bodies in several rock-units. Between Ketz River and Rancheria at least four base-metal prospects have been found in Lower Cambrian Limestone (Green, 1968). Green notes that "Generally, deposits of this type are in the form of galena- and sphalerite-bearing lenses that lie beneath thin layers of schist within the limestone. Some cross-cutting veins are also present."

Discontinuous, pod- or lens-shaped bodies of sulphide minerals locally occur within the contact metamorphic aureole of granitic plutons. Examples of this type are the base-metal prospects in limestone in the McDame area and the showings in limestone and calcareous argillite near Lucky Lake southwest of Flat River. These occurrences have many features typical of contact metamorphic mineral deposits.

The examples cited above illustrate the main characteristics of base-metal deposits that are in the Lower Cambrian and (?) Eocambrian rocks in the region under consideration. They occur in a wide variety of regional and local structural settings and, although all are within or near regions of granitic intrusions or regional metamorphism, they show no consistent spatial relationship to granitic or metamorphic rocks.

### Relationship Between Base-Metal Occurrences and Sedimentary Facies

Figure 2 shows the distribution of facies in Lower Cambrian strata. Northeast of Tintina and Rocky Mountain Trenches the easternmost belt comprises thick sequences of sandstone, siltstone, and shale. Thick sequences of coarse polymictic conglomerate are present in the southeastern part of the region.

East of Coal River the clastic rocks are underlain by basic volcanic flows of either Early Cambrian or Late Proterozoic age. No base-metal occurrences have been reported from this belt.

In northern Rocky Mountains the conglomeratic clastic rocks grade westerly into fine-grained sandstones, siltstones, and shales. This facies in-

cludes discontinuous lenses of archeocyathid-bearing limestone. In the Coal River area and to the north, the coarse clastic facies grades westerly into a sandy, buff-orange weathering dolomite succession that locally contains thin basic volcanic flows. Limestones and calcareous argillites are prominent near the western margin. The pyrrhotite rich deposit at the Canada Tungsten Mine is in the western part of this belt but no significant base-metal occurrences are known.

Still farther west the Lower Cambrian succession consists of a lower, dominantly siltstone formation and an upper, dominantly limestone formation. These rocks include the base metal deposits in barite gangue near Coal River and the Lucky Lake prospect southwest of Flat River.

Finally, the westernmost and most widespread facies of lower cambrian rocks east of Tintina and Rocky Mountain Trenches comprises fine-grained clastic rocks, mainly siltstones and shales, variably calcareous and, in places possibly tuffaceous. Discontinuous limestone bodies are present locally. These rocks underlie much of Selwyn Basin (Gabrielse, 1967). In many places it is difficult or impossible to separate the fine-grained, clastic Cambrian rocks from similar lithologies of late Proterozoic age. The strata are therefore referred to as Eocambrian. The Lower Cambrian and (?) Eocambrian strata of Selwyn Basin contain the large massive lead-zinc bodies at Faro, Vangorda, Swim Lakes, Norquest, and Quartz Lake. So far no important base-metal discoveries have been made in the older clastic strata of Hadrynian (Late Proterozoic) age.

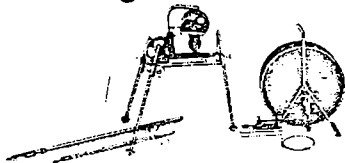
In most of the region southwest of Tintina and Rocky Mountain Trenches Lower Cambrian rocks comprise a lower sandstone formation, a relatively thin middle shale formation and an upper limestone formation. Almost all the base-metal occurrences in Cassiar Mountains are in or along the contact of the upper limestone. The limestone is also an important host rock in Pelly Mountains (Green, 1968).

In summary, no significant base-metal deposits have been found to date in the eastern clastic and sandy dolomite facies belts of Lower Cambrian rocks. On the other hand, strata of the more westerly fine-grained clastic and limestone facies are host to numerous base-metal concentrations. Thus exploration work carried out so far suggests that relatively large, strata-bound massive sulphide deposits may be confined largely to the fine-grained, variably calcareous facies.

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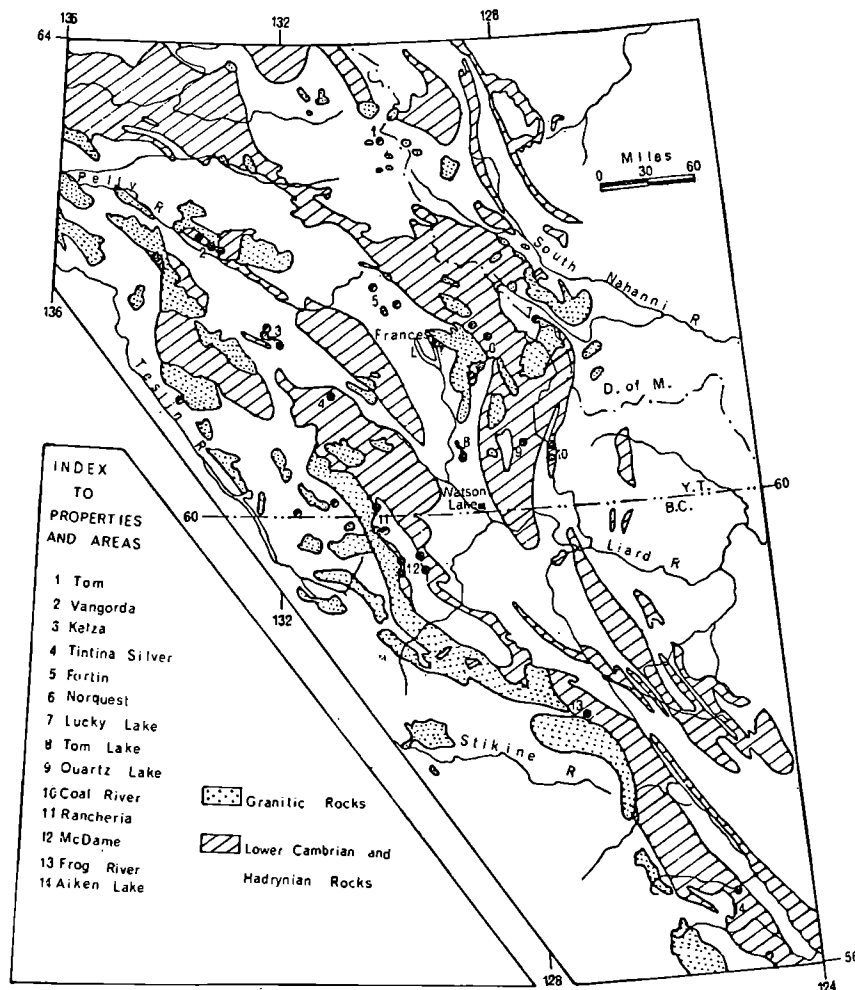


Figure 1  
Distribution of Lower Cambrian and Hadrynian strata and Mesozoic granitic rocks. Base-metal deposits in Lower Cambrian and (?) Eocambrian rocks shown as solid circles; those in younger strata shown as half solid circles.

## Comments

The empirical relationship between base-metal deposits and Lower Cambrian strata in the region discussed must be considered in any concept concerning ore genesis. Also, concepts of ore genesis should take into account the apparent lack of significant base-metal deposits in such widespread and lithologically varied sequences as the older Hadrynian strata; the Upper Cambrian Lower Ordovician limestones, silty and argillaceous limestones, and calcareous argillites; the Siluro-Devonian carbonates; and the Upper Paleozoic rocks such as the Cache Creek Group, and much of the Sylvester Group. To the writer's knowledge the only relatively large base-metal deposit in the region that may be in strata younger than Cambrian is that on the Tom property near Canol Road (Green, 1965). The age of the host rocks there, however, is in doubt. Green considers them to be Ordovician or Silurian whereas Tempelman-Kluit (personal communication, 1968) believes they may be of

Late Devonian-Early Mississippian age. As noted above a number of small showings are in strata stratigraphically near the Middle Devonian-Late Devonian boundary.

The widespread distribution of base-metal deposits in varied lithologies of Lower Cambrian and (?) Eocambrian age and the lack of significant concentrations of these metals in most other stratigraphic assemblages are difficult to reconcile with concepts of epigenesis that require Mesozoic and Tertiary granitic plutons as source rocks. A more probable role of plutonic activity may well be that of concentrating metals previously dispersed in the host rock.

The McDame area provides a most interesting study in this regard. There the Lower Cambrian strata are underlain by several thousand feet of well-bedded limestones, argillites, siltstones, and slates of Hadrynian age. Overlying the Lower Cambrian rocks are strata ranging in age from Late Cambrian to Late Paleozoic and including a wide variety of lithologies

with several important limestone units. Nevertheless, it appears as if only the Lower Cambrian limestone contains significant concentrations of lead and zinc. For the region as a whole the base-metal-Lower Cambrian relationship is even more remarkable in view of the wide variations in facies of the mineralized strata.

If the Lower Cambrian rocks are the source of the metals one must look for unique aspects of Early Cambrian tectonics and sedimentation that resulted in their unusually high base-metal content. Two contrasting possibilities are the following:

1. During the Early Cambrian and Late Proterozoic large volumes of cratonal Precambrian crystalline rocks were eroded. This resulted in the last great contribution of clastic sedimentary rocks to the Cordilleran geosyncline from the craton. Perhaps these sediments contained the metals that were later remobilized and concentrated to produce the base-metal deposits mainly in Lower Cambrian rocks.

2. In this region important movements took place during Early Cambrian time along faults near the eastern margin of Lower Cambrian deposition (G. C. Taylor, personal communication). That deep seated fractures occurred in this region is attested to by the local extrusion of basic lavas. Possibly, thermal springs related to such deep seated fractures were important in ore genesis.

Future work should contribute to an understanding of the relationship between Lower Cambrian and (?) Eocambrian strata and base-metal occurrences. In any event, the empirical relationship points to a number of exploration targets. For example, the belt of Lower Cambrian and associated strata that extends southeasterly from the McDame area to the Aiken Lake area would seem to merit careful prospecting. The northwesterly extension of this belt into the Ketza area has already yielded a number of showings. Those areas in Selwyn Basin that include Lower Cambrian and (?) Eocambrian strata appear

most promising for strata-bound massive sulphide deposits.

On a regional scale there is an impressive concentration of base-metal deposits in areas that include both Lower Cambrian and (?) Eocambrian strata and large granitic plutons. This applies to the Vangorda area and to a northeasterly trending belt extending from Rancheria and McDame to Lucky Lake. The northeasterly trending belt may be of major tectonic significance. Deep-seated structures with this trend are important in the eastern part of the northern Cordillera and in the crystalline basement of the adjacent Canadian Shield. In this regard it is interesting to note the apparent concentration of mineral deposits elsewhere in the Canadian Cordillera along or near northeasterly trending belts of plutonic rocks. Such belts are as follows: Stikine Arch (Souther and Armstrong, 1966); Skeena Arch (Souther and Armstrong, 1966); and the belt across southernmost British Columbia.

## Conclusion

Lower Cambrian and (?) Eocambrian strata appear to be the most important host rocks for base-metal deposits in the region herein considered. This relationship is important for future exploration and for consideration in concepts of ore genesis.

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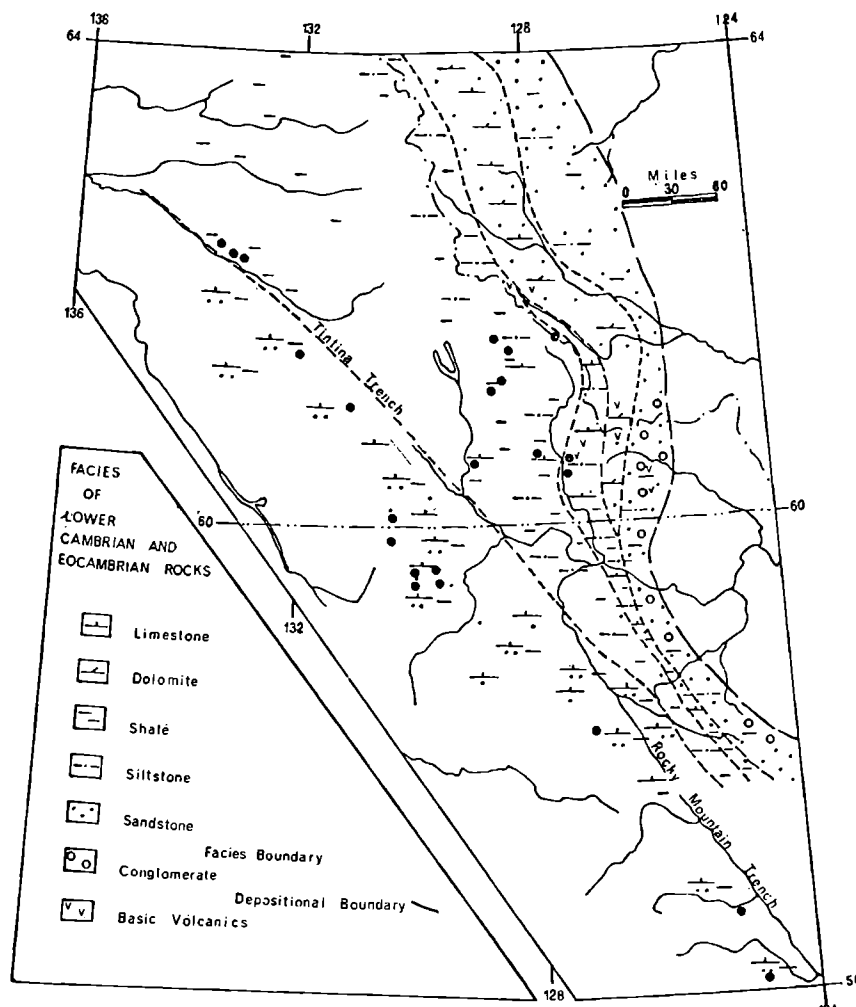


Figure 2  
Distribution of base-metal deposits (solid circles) and facies of Lower Cambrian and Eocambrian rocks.

1965

1. We established camp T.D. 11# at 4800' elevation, approximately  $3\frac{1}{2}$  miles N.E. of T.D. 10#.
2. We have traversed the area bordering on the general zone of the intrusive contact.

The intrusive contact with the sediments swings from North bearing to Easterly at the border and the before mentioned Grizzly showings. It is within this immediate area that the mineralization occurs over the largest area. It occurs as before noted at an elevation of from 6000' to over 7000', obscured in one part by a fairly large glacier is bordered on both flanks by mineral bearing skarn beds and fracture zones containing massive mineral.

3. The mineralization consisting of the sulphides galena, sphalerite, minor calcopyrite occurs in desiminations and massive replacement within the limestone bordering on the intrusive. The mineral occurs from immediately on contact to a distance in places of over 1000' from contact. The limestones are cut in part by fractures and jointing and in these areas contain the highest grade of mineralization. In all cases argillite occurs nearby. There are zones of massive pyrrholite calcopyrite contained in the intrusive which I would term a magnetic segregation within the quartz diorite. In general the area of mineral containing galena, sphalerite appears to be an intermediate temperature zone, a contact metamorphic zone with a silicification of the impure limestone being the alteration product, with calcite occurring within the major fracture zones. The general trend of fracturing strikes N 40°E dipping from 85°N to 85° S.
- No signs of previous prospectors have been observed within the traversed area.

The nature of the terrain in the traversed area can only be described as rough. It would be exceedingly difficult to stake. Possibly on this it may be best to have a geologist map the area and then proceed with staking if warranted. Or a copter staking by air drop. Possibly 9 claims and 1 or 2 fractional claims.

Grab samples have been obtained from zones B# and C# and the one from A# is already in your possession marked "N.W.T."

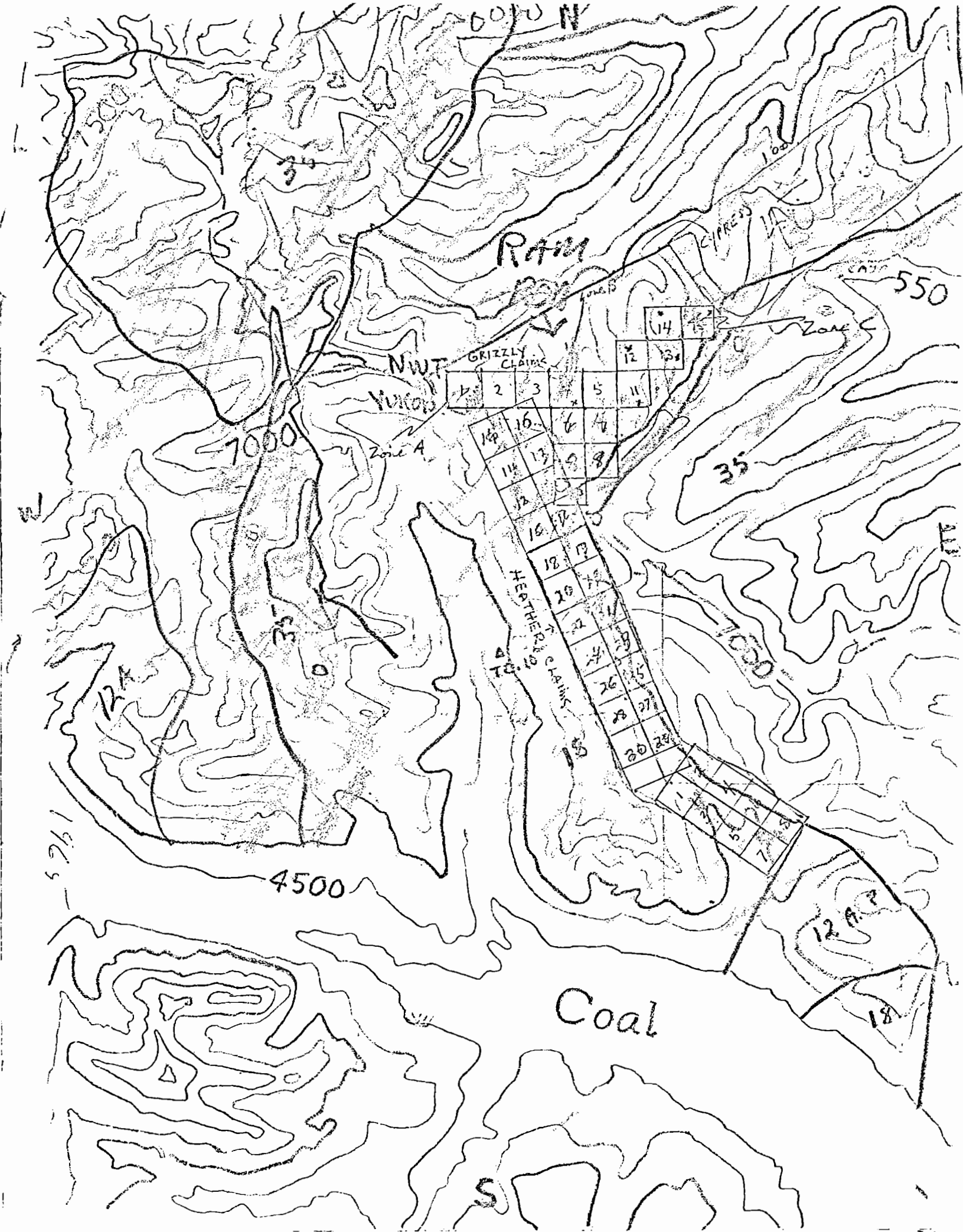
Zone "B" is interesting as it appeared to have a clear cut fracture zone 20' wide and 1000' long containing high grade galena, with altered zones bordering it containing from sparce to high grade material. Large amount of huge boulder float below the showing containing fair amount of mineral, Zn, Pb.

Zone "C" appears to consist of the remnants of mineral beds or bed which outcrop over several hundred feet, from 6500' to 7000' about 20' wide on the average of fairly good mineralization.

Zone "B" is the area in which the before mentioned glacier occurs and borders on the East of the Grizzly showings.

We observed an old copter supplied samp at 4800' in the cirque 1 mile East of T.D. 11. The area has no doubt been looked at up to there, as it borders on Taylors ground. However, the general rock structure in the cirque, argillite, quartz diorite and limestone with a very small amount of mineralization float on the east side in the talus, would tend to discourage prospectors from supposing there was a continuation to the west of the Taylors showing. In the cirque to the west where our finds lie, the mineral is quite high, no gossans and the mineral ized float occurs immediately below the mineral in place. All showings are at the far and difficult end and could easily be overlooked.

Contrary to popular opinion no float is found any distance below the showings in the creeks.



ADDENDA - HEATHER CLAIMS(1) Assessment Work

During the period August 31st to September 10th inclusive, J. C. Turner and two men completed the assessment work on the Heather Claims.

Claims were placed in two groups for the purpose of recording assessment work.

Group 1 - Heather #1 - #8 and #23 to #30 inclusive.

A series of trenches were dug, drilled and blasted, exposing the rock surface and fresh unoxidized material for observation and assaying.

The Heather 1 showing is located on the location line of claims Nos. 3 and 4.

Trench 1 was drilled and blasted over a zone or area of approximately 30' in length and 8' to 10' in depth exposing the unoxidized zone. The mineralized zone consists of massive and disseminated sulphides in limy - altered sediments over an area of 8' in width dipping and disappearing into the creek and overburden approximately 20' in length. The massive zone appears to be about 3' in width, however, due to the creek and overburden obscuring the footwall if any it may be much wider.

Trench 2 was dug and drilled and blasted across the creek and adjacent to Trench 1. Massive sulphides occur over a width of ten feet with disseminated sulphides continuing for another 3' and possibly more.

The area in general is cut through in places with quartz-diorite and the sediments are highly altered and there is quite a bit of local

folding and displacement. There is a major fracture zone in the intrusive and sediments and the sampling in Trench 2 was taken across the fracture zone.

Two (2) trenches were dug on a magnetic anomaly on the location line of #1 and #2 claims - however, bedrock was not reached.

Heather #2 showing, is located adjacent to the location line of claims #7 and #8, approximately 950' from the #1 posts on claim #7.

The area is confined to a canyon through which a creek flows.

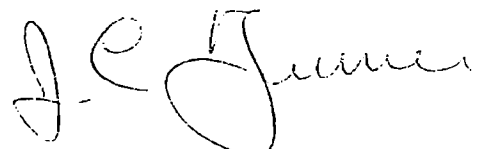
Trenches No.s 1, 2 and 3 were drilled in skarn and limy inclusions in argillite containing disseminated and massive mineral. The occurrences are of a lense type structure with fracture fillings throughout.

Trench No. 4, consists of a large zone of mineral occurrences en-echelon with pods of massive material and the remaining area of medium to low grade mineral disseminated through the rock which I would term limestone - chert. There is a large overburden covered - fracture zone above the argillite beds.

Trench No. 5 was blasted by use of pop-shots over an area of 40' and mineral occurs over 50' in disseminated form in rock which I would term as chert.

Trench #6 was blasted immediately above #4 to establish a quantity of rock for assessment work purposes, minor mineralization was encountered.

Owing to the time limit on the assessment due date we were unable to complete the program on the mineral outcrop on claim #22, Group 2.



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ASSAYERS  
CHEMISTS  
GEOCHEMISTS

## CERTIFICATE OF ANALYSIS


SAMPLE(S) FROM NORTHWEST MINERALS LIMITED

REPORT NO.  
V - 1656

SAMPLE(S) OF ORE

	Gold (Au) Troy ounces per 2,000 lbs.	Silver (Ag) Troy ounces per 2,000 lbs.	Lead (Pb) %	Zinc (Zn) %	Molybdenum (Mo) %
21143	<i>Neomon</i>	<i>Alm...</i>	---	---	0.072
21144	<i>4.46</i>	<i>8.34</i>	---	---	---
3953	<i>✓ leather 22"</i>	23.40	---	<i>gyp</i>	---
3954	<i>✓ leather 19"</i>	66.10	79.92	<i>gyp</i>	1.30
3955	<i>Neomon 10' elips</i>	---	---	---	0.484

DATE November 2, 1966

SIGNED 

	Gold(Au) Troy ounces per 2,000 lbs.	Silver(Ag) Troy ounces per 2,000 lbs.	Lead (Pb) %	Zinc (Zn) %	Copper (Cu) %
1127	trace	1.96	0.40	9.30	8' chip ---
1128	.005	3.00	10.10	17.75	10' chip --- X
1129	.01	3.20	11.40	11.60	8' chip + grab --- X
1130	trace	2.40	14.25	15.15	5' rep. grab ---
1131	---	0.40	3.45	3.50	3' chip. ---
1132	.005	0.96	6.00	5.10	5' chip ---
1133	trace	trace	4.90	3.95	3' chip 0.03 <i>found</i>
1134	.005	6.60	15.85	27.25	12' selected --- <i>found</i>
1135	.005	7.20	3.80	19.05	20' selected ---
1136	trace	trace	12.95	11.25	8' chip + grab ---
1137	.005	0.16	1.35	1.60	20' chip ---
1138	---	9.40	1.90	2.30	50' chip. ---
1139	---	0.10	0.30	0.35	20' chip ---
1140	---	0.15	1.70	1.85	50' selected ---
1141	trace	4.80	13.15	22.75	Border grab ---
1142	---	trace	8.25	10.40	Border. grab ---

TE October 13, 1966

SIGNED 

DIVISION OF TECHNICAL SERVICE LABORATORIES

217

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9-28

Turner & Duquette

T.D. 10#

Aug. 21, 1965

Attn.

Mr. A.F. Reeve

Norquest Joint Venture

1. Established T.D. 10# Aug. 14, 1965 approx. 3 miles N.W. of T.D. 9. 3 miles NorthE. of Coal River, 1½ miles S.W. of N.W.T. Border.
2. Border Showing:  
The Border showing lies approx. 1 mile N.E. of T.D. 10 on the S.E. side of cirque at 5700' elev. Altered limestone, skarn, calcopyrite, galena, sphalerite mineralization. Area from 5700' to 5850' over 200' in length consisting of several beds containing the before-mentioned mineral. Grab samples taken over zone. N65°E48°S. Massive pyrrhotite lenses, heavy green skarn 6500' on contact with intrusive quartz. Request assay of Border Showing.
3. Grizzly Showing I:  
The Grizzly I showing occurs in cirque on N face at N.W.T. Border. 6400' elev. Massive beds of skarn containing sphalerite ~~5560' - 7500'~~. Sample obtained listed I "Request assay." Quartz beds in area contain galena, calcopyrite and sphalerite. Much copper stain n float in area. The beds cover an area covered in past by large talus slopes, but outcrop over an area of around an estimated 800' in length and 200' in height. The mineralization appears to be of low grade.
4. Grizzly II showing:

The Grizzly II showing occurs on the South face of the same cirque 6300' elev. large talus area. Beds occur over several hundred feet, however appear rather narrow 3' of high grade, mineral, galena, calcopyrite, sphalerite. Representative sample obtained for assay. Heavy piece of mineralized float in talus also taken for assay as it appears to be local. "A". "B"

5. Grizzly III showing:

Occurs on ridge  $1\frac{1}{2}$  miles N of T.D. 10 at 6800' to 7000' elevations. Heavy galena mineralization in beds observed over 300' and more in widths of from 15' to 3'. Sphalerite is the predominant mineral in the large beds massive galena in the smaller.  $N30^{\circ}E\ 80^{\circ}W$ . Intrusive quartz diorite outcrops over 100' in general area. Two samples were obtained for assay. "A", "B". "B" should also be assayed for cadmium as there is quite a lot of yellow stain in area.

6; Grizzly IV Showing:

Occurs approx.  $\frac{1}{2}$  mile South from Grizzly III it is a general area covering several hundred feet from 6000' to 6400' in elevation consisting of several beds of mineralized skarn containing galena, sphalerite, calcopyrite, in various amounts from massive to sparse.  $N10^{\circ}E50^{\circ}S$ . Sample taken for assay.

The country in which the mineral occurs is difficult to traverse, it is on the same contact as the Heather & Border showings and is no doubt continuous throughout. The Grizzly showings are a continuous series of outcrops over  $1\frac{1}{2}$  miles in length.

	-----Silver-----	-----Zinc-----	-----Lead-----
<u>Heather I(A):</u>	.32	11.98	--Not assayed--
<u>Heather I:</u>	2.3	7.04	7.64
<u>Heather II(G):</u>	2.4	--Not assayed--	9.56
<u>Heather II(D):</u>	--Not assayed--	13.21	13.12

Turner & Duquette

T.D. 9#

Aug. 13, 1965

Attn.

Mr. A.F. Reeve

Norquest Joint Venture

1. Established T.D. 9. 4 miles N.E. of T.D. 8# across the Coal River 4640' elev.
2. Prospect immediate area, sediments contacting on quartz-diorite intrusive. Sediments are of a limy chert, argillite and minor limestone. Gossan area are argillite on contact.
3. Heather I Showing: 5000'  
Occurs approx. 3/4 mile N.W. of T.D. 9# at the junction of two creeks. It is on the contact area of sediments with quartz-diorite. The mineral. galena, sphalerite, and pyrrhotite, arsenopyrite occurs in limy gangue over 70' in width intruded in two places by quartz diorite. The mineral is mainly massive in form with parts of rock containing disseminated mineral.

The mineral beds S 330° vertical dip are on both sides of creek, and are conservatively estimated at 15' mineral, 20' diorite, 8' mineral, 12' diorite, 10' mineral on the West side, similar beds occur on the East. The beds outcrop about 15' in height obscured by a mantle of overburden which covers the entire valley cirque area in rolling type country with few outcrops. Representative grab samples obtained for assay Ag. Au. Zn. Pb. and Cadmium as a very yellow stain is observed in a sample.

Heather II Showing: 4900'

Occurs approx.  $\frac{1}{4}$  mile East in canyon walls of creek T.D. 9<sup>#</sup>. Consists of galena, sphalerite, possible molybedendite, pyrrhotite. General strike 330' on contact with quartz diorite. Mineral occurs over an area 150' in length 50' in height, disseminated within the limy sediments and in fracture zones. Representative grab samples obtained for assay. Au. Ag. Pb. Zn. Moly?

5.

Samples were taken from "A" and "B", Heather I and Zones "C" and "D".

6. Heather II:

Claims were staked on a bearing of 310° to cover known mineralization and general strike and contact area. The Heather claims are dated the 15th of Aug. and it is hoped that assays will be expedited so that results are known in ample time to arrange the recording of the claims if warranted.

While staking 1 & 2 a compass anomaly was picked up a approx. 500' from the claims posts situated on outcrop at Heather I.

The general lay of the country is alpine with scrub spruce, quite open and gently rolling, would be ideal for a geophysical survey.

J.C. Turner

The intrusive quartz monzonite to quartz diorite, sediments are crystalline foliated limestone beds with argillite occurring throughout the area.

Further mineralization, galena, sphalerite, pyrrhotite, was located on the reverse slope within the N.W.T. of the Grizzly I showing, sample was secured of sphalerite & galena.

In general the Heather group Grizzly, Border, showings are restricted to the immediate area of the intrusive contact. They occur as known, up to the time of this writing, over an area of 4 miles in length with the average outward widths of the observable mineral of around 200'.

This area appears mineral wise, and fairly clear out geologically, to be a more favourable economic deposit than the McBean find west of the Cantung Rd. of 1963.

We urgently request helicopter support if possible, to facilitate staking within the Yukon side and a reconnaissance along the contact to determine if the mineral continues for any distance within the N.W.T. These claims should be recorded soonest and prospectors' licenses obtained for the N.W.T. if the copter reconnaissance proves fruitful.

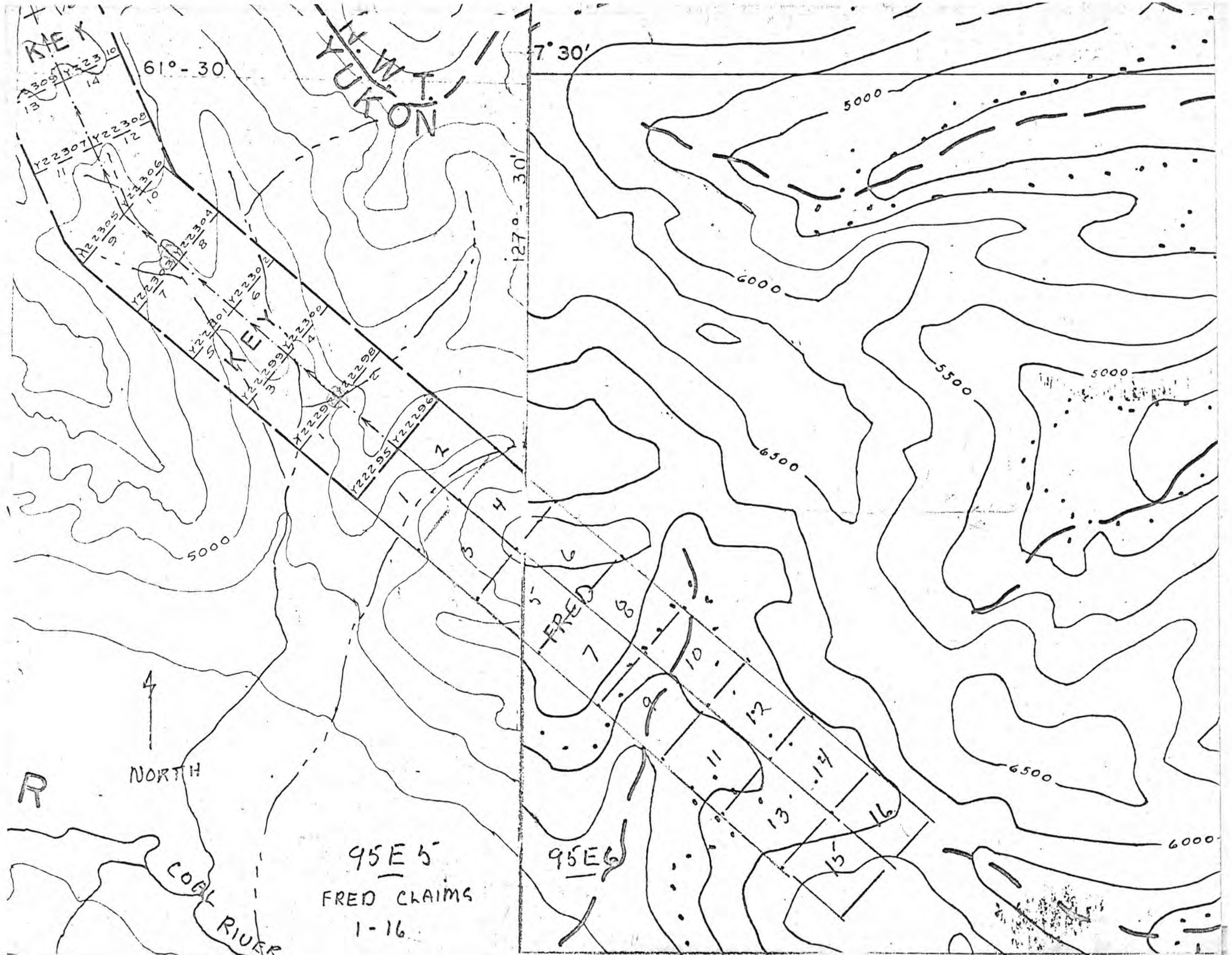
Owing to the extremely difficult terrain and the unsettled state of the weather this time of year, I believe that it is imperative that action be taken to protect the known occurrence.

Pointing out that these occurrences occur around 6000' elevation and will be snowed in shortly and the possibility of other prospectors within the area I pray we will secure this ground soonest.

J.C. Turner

BORDER SHOWING:

<u>Au</u>	<u>Pb</u>	<u>Zn</u>
2.8	4.68	6.39
<u>GRIZZLY I:</u>		
1.1	1.87	6.34
<u>GRIZZLY II: (A)</u>		
2.0	11.88	13.28
<u>GRIZZLY III:</u>		
16	49.16	13.43
<u>GRIZZLY III(A):</u>		
2.8	33.48	-----
<u>GRIZZLY IV:</u>		
1.1	1.87	6.34
<u>N.W.T.:</u>		
3.6	5.37	8.80



KEY

61°-30'

127°-30'

YUKON

KEY

NORTH

R

COAL RIVER

95E5  
FRED CLAIMS  
1-16

95E6

FRED

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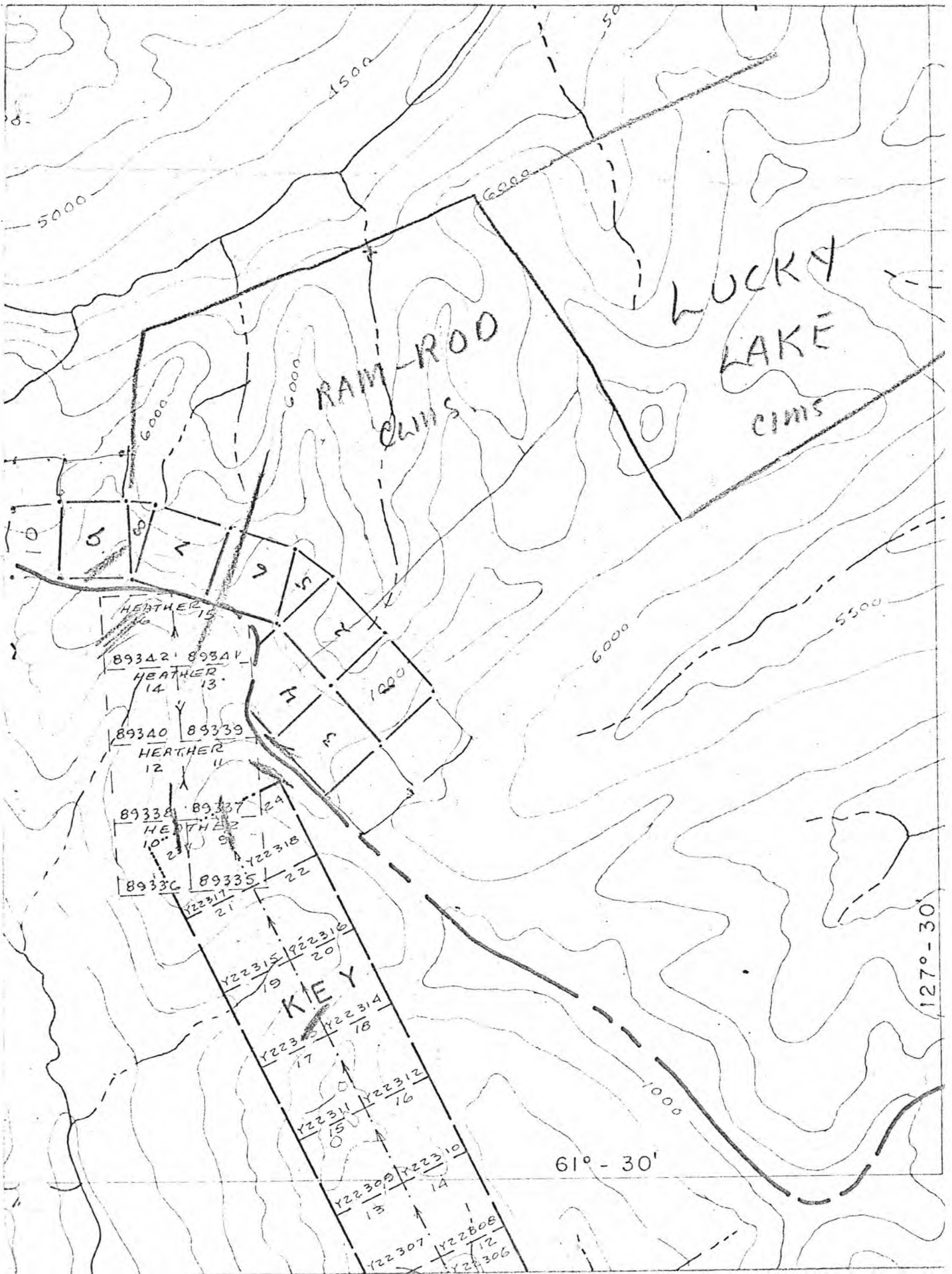
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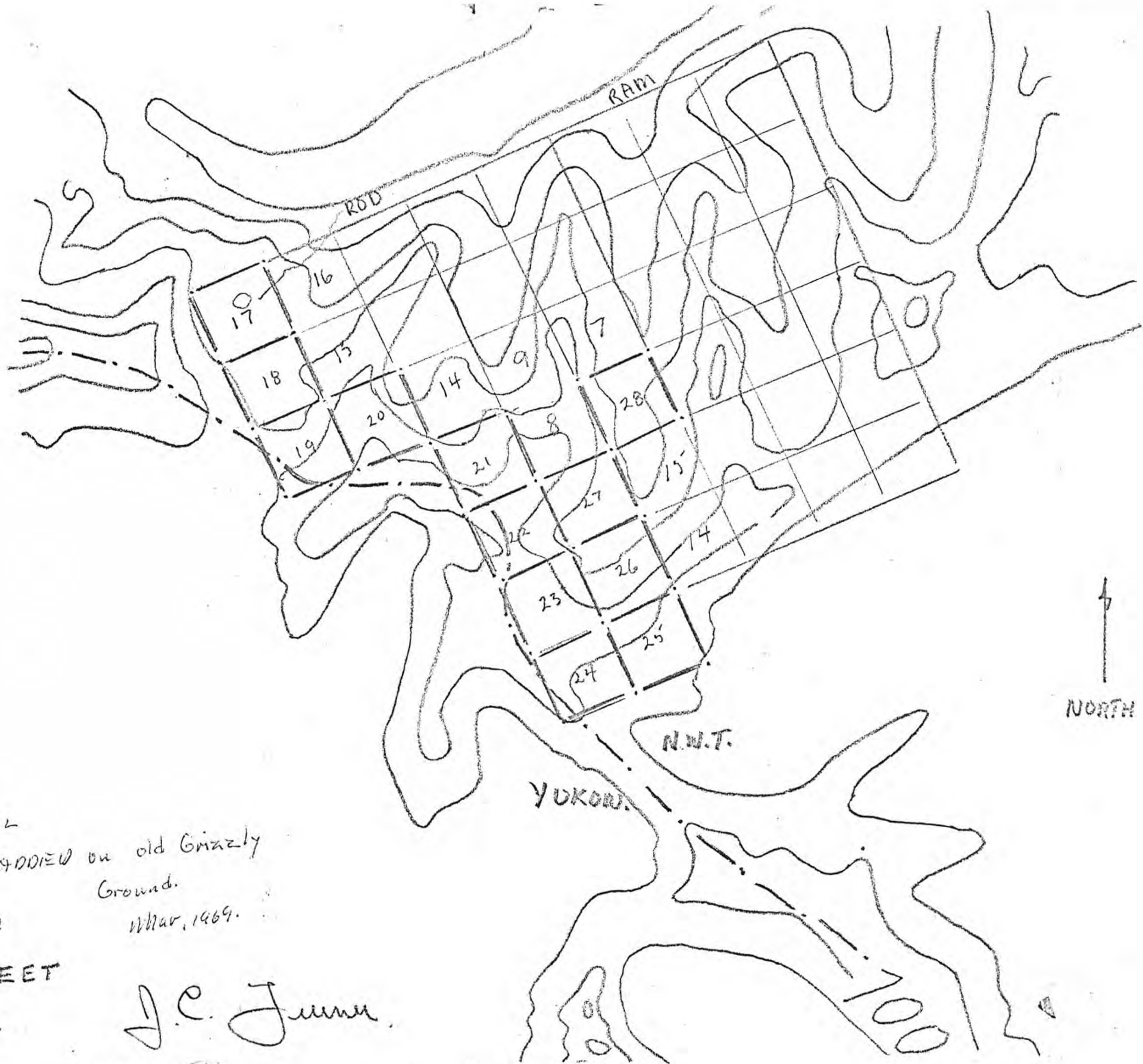
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N.W.T.  
BOUNDARY  
YUKON



ADDITIONAL

12 elms ADDED on old Grizzly  
Ground.

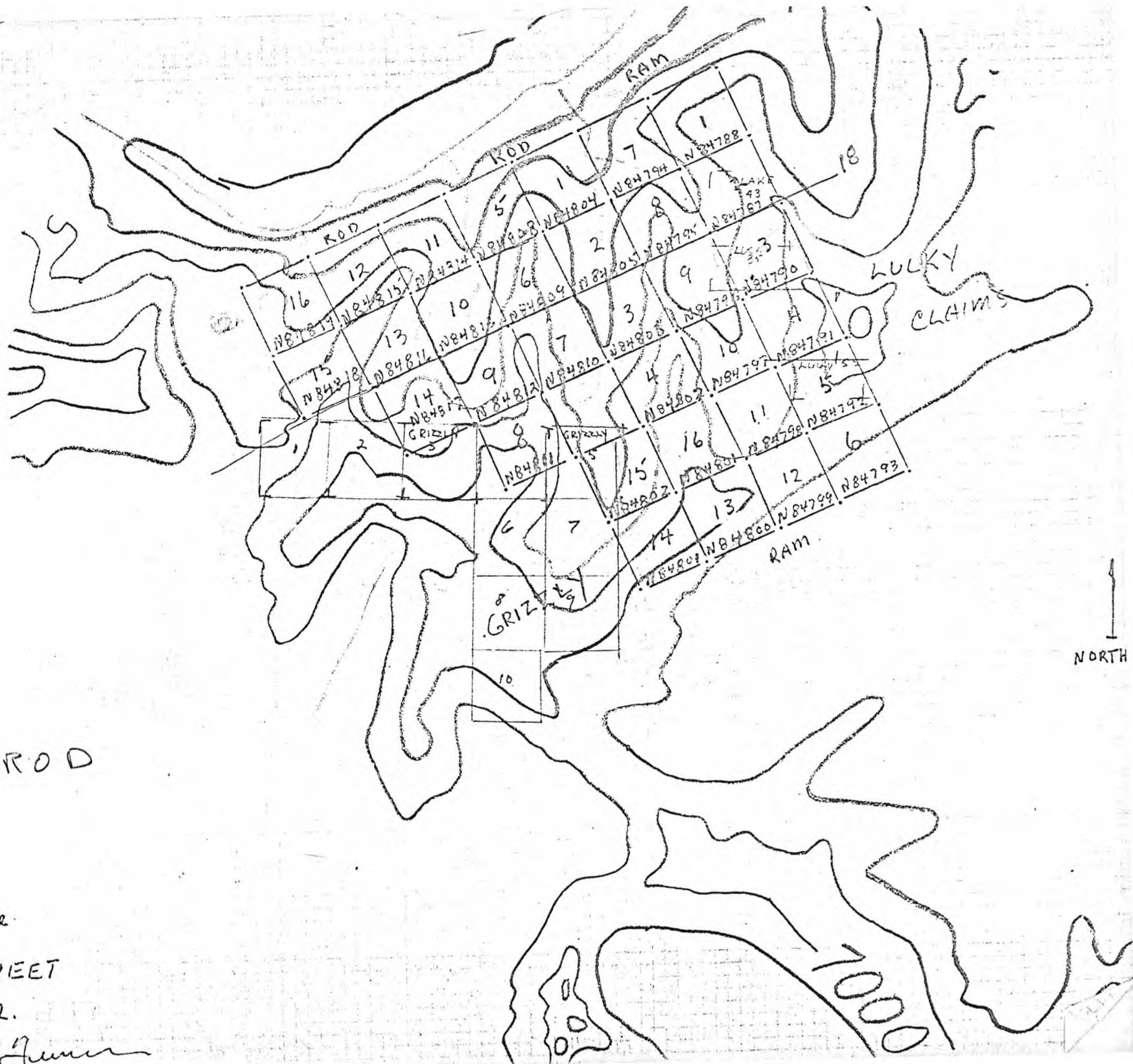
1" =  $\frac{1}{2}$  mile

Mar, 1969.

CLAIM SHEET

95E12

J. C. Jumper



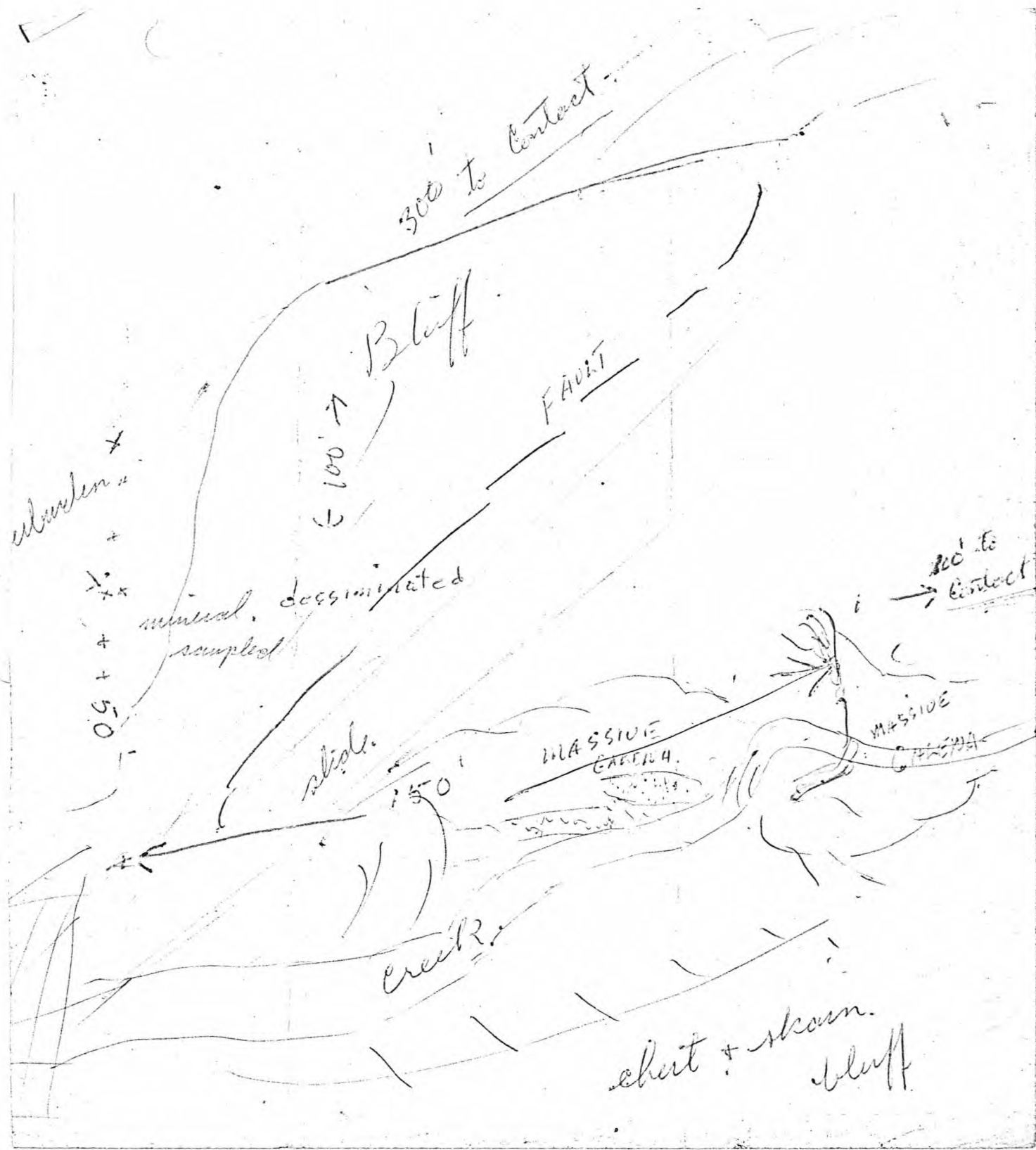
RAM-ROD

1" = 1/2 mile

CLAIM SHEET

95 E 12.

A. E. Turner

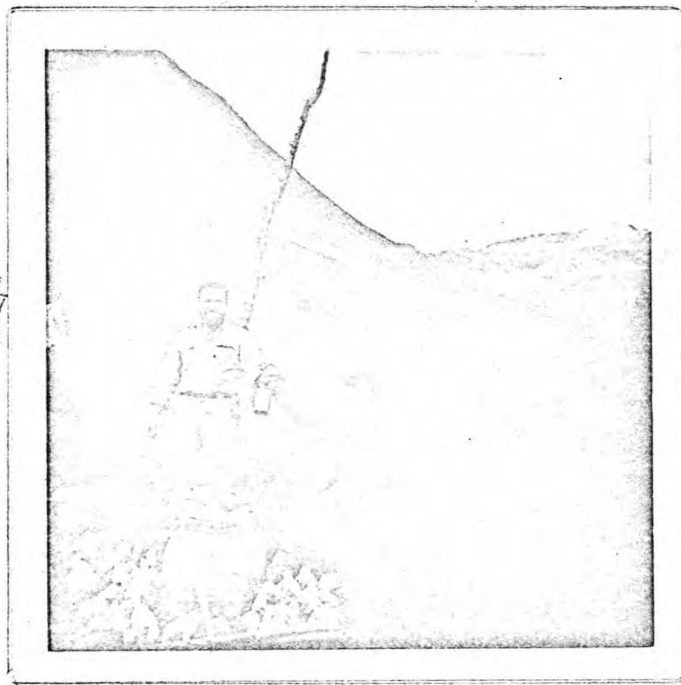


B 1

ZONE B 1

Mineral located in canyon walls in  
creek. 1965 - Trenching & sampling 1966  
Geophysical E.M. MAG. Geochem 1968  
KEY CLAIMS. In contention.

↑  
EAST



↑  
WEST

ZONE B 2.

massive lead-zinc opened up in  
overburden 1966 located approximately  
4500' due ~~east~~ west of B1 zone on  
strike of sediment granite contact.

