



GEOLOGICAL REPORT ON  
THE RIO 1 - 30 CLAIM GROUP  
BONNET PLUME RIVER AREA, YUKON TERRITORY  
SHEET 106-C-10

LAT.  $64^{\circ}30'N$  LONG.  $132^{\circ}30'W$

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

~~\$~~ *Not recommended* For acceptance

*[Signature]*

Resident Geologist or  
Resident Mining Engineer

~~Refuses under.~~  
Considered as representation work under  
Section 53 (4) Yukon Quartz Mining Act.

FOR / Commissioner of Yukon Territory



Vancouver, B.C.

July 20, 1975



# BONNET PLUME PROPERTIES

YUKON TERRITORY

SCALE

MILES 4 2 0 4 8 MILES

ALTAIR DRAFTING

64° 45' N

64° 45' N

132° 30'

132° 30'

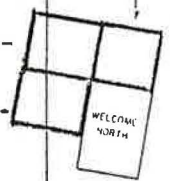
132° 30'



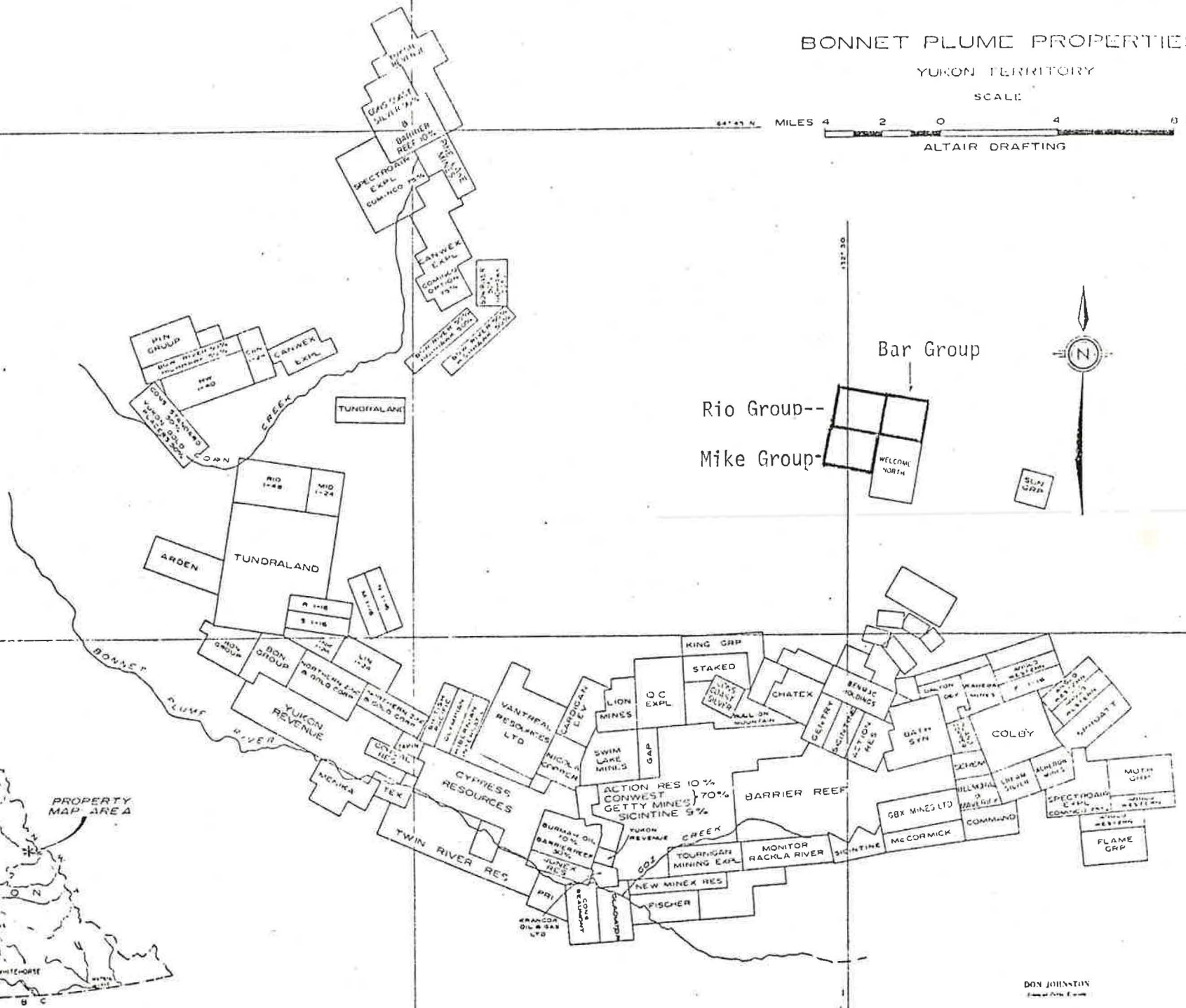
Bar Group

Rio Group--

Mike Group



SLA GRP



PROPERTY MAP AREA



DON JOHNSTON

DONALD BERRY JOHNSTON & SONS, INC. 1950  
1000 10th Avenue  
Whitehorse, Yukon  
Yukon Territory

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SUMMARY

The 30 claim Rio group is located ten miles north of a new major zinc discovery in the Bonnet Plume area of the Yukon Territory, made in the summer of 1973 by Barrier Reef Resources of Vancouver.

It is classified as a partially explored prospect underlain by Mid-Devonian dolostone containing recently discovered stratabound zinc-lead deposits. It is recommended that a staged exploration programme be carried out with a total expenditure of \$60,000.00.

INTRODUCTION

This report is based on information gathered by the writer from available government and private reports on the area and personal examination of the property. It was prepared at the request of Mr. Carl Toporowski

of Vancouver, B.C., owner of the claims. The claims were examined June 28 - 30, 1974. Their location on the attached plan is approximately correct.

PROPERTY

The Rio Property comprises a rectangular block of 30 unpatented mining claims two miles long by one mile wide. They were staked in July, 1974 and recorded at Mayo, Yukon Territory. Due dates are July, 1975. Several posts were examined and found to be staked in accordance with the Yukon Quartz Mining Act.

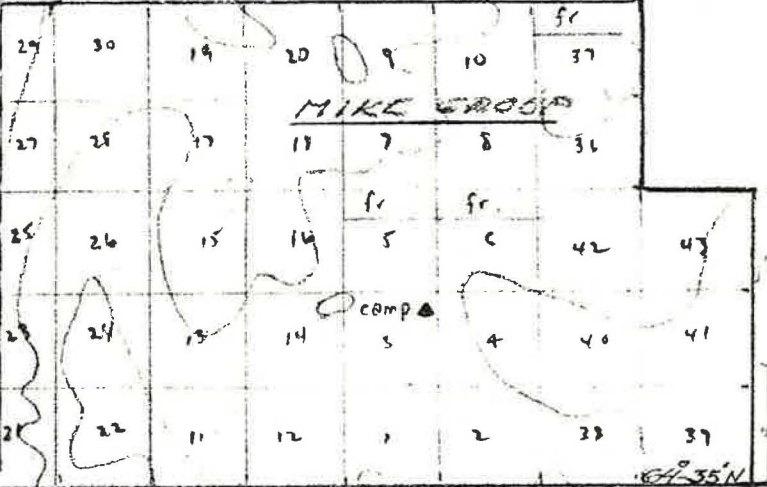
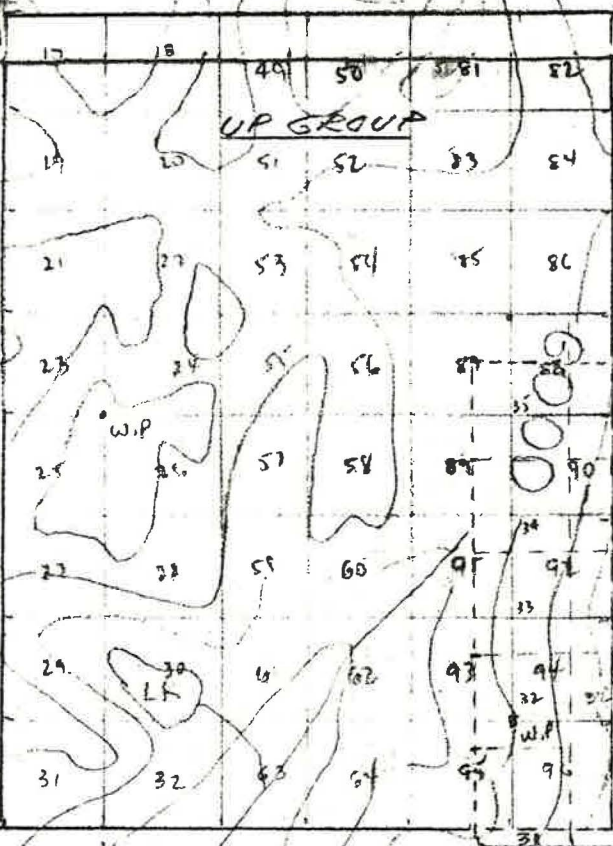
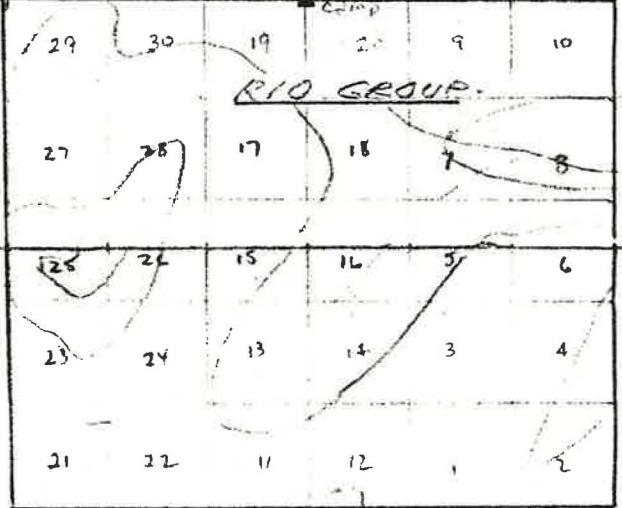
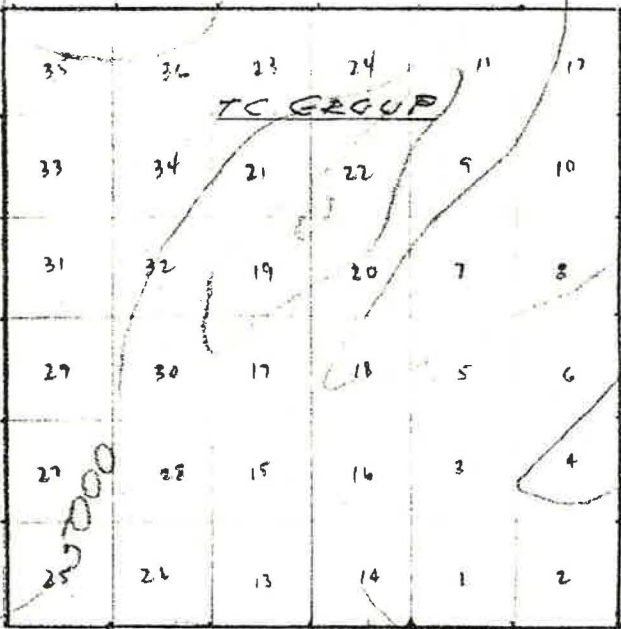
<u>Name of Claims</u>	<u>Grant Numbers</u>	<u>Due Date</u>
Rio 1 - 30	Pending	September 1976

CLAIM LOCATION MAP OF RIO GROUP AND ADJOINING CLAIMS

Snake River Area, Mayo Division, Yukon



5000



over claim length

NTS H6 106 C10  
(SCALE 1" = 1/2 MI)

67° 35' N

### LOCATION AND ACCESS

The claims are located approximately 135 miles NE of Mayo, Y.T. near the Snake River. Approximate coordinates are as follows:

LAT.  $64^{\circ}35'$  North; LONG.  $132^{\circ}30'$  W, NTS Sheet 106-C-10

Access to the property is by helicopter. Fixed-wing aircraft can land on Goz Lake or Goz Creek approximately eight miles southeast of the property.

Barrier Reef Resources is constructing a winter airstrip in the Creek Valley, about ten miles south of the property. An all-weather strip suitable for DC-3 aircraft is being planned which will greatly improve operating cost in the area. A winter tote road is also planned to the area from Mayo.

The Mayo-Elsa, all-weather highway ends at Keno City, 80 miles south-west of the property. A winter caterpillar road, extends from the end of the Mayo Highway a distance of 40 miles to Kathleen Lake, about 50 miles west of the property.

### TOPOGRAPHY

The claim group is located ten miles north of the Goz Creek at elevations from 3,000 to 5,000 feet. The topography is a moderately sloping upland plateau incised by two canyons.

The water supply in the nearby creeks is suitable for all purposes.

## GENERAL GEOLOGY

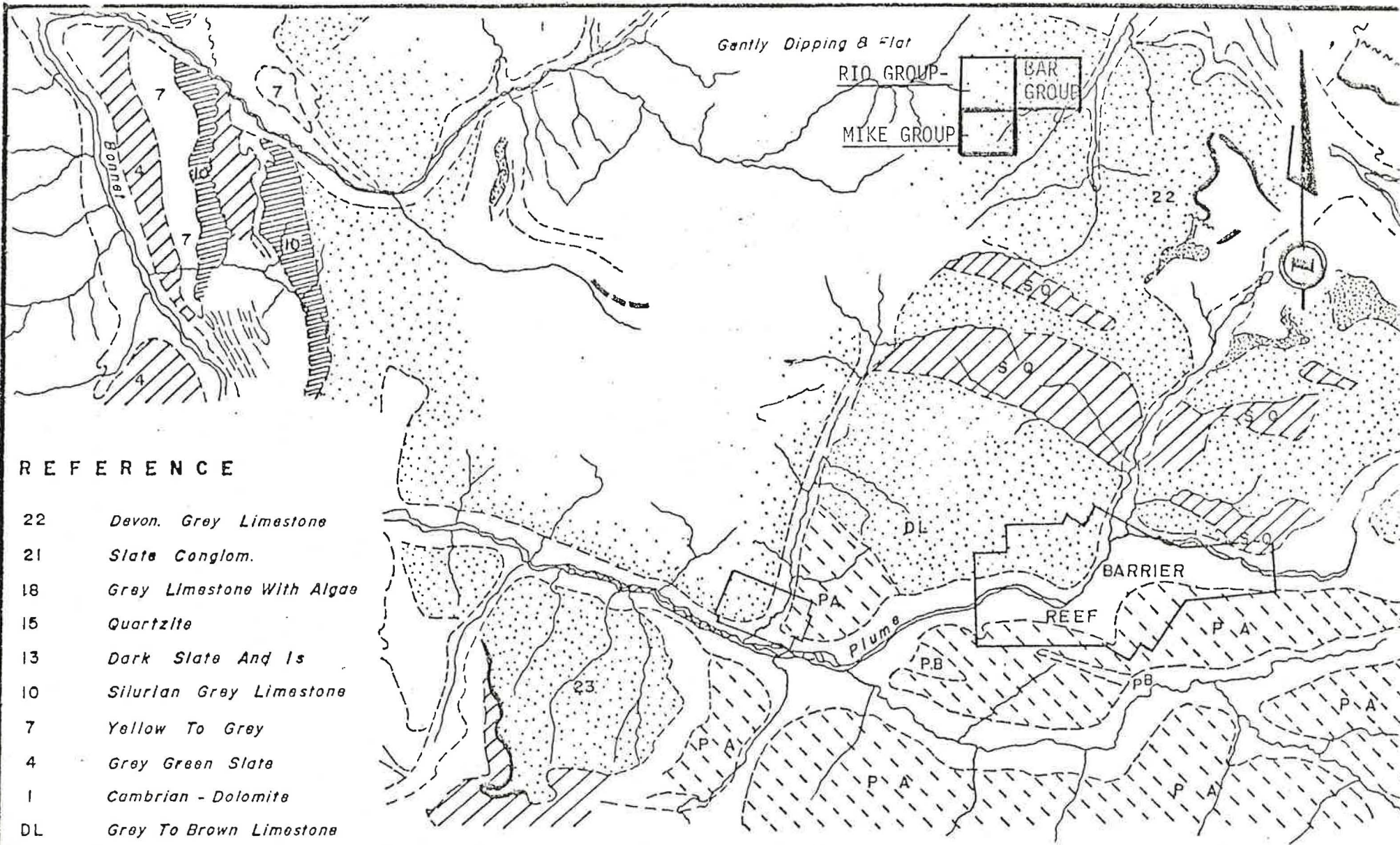
The area of the recent staking along the Bonnet Plume River is underlain by closely folded rocks of probable Cambrian or earlier age. Recent mapping places them as Proterozoic in age. The most widespread and believed to be the oldest formation, is composed of reddish-brown weathering dolomite and sandy dolomite, with minor amounts of grey limestone, dark grey slate, and quartzite. The sandy, cherty or argillaceous facies stand out in relief over the dolomite facies, to produce a very rough surface. The rock is composed mostly of fine-grained, dolomite. The dolomite does not react to hydrochloric acid. Some bands contain considerable proportions of dark clay, minerals and local chert nodules. There are numerous quartz veinlets 2 to 3 inches wide.

Most rocks show irregular banding. They have a rough, sandy texture. Concretions are common.

A distinctive feature is the presence of concentric, banded, circular forms 4 to 6 inches across and up to 14 inches. Some are columnar. These are believed to be algal structures, and they appear in great numbers suggesting colonies that form bioherms.

These structures are believed to be important from the standpoint of mineral deposition and sphalerite often replaces them locally.

Within the dolomitic formation are a few beds of grey limestone, bluish grey, platy, pyritic slates, and quartzites. A banded pale-green, chloritic, limestone overlies the algal bearing dolomites in places and elsewhere a grey weathering pale grey limestone occurs. Also dark grey and black slates, associated with varying amounts of grey and white quartzite, overlie the dolomite conformably at many localities.



**REFERENCE**

- 22 *Devon. Grey Limestone*
- 21 *Slate Conglom.*
- 18 *Grey Limestone With Algae*
- 15 *Quartzite*
- 13 *Dark Slate And ls*
- 10 *Silurian Grey Limestone*
- 7 *Yellow To Grey*
- 4 *Grey Green Slate*
- 1 *Cambrian - Dolomite*
- DL *Grey To Brown Limestone*
- SQ *Brown Slate & Quartzite*
- PA *Grey Green Slate*
- PB *Grey Limestone*

**CLAIMS**

Scale: 1 inch = 4 miles

Geology From G.S.C. Map 53-7

AXTEN DRAFTING LIMITED

The thickness of this sequence of dolomites, grey limestone and slates is not known. Smith (15) states the principal lead-zinc deposits of the larger sedimentary belt known as the Selwyn Basin and Mackenzie Fold Belt fall within two distinct classes: stratiform types of marine-volcanic association (ANVIL, TOM, HOWARD PASS, FORTIN); and MISSISSIPPI VALLEY TYPE (BARRIER REEF, GODLIN, NAHANNI).

Preliminary mapping of the Barrier Reef Property Bonnet Plume area, has outlined a breccia zone of high grade Zn-Pb averaging about 20% combined metal having a strike length of greater than 1,800 feet and a width of 30-40 feet. More detailed sampling, and diamond drilling is required to assign tonnage and grade to the deposit. Extensive outcrops, containing zinc sulphides in bedded carbonate rocks, have been found elsewhere on the claims by preliminary prospecting. These outcrops represent a mineralized "belt" about 5½ miles in length according to company reports.

#### MINERALIZATION

Mineralization on the Barrier Reef and other properties in the area generally is comprised of light buff-colored, to reddish-brown, sphalerite in porous dolostone, with aggregates and irregular patches of galena and minor quantities of possibly Jamesonite mineralization, are reported in higher grade zones.

Most of the high-grade mineralization is associated with breccia zones, but some occurs parallel to bedding planes with very little associated quartz.

GENERAL DISCUSSION OF GEOLOGY ON RIO CLAIMS:

The Rio Group claims are underlain by a flat-lying pile of Middle Devonian limestone and dolomite sediments. Their age has been definitely determined by the identification of the presence of mid-Devonian Brachiopod fossils in dark grey limestone beds overlying a bioherm algal deposit in which the sphalerite replacement occurs. The limestone unit is exposed over a vertical height of at least 200 feet in bluffs along the south border of the claims. The unit is quite regular on the claims but shows thrust faulting and attitude change to the north of the claims group.

The unit is overlain by black to brown shale, locally well shattered. It forms rounded hummocks up to 500 feet or so in height. It may be Upper Devonian in age. The sequence of Devonian limestone and dolomites, overlain by black shales, resembles the Upper Devonian shale/mid-Devonian limestone/unit of the Pine Point area, well known for the prolific lead-zinc deposits within the Presqu'ile sediments.

The presence of algal reef fragments replaced by massive sphalerite in colliform structures, also characteristic of the Pine Point deposits, supports this view.

The claim group is located on a gently sloping upland, plateau for the most part, on which rounded hills of upper black shale provide the principal topographic relief.

The plateau is incised at the edges by creek canyons that lead into the main north-south tributary of the Snake River

that borders the property on the east. The mineralized showings found to date, are on the gently sloping limestone shelf within a few feet of surface. Since there are large areas of flat-lying limestone bare of overburden, the prospecting is easier than normal and frequent patches of sphalerite mineralization occur across the claims group on surface. These provide a unique situation for exploration and future development.

The mineralization so far encountered occurs in two principal modes:

- 1) Massive light-brown resinous sphalerite often in colliform masses up to two inches in thickness, replacing fragments of algal from a bioherm reef.
- 2) Veinlets and intergrowths of resinous sphalerite and white, coarse grained calcite in brecciated zones. Sphalerite often makes up to 50 percent of the zone. Galena is sparingly present but no pyrite.

In the discovery zone on claim Rio 2 both types of occurrence are present. These modes of occurrence resemble the main deposit at the Barrier Reef property ten miles to the south although they occur there in dolostones of Proterozoic age stratigraphically much lower than the Mike group.

In many respects the occurrence of the Barrier Reef and Mike Group stratigraphic deposits resemble those of such well known lead-zinc fields as the Tristate deposits in the Mississippi Valley, Pine Point, and elsewhere; and warrant careful detailed exploration.

The flatness of the limestone beds on the Rio group do not indicate as a whole any apparent structural disturbances of the beds. However, the large thrust fault on the north side of the group may have caused pressure on the block and subjected it to compressive stresses that opened up later tensional fracturing which provided channel ways for ore solutions. The overlying black shales may be the source beds from which percolating surface water brought the zinc ions into the reef areas where they were precipitated by sulphides generated from algal decomposition. In which case the contact between the shales and the underlying limestone would be good areas to search in detail.

Although the massive sphalerite itself is a poor conductor, there is locally enough galena present to warrant the use of the induced polarization geophysical method in the search for ore deposits. Frequency tests were carried out on a well mineralized specimen of sphalerite containing less than 1% galena and no pyrite. A rating of 100 units was obtained. This compares with 300 units on a similar test of good conductive rock from another area. The I.P. method could thus be of value in searching for ore deposits.

#### DESCRIPTION OF SHOWINGS ON THE RIO GROUP:

Showings of sphalerite in dolomite-limestone breccia were seen at six widely separated locations on the claims group. No work has been done on the occurrences and all are prospectors' discoveries in exposed outcrops of flat-lying limestone of mid-Devonian age. They are similar in nature and occur at approximately the same stratigraphic level in the limestone-dolomite pile somewhere near the eroded off contact of the overlying black shales.

The preliminary examination of the Rio Group shows that separate mineralized outcrops containing sphalerite replacement in brecciated reefoid beds of grey dolomite-limestone occur over a wide area several miles in extent. The individual extent of the mineralized zones are not known. All are recent discoveries that require detailed examination to evaluate their importance.

CONCLUSIONS & RECOMMENDATIONS:

Visual evidence shows that the limestone pile contains a series of sphalerite bearing strata that appear as flat-lying exposures at various locations over a considerable horizontal distance measured in thousands of feet. Careful topographic and geological mapping is needed to evaluate their continuity, extent and significances. From the extensive lateral and vertical spread of individual high grade showings however it is apparent that a significant strataform zinc discovery in favorable Middle Devonian limestone-dolomite sediments has been discovered. The most important zinc bearing bed is a hackly surfaced grey dolomitic limestone that is flat-lying or dips gently east. This horizon contains collapse breccia zones and bioherm reef structures that have replacements of heavy calcite containing light brown sphalerite with minor galena. Local concentrations of economic grade material averaging 15 to 20% zinc are present.

The mineralized beds vary from 12 to 25 feet in thickness and lengths up to 500 feet have been indicated. Continuity between various showings has not yet been established. The possibility of finding a substantial strata-band lead-zinc deposit on the property is considered excellent and a detailed exploration program including topographic, geological, geochemical and geophysical survey followed by trenching and diamond drilling is recommended immediately. The cost is estimated at \$60,000.00. The program could be completed this season in two months.

ESTIMATED COST:

An initial exploration programme is warranted on the claims, totalling \$60,000 as follows:

Phase I:

Line cutting - 30 miles	\$ 4,000.00
Geological Survey	2,500.00
Geochemical Survey	4,000.00
Induced Polarization Survey	4,500.00
Prospecting and Trenching	2,000.00
Helicopter - 20 hours @ \$200	4,000.00
Fixed Wing	2,000.00
Camp and Supplies	2,000.00
Assay	2,000.00
Supervision and Consulting	5,000.00
Contingencies	<u>6,000.00</u>
Total Phase I	\$38,000.00

Phase II:

Winkie Diamond Drilling	
4,000 feet @ \$5.50/foot	<u>22,000.00</u>
Total Phases I & II	<u>\$60,000.00</u>

APPENDIX NO. 1

1. J.O. Wheeler - GSC Paper 53-7  
A Geological Reconnaissance of the Northern  
Selwyn Mountains.
2. GSC Report of Activities 1969-1970.
3. Mineral Industry Report 1969-1970 Vol. 1
4. S.L. Blusson GSC Paper 71-22  
Sekwi Mountain Map Area, Yukon Territory and  
District of McKenzie.
5. 1972 Composite Geological Map of the Yukon Territory.
6. Statement of Material Facts. Barrier Reef  
Resources Ltd. July 24, 1973.
7. Barrier Reef Resources Ltd. (N.P.L.) Report to  
Shareholders Nov. 23, 1973.
8. E.O. Chisholm P.Eng. Private Report Rackla River Mines  
Ltd., Yukon Territory dated March 30, 1968.
9. P.W. Sevensma P.Eng. Report Rackla River Mines Ltd.  
dated Sept. 13, 1969.
10. R.E. Chaplin P.Eng. Report on Barrier Reef Mines Ltd.  
Bonnet Plume lead-zinc property dated Aug. 15, 1973.
11. R.E. Chaplin P.Eng. Report of HELI Claims Godlin  
Lakes Area N.W.T. dated March 15, 1973.
12. John S. Brock V.P. Welcome North Mines Ltd.,  
Exploration Progress Report dated Aug. 29, 1973.
13. R.E. Chaplin P.Eng. Report on PAL (1-51)  
Mineral claims, Bonnet Plume-Goz Creek Area,  
Yukon Territory dated Aug. 15, 1973.
14. R.E. Chaplin P.Eng. Report on Ann 1-64 Mineral Claims  
Bonnet Plume - Goz Creek Area dated Aug. 15, 1973.
15. G.C. Gutrath P.Eng. Report on CYPRESS Resources property  
Bonnet Plume zinc-lead property dated Sept. 1973.
16. Clyde L. Smith Ph.D P.Eng. Report on Ogilvie Joint  
Venture dated Dec. 1973.
17. A Harman, Harman Management Ltd. Personal Communications.

### Prospectors Description of Rio Discoveries

Sphalerite mineralization occurs locally throughout the claims group in the Devonian limestone beds generally near its contacts with the overlying black Besa shales. The showings consist of disseminated to massive honey colored crystalline sphalerite sometimes associated with sparse galena. The most common type of occurrence is in a coarse grained dolomite or calcite breccia within the limestone. The zones vary in size from a few feet to hundreds of feet in length and from a few inches up to tens of feet in width.

Location 1.: Twenty feet west of #1 posts of claims 5 and 6. Coarse sphalerite in a reefoid limestone bed with dolomite breccia. A length of 10 feet exposed. A representative sample ran 15.49 % zinc (#27021)

Location 2: At the number 2 posts of claims 21 and 22 on the Bar Group and Rio Group joint boundary. Dolomite breccia intermittedn over 150 feet in length. Estimated thickness 6 feet of good sphalerite mineralization. Widths of 15 to 20 feet noted along strike. A large 10 pound representative sample #27022 assayed 13.21% zinc.

Location 3: Nearpost 1, claim Rio # 11 and #12. A 150 foot long dolomite breccia zone containing coarse sphalerite mineralization, in reefoid material. A representative grab sample (#27023) assayed 5.24% zinc.


Other occurrences of disseminated sphalerite were noted on the eastern half of the group along limestone and shale contacts.

CERTIFICATE

I, Edward O. Chisholm, of the City of Vancouver in the Province of British Columbia, hereby certify that:

- 1) I am a geologist with offices at 821-602 West Hastings Street, Vancouver, B. C.
- 2) I am a graduate of the University of Toronto, Ontario, Master of Arts, 1945.
- 3) I am a member of the Professional Engineers of Ontario and British Columbia.
- 4) I have no direct or indirect interest in the Rio Group property.
- 5) Permission is granted for submission of the report to the Vancouver Stock Exchange.
- 6) This report is based on my personal visit to the area and published geological literature.

DATED at Vancouver, British Columbia  
this 20th day of July, 1975:



EDWARD O. CHISHOLM, P.ENG.

STATEMENT OF COSTS

For 144 Mineral Claims as follows:

Mike 1 - 43  
 Rio 1 - 30  
 T.C. 1 - 36  
 Algal 1 - 35

1) Wages 30 Man Days

(John Toporowski/Mike Brodrigg/  
 Kevin Milledge)

\$ 900.00	
<u>300.00</u>	\$ 1,200.00

Supervision 3 man days

2) Supervision 3 Man Days

300.00

3) Camp Costs

330.00

4) Field Equipment Expense

231.00

5) Recording Fees

1,400.00

6) Staker's Fees

450.00

7) Claim Post Cost

315.00

8) Helicopter Flying

July 27 - August 7:

275605 218.90

275606 278.60

275609 278.60

275610 457.75

275613 378.10

275616 199.00

275614 159.20

1,970.15

- Flying	\$ 870.00	
- Fuel	394.20	\$ 1,264.20

9) Fixed Wing Flying:

Yukon Air		
2583	457.00	
108 Mile Airways		
# 870	1,118.40	
867	643.20	
859	<u>1,082.40</u>	3,301.00

10) Pro Rata General Expenses

144/700 (\$8,438.00)		<u>2,000.00</u>
----------------------	--	-----------------

TOTAL ON ACCOUNT

12,761.35

# EWING TRANSPORT

Mayo, Y. T. ..... 1 August ..... 1951

**To** Harrison Management  
 821 - 602 West Hastings  
 VANCOUVER, B. C.

Jul 11	B/L No. 11 12 pcs 2" x 4" x 16" slts	137 ..... U.S. Tax @ 11.04%	213.16 1.52	
20	B/L No. 17 300 pcs 2" x 2" x 4"	@ 90¢	270.00	
22	B/L No. 18 100 pcs 4" x 4" x 4"	@ 1.75	175.00	
23	B/L No. 20 80 pcs 4" x 4" x 4"	@ 1.75	140.00	613.88
<i>Terms: 30 Days . . . Nominal interest charged thereafter</i>				











# YUKON AIR LTD.

BOX 2244  
WHITEHORSE, YUKON  
PHONE: 668-2355

No. B 2583

3HT REPORT No.:

CHARTER No.:

DATE: July 27 1974 A/C: Cessna 185 WTD

NAME: HARMAN MANG'T LTD.

ADDRESS: Box 4509 WHITE HORSE

	Miles		RATE	TOTAL		FREIGHT OR PASSENGER
	Hours					
FROM: <u>FARO</u> <u>JOHNSON LK</u>	/					
TO: <u>F02 LK.</u>	170		80	136	00	<u>4 SLACKERS.</u>
TO: <u>JOHNSON LK.</u>	170		85	144	00	
TO: <u>ROSS RIVER</u>	35		80	28	00	<u>1 LINK CUTTER</u>
TO: <u>F02 LK.</u>	185		80	148	00	
WAITING TIME	/					
R CHARGES				456	00	PILOT <u>H. Walker</u>
DISCOUNT						CHARTERER
TOTAL				456	00	REMARKS:
				457.00		

# OLYMPIC HELICOPTERS LTD.

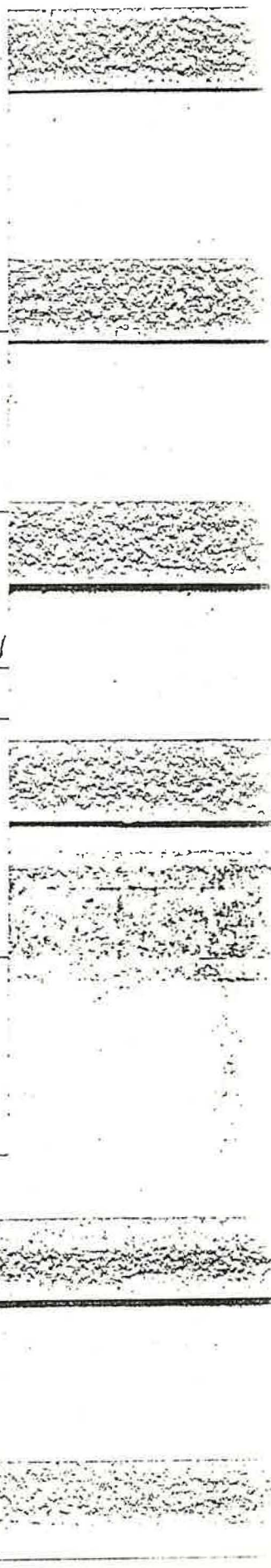
P.O. BOX 622  
MONTREAL 379, P.Q.

PHONE 514-334 2332

## FILGHT REPORT

HELICOPTER: **BELL 47B-3** CF-**YUC**  
PILOT: **DRZYMALA**  
BASE: **PALMER LAKE**

DATE	TIME OFF	TIME DOWN	HOURS	CUSTOMER
<b>28 July 74</b>				ADDRESS
				CHARGE TO
				<b>HARMAN MANAGEMENT</b>
				ADDRESS <b>Box 4509,</b>
				<b>WHITEHORSE, YUKON</b>
			<b>6.0</b>	AUTHORIZED
				FLIGHT FROM TO
				FROM TO
				FROM TO
			<b>6.0</b>	GAS & OIL SUPPLIED COMP. <input type="checkbox"/>
				CUST. <input checked="" type="checkbox"/>
TOTAL HOURS FLOWN				
STANDBY-TIME				
SPECIAL INSTRUCTIONS & REMARKS				
<b>Harman fuel</b>				



## OLYMPIC HELICOPTERS LTD.

P.O. BOX 622  
MONTREAL 379, P.Q.Harman Management Ltd.  
Box 4509  
WHITEHORSE, Y. T.

DATE: August 9, 1974

Please mail cheque to:  
Yukon Business Services Ltd.  
205-205A Main St.  
WHITEHORSE, Y. T.

Rate: \$145.00 per hour

Flight report July 28/74

6.0 hours

\$870.00

(Report attached)

Terms: Net Cash on receipt of invoice.



Indian and Northern Affairs Affaires indiennes et du Nord

GENERAL RECEIPT

RÉCÉPISSÉ GÉNÉRAL

B 300685

Branch  
Direction

Date 9 Aug 74	Nature and No. of Remittance - Forme et n° de la remise CHEQUE	Invoice No. - Facture n°	Location - Endroit MAYO, V.T.
Received the Sum of - Reçu la somme de THREE HUNDRED		00 / 100 DOLLARS \$300. <sup>50</sup> <sub>100</sub>	

IAN D 10-38 (3-72) 7530-21-023-4068

From - De

( HARMAN MANAGEMENT )  
 BOX 4509  
 WHITEHORSE, V.T.

For - Pour 30-Qtz. REC. FEES

RIO # 1-30 - 106-C-10

GOZ LAKE AREA

*Jim Wood*

Authorized Officer - Fonctionnaire autorisé

AFFIDAVIT

Supporting Summary of Costs

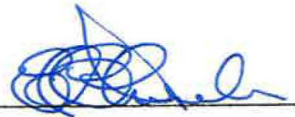
I, E.O. Chisholm, Consulting Geologist, 821-602 West Hastings St.  
Vancouver British Columbia, do hereby state that to the best of my  
knowledge the statement of costs presented in this report is correct.

Dated at Vancouver, 28th day of August 1975.

Sworn before me at Vancouver,  
British Columbia 28th day of August, 1975

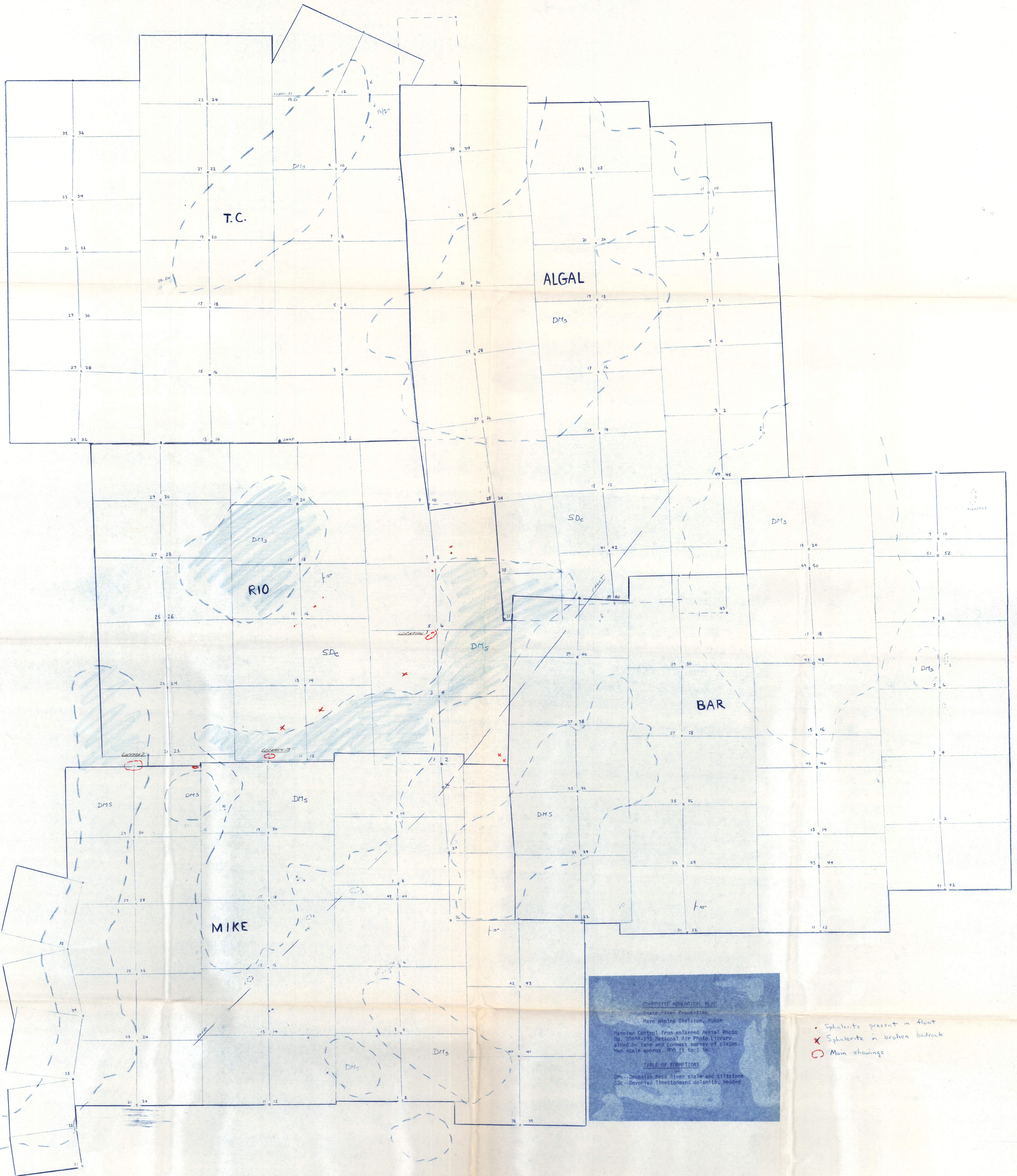


A handwritten signature in blue ink, appearing to read "John Brown", written over a horizontal line.



A handwritten signature in blue ink, appearing to read "E.O. Chisholm", written over a horizontal line. To the left of the signature is a vertical wavy line.

E.O. Chisholm



- Sphalerite present in float
- X Sphalerite in broken bedrock
- Main showings