8169

ROUGH CLAIMS

Liard M.D. N.T.S. 94L/8E

58° 17'N, 126° 10'W

G. D. Hodgson April, 1980.

Owner: Texasgulf Canada Ltd. Operator: Riocanex Ltd.

Work performed on:

	Record No.	Expiry Date
Rough 1	210	820902
2	211	860902
3	212	820902
4	213	850902
5	214	810902
6,7	423, 424	810708
8,9	425, 426	800708

SUMMARY

The Rough claims are underlain by a package of Paleozoic sediments being predominantly shales and fine grained siltstones. Structure is controlled by south-westerly dipping thrust faults. Texasgulf Canada Ltd, staked the claims in 1976 after discovery of a sphalerite showing, and subsequent work by them outlined an extensive Pb geochemical anomaly underlain by Devono-Mississippian siliceous shales.

A detailed geochemical survey by Riocanex Ltd. in 1979 focused on the anomaly because it was recognized that the shales had potential for hosting stratiform Pb-Zn mineralization of the Cirque type. The Riocanex programme delineated two zones of high lead in soils, and it is concluded that although the soil has been disturbed by solifluction, the source of the high values must lie nearby.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

The Rough claims were staked in 1976 by Texasgulf Canada Ltd., following work in the Gataga River area. Of interest were (1) sphalerite in a chert breccia in rocks of lower Paleozoic age and (2) a major Pb geochemical anomaly in soils over shales of Devono-Mississippian age.

Work by Texasgulf included prospecting, structural and stratigraphic mapping, hand trenching, soil sampling and geophysics, The sphalerite showing was their primary target but results were inconclusive.

Seeking a partner for exploration in 1979, Texasgulf invited Riocanex Ltd. to option the property. The main thrust of the Riocanex programme in 1979 was a detailed soil geochemical survey of the Pb anomaly in conjunction with geological mapping.

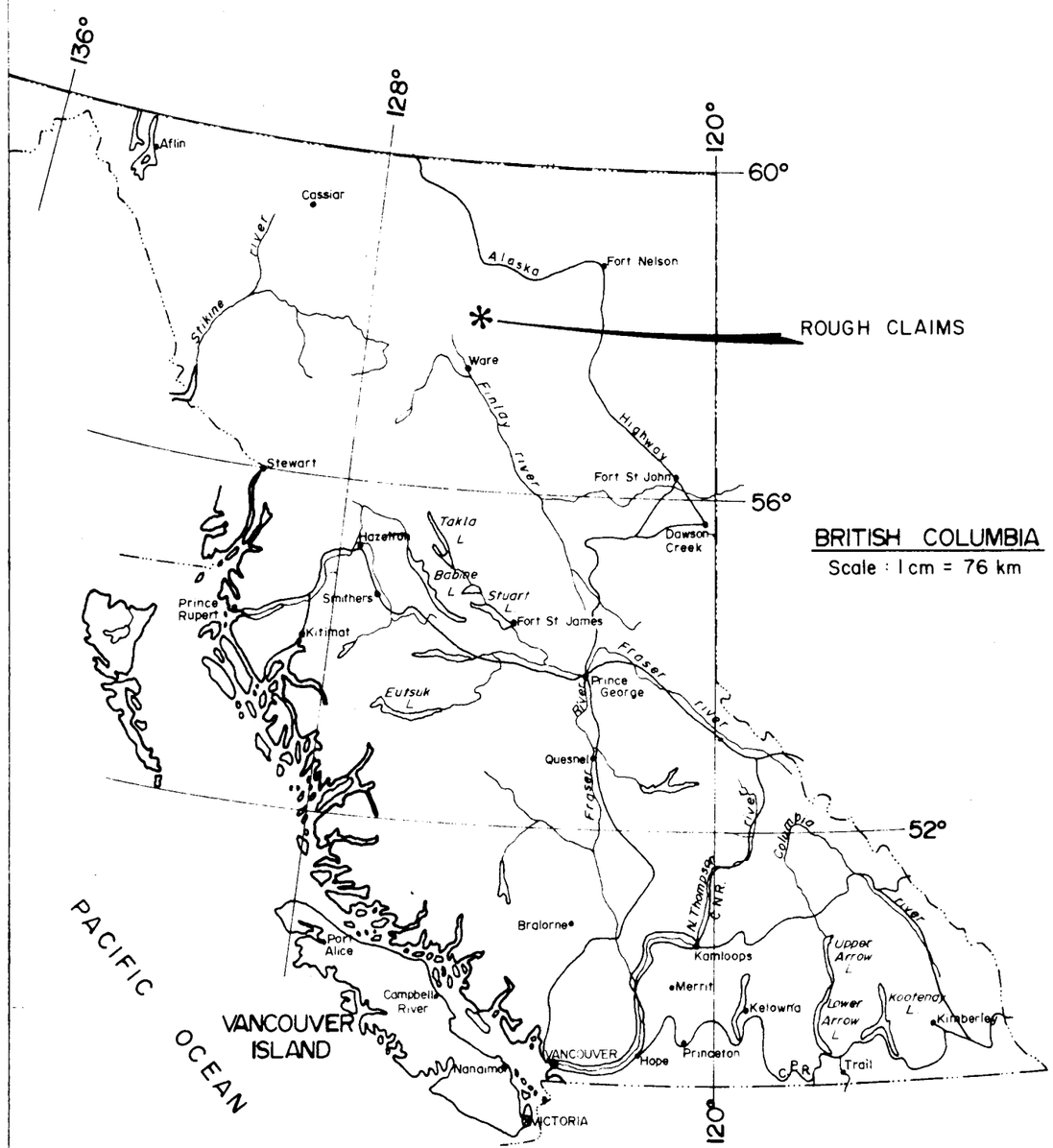
2. LOCATION AND ACCESS

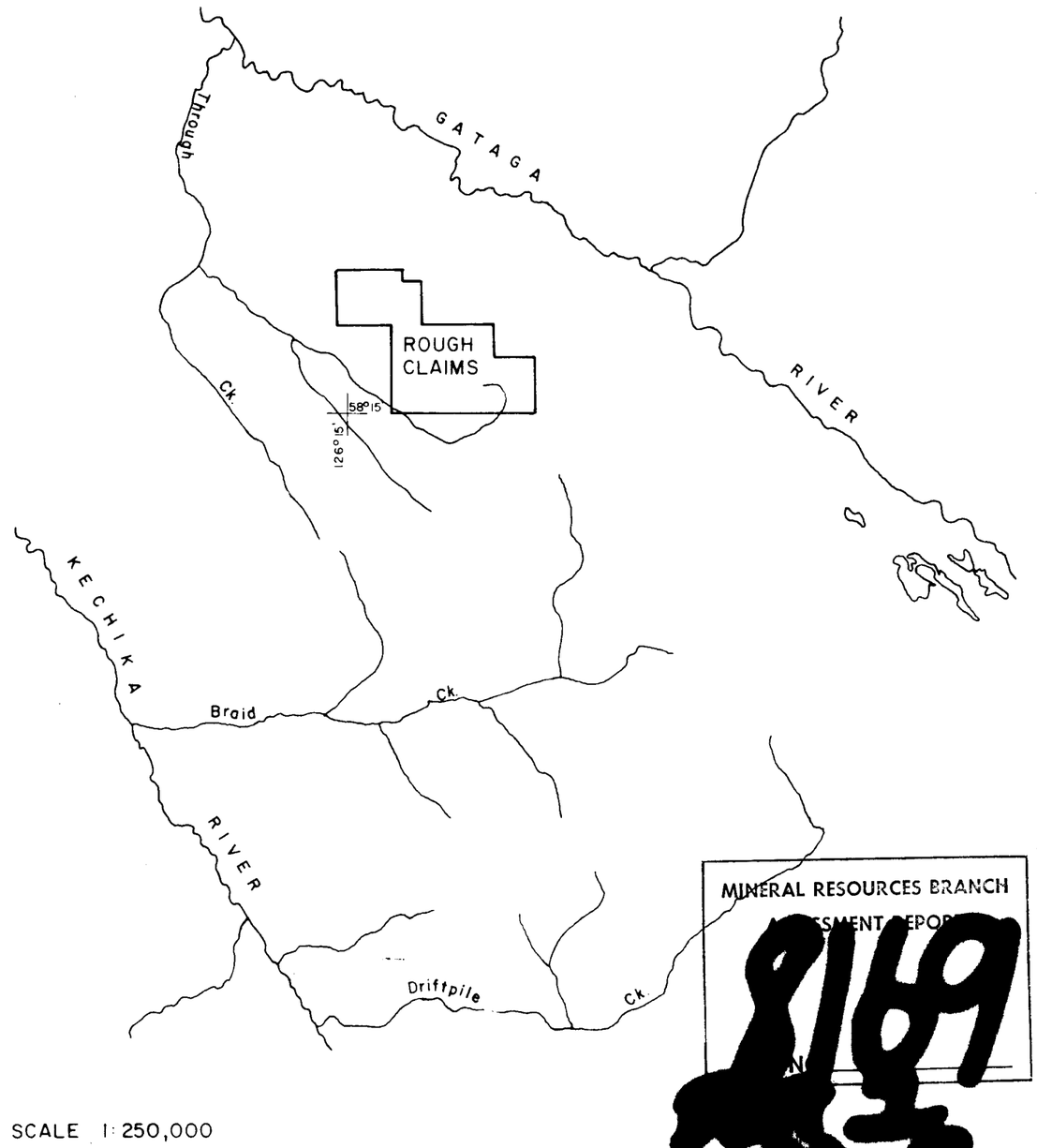
The Rough claims are situated in the western ranges of the Rocky Mountains of northern British Columbia, between the Gataga River and its tributary, Through Creek (Dwg. L-6621).

Latitude:	58° 17'N
Longitude:	126° 10'W
N.T.S.:	94L/8E
Liard Mining Division	

The nearest major centres are Fort Nelson, B.C., 200 km to the northeast and Watson Lake, Y.T., 240 km to the northwest. Between these two towns the Alaska Highway swings to within 75 km of the property at Muncho Lake. A bulldozer trail is reported to end 23 km east of the claims at the divide between the West Road and the Gataga Rivers.

Access to the property is by helicopter, which in 1979 was based at the Riocanex camp on Pretzel Lake, 115 km to the south.





SCALE 1:250,000

N.T.S. 94 L / 8E

LIARD M.D.

MINERAL RESOURCES BRANCH

ASSESSMENT REPORT

8169

RIO TINTO CANADIAN EXPLORATION LTD.

ROUGH CLAIMS

LOCATION MAP

FEB. 80 | G.D.H./s.g. | DWG. L-6621

3. TOPOGRAPHY AND VEGETATION

From the broad valley of the Gataga River, less than 1,000 m above sea level, the ground rises abruptly to northwest-trending ridges, locally over 2,400 m high, underlain by craggy, cliff-forming limestones. Shales underlie lower, rounded ridges. Most of the property is above treeline and is covered by talus, felsenmeer and patches of alpine meadow. Dense scrub occupies the valley bottoms.

4. HISTORY AND PREVIOUS WORK

Geophoto Consultants conducted the first major regional exploration programme in the area in the early 1970's. This led to Canex Placer's discovery of lead-zinc mineralization at Driftpile Creek (27 km to the S.E. of the present Rough claims) in 1973. After the initial work Canex Placer and several other parties entered into a joint venture under the supervision of Archer, Cathro and Associates. By 1976 and 1977 other companies active in the area included Cominco Ltd., Granby Mining Corporation, S.E.R.E.M. Ltd. and United Mineral Services Ltd.

Texasgulf staked the Rough claims in August 1976. Prospecting and geological mapping in 1977 located several sphalerite-galena occurrences along a limestone-shale contact, and soil geochemistry established extensive anomalies with respect to lead and zinc. The 1978 programme comprised further mapping, soil sampling and also trenching and geophysics.

Regional geologic and stratigraphic work has been by Cathro and Carne (1978), Gabrielse (1962, 1977), Taylor and Stott (1973), and MacIntyre (1980a).

5. WORK PERFORMED IN 1979

The Riocanex 1979 exploration programme comprised (i) detailed soil sampling whereby samples were collected at 10 m intervals along lines 50 m apart, and (ii) geological mapping at a scale of 1:25,000.

6. PERSONS EMPLOYED

G. D. Hodgson was party chief. Geological mapping was by Hodgson and R. L. Faulkner, who also supervised the soil sampling team of four. Viking Helicopters Ltd. supplied helicopter support. The programme was conducted under the general direction of R. V. Longe, Riocanex District Geologist for B.C.

7. GEOLOGY

7.1 General Statement

Rocks ranging in age from Proterozoic to early Triassic are exposed regionally. The various formations have been folded into northwest-trending linear belts bounded by sub-parallel thrust faults.

7.2 Regional Stratigraphy

Hadrynian to early Cambrian metasediments are exposed in the Gataga River valley and the ranges to the east. They comprise a 1500 m thick sequence of phyllites, slates, schists and quartzites (Taylor & Stott, 1973) forming a structurally complex package that MacIntyre (1980a) reported was unconformably overlain by the prominent cliff-forming rocks of the lower and middle Cambrian Atan Group.

According to Cathro & Carne (1978) the lower member of the Atan Group is a thickly bedded to massive, well sorted white quartzite. The upper member largely comprises massive grey micritic limestone, locally interbanded with forereef breccias and debris flows, capped by thickly-bedded grey dolomites and argillaceous limestones.

Ordovician to Silurian rocks are represented by graptolitic, carbonaceous shales of the Road River Formation below, and unnamed flaser-bedded siltstones above. The Road River rocks include siltstones, black cherts and limestones but are dominated by black shales deposited in the long-lived Kechika Trough, a southern tectonic extension of the Selwyn Basin. A relatively competent brown-weathering Silurian dolomitic siltstone commonly outcrops along ridges. MacIntyre (1980a) believed the unit rested unconformably on the Road River shales.

Resting conformably to disconformably (MacIntyre, 1980a) on the Silurian are black clastic rocks of Devonian and possibly Mississippian age. Generally recessive and poorly exposed, these shales host the stratiform lead-zinc-silver deposits at Driftpile Creek (Cathro & Carne, 1978) and Cirque (Roberts, 1978, MacIntyre, 1980b) where diamond drilling has helped define a broad two-fold subdivision. The lower unit comprises moderately siliceous, silty shales, siltstones, minor sandstones, thin limestones and local cherts. Cathro & Carne (1978) mapped wedges of poorly sorted sandstones and polymictic pebble conglomerates that they interpreted as being westerly-derived submarine fan sequences. MacIntyre (1980a) reported that these rocks also interfinger with and in places overlie the upper unit of the black clastics. The upper unit comprises mainly black, pyritic, siliceous shales and cherts and at least one major baritic member. Mineralization is associated with the barite, which occurs either as a massive, fine-grained bed or as small nodules within

the black shales. Cathro & Carne (1978) applied the name "Gunsteel Formation" to the Devonian and Devono-Mississippian rocks, but MacIntyre (1980a) used the term in reference to the upper unit only. He correlated the lower unit with the Besa River Formation of the eastern Rockies (Taylor & Stott, 1973, Taylor, 1979).

Above the Gunsteel Formation in the Driftpile Creek area Cathro & Carne (1978) mapped a Mississippian unit of brown weathering calcareous siltstones. This was not recognized by either Gabrielse (1962, 1977) or MacIntyre (1980a) but they did report a Trassic siltstone unit in the Mt. Holben area, 55 km S.E. of Driftpile Creek. Gabrielse (1980, pers. comm.) has also mapped local Trassic black shales.

7.3 Property Geology

Across the claims is a belt of northwest trending shales dipping to the southwest and flanked by limestones. Graham (1978) interpreted this as representing an overturned syncline. He divided the shales, Ordovician to Mississippian in age, into six units and the underlying Cambrian rocks into 2 units. Graham noted that mineralization occurred at the base of the shale sequence in a cherty unit in contact with the underlying limestones; and he thought that the shales associated with a baritic chert member at a much higher level within the sequence also had potential for hosting economic mineralization, though sulphides were not found.

In this report the geology is reinterpreted (Dwg. G-7558). Lithologies are thought to be repeated by two major thrust faults. The mineralized cherty unit of Graham (1978) is relegated in importance, and is at this stage believed to be little more than a thin wedge of brecciated rock caught up in the sole of one of the thrusts. The Devono-Mississippian baritic and cherty shales, overlain by a major geochemical anomaly (see Chapter 8), appear to have a better chance of hosting stratiform Pb-Zn-Ag deposits of the Cirque type (Roberts, 1978; MacIntyre, 1980b).

Various siliceous quartzites and siltstones and assorted thickly-bedded grey micritic limestones of the Cambrian Atan Group crop out on the northeast side of the property. The limestones are locally dolomitized (Graham, 1978).

The nodular calcareous shales of the Cambro-Ordovician Kechika Group (Gabrielse, 1977; MacIntyre, 1980a) are absent and Ordovician shales and slates of the Road River Formation directly overlie the Atan carbonates. The Road River Formation comprises a package of calcareous and graphitic shales and fine-grained siltstones, locally bearing graptolites, and also thin layers of orange-weathering grey limestone. Much of the unit is stained by iron oxides.

Overlying the Road River Formation is a brown-weathering unit of Silurian age which consists largely of interbanded dolomitic siltstone and shale.

Above this are siliceous shales of Devono-Mississippian age in which bedding is indistinct owing to the strong slaty cleavage that had developed. Local thin graded beds of fine-grained sediment (rhythmites) indicate the shales were laid down as distal turbidites. A distinctive member of this unit is a band of black chert that has associated minor discontinuous barite.

Thrust over the Devono-Mississippian shales from the southwest is a repeated sequence of black Road River shales. Above these, and below the second major thrust fault, is a thin slice of Silurian siltstones. The second thrust brings up Cambrian limestones, Ordovician shales and Silurian siltstones.

7.4 Mineralization

Known mineralization is restricted to the Waterfall showing. Brecciated chert and minor shales, cut by white quartz veins, host some crystalline yellow sphalerite. Boyle (1978) reported three samples with more than 8% Zn, but most were considerably less than this and nearly all Pb results were below 0.1% Pb.

8. GEOCHEMISTRY

Geochemical sampling by Texasgulf in 1978 established an extensive area of ground with greater than 50 ppm Pb in soils. Scattered values of more than 1,000 ppm Pb were also reported (Boyle, 1978) but the most important area appeared to be on the border between claims Rough 3 and Rough 4, where the 1,000 ppm Pb isopleth outlines an area of about 350 m x 150 m. As this area is underlain by Devono-Mississippian siliceous shales it was thought to have the potential for hosting a stratiform Pb-Zn deposit (Graham, 1974; Longe, 1979). The two hand-dug trenches of Texasgulf had failed to intersect mineralization, so the initial Riocanex attack in 1979 was to better delineate potentially mineralized units by a very detailed soil sampling programme (Dwg. GC-7559).

In 1979, 570 soil samples were collected at 10 m intervals on lines spaced 50 m apart (Dwg. GC-8758). Samples were taken from holes about 10-20 cm deep, dug with a grab hoe. Where possible the 'B' horizon was sampled, but failing that material from the 'C' horizon was substituted and the samples were collected in paper bags to be sent for analysis for Cu, Pb and Zn in the Riocanex laboratory in North Vancouver.

The samples were prepared by drying and sieving to -80 mesh. 0.6 gm of each sample was placed in a test tube to which was added 2 ml concentrated nitric acid. The solution was heated in a hot water bath at 95°C for ½ hour and then allowed to cool. 1 ml concentrated hydrochloric acid was then added, and the solution heated in a hot water bath at 95°C for 1½ hours. After being cooled each sample solution was diluted with deionized water to a final volume of 12 ml. The sample solutions were then analyzed by atomic absorption.

Little significance is attached to the rather low copper values. It is assumed the lead and zinc values reflect the metalliferous nature of the underlying shales and it is hoped the higher values indicate the presence of mineralization. However, the highest values for lead and zinc do not correspond. This is thought to be due to zinc's hydromorphous character allowing it to be readily transported in groundwater. On the other hand lead in galena is moved slowly by mechanical processes. The soil profile has also been affected by solifluction.

9. CONCLUSIONS

9.1 Geology

The Devono-Mississippian siliceous and locally cherty shales that outcrop across the centre of the property are similar to those that host the Driftpile prospect, 27 km to the southeast, and the Cirque deposit, 100 km to the southeast. Thrust faulting, rather than folding, is the most important structural control on the geology.

9.2 Geochemistry

The 1,000 ppm Pb isopleths outline two zones about 40 m wide and 100 m apart. The soil is thin and so the source must be near surface. However, it is not known how far downslope the lead has been transported by solifluction.

The one major zinc source appears to be unrelated to the lead and the significance of this is not known at this time.

These values and the area covered by the anomaly is comparable to soil anomalies on the Pie claims and the Cirque claims.

10. REFERENCES

Boyle, P.J.S., 1978: B.C. Ministry of Energy, Mines & Petroleum Resources, Assessment Rept. 6997

Cathro, R.J. & Carne, R.C., 1978: B.C. Ministry of Energy, Mines & Petroleum Resources, Assessment Rept. 6666.

Gabrielse, H., 1962: Kechika map-area. Geol. Surv. Can. Map 42-1962.

1977: Ware west half and Toodoggone River map areas. Geol. Surv. Can. O.F. 483

Graham, R.A.F., 1978: Texasgulf memo dated October 27, 1978.

Longe, R.V., 1979: Rough claims property appraisal. Internal Riocanex report, dated January, 1979.

MacIntyre, D.G., 1980a: Driftpile Creek - Akie River Project. B.C. Ministry of Energy, Mines & Petroleum Resources Paper 1980-1, 55-67.

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Roberts, W., 1978: B.C. Ministry of Energy, Mines & Petroleum Resources, Assessment Rept. 6743.

Taylor, G.C., 1979: Ware east half and Trutch map-areas, Geol, Surv. Can. O.F. 606

Taylor, G.C. & Stott, D.F., 1973: Tuchodi Lakes map-area, British Columbia, Geol. Surv. Can. Mem. 373

CERTIFICATE

I, Geoffrey David Hodgson, with business address in Vancouver, British Columbia, and residential address in North Vancouver, British Columbia, do hereby declare

1. I am a geologist employed by Rio Tinto Canadian Exploration Limited.

2. I graduated from Exeter University, U.K., in 1972 with a B.Sc. (Hons.) degree in geology.

3. I graduated from the University of Alberta in 1976 with an M.Sc. degree in geology.

4. I am a Professional Geologist with the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

5. From 1970 to 1980 I have been employed on both a temporary and full-time basis by the Geological Survey of Greenland, Research Council of Alberta, University of Alberta, Cominco Ltd., and Riocanex Ltd.

Respectfully Submitted,

G. D. Hodgson

COST STATEMENT

B.C. ROUGH OPTION

28 May - 23 September 1979

GEOLOGY

Salaries & Wages	
8 persons, 14 Jun - 25 Aug, 17 man days @ $37	$ 629.00
Benefits @ 20% of salaries & wages	125.80
Riocanex Equipment 17 man days @ $3	51.00
General Costs (From Sikanni Camp)	
17/342 x $172,876.06	8,593.25
GEOLOGY TOTAL	$9,399.05

GEOCHEMISTRY

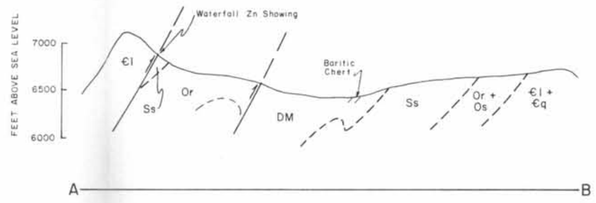
Salaries & wages	
8 persons, 14 Jun - 25 Aug, 11 man days @ $37	$ 407.00
Benefits @ 20% of salaries & wages	81.40
Riocanex Equipment 11 man days @ $3	33.00

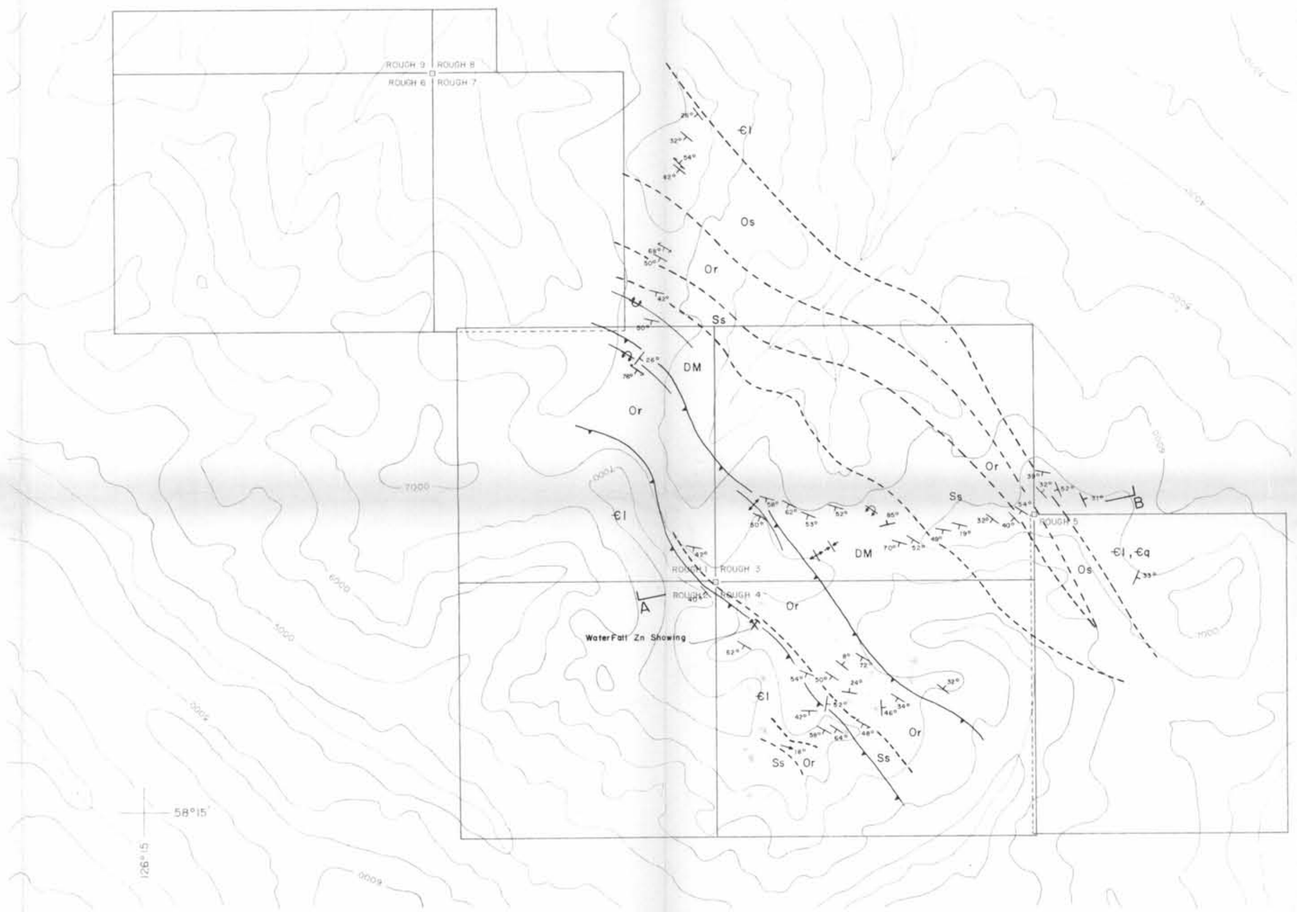
Geochemical Analysis

Bondar-Clegg Lab		
3 rocks for Pb, Zn, Ba, @ $13.83 (prep, retn, shpng)	$41.49	
3 sludge for Pb, Zn, Ba @ $13.83 (prep, retn, shpng)	41.49	
10 rocks for Pb, Zn, Ag, Ba @ $10 (prep, shpng)	100.00	182.98
Riocanex Lab		
568 soils for Cu, Pb, Zn @ $3.60		2,044.80
General costs (from Sikanni Camp)		
11/342 x $172,876.06		5,560.34
GEOCHEMISTRY TOTAL		$8,309.52

COSTS APPORTIONED TO CLAIMS

Claim	Units	Geology	Geochemistry	Total
Rough 1	16	$1,446.01	$ -	$1,446.01
Rough 2	16	1,446.01	-	1,446.01
Rough 3	20	1,807.51	4,154.76	5,962.27
Rough 4	20	1,807.51	4,154.76	5,962.27
Rough 5	20	1,807.51	-	1,807.51
Rough 6	20	-	-	-
Rough 7	12	1,084.50	-	1,084.50
Rough 8	1	-	-	-
Rough 9	5	-	-	-
	130	$9,399.05	$8,309.52	$17,708.57





MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 8169
Part 1 of 2

LEGEND

DM	Devonian Mississippian "Black Clastics", Mainly Shales and Chert		Thrust Fault
Ss	Silurian Siltstones		Bedding, Cleavage, Fold Axis
Or + Os	Ordovician Shales and Siltstones, Road River Formation		Anticline, Overturned
€l + €q	Cambrian Limestones and Quartzites, Atan Group		Syncline, Overturned

SCALE 1:25,000

500 0 500 1000 1500 2000 Meters

NTS 94/8E

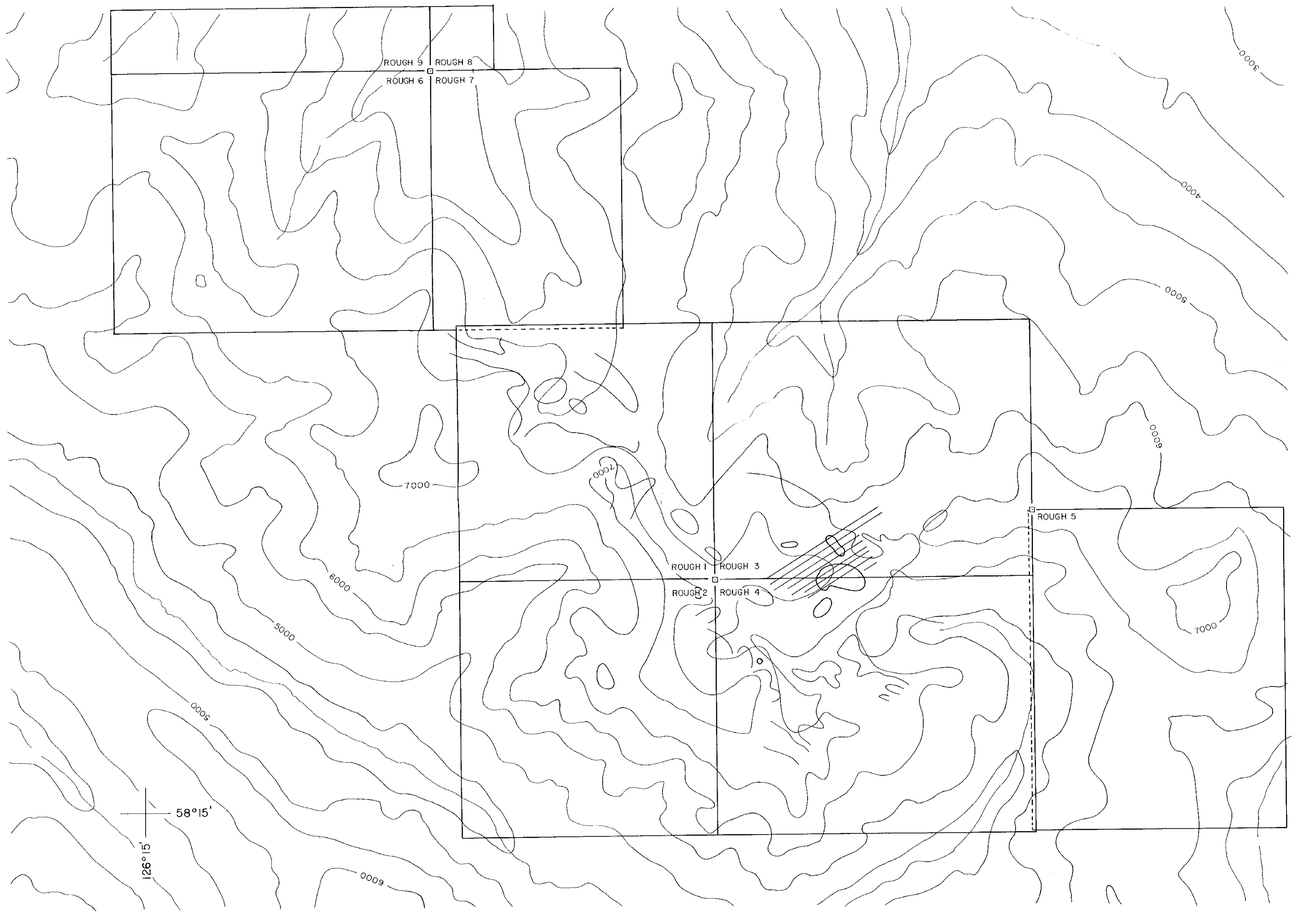
LIARD MINING DIVISION

RIO TINTO CANADIAN EXPLORATION LTD.

ROUGH CLAIMS

GEOLOGY

DATE	DRAWN BY	DWG
FEB 1980	G.H./exclusive	GC-7558



SCALE 1:25,000

500 0 500 1000 1500 2000 Meters

Pre 1979 Geochemistry
ppm Pb in Soils

1000
50

1979 Soil Sample Grid

N.T.S. 94/8E

LIARD MINING DIVISION

RIO TINTO CANADIAN EXPLORATION LTD.

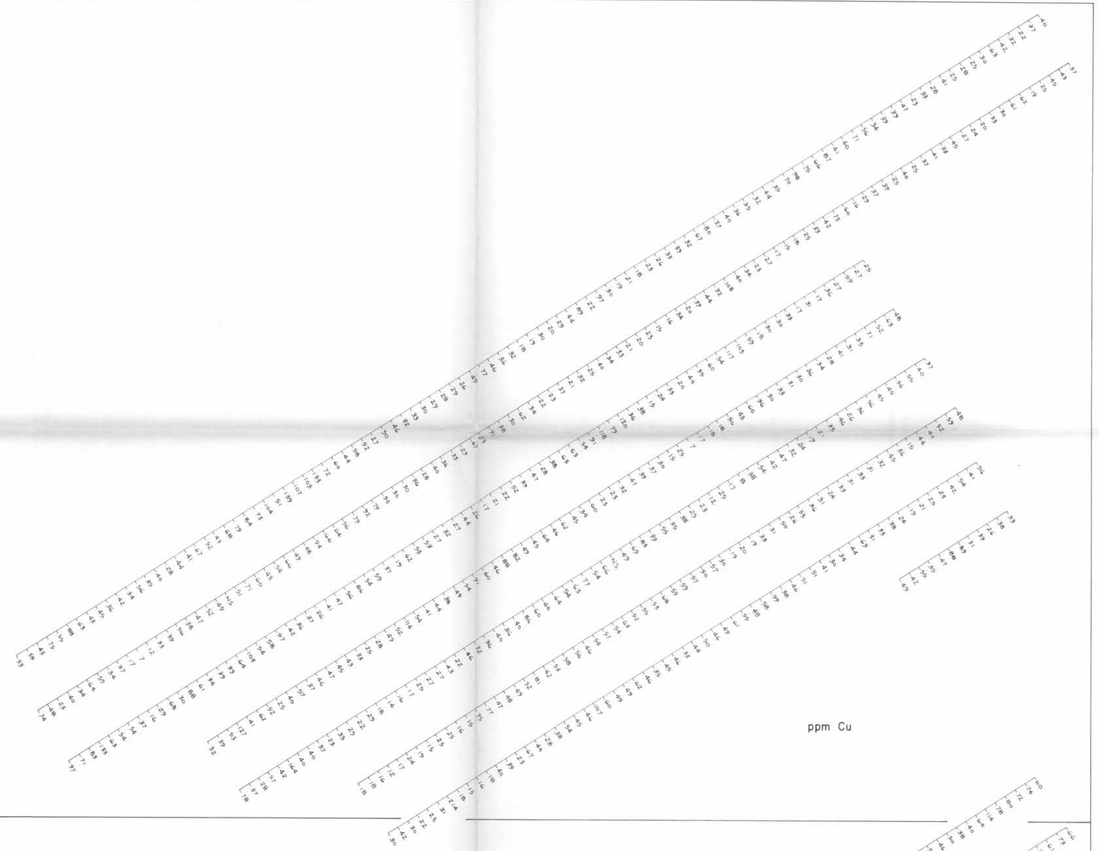
ROUGH CLAIMS

SOIL SAMPLE GRID LOCATION

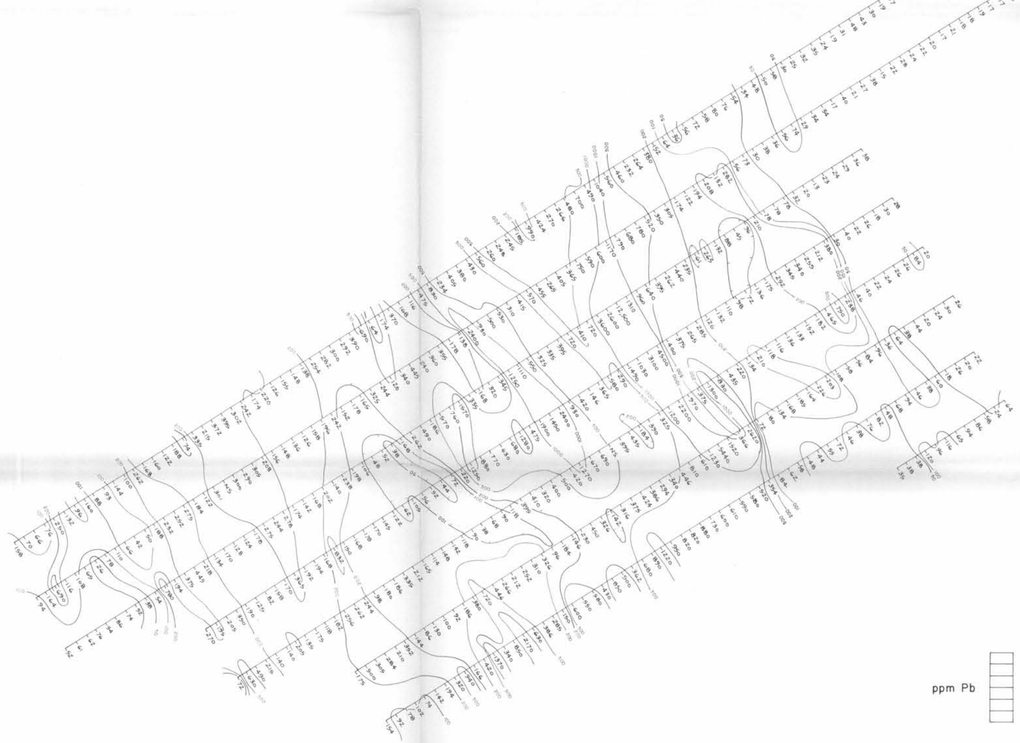
DATE	DRAWN BY	DWG.
FEB. 1980	G.H./exclusive	GC - 7559

Soil Sample Location and Number

Note : All numbers preceded by 790

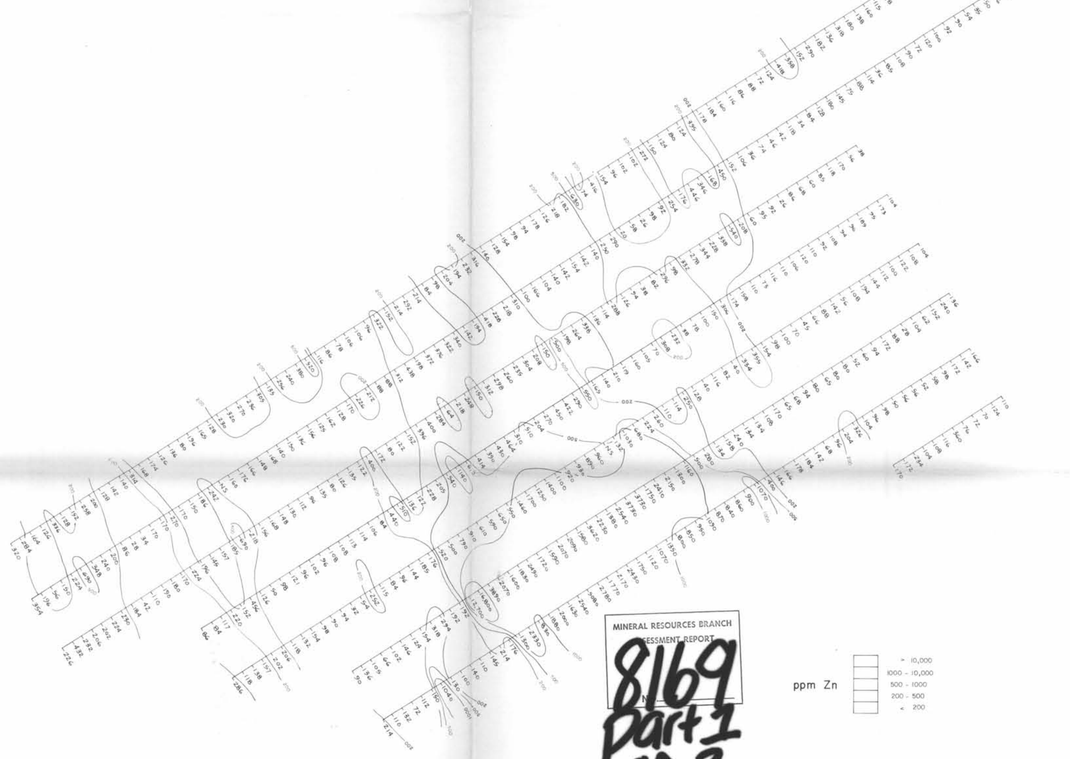


ppm Cu



ppm Pb

	> 1000
	500 - 1000
	200 - 500
	100 - 200
	50 - 100
	< 50



ppm Zn

	> 10,000
	1000 - 10,000
	500 - 1000
	200 - 500
	< 200

NTS. 94/8E

LIARD MINING DIVISION

SCALE 1:2000

50 0 50 100 150 Metres

RIO TINTO CANADIAN EXPLORATION LTD.

ROUGH CLAIMS

SOIL SAMPLE LOCATION

ppm Cu, Pb, Zn

DATE	DRAWN BY	DWG.
FEB. 1980	G.H./exclusive	GC-8758