

DOG CLAIMS, B.C.

Omineca, M.D.

GEOLOGY, 1980

57°22'N 124°50'W

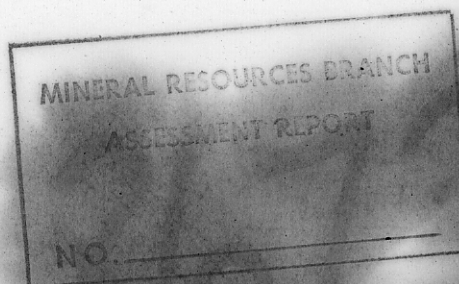
N.T.S. 94F/7W

G.D. Hodgson, December 1980

'80-#958-  
#8673

Owner & Operator: Rio Tinto Canadian Exploration Ltd.

Work Performed On: DOG 1 - 11



DOG CLAIMS, B.C.

Omineca, M.D.

GEOLOGY, 1980

57°22'N 124°50'W

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SUMMARY

Devonian black shales in the northern Rockies of British Columbia host important deposits of lead, zinc, and silver. Riocanex staked the Dog claims in 1978 to cover anomalous stream-silt geochemistry. The property covers the strike continuation of a mineralized unit on the adjacent Fluke and Elf claims of Cyprus Anvil Mining Corporation and Hudson's Bay Oil and Gas. The 1980 Riocanex exploration programme largely involved mapping the Dog claims. From this work a subdivision of the Devonian package allowed comparison with the Fluke claims and other properties elsewhere. It is concluded that the favourable Devonian unit, known as the Active Zone, may be present on the Dog claims. Outcrop is, however, poor.

LIST OF ILLUSTRATIONS

<u>DRAWING NO.</u>			<u>AFTER PAGE</u>
L-6684	Location Map	1:250,000	1
C-6685	Claim Map	1:50,000	2
G-8805	Geology	1:10,000	In Pocket

APPENDICES

- I Cost Statement
- II Certificate

TABLE OF CONTENTS

PAGE

1. INTRODUCTION	1
2. LOCATION AND ACCESS	1
3. TOPOGRAPHY AND VEGETATION	2
4. HISTORY AND PREVIOUS WORK	2
5. WORK PERFORMED IN 1980	2
6. GEOLOGY	
6.1 Regional Stratigraphy	3
6.2 Property Geology	4,5
6.3 Structure	6
6.4 Mineralization	6
7. CONCLUSIONS	7
8. REFERENCES	7

## 1. INTRODUCTION

Devonian black shales in the northern Rockies of British Columbia host important deposits of lead, zinc and silver, e.g., the Cirque deposit of Cyprus Anvil Mining Corporation and Hudson's Bay Oil and Gas. Riocanex staked the Dog claims in 1978 to cover anomalous stream-silt geochemistry on the strike continuation of the mineralized rocks on the Elf claims to the southeast and the Fluke claims to the northwest. The 1980 Riocanex exploration programme comprised geological mapping at a scale of 1:10,000, plus some helicopter pad building and minor line cutting in preparation for the 1981 programme.

## 2. LOCATION AND ACCESS

The claims are situated in the western ranges of the northern Rocky Mountains south of the Kwadacha River (Dwg. L-6684).

Latitude 57°22'N

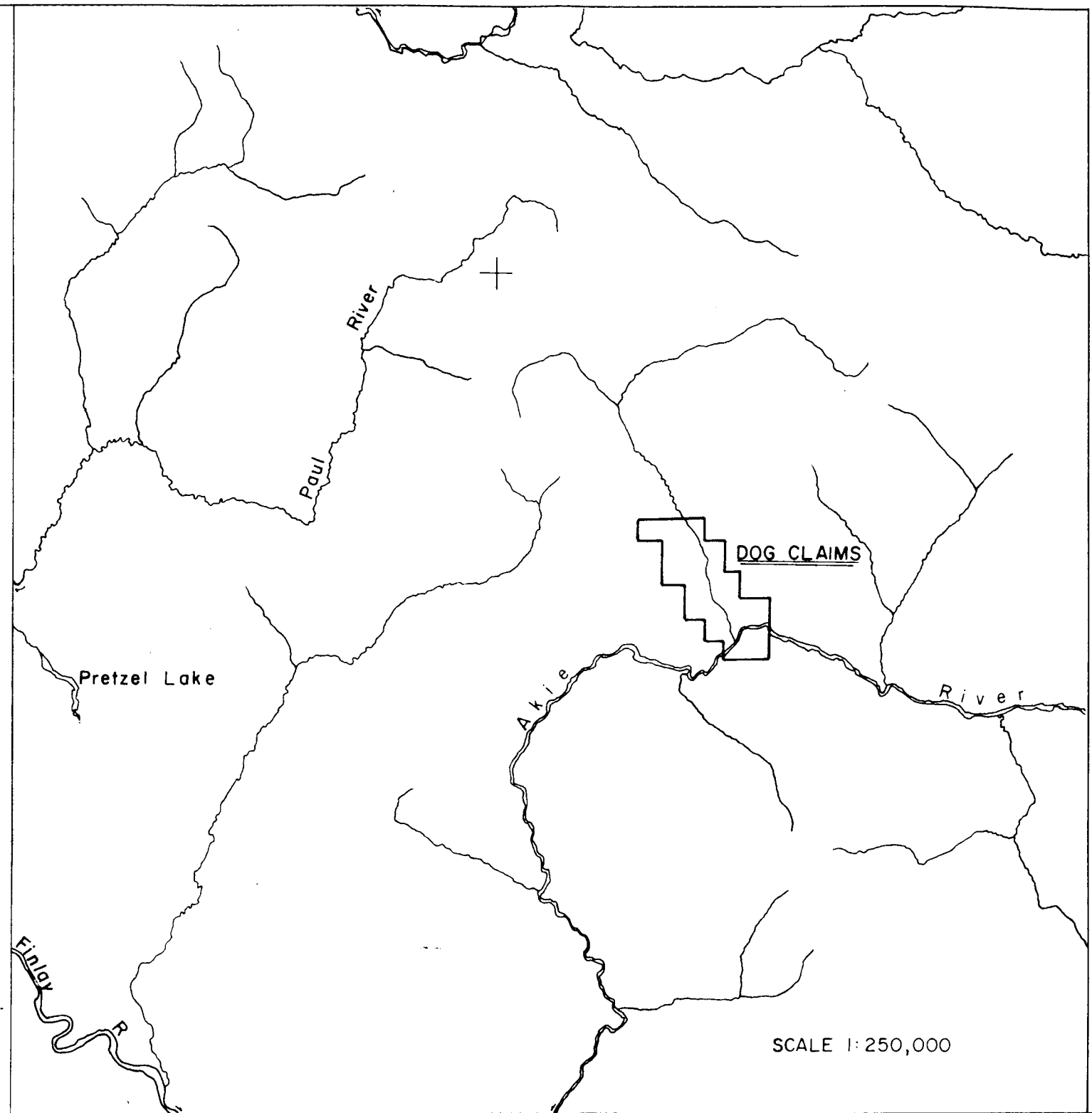
Longitude 124°50'W

N.T.S. 94F/7W

Omineca Mining District

The nearest major centre is Fort Nelson, 205km to the northeast. Mackenzie, at the south end of Williston Lake, is 250km away. On the Finlay River 50km to the northwest is the small Indian settlement of Fort Ware, downstream of which Cyprus Anvil is constructing a 1700m gravel airstrip to facilitate development of the Cirque property. After the spring breakup, barges run from Mackenzie to the north end of Williston Lake.

Access to the Dog claims is by helicopter, which is permanently based at Fort Nelson and Mackenzie. In 1980 the Riocanex exploration camp was situated at Pretzel Lake 25km south of the property.



N.T.S. 94F/7

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
NO. **8673**

RIO TINTO CANADIAN EXPLORATION LTD.

DOG CLAIMS

LOCATION MAP

DATE DEC. 1980	DRAWN BY GDH /	DWG. L-6684
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### 3. TOPOGRAPHY & VEGETATION

The area is mountainous and elevations range from 1000m to 2000m above sea level. Some of the area is above tree line and is covered by alpine meadows or scree where the slopes are steeper. Lower slopes and valley bottoms are forested with spruce and alder.

### 4. HISTORY & PREVIOUS WORK

In 1977 Cyprus Anvil and Hudson's Bay Oil and Gas discovered barite-pyrite-sphalerite-galena mineralization south of the Kwadacha River. This deposit, the Cirque, was drilled by them in 1978, 1979 and 1980. They also found galena(-sphalerite) mineralization south of the Akie River (Elf claims) which they drilled in 1979 and 1980.

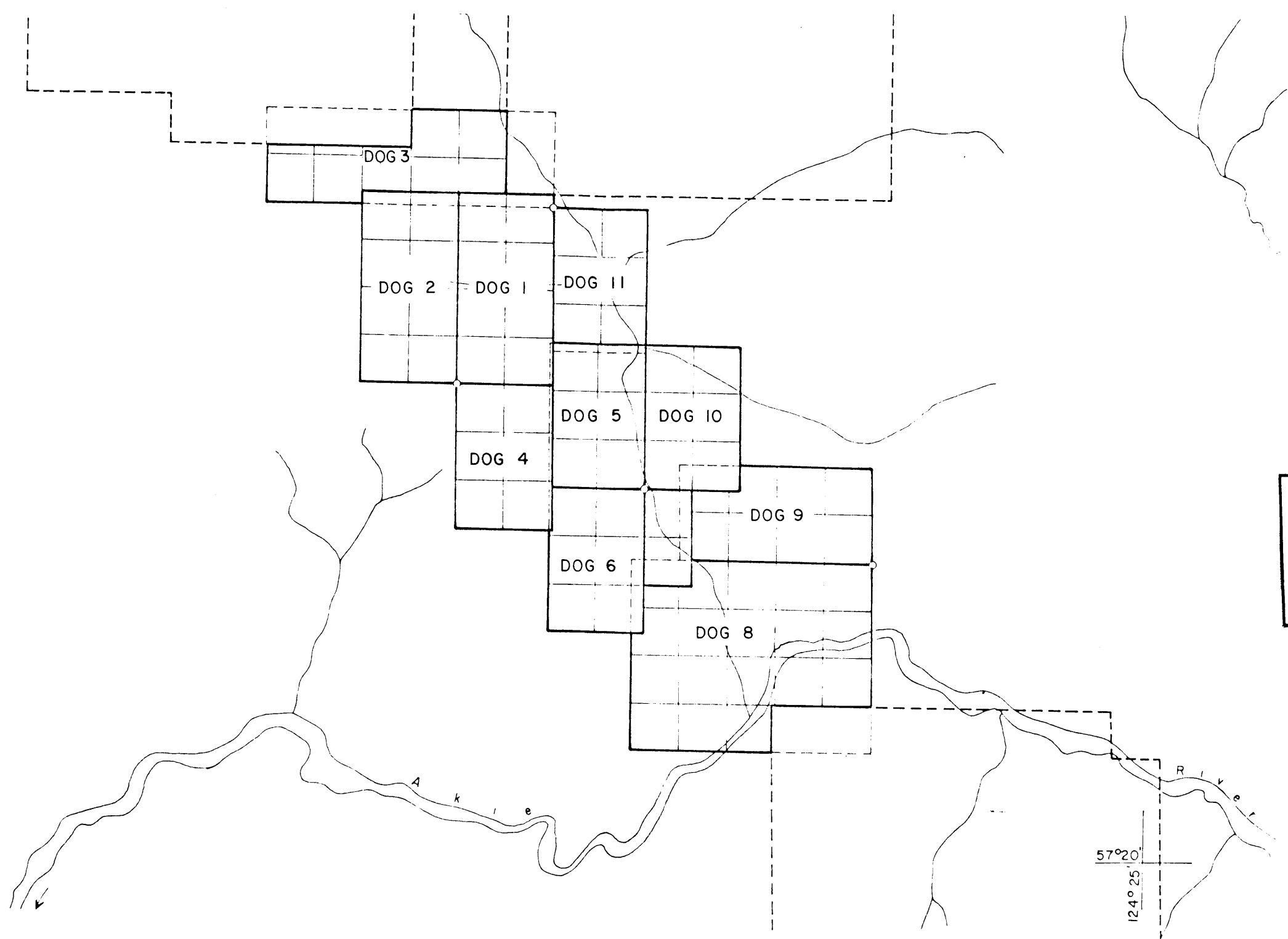
Riocanex staked the Dog claims in 1978 following a regional exploration programme. The 1979 Riocanex programme involved some reconnaissance mapping and minor geochemical soil sampling.

There has been geological mapping on a scale of 1:125,000 by the G.S.C. (Gabrielse, 1977; Taylor, 1979). MacIntyre (1980) has mapped the belt on a scale of 1:250,000 for the B.C. Ministry of Energy of Mines and Petroleum Resources.

### 5. WORK PERFORMED In 1980

The 1980 Riocanex exploration programme comprised 1:10,000 geological mapping of the property. At the end of the field season, preparations were begun for the 1981 programme in the form of helicopter pad construction and some line cutting.

Geological mapping was by J.F.H. Thompson. P.S. McCarthy supervised the line cutting crew. The programme was under the field direction of G.D. Hodgson; Northern Mountain Helicopters, Ltd., of Prince George, provided helicopter support.



MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
**8673**

57°20'  
124°25'



N.T.S. 94F / 7W

SCALE 1:50,000



RIO TINTO CANADIAN EXPLORATION LTD.		
DOG CLAIMS		
CLAIM MAP		
DATE DEC. 1980	DRAWN BY GDH / sg	DWG. L-6685



## 6. GEOLOGY

### 6.1 Regional Stratigraphy

Little work has been done in the area and the reader is referred to G.S.C. Open Files 483 (Gabrielse, 1977) and 606 (Taylor, 1979) for more information on regional geology. D.G. MacIntyre (1980) of B.C. Ministry of Energy, Mines and Petroleum Resources has released a compilation map. Several informal field names are introduced below.

Talcy-lime shales and shaly-banded limestones of the Cambro-Ordovician Kechika Group are probably unconformably overlain by black calcareous shales of the Ordovician-Silurian Road River Group. Although the predominant Ordovician lithology is a black, carbonaceous, limy shales that commonly bears graptolites, a local facies variation of the Road River rocks is the Del Creek formation -- a hematitic siltstone with associated agglomerates. Above the shales is the Silurian Nep formation, a distinctive grey micrite commonly associated with chert bands. An unconformity locally cuts the Nep formation out of the succession and the overlying tan-weathering Silurian Muskwa siltstones are distinguished by the presence of intense bioturbation. Eastwards, these silts are represented by a variable sand facies.

Thickly-bedded grey limestones lie above the Silurian north and east of the Dog claims. The unit represents a reefal buildup on the edge of a middle Devonian shale basin. Elsewhere, these limestones are reduced and are represented largely by debris flows and breccias. The Devonian Black Clastics comprise a lower silty shale unit, a middle unit of calcareous and siliceous shales and an upper, coarser, black clastic unit. Barite-Pb-Zn-Ag mineralization is thought to occur between the lower and central units.

The youngest rocks in the area are Permo-Triassic silty shales. These are fault-bounded and their relationship to older units is not known.

## 6.2 Property Geology

The Dog claims are underlain by shales, cherts, siltstones and limestones of Ordovician to Devonian age (see Dwg. G-8805). Structure is important in the distribution of the stratigraphic units, and folding tectonics dominate the geology of the property. A large overturned anticline/syncline couple with fold axial surfaces dipping to the southwest has been mapped.

The Road River Group: The Road River sediments on the Dog claims have been divided into four units:

- (iv) Muskwa siltstones ) Silurian
- (iii) Nep limestones and cherts ) Silurian
- (ii) Del Creek siltstones ) Ordovician
- (i) Road River black shales ) Ordovician

(i) Road River shales: The shale facies varies in colour from grey to black, but locally displays a light grey- to silver-weathering colour. This is a reflection of composition and cleavage surface/bedding surface intersection angles. Compositionally, the facies varies from paper- or chip-shale to more massive siliceous shale and chert. Limestone beds, from 1m - 10m thick, occur towards the base of the shale unit. These limestones commonly contain sedimentary structures providing definitive "way-up" criteria. Ordovician graptolites are locally present throughout the shale sequence.

(ii) Del Creek siltstones: Exposed west of the Dog claims is an orange siltstone that appears to be a facies equivalent of the lower part of the Road River black shale package. The colour is due to abundant iron oxides, commonly occurring as discontinuous laminae. Minor chert and limestone are interbedded with the siltstones. A group of distinctive orange weathering, limy breccias and conglomerates also occur within the siltstones. A chloritic matrix supports clasts of various sizes and compositions, and a volcanic association is postulated for these agglomerates (Unit A in Dwg. G-8805).

## 6.2 Property Geology (Cont'd.)

### (iii) Nep formation:

The Road River shales pass conformably up into a unit of grey micrite interbedded with black chert. Siltstones with shale pods and limestone may occur, commonly bearing Silurian monograptids. South of the Dog claims, south of the Akie River, the Nep formation largely comprises thickly-bedded limestones with subordinate chert bands. To the north the unit is thinly-bedded and chert bands locally make up 40% of the rock. An overlying unconformity has locally reduced the Nep formation, and elsewhere it is cut out by thrust faulting.

(iv) Muskwa siltstones: These tan-weathering, dolomitic Silurian siltstones are resistant and commonly underlie the higher peaks and ridges. They vary from fissile, silty flagstones to highly bioturbated, rubbly siltstones with numerous worm burrows and spiral feeding trails. Monograptids, some of which are 1m long, and cyrtograptids are locally present. Thin, laminated limestone beds may represent algal mats. Not uncommon are calcareous concretions, up to 1m across, and hematite or pyrite nodules.

Devonian: On the Dog claims, Devonian shales rest, apparently conformably, directly on the Silurian siltstones. East of the claims, however, middle Devonian reefal limestone and limestone debris flows overlie the Silurian rocks. A four-fold subdivision of the Devonian rocks has been established for the Dog claims:

- (iv) Warneford facies
- (iii) Gunsteel shales
- (ii) Akie shales
- (i) Kwadacha limestone

(i) Kwadacha limestone: Cliff-forming middle Devonian limestone outcrops east of the Dog claims, overlying the Silurian silt-

- (i) Kwadacha limestone: (Cont'd)  
stones. Two-hole crinoids, corals and stromatoporoids are present in the limestone.
- (ii) Akie shales: The Akie shales consist of a pyritic, hematite-stained shale, locally calcareous and silty. Chert nodules are not uncommon within the unit.
- (iii) Gunsteel shales: The Gunsteel shales comprise a laminated calcareous shale, a uniform grey shale, siliceous shale and porcellanite and chert. Locally, the lowest part of the Gunsteel hosts blebby barite and pyrite laminae. This is known as the Active Zone which is the favourable unit for massive bedded barite-sphalerite-galena mineralization elsewhere, e.g., the Fluke property, adjacent to the north.
- (iv) Warneford is the name given to a unit variously comprised of black hematitic shales, quartzite and polymictic conglomerates. In part, it inter-digitates with the Gunsteel shales, but elsewhere is younger. The unit is best developed north of the Warneford River, but crops out also on the Dog claims.

### 6.3 Structure

A large scale syncline/anticline couple with southwest-dipping fold axial surfaces dominates the structural geology of the Dog claims. Along the western margins of the property, the beds are upside-down and older units overlie younger ones. The rocks are in the overturned limb of a major syncline. Down the centre of the property, the southwest-dipping common limb of the syncline/anticline couple, the beds are right-way-up. Rocks in the eastern limb of the anticline are poorly exposed, but are probably nearly vertical.

### 6.4 Mineralization

Graf (1978) shows a barite-pyrite showing in one of his maps (Dwg. G-8667) on the Dog claims, but this is not referred to in his text. No sulphide mineralization was found on the property in 1980.

## 7. CONCLUSIONS

Elsewhere within the Devonian shale belt of the area. the unit is favourable for barite-sphalerite-galena mineralization, the Active Zone occurs at the base of the Gunsteel shales. Active Zone shales were not mapped on the Dog claims in 1980, but the contact exists between the Gunsteel shales above and the Akie shales below. Active Zone shales host mineralization on the Fluke property on strike immediately to the north. The Dog claims, therefore, have the potential for bearing a major deposit.

## 8. REFERENCES

GABRIELSE, H., 1977: Ware W $\frac{1}{2}$  and Toodogone River Map-areas. Geol. Surv. Can., O.F. 483.

GRAF, C., 1978: Williston Lake Shale-Hosted Lead-Zinc Reconnaissance. Riocanex Report #566.

MACINTYRE, D.G., 1980: Geological Compilation and Mineral Occurrence Map, Driftpile Creek - Akie River, B.C. Ministry of Energy, Mines and Petroleum Resources, Preliminary Map 38.

TAYLOR, G.C., 1979: Ware E $\frac{1}{2}$  and Trutch Map-areas. Geol. Surv. Can., O.F. 606.

APPENDIX I  
COST STATEMENT

COSTS STATEMENT

B.C. DOG CLAIMS

GEOLOGY, LINECUTTING

11 May - 14, SEPTEMBER 1980

SALARY & WAGES

10 Men, 17 May-14 Sep, 58 Man Days @ \$45 \$2,610

BENEFITS @ 20% 522

RIOCANEX EQUIPMENT 58 Man Days @ \$3 174

FOOD & ACCOMODATION 58 Man Days @ \$18 1,050

SUPPLIES 2,981

MISCELLANEOUS TRAVEL 723

FIXED WING

Northern Thunderbird Air 626

HELICOPTER

Northern Mountain, 15.4 hrs. @ \$305 4,703

FUEL 806

REPAIRS 830

RENTALS

Traeger SSB50C Radio, 35 Days @ \$7 \$245  
2 Traeger 5X5SSB Radio, 35 Days @ \$7/ea. \$490  
6 Traeger Hand Portables, 35 Days @ \$3/ea \$630  
2 Sunrise Rentals Oleo Mac Chain Saws  
@ \$4/ea. \$280 1,645

REPORT PREPARATION 960

TOTAL \$17,630

COSTS APPORTIONED TO CLAIMS

<u>CLAIM</u>	<u>UNITS</u>	<u>GEOLOGY</u>	<u>LINE CUTTING</u>	<u>TOTAL</u>
Dog 1	8*	\$1,763	\$1,763	\$3,526
Dog 2	8*	1,763	1,763	3,526
Dog 3	12*	2,645	2,645	5,290
Dog 4	6*	1,322	1,322	2,644
Dog 5	6*	1,322	1,322	2,644
Dog 6	6	-	-	-
Dog 7	2	-	-	-
Dog 8	20	-	-	-
Dog 9	8	-	-	-
Dog 10	6	-	-	-
Dog 11	6	-	-	-
	<hr/>	<hr/>	<hr/>	<hr/>
	88	\$8,815	\$8,815	\$17,630

SE/jc



APPENDIX II  
CERTIFICATE

CERTIFICATE

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

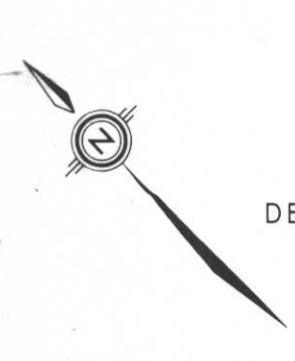
1. I am a geologist employed by Rio Tinto Canadian Exploration Limited.
2. I graduated from Exeter University, U.K., in 1972 with a BSc (Hons.) degree in geology.
3. I graduated from the University of Alberta in 1976 with an MSc degree in geology.
4. I am a Professional Geologist with the Association 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,

A handwritten signature in black ink, appearing to read 'G.D. Hodgson', written in a cursive style.

G.D. Hodgson





- DEVONIAN**
- 3w Warnford sandstones and conglomerates
  - 3g Gunsteel siliceous shales and chert
  - 3z Active Zone baritic shales
  - 3a Akie hematitic, silty shales
  - 3k Kwadacha Limestone with abundant fossil fragments

— BESA RIVER GROUP —

- SILURIAN**
- 2m Muskwa dolomitic siltstones
  - 2n Nep Limestones and chert
- ORDOVICAN**
- 2r Road River graptolitic shales
  - 2d Del Creek siltstones with hematite laminae

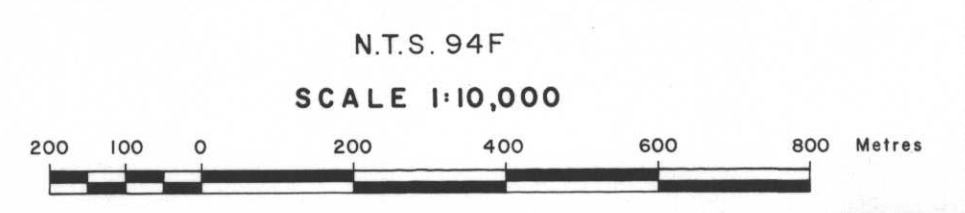
— ROAD RIVER GROUP —

— LEGEND —

- ORDOVICAN** — 1k Kechika talcy shales with limestone pods
- ORDOVICAN** — A Agglomerate
- <sub>45</sub> Strike direction and dip magnitude
  - <sub>110</sub> Cleavage strike and dip magnitude
  - <sub>30</sub> Strike direction and dip magnitude of overturned beds
  - Thrust fault
  - Fault — downthrown side indicated
  - Anticlinal axis, overturned anticlinal axis
  - Synclinal axis

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT

**8673**



RIO TINTO CANADIAN EXPLORATION LTD.		
DOG CLAIMS		
GEOLOGY		
DATE	DRAWN BY	T.DWG.
OCT. 80	JT / rj	G 8805