

**ASSESSMENT REPORT**

describing

**DRILLING**

on the

**RED LINE PROPERTY**

Red Line 1-12 YB60825-YB60836  
13-28 YB70624-YB70639

Latitude 61°25'N; Longitude 130°22'W

NTS 105G/8

in the

**WATSON LAKE MINING DISTRICT  
YUKON TERRITORY**

Prepared by

Archer, Cathro & Associates (1981) Limited

for

**EXPATRIATE RESOURCES LTD.**

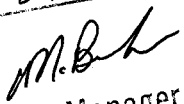


**0935 85**

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L.C. Pigage Consulting

September, 1996

This report has been examined by  
the Geological Evaluation Unit  
under Section 53 (4) Yukon Quartz  
Mining Act and is allowed as  
representation work in the amount  
of \$ 8400.00.

*for*   
Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

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## INTRODUCTION

The Red Line property consists of twenty-eight contiguous mineral claims owned 100% by Expatriate Resources Ltd. The first twelve claims were staked in August 1995 to cover two soil sample sites from a 1973 regional joint venture exploration program managed by Archer, Cathro & Associates Limited (Cathro, 1973); the sample values were moderately to strongly anomalous in lead and zinc. Sixteen claims were subsequently added in October 1995 to bring the total to twenty-eight.

The Red Line property was considered to be favourable for VMS (volcanogenic massive sulphide) type mineralization. Field work conducted in 1995 and early 1996 outlined coincident soil geochemical and weak geophysical anomalies on the property (Wengzynowski, 1996).

Between May 29 - June 30, 1996 a small drill was mobilized onto the Red Line property to test the coincident soil geochemical and weak geophysical anomalies. At the same time limited geological mapping was completed to help delineate the drill targets. A total of 851.00 m was drilled in 6 BTW diamond drill holes. This report summarizes the results of the 1996 geological mapping and drilling programs. The author supervised the work described in this report; a statement of qualifications is included as Appendix I.

## LOCATION and ACCESS

The Red Line property is located in southeast Yukon at latitude 61° 25' N and longitude 130° 22' W (Figure 1) in the Watson Lake Mining District. It consists of twenty-eight contiguous mineral claims registered in the name of Archer, Cathro & Associates (1981) Limited which holds them in trust for Expatriate. Table 1 lists the pertinent claim information.

Table 1. Claim Registration Information

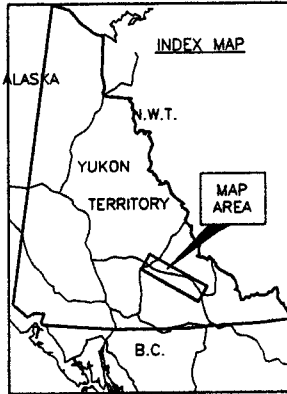
Claim Name	Grant Number	Expiry Date*
Red Line 1-12	YB60825-YB60836	March 17, 2002
Red Line 13-28	YB70624-YB70639	March 17, 2001






\* Expiry date includes work filed for assessment credit but not yet accepted.

The claims are situated in a broad glacial valley immediately east of two small unnamed lakes in NTS map sheet 105G/8 (Figure 2). Elevations range from 1255 m to 1665 m above sea level. Topographic relief is gentle with the exception of one area in the southwest corner of the property where slopes average 25°. Creeks

Figure 1

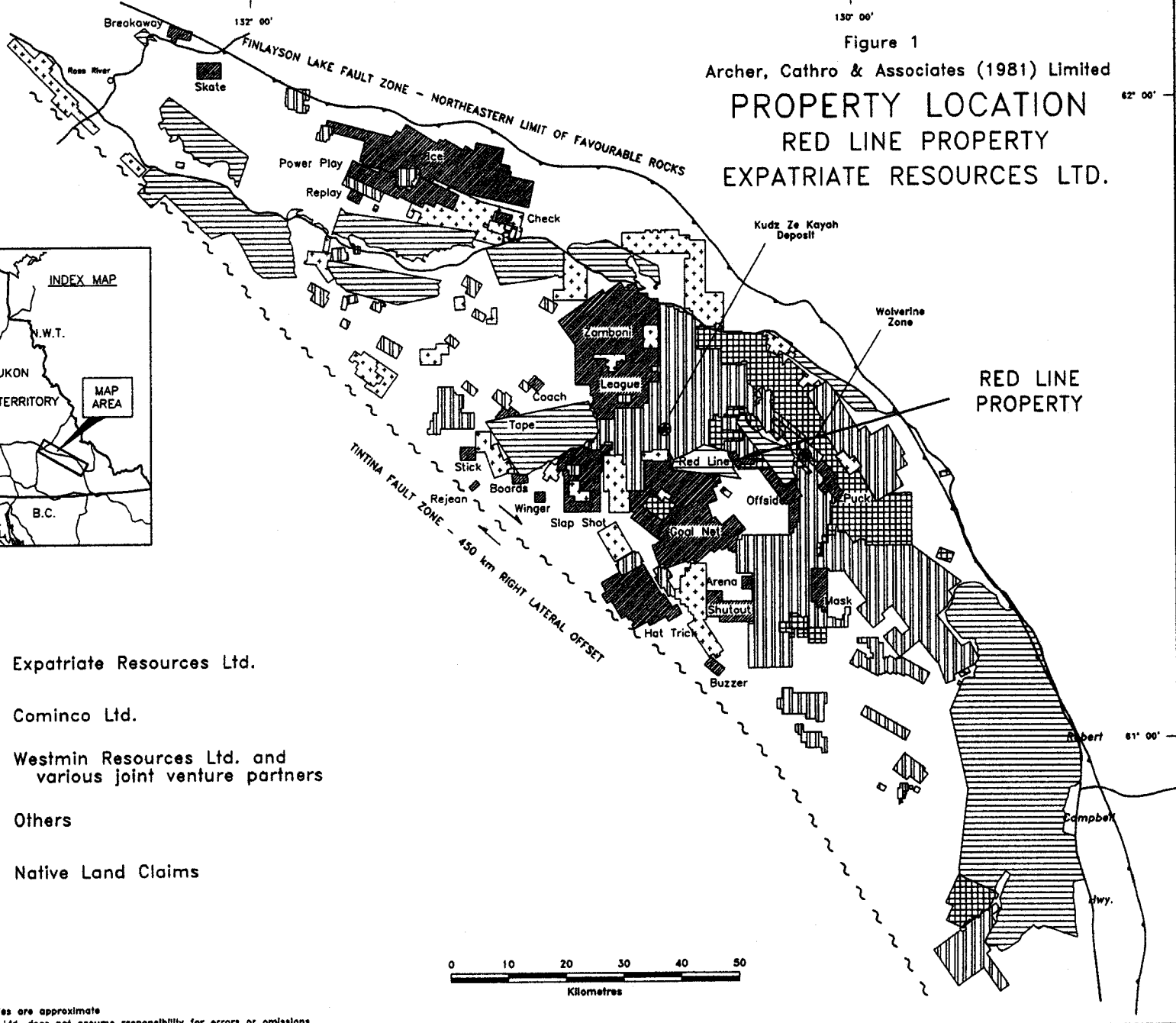
Archer, Cathro & Associates (1981) Limited  
**PROPERTY LOCATION**  
**RED LINE PROPERTY**  
**EXPATRIATE RESOURCES LTD.**

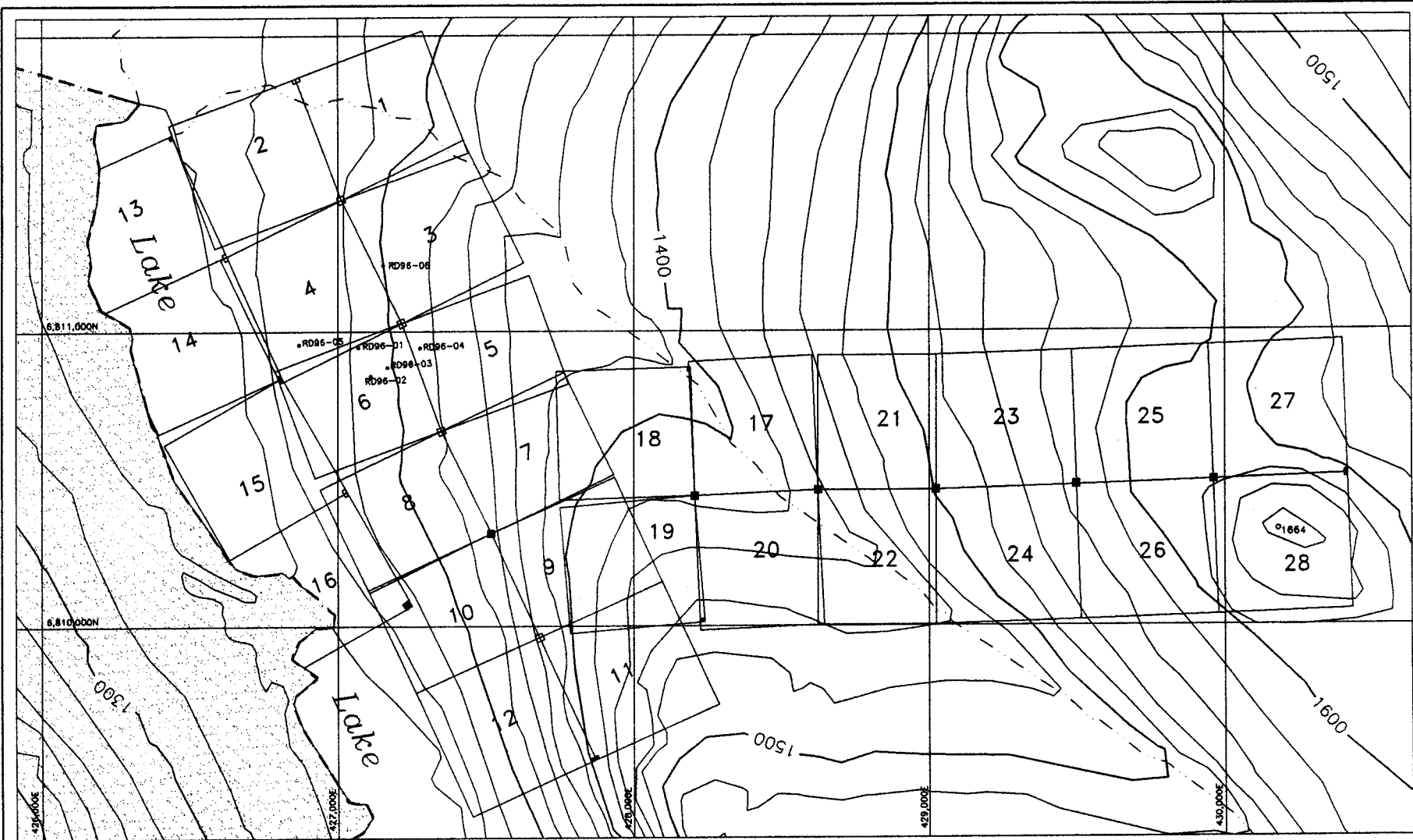


-  Expatriate Resources Ltd.
-  Cominco Ltd.
-  Westmin Resources Ltd. and various joint venture partners
-  Others
-  Native Land Claims



August 26, 1996  
Note: Claim boundaries are approximate  
Expatriate Resources Ltd. does not assume responsibility for errors or omissions





- Claim Posts – Located in field with GPS coordinates
- Claim Posts – Located in field with no GPS coordinates
- ▣ Native Land Claims
- Claim Line

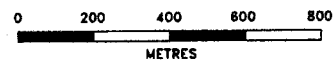
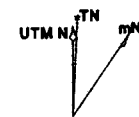


Figure 2  
Archer, Cathro & Associates (1981) Limited

**CLAIM LOCATION**  
**RED LINE PROPERTY**

**EXPATRIATE RESOURCES LTD.**

SCALE: 1:20,000 FILE: RDCLAIM.DWG  
DRAWN: LCP PROJ: FP DATE: 18/09/1996

draining the property flow northward into Wolverine Lake and eventually into the Frances and Liard Rivers, which are part of the MacKenzie River drainage. Pleistocene valley glaciation resulted in scattered clusters of scoured bedrock surrounded by glacial till. Most hillsides are blanketed by talus.

The property straddles the treeline. Vegetation ranges from moderately dense growths of stunted black spruce and alder at lakeshore, through buckbrush, willow, and moss above 1380 m, to scattered buckbrush, alpine grass and lichen at elevations exceeding 1600 m. Marshes are common on upland plateaus.

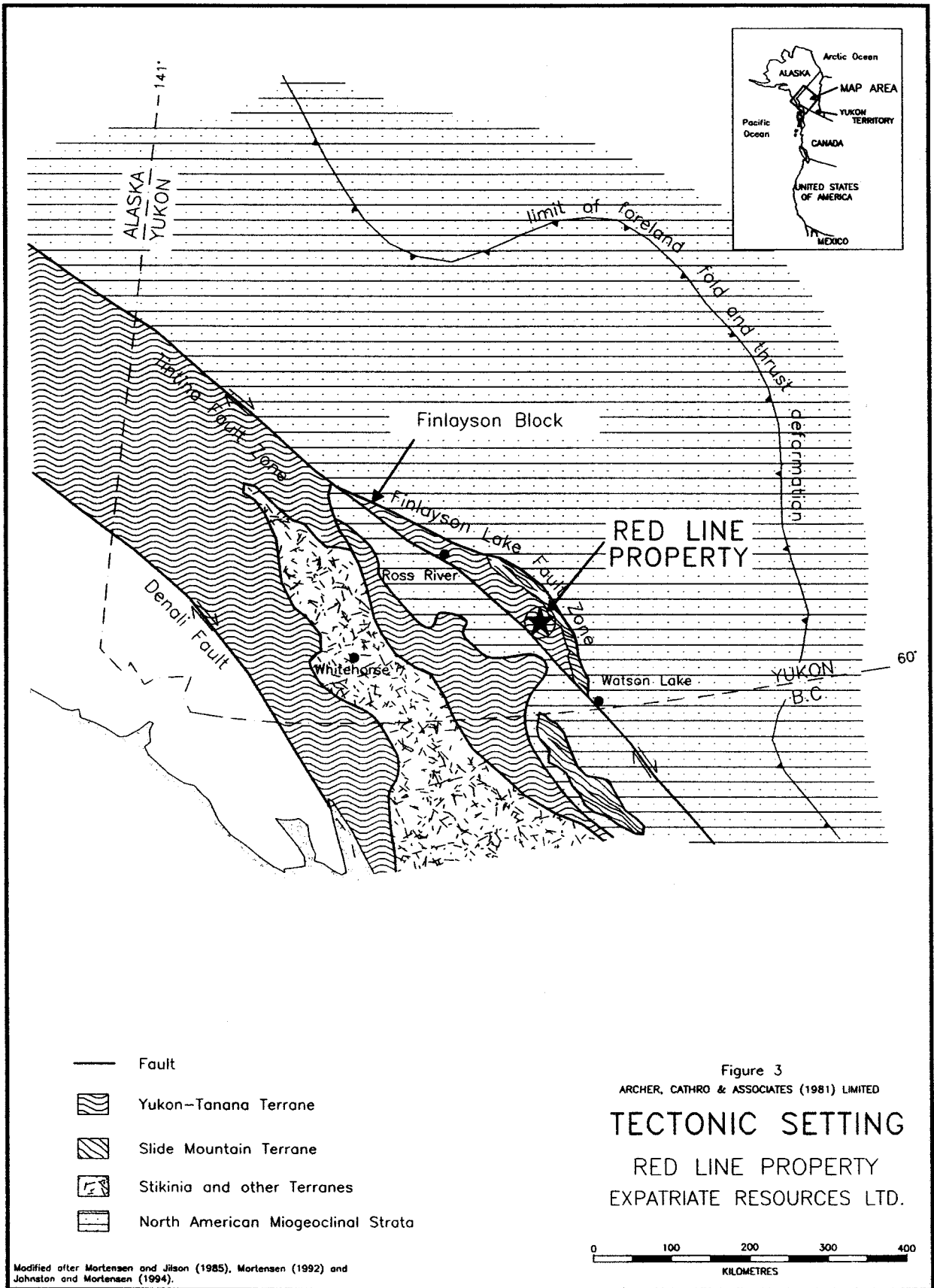
During the 1996 field season access to the property was by contract helicopter from the base camp located at the southeast end of Finlayson Lake. The Finlayson Lake base camp was situated 27 km north-northwest of the property. The Red Line property is located 10 km due west of the Westmin Resources Limited exploration camp at Wolverine Lake.

## **REGIONAL GEOLOGY**

The Red Line property is located within the Finlayson Block, a 380 km by 60 km area comprised of Yukon-Tanana and Slide Mountain geologic terranes (Figure 3). These terranes represent the innermost of the accreted or "suspect" terranes in the Canadian Cordillera (Mortensen and Jilson, 1985). The northeast margin of the block is the Finlayson Lake Fault Zone (FLFZ) a complex zone of steep and shallow faults related to transpressive suturing. The southwest boundary of the block is the Tintina Fault, a major strike-slip fault with at least 450 km of dextral displacement during late Cretaceous and/or early Tertiary time (Tempelman-Kluit *et al.*, 1976).

Regional mapping of the Finlayson Block was completed by the Geological Survey of Canada in the mid to late 1970's (Tempelman-Kluit, 1977, 1979). More recent regional studies have been published by Mortensen and Jilson (1985) and Mortensen (1992). The following discussion of the regional geology (Figure 4) is based partly on the published work and partly on unpublished geologic mapping completed in 1996 (Tempelman-Kluit, personal communication, 1996).

The Yukon-Tanana terrane is comprised largely of Paleozoic continental margin and/or arc stratigraphy deposited on a continental basement of uncertain origin (Mortensen, 1992). The Yukon-Tanana terrane in the Finlayson Block contains three major sequences. The lowermost unit consists of garnet-mica schist with interbanded marbles, calc-silicates, and calcareous schists near the top. The middle unit is a carbonaceous quartzite, schist, or phyllite with rare conglomerates and locally extensive felsic and mafic volcanic interbands. Marble and quartzite constitute the uppermost unit. Radiometric dating of the felsic metavolcanics in the middle unit has



130° 00'

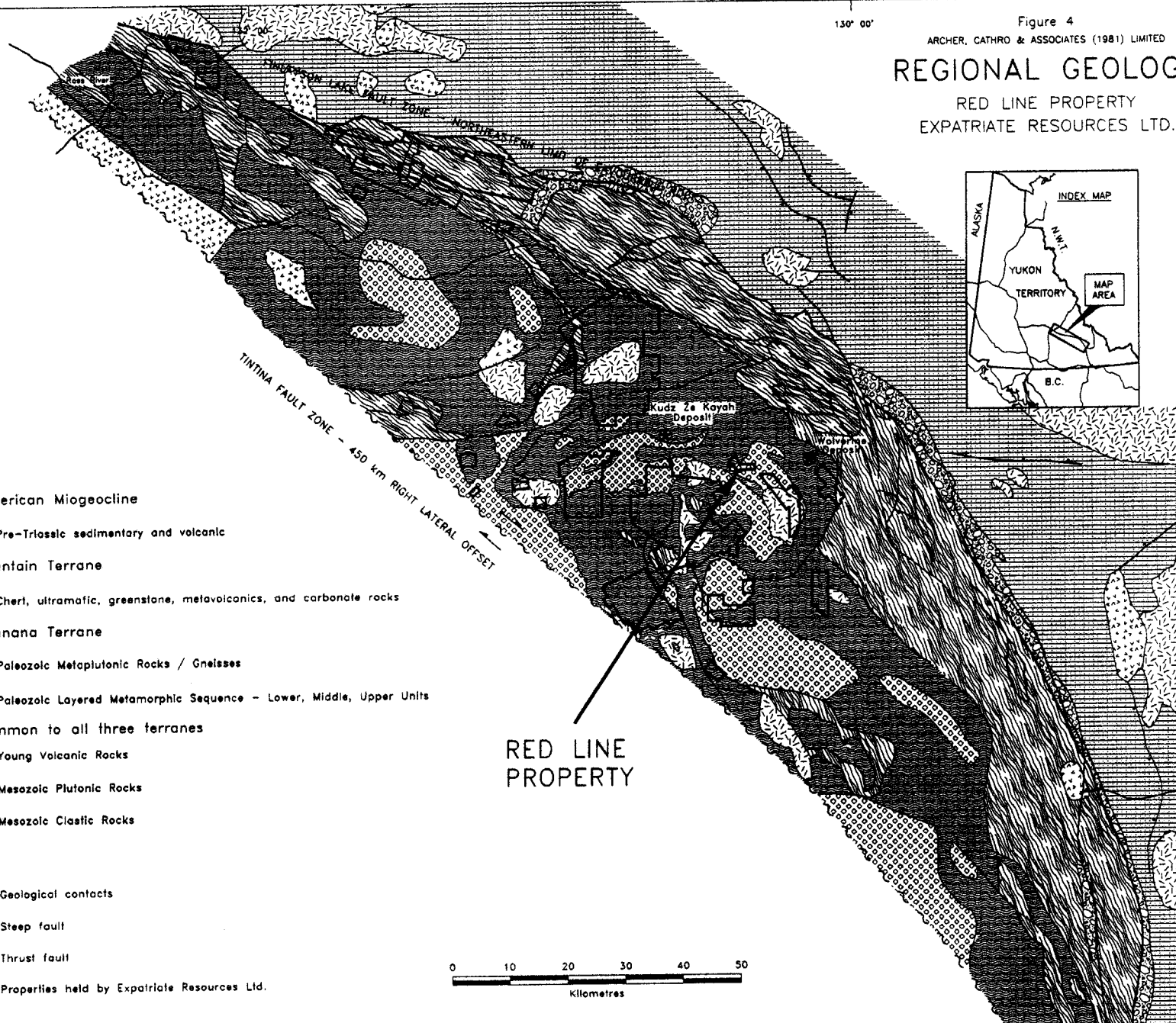
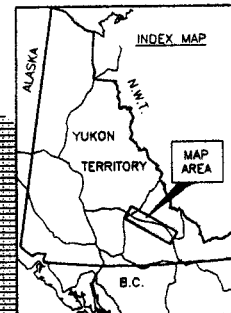
Figure 4

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# REGIONAL GEOLOGY

RED LINE PROPERTY  
EXPATRIATE RESOURCES LTD.

62° 00'



### North American Miogeocline

Pre-Triassic sedimentary and volcanic

### Slide Mountain Terrane

Chert, ultramafic, greenstone, metavolcanics, and carbonate rocks

### Yukon-Tanana Terrane

Paleozoic Metaplutonic Rocks / Gneisses

Paleozoic Layered Metamorphic Sequence - Lower, Middle, Upper Units

### Units common to all three terranes

Young Volcanic Rocks

Mesozoic Plutonic Rocks

Mesozoic Clastic Rocks

Geological contacts

Steep fault

Thrust fault

Properties held by Expatriate Resources Ltd.

RED LINE  
PROPERTY



consistently resulted in late Devonian to Mississippian crystallization ages. The upper unit is dated with fossils as Early Pennsylvanian to early Permian (Tempelman-Kluit, 1979).

This sequence of units in the Yukon-Tanana terrane is generally correlative with a similar stratigraphic sequence in ancestral North America (Mortensen and Jilson, 1985; Tempelman-Kluit, personal communication, 1996). The lowermost unit is correlated with the Lower Cambrian Atan Group, and the middle carbonaceous assemblage is correlated with the offshore, Siluro-Devonian Nasina quartzite assemblage. The felsic volcanics in the middle unit are most similar to the locally extensive Mississippian siliceous volcanics in the North American stratigraphy. Local calcareous phyllites and massive greenstones near the top of the lower unit are lithologically similar to the Kechika Group and lower Paleozoic alkalic and potassic greenstones, respectively.

Gneiss and augen gneiss invariably occur low in the Yukon-Tanana succession beneath either the lowermost calcareous unit or the middle carbonaceous unit. Mortensen and Jilson (1985) considered the gneisses to be metamorphosed mid-Paleozoic plutonic rocks. More recently Tempelman-Kluit (personal communication, 1996) considered these gneisses to be at least in part a replacement unit of earlier stratigraphy. Radiometric dating of the gneisses has consistently resulted in late Devonian to Mississippian ages (Mortensen, 1992). The gneisses occur in structural culminations with diameters on the order of 10 km and structural relief up to about 1 km.

The Devonian-Mississippian Simpson suite (Mortensen, 1992) forms thick intervals of hornblende granodiorite and quartz monzonite higher in the Yukon-Tanana stratigraphic sequence. Mortensen and Jilson (1985) interpreted this suite as intrusive; Tempelman-Kluit (1979, personal communication, 1996) mapped the suite as an allochthonous structural slice emplaced on top of the structural pile.

Slide Mountain terrane consists of late Devonian to late Triassic disrupted oceanic crust (Mortensen, 1992). Lithologies include massive and sheared greenstone, chert, and mafic to ultramafic plutonic rocks occurring as fault-bounded slices along thrust faults and steep faults. These units are most abundant near the northeast edge of the Finlayson Block, but are also found throughout it.

Younger units unconformably overlie units from Slide Mountain, Yukon-Tanana, and North America terranes. Mesozoic clastic rocks are Late Triassic, immature sediments containing cobbles from both Slide Mountain and Yukon-Tanana terranes. Young volcanic rocks consist of Late Cretaceous to Tertiary felsic volcanic flows and volcanoclastic deposits; they are usually found in close proximity to the Tintina Fault Zone.

Mesozoic intrusive activity in the Finlayson Block includes two suites. The first consists of several unmetamorphosed Early Jurassic mafic and intermediate composition plutons. The second suite consists of Late Cretaceous two-mica quartz monzonite or granite (Mortensen and Jilson, 1985).

Structurally Yukon-Tanana schists and gneisses contain a pervasive, flat to gently dipping foliation. Close examination of this fabric indicates that it commonly is a closely spaced crenulation cleavage. Large scale folds related to this fabric can be mapped rarely in the field. In most cases bedding and earlier fabrics are transposed into near parallelism with this dominant fabric. Later crenulation cleavages are present only locally. Some of the Cretaceous intrusions have a mild deformation fabric; others are massive and do not contain a foliation.

Thrust faults within the Finlayson Block juxtapose lithologic sequences with similar deformation fabrics. Thrusting postdates the late Paleozoic Slide Mountain lithologies and predates the Cretaceous intrusives. Recent mapping also suggests but does not definitively prove the presence of major late extensional faults juxtaposing differing sequences (Tempelman-Kluit, personal communication, 1996). East-northeast trending steep normal faults disrupt all earlier deformation fabrics.

Metamorphic grades range from lower greenschist facies to middle amphibolite facies. Contact hornfels occur locally around plutonic units.

Metamorphism and deformation are tentatively correlated with transpressive suturing of these suspect terranes with ancestral North America. Suturing is restricted to the time interval of post-Triassic continuing into the Cretaceous. Whether deformation is continuous or episodic has not been fully verified at present.

The discovery of the Kudz Ze Kayah and Wolverine volcanogenic massive sulphide deposits within the Finlayson Block in the last few years (Johnston and Mortensen, 1994) has re-focused exploration activities in the area. Both deposits occur within metasedimentary and metavolcanic sequences of the Yukon-Tanana terrane and are associated with felsic volcanics present in the middle unit of that terrane. The Yukon Minfile (DIAND, 1995) of mineral occurrences contains some twenty-one reported occurrences in the Finlayson Block which are suspected to be volcanogenic in origin.

## **PREVIOUS WORK**

Published regional geochemical data for the Finlayson Lake map sheet (105G) is limited to reconnaissance scale stream sediment sampling conducted by the Geological Survey of Canada (Hornbrook and Friske, 1988). The sampling was completed at an approximate density of one sample per 10 sq km. Each sample was

analyzed for twenty elements including copper, lead, zinc, silver, and arsenic. One sample from the database was collected from the northern part of the Red Line property (sample 3467); the sample was not anomalous.

Expatriate was able to supplement the published reports with private data summarizing the results of a 1973 regional exploration program managed by Archer, Cathro & Associates Limited (Cathro, 1973). The program included about 5000 soil and stream sediment samples collected at a density of approximately one sample per square kilometre. All samples were analyzed for lead, zinc, copper, and molybdenum. Peak values from the 1973 program in the Red Line area were 68 ppm copper, 290 ppm lead, 1080 ppm zinc, and 10 ppm molybdenum.

During the interval September 5-10, 1995 a two person crew was mobilized into the Red Line property to complete geological mapping, prospecting, and gridded soil geochemical sampling (Wengzynowski, 1996). Geologic mapping indicated the claims were underlain by a sequence of quartz-sericite schists with lesser quartz-sericite-biotite schists, biotite-quartz-chlorite schists, and muscovite-biotite-quartz augen gneisses. The units were considered to be favourable for volcanogenic massive sulphide deposits.

During the 1995 program 229 soil samples were collected at 100 m intervals on a flagged grid. All samples were analyzed by ICP for 32 elements at Chemex Labs Ltd. in North Vancouver.

The soil samples outlined anomalous values for lead, zinc, copper, silver and molybdenum extending over a 500 m long by 200 m wide area. The strongest values for the major elements were found in a 400 m by 100 m area in the centre of the soil grid. These anomalies were covered to the east and west by till.

Prospecting in the area of the soil anomalies discovered a slightly magnetic, yellow-brown, limonite boxwork float. Analysis of a sample of the boxwork resulted in background values for all metals.

A ground geophysics program consisting of 12.7 line-km of Maxmin and magnetometer surveys was conducted on the Red Line claims during the interval February 23 - March 03, 1996 by Amerok Geosciences Ltd. (as reported in Wengzynowski, 1996).

The Maxmin survey located a relatively weak conductor roughly coincident with the magnetic field high extending crudely east-west through the property. The combined geophysics anomalies are coincident with the soil geochemical anomalies previously outlined by the 1995 soil geochemical survey.

## **1996 FIELD PROGRAM**

During the interval May 30 - June 30, 1996 a geological mapping and drilling program was completed on the Red Line claims to test the coincident soil and geophysics anomalies outlined in the earlier programs. Six holes were completed for a total depth of 851 m. The holes were collared to test for both shallow and deep structures assuming dips to prospective mineralization ranging from 20 degrees north (foliaform) to vertical. Holes were inclined at either -60 degrees or -50 degrees to the south. All collar locations have been marked in the field with 4x4 posts labelled with inscribed metal tags. The drill sites were inspected to verify that all garbage was removed from the property. Drill core is being temporarily stored in the outdoor yard of E. Caron Diamond Drilling Ltd., Whitehorse, Yukon.

The drill hole data was entered into spreadsheets in the field and later transferred to a PC-XPLOR database for plotting vertical sections and plans.

Geological mapping in the vicinity of the drill collars was completed at a field scale of 1:2,000. Red Line claim posts were located and tagged as part of the 1996 program.

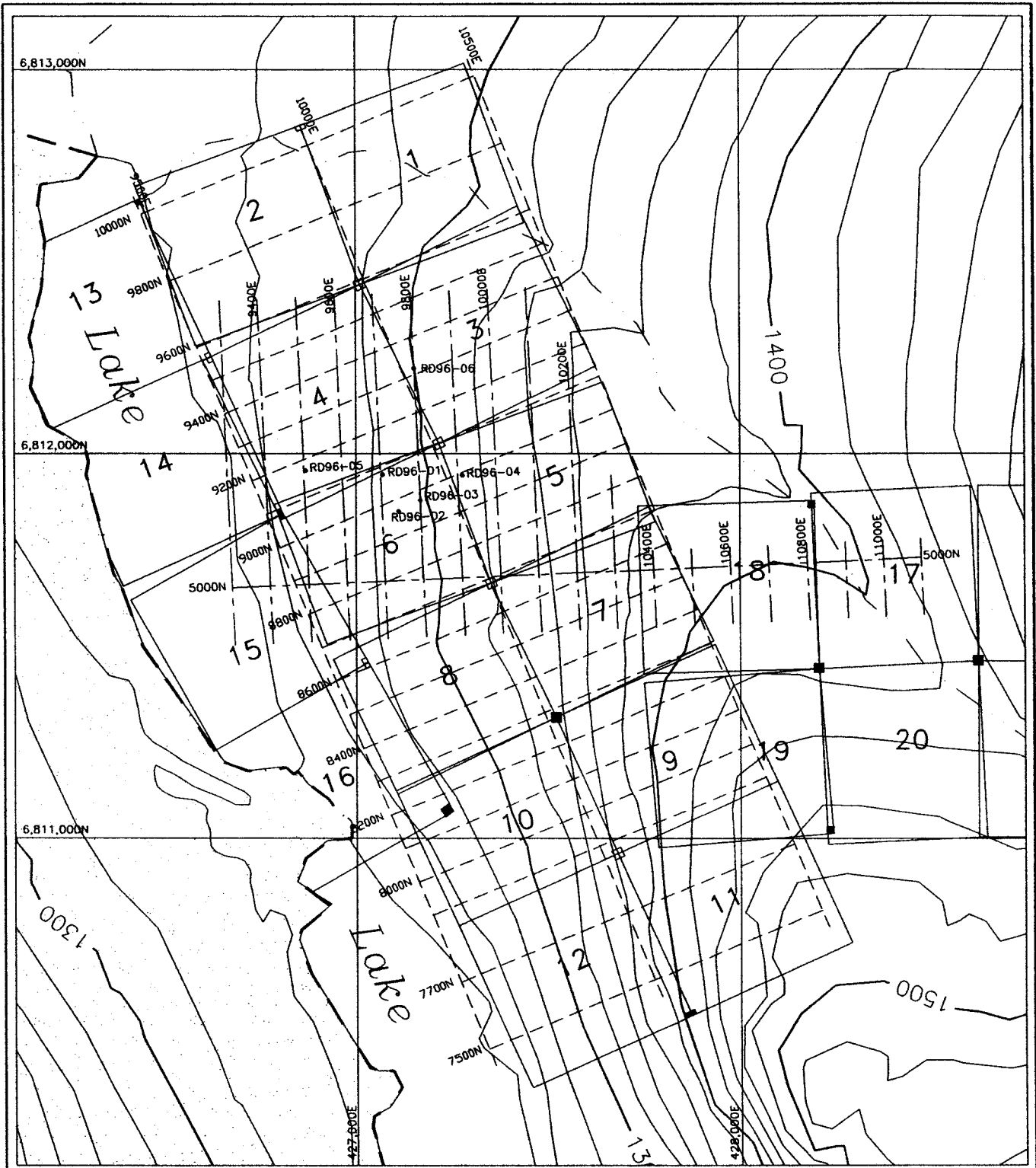
All the different 1996 information was digitized into Autocad r12 drawings. The topographic base for the Autocad drawing was digitally scanned from the 1:50,000 scale 105G/8 Wolverine Lake NTS map.

Selected hand samples and core samples were forwarded to Vancouver Petrographics Ltd. for verification of mineral modes and structural features. The report from Vancouver Petrographics (Payne, 1996) is included as Appendix II.

## **1996 SURVEY CONTROL**

The earlier 1995-96 field work resulted in the existence of two grid systems on the Red Line claims (Figure 5). The soil grid was established at compass azimuth 340° approximately along the claim staking line for claims Red Line 1-9. The baseline for the grid was slope corrected and marked at 100 m intervals with 1 m lath bearing aluminum tags inscribed with grid coordinates and sample numbers. Soil sample lines were run perpendicular to the baseline and marked with 0.5 m lath in the same manner as baseline stations.

The ground geophysics survey grid consisted of cut lines picketed at 25 m intervals with full length lath. The baseline was oriented at compass azimuth 090°; the baseline was slope corrected and the survey lines were straight chained.



- 1995 Soil grid
- 1996 Geophysics cut grid

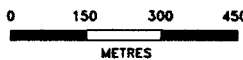
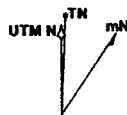


Figure 5

Archer, Cathro & Associates (1981) Limited

**GRID LINES**  
**RED LINE PROPERTY**

**EXPATRIATE RESOURCES LTD.**

SCALE: 1:15,000 FILE: RDGRID.DWG

DRAWN: LCP PROJ:FP DATE: 18/09/1996

The geophysics cut lines were used as primary control for locating the drill pads and outcrops during the 1996 geological mapping and drilling program. Selected claim posts and soil samples were also located relative to the geophysical cut lines.

During June 1996 claim posts were verified and tagged. Claim post locations and drill hole collar locations were surveyed using hand-held GPS units. The GPS positions were differentially corrected using data from base stations established at the Westmin Resources Limited Wolverine Lake exploration camp and the Ministry of Environment, Lands and Parks office at Williams Lake, British Columbia. All corrected positions should be accurate to within 5 m horizontally. Appendix III lists GPS coordinates for the different features measured with the hand-held GPS units on the Red Line claims using NAD27 UTM coordinates.

The property geology, geophysics, and soil geochemistry compilation using the geophysical cut line grid coordinate base was digitized into an Autocad r12 drawing using the geophysics grid as the coordinate system. This drawing was then "floated" into the Autocad NAD27 UTM coordinate system topographic base map using the GPS indicated locations of the drill collars and selected claim posts.

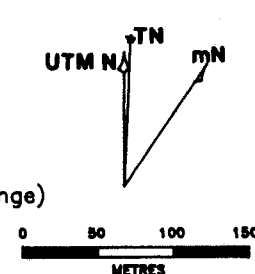
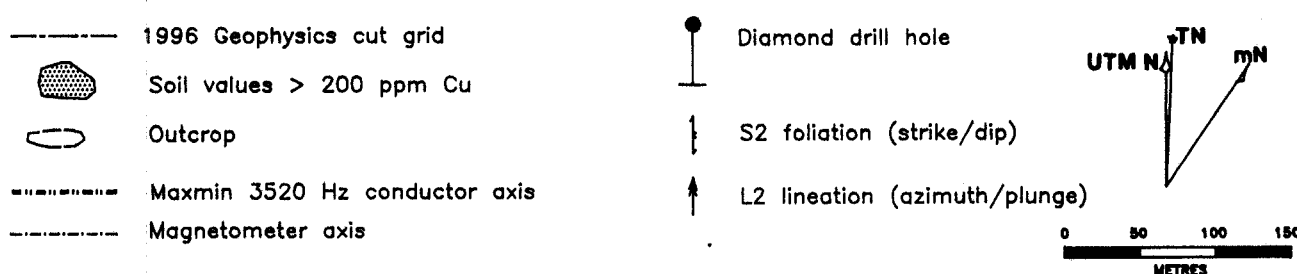
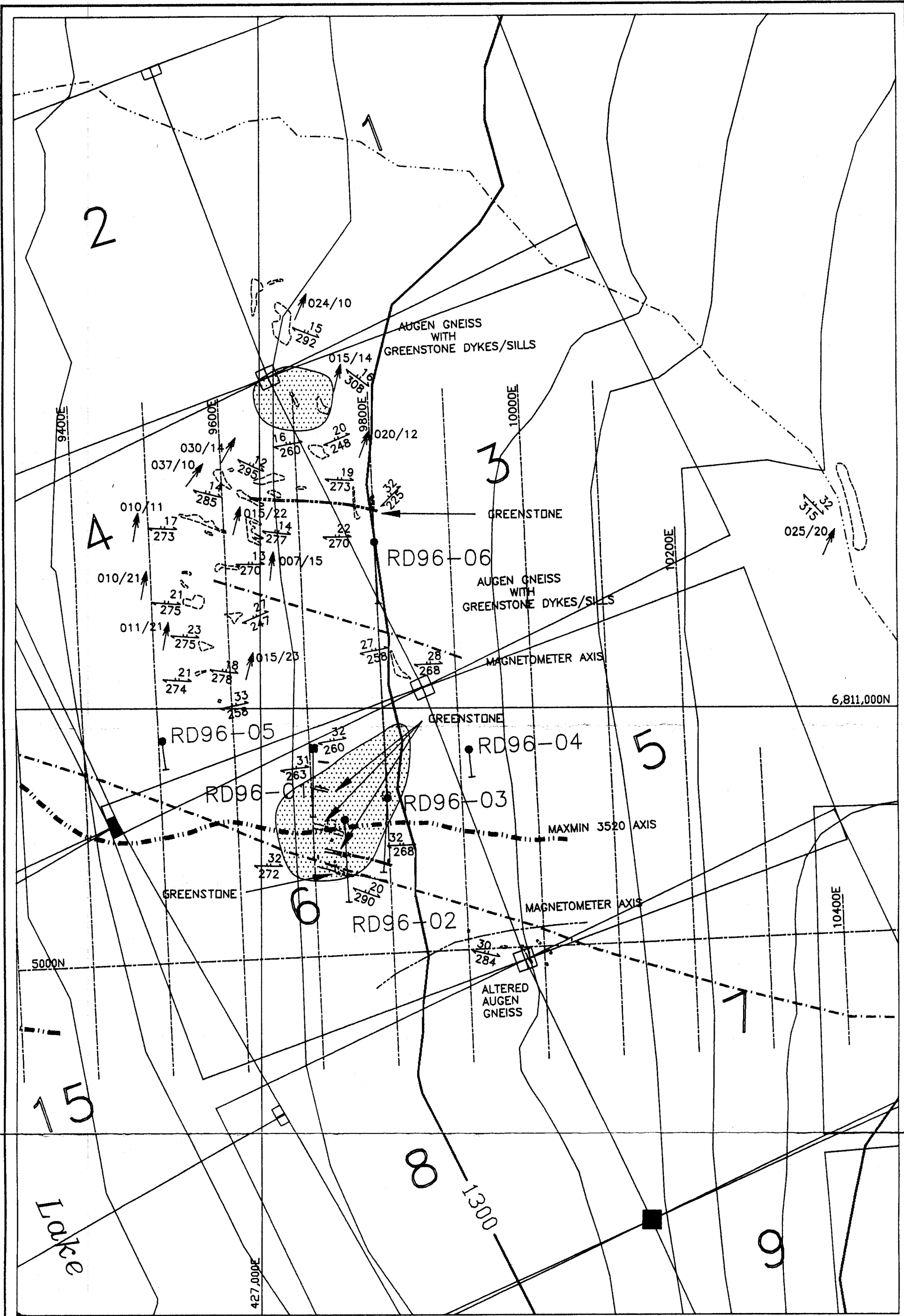
## **1996 PROPERTY GEOLOGY**

Geological mapping on the Red Line property during early June 1996 (Figure 6) determined that the claims are underlain by a sequence of interbanded massive and augen gneisses. Major minerals within the gneisses are quartz-plagioclase-K-feldspar-muscovite-biotite. Both homogeneous and augen gneisses are typically present within the same outcrop with banding being on a scale of centimetres to metres.

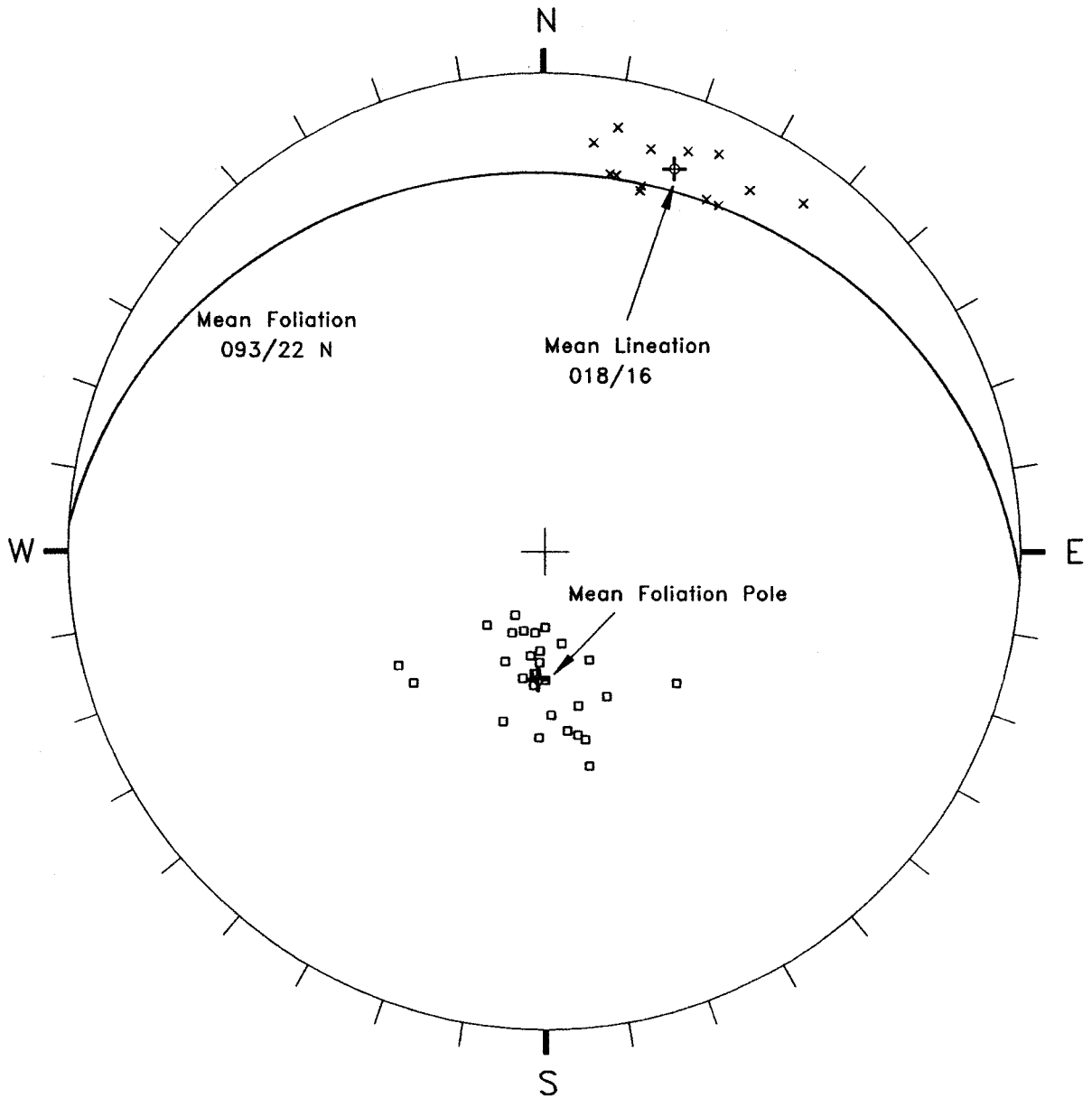
Thin, dark green, massive, biotite-chlorite-feldspar-quartz schists or greenstones occur as foliaform dykes/sills interbanded with the gneisses. In outcrop the observed greenstones attained a maximum thickness of 1.5-2.0 m.

Mineral assemblages in the gneisses and greenstones are representative of the uppermost part of the greenschist facies of regional metamorphism (Turner, 1981; Winkler, 1974). The general absence of garnet in the gneisses may well be related to composition rather than temperature-pressure conditions.

Structurally the gneisses have a single dominant foliation surface which consistently dips gently to the north. The greenstones contain exactly the same deformation fabrics as the enclosing gneisses. The mean orientation for 29 measurements of the foliation is 093/22 N (Figure 7). Regionally the dominant foliation corresponds in orientation and appearance with the S2 axial planar fabric. On the northern part of the property centimeter scale microfolds are visible as crenulations in the



**FIGURE 6**  
 Archer, Cathro & Associates (1991) Limited  
**PROPERTY GEOLOGY**  
**RED LINE PROPERTY**  
**EXPATRIATE RESOURCES LTD.**  
 SCALE: 1:5,000 DWG: RDGEOL.DWG  
 DRAWN: LCP PROJ: FP DATE: 20/09/1998



**EQUAL AREA - LOWER HEMISPHERE  
STEREONET PLOT**

- Pole to S2 foliation  
29 poles plotted
- x L2 Feldspar and mica alignment lineation  
13 lineations plotted

Figure 7

Archer, Cathro & Associates (1981) Limited

**FOLIATION - LINEATION  
STEREONET**

**RED LINE PROPERTY  
EXPATRIATE RESOURCES LTD.**

SCALE: 1: NA	FILE: RDSTRUCT.DWG
DRAWN: LCP	PROJ:FP DATE: 20/09/1996

compositional banding between the spaced surfaces of the dominant S2 foliation. These crenulations are the only readily visible evidence of an earlier S1 planar fabric noted on the property.

Feldspar augen within the gneisses show a strong elongation and alignment on the dominant S2 foliation surface. The direction of this alignment lineation, L2, is essentially downdip with an average orientation of 018/16 (Figure 7).

The structural style and orientation of the S2 foliation and L2 lineation within the gneisses suggests that the S2 structural fabric is extensional and formed as the gneisses were uplifted during orogenesis. The gneisses were still "hot" during extension resulting in the preservation of ductile rather than brittle fabrics.

## **MINERALIZATION - ALTERATION in OUTCROP**

No visible sulphide mineralization or alteration was noted in surface outcrops in the immediate vicinity of the strongest geochemical and geophysical anomalies. Scattered outcrops of gneiss about 120 m south of the geochemical anomalies are pervasively altered (Figure 6) with development of an orange-brown limonitic stain, destruction of biotite (possibly to muscovite) and destruction of feldspars to clays (?). The altered gneisses contain extensive staining typically associated with the weathering of pyrite. In the areas of alteration the gneisses still retain their augen texture, and foliation orientations remain consistent with the orientations in the unaltered areas.

## **1996 DRILL PROGRAM**

Drill holes were collared to drill south through the zone of strong geochemical anomalies and associated geophysical highs centered around 5150N, 9700E (geophysical grid). The holes were collared to test for both shallow and deep structures assuming dips to prospective mineralization ranging from 20 degrees north (foliaform) to vertical. Six holes were completed using a Craelius drill for a total depth of 851 m. Core size for all the holes is BTW (B, thin wall). Table 2 lists the locations of the holes. Drill hole locations are shown in Figures 2, 5, and 6.

Holes were inclined at either -60 degrees or -50 degrees to the south. Deviation of the holes was checked with an acid dip test at the bottom of the hole; all acid tests were corrected for meniscus effects using tables of dip angle corrections. The drill holes were collared to test the anomalous zone for a strike length extending from 9500E to 9900E. All collar locations have been marked in the field with 4x4 posts labelled with inscribed metal tags.

Table 2. 1996 Drill Hole Locations

DDH	Easting (UTM)	Northing (UTM)	Elevation (MSL)	Length (m)
RD96-01	427069	6810946	1280 m	183.49
RD96-02	427111	6810850	1286 m	182.88
RD96-03	427168	6810879	1300 m	149.35
RD96-04	427277	6810944	1314 m	76.2
RD96-05	426868	6810956	1265 m	76.2
RD96-06	427152	6811222	1300 m	182.88

Holes were logged at the Finlayson Lake base camp for lithology, structure, RQD, and % recovery. The information from the field logs was entered into a spreadsheet (Lotus v5). The data was later transferred to a PC-XPLOR database for plotting sections and plan views.

Intervals selected for analysis were split, and the samples sent to Chemex Labs Ltd. in North Vancouver. Samples at Chemex were crushed and then pulverized to better than 90% 100 micron (-150 Mesh) using a Chrome Steel Ring Mill. Most samples were dissolved in a nitric acid-aqua regia solution and analyzed for 32 elements using ICP-AES techniques. The elements Al, Ba, Be, Ca, Cr, Ga, La, Mg, K, Sc, Na, Sr, Tl, Ti, and W may only be partially leached using this digestion. These elements do not include the base metals which were the exploration target for this drilling program. Selected samples were assayed for Cu, Pb, Zn, Ag, and Au.

The drill logs are included as Appendix IV in this report. Full Chemex assay certificates for the different drill core samples are included within Appendix V.

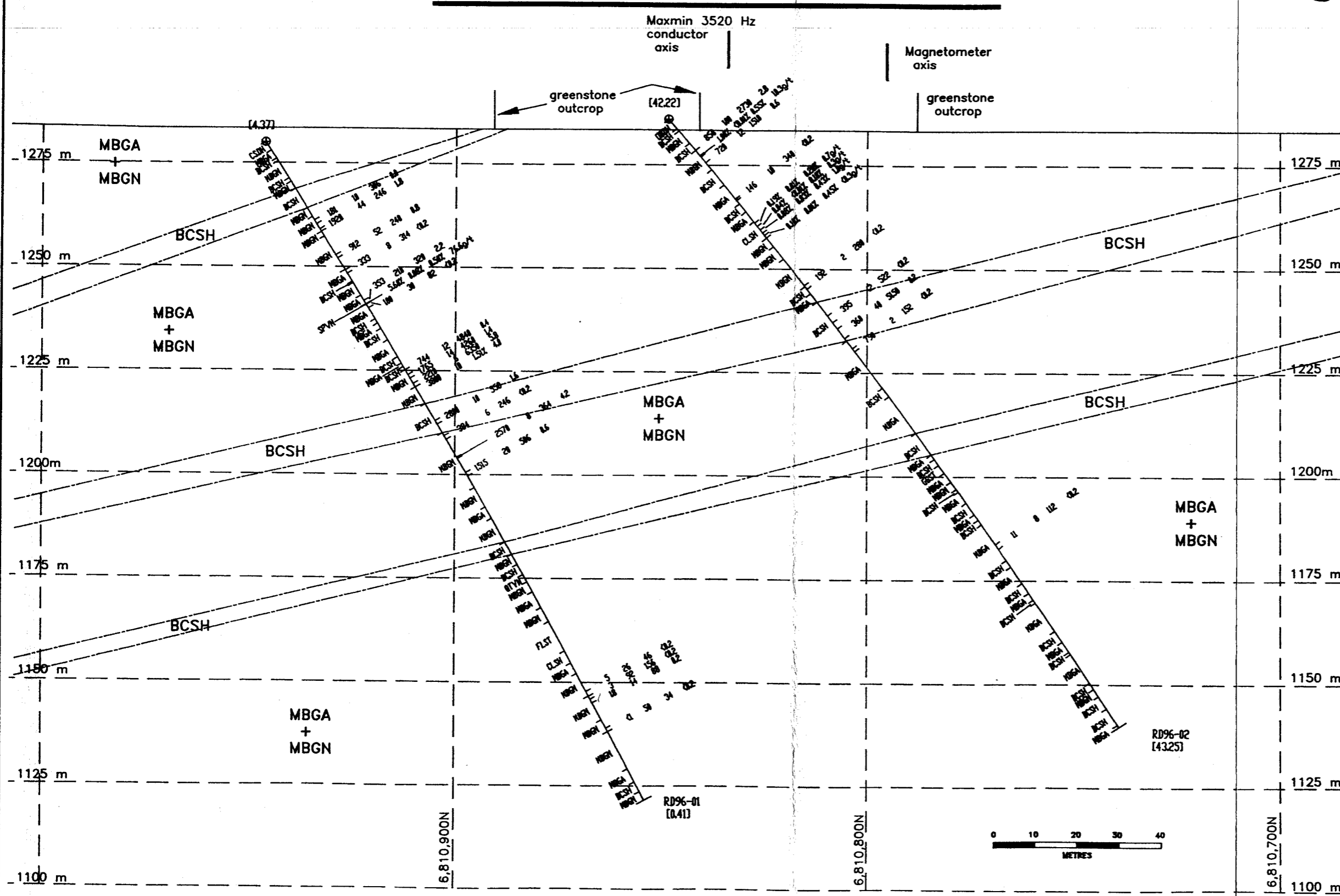
## DRILL RESULTS

The first two holes were drilled on geophysics section line 9700E. Section 9700E (Figure 8) shows that RD96-02 successfully drilled underneath the area of the geochemical anomalies and that RD96-01 tested for any gently north dipping anomalies. Correlation of greenstone interbands between the two drill holes indicates a gentle north dip of about 15°. The greenstone interbands range up to 10 m in thickness. Locally the greenstones vary extensively in thickness and number between the two drill holes. The augen gneisses cannot be correlated between drill holes.

N

S

Cu >200 ppm soil contours



**LEGEND**

Drill Hole Trace  
 [4.37] projection distance  
 Analyses  
 Rock Type  
 RD96-01 [0.41]  
 Drill Hole Name projection distance

ICP  
 Cu ppm Pb ppm Zn ppm Ag ppm  
 ASSAY  
 Cu % Pb % Zn % Ag g/t

**ROCK UNITS**

OBDH Overburden  
 LCDH Lost Core  
 BCDH Broken Core  
 CSDH Casing  
 NLDH No log  
 CLSH Chlorite schist  
 BCSH Biotite-chlorite schist  
 MBGA Muscovite-biotite augen gneiss  
 MBGN Muscovite-biotite gneiss  
 SPVN Sulphide-rich vein  
 QZVN Quartz vein  
 CAVN Calcite vein  
 FLST Fault  
 GGST Fault gouge

**FIGURE 8**  
 Archer, Cathro & Associates (1981) Limited

**SECTION 9700E**  
 RED LINE PROPERTY

**EXPATRIATE RESOURCES LTD.**

SCALE: 1:1,000 FILE: XS9700E.DWG  
 DRAWN: LCP PROJ: FP DATE:25/09/1998

Holes RD96-06 (Figure 9) and RD96-03 (Figure 10) were completed on section line 9800E. Hole RD96-03 tested for shallow mineralization in the immediate vicinity of the geochemical soil anomalies. Hole RD96-06 tested for a deeper downdip extension of the geochemical soil anomalies assuming a foliaform nature to any potential mineralization. As with section 9700E, greenstone interbands are up to about 10 m in thickness and dip gently to the north at approximately 15°.

Holes RD96-04 (Figure 12) and RD96-05 (Figure 11) tested for shallow mineralization along the strike extent of the geochemical soil anomalies.

Massive and augen gneisses are typically interbanded on a scale of 0.5 - 5 m in the drill holes. Both gneisses consist dominantly of quartz-feldspar-muscovite with variable amounts of disseminated biotite. The pervasive S2 foliation is well defined by the micas within the gneisses. Feldspar augen are ovoid-elongate in the foliation and range from 2 mm to 2 cm in size. The rapid variation between massive and augen gneisses suggests that the protolith for the gneisses may have been intermediate to felsic volcanics locally containing feldspar phenocrysts.

Greenstone intervals are massive, pervasively foliated, locally calcareous, dark brownish green, biotite-chlorite schists; they occur in both the augen gneisses and the massive gneisses. Occasionally the greenstones attain thicknesses of greater than 6 m; more commonly they are 0.1 m to 3 m in thickness. Core contacts and cross section interpretation indicates the greenstones are foliaform; they represent either transposed dykes or mafic flows within the gneisses. In either case bimodal magmatism is indicated for the Red Line area.

## **ALTERATION**

The biotite-chlorite schists commonly show patchy retrograde alteration of the biotite to chlorite. This alteration occurs in thin bands parallel to the foliation and as thin envelopes adjacent to fractures and/or quartz veins. Locally primary feldspar grains are altered to white calcite or pale apple green epidote.

The muscovite-biotite massive and augen gneisses locally exhibit partial to complete retrograde alteration of biotite to chlorite. This alteration typically occurs in extensive zones reaching several metres in thickness. Another, more subtle alteration consists of the breakdown of biotite to form muscovite and fine, disseminated pyrite grains. As with the chlorite growth, this alteration occurs in thick intervals within the augen and massive gneisses. This type of alteration becomes more prevalent with depth. It is difficult to distinguish unequivocally and is therefore not fully documented. It

N

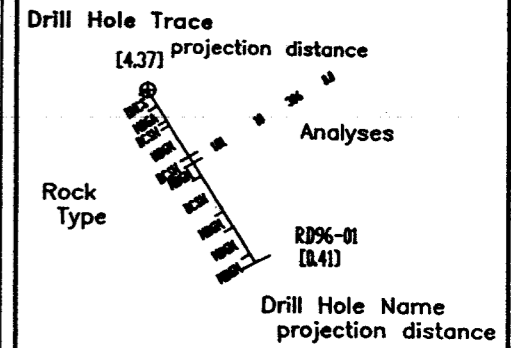
S

Magnetometer axis

greenstone outcrop

[-0.67]

LEGEND



ICP  
Cu ppm Pb ppm Zn ppm Ag ppm  
ASSAY  
Cu % Pb % Zn % Ag g/t

- ROCK UNITS
- OBDH Overburden
  - LCDH Lost Core
  - BCDH Broken Core
  - CSDH Casing
  - NLDH No log
  - CLSH Chlorite schist
  - BCSH Biotite-chlorite schist
  - MBGA Muscovite-biotite augen gneiss
  - MBGN Muscovite-biotite gneiss
  - SPVN Sulphide-rich vein
  - QZVN Quartz vein
  - CAVN Calcite vein
  - FLST Fault
  - GGST Fault gouge

Geological contact

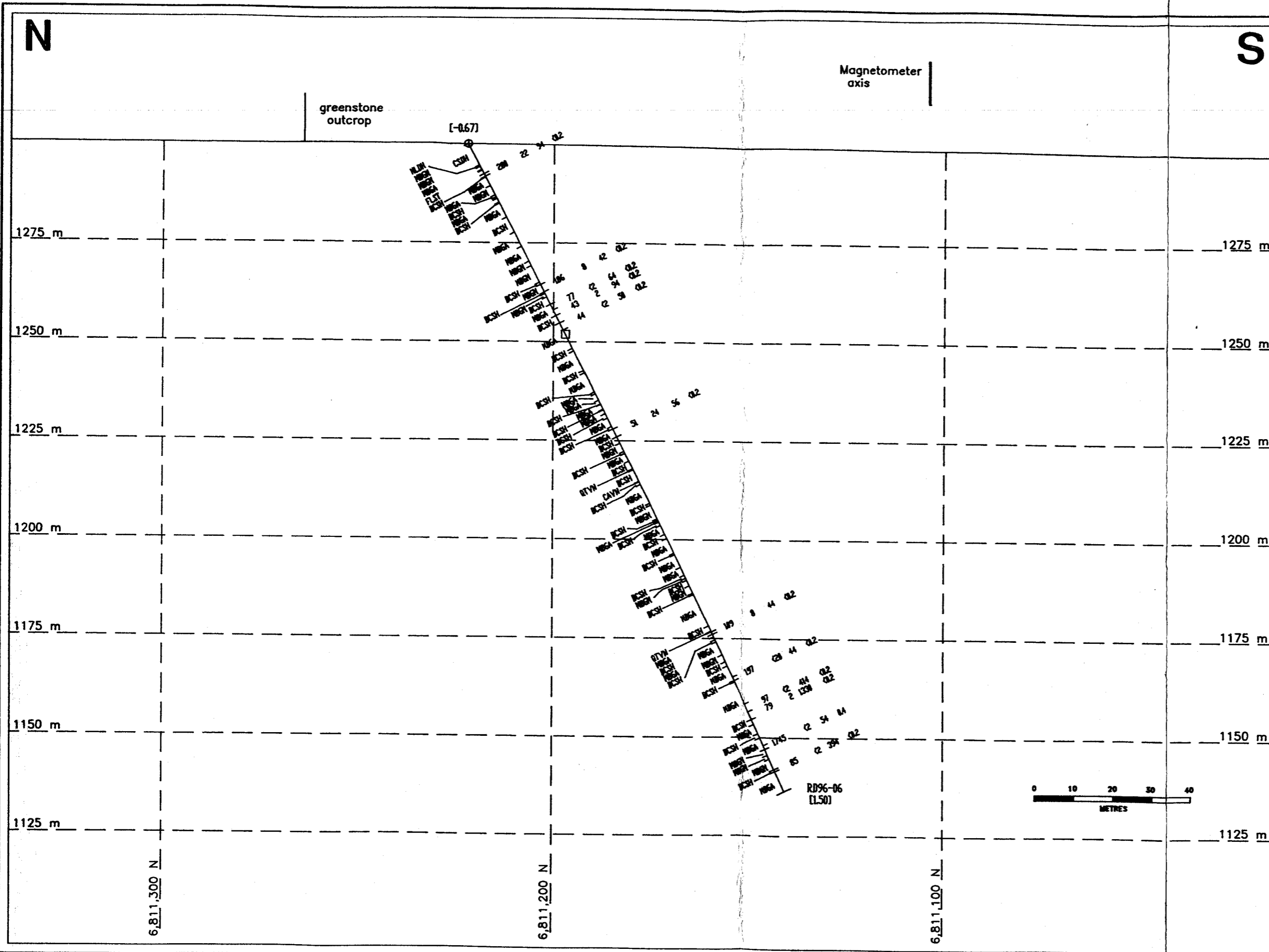
6,811,300 N

6,811,200 N

6,811,100 N



FIGURE 9  
Archer, Cathro & Associates (1981) Limited  
**SECTION 9800E (North)**  
RED LINE PROPERTY  
**EXPATRIATE RESOURCES LTD.**  
SCALE: 1:1,000 FILE: XS9800EN.DWG  
DRAWN: LCP PROJ: FP DATE: 26/09/1996





N

Magnetometer axis

S

[4.37]

1250 m

1250 m

1225 m

1225 m

1200 m

1200 m



6,811,000N

6,810,900N

RD96-05  
[8.09]

Drill Hole Trace

[4.37] projection distance

Rock Type

RD96-01 Drill Hole Name  
[0.41] projection distance

ICP

Cu ppm Pb ppm Zn ppm Ag ppm

ASSAY

Cu % Pb % Zn % Ag g/t

ROCK UNITS

CSDH Casing  
OBDH Overburden  
NLDH No log

CLSH

Chlorite schist

BCSH

Biotite-chlorite schist

MBGA

Muscovite-biotite augen gneiss

MBGN

Muscovite-biotite gneiss

QZVN

Quartz vein

CAVN

Calcite vein

SPVN

Sulphide-rich vein

FLST

Fault

GGST

Fault gouge

Figure 11

Archer, Cathro & Associates (1981) Limited

SECTION 9500E

RED LINE PROPERTY

EXPATRIATE RESOURCES LTD.

SCALE: 1: 650 FILE: XS9500E.DWG

DRAWN: LCP PROJ: FP DATE:25/09/1996



probably corresponds to the alteration noted in the surface outcrops in the southern portion of the area mapped during the 1996 field season.

## **SULPHIDE OCCURRENCES**

Hole RD96-01 (Figure 8) intersected 0.11 m of coarse grained sulphide vein material from 45.90-46.01 m. The intersection contains rounded fragments of quartz and biotite in a sulphide matrix composed of pyrite, pyrrhotite, and lesser chalcopyrite. Another significant sulphide intersection occurs at 64.42-69.30 m. This occurrence consists of stringers of pyrite with lesser chalcopyrite, pyrrhotite, and sphalerite associated with chlorite fractures within an augen gneiss. Sulphide mineralization in the rest of the hole consists of disseminated pyrite and pyrrhotite. Occasionally trace chalcopyrite is noted associated with the pyrite and pyrrhotite. These disseminated sulphide occurrences are in both the greenstones and the gneisses.

Hole RD96-02 (Figure 8) had two intersections with significant sulphides. The first, at 9.90-13.72 m, consists of coarsely crystalline pyrite with irregular stringers of pyrrhotite and chalcopyrite associated with a white bull quartz vein. The second intersection, at 32.13-37.13 m, consists of wispy, foliaform stringers of pyrite and pyrrhotite in a strongly chloritic greenstone schist. Chalcopyrite occurs in trace amounts in the latter intersection. Further down the hole, sulphide occurrences consist of wispy stringers and bands of disseminated pyrite or pyrrhotite grains associated with foliaform thin clear quartz veins. Chalcopyrite occurs only in trace amounts in some of these sulphide bearing intervals.

Holes RD96-03 (Figure 10), RD96-04 (Figure 12), RD96-05 (Figure 11), and RD96-06 (Figure 9) tested the geochemical-geophysical targets at different structural levels along strike. All holes only intersected trace amounts of wispy sulphide stringers consisting of pyrite, pyrrhotite, and locally chalcopyrite. These intersections confirm that the sulphides typically occur as disseminated grains and irregular stringers associated with foliaform or slightly discordant clear quartz veins up to 5 cm thick. Splashy sulphide intersections are also contained within coarsely crystalline white bull quartz veins.

## **CONCLUSIONS and RECOMMENDATIONS**

Splashy sulphide occurrences are noted in association with coarsely crystalline white quartz veins. Typically the sulphide minerals in this setting are pyrite, pyrrhotite, and chalcopyrite. Sulphides form intergrown aggregates interstitial to the quartz grains. Although high grade within the quartz veins, no extensive "leakage" of the sulphides to the wall rock is noted.

The other major sulphide type with any "grade" consists of thin, wispy, irregular, discontinuous sulphide stringers parallel to the foliation within the biotite-chlorite and chlorite schists. The sulphides present (in decreasing modal amounts) are pyrite, pyrrhotite, and chalcopyrite. Concentration of sulphides within the mafic interbands occur only locally. In some occurrences, the sulphides are also associated with white vein quartz.

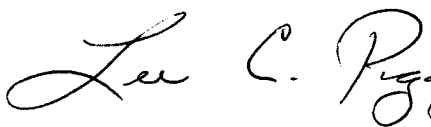
More commonly pyrite and pyrrhotite occur as fine, disseminated grains within the muscovite-biotite massive gneisses and augen gneisses. The sulphides typically form irregular, interstitial aggregates associated with clear quartz veins subparallel to the foliation. These veins form diffuse bands in the core ranging from 1 cm to 10 cm in thickness. Chalcopyrite is rarely present in these occurrences.

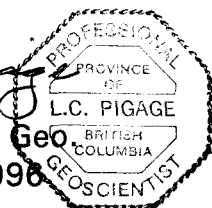
Pyrite also occurs as a reaction product in the alteration breakdown of biotite to form muscovite-pyrite aggregates (see above).

All of these occurrences are local and spotty in extent. The presence of this poddy mineralization near surface would explain the high copper geochemical anomalies noted from the 1995 gridded soil samples. Sphalerite was not field identified within the core samples: zinc analyses up to 1.51% substantiate the presence of sphalerite in some of the sulphide intersections. Galena also was not identified in the field logs; the locally slightly elevated lead analyses verify that it occurs only locally in minor amounts.

Because of the spotty, discontinuous nature of the above sulphide occurrences, the probability of major, mineable sulphide mineralization is considered to be minimal. Other major forms of economic mineralization were not noted in the drill core. No further work is recommended for the Red Line claims.

Respectfully submitted,

  
Lee C. Pigage, Ph.D., P. Geo.  
September 30, 1996



## SELECTED REFERENCES

- Cathro, R.J., 1973. Final Report, Finlayson Joint Venture, November 30, 1973. Unpublished company report.
- DIAND, 1995. Yukon Minfile, Version 2.05, 31 July/95. Exploration and Geological Services Division, Indian and Northern Affairs Canada.
- Hornbrook, E.H.W. and Friske, P.W.B., 1988. Regional stream sediment and water geochemical data, southeastern Yukon. Geological Survey of Canada, Open File 1648 (105G).
- Johnston, S.T., and Mortensen, J.K., 1994. Regional setting of porphyry Cu-Mo deposits, volcanogenic massive sulphide deposits, and mesothermal gold deposits in the Yukon-Tanana terrane, Yukon. Yukon Metallogeny: Recent developments, Canadian-Yukon economic development agreement, 30-34.
- Mortensen, J.K., 1992. Pre-mid-Mesozoic tectonic evolution of the Yukon-Tanana terrane, Yukon and Alaska. *Tectonics*, 11, 836-853.
- Mortensen, J.K., and Jilson, G.A., 1985. Evolution of the Yukon-Tanana terrane: evidence from southeastern Yukon Territory. *Geology*, 13, 806-810.
- Payne, J., 1996. Petrographic Report #960617, Project: Finlayson, Property: Red Line. Vancouver Petrographics Ltd., unpublished company report.
- Tempelman-Kluit, D.J., 1977. Quiet Lake (105F) and Finlayson Lake (105G) map areas. Geological Survey of Canada, Open File 486.
- Tempelman-Kluit, D.J., 1979. Transported cataclasite, ophiolite and granodiorite in Yukon: evidence of arc-continent collision. Geological Survey Canada, Paper 79-14, 27 pages.
- Tempelman-Kluit, D.J., Gordey, S.P., and Read, B.C., 1976. Stratigraphic and structural studies in the Pelly Mountains, Yukon Territory. Geological Survey of Canada, Paper 76-1A., 97-106.
- Turner, F.J., 1981. Metamorphic petrology, mineralogical, field, and tectonic aspects, 2nd edition. McGraw-Hill Book Company, New York.
- Wengzynowski, W.A., 1996. Assessment report describing prospecting, geochemical and geophysical surveys on the Red Line property. Expatriate Resources Ltd., unpublished company report.

Winkler, H.G.F., 1974. Petrogenesis of metamorphic rocks, 3rd edition. Springer-Verlag, New York.

**APPENDIX I**  
**STATEMENT OF QUALIFICATIONS**

## STATEMENT OF QUALIFICATIONS

I, Lee C. Pigage, am a resident of the Yukon Territory, living at 2 Rosewood Place, Whitehorse, Yukon Y1A 4X3.

I graduated from the University of Wyoming in 1970 with a B.Sc. in Geological Sciences.

I graduated from the University of British Columbia in 1973 with a M.Sc. in Geological Sciences.

I graduated from the University of British Columbia in 1978 with a Ph.D. in Geological Sciences.

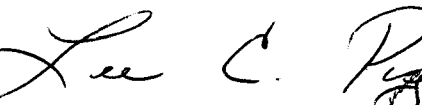
I have worked in economic geology and the mining industry continuously since 1979.

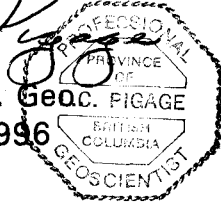
I am a Fellow in the Geological Association of Canada.

I am a Professional Geoscientist (#21130) registered with the Association of Professional Engineers and Geoscientists of the Province of British Columbia (APEGBC).

I personally participated in and supervised the project described in this report.

I do not have any investment interest in any of the quartz claims covered in this report.

  
Lee C. Pigage, Ph.D., P. Geoc. Pigage  
September 30, 1996



## **APPENDIX II**

### **Vancouver Petrographics Ltd. Report**



# Vancouver Petrographics Ltd.

8080 GLOVER ROAD, LANGLEY, B.C. V3A 4P9  
PHONE (604) 888-1323 • FAX (604) 888-3642

Report # 960617 for:

**Tom Becker,**  
**Archer Cathro & Associates,**  
**1016 - 510 West Hastings Street,**  
**Vancouver, B.C., V6B 1L8**

September, 1996

copy to:

**Lee Pigage, L.C. Pigage Consulting,**  
**2 Rosewood Place, Whitehorse, Yukon, Y1A 4X3**

**Project: Finlayson**

**Property: Red Line**

**Samples: RD96-23, RD96-27**

**RD96-02: 9.30 m, 21.90 m, 33.45 m, 47.60 m,**

**RD96-03: 27.00 m, 32.90 m, 38.30 m, 54.40 m, 56.90 m**

**Summary:**

**Sample RD96-23** is an augen gneiss containing megacrysts of plagioclase and much less abundant ones of biotite in a very fine grained slightly banded groundmass dominated by plagioclase and quartz. Quartz and plagioclase are segregated slightly to moderately into separate bands. Muscovite and biotite are concentrated in seams which define a moderate foliation. Biotite is replaced slightly by chlorite.

**Sample RD96-27** is an augen gneiss containing megacrysts of plagioclase in an extremely fine grained groundmass dominated by quartz and K-feldspar. Megacrysts are replaced strongly by K-feldspar. Muscovite and much less abundant biotite are concentrated in seams parallel to foliation.

**Sample RD96-02 9.30 m** is a porphyritic gneiss containing biotite megacrysts in a very fine grained well foliated groundmass dominated by quartz, and biotite, with less abundant epidote and plagioclase, and minor sphene and K-feldspar. Biotite oriented perpendicular to foliation may have formed during a recrystallization event. A few veinlets are of calcite.

**Sample RD96-02 21.90 m** is an augen gneiss containing slightly elongate patches dominated by quartz or quartz-plagioclase up to several mm long, which are flattened moderately in the foliation plane. The moderately foliated groundmass is dominated by very fine grained quartz and muscovite, with lesser plagioclase and biotite. Muscovite and biotite are concentrated strongly in bands parallel to foliation up to 1.5 mm wide. Biotite forms a few porphyroblasts oriented at a high angle to foliation.

**Sample RD96-02 33.45 m** is a semi-massive sulfide, which is coarsely banded, with bands dominated by fine grained biotite and by sulfides. Biotite has an unusual green colour and strong pleochroism. Sulfides are dominated by pyrite and pyrrhotite, with much less abundant sphalerite and minor chalcopyrite. Epidote forms disseminated grains in biotite. Interstitial patches are of K-feldspar and minor quartz and carbonate.

**Sample RD96-02 47.60 m** is a gneiss containing a few ragged megacrysts of plagioclase and porphyroblasts of biotite in a well foliated, very fine grained groundmass dominated by plagioclase and quartz, with much less abundant muscovite and minor K-feldspar and biotite. Muscovite is concentrated moderately in seams parallel to foliation. Biotite is replaced slightly by chlorite. Only one foliation is present. A vein 1.2 mm wide is of quartz with minor K-feldspar, biotite (altered to chlorite), and pyrite.

**Sample RD96-03 27.00 m** is a well foliated, moderately banded gneiss dominated by quartz and muscovite with less abundant K-feldspar (in part as porphyroblasts) and minor chlorite, plagioclase, biotite, and opaque. A few bands parallel to foliation up to several mm across are dominated by coarser grained quartz and opaque, with a few porphyroblasts of K-feldspar, patches of sphalerite, and disseminated flakes of muscovite and chlorite.

**Sample RD96-03 32.90 m** is a well foliated gneiss dominated by quartz and biotite, with lesser K-feldspar and plagioclase, and minor pyrite and muscovite. Biotite and muscovite are concentrated moderately in a few mica-rich bands up to 1.5 mm wide. A segregated band a few mm wide is dominated by quartz with lesser pyrite and much less biotite and chlorite.

**Sample RD96-03 38.30 m** is a well foliated, slightly compositionally banded gneiss with slight segregation of minerals into bands rich in each of the following: quartz-pyrite-(sphalerite), plagioclase-K-feldspar-(quartz), and muscovite-biotite-(epidote). Foliation is defined by muscovite-rich seams, which are warped slightly about patches of quartz-feldspar.

**Sample RD96-03 54.40 m** is an augen gneiss containing patches up to 1 cm in size of very fine to fine grained quartz, plagioclase, and K-feldspar. They are set in a well foliated, compositionally banded groundmass dominated by quartz and muscovite with less abundant biotite and K-feldspar, and minor plagioclase and epidote. Biotite is replaced slightly by chlorite. A few segregated lenses are of quartz-opaque with lesser ankerite and muscovite.

**Sample RD96-03 56.90 m** is a well foliated, very fine to fine grained gneiss composed of biotite, plagioclase, quartz, and epidote with accessory sphene and K-feldspar, and minor apatite. Plagioclase contains patches of myrmekite and is replaced moderately by K-feldspar. A lens up to a few mm long is of fine grained calcite-K-feldspar.

### **General Mineral Identification:**

Patches of cryptocrystalline biotite in several samples may be secondary after grains of amphibole.

In thin sections, opaque minerals could not be identified completely; most appear to be pyrite, and those with abundant sulfides probably also include pyrrhotite and minor chalcopyrite.

**Sample RD-23** is the only sample which shows textures suggestive of a metamorphic/ deformation event prior to that which formed the main foliation. This is represented by the fact that in some muscovite-rich seams, a few aggregates of subparallel muscovite flakes perpendicular to the foliation appear to be relics of an earlier foliation which was mainly destroyed by later recrystallization in the present, main foliation plane.

The augen of plagioclase may have been formed during an earlier metamorphic event or may be original grains in the parent rock. Many of them are corroded moderately and replaced in part by groundmass minerals.

No direct evidence indicates that biotite was replaced by muscovite-pyrite. Biotite is replaced locally by pseudomorphic chlorite, probably during retrogressive metamorphism. Where biotite and muscovite are present together they appear to be mainly in equilibrium. Biotite porphyroblasts which cut across the foliation probably were formed during a late stage of metamorphism after the stress accompanying the main metamorphic event was decreased.

**Sample RD96-02 33.45 m** contains intergrowths of pyrite, pyrrhotite, sphalerite, and minor chalcopyrite. Although pyrite tends to be subhedral to euhedral and surrounded by other sulfides, the textures are typical of metamorphism, and no primary paragenetic sequence is obvious. Minor pyrrhotite is replaced by secondary pyrite and dusty non-reflective material.

**Samples RD96-03 27.00 m and RD96-03 32.90 m** contain patches of cryptocrystalline biotite which may represent altered amphibole.

Based on the presence of biotite, muscovite, and epidote, and general absence of chlorite and hornblende, the metamorphic grade for most samples is upper greenschist to lower amphibolite facies. A few samples containing altered amphibole(?) and one containing a corroded grain of garnet suggest that the metamorphic grade may have reached middle amphibolite facies locally or for a short time. Alteration of biotite to chlorite may be associated with retrograde metamorphism or weak, late-stage hydrothermal alteration.



**John G. Payne, Ph.D.,**  
**Tel: (604)-986-2928**  
**Fax: (604)-983-3318**

Megacrysts of plagioclase and much less abundant ones of biotite are set in a very fine grained slightly banded groundmass dominated by plagioclase and quartz. Quartz and plagioclase are segregated slightly to moderately into separate bands. Muscovite and biotite are concentrated in seams which define a moderate foliation. Biotite is replaced slightly by chlorite.

<b>megacrysts</b>			
plagioclase	10-12%		
biotite	2- 3		
<b>groundmass</b>			
plagioclase	45-50	apatite	0.2%
quartz	25-30	opaque	0.2
muscovite	4- 5	chlorite	0.1
biotite	2- 3	allanite(?)	minor
K-feldspar	2- 3	zircon	trace
sphehne	0.3		

Plagioclase forms megacrysts averaging 1-1.5 mm in size, with a few prismatic grains up to 1.8 mm long. Most have irregular borders against the groundmass. In the groundmass it forms equant grains averaging 0.05-0.08 mm in size. A few megacrysts contain minor to moderately abundant inclusions of sericite and lesser chlorite, and most grains contain moderately abundant dusty inclusions. A few patches of chlorite are up to 0.15 mm across, and one lensy veinlet is 0.8 mm long. Several grains are replaced slightly to moderately by irregular patches of K-feldspar.

Biotite forms ragged grains averaging 0.3-0.7 mm in size and a few up to 1.2 mm long. Some are oriented parallel to foliation. Pleochroism is from light to medium/dark brown. It also occurs in the groundmass as disseminated flakes averaging 0.07-0.15 mm long. A few interstitial patches of flakes are replaced moderately to strongly by pseudomorphic, pale green chlorite. A few other interstitial patches up to 0.15 mm in size are of chlorite which appears to be primary.

Quartz forms equant grains averaging 0.03-0.1 mm in size, and a few up to 0.4 mm across. It is concentrated slightly in quartz rich lenses up to 0.3 mm wide and 2.5 mm long oriented parallel to foliation as grains averaging 0.1-0.3 mm in size. Larger grains commonly are strained slightly.

K-feldspar forms disseminated grains in the groundmass averaging 0.03-0.05 mm in size; its distribution is shown in the stained offcut block. Grains in the groundmass are difficult to identify in thin section.

Muscovite is concentrated in seams up to 1.2 mm wide, mainly as grains averaging 0.05-0.15 mm in size with a few up to 0.4 mm long. Some patches of these are oriented sub-perpendicular to the length of the lens, suggesting that they have been recrystallized

Sphene forms ragged grains averaging 0.03-0.05 mm in size and a few from 0.1-0.15 mm across. Some occur as rims on opaque grains, suggesting that the opaque is, in part at least, ilmenite. It is concentrated in one lens 1.2 mm long of skeletal grains up to 0.3 mm in size. Opaque forms disseminated grains averaging 0.03-0.07 mm in size, commonly associated with muscovite or biotite. Apatite forms disseminated grains averaging 0.02-0.05 mm in size and a few grains up to 0.3 mm in size. Allanite(?) forms disseminated grains averaging 0.03-0.05 mm in size. Grains are pleochroic from neutral to light reddish brown. Zircon forms a few stubby prismatic grains up to 0.1 mm long, mainly included in biotite or muscovite. Biotite surrounding the zircon grains has a narrow, dark, pleochroic halo. One elongate, euhedral prismatic grain 0.16 mm long and one stubby prismatic grain 0.13 mm long of zircon occur in groundmass plagioclase-quartz.

**Sample RD96-27 Augen Gneiss: Plagioclase Megacrysts altered Strongly to K-feldspar; K-feldspar-Quartz-Muscovite Groundmass; Limonite Veinlets**

Megacrysts of plagioclase are set in an extremely fine grained groundmass dominated by quartz and K-feldspar. Megacrysts are replaced strongly by K-feldspar. Muscovite and much less abundant biotite are concentrated in seams parallel to foliation.

<b>megacrysts</b>			
plagioclase/K-feldspar	20-25%		
<b>groundmass</b>			
K-feldspar	35-40	pyrite	0.2
quartz	25-30	sphene	minor
muscovite	4- 5	allanite(?)	minor
biotite	0.5	apatite	minor
<b>veinlets, patches</b>			
limonite	1- 2		

Plagioclase forms megacrysts up to 5 mm in size. Alteration is strong to K-feldspar; grains contain ragged, relic patches of plagioclase, mainly in the cores of grains. Smaller plagioclase grains of similar origin average 0.3-0.7 mm in size; they are altered slightly to moderately to K-feldspar. K-feldspar contains moderately abundant dusty inclusions. One megacryst is cut by a veinlet averaging 0.15 mm wide of pale greenish brown chlorite/biotite.

In the groundmass, K-feldspar forms equant grains averaging 0.015-0.03 mm in size. Quartz forms grains averaging 0.03-0.07 mm in size. It is concentrated moderately in a few lenses and patches up to 1 mm wide as grains averaging 0.1-0.5 mm in size and a few up to 1 mm across. Coarser grains commonly are strained moderately. These patches commonly are adjacent to feldspar megacrysts.

Muscovite is concentrated in seams parallel to foliation as flakes averaging 0.1-0.25 mm in size. Biotite forms flakes averaging 0.07-0.2 mm in size intergrown with muscovite. Pleochroism is from pale to medium brown.

Apatite forms grains averaging 0.07-0.2 mm in size, concentrated strongly in muscovite-rich bands.

Pyrite forms subhedral to euhedral grains averaging 0.05-0.15 mm in size and a few grains up to 0.7 mm across, mainly associated with muscovite-rich bands. Pyrite was replaced completely by limonite, and limonite lost from the rock leaving casts of the original grains.

Ti-oxide forms disseminated clusters of anhedral grains averaging 0.02-0.05 mm in size intergrown with very fine grained biotite and plagioclase.

Allanite(?) forms anhedral to subhedral grains averaging 0.03-0.05 mm in size. Pleochroism is slight from neutral to pale reddish brown.

Associated with bands of muscovite-biotite are patches of cryptocrystalline limonite.

Late veinlets up to 0.15 mm wide are of dark brown, cryptocrystalline limonite/hematite.

**Sample RD96-02 9.30 m      Porphyritic Plagioclase-Biotite-Quartz-Epidote Gneiss;  
Biotite Megacrysts**

Biotite megacrysts are set in a very fine grained well foliated groundmass dominated by quartz, and biotite, with less abundant epidote and plagioclase, and minor sphene and K-feldspar. Biotite oriented perpendicular to foliation may have formed during a recrystallization event. A few veinlets are of calcite.

<b>megacrysts</b>	
biotite	20-25%
<b>groundmass</b>	
quartz	30-35
biotite	17-20
epidote	10-12
plagioclase	10-12
K-feldspar	1
sphene	1- 2
apatite	0.1
<b>veinlets</b>	
calcite	0.2

Biotite forms ragged megacrysts averaging 1-1.7 mm in size, and a few up to 2.5 mm long. These grade downwards in size to groundmass biotite averaging 0.07-0.2 mm in size. Pleochroism is from light brown to medium/dark brown. Many grains are oriented parallel to foliation, but about 10% are oriented sub-perpendicular to this orientation; these may represent porphyroblasts which were formed during a period of recrystallization.

Quartz forms anhedral grains averaging 0.05-0.2 mm in size and a few from 0.2-0.5 mm across.

Epidote forms disseminated anhedral to subhedral grains averaging 0.05-0.1 mm in size and a few grains from 0.2-0.5 mm long.

Plagioclase forms disseminated anhedral grains averaging 0.1-0.15 mm in size. It is concentrated in a few patches up to 0.5 mm in size as interlocking grains averaging 0.03-0.05 mm in size. K-feldspar forms disseminated grains averaging 0.1-0.3 mm in size.

Sphene forms disseminated subhedral grains averaging 0.03-0.05 mm in size intergrown with biotite and concentrated moderately in trains parallel to foliation.

Calcite forms a few patches up to 0.8 mm in size.

Apatite forms subhedral to euhedral grains averaging 0.07-0.1 mm in size.

A few wispy, discontinuous veinlets averaging 0.01-0.02 mm wide of calcite cut the rock, and are controlled in their emplacement along biotite cleavage planes. A few calcite veinlets up to 0.03 mm wide are parallel to foliation.

**Sample RD96-02 21.90 m Augen Gneiss: Quartz-Plagioclase-rich patches;  
Groundmass of Quartz-Muscovite-Plagioclase-Biotite-Pyrite-K-feldspar**

Slightly elongate patches dominated by quartz or quartz-plagioclase form augen up to several mm long, which are flattened moderately in the foliation plane. The moderately foliated groundmass is dominated by very fine grained quartz and muscovite, with lesser plagioclase and biotite. Muscovite and biotite are concentrated strongly in bands parallel to foliation up to 1.5 mm wide. Biotite forms a few porphyroblasts oriented at a high angle to foliation.

<b>augen</b>		<b>groundmass (continued)</b>	
quartz	12-15%	plagioclase	12-15
plagioclase	10-12	biotite	7- 8
muscovite	0.3	pyrite	4- 5
biotite	0.1	K-feldspar	3- 4
pyrite	minor	epidote	0.5
chlorite	trace	calcite	0.3
<b>groundmass</b>		apatite	0.1
quartz	20-25	Mineral X	0.1
muscovite	15-17	zircon	minor

Patches averaging 5-10 mm across are dominated by slightly interlocking quartz grains averaging 0.1-0.25 mm in size, with a few up to 0.4 mm across and a very few up to 1 mm across. Coarser grains commonly are strained moderately. Other patches contain about equal amounts of quartz and plagioclase grains averaging 0.2-0.5 mm in size. Muscovite and much less abundant biotite form disseminated flakes averaging 0.07-0.1 mm in length. Pyrite forms minor disseminated subhedral to euhedral grains and patches of a few grains averaging 0.1-0.2 mm in size. Chlorite (probably after biotite) forms a few flakes up to 0.15 mm long; pleochroism is from light to medium green. Calcite forms minor, irregular, interstitial grains averaging 0.03-0.05 mm in size.

In the groundmass, quartz forms anhedral grains averaging 0.05-0.15 mm in size, with textures similar to those in the quartz-rich patches. Plagioclase forms anhedral grains averaging 0.07-0.2 mm in size. It contains moderately abundant dusty inclusions and is altered very slightly to sericite.

Muscovite and lesser biotite are concentrated strongly in subparallel bands up to 2 mm wide. Muscovite forms flakes averaging 0.1-0.4 mm in size. Biotite forms disseminated flakes averaging 0.1-0.5 mm in size and a few porphyroblasts up to 1 mm long. Pleochroism of biotite is from light to dark brown.

Pyrite is concentrated strongly in a few patches up to several mm across as anhedral to subhedral grains averaging 0.3-0.5 mm in size. It also forms disseminated grains averaging 0.05-0.2 mm in size in muscovite-rich seams.

K-feldspar forms disseminated grains averaging 0.1-0.3 mm in size and a few up to 1.2 mm long. It is concentrated moderately in a few seams parallel to foliation.

Epidote forms disseminated grains averaging 0.03-0.05 mm in size, mainly in muscovite-rich bands. Calcite forms a few patches up to 0.6 mm in size of grains averaging 0.07-0.2 mm in size.

Leucoxene forms a few patches up to 0.3 mm across of cryptocrystalline to extremely fine grains. Apatite forms equant grains averaging 0.03-0.08 mm in size, mainly in muscovite-rich layers. One prismatic grain is 0.4 mm long. Mineral X forms a few ragged patches from 0.1-0.3 mm across of extremely fine to cryptocrystalline grains. It is medium to dark orange in colour with high relief and low birefringence. Zircon forms a few equant grains up to 0.15 mm in size mainly concentrated with muscovite and biotite.

**Sample RD96-02 33.45 m Semi-Massive Sulfide: Biotite-Pyrite-Pyrrhotite-  
(Epidote-K-feldspar-Sphalerite)**

The rock is coarsely banded with bands dominated by fine grained biotite and by sulfides. Biotite has an unusual green colour and strong pleochroism. Sulfides are dominated by pyrite and pyrrhotite, with much less abundant sphalerite and minor chalcopyrite. Epidote forms disseminated grains in biotite. Interstitial patches are of K-feldspar and minor quartz and carbonate.

biotite	60-65%	sphalerite	1%
pyrite	12-15	quartz	0.3
pyrrhotite	12-15	chalcopyrite	0.3
epidote	4- 5	carbonate	0.1
K-feldspar	2- 3	galena	trace

Biotite forms mainly slender flakes averaging 0.3-1 mm in size oriented moderately parallel to foliation and compositional banding. Pleochroism is from pale to medium slightly brownish green.

Epidote forms disseminated, subhedral prismatic grains averaging 0.07-0.15 mm in size in biotite, and a few up to 0.4 mm long.

Sulfides are concentrated one main band up to 1 cm wide and a few smaller lenses mainly parallel to foliation. Pyrite forms subhedral to euhedral grains averaging 0.3-0.7 mm in size and a few from 1-1.8 mm in size. These are mainly surrounded by patches of very fine to fine grained pyrrhotite and minor sphalerite and chalcopyrite. Pyrite also forms disseminated, subhedral to euhedral grains averaging 0.07-0.3 mm in size in biotite. A few patches of pyrrhotite are replaced slightly to strongly by pyrite with minor disseminated non-reflective material. A few patches consist of submosaic pyrrhotite grains averaging 0.3-0.6 mm in size. On margins of some of these are patches of very fine to fine grained sphalerite and chalcopyrite.

Sphalerite (deep red) forms disseminated, equant grains averaging 0.05-0.1 mm in size and a few lenses up to 0.6 mm long included in pyrite-pyrrhotite. A few patches are dominated by sphalerite with lesser chalcopyrite and/or pyrrhotite, the largest of these is 1.2 mm in size.

Chalcopyrite forms a few patches up to 0.4 mm in size intergrown with sphalerite.

K-feldspar (and quartz?) forms anhedral, interstitial grains averaging 0.1-0.7 mm in size; these are concentrated moderately patches up to a few mm across.

Quartz is concentrated in one lens 1.5 x 0.4 mm in size elongated parallel to foliation as grains averaging 0.1-0.4 mm in size.

Carbonate forms two proximal grains up to 0.4 mm long interstitial to sulfides.

Galena occurs in a few inclusions up to 0.03 mm in size in pyrite.

## Sample RD96-02 47.60 m Plagioclase-Quartz-(Muscovite-K-feldspar-Biotite) Gneiss

A few ragged megacrysts of plagioclase and porphyroblasts of biotite occur in a well foliated, very fine grained groundmass dominated by plagioclase and quartz, with much less abundant muscovite and minor K-feldspar and biotite. Muscovite is concentrated moderately in seams parallel to foliation. Biotite is replaced slightly by chlorite. Only one foliation is present. A vein 1.2 mm wide is of quartz with minor K-feldspar, biotite (altered to chlorite), and pyrite.

### **megacrysts**

biotite 0.5%

plagioclase 0.3

### **groundmass**

plagioclase 45-50

quartz 35-40

muscovite 5- 7

K-feldspar 2- 3

biotite 1- 2%

pyrite 0.2

apatite trace

zircon trace

### **vein**

quartz-(K-feldspar-pyrite-biotite) 3- 4

Plagioclase forms a few anhedral megacrysts from 0.5-1 mm across. These are corroded moderately and replaced moderately by very fine grained quartz.

In the groundmass, plagioclase forms anhedral grains averaging 0.05-0.1 mm in size. Quartz forms anhedral grains averaging 0.05-0.15 mm across. A few slightly coarser grained lenses of quartz up to 0.3 mm wide consists of grains averaging 0.15-0.4 mm in size. Coarser grains commonly are strained moderately. K-feldspar forms disseminated grains averaging 0.1-0.15 mm in size. It is concentrated moderately in wispy seams parallel to foliation. Its distribution is shown in the stained offcut block; in the thin section only a few grains could be identified optically with certainty.

Muscovite is concentrated in seams parallel to foliation as slender flakes averaging 0.1-0.3 mm long and a few up to 0.5 mm long. A few equant flakes are oriented with their cleavage perpendicular to the foliation, and may be porphyroblasts.

Biotite forms flakes averaging 0.2-0.5 mm long and a few up to 1.5 mm long, mainly oriented parallel to foliation. Some grains are at a moderate angle to foliation, and have the texture of late-formed porphyroblasts. Pleochroism is from pale to medium/dark slightly greenish brown. A few flakes are replaced strongly to completely by pseudomorphic chlorite which is pleochroism from pale to medium green. A few large flakes are replaced moderately to strongly in lenses parallel to foliation by unoriented, cryptocrystalline flakes of pale green chlorite(?).

Pyrite forms a few subhedral to euhedral equant grains averaging 0.07-0.12 mm in size, and a few anhedral grains up to 0.2 mm long.

Apatite forms anhedral grains up to 0.07 mm across.

Zircon forms an anhedral grain 0.07 mm in size.

The vein is dominated by slightly interlocking quartz grains averaging 0.3-0.7 mm in size, with a few up to 1 mm long. K-feldspar forms a few interstitial grains up to 0.5 mm long, mainly in the core of the vein; it contains moderately abundant dusty inclusions. Biotite forms a few flakes averaging 0.1-0.15 mm in size. Alteration is complete to pseudomorphic chlorite, with or without minor lenses of calcite. Pyrite forms a few subhedral to euhedral grains averaging 0.1-0.15 mm in size.

**Sample RD96-03 27.00 m Well Foliated, Banded Gneiss: Quartz-Muscovite-(K-feldspar);  
Bands of Quartz-Pyrite-K-feldspar-Sphalerite-Muscovite-Ankerite**

The sample is a well foliated, moderately banded gneiss dominated by quartz and muscovite with less abundant K-feldspar (in part as porphyroblasts) and minor chlorite, plagioclase, biotite, and opaque. A few bands parallel to foliation up to several mm across are dominated by coarser grained quartz and opaque, with a few porphyroblasts of K-feldspar, patches of sphalerite, and disseminated flakes of muscovite and chlorite.

**main rock (85% of sample)**

quartz	50-55%	plagioclase	1- 2%
muscovite	25-30	epidote	0.5
K-feldspar	5- 7	biotite	0.3
opaque	2- 3	Ti-oxide	0.2
chlorite	2- 3	apatite	0.1
amphibole(?)	1- 2	zircon	0.1

**segregated bands (15% of sample)**

quartz	55-60	muscovite	4- 5
opaque	17-20	ankerite	2- 3
K-feldspar	5- 7	chlorite	0.5
sphalerite	5- 7	epidote	0.3

In much of the rock, quartz forms anhedral grains averaging 0.1-0.3 mm in size.

Muscovite forms clusters, seams, and disseminated flakes averaging 0.1-0.2 mm in size, and a few up to 0.5 mm across. It is concentrated strongly in a few seams up to 1.5 mm wide.

K-feldspar forms a few porphyroblastic grains from 1-2.5 mm long (oriented parallel to foliation). These grains have wavy extinction. Foliation in muscovite is warped around many of these. It also occurs with plagioclase as aggregates of grains averaging 0.05-0.1 mm in size

Amphibole(?) forms anhedral patches averaging 0.1-0.4 mm in size and a few up to 1.2 mm long. These were recrystallized to cryptocrystalline, light to medium brown biotite.

Biotite forms flakes from 0.07-0.2 mm long were not recrystallized. A few mica rich seams contain subparallel aggregates of muscovite with minor to moderately abundant biotite. Pleochroism of biotite is from pale or light straw to medium reddish brown. Some of these grains are altered slightly to moderately along cleavage to pale green chlorite.

Chlorite forms disseminated flakes and clusters of a few flakes averaging 0.1-0.15 mm in size and a few up to 0.4 mm long. Pleochroism is from very pale to pale greyish green. Some grains contain minor patches of Ti-oxide, suggesting that chlorite is secondary after biotite.

Plagioclase forms a few anhedral grains up to 0.7 mm in size. Alteration is moderate to disseminated grains of cryptocrystalline to very fine grained sericite and chlorite. Some patches are replaced slightly to moderately by cryptocrystalline limonite/biotite.

Opaque forms disseminated, subhedral to euhedral grains averaging 0.07-0.15 mm in size, and anhedral patches up to 0.3 mm in size.

Epidote forms grains averaging 0.01-0.05 mm in size, mainly intergrown with muscovite, and concentrated moderately in patches up to 1 mm in size. It also forms a few dense patches up to 0.15 mm in size of cryptocrystalline grains.

(continued)

Apatite forms anhedral grains averaging 0.05-0.07 mm in size and a few up to 0.12 mm across.

Ti-oxide/leucoxene forms patches up to 0.15 mm in size of cryptocrystalline grains, in part associated with and rimming zircon.

Zircon forms subhedral to subrounded grains averaging 0.05-0.07 mm in size and a few up to 0.2 mm long, mainly associated with muscovite and locally with Ti-oxide.

Two bands up to a few mm across parallel to foliation are dominated by fine to medium grained quartz with patches of opaque up to a few mm across and scattered grains of K-feldspar up to 1.5 mm long. One band at one end of the section contains patches up to 2 mm in size of deep red-brown sphalerite. Siderite (carbonate with high relief stained pale to light orange by limonite) forms patches averaging 0.1-0.5 mm in size, commonly interstitial to opaque. Some of these have a colloform texture with a radiating texture and fine concentric banding. Muscovite forms disseminated flakes and a few clusters/seams of flakes averaging 0.07-0.2 mm in size. Chlorite forms flakes averaging 0.07-0.12 mm in size, commonly bordering opaque grains. Epidote forms minor grains averaging 0.03-0.07 mm in size intergrown with muscovite.

A braided veinlet up to 0.1 mm wide is of lenses of opaque intergrown with much less abundant, very fine grained flakes of muscovite.

## Sample RD96-03 32.90 m Quartz-Biotite-K-feldspar-Plagioclase-Pyrite-Muscovite Gneiss

The sample is a well foliated gneiss dominated by quartz and biotite with lesser K-feldspar and plagioclase, and minor pyrite and muscovite. Biotite and muscovite are concentrated moderately in a few mica-rich bands up to 1.5 mm wide. A segregated band a few mm wide is dominated by quartz with lesser pyrite and much less biotite and chlorite.

quartz	55-60%	epidote	0.7
biotite	15-17	amphibole(?)	0.1
recrystallized	2-3	apatite	0.1
K-feldspar	8-10	garnet	minor
plagioclase	7-8	chlorite	minor
pyrite	3-4	zircon	trace
muscovite	1-2		
veinlet			
opaque	minor		

In the finer part of the rock, quartz forms anhedral grains averaging 0.1-0.4 mm in size. In a few coarser grained lenses parallel to foliation grains average 0.3-0.7 mm in size.

Biotite forms flakes averaging 0.3-0.8 mm long, and a few up to 1.7 mm long, mainly oriented parallel to foliation. Pleochroism is from pale to medium brown. In some patches, minor to moderately abundant grains of amphibole(?) are replaced completely by cryptocrystalline biotite.

K-feldspar forms anhedral grains averaging 0.3-1.2 mm in size and a few up to 1.7 mm long. A few contain minor to abundant inclusions of epidote grains averaging 0.03-0.1 mm in size and minor biotite flakes up to 0.1 mm long.

Plagioclase is concentrated in a few bands and patches as grains averaging 0.03-0.07 mm in size and locally up to 0.5 mm across, in part intergrown with quartz grains of similar to slightly coarser grain size. Finer grained plagioclase is altered slightly to strongly to extremely fine grained epidote and locally to cryptocrystalline biotite. Coarser grained plagioclase is altered slightly to moderately to disseminated grains of epidote averaging 0.01-0.02 mm in size and minor dusty limonite.

Muscovite is concentrated in a few lenses and bands parallel to foliation intergrown with biotite. Chlorite forms a few flakes averaging 0.1-0.15 mm long. Pleochroism is from pale to light greyish green. It may be secondary after biotite.

Pyrite forms anhedral patches averaging 0.5-1.2 mm in size. Some are intergrown intimately with biotite and muscovite.

Epidote forms disseminated grains averaging 0.07-0.15 mm in size. A few patches up to 0.4 mm in size are of cryptocrystalline to extremely fine grains. It is concentrated moderately in a few biotite-rich patches as anhedral, equant to prismatic grains up to 0.2 mm in size.

Garnet forms a skeletal grain 0.6 mm across intergrown with very fine grained quartz.

Apatite forms disseminated subrounded grains and clusters of grains averaging 0.02-0.05 mm in size and a few up to 0.07 mm across.

Zircon forms disseminated, subhedral grains averaging 0.03-0.05 mm in size.

A lens a few mm across is dominated by very fine to fine grained quartz with abundant patches of opaque up to 2 mm across. A few biotite flakes border patches of opaque. One patch 0.8 mm across interstitial to opaque is of extremely fine grained, pale green chlorite.

A veinlet up to 0.07 mm wide is of opaque. It occurs mainly in biotite flakes, and in some coarser flakes is distributed into a few seams along biotite cleavage planes.

## Sample RD96-03 38.30 m Quartz-Plagioclase-Muscovite-K-feldspar-Biotite-Opaque Gneiss

The sample is a well foliated, slightly compositionally banded gneiss with slight segregation of minerals into bands rich in each of the following: quartz-pyrite-(sphalerite), plagioclase-K-feldspar-(quartz), and muscovite-biotite-(epidote). Foliation is defined by muscovite-rich seams, which are warped slightly about patches of quartz-feldspar.

quartz	35-40%	opaque	4- 5	Ti-oxide	minor
plagioclase	20-25	(pyrite, pyrrhotite)		ankerite	minor
muscovite	15-17	epidote	0.5	zircon	minor
K-feldspar	7- 8	sphalerite	0.5		
biotite	4- 5	apatite	0.2		
<b>veinlets</b>					
opaque	minor				

In quartz-rich bands, quartz forms anhedral grains averaging 0.15-0.5 mm in size, with a few up to 1.2 mm long. In bands in which it is intergrown with feldspars, quartz forms anhedral grains averaging 0.07-0.1 mm in size.

Plagioclase forms anhedral grains averaging 0.07-0.12 mm in size. Some patches of plagioclase contain moderately abundant muscovite flakes up to 0.1 mm in size; these may be secondary after plagioclase, and formed during metamorphism. Many plagioclase grains are replaced slightly to moderately by K-feldspar. Plagioclase also contains moderately abundant dusty inclusions of hematite(?).

K-feldspar forms anhedral grains averaging 0.1-0.3 mm in size, mainly intergrown with plagioclase, and a few coarser interstitial grains up to 1 mm long. Grains commonly have minor dusty hematite(?) inclusions.

Muscovite and lesser biotite are concentrated strongly in seams up to 0.7 mm wide parallel to foliation. Muscovite forms flakes averaging 0.1-0.5 mm long. Biotite forms anhedral flakes averaging 0.5-1 mm in size, mainly oriented parallel to foliation and a few up to 1.5 mm long. It is concentrated in a few patches up to 2.5 mm long in which grains are oriented sub-parallel to foliation. A few porphyroblastic grains up to 1 mm in size are oriented sub-perpendicular to foliation. Pleochroism is from pale to medium reddish brown. In a few seams parallel to foliation, biotite is altered moderately to strongly to pseudomorphic, pale green chlorite.

Opaque (pyrite) forms disseminated grains and patches of grains averaging 0.07-0.15 mm in size. Larger patches of opaque up to 1.5 mm long and mainly oriented parallel to foliation probably are of both pyrite and pyrrhotite.

Epidote forms anhedral to subhedral grains averaging 0.05-0.1 mm in size, mainly in muscovite-rich seams.

Sphalerite forms a few patches up to 0.5 mm in size intergrown with opaque. One patch 1.8 mm long occurs in a very fine to medium grained quartz-rich band. Sphalerite is deep red-brown in colour.

Apatite forms disseminated, anhedral grains averaging 0.05-0.12 mm in size. Ti-oxide is concentrated in clusters of anhedral grains averaging 0.01-0.02 mm in size intergrown with biotite. Zircon forms anhedral grains averaging 0.03-0.05 mm in size and a few up to 0.1 mm long, mainly concentrated with biotite. Many grains have thin, dark pleochroic halos.

Ankerite forms a few grains up to 0.1 mm in size, mainly associated with opaque.

A few braided seams from 0.02-0.04 mm wide are of opaque, probably pyrite/marcasite.

**Sample RD96-03 54.40 m Augen Gneiss: Quartz-Plagioclase-K-feldspar Patches;  
Quartz-Plagioclase-Biotite-K-feldspar-Muscovite Groundmass;  
Quartz-Pyrite-(Ankerite) Lenses**

Patches up to 1 cm in size are of very fine to fine grained quartz, plagioclase, and K-feldspar. They are set in a well foliated, compositionally banded groundmass dominated by quartz and muscovite with less abundant biotite and K-feldspar, and minor plagioclase and epidote. Biotite is replaced slightly by chlorite. A few segregated lenses are of quartz-opaque with lesser ankerite and muscovite.

	<b>augen patches</b>	<b>groundmass</b>	<b>lenses</b>
quartz	12-15%	40-45%	4- 5%
plagioclase	10-12	2- 3	-
K-feldspar	1- 2	3- 4	-
muscovite	0.2	20-25	0.3
chlorite	0.1	-	minor
epidote	-	1- 2	-
apatite	-	0.2	-
opaque	-	0.2	2- 3
calcite/ankerite	minor	minor	0.2
apatite	-	0.2	-
zircon	-	minor	-

Angular to lency patches up to 1 cm in size are dominated by quartz and plagioclase grains averaging 0.1-0.4 mm in grain size and a few up to 0.6 mm across. Plagioclase also forms interstitial grains averaging 0.05-0.15 mm in size which contain moderately abundant dusty hematite inclusions. K-feldspar occurs in some patches as scattered grains and clusters of grains from 0.1-0.7 mm in size. Muscovite and chlorite each forms scattered flakes averaging 0.1-0.15 mm long. Pleochroism of chlorite is from pale to light green. A few interstitial patches up to 0.4 mm long are of very fine grained calcite.

In the groundmass, quartz forms grains averaging 0.1-0.3 mm in size with a few up to 0.7 mm long and a few lenses in which grains average 0.05-0.08 mm in size.

Muscovite is concentrated in seams parallel to foliation up to 2 mm wide as flakes averaging 0.2-0.5 mm long.

Biotite forms disseminated slender flakes averaging 0.5-1 mm long, and a few ragged porphyroblasts up to 2 mm long, many of which are oriented parallel to foliation and many are concentrated in micaceous seams. Pleochroism is from pale/light to dark brown. A few grains are replaced to pseudomorphic chlorite with minor patches of Ti-oxide.

Plagioclase forms equant grains averaging 0.1-0.5 mm in size and a few up to 0.7 mm across. Alteration is slight to moderate to cryptocrystalline biotite.

Epidote forms disseminated subhedral grains averaging 0.03-0.1 mm in size, mainly enclosed in muscovite. A few patches up to 0.4 mm in size are of dense aggregates of cryptocrystalline to extremely fine grains. Opaque (pyrite) forms anhedral to subhedral patches averaging 0.1-0.3 mm in size. Apatite forms disseminated grains averaging 0.05-0.1 mm in size and a few up to 0.15 mm in length. Zircon forms anhedral, equant grains averaging 0.05 mm in size and a few subhedral ones up to 0.1 mm across. Many of these occur in biotite porphyroblasts, and have dark pleochroic halos.

A few lenses up to 2.5 mm wide parallel to foliation are dominated by very fine to fine grained quartz and pyrite. Ankerite forms patches up to 0.2 mm in size. Muscovite forms flakes averaging 0.1-0.2 mm long.

**Sample RD96-03 56.90 m Biotite-Plagioclase-Quartz-Epidote-(Sphene) Gneiss;  
Calcite-K-feldspar Lens**

The sample is a well foliated, very fine to fine grained gneiss composed of biotite, plagioclase, quartz, and epidote with accessory sphene and K-feldspar, and minor apatite. Plagioclase contains patches of myrmekite and is replaced moderately by K-feldspar. A lens up to a few mm long is of fine grained calcite-K-feldspar.

biotite	35-40%
plagioclase	20-25
quartz	17-20
epidote	10-12
K-feldspar	2- 3
sphene	2- 3
apatite	0.5
opaque	0.2
<b>lens</b>	
K-feldspar-calcite	1

Biotite forms flakes mainly oriented parallel to foliation averaging 0.2-0.4 mm long with a few grains up to 0.7 mm long. Pleochroism is from light to dark brown.

Plagioclase forms anhedral grains averaging 0.05-0.3 mm in size with a few up to 0.5 mm across. Some contain patches of myrmekite containing extremely fine, wormy lenses of quartz. Plagioclase is moderately in irregular patches by K-feldspar. Patches of plagioclase which are not replaced by K-feldspar contain abundant dusty inclusions.

K-feldspar forms anhedral grains up to 0.4 mm in size; some may be complete replacements of plagioclase and others probably are primary K-feldspar.

Quartz forms anhedral grains averaging 0.05-0.15 mm in size and a few up to 0.2 mm across. A few lenses are of slightly coarser grained quartz and K-feldspar.

Epidote forms equant, subhedral to anhedral grains averaging 0.07-0.15 mm in size and a few subhedral to euhedral grains up to 0.3 mm across, mainly intergrown with biotite.

Sphene forms anhedral grains averaging 0.01-0.03 mm in size, which are concentrated strongly in lenses and patches associated with biotite, and commonly along cleavage planes in biotite.

Apatite forms anhedral to subhedral grains averaging 0.03-0.07 mm in size.

Opaque forms a few irregular patches up to 0.5 mm in size.

A replacement lens from 0.3-0.7 mm wide and 5 mm long is of very fine to fine grained K-feldspar and calcite.

## **APPENDIX III**

### **GPS Information for Red Line Claims**

**Red Line Property**  
**GPS Survey Coordinates**

**Data Quality:** Standard = The surveyed positions were recorded in 3D mode and were differentially corrected. The reported UTM coordinates are within 1 to 5 meters of their actual locations; Poor = >25% of the surveyed positions were recorded in 2D mode; Uncorrected = The surveyed positions were not differentially corrected; N/S = No survey data available.

**Base Station:** W = Westmin Resources Ltd. base station at Wolverine Lake; WL = Ministry of Environment, Lands and Parks base station at Williams Lake; DL = Ministry of Environment, Lands and Parks base station at Dease Lake; RR = Department of Renewable Resources (Forestry) at Whitehorse.

**A. Drill Collars**

Hole No.	MSL	UTM Coordinates		Data Quality	Base Station	Date
		Northing	Easting			
RD96-01	1280	6810946	427069	Standard	W	06/24/96
RD96-02	1286	6810850	427111	Standard	W	06/24/96
RD96-03	1300	6810879	427168	Standard	W	06/24/96
RD96-04	1314	6810944	427277	Standard	W	06/24/96
RD96-05	1285	6810956	428866	Standard	W	06/24/96
RD96-06	1300	6811222	427152	Standard	W	06/24/96

**B. Grid Station Points**

	Grid Coordinates		UTM Coordinates		Data Quality	Base Station	Date
	Northing	Easting	Northing	Easting			
Geophysical	5000	9800	6810675	427174	Standard	WL	06/01/96
	5000	9900	6810650	427287	Poor	WL	06/01/96
	5000	10000	6810638	427392	Poor	WL	06/01/96
Geochemical	8800	10000	6810731	427317	Poor	WL	06/01/96
	9300	10000	6811235	427076	Poor	WL	06/01/96
	9800	10000	6811735	426905	Poor	WL	06/01/96

**C. Expatriate Resources Ltd. Claim Posts**

	Posts 1	Posts 2	UTM Coordinates		Data Quality	Base Station	Date
			Northing	Easting			
Red Line	1,2	-	6811900	426540	Poor	WL	06/01/96
	3,4	1,2	6811590	426932	Poor	WL	06/01/96
	5,8	3,4	6811027	427235	Poor	WL	06/01/96
	7,8	5,8	6810667	427386	Poor	WL	06/01/96
	9,10	7,8	6810314	427519	Standard	WL	06/01/96
	11,12	9,10	6809784	427635	Poor	WL	06/01/96
	-	11,12	6809539	427672	Standard	WL	06/01/96
Red Line	13	-	6811863	426436	Poor	WL	06/02/96
	14	13	6811494	426586	Poor	WL	06/01/96
	15	14	6810844	426810	Poor	WL	06/01/96
	16	15	6810337	427064	Poor	WL	06/01/96
	-	16	6810070	427252	Poor	WL	06/01/96
Red Line	18	-	6810878	426192	Poor	WL	06/01/96
	17,19,20	18	6810442	426204	Standard	WL	06/01/96
	-	20	6810014	428239	Standard	WL	06/01/96
	21,22	17,19	6810462	426622	Standard	WL	06/01/96
	23,24	21,22	6810461	429023	Standard	WL	06/01/96
	25,26	23,24	6810477	429500	Standard	WL	06/01/96
	27,28	25,26	6810492	429662	Standard	W	06/07/96
	-	27,28	-	-	N/S	-	-

**D. Claim Posts From Adjoining Claim Blocks**

	Posts 1	Posts 2	UTM Coordinates		Data Quality	Base Station	Date
			Northing	Easting			
Ang	3,4	1,2	6809610	428112	Standard	WL	06/01/96
	7,8	5,6	6809586	429017	Standard	WL	06/01/96
	30,31	28,29	6810528	430890	Standard	W	06/07/96
	32,33	30,31	6810524	431352	Standard	W	06/07/96
	34,35	32,33	6810526	431801	Standard	W	06/07/96
On	232,233	230,231	6811306	429609	Standard	WL	06/01/96
	230,231	228,229	6811284	429168	Standard	WL	06/01/96
	228,229	226,227	6811234	428731	Standard	WL	06/01/96
	226,227	225,224	6811212	428294	Poor	WL	06/01/96
	225,224	-	6810775	428302	Standard	WL	06/01/96

**APPENDIX IV**

**1996 Drill Logs**

**SYNOPTIC LOG  
FINLAYSON PROJECT**

EXPATRIATE RESOURCES LTD.

Hole: RD96-01

Property: Red Line

Page 1 of 3

Easting: Northing: Elevation: Depth:  
427069 6810946 1280 183.49

Logged by: Greg Bell  
Drilling Dates: June 3-6, 1996

Depth	Azimuth	Dip	Method
0	180	-58	Brunton
183.49		-62	Acid

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
0.00	2.44	2.44	CSDH	Casing										
2.44	4.77	2.33	MBGA	Muscovite-biotite-quartz augen gneiss										
4.77	5.50	0.73	BCSH	Biotite schist										
5.50	10.40	4.90	MBGN	Muscovite-biotite gneiss										
10.40	11.40	1.00	BCSH	Biotite-chlorite schist										
11.40	13.40	2.00	MBGN	Muscovite-biotite schist										
13.40	18.90	5.50	BCSH	Biotite-chlorite schist										
18.90	21.35	2.45	MBGN	Muscovite-biotite-quartz schist										
21.35	25.55	4.20	MBGN	Muscovite-quartz-biotite gneiss										
					22.35	23.36	1.01	N110351	95	181	10	306	<0.2	
					24.80	25.50	0.70	N110352	99	1920	44	246	1.8	
25.55	26.85	1.30	MBGN	Muscovite-biotite-quartz gneiss										
26.85	36.28	9.43	MBGN	Muscovite-biotite-quartz gneiss										
					32.11	33.00	0.89	N110353	100	912	52	1240	0.8	
36.28	39.55	3.27	MBGA	Muscovite-biotite augen gneiss										
					36.35	37.30	0.95	N110354	100	333	8	314	<0.2	
39.55	39.95	0.40	BCSH	Biotite-chlorite schist										
39.95	43.50	3.55	MBGN	Muscovite-biotite-quartz gneiss										
43.50	45.90	2.40	MBGA	Muscovite-biotite augen gneiss										
					44.90	45.90	1.00	N110355	100	353	210	320	2.2	
45.90	46.01	0.11	SPVN	Sulphide rich vein										
					45.90	46.01	0.11	N110356	100	5.60%	0.08%	0.50%	76.6 g/t	170
46.01	50.15	4.14	MBGA	Muscovite-biotite-quartz augen gneiss										
					46.01	47.01	1.00	N110357	98	100	30	82	<0.2	
50.15	51.35	1.20	BCSH	Biotite-quartz-chlorite schist										
51.35	52.90	1.55	MBGA	Muscovite-quartz-biotite augen gneiss										
52.90	56.08	3.18	BCSH	Biotite-quartz schist										
56.08	60.80	4.72	MBGA	Muscovite-quartz-biotite augen gneiss										
60.80	62.60	1.80	BCSH	Biotite-chlorite-quartz schist										
62.60	63.50	0.90	MBGA	Muscovite-quartz-biotite augen gneiss										
63.50	64.42	0.92	BCSH	Biotite-chlorite-quartz schist										

**SYNOPTIC LOG  
FINLAYSON PROJECT**

Hole: RD96-01

Property: Red Line

Page 2 of 3

EXPATRIATE RESOURCES LTD.

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
64.42	69.30	4.88	MBGN	Muscovite-quartz-biotite gneiss										
					64.42	65.80	1.38	N110363	89	744	12	4840	0.4	
					65.80	66.80	1.00	N110364	90	1765	14	4260	1.4	
					66.80	68.28	1.48	N110365	50	2210	6	6350	5.8	
					68.28	69.30	1.02	N110358	90	3800	10	1.51%	4.0	
69.30	74.05	4.75	MBGN	Muscovite-biotite-quartz gneiss										
74.05	82.15	8.10	BCSH	Biotite-chlorite schist										
					78.70	79.70	1.00	N110359	70	2800	10	558	1.6	
82.15	97.40	15.25	MBGN	Muscovite-biotite-quartz gneiss										
					82.90	83.95	1.05	N110360	95	384	6	246	<0.2	
					88.90	89.30	0.40	N110361	80	2570	8	364	4.2	
					93.18	94.18	1.00	N110362	95	1515	20	506	0.6	
97.40	102.80	5.40	MBGN	Muscovite-quartz-biotite gneiss										
102.80	106.00	3.20	MBGA	Muscovite-biotite-quartz-feldspar augen gneiss										
106.00	112.58	6.58	MBGN	Muscovite-quartz-biotite gneiss										
112.58	116.00	3.42	BCSH	Biotite-chlorite-quartz schist										
116.00	118.80	2.80	MBGN	Muscovite-biotite-quartz gneiss										
118.80	121.60	2.80	BCSH	Biotite-chlorite schist										
121.60	123.60	2.00	QTVN	White quartz vein										
123.60	126.35	2.75	MBGN	Muscovite-biotite-quartz gneiss										
126.35	130.70	4.35	MBGA	Muscovite-biotite-quartz augen gneiss										
130.70	134.47	3.77	MBGN	Muscovite-biotite-quartz gneiss										
134.47	142.60	8.13	FLST	Faulted chlorite schist										
142.60	145.94	3.34	CLSH	Chlorite-biotite schist										
145.94	148.80	2.86	MBGA	Muscovite-biotite-quartz augen gneiss										
148.80	154.98	6.18	MBGN	Muscovite-biotite-quartz gneiss										
					153.67	154.98	1.31	N110366	87	5	26	46	<0.2	
154.98	161.53	6.55	MBGN	Muscovite-biotite-chloritic gneiss										
					154.98	155.80	0.82	N110367	95	3	92	156	<0.2	
					155.80	156.80	1.00	N110368	95	18	14	88	0.2	
161.53	164.75	3.22	MBGN	Muscovite-biotite-quartz gneiss										
					163.75	164.75	1.00	N110369	99	<1	50	34	<0.2	
164.75	174.92	10.17	MBGN	Muscovite-biotite-quartz gneiss										



**SYNOPTIC LOG  
FINLAYSON PROJECT**

EXPATRIATE RESOURCES LTD.

Hole: RD98-02 Property: Red Line

Easting: Northing: Elevation: Depth:  
427111 6810850 1286 182.88

Logged by: John McPhee  
Drilling Dates: June 7-9, 1996

Depth	Azimuth	Dip	Method
0	177	-50	Brunton
182.88		-57	Acid

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
0.00	3.05	3.05	OBDR	Overburden										
3.05	3.75	0.70	BCSH	Biotite-chlorite-quartz schist										
3.75	7.64	3.89	MBGN	Muscovite-biotite-quartz gneiss										
7.64	9.90	2.26	BCSH	Biotite-chlorite-quartz schist										
9.90	15.94	6.04	MBGN	Muscovite-biotite-quartz gneiss										
					9.90	11.52	1.62	N110383	83	856	100	2730	2.8	
					11.52	11.94	0.42	N110384	98	1.00%	0.01%	0.55%	10.3g/t	<5
					11.94	13.72	1.78	N110385	48	720	12	1510	0.6	
15.94	20.70	4.76	BCSH	Biotite-chlorite-quartz schist										
20.70	26.60	5.90	MBGA	Muscovite-biotite-quartz augen gneiss										
					25.03	25.58	0.55	N110386	94	146	10	340	<0.2	
26.60	29.00	2.40	BCSH	Biotite-chlorite-quartz schist										
29.00	32.13	3.13	MBGA	Muscovite-biotite-quartz augen gneiss										
32.13	37.13	5.00	CLSH	Chlorite schist										
					32.45	33.51	1.06	N110387	100	0.19%	0.01%	0.20%	0.7g/t	<5
					33.51	34.61	1.10	N110388	97	0.04%	0.01%	0.10%	0.3g/t	<5
					34.61	35.61	1.00	N110389	100	0.08%	0.03%	0.43%	1.0g/t	<5
					36.30	37.13	0.83	N110390	86	0.10%	0.01%	0.45%	<0.3g/t	<5
37.13	39.80	2.67	MBGN	Muscovite-biotite-quartz gneiss										
39.80	43.60	3.80	MBGN	MBGN with 30% BCSH										
43.60	52.06	8.46	MBGN	Muscovite-biotite-quartz gneiss										
					51.74	52.85	1.11	N110391	90	192	2	280	<0.2	
52.06	54.25	2.19	BCSH	Biotite-chlorite-quartz schist										
54.25	56.78	2.53	MBGA	Muscovite-biotite-quartz gneiss										
56.78	66.63	11.85	BCSH	Biotite-chlorite-quartz schist										
					61.01	63.09	2.08	N110392	94	365	<2	522	<0.2	
					64.98	67.91	2.93	N110393	78	360	40	5150	0.2	
66.63	82.97	14.34	MBGA	Muscovite-biotite-quartz augen gneiss										
					70.98	71.91	0.93	N110394	96	790	2	152	<0.2	
82.97	85.56	2.59	BCSH	Biotite-chlorite-quartz schist										
85.56	96.62	11.06	MBGA	Muscovite-biotite-quartz augen gneiss										

**SYNOPTIC LOG  
FINLAYSON PROJECT**

Hole: RD98-02

Property: Red Line

EXPATRIATE RESOURCES LTD.

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
98.62	103.09	6.47	BCSH	Biotite-chlorite schist										
103.09	104.44	1.35	MBGA	Muscovite-biotite-quartz augen gneiss										
104.44	106.21	1.77	BCSH	Biotite-chlorite schist with MBGA										
106.21	108.54	2.33	GGST	Fault gouge										
108.54	111.25	2.71	MBGA	Muscovite-biotite-quartz augen gneiss										
111.25	113.44	2.19	MBGN	Muscovite-biotite-quartz gneiss										
113.44	114.20	0.76	BCSH	Biotite-chlorite schist										
114.20	117.45	3.25	MBGA	Muscovite-biotite-quartz augen gneiss										
117.45	120.92	3.47	BCSH	Biotite-chlorite schist										
120.92	122.53	1.61	MBGA	Muscovite-biotite-quartz augen gneiss										
122.53	123.87	1.34	BCSH	Biotite-chlorite schist										
123.87	134.41	10.54	MBGA	Muscovite-biotite-quartz augen gneiss										
					129.68	131.06	1.38	N110395	97	11	8	112	<0.2	
134.41	136.37	1.96	BCSH	Biotite-chlorite schist with MBGA										
136.37	141.17	4.80	MBGA	Muscovite-biotite-quartz augen gneiss										
141.17	144.05	2.88	BCSH	Biotite-chlorite schist with MBGN										
144.05	146.06	2.01	MBGA	Muscovite-biotite-quartz augen gneiss										
146.06	148.91	0.85	BCSH	Biotite-chlorite schist										
148.91	155.19	8.28	MBGA	Muscovite-biotite-quartz augen gneiss										
155.19	158.33	3.14	BCSH	Biotite-chlorite schist										
158.33	161.25	2.92	MBGA	Muscovite-biotite-quartz augen gneiss										
161.25	161.90	0.65	BCSH	Biotite-chlorite schist										
161.90	170.15	8.25	MBGA	Muscovite-biotite-quartz augen gneiss										
170.15	171.91	1.76	BCSH	Biotite-chlorite schist										
171.91	174.04	2.13	MBGN	Muscovite-biotite-quartz gneiss										
174.04	177.56	3.52	BCSH	Biotite-chlorite schist with MBGA and MBGN										
177.56	182.20	4.64	BCSH	Biotite-chlorite schist										
182.20	182.88	0.68	MBGA	Muscovite-biotite-quartz augen gneiss										
				EOH										

**SYNOPTIC LOG  
FINLAYSON PROJECT**

EXPATRIATE RESOURCES LTD.

Hole: RD96-03 Property: Red Line

Easting: 427168 Northing: 6810879 Elevation: 1300 Depth: 149.35

Logged by: Greg Bell  
Drilling Dates: June 9-11, 1996

Depth	Azimuth	Dip	Method
0	183	-50	Brunton
149.35		-47	Acid

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
0.00	2.44	2.44	CSDH	casing										
2.44	6.05	3.61	MBGN	muscovite biotite qtz gneiss										
					4.80	6.15	1.35	N110396	79	0.10%	0.01%	0.05%	2.1gf	25
6.05	7.50	1.45	MBGN	muscovite biotite qtz gneiss										
					6.15	7.50	1.35	N110397	80	0.06%	0.01%	0.07%	2.1gf	120
7.50	10.19	2.69	MBGN	muscovite biotite qtz gneiss										
					7.50	9.14	1.64	N110398	90	0.01%	0.01%	0.01%	<0.3gf	<5
10.19	12.15	1.96	MBGN	muscovite biotite qtz gneiss										
12.15	21.74	9.59	MBGN	muscovite biotite qtz gneiss										
					15.50	16.85	1.35	N110399	90	0.05%	0.01%	0.02%	0.3gf	25
21.74	24.15	2.41	BCSH	biotite chlorite schist										
24.15	29.55	5.40	MBGN	muscovite biotite qtz gneiss										
29.55	30.58	1.03	BCSH	biotite chlorite schist										
30.58	33.43	2.85	MBGN	muscovite biotite qtz gneiss										
33.43	37.30	3.87	BCSH	biotite schist with gneiss										
37.30	39.52	2.22	MBGN	muscovite biotite qtz gneiss										
					37.30	38.71	1.41	N110400	99	0.07%	0.01%	0.10%	1.0gf	20
39.52	41.25	1.73	BCSH	biotite chlorite schist										
41.25	46.20	4.95	MBGN	muscovite biotite qtz gneiss										
46.20	50.20	4.00	MBGA	muscovite biotite qtz augen gneiss										
50.20	51.47	1.27	BCSH	biotite chlorite schist										
51.47	54.96	3.49	MBGA	muscovite biotite qtz augen gneiss										
54.96	58.20	3.24	BCSH	biotite chlorite schist										
58.20	65.40	7.20	MBGA	muscovite biotite qtz gneiss with augen gneiss										
65.40	69.95	4.55	MBGN	MBGN, MBGA, BCSH mix										
69.95	73.20	3.25	MBGN	massive muscovite qtz gneiss										
73.20	76.05	2.85	MBGN	muscovite biotite qtz augen gneiss										
76.05	78.25	2.20	BCSH	biotite chlorite schist										
78.25	80.39	2.14	MBGN	massive muscovite qtz gneiss										
80.39	81.21	0.82	BCSH	biotite chlorite schist										
81.21	84.74	3.53	MBGN	muscovite biotite gneiss										



**SYNOPTIC LOG  
FINLAYSON PROJECT**

EXPATRIATE RESOURCES LTD.

Hole: RD96-04 Property: Red Line

Easting: Northing: Elevation: Depth:  

427277	6810944	1314	76.20
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Logged by: John McPhee  
 Drilling Dates: June 12, 1996

Depth	Azimuth	Dip	Method
0	174	-61	Brunton
76.20		-60	Acid

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
0.00	3.05	3.05	CSDH	casing										
3.05	4.64	1.59	MBGN	muscovite biotite qtz gneiss										
4.64	12.19	7.55	MBGN	muscovite biotite qtz gneiss										
					7.54	9.14	1.60	N112001	100	0.02%	<0.01%	0.02%	0.3g/t	<5
					9.14	10.66	1.52	N112002	100	0.01%	<0.01%	0.20%	0.3g/t	<5
					10.66	12.19	1.53	N112003	100	0.01%	0.02%	0.06%	2.7g/t	<5
12.19	16.48	4.29	MBGN	muscovite biotite qtz gneiss										
16.48	18.08	1.60	MBGN	muscovite biotite qtz gneiss										
18.08	21.55	3.47	MBGN	muscovite biotite qtz gneiss										
21.55	26.82	5.27	MBGN	muscovite biotite qtz gneiss										
26.82	27.74	0.92	BCSH	biotite chlorite schist										
					26.82	27.74	0.92	N112004	95	138	8	476	0.2	
27.74	36.58	8.84	MBGN	muscovite biotite qtz gneiss										
36.58	39.32	2.74	MBGN	muscovite biotite qtz gneiss										
39.32	40.61	1.29	QZVN	qtz vein										
40.61	43.30	2.69	MBGA	muscovite biotite qtz augen gneiss										
43.30	47.67	4.37	MBGN	muscovite biotite qtz gneiss										
					44.04	46.23	2.19	N112005	98	398	6	2110	0.6	
47.67	50.06	2.39	MBGN	muscovite biotite qtz gneiss										
					48.12	49.38	1.26	N112006	100	0.10%	0.01%	0.02%	0.7g/t	<5
50.06	52.93	2.87	BCSH	biotite chlorite schist										
52.93	59.00	6.07	MBGN	muscovite biotite qtz gneiss										
					54.22	54.86	0.64	N112007	95	0.08%	0.01%	0.18%	0.7g/t	<5
					56.45	56.96	0.51	N112008	100	0.15%	<0.01%	0.09%	1.0g/t	<5
					57.91	58.62	0.71	N112009	100	0.08%	<0.01%	0.07%	0.7g/t	<5
59.00	61.42	2.42	MBGN	muscovite biotite qtz gneiss										
61.42	65.42	4.00	MBGN	muscovite biotite qtz gneiss										
					62.87	65.12	2.25	N112010	100	718	10	362	0.2	
65.42	67.94	2.52	MBGN	muscovite biotite qtz gneiss										
67.94	70.80	2.86	MBGN	muscovite biotite qtz gneiss										
					68.00	70.63	2.63	N112011	100	297	<2	9010	0.2	





**SYNOPTIC LOG  
FINLAYSON PROJECT**

EXPATRIATE RESOURCES LTD.

Hole: RD 96-06

Property: Red Line

Page 1 of 4

Easting: 427152 Northing: 6811222 Elevation: 1300 Depth: 182.88

Logged by: G. McDougall  
Drilling Dates: June 15-17, 1996

Depth	Azimuth	Dip	Method
0	176	-62	Brunton
182.88		-65	Acid

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
0.00	6.10	6.10	CSDH	Casing										
6.10	6.55	0.45	NLDH	Rubble										
6.55	7.39	0.84	MBGN	Quartz rich biotite gneiss										
7.39	7.62	0.23	MBGN	Rubble										
7.62	8.62	1.00	MBGA	Augen gneiss with quartz veins										
8.62	9.37	0.75	FLST	Rubble, sand, fault zone										
					8.62	9.37	0.75	N110371	19	280	22	94	<0.2	
9.37	9.58	0.21	BCSH	Biotite rich schist										
9.58	12.02	2.44	MBGA	Biotite rich gneiss with quartz, feldspar										
12.02	14.63	2.61	MBGN	Quartz rich gneiss										
14.63	15.23	0.60	MBGA	Biotite quartz augen gneiss										
15.23	15.66	0.43	BCSH	Biotite schist with calcite eyes										
15.66	16.73	1.07	MBGA	Biotite quartz augen gneiss										
16.73	17.02	0.29	BCSH	Biotite schist with quartz veins										
17.02	20.98	3.96	MBGA	Quartz rich augen gneiss										
20.98	25.28	4.30	BCSH	Foliated biotite schist										
25.28	29.30	4.02	MBGA	Quartz and feldspar augen gneiss, inc. bio.										
29.30	33.52	4.22	MBGA	Biotite rich quartz augen gneiss										
33.52	34.80	1.28	MBGN	Quartz rich gneiss										
34.80	39.47	4.67	MBGN	Quartz biotite muscovite gneiss										
39.47	40.16	0.69	BCSH	Massive biotite schist										
					40.16	42.24	2.08	N110372	100	186	8	42	<0.2	
40.16	42.24	2.08	MBGN	Quartz biotite gneiss										
42.24	42.69	0.45	BCSH	Biotite schist										
42.69	43.66	0.97	MBGN	Quartz biotite gneiss										
43.66	45.78	2.12	BCSH	Biotite schist with large quartz veins										
45.78	48.99	3.21	MBGA	Augen gneiss w/ minor sulphide stringers										
					45.78	47.38	1.60	N110373	98	77	<2	64	<0.2	
					47.38	48.99	1.61	N110374	100	43	2	94	<0.2	
48.99	51.04	2.05	BCSH	Biotite schist with calcite eyes										

**SYNOPTIC LOG  
FINLAYSON PROJECT**

Hole: RD96-06

Property: Red Line

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**EXPATRIATE RESOURCES LTD.**

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
51.04	58.24	7.20	MBGA	Augen gneiss										
					51.04	53.04	2.00	N110375	100	44	<2	50	<0.2	
58.24	58.95	0.71	BCSH	Biotite schist										
58.95	64.51	5.56	MBGA	Qtz musc bio gneiss w/ qtz and feld augen										
64.51	65.11	0.60	BCSH	Biotite schist w/ feldspar "phenocrysts"										
65.11	70.60	5.49	MBGA	Coarse augen gneiss										
70.60	71.17	0.57	BCSH	Biotite schist w/ chlorite alteration										
71.17	72.96	1.79	MBGA	Coars augen gneiss										
72.96	74.03	1.07	MBGA	Small augen gneiss, more mafic										
74.03	74.11	0.08	BCSH	Massive biotite schist										
74.11	75.52	1.41	MBGA	Coarse, stretched augen gneiss										
75.52	75.68	0.16	BCSH	Biotite schist										
75.68	76.76	1.08	MBGA	Coarse augen gneiss										
76.76	78.05	1.29	BCSH	Biotite schist										
78.05	80.41	2.36	MBGA	Augen gneiss										
80.41	81.12	0.71	BCSH	Biotite schist with large quartz veins										
81.12	83.35	2.23	MBGA	Muscovite biotite quartz feld augen gneiss										
					81.12	83.35	2.23	N110380	99	51	24	56	<0.2	
83.35	85.15	1.80	BCSH	Calcareous biotite schist										
85.15	87.47	2.32	MBGN	Quartzose gneiss										
87.47	88.02	0.55	BCSH	Biotite schist with calcite eyes										
88.02	90.25	2.23	MBGA	Quartz muscovite augen gneiss										
90.25	92.38	2.13	BCSH	Quartz rich biotite schist										
92.38	92.70	0.32	QTVN	Quartz vein w/ slivers biotite schist										
92.70	95.92	3.22	BCSH	Biotite schist with minor MBGA										
95.92	96.08	0.16	CAVN	Calcite and quartz vein										
96.08	96.82	0.74	BCSH	Biotite schist with bands small quartz augen										
96.82	102.12	5.30	MBGA	Muscovite biotite quartz feld augen gneiss										
102.12	102.65	0.53	BCSH	Biotite schist with small quartz augen										
102.65	106.48	3.83	MBGN	Quartz rich muscovite biotite gneiss										
106.48	106.98	0.50	BCSH	Biotite schist										
106.98	107.44	0.46	MBGA	Biotite muscovite augen gneiss										
107.44	108.35	0.91	BCSH	Biotite schist										

**SYNOPTIC LOG  
FINLAYSON PROJECT**

Hole: RD96-06

Property: Red Line

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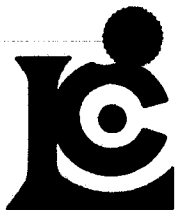
EXPATRIATE RESOURCES LTD.

From (m)	To (m)	Interval (m)	Unit	Comments	From (m)	To (m)	Interval (m)	Sample No.	REC %	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ag (ppm)	Au (ppb)
108.35	110.82	2.47	MBGA	Quartzose muscovite biotite augen gneiss										
110.82	112.07	1.25	BCSH	Biotite to muscovite schist										
112.07	116.20	4.13	MBGA	Muscovite quartz feldspar augen gneiss										
116.20	116.63	0.43	BCSH	Biotite schist										
116.63	120.16	3.53	MBGA	Muscovite quartz feldspar augen gneiss										
120.16	122.37	2.21	MBGA	Bio musc qtz gneiss w/ qtz and feld augen										
122.37	123.21	0.84	BCSH	Biotite chlorite schist										
123.21	123.81	0.60	MBGN	Quartz biotite muscovite gneiss										
123.81	125.33	1.52	BCSH	Biotite schist with calcareous bands										
125.33	127.47	2.14	MBGN	Muscovite quartz gneiss										
127.47	127.82	0.35	BCSH	Biotite quartz (feldspar) schist										
127.82	136.63	8.81	MBGA	Quartz muscovite biotite augen gneiss										
136.63	138.08	1.45	BCSH	Biotite schist w/ epid-chlorite porphyroblasts										
138.08	138.28	0.20	QTVN	Quartz vein										
					138.28	138.98	0.70	N110381	100	109	8	44	<0.2	
138.28	138.98	0.70	MBGA	Silicified augen gneiss										
138.98	139.68	0.70	BCSH	Quartzose biotite muscovite schist										
139.68	140.50	0.82	MBGA	Quartz muscovite augen gneiss										
140.50	141.08	0.58	BCSH	Quartzose biotite muscovite augen gneiss										
141.08	144.70	3.62	MBGA	Quartz muscovite augen gneiss										
144.70	146.67	1.97	MBGN	Massive biotite muscovite gneiss										
146.67	147.83	1.16	BCSH	Biotite schist with quartzose bands										
147.83	151.91	4.08	MBGA	Quartz muscovite feldspar augen gneiss										
					150.91	151.91	1.00	N110382	100	197	<2	44	<0.2	
151.91	152.30	0.39	BCSH	Biotite schist										
152.30	162.84	10.54	MBGA	Coarse augen gneiss										
					158.50	160.67	2.17	N110376	100	97	<2	414	<0.2	
					160.67	162.84	2.17	N110377	98	79	2	1330	<0.2	
162.84	164.18	1.34	BCSH	Biotite quartz feldspar schist										
164.18	166.80	2.62	MBGA	Coarse augen gneiss										
166.80	167.95	1.15	BCSH	Quartz biotite schist										
167.95	171.07	3.12	MBGA	Small augen gneiss										
					170.04	171.07	1.03	N110378	100	1745	<2	54	0.4	



## **APPENDIX V**

### **Certificates of Analysis**



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers

212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
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VANCOUVER, BC  
V6B 1L8

Page : 1-A  
Total Pages : 1  
Certificate Date: 27-JUN-96  
Invoice No. : I9621778  
P.O. Number :  
Account : MPO

Project : REDLINE  
Comments:

## CERTIFICATE OF ANALYSIS A9621778

SAMPLE	PREP CODE		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo
			ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm
RD96-01 N110351	205	226	< 0.2	2.21	< 2	100	< 0.5	2	0.52	< 0.5	9	77	181	5.91	< 10	< 1	1.50	60	0.93	975	3
RD96-01 N110352	205	226	1.8	2.27	2	60	0.5	26	0.21	0.5	6	73	1920	8.06	< 10	< 1	1.26	70	0.89	660	3
RD96-01 N110353	205	226	0.8	1.87	< 2	110	< 0.5	26	0.11	6.5	21	93	912	5.73	< 10	< 1	1.30	30	0.75	490	1
RD96-01 N110354	205	226	< 0.2	1.94	6	120	< 0.5	6	0.31	< 0.5	5	129	333	4.97	< 10	< 1	1.28	50	0.70	505	1
RD96-01 N110355	205	226	2.2	2.24	2	70	< 0.5	16	0.16	1.0	16	155	353	6.34	< 10	< 1	1.47	30	0.97	710	1
RD96-01 N110357	205	226	< 0.2	0.92	4	90	< 0.5	8	0.27	< 0.5	3	139	100	3.31	< 10	< 1	0.47	80	0.25	130	2
RD96-01 N110358	205	226	4.0	1.75	< 2	40	< 0.5	36	0.99	81.5	13	58	3800	9.58	< 10	< 1	0.73	60	0.84	475	< 1
RD96-01 N110359	205	226	1.6	4.76	8	50	< 0.5	2	0.92	1.0	18	114	2800	12.00	20	< 1	1.98	30	2.85	970	< 1
RD96-01 N110360	205	226	< 0.2	4.89	6	190	< 0.5	< 2	0.25	< 0.5	5	131	384	8.82	10	< 1	1.95	40	2.81	890	< 1
RD96-01 N110361	205	226	4.2	3.78	< 2	300	< 0.5	< 2	0.42	2.0	7	121	2570	6.52	10	< 1	2.40	40	1.94	650	1
RD96-01 N110362	205	226	0.6	5.42	2	250	< 0.5	6	0.41	0.5	11	125	1515	10.25	10	< 1	2.18	20	2.62	795	< 1
RD96-01 N110363	205	226	0.4	1.51	< 2	110	0.5	2	3.79	32.5	4	82	744	3.96	< 10	< 1	0.36	80	0.60	465	1
RD96-01 N110364	205	226	1.4	2.45	< 2	60	< 0.5	10	2.76	22.0	11	77	1765	8.04	< 10	< 1	0.99	70	1.26	615	3
RD96-01 N110365	205	226	5.8	1.75	< 2	200	< 0.5	< 2	0.71	31.0	3	118	2210	4.11	< 10	< 1	0.84	80	0.90	320	3
RD96-01 N110366	205	226	< 0.2	0.76	18	20	< 0.5	< 2	0.34	< 0.5	3	82	5	8.15	< 10	1	0.49	60	0.34	140	3
RD96-01 N110367	205	226	< 0.2	3.45	36	80	0.5	< 2	3.13	< 0.5	3	29	3	5.66	10	< 1	1.00	70	3.46	2340	3
RD96-01 N110368	205	226	0.2	2.73	14	80	< 0.5	< 2	1.56	< 0.5	14	62	18	6.21	< 10	< 1	1.43	30	2.62	1445	1
RD96-01 N110369	205	226	< 0.2	1.11	26	40	< 0.5	< 2	0.21	< 0.5	4	98	< 1	6.17	< 10	< 1	0.71	50	0.77	225	3

CERTIFICATION: *Phai D Ma*



# Chemex Labs Ltd.

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Project : REDLINE  
 Comments:

Page : 1-B  
 Total Pages : 1  
 Certificate Date: 27-JUN-96  
 Invoice No. : 19621778  
 P.O. Number :  
 Account : MPO

## CERTIFICATE OF ANALYSIS

## A9621778

SAMPLE	PREP		Na	Ni	P	Pb	Sb	Sc	Sr	Ti	Tl	U	V	W	Zn
	CODE		%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
RD96-01 N110351	205	226	< 0.01	6	860	10	< 2	5	17	0.25	< 10	< 10	41	< 10	306
RD96-01 N110352	205	226	0.01	2	380	44	< 2	4	10	0.15	< 10	< 10	11	< 10	246
RD96-01 N110353	205	226	< 0.01	1	230	52	< 2	2	7	0.14	< 10	< 10	6	< 10	1240
RD96-01 N110354	205	226	0.01	1	420	8	< 2	3	23	0.13	< 10	< 10	8	< 10	314
RD96-01 N110355	205	226	0.01	4	300	210	< 2	3	15	0.16	< 10	< 10	21	< 10	320
RD96-01 N110357	205	226	0.04	2	450	30	< 2	2	12	0.04	< 10	< 10	4	< 10	82
RD96-01 N110358	205	226	0.03	4	280	10	< 2	7	46	0.11	< 10	< 10	31	< 10	>10000
RD96-01 N110359	205	226	0.08	5	670	10	< 2	10	24	0.22	< 10	< 10	86	< 10	558
RD96-01 N110360	205	226	0.06	4	530	6	< 2	11	15	0.21	< 10	< 10	50	< 10	246
RD96-01 N110361	205	226	0.06	4	740	8	< 2	8	25	0.28	< 10	< 10	60	< 10	364
RD96-01 N110362	205	226	0.06	6	600	20	< 2	10	16	0.22	< 10	< 10	71	< 10	506
RD96-01 N110363	205	226	0.04	5	350	12	< 2	7	61	0.03	< 10	< 10	19	< 10	4840
RD96-01 N110364	205	226	0.01	8	430	14	< 2	7	95	0.13	< 10	< 10	25	< 10	4260
RD96-01 N110365	205	226	0.04	3	430	6	< 2	5	30	0.10	< 10	< 10	12	< 10	6350
RD96-01 N110366	205	226	0.03	2	570	26	< 2	1	11	0.01	< 10	< 10	3	< 10	46
RD96-01 N110367	205	226	0.08	1	970	92	< 2	5	104	0.05	< 10	< 10	21	< 10	156
RD96-01 N110368	205	226	0.04	2	1250	14	< 2	16	60	0.22	< 10	< 10	151	< 10	88
RD96-01 N110369	205	226	0.01	2	490	50	< 2	1	14	0.04	< 10	< 10	4	< 10	34

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Page 1 : 1  
Total Pages : 1  
Certificate Date: 30-JUN-96  
Invoice No. : 19621783  
P.O. Number :  
Account : MPO

## CERTIFICATE OF ANALYSIS

A9621783

SAMPLE	PREP CODE	Au ppb FA+AA	Ag g/t	Cu %	Pb %	Zn %						
RD96-01 N110356	208 226	170	76.6	5.60	0.08	0.50						

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Total Pages : 1  
Certificate Date: 08-JUL-96  
Invoice No. : I9622541  
P.O. Number :  
Account : MPO

## CERTIFICATE OF ANALYSIS

### A9622541

SAMPLE	PREP CODE	Au oz/T	Ag oz/T	Cu %	Pb %	Zn %						
N110384	208 226	< 0.001	0.30	1.00	< 0.01	0.55						
N110387	208 226	< 0.001	0.02	0.19	< 0.01	0.20						
N110388	208 226	< 0.001	0.01	0.04	< 0.01	0.10						
N110389	208 226	< 0.001	0.03	0.08	0.03	0.43						
N110390	208 226	< 0.001	< 0.01	0.10	0.01	0.45						

CERTIFICATION:



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Total Pages : 1  
Certificate Date: 06-JUL-98  
Invoice No. : I9622542  
P.O. Number :  
Account : MPO

## CERTIFICATE OF ANALYSIS A9622542

SAMPLE	PREP CODE		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo
			ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm
N110383	205	226	2.8	3.35	< 2	40	< 0.5	26	0.15	11.0	8	94	856	9.90	10	1	2.38	30	1.51	965	1
N110385	205	226	0.6	1.99	< 2	140	0.5	2	1.77	4.0	3	115	720	5.64	< 10	< 1	0.85	70	0.87	560	3
N110386	205	226	< 0.2	2.64	< 2	310	< 0.5	10	0.32	1.0	11	179	146	4.95	< 10	< 1	1.60	60	1.40	485	2
N110391	205	226	< 0.2	6.48	< 2	330	0.5	< 2	0.24	< 0.5	10	10	192	8.99	20	< 1	5.06	100	4.15	750	3
N110392	205	226	< 0.2	6.09	< 2	180	1.0	< 2	0.75	0.5	14	35	395	9.82	10	< 1	4.63	50	3.48	870	< 1
N110393	205	226	0.2	7.10	< 2	430	1.0	4	0.78	27.0	8	34	360	9.32	20	2	3.74	60	5.34	1220	1
N110394	205	226	< 0.2	5.13	< 2	50	1.0	8	0.15	0.5	31	40	790	11.75	10	< 1	4.09	30	2.54	640	4
N110395	205	226	< 0.2	0.68	< 2	70	0.5	< 2	1.00	0.5	10	111	11	3.84	< 10	< 1	0.24	70	0.21	145	10

CERTIFICATION: Hart Bickler



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
 212 Brooksbank Ave., North Vancouver  
 British Columbia, Canada V7J 2C1  
 PHONE: 604-984-0221 FAX: 604-984-0218

EXPATRIATE RESOURCES LTD.  
 C/O ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
 1016 - 510 W. HASTINGS ST.  
 VANCOUVER, BC  
 V6B 1L8

Project : RED LINE  
 Comments:

Page : 1-B  
 Total Pages : 1  
 Certificate Date : 06-JUL-96  
 Invoice No. : I9622542  
 P.O. Number :  
 Account : MPO

## CERTIFICATE OF ANALYSIS A9622542

SAMPLE	PREP CODE		Na	Ni	P	Pb	Sb	Sc	Sr	Ti	Tl	U	V	W	Zn
			%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
N110383	205	226	0.06	< 1	320	100	2	7	13	0.17	< 10	< 10	15	< 10	2730
N110385	205	226	0.03	1	350	12	< 2	5	34	0.08	< 10	< 10	6	< 10	1510
N110386	205	226	0.01	8	500	10	< 2	6	16	0.18	< 10	< 10	37	< 10	340
N110391	205	226	0.06	< 1	470	2	< 2	10	13	0.23	< 10	< 10	12	< 10	280
N110392	205	226	0.04	4	750	< 2	2	13	19	0.41	< 10	< 10	71	< 10	522
N110393	205	226	0.14	3	510	40	2	10	22	0.22	< 10	< 10	43	< 10	5150
N110394	205	226	0.01	2	500	2	2	7	12	0.33	< 10	< 10	29	< 10	152
N110395	205	226	0.02	17	400	8	< 2	1	20	< 0.01	< 10	< 10	4	< 10	112

CERTIFICATION: Hart Becker



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British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221 FAX: 604-984-0218

EXPATRIATE RESOURCES LTD.  
C/O ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016 - 510 W. HASTINGS ST.  
VANCOUVER, BC  
V6B 1L8

Project: RED LINE  
Comments:

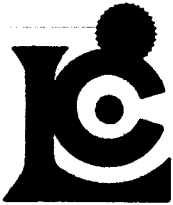
Page: 1-A  
Total Pages: 1  
Certificate Date: 06-JUL-96  
Invoice No.: 19622579  
P.O. Number:  
Account: MPO

## CERTIFICATE OF ANALYSIS

### A9622579

SAMPLE	PREP CODE		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo
			ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm
N110371	205	226	< 0.2	3.48	< 2	1970	2.0	< 2	3.24	1.0	19	212	280	4.87	10	1	2.26	40	2.24	650	1
N110372	205	226	< 0.2	1.98	< 2	400	0.5	< 2	0.49	< 0.5	9	99	186	3.68	< 10	< 1	1.20	70	0.90	255	3
N110373	205	226	< 0.2	1.80	< 2	330	0.5	< 2	0.54	< 0.5	9	120	77	3.54	< 10	< 1	1.04	70	0.86	240	< 1
N110374	205	226	< 0.2	1.78	< 2	310	< 0.5	< 2	0.42	< 0.5	8	71	43	3.49	< 10	< 1	1.19	70	0.89	240	3
N110375	205	226	< 0.2	1.47	< 2	220	< 0.5	< 2	0.38	< 0.5	8	49	44	3.13	< 10	< 1	0.96	70	0.81	235	1
N110376	205	226	< 0.2	0.68	< 2	140	< 0.5	2	0.21	2.0	4	83	97	2.43	< 10	< 1	0.45	60	0.17	150	2
N110377	205	226	< 0.2	0.60	< 2	130	< 0.5	< 2	0.21	6.5	3	97	79	2.31	< 10	< 1	0.36	50	0.15	105	2
N110378	205	226	0.4	2.12	< 2	190	0.5	< 2	0.29	< 0.5	11	52	1745	4.61	< 10	1	1.42	40	1.09	405	1
N110379	205	226	< 0.2	5.07	< 2	490	0.5	< 2	0.94	0.5	20	210	85	8.40	30	< 1	3.19	10	3.42	1340	8
N110380	205	226	< 0.2	1.52	< 2	100	0.5	< 2	0.94	< 0.5	9	88	51	3.62	< 10	< 1	0.65	50	0.93	520	3
N110381	205	226	< 0.2	0.97	< 2	70	0.5	< 2	1.68	< 0.5	6	111	109	2.65	< 10	< 1	0.29	50	0.48	320	4
N110382	205	226	< 0.2	1.40	< 2	110	0.5	< 2	0.59	< 0.5	4	112	197	4.23	< 10	< 1	0.81	40	0.58	295	2

CERTIFICATION: Hart Bickler



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EXPATRIATE RESOURCES LTD.  
C/O ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016 - 510 W. HASTINGS ST.  
VANCOUVER, BC  
V6B 1L8

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Total Pages : 1  
Certificate Date: 06-JUL-96  
Invoice No. : I9622579  
P.O. Number :  
Account : MPO

Project : RED LINE  
Comments:

## CERTIFICATE OF ANALYSIS A9622579

SAMPLE	PREP CODE	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
N110371	205 226	0.12	71	630	22	< 2	17	43	0.22	< 10	< 10	117	10	94
N110372	205 226	0.04	5	840	8	< 2	6	23	0.24	< 10	< 10	37	< 10	42
N110373	205 226	0.05	5	800	< 2	< 2	6	23	0.21	< 10	< 10	27	< 10	64
N110374	205 226	0.04	5	830	2	< 2	6	25	0.24	< 10	< 10	34	< 10	94
N110375	205 226	0.03	4	860	< 2	< 2	6	22	0.20	< 10	< 10	27	< 10	50
N110376	205 226	< 0.01	2	610	< 2	< 2	1	19	0.05	< 10	< 10	3	< 10	414
N110377	205 226	0.02	3	470	2	< 2	1	18	0.05	< 10	< 10	3	< 10	1330
N110378	205 226	< 0.01	2	410	< 2	< 2	7	26	0.18	< 10	< 10	21	< 10	54
N110379	205 226	< 0.01	26	610	< 2	< 2	17	26	0.40	< 10	< 10	127	< 10	394
N110380	205 226	0.04	3	530	24	< 2	6	28	0.14	< 10	< 10	20	< 10	56
N110381	205 226	0.01	3	650	8	< 2	4	45	0.06	< 10	< 10	22	< 10	44
N110382	205 226	< 0.01	3	550	< 2	< 2	3	25	0.10	< 10	< 10	9	< 10	44

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 VANCOUVER, BC  
 V6B 1L8

Project : RED LINE  
 Comments:

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 Total Pages : 1  
 Certificate Date: 06-JUL-96  
 Invoice No. : 19622581  
 P.O. Number :  
 Account : MPO

## CERTIFICATE OF ANALYSIS A9622581

SAMPLE	PREP CODE		Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo
			ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm
N112004	205	226	0.2	3.90	< 2	140	1.0	< 2	0.85	< 0.5	28	75	138	7.41	10	< 1	3.09	< 10	2.26	1215	< 1
N112005	205	226	0.6	2.19	8	40	< 0.5	14	0.12	15.5	11	46	398	8.61	< 10	< 1	1.59	10	0.93	735	8
N112010	205	226	0.2	3.36	< 2	60	0.5	12	0.21	< 0.5	10	66	718	8.85	10	< 1	2.49	30	1.54	1030	< 1
N112011	205	226	0.2	1.73	14	30	< 0.5	2	0.21	39.5	7	46	297	7.65	< 10	< 1	1.30	30	0.79	625	1

CERTIFICATION: Hart Bichler



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 V6B 1L8

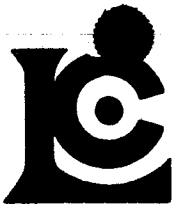
Project : RED LINE  
 Comments:

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 Total Pages : 1  
 Certificate Date: 06-JUL-96  
 Invoice No. : I9622581  
 P.O. Number :  
 Account : MPO

## CERTIFICATE OF ANALYSIS A9622581

SAMPLE	PREP CODE	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
N112004	205 226	< 0.01	15	1410	8	< 2	17	25	0.50	< 10	< 10	208	< 10	476
N112005	205 226	< 0.01	3	440	6	< 2	3	7	0.18	< 10	< 10	7	< 10	2110
N112010	205 226	< 0.01	4	560	10	< 2	3	11	0.22	< 10	< 10	29	< 10	362
N112011	205 226	< 0.01	1	500	< 2	< 2	2	11	0.14	< 10	< 10	8	< 10	9010

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 VANCOUVER, BC  
 V6B 1L8

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 Total Pages : 1  
 Certificate Date: 08-JUL-96  
 Invoice No. : I9622582  
 P.O. Number :  
 Account : MPO

Project : RED LINE  
 Comments:

<b>CERTIFICATE OF ANALYSIS</b>	<b>A9622582</b>
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SAMPLE	PREP CODE	Au ppb FA+AA	Ag oz/T	Cu %	Pb %	Zn %					
N112001	208 226	< 5	0.01	0.02	< 0.01	0.02					
N112002	208 226	< 5	0.01	0.01	< 0.01	0.20					
N112003	208 226	< 5	0.08	0.01	0.02	0.06					
N112006	208 226	< 5	0.02	0.10	0.01	0.02					
N112007	208 226	< 5	0.02	0.08	0.01	0.18					
N112008	208 226	< 5	0.03	0.15	< 0.01	0.09					
N112009	208 226	< 5	0.02	0.08	< 0.01	0.07					

CERTIFICATION:



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers  
 212 Brooksbank Ave., North Vancouver  
 British Columbia, Canada V7J 2C1  
 PHONE: 604-984-0221 FAX: 604-984-0218

EXPATRIATE RESOURCES LTD.  
 C/O ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
 1016 - 510 W. HASTINGS ST.  
 VANCOUVER, BC  
 V6B 1L8

Page : 1  
 Total Pgs : 1  
 Certificate Date: 09-JUL-96  
 Invoice No. : 19622583  
 P.O. Number :  
 Account : MPO

Project : RED LINE  
 Comments:

## CERTIFICATE OF ANALYSIS A9622583

SAMPLE	PREP CODE	Au ppb FA+AA	Ag oz/T	Cu %	Pb %	Zn %						
N110396	208 226	25	0.06	0.10	< 0.01	0.05						
N110397	208 226	120	0.06	0.06	< 0.01	0.07						
N110398	208 226	< 5	< 0.01	0.01	< 0.01	0.01						
N110399	208 226	25	0.01	0.05	< 0.01	0.02						
N110400	208 226	20	0.03	0.07	< 0.01	0.10						

CERTIFICATION:

*Sard / Letna*



# Chemex Labs Ltd.

Analytical Chemists \* Geochemists \* Registered Assayers

212 Brooksbank Ave., North Vancouver  
British Columbia, Canada V7J 2C1  
PHONE: 604-984-0221 FAX: 604-984-0218

EXPATRIATE RESOURCES LTD.  
C/O ARCHER, CATHRO & ASSOCIATES (1981) LIMITED  
1016 - 510 W. HASTINGS ST.  
VANCOUVER, BC  
V6B 1L8

Page No. : 1  
Total Pages : 1  
Certificate Date: 05-JUL-96  
Invoice No. : I9622803  
P.O. Number :  
Account : MPO

Project : REDLINE  
Comments:

## CERTIFICATE OF ANALYSIS

A9622803

SAMPLE	PREP CODE	Zn %									
N110358	244 --	1.51									

CERTIFICATION:

# ARCHER, CATHRO

& ASSOCIATES (1981) LIMITED


CONSULTING GEOLOGICAL ENGINEERS

Box 4127, 2054 SECOND AVENUE, WHITEHORSE, Y.T. Y1A 3S9 Tel (403) 667 - 4415

## AFFIDAVIT

I, Joan Mariacher, of WHITEHORSE, YUKON make oath and say:

That to the best of my knowledge the attached Statement of Expenditures for exploration work on the RED LINE 1-28 mineral claims on Claim Sheet 1056/8 is accurate.

  
\_\_\_\_\_  
Joan Mariacher

Sworn before me at WHITEHORSE YUKON  
this 27TH day of  
SEPTEMBER, 1996



  
\_\_\_\_\_  
Notary, Yukon Territory

**Statement of Expenditures  
Red Line 1-28 Mineral Claims  
September 25, 1996**

Expenses

E. Caron Diamond Drilling Ltd. .... \$69,849.17

Red Line 3 - DDH RD96-6 - \$13,699.76  
4 - DDH RD96-5 - 6,596.04  
5 - DDH RD96-4 - 6,844.81  
6 - DDH RD96-1  
to RD96-3 - 42,708.56  
  
\$69,849.17



E. CARON DIAMOND DRILLING LTD.

7 Roundel Road Whitehorse, Yukon Y1A 3H3

Phone (403) 668-2424 FAX (403) 668-4520

June 15, 1996  
Invoice #3402  
Drill #260

IN ACCOUNT WITH

Expatriate Resources Ltd.,  
1016 - 510 West Hastings Street,  
Vancouver, B. C.  
V6B 1L8

Drilling Charges June 1 to 15, 1996: (Finlayson Lake)

Hole: RD96-1/-60/BTW

Moving

✓ 83 man hrs. @ \$35.00 per hr. = \$ 2,905.00

Drilling Anchor

✓ 6 man hrs. @ \$35.00 per hr. = \$ 210.00

✓ 3 machine hrs. @ \$21.00 per hr. = \$ 63.00 \$ 273.00

Waterline

✓ 12 man hrs. @ \$35.00 per hr. = \$ 420.00

Conditioning Hole

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00

1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Testing

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00

1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Casing

✓ 0 - 8 = 8 ft. @ \$20.00 per ft. = \$ 160.00

Coring

✓ 8 - 602 = 594 ft. @ \$19.00 per ft. = \$11,286.00 \$15,226.00

Hole: RD96-2/-50/BTW

Moving

✓ 48 man hrs. @ \$35.00 per hr. = \$ 1,680.00

Drilling Anchor

✓ 6 man hrs. @ \$35.00 per hr. = \$ 210.00

✓ 3 machine hrs. @ \$21.00 per hr. = \$ 63.00 \$ 273.00

Waterline

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00

Testing

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00

1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Casing

✓ 0 - 10 = 10 ft. @ \$20.00 per ft. = \$ 200.00

Coring

✓ 10 - 600 = 590 ft. @ \$19.00 per ft. = \$11,210.00 \$13,524.00

*rd/06  
#260*



Hole: RD96-3/-50/BTW

Moving

✓ 32 man hrs. @ \$35.00 per hr. = \$ 1,120.00

Drilling Anchor

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00  
 1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Waterline

✓ 8 man hrs. @ \$35.00 per hr. = \$ 280.00

Testing

2 man hrs. @ \$35.00 per hr. = \$ 70.00  
 ✓ 1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Casing

✓ 0 - 8 = 8 ft. @ \$20.00 per ft. = \$ 160.00

Coring

✓ 8 - 480 = 472 ft. @ \$19.00 per ft. = \$ 8,968.00 \$ 10,710.00

Hole: RD-4/-60/BTW

Moving

✓ 32 man hrs. @ \$35.00 per hr. = \$ 1,120.00

Drilling Anchor

✓ 3 man hrs. @ \$35.00 per hr. = \$ 105.00  
 1.5 machine hrs. @ \$21.00 per hr. = \$ 31.50 \$ 136.50

Waterline

✓ 4 man hrs. @ \$35.00 per hr. = \$ 140.00

Testing

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00  
 1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Casing

✓ 0 - 8 = 8 ft. @ \$20.00 per ft. = \$ 160.00

Coring

✓ 8 - 250 = 242 ft. @ \$19.00 per ft. = \$ 4,598.00 \$ 6,245.50

Hole: RD-5/-60/BTW

Moving

✓ 28 man hrs. @ \$35.00 per hr. = \$ 980.00

Drilling Anchor

✓ 4 man hrs. @ \$35.00 per hr. = \$ 140.00  
 2 machine hrs. @ \$21.00 per hr. = \$ 42.00 \$ 182.00

Testing

2 man hrs. @ \$35.00 per hr. = \$ 70.00  
 ✓ 1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Casing

✓ 0 - 10 = 10 ft. @ \$20.00 per ft. = \$ 200.00

Coring

✓ 10 - 250 = 240 ft. @ \$19.00 per ft. = \$ 4,560.00 \$ 6,013.00





E. CARON DIAMOND DRILLING LTD.

7 Roundel Road Whitehorse. Yukon Y1A 3H3

Phone (403) 668-2424 FAX (403) 668-4520

Hole:RD-6/-60/BTW

Moving

✓ 18 man hrs. @ \$35.00 per hr. = \$ 630.00

Drilling Anchor

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00

1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Waterline

✓ 4 man hrs. @ \$35.00 per hr. = \$ 140.00

Casing

✓ 0 - 20 = 20 ft. @ \$20.00 per ft. = \$ 400.00

Coring

✓ 20 - 110 = 90 ft. @ \$19.00 per ft. = \$ 1,710.00 \$ 2,971.00

Items Consumed & Chargeable

✓ 7 - 10' BTW rods @ \$126.60 @ 50% = \$ 443.10

✓ 2 bags Quik-Gel @ \$15.00 each = \$ 30.00

✓ 2 pails rod grease @ 92.00 each = \$ 184.00

✓ 1 pail GS-550 @ \$252.00 each = \$ 252.00

\$ 909.10

Sub Total

\$55,598.60

G.S.T. 10155 7122RT @ 7%

\$ 3,891.90

Total Invoice

\$59,490.50 ✓

*2 x 90' = 180'*





June 30, 1996  
Invoice #3414  
Drill #260

IN ACCOUNT WITH

Expatriate Resources Ltd.,  
1016 - 510 West Hastings Street,  
Vancouver, B. C.  
V6B 1L8

Drilling Charges June 16 to 30, 1996: (Finlayson Lake)

Hole: RD96-6/-60/BTW

Waterline

✓ 8 man hrs. @ \$35.00 per hr. = \$ 280.00

Testing

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00  
1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Coring

✓ 110 - 600 = 490 ft. @ \$19.00 per ft. = \$ 9,310.00 \$ 9,681.00

Hole: SL96-01/-90/BTW

Moving

✓ 98 man hrs. @ \$35.00 per hr. = \$ 3,430.00

Drilling Stuck Rods

20 man hrs. @ \$35.00 per hr. = \$ 700.00  
✓ 10 machine hrs. @ \$21.00 per hr. = \$ 210.00 \$ 910.00

Waterline

✓ 38 man hrs. @ \$35.00 per hr. = \$ 1,330.00

Conditioning Hole

✓ 4 man hrs. @ \$35.00 per hr. = \$ 140.00  
2 machine hrs. @ \$21.00 per hr. = \$ 42.00 \$ 182.00

Testing

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00  
1 machine hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Casing

✓ 0 - 6 = 6 ft. @ \$20.00 per ft. = \$ 120.00

Coring

✓ 6 - 500 = 494 ft. @ \$19.00 per ft. = \$ 9,386.00 \$15,449.00

Hole: LS96-02/-50/BTW

Waterline

✓ 52 man hrs. @ \$35.00 per hr. = \$ 1,820.00

Conditioning Hole

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00  
1 man hr. @ \$21.00 per hr. = \$ 21.00 \$ 91.00

Standby

✓ 2 man hrs. @ \$35.00 per hr. = \$ 70.00

*Paul Jones 10/1/96*  
*#260*

