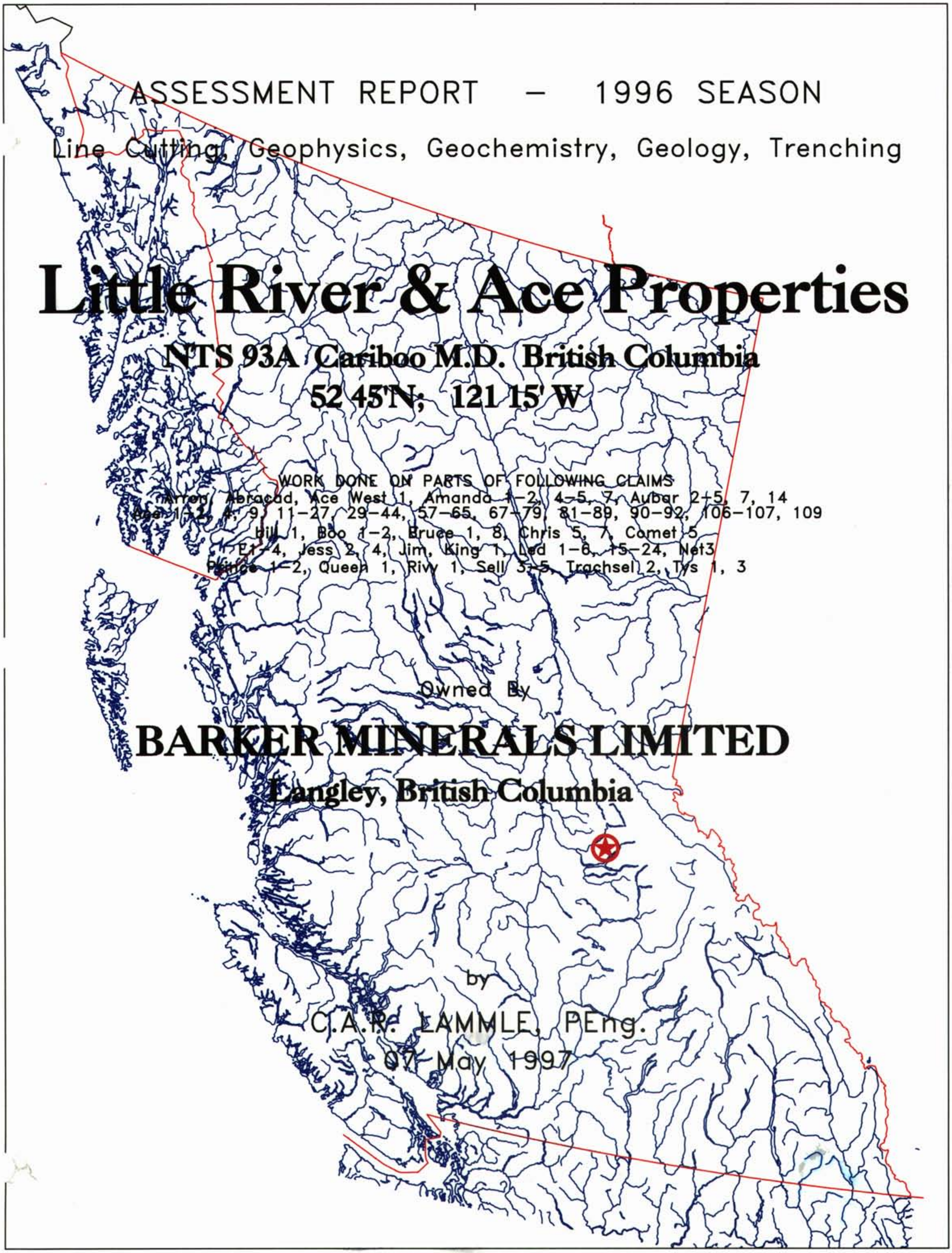

ASSESSMENT REPORT – 1996 SEASON

Line Cutting, Geophysics, Geochemistry, Geology, Trenching

Little River & Ace Properties

NTS 93A Cariboo M.D. British Columbia
52 45'N; 121 15' W

WORK DONE ON PARTS OF FOLLOWING CLAIMS
Arron, Abracad, Ace West 1, Amanda 1–2, 4–5, 7, Aubar 2–5, 7, 14
Ace 1–2, 4, 9, 11–27, 29–44, 57–65, 67–79, 81–89, 90–92, 106–107, 109
bill 1, Boo 1–2, Bruce 1, 8, Chris 5, 7, Comet 5
E1–4, Jess 2, 4, Jim, King 1, Led 1–6, 15–24, Net3
Prince 1–2, Queen 1, Rivy 1, Sell 3–5, Trachsel 2, Tys 1, 3

Owned By

BARKER MINERALS LIMITED
Langley, British Columbia

by

C.A.R. LAMMLE, PEng.

07 May 1997

Prospecting, Line Cutting, Geochemistry, Geophysics, Geology and Trenching

Little River & Ace Properties

Cariboo Mining Division, British Columbia

52° 45' N; 121° 15' W

Work done on all, or on parts of the following 2-Post and 4-Post Metric Claims:

Aaron; Abracad 1-2; Ace West 1; Amanda 1-2, 4-5, 7; Aubar 2-5, 7, 14;
Ace 1-2, 4, 9, 11-27, 29-44, 57-65, 81-89, 90-92, 106-107, 109;
Bill 1; Boo 1-2; Bruce 1-8; Chris 5, 7; Comet 5;
E 1-4; Jess 2, 4; Jim; King 1; Led 1-6, 15-24; Net3;
Prince 1-2; Queen 1, Rivy 1; Sell 3-5; Trachsel 2; Tys 1, 3.

owned by

Barker Minerals Limited

Langley, B.C.

by

C.A.R. Lammle, PEng.

07May1997

1996 PROGRAM

PETROGRAPHY

INDUCED POLARIZATION

SOILS - ACE GRID

MAG - ACE GRID

MAG - ACE WEST

SOILS - ROAD TRAVERSES

TRENCHES - EM CONDUCTORS

Prospecting, Line Cutting, Geochemistry, Geophysics, Geology and Trenching

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Prince 1-2; Queen 1, Rivy 1; Sell 3-5; Trachsel 2; Tys 1, 3.

owned by

Barker Minerals Limited

Langley, B.C.

by

C.A.R. Lammle, PEng.

07May1997

Summary

In the fall of 1993, Louis Doyle was hunting with friends, along new logging roads in the Little River Area northeast of Likely, and discovered some gold in the sand at the outlet of a culvert. Consequently, he decided to try his hand, for the first time, in the exploration business. He began by staking a couple of claims; the first two were called "Unlikely".

Since the hunting trip, three exploration seasons have now passed. In those three years, Doyle has made a huge effort. He founded Barker Minerals, learned a lot, found a large amount of money, and spent the large amount of money on the property. Much field work has been done, mainly prospecting at the start; then much detailed work - grid cutting, soil and float geochemistry, magnetics and VLF-EM, induced polarization, and even some relatively untested, still-experimental resistivity work.

What are the results of all this?

A) Doyle discovered a float train. Some of the boulders contain iron-rich sulphides resembling those in volcanogenic massive sulphides. Many yielded selected specimens that carried some gold, and small amounts of many other elements. Base metal content is low.

B) The float train lies along stratigraphy known as Downey Succession, which is the stratigraphy at the old mines near Wells and Barkerville. In this report, part of this succession is called "Downey carbonaceous metallotect".

C) The middle third (2.5km) of the float train parallels the stratigraphy between two late northeast-trending normal faults.

D) The northern margin of the float train envelope, along this middle third, has been shown to have slightly increased amounts of Pb, Zn, silica and magnetic minerals, and the area of these faint anomalous features is large enough to contain a deposit of strata-bound mineralization.

E) Two weeks of backhoe (Hitachi 200) work were done on the float train, mainly along roads. Strata exposed were iron- silica- and graphite-rich. Many samples from the trenches and from trench-rock were taken; a few had some interesting and encouraging geochemical amounts of gold.

F) Two other more exploration targets are suspected – along the two mentioned normal faults that divide the float train into thirds. These two faults are like those near Wells and Barkerville, which broke-up and dilated the favourable stratigraphy there, and prepared the ground for mineralization. Small but increased amounts of magnetic minerals appear to be associated with these faults, and some of the interesting rock geochemistry could be coming from them.

G) A very large number of peripheral claims have been staked, in response to speculation of the kind that occurred at Voisey's Bay. Some scattered reconnaissance road traverse work was done on portions of these claims.

Much work remains to be done to determine whether there are economic-sized concentrations of minerals underlying the float train. As the float train is the reason-for-being for everything else, it should be, and remain, the primary exploration target. It should be, and remain the focus for the 1997 exploration work now being anticipated.

Much preliminary work would be necessary to allow some initial, rudimentary appraisal of the speculative peripheral ground.

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INTRODUCTION

Preamble During 1996 Barker Minerals Limited, a private company with head office in Langley, B.C., continued exploring mineral claims located northeast of Likely, B.C., near Little River. During the first half of the year, a great deal of peripheral protective ground was added to the property with the object of offering it for option to potential joint venture partners. Preliminary exploration work was done during the season on widely separated parts of the new peripheral ground. Additional, more detailed work was also done on Doyle's Float Train, and on other parts of the original Ace Property. The work consisted of geology, geochemistry, geophysics and backhoe trenching, the geology being minimal because of sparse outcrop. Most of this was done by contractors; a small amount was done by employees; all was supervised by the company. The exploration work started early in the year (22Mar'96) when the crust on the snow was good for snowshoes, and ended at the time the snow returned in the fall (29Oct'96). The additional staking had started earlier in February.

The draftsman and author of this report was involved, but quite minimally, with the field program. The work was in the care of the Vice President of Explorations, an applied geochemist hired and promoted for the purpose, from the beginning of June. To give him a free hand, Lammle accordingly made only four brief trips to the property. The first was during the last days of an IP survey when no one else was there. The second was during a visit by provincial geologists. The last two related to trenching; once to help lay it out at the beginning, and once again at the end. Lammle is familiar with the property, however, having visited the property a number of times during the previous year, and having written up that seasons work for assessment report purposes.

This report describes the work done by the company and its contractors on the properties during 1996. It has been prepared for purposes of filing work on the claims, to advance their expiry dates. In this connection, a Statement of Expenditures is attached to the report. The author was not involved in any way with the accounting from which this Statement of Expenditures was derived. Accordingly, as the Statement of Expenditures in this report was prepared by the company, and inserted in the report by the company, the company in accepting this report, naturally accepts all responsibility for the accounting.

Background and Summary of Work Done While hunting with friends south of Little River (10Oct1993), about 34 km northeast of Likely, B.C., Louis Doyle noticed something yellow glistening in the water, at the outlet of a corrugated steel culvert along the "F" spur, a branch off Weldwood's "8400" logging road. Using a flat stone, he scooped up some of this cone of sand, wrapped it in saran-wrap, took it home along with a second similarly wrapped sample, and had some of it analyzed. The material he assayed at that time contained 129 g/t gold.

Although realizing that the sample had commingled partly with another he took earlier, (from 2km down the road) Doyle returned to the area at the end of October to stake two claims on what he thought was the probable source area. He named these Unlikely I and Unlikely II. Then early in November and needing assistance, he contacted a highly regarded Kamloops contractor with much staking and field-work experience. Barker Minerals Limited was subsequently founded.

Additional claims were staked during the 1994 season on the north-facing slope of Mount Barker. The first group was named Ace. In due course, the exploration program that followed came to be called by the same name as the mountain - Mount Barker, and in like manner, the property came to be called by the same name as the claims - Ace. In spite of much additional work – prospecting, reconnaissance geology, line cutting and soil geochemistry - during that summer, in a large area more or less centered on the discovery culvert, no additional gold of the kind found originally at that culvert has been found since. However, the search which had by then become a broad, organized prospecting program, began uncovering a many cobbles and boulders of glacially transported quartz, quartz-pyrite-pyrrhotite, and semi-massive iron-rich sulphide boulders, sometimes bearing small amounts of graphite, sometimes small amounts of tourmaline, and sometimes small amounts of sphalerite, chalcopyrite and galena. Some of the boulders, but not all, contained a little gold. A boulder train 8 km long, (8423km-8431km post) generally paralleling Weldwood's main haul "8400" Road, was eventually delimited, and this came to be called Doyle's Float Train, after the name of the son and father prospecting team. The 1994 program is described in BC Assessment Report 23733.

The 1995 season work resumed at the point where the previous seasons' work ended. It included additional prospecting, and more extensive line cutting, geochemistry, geophysics and geology. No mineralization of economic size and grade had yet been discovered in place. However, results were intriguing, and there was much interest and encouragement from expert geologists and mineral explorers who had looked at select pieces of float . That work is described in BC Assessment Report 24286.

Armed with that encouragement, the private investors continued to back the venture into 1996. At that point, Barker Minerals decided to stake some 2500 additional protective peripheral claim units, with intent to offer packages (20 or so packages) to potential "Eastern" joint venture partners, and to continue with the Ace Program as soon as the periphery was this well protected. To accomplish this, the company hired a person with 20 years federal government background in applied geochemistry to look after all of Barker Mineral's exploration work. The company duly appointed and gave him authority as Vice President, and turned direction of exploration over to him. His supervision work ebbed immediately and unfortunately ceased, appearing to have been distracted by a number of other agendas in other parts of the province. The then vice president's program was not as productive as it might have been! The seasons program suffered badly.

The rational for the selection of peripheral areas to be staked were the BCRGSS stream sediment geochemistry analyses that had been done jointly by the provincial and federal governments early in the 1980's, and made available as an Open File at that time. Thus, by the end of the year, Aurizon Mines Ltd. and L.E. Doyle shared title 50:50 in 7143 hectares of this protective peripheral ground, and L.E. Doyle separately held 100% in all of the remaining mineral claims (and in some placer claims). Also, during the year, Barker had undertaken some discussion and correspondence regarding joint venturing with others, but at time of writing, it is not known whether any agreement has been signed.

(In this report, the term "Little River Area", is used to denote the area of Barker Minerals peripheral mineral claims, ie., those generally between Cariboo River and North Arm of Quesnel Lake. The term "Ace" is used as before, to designate the original project area on the north-facing slopes of Barker Mtn.)

Objective Barkerville Terrane is the one of primary economic interest from the exploration point of view, and it is *the* target stratigraphy in the Little River Area for Barker Minerals to concentrate its exploration efforts on. More specifically, a portion of the Downey Succession, within the Barkerville Terrane, is the focus. This portion is thought of and referred to herein as the "Downey carbonaceous metallotect".

Much of the production form the Wells and Barkerville areas, and most of the other related properties with important mineral prospects are in the eastern or 'upper' third of Barkerville Terrane. One of the principal exploration guides formerly used in the former Cariboo mines was the contact between two formations - one was called Baker; the other Rainbow. This favourable stratigraphic contact was between beds containing carbonate, and beds containing carbonaceous quartzite and phyllite strata. The author believes this is the same horizon as the Downey carbonaceous metallotect. Furthermore, at the former mines, this contact area was of decided interest where it was broken by late stage, north- or northeast-trending, southeast dipping normal faults, which down-dropped, relatively, the block on the southeast.

It is fairly clear that the same structural scenario exists on the Ace Property, in proximity to Doyle's Float Train. The graphitic layers are there; the northeast-trending normal faults are there; there is some carbonate (or ankeritic) rock in the area; and what is more, there is good evidence in the float to suspect the existence of volcanogenic massive sulphides. Thus there are two different types of deposits to be conscious of – (1) gold-bearing quartz veins and perhaps pyritic replacement deposits in limestone, as at Wells and Barkerville, and (2) gold-bearing strata-bound massive sulphides, similar to that at Goldstream.

Although the float specimens found to date are iron-rich (pyrite and pyrrhotite), and base metal poor, the prospectors' selected samples chipped from these specimens, indicate that some (but not all) carry intriguing amounts of gold, and some likewise have interesting values in base metals. The gold, however, is the stimulus that justifies additional exploration work. Furthermore, it is believed that if there is a mineral deposit in the area, and if it is a viable one, it will be viable mainly because of gold. So the focus should be re-focused back to, and remain on gold, and on pathfinder, structural, and other geological elements that could lead to it.

The exploration priorities attached to the peripheral protective ground remain they were at the time of staking, as they were not advanced materially by the 1996 road-side work. Barker should continue its efforts to interest joint venture partners in specific blocks of this very large parcel of ground, as was the original intention. Assessment reports pertinent to this work are listed in the Bibliography, and have been available to the public for a long time.

Work Accomplished during 1996 Some of the work accomplished during the 1996 exploration season was commissioned by Barker to professional contractors. The work performed by these contractors has been written up and described by them. Barker submits their stand-alone reports as independent parts of its package of data. Lammle takes no responsibility (nor credit, as some might be due) for the quality or sufficiency of the other contractor's work. Specifically, this work is itemized immediately below:

- Reconnaissance geological road mapping by project geologist - Stephen Roach from Ottawa, (see separate stand-alone report – ***Roach, S.N., 05Feb'97, Geological Mapping Services, Goose Range Project Area, Cariboo Mining Division, B.C.)***

- An experimental "E-Scan" resistivity survey - Premier Geophysics of Vancouver, B.C., (see separate stand-alone report – ***Shore, G.A., 20Aug'96, Report on E-Scan 3D Resistivity Survey on the Kloo Grid, June-July'96.)***

Additional geophysical work was done during the year on the recommendations of Lammle. It consisted of a test IP Survey on the central part of Doyle's Float Train. It was done with the understanding that Barker Minerals would write up, draft and describe the work, and attach the logistical data supplied by the contractor to this report. This work consisted of:

- a test induced polarization survey - Scott Geophysics of Vancouver, B.C., it is attached in its entirety in Appendix II.

Further work was done on along roads on widely scattered parts of the peripheral protective ground. Arrangements were made by Barker from Kelowna for this work. Field work was done by MinConsult of Vernon, and Amex Exploration of Kamloops. When the field assignments of these two companies were over, Barker commissioned Lammle to draft and describe the work sufficiently for assessment report purposes. This additional work included the following:

- grid line; repairing after winter logging; and new lines: Amex Exploration Services, Kamloops, and Twin Mountain Enterprises, Whitehorse, YT.

- reconnaissance road-side soil geochemistry - MinConsult of Vernon, B.C.,

- additional soil sampling (600 samples) and ICP analyses on portions of the Ace Grid – staff, Barker Minerals Limited.

- additional Thin Section Petrography by John G. Payne, Ph.D.

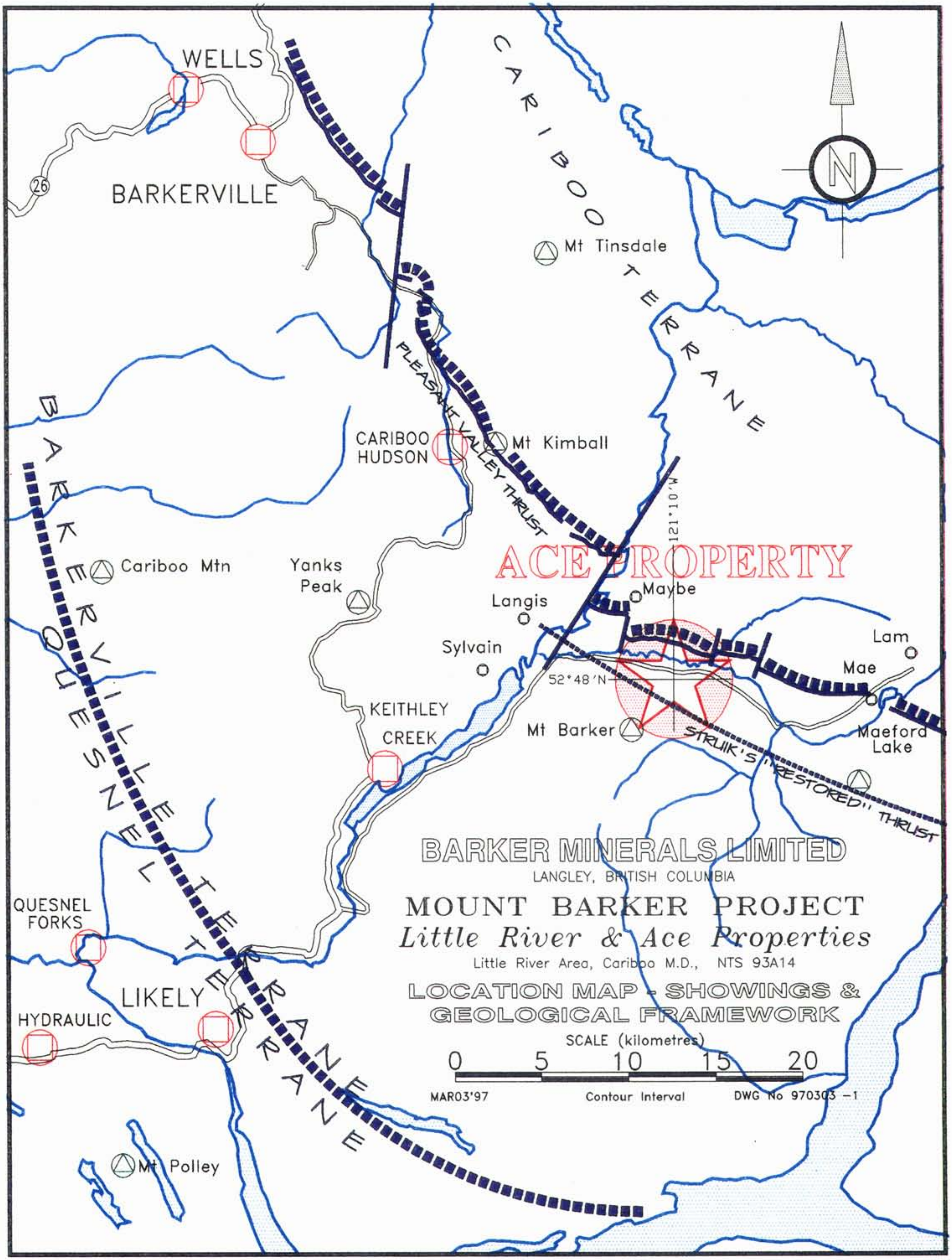
- additional magnetics/Cutler VLF-EM: three test grids and four widely scattered road-side traverses - Amex Exploration Services of Kamloops, B.C.,

- preliminary excavator/backhoe trenching – Rylant Construction, Princeton, B.C.

Work was done by Free Miners under Reclamation Permit MX-10-155. Pre-arranged government intra-office clerk authorization enabling acceptance of written descriptions made by Free Miners of their previously approved and previously authorized field programs, is given by Current Work Approval Number is PRG1997-1000921- 8003. Work Approval Number for 1995 was 1000921-7192; for 1996, 100092-7316. Free Miner's licenses were used in conjunction with signing a couple of relevant papers.

Location and Access The Little River Area is 95km northeast of Williams Lake which is the nearest supply center, or alternatively, 34km northeast of Likely, the nearest settlement, (see Dwg20 Dec95-1, Page 9). Williams Lake is an intermediate-sized city on Highway 97, on BCRailway, on major hydro-electric power, and with modern airport. The settlement of Likely, 65 air kilometres NE of Williams Lake (and a like distance SE of Quesnel), is scattered around at the outlet of Quesnel Lake. It has a grocery store, gas station, motel, restaurant and a few hundred residents. Highway 97 turnoff for Likely is at 150 Mile House, near Williams Lake. This small settlement is about one-half hour by gravel logging road from the Ace Property. Now however, some of the westernmost peripheral claims are only 10 air kilometres distant.

Weldwood has been actively logging fir, spruce and pine in the area, principally during winters. Outlines of existing and planned cutblocks in vicinity of the project area have been provided, very congenially, and are reproduced in part on some of the drawings attached.



WELLS
BARKERVILLE
26
CARIBOO TERRANE
Mt Tinsdale
PLEASANT VALLEY THRUST
CARIBOO HUDSON
Mt Kimball
121°10'W
ACE PROPERTY
BARKERVILLE TERRANE
QUESNEL TERRANE
Cariboo Mtn
Yanks Peak
Langis
Maybe
Sylvain
Lam
Mae
52°48'N
KEITHLEY CREEK
Mt Barker
Maeford Lake
STRUIK'S "RESTORED" THRUST
BARKER MINERALS LIMITED
LANGLEY, BRITISH COLUMBIA
MOUNT BARKER PROJECT
Little River & Ace Properties
Little River Area, Cariboo M.D., NTS 93A14
LOCATION MAP - SHOWINGS & GEOLOGICAL FRAMEWORK
SCALE (kilometres)
0 5 10 15 20
MAR03'97
Contour Interval
DWG No 970303 -1
QUESNEL FORKS
LIKELY
HYDRAULIC
Mt Polley

Property The Property consists of three parts: (1) the original Ace Property, (2) the Peripheral Protective Property, and (3) Placer Claims. The peripheral protective ground was staked on speculation, enthusiasm and exploration intrigue generated by the presence of Doyle's Float Train on the original ground; rational at the time was largely the published (early 1980's) government stream sediment data for NTS mapsheet. Regardless, the merit of the latter depends, appreciably and considerably, on the economic merit of the float train, and in the author's opinion, only minimally on the amounts of As and Sb in long-published stream sediment analyses.

Configuration of claims is shown on Page11. Almost all have been staked carefully and expertly, under A.A. Ablett's supervision, and with overlap to obviate fractions. Also, as a precaution to ensure some title (in case of competition at the time of original staking) areas close to certain of the government stream sediment sample sites, were staked doubly – one block of metric claims overstaking small blocks of two-post claims. These consisted of 38 units, usually small blocks of 4-two post claims; they are shown on the attached maps for the record. All of these small blocks of overstaked claims were officially "included", this spring, within the metric claim that overstaked it. This office procedure obviates the existence of those small blocks. For the record, these voided claims were named: Cari, Ball, Tuk, Top, Hardy and Chuk. It should be noted here that, at this point in time, the accuracy of the claim positions shown in this report, is the same as produce by the staker when positioning the claims on the government maps.

ACE As presently delimited, the Ace Property consists of 176 units, staked mainly by the two-post method. All are registered in Louis Doyle's name, and are held in trust by him for Barker Minerals Limited. They are listed and sorted by expiry date on the "Ace" spreadsheet attached below. These claims are shown on the attached blown up portion of the claim map (Dwg No 961106-01, Page 14), and elsewhere in this report, the claim configuration map is used as a base map to show the position of the work done.

PERIPHERAL Also, as presently delimited, the peripheral claims consist of 2590 units, staked mainly by the four-post (metric) method. They too are in Doyle's name, in trust for the company. They are listed and sorted by expiry date on the "Peripheral" spreadsheet attached below.

AURIZON Aurizon Mines Ltd owns 50% of the title to 323 units – the Aubar Claims. One of the blocks owned by Aurizon is situate west of Cariboo River, just north of Harvey's Creek, separated from the others by a wetland and wildlife preserve, and accordingly is not contiguous with the remainder of the claims. These Aubar claims, partly owned by Aurizon, are outlined in colour on the attached claim location map. (Page 11)

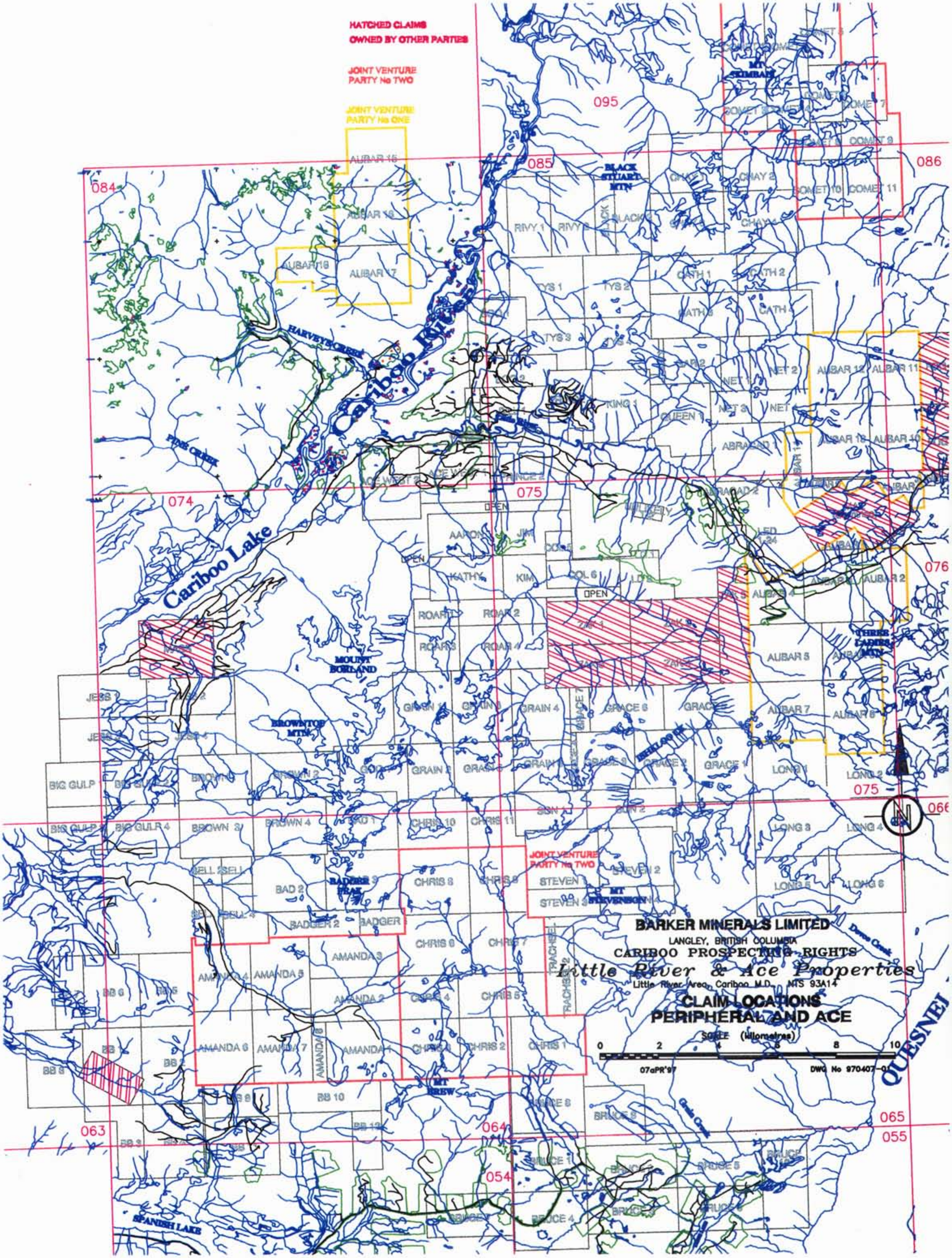
TINTINA Tintina Mines Limited is negotiating a 50% joint venture interest in 484 units – the Comet, Chris and Amanda Claims. They too are outlined in colour on the same attached claim location map.

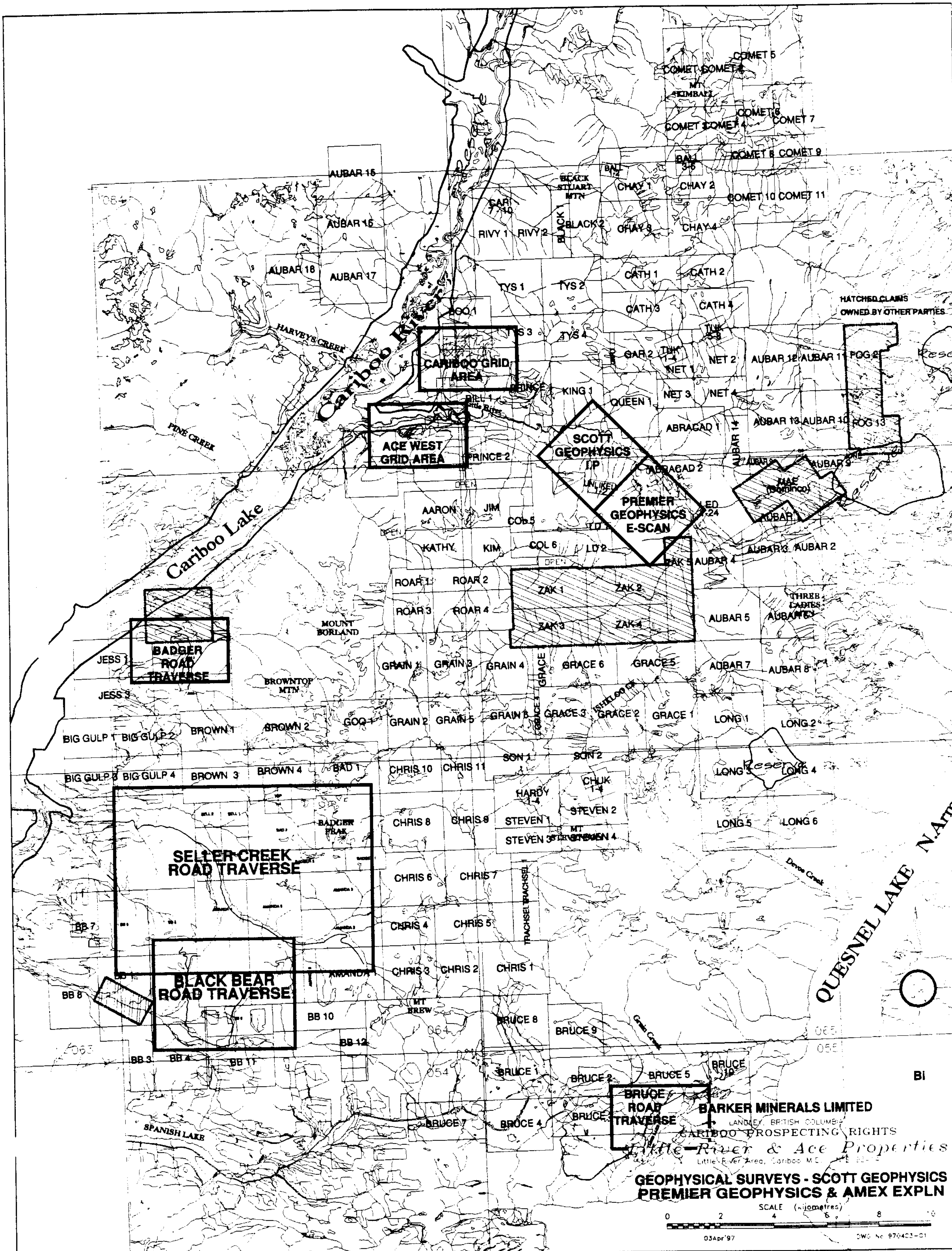
LOUIS DOYLE All of the remaining mineral claim and other interests are registered Louis Doyle's name, and held in trust by him for Barker Minerals Ltd.

PLACER The Placer ground consists of 15 placer units – named P3, P4, P6, Roar and Kloo. GSM-19 work on Ace West 1 & 2 has been used for assessment work on Roar 1-8 placer claims. All placer title is held in Louis Doyle's name, in trust for Barker Minerals Ltd. These are not shown on the attached maps, as they are not pertinent subject matter of this assessment report.

OTHER CLAIMS Several blocks of claims owned by other non-related parties are outlined in colour on this same map as well.

The configuration of all of these claims is shown (as per Mining Recorder's Maps) on the attached Dwg No 970407-01, and by a second 'inset-style map showing the detail of the two-post Ace Property. As


HATCHED CLAIMS
OWNED BY OTHER PARTIES
JOINT VENTURE
PARTY No TWO
JOINT VENTURE
PARTY No ONE
Cariboo Lake
Cariboo River
MOUNT
BORLAND
SPANISH LAKE
QUESNEL
BARKER MINERALS LIMITED
LANGLEY, BRITISH COLUMBIA
CARIBOO PROSPECTING RIGHTS
Little River & Ace Properties
Little River Area, Cariboo M.D. NTS 93A14
CLAIM LOCATIONS
PERIPHERAL AND ACE
SCALE (kilometres)
0 2 4 6 8 10
07aPR'97


BARKER MINERALS LIMITED
LANGLEY, BRITISH COLUMBIA
CARIBOO PROSPECTING RIGHTS
Little River & Ace Properties
Little River Area, Cariboo M.D.
GEOPHYSICAL SURVEYS - SCOTT GEOPHYSICS
PREMIER GEOPHYSICS & AMEX EXPLN
SCALE (kilometres)
0 2 4 6 8
03Apr'97
HATCHED CLAIMS OWNED BY OTHER PARTIES
CARIBOO GRID AREA
ACE WEST GRID AREA
SCOTT GEOPHYSICS I.P.
PREMIER GEOPHYSICS E-SCAN
BADGER ROAD TRAVERSE
SELLER CREEK ROAD TRAVERSE
BLACK BEAR ROAD TRAVERSE
BRUCE ROAD TRAVERSE
Cariboo River
Cariboo Lake
QUESNEL LAKE N.Arm
HARVEYS CREEK
PINE CREEK
SPANISH LAKE
MOUNT BORLAND
BROWNTOP MTN
BLACK STUART MTN
MT KIMBALL
BADGER PEAK
MT BREW
Devos Creek
Grain Creek
Bi
COMET 5
COMET 6
COMET 7
COMET 8
COMET 9
COMET 10
COMET 11
AUBAR 15
AUBAR 16
AUBAR 17
CHAY 1
CHAY 2
CHAY 3
CHAY 4
RIVY 1
RIVY 2
BLACK 1
BLACK 2
TYS 1
TYS 2
TYS 3
TYS 4
CATH 1
CATH 2
CATH 3
CATH 4
GAR 2
NET 1
NET 2
NET 3
NET 4
AUBAR 12
AUBAR 11
AUBAR 13
AUBAR 10
FOG 13
KING 1
QUEEN 1
PRINCE 2
ABRACAD 1
ABRACAD 2
AUBAR 14
AUBAR 9
AUBAR 1
AUBAR 2
AUBAR 3
AUBAR 4
AUBAR 5
AUBAR 7
AUBAR 8
AARON
JIM
KATHY
KIM
COL 5
COL 6
LD 2
ZAK 1
ZAK 2
ZAK 3
ZAK 4
ZAK 5
ROAR 1
ROAR 2
ROAR 3
ROAR 4
THREE LADIES
JESS 1
JESS 2
GRAIN 1
GRAIN 2
GRAIN 3
GRAIN 4
GRAIN 5
GRAIN 6
GRACE 1
GRACE 2
GRACE 3
GRACE 5
GRACE 6
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LONG 2
LONG 3
LONG 4
LONG 5
LONG 6
BIG GULP 1
BIG GULP 2
BIG GULP 3
BIG GULP 4
BROWN 1
BROWN 2
BROWN 3
BROWN 4
BAD 1
CHRIS 1
CHRIS 2
CHRIS 3
CHRIS 4
CHRIS 5
CHRIS 6
CHRIS 7
CHRIS 8
CHRIS 9
CHRIS 10
CHRIS 11
SON 1
SON 2
CHUK 1-4
HARDY 1-4
STEVEN 1
STEVEN 2
STEVEN 3
STEVEN 4
TRACHSEL
AMANDA 1
BB 3
BB 4
BB 6
BB 7
BB 10
BB 11
BB 12
BRUCE 1
BRUCE 2
BRUCE 4
BRUCE 5
BRUCE 7
BRUCE 8
BRUCE 9
BRUCE 10
OPEN

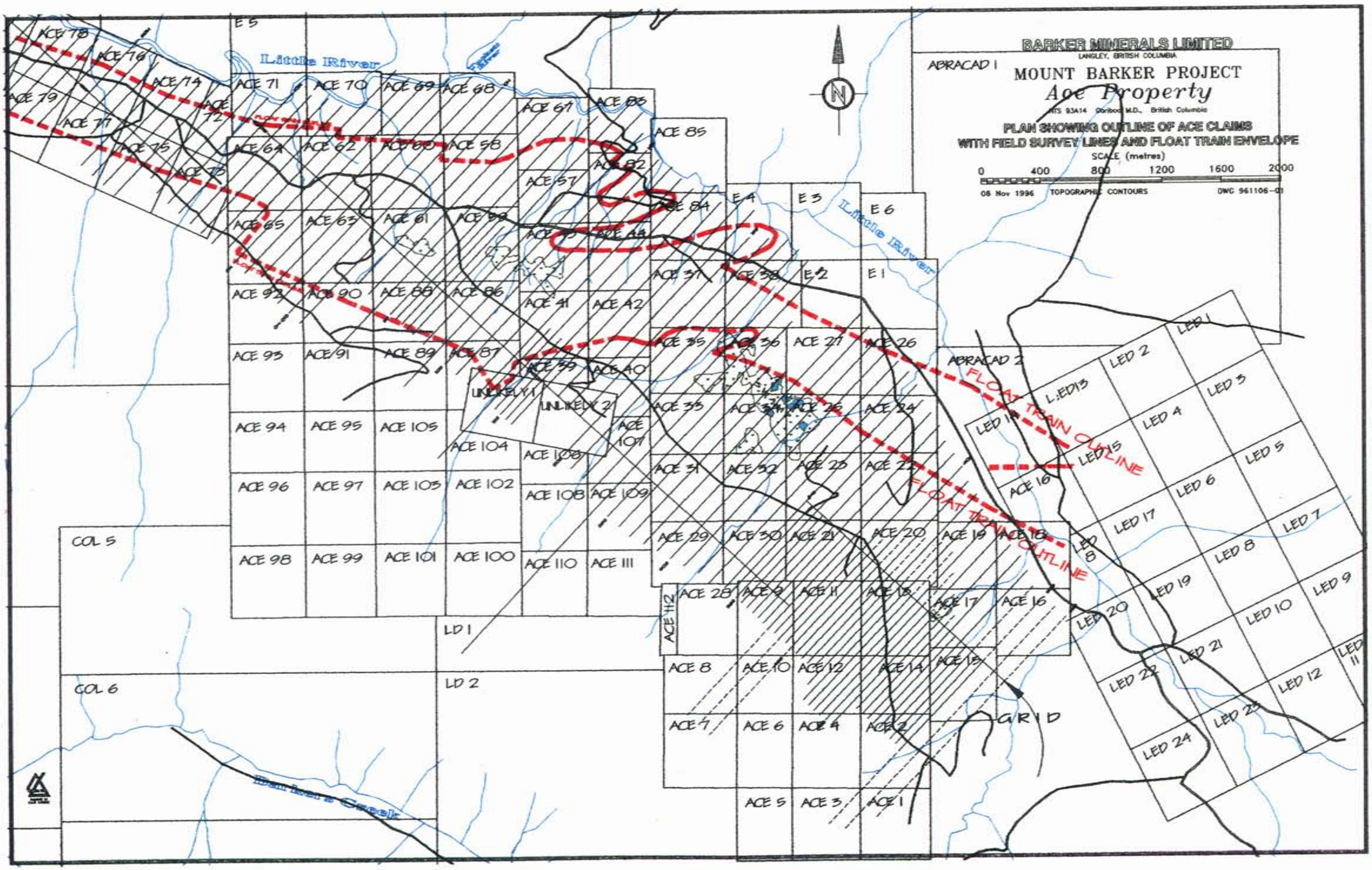
Sort2	Sort1

1997/04/07

CARIBOO MINERAL CLAIMS PERIPHERAL CLAIMS

CLAIM	STAKED	UNITS	TENURE	EXPIRY Y/M/D	PACKAGE	J.VENTURE
Cari 1	1996/02/12	1	343686	1997/02/12	CARIBOO	
Cari 2	1996/02/12	1	343687	1997/02/12	CARIBOO	
Cari 3	1996/02/12	1	343688	1997/02/12	CARIBOO	
Cari 4	1996/02/12	1	343689	1997/02/12	CARIBOO	
Cari 5	1996/02/12	1	343690	1997/02/12	CARIBOO	
Cari 6	1996/02/12	1	343691	1997/02/12	CARIBOO	
Cari 11	1996/02/14	1	343696	1997/02/12	CARIBOO	
Cari 12	1996/02/14	1	343697	1997/02/12	CARIBOO	
Ball 1	1996/02/13	1	343710	1997/02/13	KIMBALL	
Ball 2	1996/02/13	1	343711	1997/02/13	KIMBALL	
Ball 3	1996/02/13	1	343712	1997/02/13	KIMBALL	
Ball 4	1996/02/13	1	343713	1997/02/13	KIMBALL	
Ball 5	1996/02/13	1	343714	1997/02/13	KIMBALL	
Ball 6	1996/02/13	1	343715	1997/02/13	KIMBALL	
Cari 7	1996/02/14	1	343692	1997/02/14	BLACK STEWART	
Cari 8	1996/02/14	1	343693	1997/02/14	BLACK STEWART	
Cari 9	1996/02/14	1	343694	1997/02/14	BLACK STEWART	
Cari 10	1996/02/14	1	343695	1997/02/14	BLACK STEWART	
Tuk 1	1996/02/16	1	343699	1997/02/16	LITTLE RIVER	
Tuk 2	1996/02/16	1	343700	1997/02/16	LITTLE RIVER	
Tuk 3	1996/02/16	1	343701	1997/02/16	LITTLE RIVER	
Tuk 4	1996/02/16	1	343702	1997/02/16	LITTLE RIVER	
Tuk 5	1996/02/16	1	343703	1997/02/16	LITTLE RIVER	
Tuk 6	1996/02/16	1	343704	1997/02/16	LITTLE RIVER	
Tuk 7	1996/02/16	1	343705	1997/02/16	LITTLE RIVER	
Tuk 8	1996/02/16	1	343706	1997/02/16	LITTLE RIVER	
Top 1	1996/02/24	1	343855	1997/02/24	BADGER	
Top 2	1996/02/24	1	343856	1997/02/24	BADGER	
Top 3	1996/02/24	1	343857	1997/02/24	BADGER	
Top 4	1996/02/24	1	343858	1997/02/24	BADGER	
Hardy 1	1996/02/27	1	343847	1997/02/27	MT STEVENSON	
Hardy 2	1996/02/27	1	343848	1997/02/27	MT STEVENSON	
Hardy 3	1996/02/27	1	343849	1997/02/27	MT STEVENSON	
Hardy 4	1996/02/27	1	343850	1997/02/27	MT STEVENSON	
Chuk 1	1996/02/27	1	343851	1997/02/27	MT STEVENSON	
Chuk 2	1996/02/27	1	343852	1997/02/27	MT STEVENSON	
Chuk 3	1996/02/27	1	343853	1997/02/27	MT STEVENSON	
Chuk 4	1996/02/27	1	343854	1997/02/27	MT STEVENSON	
Comet 1	1996/06/07	18	347050	1997/06/07	COMET	TINTINA
Comet 2	1996/06/07	18	347051	1997/06/07	COMET	TINTINA
Comet 3	1996/06/07	9	347052	1997/06/07	COMET	TINTINA
Comet 4	1996/06/07	9	347053	1997/06/07	COMET	TINTINA
Comet 5	1996/06/08	15	347054	1997/06/08	COMET	TINTINA
Comet 6	1996/06/08	12	347055	1997/06/08	COMET	TINTINA
Comet 7	1996/06/08	12	347056	1997/06/08	COMET	TINTINA
Comet 8	1996/06/08	9	347057	1997/06/08	COMET	TINTINA
Comet 9	1996/06/09	12	347058	1997/06/09	COMET	TINTINA
Comet 10	1996/06/09	12	347059	1997/06/09	COMET	TINTINA
Comet 11	1996/06/09	12	347060	1997/06/09	COMET	TINTINA
Grace 3	1996/07/18	20	348643	1997/07/18	ISHKLOO	
LB 1	1996/07/28	?	348935	1997/07/28	NICOLA M.D.	
LB 2	1996/07/28	?	348936	1997/07/28	NICOLA M.D.	
LB 3	1996/07/28	?	348937	1997/07/30	NICOLA M.D.	
LB 4	1996/07/30	?	348938	1997/07/30	NICOLA M.D.	
LB 5	1996/07/30	?	348939	1997/07/30	NICOLA M.D.	
LB 6	1996/07/30	?	348940	1997/07/30	NICOLA M.D.	
LB 7	1996/07/30	?	348941	1997/07/30	NICOLA M.D.	
Chay 1	1996/02/13	20	343725	1998/02/13	KIMBALL	
Chay 2	1996/02/13	20	343726	1998/02/13	KIMBALL	
Chay 3	1996/02/13	20	343727	1998/02/13	KIMBALL	
Chay 4	1996/02/13	20	343728	1998/02/13	KIMBALL	
Cath 1	1996/02/14	18	343766	1998/02/14	KIMBALL	
Cath 2	1996/02/14	12	343767	1998/02/14	KIMBALL	
Cath 3	1996/02/14	18	343768	1998/02/14	KIMBALL	
Cath 4	1996/02/14	15	343769	1998/02/14	KIMBALL	
Rivy 1	1996/02/15	18	343735	1998/02/15	BLACK STEWART	
Rivy 2	1996/02/15	18	343736	1998/02/15	BLACK STEWART	
Tys 1	1996/02/15	20	343737	1998/02/15	BLACK STEWART	
Tys 2	1996/02/15	20	343738	1998/02/15	BLACK STEWART	
Tys 3	1996/02/15	20	343745	1998/02/15	BLACK STEWART	
Tys 4	1996/02/15	20	343746	1998/02/15	BLACK STEWART	
Net 1	1996/02/15	10	343751	1998/02/15	LITTLE RIVER	
Net 2	1996/02/15	20	343752	1998/02/15	LITTLE RIVER	
Net 3	1996/02/15	12	343753	1998/02/15	LITTLE RIVER	
Net 4	1996/02/15	12	343754	1998/02/15	LITTLE RIVER	
Black 1	1996/02/15	12	343757	1998/02/15	BLACK STEWART	
Black 2	1996/02/15	18	343758	1998/02/15	BLACK STEWART	
Gar 1	1996'02/16	5	343759	1998/02/16	LITTLE RIVER	
Gar 2	1996/02/16	20	343761	1998/02/16	LITTLE RIVER	
Brown 1	1996/02/24	15	343986	1998/02/24	BADGER	
Brown 2	1996/02/24	18	343987	1998/02/24	BADGER	
Brown 3	1996/02/24	20	343988	1998/02/24	BADGER	
Brown 4	1996/02/24	20	343989	1998/02/24	BADGER	
Sell 1	1996/02/25	6	343990	1998/02/25	BADGER	
Sell 2	1996/02/25	4	343991	1998/02/25	BADGER	
Sell 3	1996/02/25	8	343992	1998/02/25	BADGER	
Sell 4	1996/02/25	12	343993	1998/02/25	BADGER	
Bad 1	1996/02/25	20	344004	1998/02/25	BADGER	
Bad 2	1996/02/25	20	344005	1998/02/25	BADGER	
Bad 3	1996/02/26	20	344006	1998/02/26	BADGER	
Badger 1	1996/02/26	6	344007	1998/02/26	BADGER	
Badger 2	1996/02/26	14	344008	1998/02/26	BADGER	
Goo 1	1996/02/26	20	344015	1998/02/26	BADGER	
Steven 1	1996/02/27	20	344009	1998/02/27	MT STEVENSON	
Steven 2	1996/02/27	20	344010	1998/02/27	MT STEVENSON	
Steven 3	1996/02/27	10	344011	1998/02/27	MT STEVENSON	
Steven 4	1996/02/27	10	344012	1998/02/27	MT STEVENSON	
Son 1	1996/02/27	15	344013	1998/02/27	MT STEVENSON	
Son 2	1996/02/27	18	344014	1998/02/27	MT STEVENSON	
Roar 2	1995/04/20	12	335485	1998/04/20	ROARING	
Roar 3	1995/04/20	9	335486	1998/04/20	ROARING	
Roar 4	1995/04/20	18	335487	1998/04/20	ROARING	
Aubar 1	1996/04/25	8	345690	1998/04/25	THREE LADIES	AURIZON
Aubar 2	1996/04/25	15	345691	1998/04/25	THREE LADIES	AURIZON
Aubar 3	1996/04/25	20	345692	1998/04/25	THREE LADIES	AURIZON
Aubar 4	1996/04/25	20	345693	1998/04/25	THREE LADIES	AURIZON

Aubar 5	1996/04/26	20	345694	**1998/04/26**	THREE LADIES	***AURIZON***
Aubar 6	1996/04/26	16	345695	**1998/04/26**	THREE LADIES	***AURIZON***
Aubar 7	1996/04/26	20	345696	**1998/04/26**	THREE LADIES	***AURIZON***
Aubar 8	1996/04/26	20	345697	**1998/04/26**	THREE LADIES	***AURIZON***
Aubar 11	199604/26	20	345700	**1998/04/26**	MAEFORD	***AURIZON***
Aubar 12	199604/26	20	345701	**1998/04/26**	MAEFORD	***AURIZON***
Aubar 13	***199604/26***	***20***	***345702***	***1998/04/26***	***MAEFORD***	***AURIZON***
Aubar 14	199604/26	16	345703	**1998/04/26**	MAEFORD	***AURIZON***
Aubar 9	1996/04/27	16	345698	**1998/04/27**	MAEFORD	***AURIZON***
Aubar 10	1996/04/27	20	345699	**1998/04/27**	MAEFORD	***AURIZON***
Aubar 15	1996/04/30	20	345704	**1998/04/30**	THREE MILE	***AURIZON***
Aubar 16	1996/04/30	20	345705	**1998/04/30**	THREE MILE	***AURIZON***
Aubar 17	1996/04/30	20	345706	**1998/04/30**	THREE MILE	***AURIZON***
Aubar 18	1996/04/30	12	345707	**1998/04/30**	THREE MILE	***AURIZON***
Bruce 1	1996/05/09	20	346018	**1998/05/09**	TASSE	
Bruce 4	1996/05/09	20	346021	**1998/05/09**	TASSE	
Bruce 2	1996/05/11	18	346019	**1998/05/11**	TASSE	
Bruce 3	1996/05/11	18	346020	**1998/05/11**	TASSE	
Bruce 5	1996/05/22	18	346496	**1998/05/22**	TASSE	
Bruce 6	1996/05/23	18	346497	**1998/05/23**	TASSE	
Bruce 7	1996/05/24	18	346498	**1998/05/24**	TASSE	
Bruce 8	1996/05/24	20	346499	**1998/05/24**	TASSE	
Chris 1	1996/05/26	20	346686	**1998/05/26**	MOUNT BREW	**TINTINA**
Chris 2	1996/05/26	16	346687	**1998/05/26**	MOUNT BREW	**TINTINA**
Chris 3	1996/05/26	16	346688	**1998/05/26**	MOUNT BREW	**TINTINA**
Chris 4	1996/05/27	12	346689	**1998/05/27**	MOUNT BREW	**TINTINA**
Chris 5	1996/05/27	18	346690	**1998/05/27**	MOUNT BREW	**TINTINA**
Chris 6	1996/05/27	20	346691	**1998/05/27**	MOUNT BREW	**TINTINA**
Chris 7	1996/05/27	20	346692	**1998/05/27**	MOUNT BREW	**TINTINA**
Chris 8	1996/05/28	20	346693	**1998/05/28**	MOUNT BREW	**TINTINA**
Chris 9	1996/05/28	16	346694	**1998/05/28**	MOUNT BREW	**TINTINA**
Chris 10	1996/05/28	20	346695	**1998/05/28**	ROARING	**TINTINA**
Chris 11	1996/05/28	16	346696	**1998/05/28**	ROARING	**TINTINA**
Amanda 1	1996/06/05	20	347062	**1998/06/05**	SELLERS CREEK	**TINTINA**
Amanda 2	1996/06/05	18	347063	**1998/06/06**	SELLERS CREEK	**TINTINA**
Amanda 3	1996/06/05	18	347064	**1998/06/06**	SELLERS CREEK	**TINTINA**
Amanda 5	1996/06/06	20	347066	**1998/06/06**	SELLERS CREEK	**TINTINA**
Amanda 7	1996/06/06	20	347068	**1998/06/06**	SELLERS CREEK	**TINTINA**
Amanda 8	1996/06/06	4	347069	**1998/06/06**	SELLERS CREEK	**TINTINA**
Bruce 10	1996/06/06	18	347072	**1998/06/06**	TASSE	
Amanda 4	1996'06'11	20	347065	**1998/06/11**	SELLERS CREEK	**TINTINA**
Amanda 6	1996/06/11	20	347067	**1998/06/11**	SELLERS CREEK	**TINTINA**
Grain 1	1996/06/11	20	347222	**1998/06/11**	ROARING	
Grain 2	1996/06/11	16	347223	**1998/06/11**	ROARING	
Grain 3	1996/06/11	20	347224	**1998/06/11**	ROARING	
Grain 4	1996/06/11	20	347225	**1998/06/11**	ROARING	
Grain 5	1996/06/11	16	347226	**1998/06/11**	ROARING	
Grain 6	1996/06/11	16	347227	**1998/06/11**	ROARING	
B.B. 2	1996/06/13	20	347484	**1998/06/13**	BLACK BEAR	
B.B. 1	1996/06/14	20	347483	**1998/06/14**	BLACK BEAR	
B.B. 4	1996/06/14	20	347486	**1998/06/14**	BLACK BEAR	
Bruce 9	1996/06/15	16	347071	**1998/06/15**	TASSE	
B.B. 3	1996/06/16	20	347485	**1998/06/16**	BLACK BEAR	
B.B. 5	1996/06/16	20	347589	**1998/06/16**	BLACK BEAR	
B.B. 7	1996/06/17	10	347591	**1998/06/17**	BLACK BEAR	
B.B. 8	1996/06/19	20	347592	**1998/06/19**	BLACK BEAR	
B.B. 9	1996/06/19	10	347593	**1998/06/19**	SPANISH CREEK	
B.B. 11	1996/06/19	20	347595	**1998/06/19**	SPANISH CREEK	
B.B. 6	1996/06/20	20	347590	**1998/06/20**	BLACK BEAR	
B.B. 10	1996/06/21	14	347594	**1998/06/21**	SPANISH CREEK	
B.B. 12	1996/06/22	8	347596	**1998/06/22**	SPANISH CREEK	
Long 1	1996/06/26	20	347968	**1998/06/26**	WELCOME	
Long 2	1996/06/26	15	347969	**1998/06/26**	WELCOME	
Long 3	1996/07/14	20	348637	**1998/07/14**	WELCOME	
Long 4	1996/07/14	20	348638	**1998/07/14**	WELCOME	
Grace 2	1996/07/16	20	348642	**1998/07/16**	ISHKLOO	
Grace 5	1996/07/16	18	348645	**1998/07/16**	ISHKLOO	
Long 5	1996/07/18	20	348639	**1998/07/18**	WELCOME	
Long 6	1996/07/18	20	348640	**1998/07/18**	WELCOME	
Grace 1	1996/07/18	20	348641	**1998/07/18**	ISHKLOO	
Grace 4	1996/07/18	20	348644	**1998/07/18**	ISHKLOO	
Grace 6	1996/07/18	20	348646	**1998/07/18**	ISHKLOO	
Grace 7	1996/07/18	12	348647	**1998/07/18**	ISHKLOO	
BIG GULP 1	1996/09/08	12	351089	**1998/09/08**	FRANK CREEK	
BIG GULP 3	1996/09/06	12	351091	**1998/09/08**	FRANK CREEK	
TRACHSEL 1	1996/09/10	6	351087	**1998/09/10**	MOUNT BREW	**TINTINA**
TRACHSEL 2	1996/09/10	6	351088	**1998/09/10**	MOUNT BREW	**TINTINA**
Kathy	1995/02/12	15	334102	***1999/02/12***	MOUNT BARKER	
Aaron	1995/02/12	15	334106	***1999/02/12***	MOUNT BARKER	
Roar 1	1995/04/20	6	335484	***1999/04/20***	ROARING	
Jess 2	1996/06/23	18	347965	**1999/06/23**	FRANK CREEK	
Jess 4	1996/06/23	18	347967	**1999/06/23**	FRANK CREEK	
BIG GULP 2	1996/09/08	15	351090	**1999/09/08**	FRANK CREEK	
BIG GULP 4	1996/09/06	15	351092	**1999/09/08**	FRANK CREEK	
Boo 1	1996/02/15	16	343755	**2000/02/15**	CARIBOO	
Boo 2	1996/02/15	18	343756	**2000/02/15**	CARIBOO	
Jess 1	1996/06/25	18	347964	**2000/06/25**	FRANK CREEK	
Jess 3	1996/06/25	18	347966	**2000/06/25**	FRANK CREEK	
Jim	1995/02/12	15	334101	2001/02/12	MOUNT BARKER	
Kim	1995/02/12	15	334107	2001/02/12	MOUNT BARKER	
King 1	1995/04/23	20	335605	2001/04/23	CARIBOO	
Abracad 1	1995/02/12	20	335603	2002/04/22	LITTLE RIVER	
Qeen 1	1995/04/22	20	335606	2002/04/22	LITTLE RIVER	
Prince 1	1995/04/23	15	335601	2002/04/23	CARIBOO	
Charlie 1	1995/07/13	1	338228	2004/07/13	CARIBOO	
Charlie 2	1995/07/13	1	338229	2004/07/13	CARIBOO	
Charlie 3	1995/07/13	1	338230	2004/07/13	CARIBOO	
Charlie 4	1995/07/13	1	338231	2004/07/13	CARIBOO	
Charlie 5	1995/07/13	1	338232	2004/07/13	CARIBOO	
Bill 1	1995/07/14	20	338226	2005/07/14	CARIBOO	
Prince 2	1995/04/23	20	335602	2006/04/23	MOUNT BARKER	
Ace West 1	1995/05/26	20	336739	2006/05/26	MOUNT BARKER	
Ace West 2	1995/05/26	20	336740	2006/05/26	MOUNT BARKER	
	UNITS	**2590**				



BARKER MINERALS LIMITED
LANGLEY, BRITISH COLUMBIA
MOUNT BARKER PROJECT
Ace Property
NTS 93A14 Cariboo M.D., British Columbia
PLAN SHOWING OUTLINE OF ACE CLAIMS
WITH FIELD SURVEY LINES AND FLOAT TRAIN ENVELOPE
SCALE (metres)
0 400 800 1200 1600 2000
08 Nov 1996
TOPOGRAPHIC CONTOURS
DWG 961106-01
ABRACAD 1
ABRACAD 2
Little River
Barker Creek
FLOAT TRAIN OUTLINE
FLOAT TRAIN OUTLINE
GRID
COL 5
COL 6
LD 1
LD 2
UNLIKELY 1
UNLIKELY 2
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ACE 4
ACE 2
ACE 5
ACE 3
ACE 1

FOCUS *CARIBOO MINERAL CLAIMS* BARKER MINERALS LIMITED REVISED 97/03/18

CLAIM	STAKED	UNITS	TENURE	EXPIRY Y/M/D
E 1	1995/02/26	1	334284	2000/02/26
E 2	1995/02/26	1	334285	2000/02/26
E 3	1995/02/26	1	334286	2000/02/26
E 4	1995/02/26	1	334287	2000/02/26
E 6	1995/04/22	1	335600	2000/04/22
Ace 57	1994/09/18	1	331316	2000/09/18
Ace 82	1994/09/20	1	331335	2000/09/20
Ace 83	1994/09/20	1	331336	2000/09/20
Ace 84	1994/09/20	1	331337	2000/09/20
Ace 85	1994/09/20	1	331338	2000/09/20
Ace 94	1994/09/28	1	331509	2000/09/28
Ace 95	2000/09/27	1	331510	2000/09/28
Ace 96	2000/09/27	1	331511	2000/09/28
Ace 97	2000/09/27	1	331512	2000/09/28
Ace 98	2000/09/27	1	331513	2000/09/28
Ace 99	2000/09/27	1	331514	2000/09/28
Ace 100	2000/09/27	1	331515	2000/09/28
Ace 101	2000/09/27	1	331516	2000/09/28
Ace 102	2000/09/27	1	331517	2000/09/28
Ace 103	2000/09/27	1	331518	2000/09/28
Ace 104	2000/09/27	1	331519	2000/09/28
Ace 105	2000/09/27	1	331520	2000/09/28
Ace 106	1994/09/29	1	331521	2000/09/29
Ace 107	1994/09/29	1	331522	2000/09/29
Ace 108	1994/09/29	1	331523	2000/09/29
Ace 109	1994/09/29	1	331524	2000/09/29
Ace 110	1994/09/29	1	331525	2000/09/29
Ace 111	1994/09/29	1	331526	2000/09/29
Ace 112	1994/09/29	1	331527	2000/09/29
Led 1	1994/10/15	1	332104	2000/10/15
Led 2	1994/10/15	1	332105	2000/10/15
Led 3	1994/10/15	1	332106	2000/10/15
Led 4	1994/10/15	1	332107	2000/10/15
Led 5	1994/10/15	1	332108	2000/10/15
Led 6	1994/10/15	1	332109	2000/10/15
Led 7	1994/10/15	1	332110	2000/10/15
Led 8	1994/10/15	1	332111	2000/10/15
Led 9	1994/10/15	1	332112	2000/10/15
Led 10	1994/10/15	1	332113	2000/10/15
Led 11	1994/10/15	1	332114	2000/10/15
Led 12	1994/10/15	1	332115	2000/10/15
Led 13	1994/10/17	1	332116	2000/10/17
Led 14	1994/10/17	1	332117	2000/10/17
Led 15	1994/10/17	1	332118	2000/10/17
Led 16	1994/10/17	1	332119	2000/10/17
Led 17	1994/10/17	1	332120	2000/10/17
Led 18	1994/10/17	1	332121	2000/10/17
Led 19	1994/10/17	1	332122	2000/10/17
Led 20	1994/10/17	1	332123	2000/10/17
Led 21	1994/10/17	1	332124	2000/10/17
Led 22	1994/10/17	1	332125	2000/10/17
Led 23	1994/10/17	1	332126	2000/10/17
Led 24	1994/10/17	1	332127	2000/10/17
Unlikely I	1993/10/31	1	322616	2000/10/31
Unlikely II	1993/10/31	1	322617	2000/10/31
Ace 1	1993/11/07	1	322720	2000/11/07
Ace 2	1993/11/07	1	322721	2000/11/07
Ace 3	1993/11/07	1	322722	2000/11/07
Ace 4	1993/11/07	1	322723	2000/11/07
Ace 5	1993/11/07	1	322724	2000/11/07
Ace 6	1993/11/07	1	322725	2000/11/07
Ace 7	1993/11/07	1	322726	2000/11/07
Ace 8	1993/11/07	1	322727	2000/11/07
Ace 9	1993/11/07	1	322728	2000/11/07
Ace 10	1993/11/07	1	322729	2000/11/07
Ace 11	1993/11/07	1	322730	2000/11/07
Ace 12	1993/11/07	1	322731	2000/11/07
Ace 13	1993/11/07	1	322732	2000/11/07
Ace 14	1993/11/07	1	322733	2000/11/07
Ace 20	1993/12/04	1	323070	2000/12/04
Ace 21	1993/12/04	1	323071	2000/12/04
Ace 22	1993/12/04	1	323072	2000/12/04
Ace 23	1993/12/04	1	323073	2000/12/04
Ace 24	1993/12/04	1	323074	2000/12/04
Ace 25	1993/12/04	1	323075	2000/12/04
Ace 26	1993/12/04	1	323076	2000/12/04
Ace 27	1993/12/04	1	323077	2000/12/04
Ace 28	1993/12/04	1	323078	2000/12/04
Ace 29	1993/12/04	1	323079	2000/12/04

Ace 30	1993/12/04	1	323080	**2000/12/04**
Ace 15	1993/12/05	1	323065	**2000/12/05**
Ace 16	1993/12/05	1	323066	**2000/12/05**
Ace 17	1993/12/05	1	323067	**2000/12/05**
Ace 18	1993/12/05	1	323068	**2000/12/05**
Ace 19	1993/12/05	1	323069	**2000/12/05**
Ace 31	1993/12/05	1	323081	**2000/12/05**
Ace 32	1993/12/05	1	323082	**2000/12/05**
Ace 33	1993/12/05	1	323083	**2000/12/05**
Ace 34	1993/12/05	1	323084	**2000/12/05**
Ace 35	1993/12/05	1	323085	**2000/12/05**
Ace 36	1993/12/05	1	323086	**2000/12/05**
Ace 37	1993/12/05	1	323087	**2000/12/05**
Ace 38	1993/12/05	1	323088	**2000/12/05**
Ace 40	1993/12/05	1	323090	**2000/12/05**
Ace 42	1993/12/05	1	323092	**2000/12/05**
Ace 44	1993/12/05	1	323094	**2000/12/05**
Col 6	1995/02/12	10	334103	**2001/02/12**
Col 5	1995/02/12	10	334108	**2001/02/12**
E 5	1995/02/26	1	334288	**2001/02/26**
Abracad 2	1995/04/22	9	335604	**2001/04/22**
Ace 39	1993/12/05	1	323089	**2001/12/05**
Ace 41	1993/12/05	1	323091	**2001/12/05**
Ace 43	1993/12/05	1	323093	**2001/12/05**
LD 1	1995/02/12	6	334104	**2003/02/12**
LD 2	1995/02/12	12	334105	**2003/02/12**
Ace 58	1994/09/18	1	331317	**2005/09/18**
Ace 59	1994/09/18	1	331318	**2005/09/18**
Ace 60	1994/09/18	1	331319	**2005/09/18**
Ace 61	1994/09/18	1	331320	**2005/09/18**
Ace 62	1994/09/18	1	331321	**2005/09/18**
Ace 63	1994/09/18	1	331322	**2005/09/18**
Ace 64	1994/09/18	1	331323	**2005/09/18**
Ace 65	1994/09/18	1	331324	**2005/09/18**
Ace 70	1994/09/94	1	331325	**2005/09/19**
Ace 71	1994/09/94	1	331326	**2005/09/19**
Ace 72	1994/09/94	1	331327	**2005/09/19**
Ace 73	1994/09/94	1	331328	**2005/09/19**
Ace 74	1994/09/94	1	331329	**2005/09/19**
Ace 75	1994/09/94	1	331330	**2005/09/19**
Ace 76	1994/09/94	1	331331	**2005/09/19**
Ace 77	1994/09/94	1	331332	**2005/09/19**
Ace 78	1994/09/94	1	331333	**2005/09/19**
Ace 79	1994/09/94	1	331334	**2005/09/19**
Ace 86	1994/09/27	1	331501	**2005/09/27**
Ace 87	1994/09/27	1	331502	**2005/09/27**
Ace 88	1994/09/27	1	331503	**2005/09/27**
Ace 89	1994/09/27	1	331504	**2005/09/27**
Ace 90	1994/09/27	1	331505	**2005/09/27**
Ace 91	1994/09/27	1	331506	**2005/09/27**
Ace 92	1994/09/27	1	331507	**2005/09/27**
Ace 93	1994/09/27	1	331508	**2005/09/27**
Ace 67	1994/10/14	1	332097	**2005/10/14**
Ace 68	1994/10/14	1	332098	**2005/10/14**
Ace 69	1994/10/14	1	332099	**2005/10/14**
		176		

CARIBOO PLACER CLAIMS <u>BARKER MINERALS LIMITED</u>

P. CLAIM	*STAKED*	*UNITS*	*TENURE*	*EXPIRY Y/M/D*
P 1	1995/02/25	1	334278	1998/02/25
P 2	1995/02/25	1	334279	1998/02/25
P 5	1995/02/25	1	334289	1998/02/25
Oxbow 1	1995/07/12	1	338222	1998/07/12
Oxbow 2	1995/07/12	1	338223	1998/07/12
P 3	1995/02/25	1	334280	**1998/02/25**
P 4	1995/02/25	1	334281	**1998/02/25**
P 6	1995/02/25	1	334290	**1998/02/25**
Roar 1	1996/02/28	1	343996	**1998/02/28**
Roar 2	1996/02/28	1	343997	**1998/02/28**
Roar 3	1996/02/28	1	343998	**1998/02/28**
Roar 4	1996/02/28	1	343999	**1998/02/28**
Roar 5	1996/02/28	1	344000	**1998/02/28**
Roar 6	1996/02/28	1	344001	**1998/02/28**
Roar 7	1996/02/28	1	344002	**1998/02/28**
Roar 8	1996/02/28	1	344003	**1998/02/28**
Kloo 1	1994/07/06	1	328701	**1999/07/06**
Kloo 2	1994/07/06	1	328702	**1999/07/06**
Kloo 3	1994/07/06	1	328703	**1999/07/06**
Kloo 4	1994/07/06	1	328704	**1999/07/06**

Mines at Wells and Barkerville The former mines at Wells and Barkerville were in the same assemblage of rocks as that believed to underlie Doyles' Float Train. At the mines, the strata trend 045° and dip 45°NE, and are cut by north- to northeast-trending normal faults dipping 60°E. The zones of economically important quartz vein mineralization were near a contact between carbonate-bearing and graphite-bearing layers. The miners called these Baker and Rainbow Members, the ore being mainly in the Rainbow. The late normal faults, crossing strata of different competencies – brittle black quartzites and light coloured carbonates – caused dilatant zones which were then preferentially filled by quartz. Cleavage in the rocks was often parallel to bedding, resulting in interpretations of isoclinal folds. Two sets of quartz veins were mineralized – transverse veins striking 030°, and diagonal veins striking 070°. Two other sets of quartz veins were unmineralized. In places, ore was made by a high density (large number of veins in a given volume of rock) of short, discontinuous veins. Transverse veins with widths to 0.3m and lengths to 15m, were the most numerous. Diagonal veins occasionally attained lengths of 45m. Veins that made ore consisted of 15-25% pyrite, and to estimate grade, miners used a rule of thumb that 100% pyrite would yield 2oz/st Au. Pyrite from pyritized wall rock contained less gold. Other sulphides common in the mines were arsenopyrite, galena, sphalerite, cosalite (PbBiS), scheelite, galena bismuthinite and bismuthinite (BiS3). Free gold was found often associated with nests of cosalite. Ankeritic and sericite alteration accompanied the veins.

Also, mineralization of a second kind - replacement bodies of auriferous pyrite in carbonate rocks - was important, particularly in the Island Mountain Mine, north of Jack of Clubs Lake. It accounted for about one-third of the ore mined. The last replacement ore was found in 1944, in the lower part of the Baker member, within 30m of the underlying Rainbow member. Apparently the miners were following a quartz lead in brittle argillaceous quartzite; when the quartz lead terminated in ductile limestone, the mineralization changed to replacement of limestone by coarsely crystalline pyrite, in layers parallel to bedding, less than a metre in thickness. The complex structure in this mine is described in the literature as being a large drag fold, "N" shaped in cross section, but partly laid over on its side, towards the northeast. Also in places, persistent mineralization developed along the plunge of crests of folds.

Kootenay Terrane VMS Deposits Semi-massive to massive sulphide deposits are known to occur in Kootenay Terrane, and other similar terranes such as Yukon-Tanana and Nisling, and perhaps the Klondike Schists. Host rocks are usually multiply deformed and multiply metamorphosed assemblages of micaceous quartzite, phyllite, and schist usually with graphite, and usually with some marble and meta-volcanic rock.

The type of massive sulphide deposits that might be expected in these old metamorphosed sediments are conformable semi-massive to massive sulphide layers of three main kinds:

1) iron-rich and copper-bearing, associated with mafic volcanism
2) Pb-Zn-Cu, associated with felsic volcanism
3) Pb-Zn-Ba, associated with thin tuff horizons in deep marine basins.

The first kind is usually iron-rich and copper–bearing (pyrite, pyrrhotite, magnetite; chalcopyrite), sometimes with sphalerite, but rarely with significant galena. Host rocks are usually sediments, and often siltite, quartzite and carbonaceous schists near assemblages of mafic meta-volcanics (amphibolite). This kind of mineralization is described as Besshi-type, after a site in Japan. It is the kind that might be expected to be found in Barkerville sub-Terrane. Examples are Goldstream, Vine (in SE B.C.), and Granduc (NW of Stewart).

Other massive sulphide deposits are referred to as Kuroko-type and Sedex-type. The former are characterized by massive Pb-Zn-Cu in similar metamorphic host rocks, but are associated with felsic metavolcanics in the form of sub-volcanic domes. Kudz de Kayah and Wolverine in the Yukon are good examples.

The last kind are sedex deposits. These are Pb-Zn-Ba layers in marine-basin carbonaceous and pelitic strata. They are usually associated with thin felsic meta-tuff layers. Howards Pass, near the boundary of Yukon and NWT, is a good example.

Geography and Physiography The Little River Area is in the east central part of the province, between the eastern edge of Interior Plateau and the western foothills of Columbia Mountains. More specifically, this area is the central part of Quesnel Highland. Being an uplifted part of Interior Plateau, Quesnel Highland is an area of rounded mountains transitional between rolling plateaux to the west and rugged Cariboo Mountains to the east. In places, remnants of this uplifted plateau surface have survived erosion; good examples are found east, north and south-west of Maeford Lake, and particularly among the headwaters of Ishkloo Creek. Pleistocene and Recent ice that accumulated on these old elevated pleateau surfaces flowed away to the southwest (Cariboo River), west (Little River) and northwest (Quesnel Lake), carving "U" shaped valleys into the general level of Fraser Plateau, which is about 1000m. This pattern of glacially carved valleys indicates that a large former accumulation area for the glaciers existed in this part of Cariboo Mountains. Summits smoothed by this ice exceed elevations of 2000m. More recently, alternate freezing and thawing of cornice melt-water has scalloped steep-walled cirques, with tarns, into the north and northeast sides of the higher, smoothed mountains. Excellent topographic examples with this geomorphology are found in the Three Ladies - Welcome Mountain - Mount Stevenson area. Peaks further east in the Cariboo Mountains are higher still and much more rugged, rising to 2600m; some may have been nunataks that protruded through the continental ice sheet.

Rain in recent summer has been frequent and heavy; snow in winter, deep. Drainage is west via Cariboo, Little, and Quesnel Rivers to Fraser River, and then south to the sea. Quesnel Lake is the main scenic and topographic feature in the region. It is a long, forked, fjord-like, glacier-carved lake with outlet at 725m. It is one of the deepest lakes in the province.

The Last Sheet of Glacial Ice The last continental ice sheet melted and ablated 10,000 years ago. In reality, however, remnants of it still exist in the cold regions – Antarctic, Arctic, Greenland, etc., and some smaller remnants still cap the highest mountains, particularly those in Pacific Coast and Rocky Mountain ranges. Ice and snow filled the valleys, covered the plateaux, and inundated all but the highest peaks. It extended as far south as northern USA. It would retreat during periods of relatively warm weather, and advance during periods of relative cold.

Glacial moraine are sometimes prospected for mineralized float, and once found, the float train on the surface of the glacier can often be traced to the source. The Granduc Mine was discovered by following ice-eroded ore along a marginal moraine, up-ice, to the source alongside a valley glacier. The technique can also be used where the ice has been gone for a long time, but with much more difficulty because of the soil cover now, and forest floor. Study of aerial photos and maps can be used to establish the positions of former ice sheets, and the pattern of merging valley glaciers that flowed from them. In places the trail may lead up-ice through progressively smaller tributary valleys.

The Doyle Float Train was probably deposited by ice from a large sheet that accumulated at the headwaters of Ishkloo drainage basin, and which flowed and merged from several valleys, eventually filling Little River Valley. At the time, a larger valley glacier probably filled Cariboo River valley, stopping off the exit there to Little River Ice. The distance such float has been transported is difficult to establish.

The last glacial stage that affected Quesnel Highland was called Fraser Glaciation. Having begun some 30,000 years ago, this ice age finally wasted away 10000 years ago. Remnants of the last sheets of glacial ice remain among as small alpine ice fields, high among the more shaded peaks of Cariboo Mountains. At the lower elevations however, this last ice had bulldozed the erosional debris left by the preceding ice advance, almost completely destroying that older stratigraphic record. The glacial debris now left over is a chaotic mixed assemblage of unsorted till, moraine and drift, with lenses of gravel and sand that had been rough sorted by meltwater and rivers, and with beds of silt and mud that had been stratified by settlement in ice dammed lakes. The debris uniformly covers the bedrock valleys below 1700m, smoothing and contouring the landscape. Although almost all of the ice is now gone, the landform caused by it – "U" shaped valleys, ice-sculpted drumlins, moraine terraces, glacier and river benches, etc. - can be clearly distinguished in many places.

In other places in the Cariboo district and also at Little River, there is a blue clay, either above bedrock or on it. It is distinctive clay – hard, compact, and semi-rigid. It is believed to have formed by erosional processes that affected the drift left by the second-from-last ice advance (the one prior to Fraser Glaciation), and to have been compacted by the weight of the last ice. It acts as a false bedrock. In the well known placer-gold areas of the Cariboo, large amounts of gold were recovered from gravels resting on it, and in places it was penetrated by the miners to richer pay streaks on real bedrock below. When encountered during trenching, gravel fines on the surface of blue clay should be sampled and panned, and if the trenching penetrates to bedrock, the gravel fines on bedrock should likewise be sampled and panned. Heavy mineral concentrates, perhaps some base metal minerals, and suites of other heavy rock-forming minerals from the gold pan, or from more elaborate gravity separations, might yield useful clues, or incentives, for prospecting back to their sources.

Some small flows and pyroclastic breccia deposits of distinctive olivine basalt are of interest locally in the Quesnel Lake – Clearwater Lake area, because of their relationships to the last ice. This basalt is found in several places, including the top of a mountain near the former Boss Mountain Molybdenum Mine. At Quesnel Lake, Tasse Lake, and at the headwaters of Devoe Creek, the flows and breccias have been shown, by relationships to features from former glaciers, to have formed when the last ice was wasting away.

GEOLOGY

General Geology General district geology has been professionally described by L.C. Struik and by others. (see Bibliography) Struik spent many of his summers since 1980 in the Cariboo, studying the sediments. He sums up his work in 1988 with his well documented GSC Memoir 421. Some of his tables and figures have been copied and attached to this report for convenience, and the interested reader is referred further to his fine regional maps. (He has recommended, because of inconsistencies and duplicity in strata names that has evolved over the decades, that the existing names for units within the terranes be abandoned.)

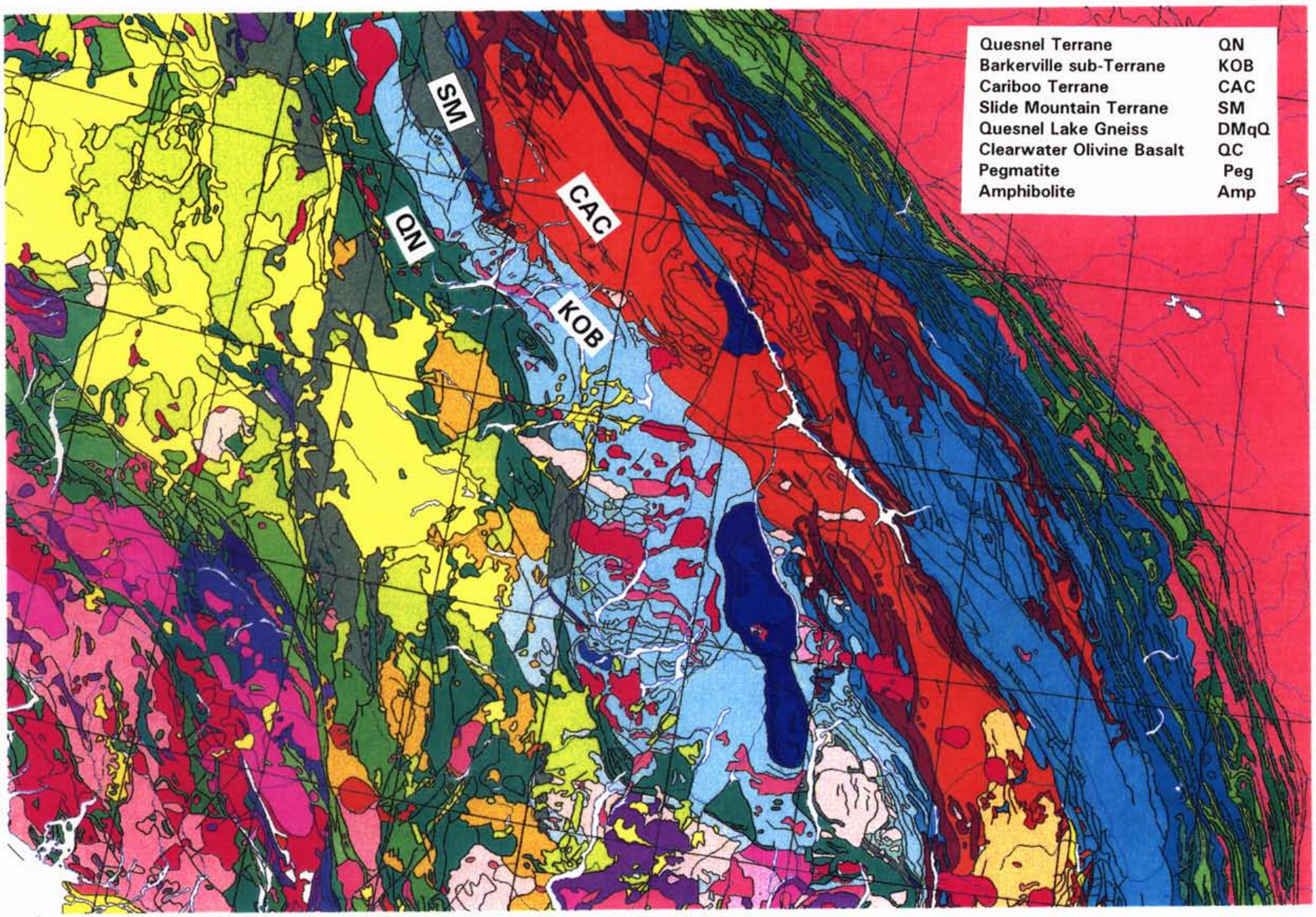
In general, the detritus that eroded from the west-central part of the then passive western margin of North America, during the late Proterozoic and early Paleozoic, accumulated in the ocean, as layers of sediment along the shore. It consisted mainly of mud and clay, quartz silt and quartz sand. Occasionally there were reefs of shell and coral, and other remains of the organisms that created the shell and coral. Some of these organisms adsorbed heavy metal ions out of the sea. Over geological time, the mud and organic remains, being very fine in size, winnowed out and were carried in suspension long distances from shore before settling out. The silt and sand were harder and coarser, being siliceous, and were carried progressively shorter distances by higher-energy flowing water. Carbonate layers formed reefs, close to the edge of the continent. Submarine volcanism may have occurred, showering the sediments with local layers of breccia and ash, and perhaps, at greater distances, fine laminated layers of siliceous dust, at times with sulphides. Some geologists familiar with continental correlations, infer some right lateral rifting, close to the edge of the continent at about this time.

What was happening then in the ocean off the western edge of North America, then was similar to what is happening now in the northern part of Gulf of Mexico, off the southern edge of North America. Here, deep deposits of mud are forming offshore, and they are being buried periodically by other layers of silt and sand. From time to time, these offshore sediments slump sea-ward, causing turbidity currents; the larger slump events being accompanied by growth faults. With time, the weight of overlying sediments cause compaction and other related phenomena - dewatering, diagenesis, deformation, lithification, salt doming, metamorphism, etc. A long belt of sediment, prism-shaped in cross section, on the edges of the continents is the result.

Since deposition these strata have undergone changes – by de-watering; by metamorphism caused by of pressures and temperatures related to depth of burial; by deformation caused by compression related to plate tectonic collision; and lastly by changes caused by extensional tectonics related to uplift. Metallic ions adsorbed by organisms at the time, and later concentrated in sea-bottom carbonaceous layers, could have been concentrated, again and again over geological time, by dewatering or remobilizing processes. These might now be potential targets for mineral exploration.

Terranes Large assemblages of rock with common environments of formations, and other common genetic characteristics, are referred to as "terranes". All of the terranes pertinent to Barker Minerals' Little River Area, are composed of marine sediments that originated as material that progressively eroded from the continent and that were progressively transported west for submarine deposition on shelf and slope, adjacent to the continent. They consist of siliceous sandy clastics (or arenite), carbonaceous muddy pelite, and carbonate. Needless to say, this deposition was slow, and it persisted for a very long period of geological time. Accordingly, this thick succession of marine sediments now occupies the space between North American craton on the east, and the allochthonous and accreted volcanic terrane, known as Quesnellia, on the west. (See Page 21, Part of GSC Map 1712A, after Wheeler & McFeely)

Pertinent terranes are discussed below, generally and briefly:



PORTION OF MAP GSC 1712A

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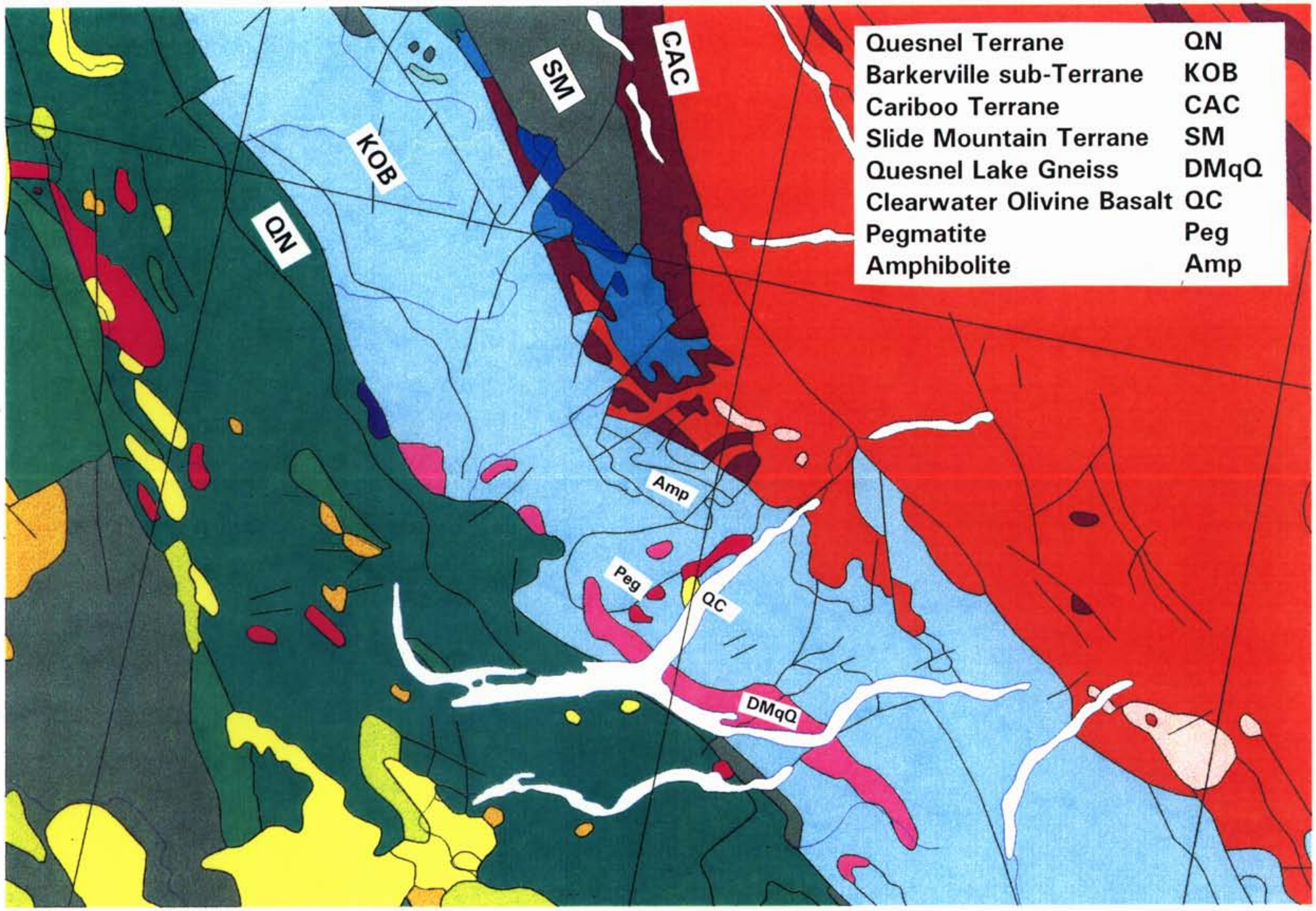
1997 04 06

CENTERED ON KOOTENAY TERRANE & BARKERVILLE sub-TERRANE

PORTION GSC MAP 1712A

Scale 1: 772 884



1: 772,884

PORTION OF MAP GSC 1712A

CENTERED ON BARKERVILLE SUB-TERRANE AT ACE CLAIMS

Barkerville Terrane Little River Area is mainly underlain by marine strata of Barkerville Terrane. It is the stratigraphic group of economic interest throughout the Cariboo, particularly the eastern one-third of the sequence (ie., the upper third of the strata if they are right side up, but since stratigraphic tops is not known with certainty, the eastern-third). (See Page 22, also after GSC Map 1712A)

Stratigraphic units in this terrane are the same as the ones in the former "Snowshoe Group". Earlier geologists had used the term "Cariboo Series". The group as a whole and many of its current fourteen subdivisions resemble Horsethief Creek Group, better known further to the southeast; and resembles also the Eagle Bay Formation, better known further to the southeast as well because of massive sulphide deposits near Adams Lake. In the early 1970's, the 'upper' or eastern portion of Barkerville Terrane was regarded as Hadrynian and renamed "Kaza Group".

Struik's nomenclature is adopted in this report.

Barkerville Terrane (750Ma) is similar to Kootenay Terrane in character and suspected origin, and is categorized by GSC as a subdivision of the Kootenay. In this large part of western North America, the sedimentary layers formed under circumstances similar to those described in the above generalized, continent erosion scenario. Layers of impure sand, silt, mud and some ash became sandstone siltsone, shale, limestone and tuff; then metamorphosed to impure quartzite, siltite, ankeritic dolomite, pelite and amphibolite, perhaps by then with dykes and sills of meta-diorite. The entire package was subsequently deformed by an intense tectonism that caused complex folding and overturning, and which at times caused stratigraphic layers to fold isoclinally back upon themselves. The result is the existing assemblage of co-mingled marine sedimentary layers with variable phyllitic, schisty, augen, graphitic, slickensided, and mylonitic fabrics that are quite difficult to unravel and interpret, geologically. Some imply suspect that the terrane itself is suspect, implying that they think that its location may have shifted (or rifted) a little, relative to the continent.

It can be concluded that the terrane is not well understood. As a consequence of the relatively poor general understanding, the whole sequence has been categorized, or dumped, into a very broad range of ages – from late Proterozoic to mid-Paleozoic, and understandably, the assemblage undergoes re-categorization every few decades, with most new passing studies.

Barkerville Terrane hosts the mid-Devonian Quesnel Lake Gneiss (350Ma) – a coarse grained leucocratic biotite granite with megacrysts of potassium feldspar. It is an old intrusion, both concordant with and perpendicular to layering, but in general parallel with the eastern border of Intermontane Belt. It is up to 30km long and 3km wide, and was affected by the regional metamorphism and deformation. Literature indicates four mappable phases – hornblende gneiss, feldspar gneiss, amphibolite gneiss and garnetiferous syenite gneiss. Contact relationship with Barkerville rocks are controversial.

Barkerville Terrane likewise hosts some folded, sill-like masses of 'meta diorite' or perhaps gneissic meta-diorite (400Ma), up to 300m thick, which may or may not be properly called amphibolite. It also contains some post-metamorphic anatectic pegmatite (86Ma), particularly in the high-grade metamorphic aureole, northwest of the North Arm of Quesnel Lake.

A copy of Struik's table of formations for the Barkerville Terrane (and also for the Cariboo) is attached for reference on Page 24. Some of his figures are also attached on pages 26, 27 & 30, for easy reference.

Cariboo Terrane A large northeastern portion of Little River Area is underlain by marine peri-cratonic sedimentary strata, collectively known as Cariboo Terrane. With respect to broad age-range category, it is similar to Barkerville Terrane. But with respect to rock types it differs, being comprised mainly of limestone and dolomite with smaller amounts of siliceous clastic sediments. Non-the-less, geologists reason the two terranes could be the same, the Cariboo merely being a nearer-shore, shallow

AFTER STRUIK, L.C., 1986 G.S.C.
CAN. J. EARTH SCI.
V. 23, 1986

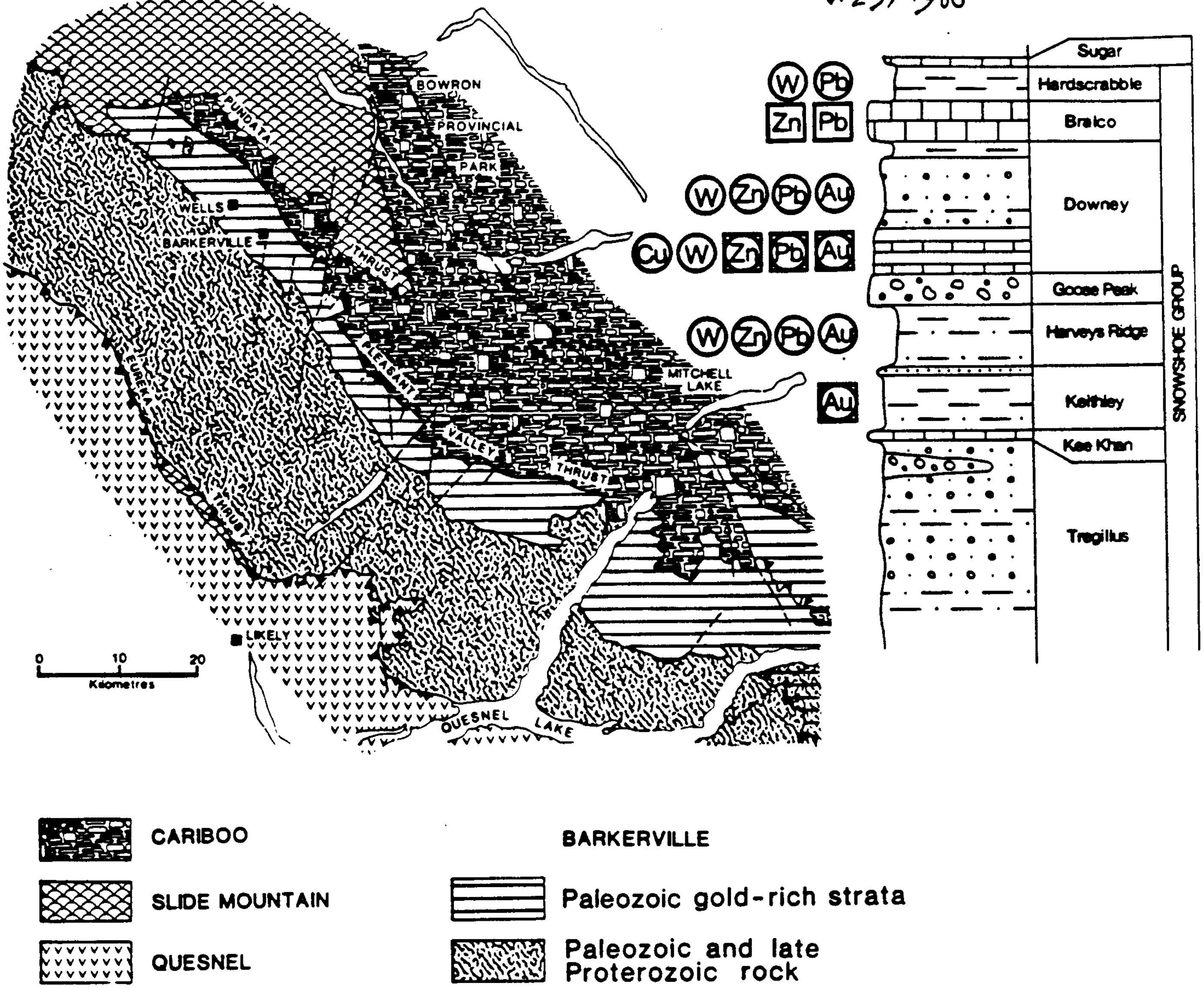


FIG. 11. The stratigraphic column shows the relationship of mineral occurrences to stratigraphic units in Barkerville terrane. The map shows the distribution of the unit with the bulk of the occurrences. The squares represent replacement deposits, and the circles represent vein deposits of the following elements: Au, gold; Pb, lead; Zn, zinc; W, tungsten; Cu, copper. Silver coexists with gold and lead.

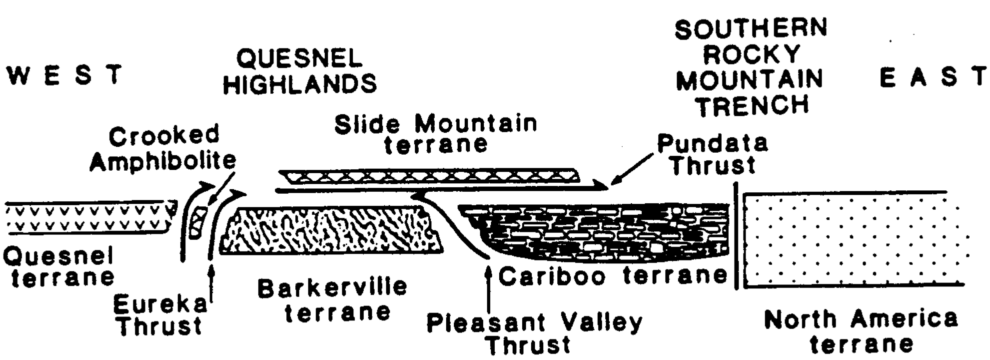


FIG. 3. A diagrammatic structure section showing the relationship between the four terranes of Cariboo gold belt and their bounding faults.

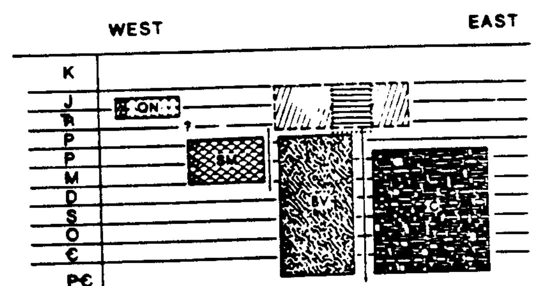


FIG. 4. The age of the rocks of the four terranes is shown by the position in the Late Precambrian to Cretaceous time scale. The age range of the thrusting of Cariboo onto Barkerville terrane is indicated by the box with horizontal lines. The age range of thrusting of Slide Mountain terrane onto Barkerville and Cariboo terranes is shown by the box with the diagonal lines. The age of thrusting of Quesnel terrane onto Barkerville is constrained to the Middle Jurassic to Late Cretaceous. Terranes: QN, Quesnel; SM, Slide Mountain; BV, Barkerville; C, Cariboo.

(200m) facies, within the same erosion-deposition system. If so, the two might well be of the same genetic regime. At least, the location relative to the continent, and the range in age - late Proterozoic to Triassic - is about the same, but rifting is not suspected, as mentioned previously regarding the Barkerville.

A reverse fault known as the Pleasant Valley Thrust, has been interpreted to account for the contact relationships between the above two major packages of strata. This fault dips NE at moderate to steep angles. The northeast (Cariboo) side has been thrust from the east, up and over the southwest (Barkerville) side, and in so doing brings older strata on top of younger. GSC Map 1712A depicts the Pleasant Valley Thrust as being over 100km long, bringing the two terranes together for this distance. A strike length of 15km of this thrust crosses Barker Mineral's Little River properties. There is some technical controversy regarding the Pleasant Valley Thrust. The specific location of it in the field is the main difficulty. Its position is quite clear on district and regional maps, but as Getsinger points out, inspite of the marked differences between the two terranes, the fault is difficult to identify in the field. This leads to the possibility that much of the movement attributed to this thrust may have occurred elsewhere than at the contact between the two terranes. On Ace Group, some of the movement may have occurred in carbonaceous siliceous mylonite exposed in the river canyon, and some of the movement may have occurred in mylonitized, slickensided, iron sulphide-rich graphitic strata right along the general line of Doyle's Float Train.

Some of the lower carbonate layers of the Cariboo Terrane are enriched in zinc and lead. BC Assessment Reports indicate preliminary exploration on Pb-Zn targets has been carried out for a couple of decades along these strata. Areas of former exploration extend at least 22km, from near the head of the North Arm of Quesnel Lake, via Maeford Lake to Maybe Prospect (now renamed Cariboo). Additionally, quartz-barite veins with associated Pb-Zn enrichment in carbonate strata has been explored at Black Stuart Mtn. No economic mineralization has been found yet; perhaps the best is at the Cariboo Prospect (formerly called Maybe, and now renamed by Barker) where some 400,000 tonnes grading 4% combined Pb-Zn was inferred by Gibraltar Mines from preliminary exploration drilling. Cominco still holds its' Maeford Lake Zn-Pb claims.

Cariboo Terrane is host to the Jura/Cretaceous Little River Stock. It is a medium grained granodiorite grading to quartz monzonite. A normal fault along its southwest side (Getsinger's Little River Fault) dips east and extends southeasterly to Limestone Point, on the west side of the North Arm. It intersects with, and from the literature appears to become confused with the Pleasant Valley Thrust. It moves chlorite-biotite grade layers of Cariboo Terrane back eastwards, to rest now on staurolite-kyanite grade layers of Barkerville Terrane.

As mentioned, a copy of Struik's table of formations for the Cariboo Terrane is attached for reference on Pages 26 and 27.

Quesnel Terrane A small southwestern portion of Little River Area is underlain by the late Triassic to early Jurassic allochthonous (transported), Quesnel Terrane. It is partly submarine and partly sub-aerial, and is made up of volcanic rock, volcaniclastic rocks, minor carbonate lenses and related sediments, and comagmatic intrusives. It hosts a number of important mineral deposits, mainly Cu and Cu-Au, such as Highland Valley, Craigmont, Copper Mountain, QR and Mt. Polley. Interestingly, the Bullion Pit from which impressive amounts of placer gold were produced by hydraulic monitoring, is just on the west side of the boundary between Barkerville and Quesnel Terranes.

As the term allochthonous implies, this terrane was involved in plate tectonic collision with the continent. Part was subducted, part obducted; and now, being firmly accreted to North America, drifts along with the continent.

Also, the suture zone (the Eureka Thrust Fault) which marks the boundary between Quesnellia and Barkerville Terrane is used to mark the boundary between the Intermontain and Omineca physiographic belts.

Table 1. Table of formations for the Cariboo Terrane.

PALEOZOIC	PENNSYLVANIAN		(0-8 m)	*Grey crinoidal, fusulinid limestone*
			Disconformity	
	MIDDLE PENNSYLVANIAN		*ALEX ALLAN FORMATION (0-5 m)*	*Dark grey micritic limestone, minor slate*
			Disconformity	
	LOWER MISSISSIPPIAN	BLACK STUART GROUP	*GREENBERRY FORMATION (0-30 m)*	*Grey crinoidal limestone*
			Conformity	
	LOWER MISSISSIPPIAN AND UPPER DEVONIAN		*GUYET FORMATION (0-300 m)*	*Conglomerate, orthoquartzite, greywacke*
			Disconformity?	
	MIDDLE DEVONIAN OR UPPER DEVONIAN		*WAVERLY FORMATION (0-50 m)*	*Agglomerate, pyroclastic, pillow basalt, minor chloritic siltstone*
			Interdigitating contact	
	MISSISSIPPIAN OR YOUNGER		*Sandstone unit (0?-50 m)*	*Olive grey micaceous and white quartzite, black and pink chert*
			Conformity	
	DEVONIAN AND (?) YOUNGER		*Black pelite unit (300-400 m)*	*Dark grey and black slate, phyllite, argillite, siltite, dolostone and limestone*
			Conformity?	
	LOWER DEVONIAN AND UPPER SILURIAN		*Chert-carbonate unit (0-60 m)*	*Mottled chert breccia, grey dolostone breccia, light grey dolostone chert*
			Disconformity?	
	UPPER ORDOVICIAN		*Black pelite unit (0-50 m?)*	*Dark grey slate and minor siltstone*
			Unconformity	
	LOWER TO (?) UPPER CAMBRIAN	CARIBOO GROUP	*DOME CREEK FORMATION (0-50 m)*	*Dark grey slate, shale and minor grey limestone*
			Conformity	
	LOWER CAMBRIAN		*MURAL FORMATION (50-500 m)*	*Grey limestone, dolostone, fine marble*
			Conformity	
PALEOZOIC AND PROTEROZOIC	LOWER CAMBRIAN AND HADRYNIAN		*MIDAS FORMATION (40-250 m)*	*Grey shale, slate, phyllite and micaceous quartzite, dark grey siltite*
			Conformity	
			YANKS PEAK FORMATION (0-290 m)	*Dark grey to white quartzite, minor shale and granule quartzite*
			Gradational contact	
PROTEROZOIC	HADRYNIAN (WINDERMERE)		*YANKEE BELLE FORMATION (170-1000 m)*	*Green-grey micaceous quartzite, siltite, grey-green shale, slate and phyllite, limestone and sandy limestone*
			Gradational contact	
			CUNNINGHAM FORMATION (400-650 m)	*Limestone, dolostone, fine grained marble*
			Gradational contact	
			ISAAC FORMATION (0-1200 m)	*Dark grey to black phyllite, slate, limestone and minor calcareous sandstone*
			Gradational contact	
	HADRYNIAN	KAZA GROUP	*BASE NOT EXPOSED*	*Micaceous poorly sorted feldspathic quartzite, grey-green and grey phyllite, limestone*

GSC

Table 14. Table of formations for the Barkerville Terrane

PALEOZOIC	LOWER PERMIAN		*SUGAR limestone (0-10 m)*	*Grey crinoidal limestone*
				Unconformable on Hardscrabble Mountain, not in contact with Island Mountain
	UPPER PALEOZOIC	SNOWSHOE GROUP	*ISLAND MOUNTAIN AMPHIBOLITE (< 150 m)*	*Amphibolite, tuff and siliceous mylonite*
				Fault contact on Eaglesnest; not in contact with Hardscrabble Mountain
			HARDSCRABBLE MOUNTAIN (≤ 150 m?)	*Black siltite, argillite and muddy granule conglomerate*
			Unconformity?	
	PALEOZOIC		*BRALCO (< 100 m)*	*Grey limestone, locally pelletal, commonly marble, includes undifferentiated phyllite*
				Conformable with Downey; not in contact with Eaglesnest
			EAGLESNEST (≥ 150 m)	*Grey and olive micaceous feldspathic poorly sorted quartzite and phyllite*
			Lateral equivalents?	
			DOWNEY (≥ 150 m)	*Olive-grey micaceous feldspathic poorly sorted quartzite and phyllite, marble, metabasaltic volcaniclastics*
			Conformity	
			AGNES (< 60 m)	*Light grey conglomerate in part with calcareous matrix*
			Lateral equivalents	
			GOOSE PEAK (< 250 m)	*Light grey poorly sorted quartzite, phyllite, minor black siltite*
			Conformity?	
			HARVEYS RIDGE (≤ 300 m)	*Black micaceous poorly sorted quartzite, siltite and phyllite; minor muddy conglomerate, limestone and basaltic metavolcaniclastics*
			Unconformity?	
PRECAMBRIAN	HADRYNIAN		*KEITHLEY (≤ 300 m)*	*Light grey quartzite; olive micaceous poorly sorted quartzite, siltite and phyllite*
			Conformity?	
			KEE KHAN (≤ 75 m)	*Marble, olive phyllite, sandy marble*
			Conformity	
			TREGILLUS (> 400 m)	*Olive-grey micaceous poorly sorted feldspathic quartzite and phyllite, conglomerate*
			Lateral equivalents?	
			RAMOS (> 300 m)	*Olive micaceous poorly sorted feldspathic quartzite and phyllite, black siltite and phyllite, amphibolite, marble, minor basaltic and felsic volcaniclastics*
			Not in contact	
	HADRYNIAN OR PALEOZOIC		*TOM (≥ 175 m)*	*Olive-grey micaceous poorly sorted feldspathic quartzite, phyllite and schist; quartzose mylonite*

The thickness of units is approximate and may vary substantially from the given estimates.

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AFTER STRUIK, L.C. GSC

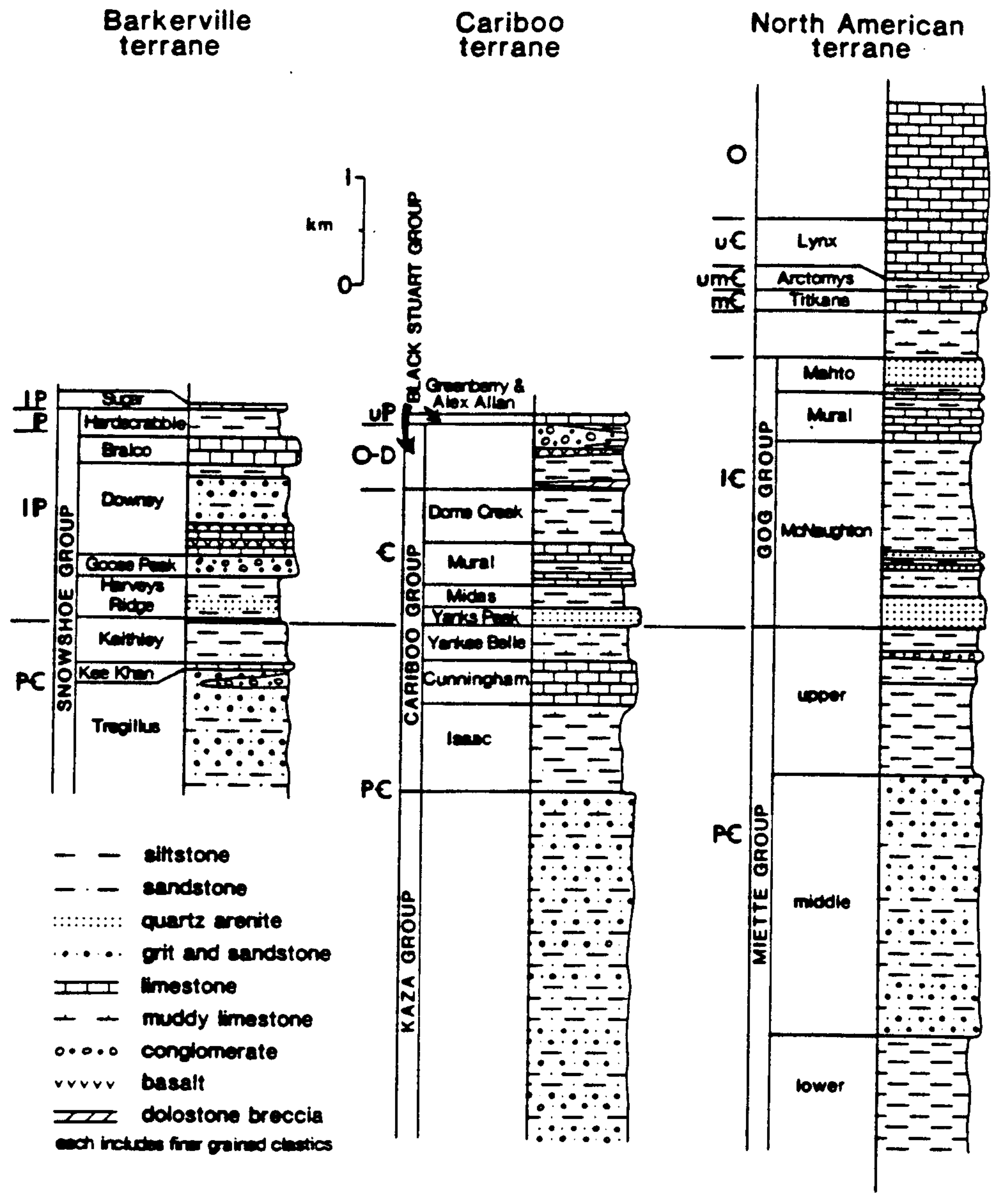


FIG. 8. Generalized stratigraphy of Barkerville, Cariboo, and North American terranes. The stratigraphy of North American terrane is fron R. B. Campbell *et al.* (1973).

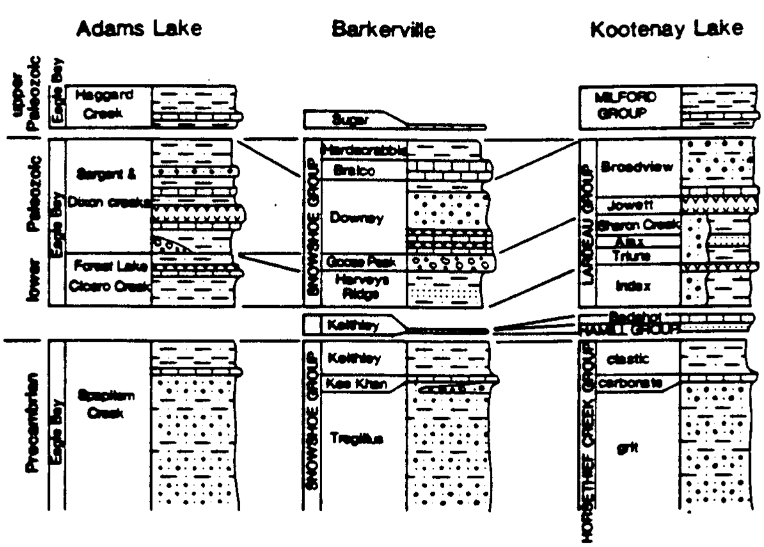


FIG. 10. Diagrammatic stratigraphic columns from Adams Lake, Barkerville, and Kootenay Lake areas to show suggested correlation between them.

Slide Mountain Terrane Rocks of Slide Mountain Terrane underlie a very small part of Little River Area. Like Quesnellia, portions of these strata were partly obducted, and partly subducted during collision of the continent with island arcs. They are exposed mainly to the east of Wells and Barkerville, (and elsewhere in BC) as the upper plate of the generally flat Pundata Thrust Fault, but where it crosses southwest Little River Area, it is depicted as being near vertical. Small slices of these strata are believed to lie along with, and parallel to the Eureka Thrust. In these slices they are mainly basic volcanics and alpine-type ultra-mafics. Rock types are marine volcanics and sediments – chert, grit, argillite, basalt and mafic intrusions. Age is Devonian to late Triassic. Regional correlations indicate part of the assemblage could be Quesnellia's basement. (See Page 30, after Struik)

Metamophic Core Complex Some distance to the southeast, the Kootenay Terrane (and thus Barkerville Terrane) overlies exposures of the Monashee metamorphic core complex. This complex is exposed as a large uplifted mass of high grade metamorphic rocks that formed under high temperatures and pressures – paragneiss, quartzite and marble. The assemblage of metamorphic minerals in these rocks have been used as geological temperature and pressure guages. Some of the same minerals have been made artificially, and thus allow estimates of the depths of burial that these strata must have endured to enable natural growth of these minerals. Since the rocks are now exposed at surface, they must have been uplifted, and the necessity of this uplift leads to further interpretations that the strata overlying the core complex, rifted apart during the uplift, and slid off the core complex as large rafts. The surface on which the sliding occurred is referred to as a detachment fault. The theory is that some of the overlying strata slid off to the southwest, and some to the northeast, and while doing so, endured severe dynamic metamophism, deformation, crumpling over-turning, etc. Because of this, some of Barkerville strata may be over turned or upside down, with the younger strata on the bottom, and regardless it is known to be very complexly deformed.

The orientation of Pleasant Valley Thrust is such that it could once have been associated with detachment of overlying blocks off upper portions of a core complex. However, the sense of movement of the overlying Cariboo strata is westward - wrong from the point of view of tectonic sliding, and hence if associated, the thrust fault might better relate to the uplift itself. Regardless, most of Little River Area is affected by an unexposed portion of this metamorphic core complex. The main area affected is that between the Ace Claims and the North Arm of Quesnel Lake. Here a well defined metamorphic aureole on the northwest side of the Arm, is defined by rock mineralogy. Metamophic grade on the opposite, southeast side of the lake is biotite grade. This indicates a large west-side-up displacement along a fault paralleling the North Arm of the lake. Regional geologists reason that a northeast trending fault, with relative uplift of the block on the northwest side, (orientation and offset similar to faults near Wells) have elevated the stratigraphic assemblage to reveal the pattern of metamorphic facies. Getsinger, making allowance for the temperature and pressure differences - 200°C and 2kb - speculates the throw on this to be as much as 6km.)

These characterizing minerals decrease in metamorphic grade with distance northwesterly from the North Arm. Near the lake they are mainly sillimanite; then progressively further northwest staurolite-kyanite, then almandine garnet, then biotite, and then eventually chlorite. The garnet isograd runs northerly across Ace Group. The biotite isograd is further to the northwest, by about 30 km. Formerly productive areas around Wells and Barkerville were in the low grade metamorphic rocks of the greenschist facies characterized by chlorite. Most of Barker Minerals Little River Area that is underlain by Barkerville Terrane, is of biotite- or higher-grade metamorphic facies – that is to say, most of the Little River Area is underlain by rocks that have endured higher temperatures and pressures than those near Wells and Barkerville. One would presume that these differences in temperatures and pressures would have caused differences in textures and compositions of any ore minerals that might have been present. Indeed those more extreme conditions may have caused such ore minerals, if they existed, to remobilize and to migrate to different locations. Age of both deformation and metamorphism is regarded as mid-Jurassic – which was the time of plate tectonic collision of the westward drifting North American plate with a group of island arcs.

LOCAL GEOLOGY

The Ace Property, and much of Barker's Little River Area, is underlain by Barkerville Terrane which, excepting its easternmost layers, is believed to be late Proterozoic. It is overthrust from the east by older Cariboo Terrane, and in plate tectonic collision contact with Slide Mountain and Quesnel Terranes on the west.

Easternmost Barkerville strata, ie., those forming the footwall of the Pleasant Valley Thrust, are massive to thin bedded light-coloured, coarsely crystalline white calcite marble. It is known as Bralco Marble and is believed to be Paleozoic. Near Cominco's Mae mineral claims it is up to 500m thick, forming light grey to buff weathering cliffs. Locally it contains siliceous dolomite and radiating needles of white tremolite. Layering is discontinuous and lens-like, being marked by faint grey wisps and streaks. Truncation of some bedding features indicates some transposition of layers along those bedding planes. Getsinger indicates the Bralco has a sharp conformable contact with 'underlying' arenites and pelites, but conflictingly, mentions that Bralco rocks have gentle dips, and that the underlying clastic ones have steeper dips. Some regional geologists indicate that the direction in which the beds become younger cannot be determined, keeping open the possibility that some parts may be overturned.

Hanging wall of the Pleasant Valley Thrust is made up of strata that are older than those in the footwall, and that differ with distance southeast along the fault. In other words the Pleasant Valley Fault has sliced obliquely through the stratigraphy. In fact, a large southwestern portion of Cariboo Terrane is greatly and variously imbricated and offset by many more compression faults, and many tension faults as well. To the northwest beyond Cariboo River, the hanging wall is mainly dark siltstone and quartzite, with minor shale and argillite - the Hadrynian Midas Formation. Nearer the river and near the northern parts of Ace Group, hanging wall layers are thin bedded, green and grey argillite and shale with minor quartzite, phyllite and limestone – the Hadrynian Yankee Belle Formation. Further to the southeast towards Maeford Lake, grey limestone of the Cunningham Formation, and other similar undifferentiated beds, form the immediate upper plate of the thrust fault.

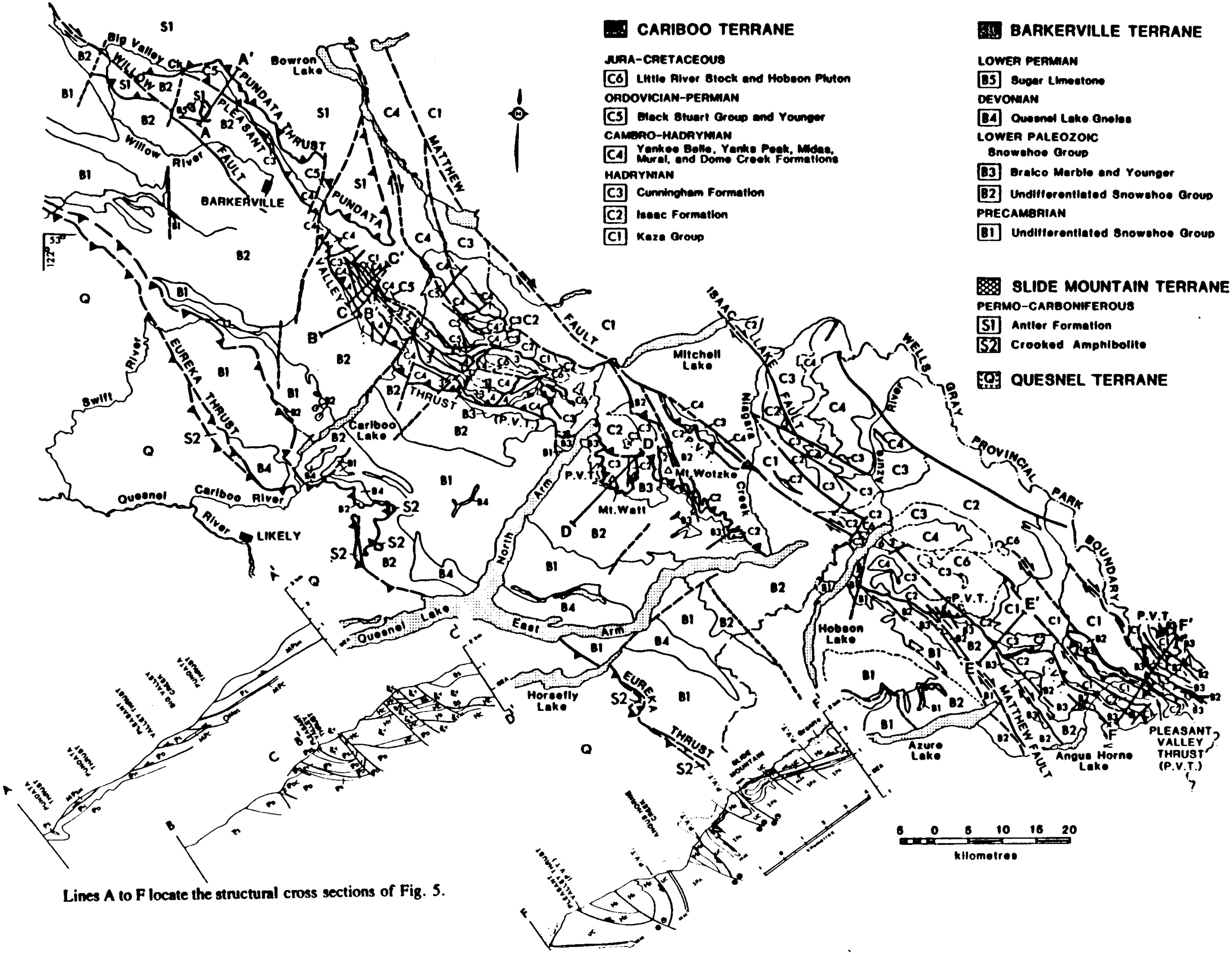
The structure separating Barkerville Terrane from Slide Mountain and Quesnel Terranes is known as Eureka Thrust. Slide Mountain rock sequences appear to have been mostly obducted on to Barkerville along this structure, while Quesnel sequences appear to have been subducted. Only thin fault slices of Slide Mountain rocks occur on Barker's Little River area properties in the area northeast of Spanish Lake. In this area they can be expected to be mainly sheared ultramafic rock, serpentinites and amphibolites of the Crooked amphibolite, similar to those mapped to the southeast, in the Crooked Lake area by Bloodgood (1988).

Well studied and well known marine and sub-aerial volcanics and derived sediments, the late Triassic Nicola Group, lie immediately west of Eureka Thrust, and help define this eastern portion of the provinces Intermontain Physiographic Belt.

Like the area of the peripheral claims, the Ace Property has not been systematically mapped in detail, in spite of the amount of work done. There are very few outcrops along the valley floor! Some outcrop can be found in the river valley, some in road cuts, some along creeks draining steep hill sides, some in cirques and some along mountain crests. Accordingly, at this time the local geology is best understood by extrapolating from Struik's regional geological picture. The vague picture put together from the few known outcrops and road cuts are in accord with his district correlations.

In general, main structural elements appear to be essentially coplanar with Pleasant Valley Thrust. Regional strike is northwest. Dip is generally regarded as being moderate northeast. Foliation dips clearly northeast, obscuring bedding. However, as the strata are regarded as being severely deformed by tight isoclinal folds, the dip cannot be everywhere uniform to the northeast. Plunge of fold axes is at moderate angles to the northwest.

FIG. 2. Generalized geology of the Cariboo gold belt, emphasizing units within Cariboo and Barkerville terranes.



Lines A to F locate the structural cross sections of Fig. 5.

STRUIK

AFTER STRUIK, L.C. GSC.

PAGE 30

Two, late, northeast-trending normal faults are projected by Struik from Cariboo Terrane to Barkerville Terrane, across Ace claims. They run south-west from the northwest end of Little River Stock, and appear to cross Barker Mountain. For convenience Barker has named these GSC1 Fault and GSC2 Fault. Barker now projects the latter fault further to the southwest than Struik shows it. Thus the two now divide Doyle's Float Train neatly into thirds. Struik shows the two as offsetting Cariboo Terrane, and the trace of Pleasant Valley Thrust, to the northeast. Given the dip, the sense of this offset requires the block between the two normal faults to be stratigraphically higher, relative to the blocks beyond to the northwest and southeast. This in turn would suggest that the dips of the two GSC faults, if they are tension faults, to be away from each other, and that the block between is a horst. Accordingly, strata in the block would likely be slightly higher in metamorphic grade, and would contain strata from greater depths – perhaps increased amounts of meta-volcanics, etc. Geophysical evidence gathered in 1996, to be described later, strongly suggests disruption of stratigraphy in this horst-like manner, and similarly suggests southwest continuation of GSC2 fault, at least to the top of the ridge of Barker Mountain. However the geophysics do not offer proof regarding which block is horst, and which is graben; therefore the options are kept open regarding this, at least until the detailed stratigraphy is better known.

Downey Carbonaceous Metallotect Of particular interest is the eastern or 'upper third' of the Barkerville succession. It is believed to consist dominantly of the Downey Succession, described by Struik as being olive and grey micaceous quartzites and phyllite, amphibolite, marble, meta-tuff, and meta-diorite sheets or sills. These descriptions are compatible with the rock types observed in the few outcrop so far studied. Notably, however, a roadcut at kilometre post 8423 of the Weldwood main haul road, exposes a finely laminated and tightly contorted, siliceous exhalite with partings and dustings of fine black sulphides, along with some quartz veining. Notable as well, is a thick graphitic layer, pyrite- and pyrrhotite-rich, with very low resistivity and very high chargeability.

Struik refers to this 'upper third' horizon as being "gold enriched", but his context relates to this horizon the formerly producing mines, 39km to the northwest, and perhaps to the Cariboo Hudson, 18 km northwest.

Of interest also with regard to this same general stratigraphic horizon – the Downey 'upper third' - is recent work done by Jennifer Getsinger (1985), and the relationship of her observations to those made much earlier by Amos Bowman (1886). Bowman described a 0.9-2.4m wide "ironstone ledge", 400m below the falls on Harvey's Creek, upstream from some placer workings of the day. He noted that there was another nearby. He said the trend was ' with the slates', specifying 090°/60°N, that the composition was olive and bluish feldspar and much red-weathering siderite, 'magnetic pyrites' and iron pyrites. He says Hoffman's analyses of his samples were gold - "distinct trace"; silver - "none", and mentions also that boulders from the iron stone ledges "strew the placer mines below". Getsinger (1985), mapping 20km to the southeast, in the Three Ladies – Mount Stevenson area for her thesis, noted up to 20% iron sulphides in a horizon exposed in a cirque on the north face of Three Ladies Mountain. A sheer 500m 60° cliff exposes resistant massive amphibolite there. She mentions hornblende crystals to several centimetres in size, accompanied by diopside, garnet, epidote, plagioclase and calcite. She mentions also a distinctive hard black graphitic quartz siltite which occurs in discontinuous layers to 5m in thickness; it has a slight phyllitic sheen, exhibits local pencil cleavage, and is folded with porphyroblastic staurolite-kyanite pelitic schist, limy schist and amphibolite. Overlying she says, is a carbonate-amphibolite sequence; it is overlain by another staurolite-kyanite schist which has *magnetite-bearing layers*, and then by a thick succession (2k) of inter-bedded grey micaceous quartzite garnetiferous quartz mica schist, and then coarse crystalline white marble.

What is of possible economic interest in these two descriptions is the line joining Getsinger's cirque with Bowman's "ironstone ledge" – it lies along the 'upper third' of the Downey Succession, and along the axis of Doyle's Float Train. Observations of rock types from within the float train conform nicely with Getsinger's on the one side, and with Bowman's on the other.

With regards to exploration potential, several expert geologists from government and industry have compared mineralization in some of the boulders from Doyle's Float Train to Besshi-type massive sulphides, complete with 'milled' texture, etc. These same geologists make comparisons directly with mineralization at the former producing mine at Goldstream, north of Revelstoke, and with mineralization at the Vine Prospect, further away in the southeast corner of the province.

This apparent stratigraphic concentration of iron minerals, and Struik's "gold enriched" phrase, indicates that the 'upper third' of Downey Succession may be described very generally as a metallotect. A good term for it might be "Downey carbonaceous metallotect".

Detracting from these intriguing description, however, is Getsinger's comment that, although there are sparse indications of pyrite, chalcopyrite and molybdenite associated with rusty oxidation near vertical northeast-trending quartz veins, " The Three Ladies – Mount Stevenson area is mostly barren of economic mineral deposits." Clearly she did not see many economic minerals, either in the cirque, or elsewhere. A couple of other points are of interest with regards to Getsinger's cirque are well worthy of mention. The first is that no known samples have been assayed for precious metals. The second is that a mag high, depicted on the federal government 1:50,000 Spanish Lake Sheet (93A14) is centered right at the base of the headwall of Getsinger's cirque. The magnetite bearing strata she mentions will probably account for the anomaly, however. (In this regard, another smaller aeromag high is shown on the south side of Barker's Creek, on Zak mineral claims. Reconnaissance traverses along the road on the south side of the creek there have yielded float composed of near-massive magnetite, the character of which would be sufficient to account for the anomaly.) (Also in this regard, disseminated magnetite in outcrop on Ace West claims would be sufficient to account for the ground mag anomaly that has been defined there.)

Of possible genetic interest is the abundance of amphibolite mapped by Struik on Barker Mtn, particularly south of the float train, and particularly in the 'uplifted' area, between the two GSC faults. A sill-like body of meta-diorite, or amphibolite, derived from metamorphosed volcanic rock, with traces of chalcopyrite and malachite, occurs just above the base of the steep slope, in this area. It appears to continue southeast, and is likely continuous with another exposure on the east side of the road up Ishkloo Creek; and beyond again to the cirque at the north face of Three Ladies Mountain. Whatever the derivation of the amphibolites, these features, along with the presence of sulphide dusting in exhalite at 'Roadcut 8423k', and along with Bowman's 'ironstone ledges', offer very good volcanogenic massive sulphide exploration possibilities.

Getsinger further describes a number of other things appropriate for theses, among them 10 structural domains from stereographic projections of various structures, 10 distinguishable metamorphic zones, and four regimes of folding, the first separable into two that are difficult to distinguish in the field – isoclinal and tight. She mentions that much of the quartz that she saw was in the form of lenses and augen paralleling foliation, indicated this kind of quartz vein was common in metamorphic rocks, and that it typical of quartz that segregates from host rock during early stages of deformation. Structural complications like these in her area indicate the likelihood of similar structural complications in Barker's other areas.

Lower Two-Thirds The preceding has been about the 'upper' third of Barkerville Terrane. What about the 'lower' two-thirds? Literature describes this lower two-thirds as inter-bedded foliated, grey micaceous quartzite, brown quartz-rich biotite-muscovite schist and lenses of amphibolite gneiss, all with minor carbonate, minor calc-silicate strata. In a few places, green grey hornblende biotite gneiss (thought to formerly be quartz diorite sills) makes up to 25% of the local section. Notably, the grain size of quartz grains in the quartzite and schist is uniformly fine. In the metamorphic aureole near the North Arm of Quesnel Lake, this portion of the stratigraphy hosts a number of small masses of anatectic pegmatite. Various assessment reports covering small and scattered areas, describe carbonaceous rocks rich in iron sulphides in places, and thus suggest repetition of upper-third stratigraphy by folding or faulting. Holland (1954), from work in the Yanks Peak and Roundtop Mountain areas, indicates that strata there are isoclinally folded on both small and large scales, and suspects far greater repetition of beds than indicated in the literature at that time.

Post-Glacial Olivine Basalt Of rock-hound (and academic) interest, is Getsinger's description of recent diktytaxitic olivine basalt flows she found in the floors of two adjacent east-facing cirques at the head of Devoe Creek. They are small flows up to 3m thick, grey in colour, flat lying and with crude columnar jointing. The vesicules are filled with pale green olivine. Pillow structures with chilled glassy margins formed in the lava at its base where it came to rest on glacial clay. She mentions a larger area of similar basalt along the shore of Quesnel Lake, northeast of the mouth of Devoe Creek. The upper portion of this flow she says, is 250m above the lake, level with the top of an adjacent marginal moraine, and appears to her to have dammed-up behind the moraine. She also mentions the flow north of Tasse Lake, and the small conical pyroclastic breccia hill there, with central depression that appears to have been a vent. These recent flows correlate with similar lavas of the Anaheim Volcanic Belt to the west, and with other similar ones near Clearwater Lake to the southeast. (GSC Map 1712A, shown in part on Page 22, depicts the North Arm olivine basalt outcrop area in yellow.)

1996 WORK PROGRAM

Grid Preparation Amex Exploration Services from Kamloops prepared grid lines in the area during 1996. This work consisted of compass work, chaining, ribboning, picketing, labeling pickets with tyvex tags, etc. During the year much of this work consisted of refurbishing some pre-existing lines in the areas of the induced polarization survey, and E-Scan resistivity surveys was done. Logging had been done in the area during the winter, thus requiring the refurbishing, and some of the lines required new work across swampy areas that could not be traversed during the summer.

Additional line work was done late in the season by Twin Mountain Enterprises Ltd., Whitehorse, YT. The Twin Mountain work related to geological work Stephen Roach did on Big Gulp claims, on the west central part of the property, near Frank Creek.

Geological Mapping Preliminary 1:20,000 scale, forest interim map, and road-controlled geological mapping was undertaken during early June-early Sept'96 by consultant, Stephen N. Roach of Ottawa. This work traversed several widely separated and scattered locations on the Little River Area properties, including the Cariboo Showing. His report is a separate, stand-alone one entitled Geological Mapping Surveys conducted on the Goose Range Project Area, Cariboo M.D., for Barker Minerals Ltd., and dated05Feb'97. The reader is referred to this report.

Very little geological mapping has been done on Ace Group due to the sparse nature of outcrop there.

E-Scan 3D Resistivity Survey A test E-Scan 3D Survey was done on a portion of the Ace (Kloo) Grid southeast from GSC2 Fault. It was done during mid-summer 1996 on lines spaced at 100m, written up, and revised by Premier Geophysics Inc., of Vancouver, under the direction of Greg A. Shore, P.Geol. The latest version of his separate and stand-alone report is entitled Revised Report on E-Scan 3D Resistivity Survey on the Kloo Grid, June-July 1996, and it is dated 27Mar'97. Results have changed from the time the field work was done, varying from version to version. The reader is referred to these. Work was done on the following claims: Ace 1-2, 4, 9, 11-27, 29-38, 40, 106-107, 109, E1, E2, E3, E4; and Abracad 2

Inspite of repeated requests and provision of data, Premier Geophysics remained disinclined to provide Barker Minerals with a report that complied with Regulations pertaining to acceptability of Assessment Reports as stipulated by the Geological Survey Branch in Victoria. Accordingly, for compliance, Barker took the liberty to make modifications to Premier Geophysics report to show where the survey work was done relative to the mineral claims.

Thin Section Petrography During November 1996, John G. Payne of Vancouver Petrographics Ltd, Langley, B.C., did thin section petrographic work on rock samples from the Ace Property. He described the results of his petrographic work in a report to Barker Minerals Ltd. Dated November 1996. His descriptions include estimates of mineral content, grain size and fabric, relationship of grains from different minerals, rock type and rock genesis. The descriptions are appended after the bibliography of this report.

Ace Grid Soil Geochemistry During the year, 600 fill-in additional samples were taken from Ace Grid. Samples were taken from the "B" soil horizon, or as close to that horizon as could be determined with the use of grub hoe and narrow nosed spade. The soil horizon consists of the forest floor, a black humus layer, a thin whitish leached layer, red mineral soil and then a rocky mix of mineral soil and debris from bedrock. The horizon sampled was the top of the first red mineral soil, generally below the leached layer, and it was generally found depths between 0.1m and 0.4m. Samples were placed in kraft paper envelopes manufactured for the purpose. The sample bags were labeled with the station and line number, with the use of a felt pen. Samples were kept under cover to dry as much as possible before shipping to Acme Analytical Laboratories in Vancouver for ICP, and other analyses.

BARKER MINERALS LIMITED - CARIBOO PROPERTIES
Summary Statistics derived from ProbPlot Analyses

Sinclair, AJ, 1981, Probability Graphs, Assoc Expl Geoch, Sp Vol 4
Stanley, CR, 1987, ProbPlot, Assoc Expl Geoch, Sp Vol 14

1981 B.C.-Fed Government Stream Sediment Analyses and Barker's 1996 Road Traverse Soil Analyses

Regional Stream Sediments

Govt 1982 Stream Seds Bkvl Terrane 93A & H	No. Samp	Underlying Stratig	Mean	St.Dev	Min	Max	Quart 1	Med	Quart 3	POPULATION 1 %	Mean	Low Thresh	Up Thresh	POPULATION 2 %	Mean	Low Thresh	Up Thresh	POPULATION 3 %	Mean	Low Thresh	Up Thresh
Cu ppm	1814	PQKLT	**25.6**	**15.5**	**3.0**	**182**	**16.0**	**22.0**	**31.0**	**1.3**	**5.4**	**3.6**	**8.2**	**97.2**	**21.9**	**8.2**	**58.5**	**1.5**	**94.1**	**56.1**	**158.0**
Cu ppm	559	PLLT	25.4	24.0	3.0	115	17.0	24.0	31.0	15.0	11.5	6.7	16.3	75.0	24.5	10.9	38.0	10.0	48.9	19.9	77.8
Cu ppm	48	QRTZ	26.9	1.6	8.0	126	21.0	28.0	39.0	10.0	10.6	6.7	16.7	85.0	28.0	15.5	50.4	5.0	73.6	27.5	196.9
Cu ppm	317	KAZA	25.6	11.9	5.0	98	18.0	23.0	31.0	25.0	13.1	7.6	22.8	74.0	27.8	15.3	50.4	1.0	71.9	46.6	111.0
Cu ppm	113	LMSN	29.5	17.4	6.0	152	18.8	25.5	36.0	3.0	6.3	5.3	7.5	72.0	21.8	10.5	45.3	25.0	44.7	25.4	78.6
Cu ppm	548	TILL	26.8	19.4	4.0	182	16.0	22.0	32.0	98.0	21.6	7.4	63.3	2.0	107.5	62.1	186.1				
Pb ppm	1814	PQKLT	**10.2**	**16.4**	**1.0**	**453**	**4.0**	**8.0**	**14.0**	**45.0**	**2.6**	**0.7**	**9.9**	**54.0**	**11.9**	**4.7**	**30.1**	**1.0**	**76.5**	**19.0**	**308.0**
Pb ppm	559	PLLT	11.6	17.5	1.0	330	4.0	8.0	16.0	65.0	4.4	0.9	21.4	30.0	16.9	12.1	23.7	5.0	42.2	13.8	129.1
Pb ppm	48	QRTZ	13.5	7.4	4.0	42	8.0	14.0	18.0	10.0	4.0	3.9	4.1	5.0	4.7	3.1	7.1	85.0	13.3	5.4	32.5
Pb ppm	317	KAZA	14.5	25.9	1.0	453	8.0	12.0	17.3	40.0	6.4	2.4	16.9	58.5	16.2	9.4	28.0	1.5	57.8	8.8	381.3
Pb ppm	113	LMSN	14.1	7.7	1.0	44	10.0	13.5	18.0	10.0	3.0	1.2	7.6	76.0	11.3	4.5	28.2	14.0	25.9	15.8	42.6
Pb ppm	548	TILL	5.1	10.4	1.0	196	1.0	3.0	6.0	70.0	1.8	0.5	5.9	28.5	8.5	3.9	18.7	1.5	39.5	10.1	154.4
Zn ppm	1814	PQKLT	**67.2**	**66.1**	**4.0**	**1600**	**42.0**	**58.0**	**74.0**	**1.3**	**15.0**	**7.0**	**32.3**	**95.7**	**55.7**	**25.4**	**122.2**	**3.0**	**255.0**	**90.4**	**717.0**
Zn ppm	559	PLLT	74.9	81.9	9.0	1600	46.5	66.0	82.0	15.0	29.9	18.5	48.5	80.0	67.4	38.3	118.6	5.0	217.8	70.5	672.7
Zn ppm	48	QRTZ	46.6	17.8	24.0	112	34.0	42.0	60.0	15.0	25.2	21.8	29.0	80.0	48.0	36.1	75.9	5.0	85.0	52.5	137.5
Zn ppm	317	KAZA	68.0	34.2	20.0	410	49.0	65.0	76.0	35.0	43.7	29.2	65.5	61.0	72.7	53.5	98.7	4.0	167.6	76.0	369.2
Zn ppm	113	LMSN	71.8	66.0	22.0	600	48.0	62.5	74.5	50.0	44.6	26.5	75.2	43.0	73.8	58.9	92.4	7.0	177.5	48.2	653.5
Zn ppm	548	TILL	57.7	35.8	4.0	480	38.0	52.0	66.0	55.0	38.2	20.8	70.2	44.0	71.8	41.8	123.5	1.0	279.0	160.5	484.9
As ppm	1814	PQKLT	**6.4**	**18.9**	**0.5**	**750**	**2.0**	**4.0**	**7.0**	**25.0**	**1.3**	**0.5**	**2.9**	**73.0**	**5.1**	**1.4**	**18.4**	**2.0**	**45.0**	**14.4**	**140.7**
As ppm	559	PLLT	6.7	32.3	0.5	750	1.0	3.0	7.0	47.0	1.2	0.5	3.0	50.0	6.1	2.0	18.8	3.0	38.0	7.3	197.5
As ppm	48	QRTZ	4.8	6.8	1.0	45	2.0	2.5	5.0	30.0	1.5	0.8	2.7	63.0	3.6	1.3	10.2	7.0	17.3	4.4	68.4
As ppm	317	KAZA	8.4	7.7	0.5	71	4.0	6.0	10.0	25.0	2.2	0.7	7.1	73.5	8.2	3.1	21.6	1.5	46.6	25.8	84.2
As ppm	113	LMSN	7.6	7.4	1.0	55	3.0	5.5	8.1	25.0	2.2	1.2	4.1	67.0	6.0	2.4	14.8	8.0	25.4	12.6	51.0
As ppm	548	TILL	5.6	8.1	0.5	75	2.0	3.5	5.5	40.0	1.8	0.7	4.7	55.0	5.0	2.1	12.3	5.0	30.8	12.6	75.1
Hg ppb	1813	PQKLT	**46.3**	**85.7**	**5.0**	**3400**	**30.0**	**40.0**	**50.0**	**25.0**	**24.0**	**6.6**	**37.8**	**70.5**	**44.3**	**22.5**	**87.5**	**4.5**	**134.3**	**52.4**	**344.2**
Hg ppb	558	PLLT	35.7	1.6	8.0	250	30.0	40.0	50.0	90.0	32.7	14.9	72.0	10.0	74.3	43.0	128.2				
Hg ppb	48	QRTZ	37.3	24.3	20.0	150	20.0	30.0	40.0	23.0	20.0	19.5	20.5	74.0	31.5	13.1	75.9	3.0	128.4	82.8	199.2
Hg ppb	317	KAZA	32.2	20.5	5.0	214	20.0	30.0	40.0	10.0	9.6	6.4	14.6	88.0	29.5	12.5	69.6	2.0	108.0	56.9	204.8
Hg ppb	113	LMSN	45.3	21.7	20.0	130	30.0	40.0	52.0	10.0	20.0	19.5	19.5	79.0	37.3	17.4	80.3	11.0	85.5	59.5	123.0
Hg ppb	548	TILL	64.2	150.6	8.0	3400	30.0	50.0	70.0	98.0	46.5	15.9	136.0	2.0	273.5	56.3	1328				
Sb ppm	1800	PQKLT	0.4	0.9	0.1	32.0	0.1	0.2	0.4	82.0	0.2	0.1	0.7	15.5	0.8	0.4	1.5	2.5	2.7	0.8	8.9
Ag ppm	1814	PQKLT	0.11	0.14	0.10	4.80	0.10	0.10	0.10	97.0	0.10	0.08	0.13	3.0	0.28	0.08	0.99				
Mo ppm	1814	PQKLT	1.4	5.0	1.0	200	1.0	1.0	1.0	96.8	1.1	0.7	1.6	3.2	5.3	1.1	25.6				
W ppm	1814	PQKLT	1.7	7.9	1.0	250	1.0	1.0	1.0	95.0	1.0	0.7	1.6	5.0	6.0	1.2	30.1				
Ni ppm	1814	PQKLT	31.1	27.3	1.0	745	19.0	26.0	36.5	2.0	5.2	2.0	13.7	95.0	25.6	10.5	62.6	3.0	117.7	52.8	262.6
Co ppm	1814	PQKLT	12.1	6.8	1.0	134	8.0	11.0	15.0	4.0	3.2	1.6	6.4	95.0	10.8	4.6	25.6	1.0	44.0	21.9	88.3
Fe %	1814	PQKLT	2.7	1.3	0.2	21.1	1.8	2.5	3.3	1.0	0.6	0.3	1.2	99.0	2.5	1.1	5.6				
Mn ppm	1814	PQKLT	624.1	1050	55.0	30000	320.0	450.0	650.0	4.0	119.0	75.0	189.0	90.0	449.0	183.0	1102	6.0	2174.0	745.0	6346

PKQLT = COMBINED PLLT+KAZA+QRTZ+LMSN+TILL ANALYSES

Road Traverse Soils

BML 1966 Road Soils	No. Samp	Crust'l Bkgrd	Mean	St.Dev	Min	Max	Quart 1	Med	Quart 3	POPULATION 1 %	Mean	Low Thresh	Up Thresh	POPULATION 2 %	Mean	Low Thresh	Up Thresh	POPULATION 3 %	Mean	Low Thresh	Up Thresh
Cu ppm	656	35	33.1	24.1	2.9	320	19.5	28.1	39.9	3.0	7.4	4.3	12.8	96.0	28.5	10.8	75.5	1.0	159.4	69.6	365.0
Pb ppm	656	20	29.1	90.1	2.4	1855	12.0	16.4	24.5	95.0	16.3	5.8	46.3	5.0	135.6	26.5	695.0				
Zn ppm	656	70	133.4	267.3	8.8	4239	70.0	90.0	120.0	5.0	29.3	14.2	60.3	90.0	92.4	43.2	197.4	5.0	554.0	112.6	2722
Au+ ppb	656	3	2.6	3.9	0.5	44.0	1.0	2.0	3.0	86.0	1.3	0.3	5.0	12.0	5.4	2.9	10.1	2.0	22.8	10.8	48.2
Ag ppb	656	400	213.0	219.0	15.0	1847	88.0	146.0	245.0	99.0	145.0	29.0	730.0	1.0	1380.0	975.0	1952				
As ppm	656	5	7.4	28.9	0.25	622	1.9	3.3	6.0	1.0	0.35	0.17	0.74	97.0	3.4	0.65	17.4	2.0	93.2	18.3	473.4
Bi ppm	656	0.3	0.52	0.54	0.05	6.7	0.3	0.4	0.6	97.0	0.4	0.05	1.2	2.0	2.2	1.9	2.6	1.0	3.6	1.6	8.2
Sb ppm	656	1.0	0.6	10.7	0.1	273	0.1	0.1	0.1	84.0	0.11	0.07	0.16	16.00	0.42	0.06	2.89				
Hg ppb	656	200	64.9	45.1	5.0	762	38.0	58.0	82.0	1.9	5.7	3.2	10.1	28.1	28.2	14.8	53.8	70.0	74.3	35.6	155.1
Mo ppm	656	3	1.6	1.7	0.1	15.9	0.7	1.0	1.7	85.0	1.0	0.4	2.5	8.0	3.0	2.1	4.4	7.0	6.1	3.0	12.4
Ni ppm	656	40	43.0	32.2	1.0	457	27.0	40.0	49.0	99.0	36.2	13.5	97.5	1.0	245.6	110.4	546.1				
Cd ppm	656	0.3	0.38	0.92	0.01	15.40	0.14	0.22	0.37	5.0	0.01	0.01	0.07	92.0	0.22	0.06	0.90	3.0	2.75	0.62	12.2
W ppm	656	2	1.05	0.36	1.0	6.0	1.0	1.0	1.0	98.5	1.01	0.83	1.25	1.5	2.43	1.13	5.25				
Cr ppm	656	500	43.7	25.3	4.0	533	33.0	41.0	51.0	5.0	16.8	8.3	33.9	94.0	41.6	22.8	76.1	1.0	139.0	43.5	447.0
Ti %	656	0.5	0.05	0.37	0.01	0.37	0.02	0.04	0.08	45.0	0.01	0.01	0.05	47.0	0.07	0.04	0.13	8.0	0.16	0.10	0.25
B ppm	656	45	2.2	7.3	1.0	131	1.0	1.0	1.0	80.0	1.1	0.7	1.7	17.0	2.9	1.4	6.1	3.0	13.5	2.0	89.4
Te ppm	656	0.01	0.13	0.06	0.1	0.6	0.1	0.1	0.1	98.0	0.12	0.06	0.22	1.0	0.30	0.29	0.31	1.0	0.33	0.23	0.47
Se ppm	656	0.6	0.30	0.40	0.15	3.90	0.15	0.15	0.30	72.0	0.17	0.10	0.27	24.0	0.46	0.21	1.00	4.0	1.5	0.7	3.4
Tl ppm	656	2.0	0.14	0.08	0.10	1.1	0.1	0.1	0.2	84.0	0.12	0.07	0.20	16.0	0.24	0.14	0.40				
Ba ppm	656	630	107.0	62.9	25.0	700	69.0	88.0	127.0	93.0	86.7	38.8	193.7	7.0	261.7	161.3	424.4				
Al %	656	8	2.5	0.8	0.3	8.1	2.0	2.4	3.0	2.0	0.7	0.3	1.5	98.0	2.5	1.3	4.5				
Mn ppm	656	1000	538.0	439.0	39.0	3274	262.0	416.0	663.0	99.0	409.0	105.0	1602	1.0	2767	2122	3608				
Fe %	656	4	5.0	1.5	0.25	16.8	4.1	4.7	5.7	2.0	1.3	0.4	4.5	96.0	4.8	2.9	7.7	2.0	10.3	7.1	14.9
Ca %	656	3.6	0.39	0.51	0.01	5.89	0.11	0.21	0.46	99.0	0.22	0.03	1.63	1.0	3.20	1.62	6.17				
Mg %	656	1.5	0.7	0.3	0.05	3.2	0.5	0.7	0.9	6.0	0.16	0.07	0.36	64.0	0.58	0.32	1.03	30.0	1.04	0.74	1.48
P %	656	0.08	0.1	0.06	0.01	0.51	0.06	0.09	0.12	1.0	0.02	0.01	0.04	98.0	0.09	0.04	0.22	1.0	0.4	0.3	0.5
Sr ppm	656	170	26.6	24.5	3.0	246	11.0	19.0	33.0	5.0	5.5	4.2	7.3	88.0	18.2	5.3	62.3	7.0	90.5	53.0	154.3
Na %	656	1	0.01	0.01	0.01	0.10	0.01	0.01	0.01	97.0	0.01	0.00	0.02	3.0	0.04	0.02	0.06				
K %	656	2.7	0.16	0.12	0.03	0.80	0.07	0.11	0.21	28.0	0.05	0.03	0.09	47.0	0.10	0.05	0.23	25.0	0.30	0.17	0.55
V ppm	656	100	47.8	19.5	5.0	179	34.0	47.0	58.0	45.0	30.7	17.0	55.3	55.0	58.7	37.5	92.0				
La ppm	656	18	34.5	25.1	9.0	496	24.0	30.0	39.0	1.0	10.7	8.5	13.6	97.0	30.4	14.5	64.0	2.0	120.2	44.2	326.8
Ga ppm	656	20	7.2	2.2	2.0	19.6	5.6	7.0	8.3	1.0	1.8	2.4	3.3	98.0	3.9	6.8	11.9	1.0	12.2	16.0	21.1

The 1995 soil sample coverage is shown on the attached small-scale maps, as are the 1996 additions to this coverage. A similar plot of the sample locations for the combined coverage is also attached, (see Pages 36a, 36b, and 36c). Combined results are contoured and shown on the attached (pocket) 1:10000 soil geochemistry maps for Pb, Zn, Cu, As, Au and Bi.

Results from 1996 Road Traverses have been analysed by the ProbPlot computer program developed by Stanley (1987) and described by Sinclair (1981). A chart showing the result of the analyses is attached (Page 35). It shows threshold values and population partitions for the common metals, for both the 1996 road soil samples and also, the published open file BCRGSS stream sediment data for NTS sheets 93A and 93H. The combined results from the Ace 1995 and 1996 soil sample work, and the results from the 1996 road reconnaissance soil sampling work, are considered and interpreted in light of the figures presented on this chart.

The results generally show the same metals-in-soils contours as the previous 1995 maps, but with slightly increased coverage, and more complete Pb and Zn anomalies, and Bi, along the northern margin of Doyle's Float Train between the two normal faults – designated GSC1 and GSC2. Bismuth occurs near the switch back on Colleen Road (near the common border of Ace 82 and Ace 84) which has always been an interesting area because of red rusty soils, mineralized float with much iron sulphides, and also mineralized galena-bearing float that carries good values in gold. It is suspected that the anomalous bismuth is associated with this very interesting galena float.

These anomalies are faint, being only in the order of about 1.5 times threshold, as determined by ProbPlot. Elsewhere, strong anomalies near exposed mineralization are often 5 to 10 times threshold. However, over thick overburden, and especially overburden that has impermeable blue clay within it, one might expect only modest response from soil geochemistry.

Moderately anomalous Cu, as defined last year, is found up on the lower slopes of Mount Barker, and an As anomaly centrally on this portion of the float train is re-defined somewhat, but not added to materially.

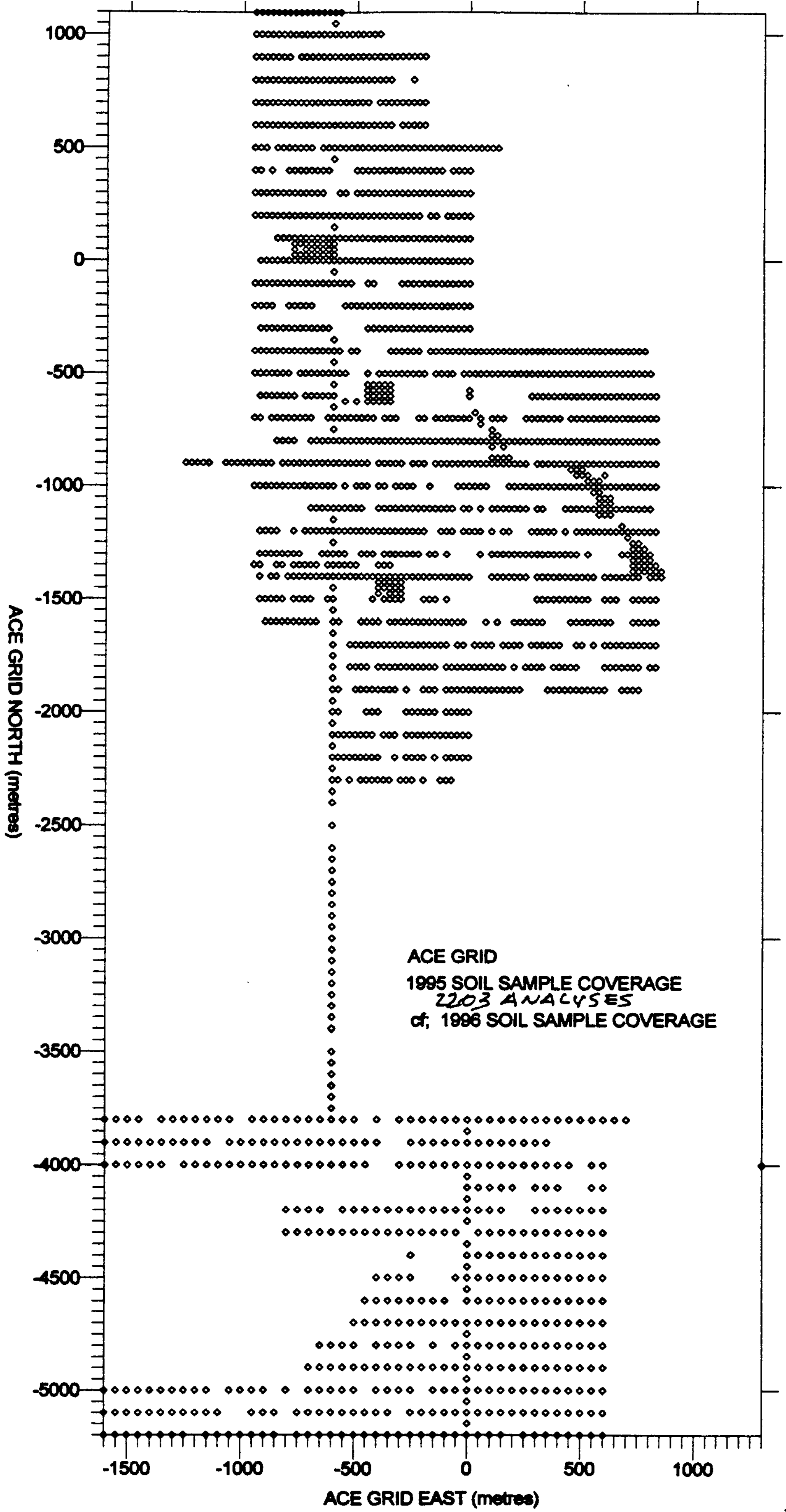
Induced Polarization Test Survey

Objective The objective of the test IP survey done (21May-06Jun'96) by Scott Geophysics, Vancouver, was to improve definition of geophysical targets outlined by magnetic and VLF-EM work done during the previous year. Specifically the target was strata-bound volcanogenic massive sulphide of the kind sometimes referred to as Besshi-type. Specimens of float contained iron-rich mineralization that resembled mineralization from Goldstream, north of Revelstoke, and Vine, in southeast B.C. The data is digital, like most of the remainder of Barker's exploration data. Odd numbered lines from Ace 700N through 1900S were covered, the line separation being 200m. The survey covered all, or parts of the following claims: Ace 37, 39-44, 57-59, 60-65, 67-69, 70, 82-89, 90, 92, 106, Unlikely I & II and E4 (see Dwg No 960620-1, Page 37).

The geophysical contractor's invoices totalled $33,269.52 for the 26.4 line km of survey – or $1260.21per line-km.

Technical supervision was by Alan Scott. Scott agreed to provide a summary Logistical Report along with pseudo-sections for depths of 25, 50, 75, 100 and 125m. For these data, the reader is referred to Scott's report entitled Logistical Report, Induced Polarization/Resistivity Survey, Mount Barker Project, Ace Property, Barker Minerals Limited, dated 10Jun'96, which is appended as Appendix II.

Barker requested permission from Scott to process the data via Surfer and AutoCAD, and to describe the results. This was to save Scott time, and Barker money, considering the time that would be required to review the voluminous file. Scott readily agreed to this, realizing that there was no need to reinvent wheels, etc.



ACE GRID
1995 SOIL SAMPLE COVERAGE
2203 ANALYSES
cf; 1996 SOIL SAMPLE COVERAGE
ACE GRID NORTH (metres)
ACE GRID EAST (metres)
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-5000
-1500
-1000
-500
0
500
1000

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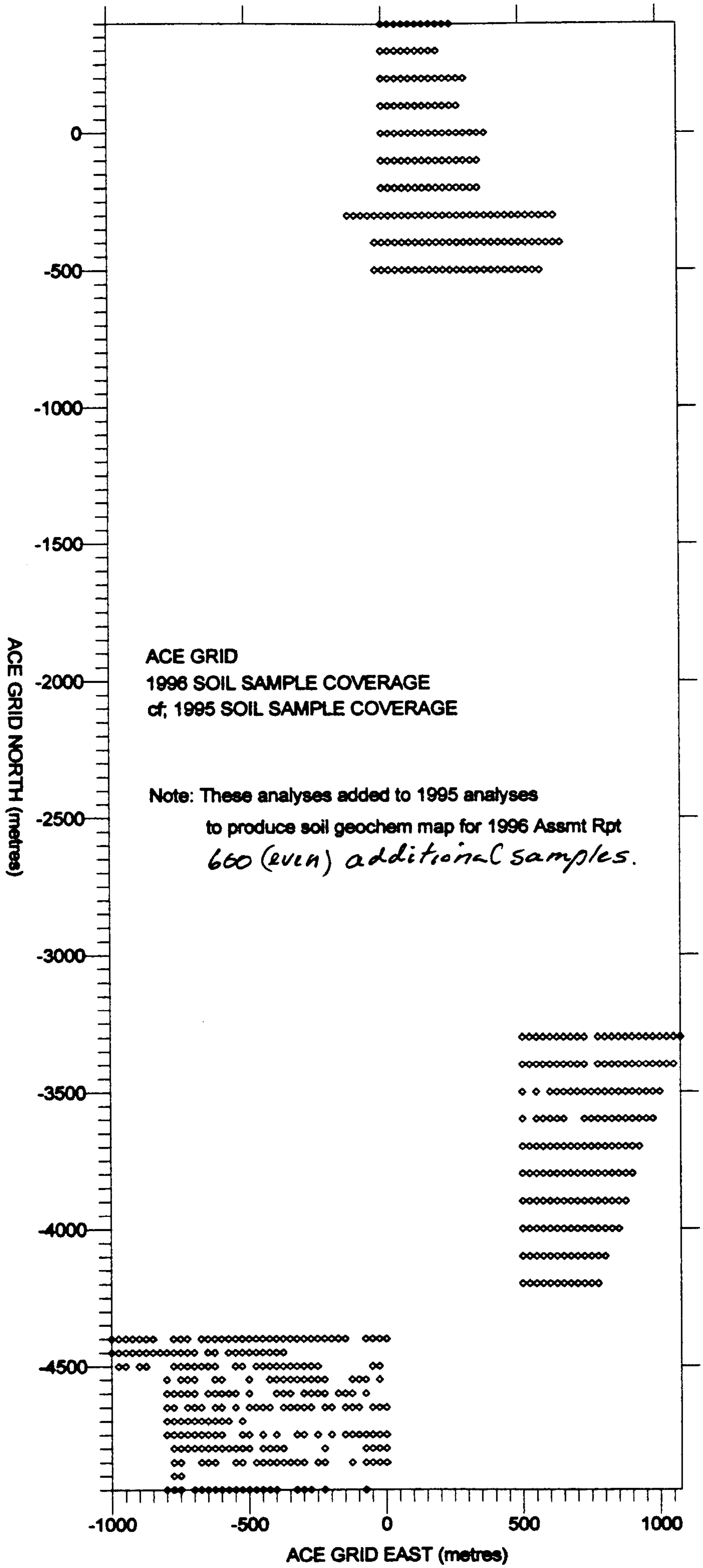
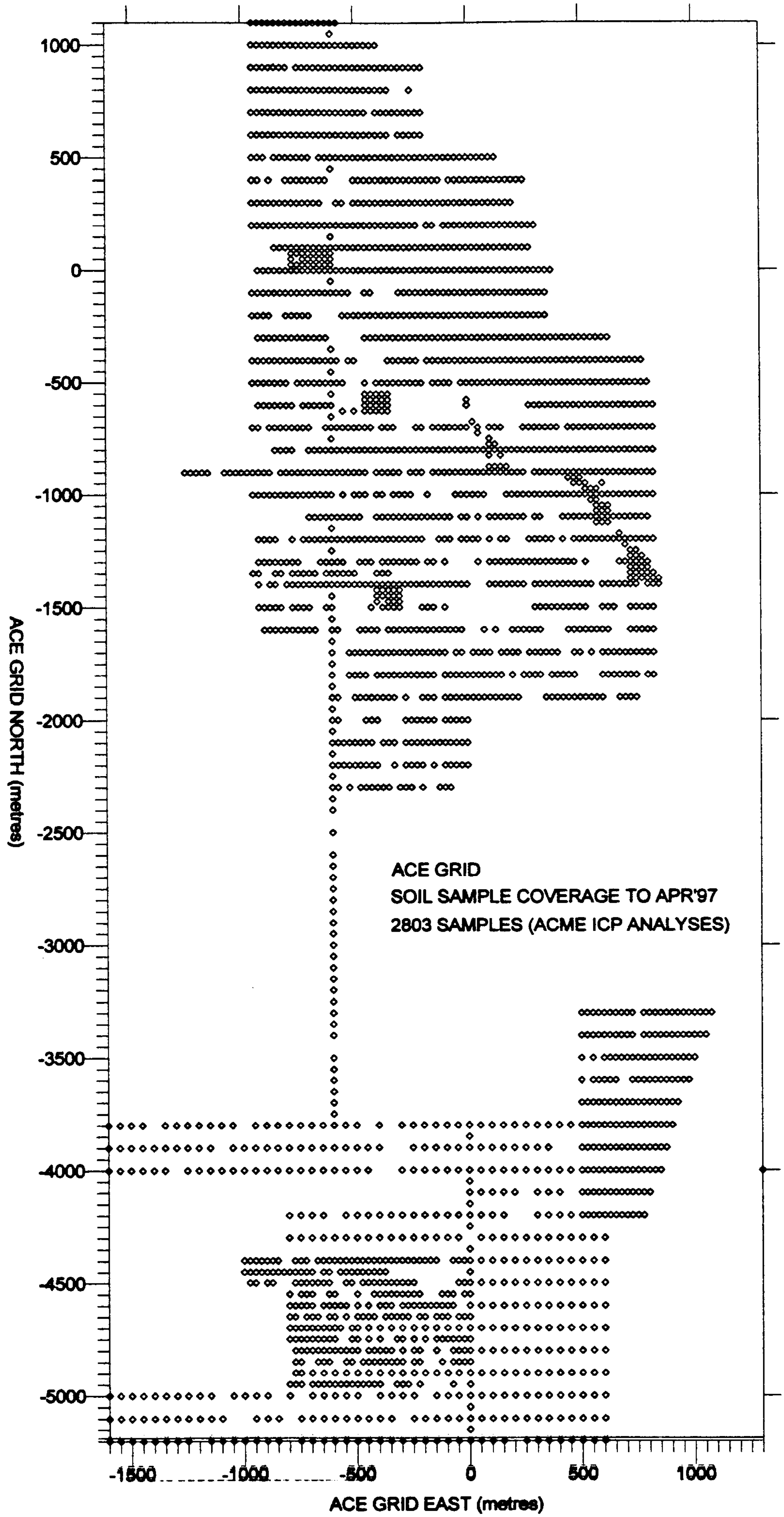
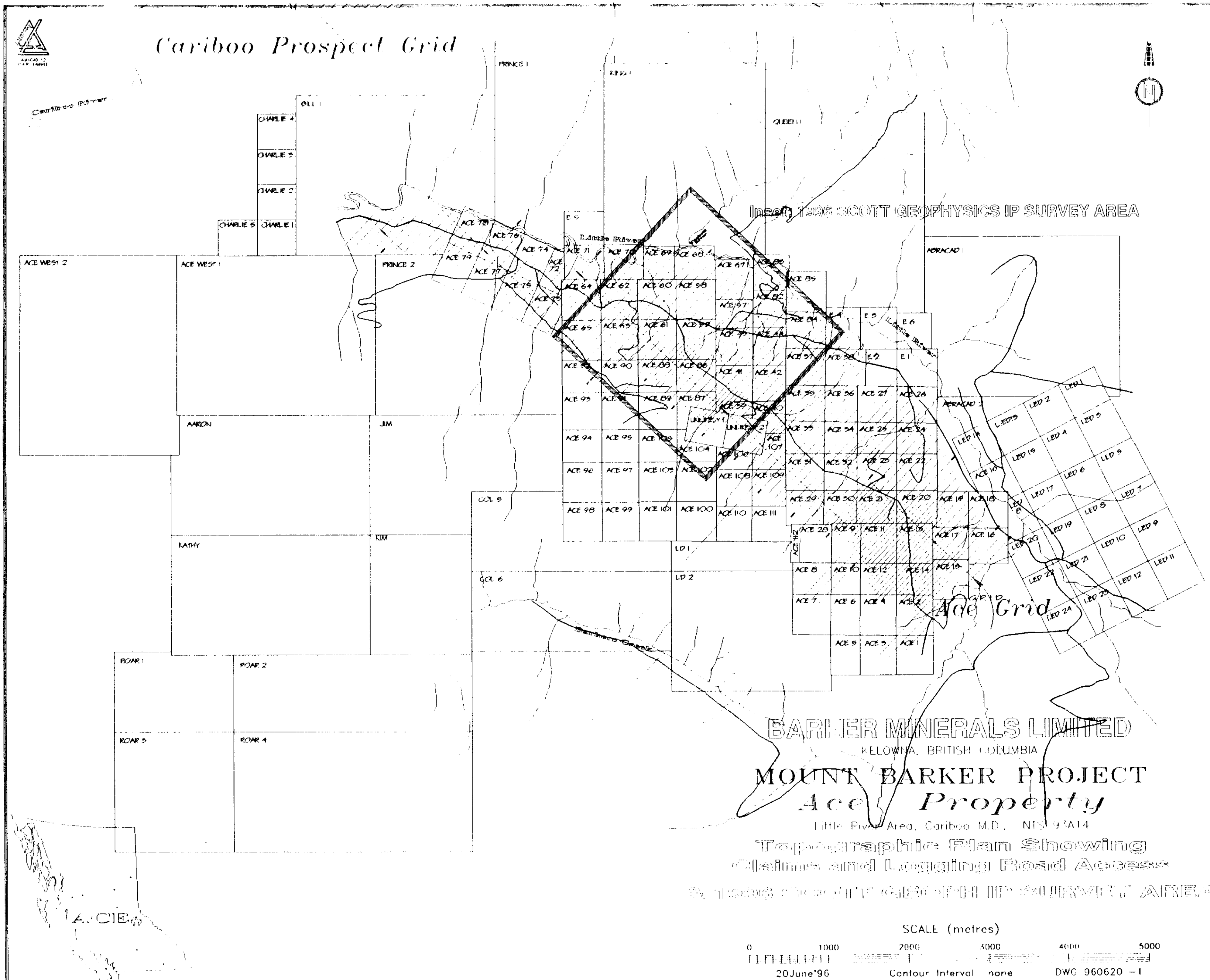

ACE GRID
1996 SOIL SAMPLE COVERAGE
cf; 1995 SOIL SAMPLE COVERAGE
Note: These analyses added to 1995 analyses
to produce soil geochem map for 1996 Assmt Rpt
660 (even) additional samples.
ACE GRID NORTH (metres)
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-1000
-500
0
500
1000
ACE GRID EAST (metres)


ACE GRID
SOIL SAMPLE COVERAGE TO APR'97
2803 SAMPLES (ACME ICP ANALYSES)
ACE GRID NORTH (metres)
ACE GRID EAST (metres)
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-4500
-5000
-1500
-1000
-500
0
500
1000

PAGE 36(c)


Cariboo Prospect Grid
Inset 1996 SCOTT GEOPHYSICS IP SURVEY AREA
Ace Grid
Little River
PRINCE 1
PRINCE 2
KING 1
QUEEN 1
BILL 1
CHARLIE 1
CHARLIE 2
CHARLIE 3
CHARLIE 4
CHARLIE 5
ACE WEST 1
ACE WEST 2
AARON
JIM
KATHY
KIM
COL 5
COL 6
LD 1
LD 2
ROAR 1
ROAR 2
ROAR 3
ROAR 4
ABRACAD 1
ABRACAD 2
UNLIKELY 1
E 1
E 2
E 3
E 4
E 5
E 6
BARKER MINERALS LIMITED
KELOWNA, BRITISH COLUMBIA
MOUNT BARKER PROJECT
Ace Property
Little River Area, Cariboo M.D., NTS 93A14
Topographic Plan Showing
Claims and Logging Road Access
SCALE (metres)
0
1000
2000
3000
4000
5000
20June'96
Contour Interval none
DWG 960620 -1
ACE

Instrument Used The transmitter used was the 10 kW TSQ4 transmitter, one of two such large transmitters in Canada. After geological discussions, this powerful transmitter was considered necessary by Scott who was experienced with graphitic strata in the Wells and Barkerville areas. Then when it was learned that rocks at the Cariboo Prospect (formerly "*MAYBE GROUP*" - ARept 17,357 & ARept 19,027) were graphitic, the 10 kW unit was recommended. The principal member of the IP field crew was Ken Moir, geophysical technician; he was assisted by technician, Mitch Davies, and by three field assistants - Brad Scott, Eric Bailey, and Sean Mellows. Subsequently, Lammle, being familiar with the property, regional and local geology, and previous exploration results, used the digital data as provided on diskette, to re-contour (via Surfer/AutoCAD) chargeability and resistivity data from three of the five arrays, and compiled this portion of the IP assessment report.

Electrode configuration was pole-dipole. Field procedure along lines was to travel northeast with current electrode on the southwest end of the array. "A" spacings used were 25m, 50m, 75m, 100m and 125m; time-domain readings were based on 2 second (0.125Hz) current-on time. Chargeability measurements, as plotted, were integrated beneath the decay curve during the period between 690 and 1050 milliseconds after current-shut off. Calculations of resistivity, as plotted, were made automatically, and records of self-potential inherent in the ground were kept.

The self-potential data were experimented with but not plotted for purposes of this report. In conventional self-potential surveys, one non-polarising porous pot electrode would be positioned at a stationary spot located at an "infinite" distance from the target: and the readings of voltage differences would be made while the second porous pot was being moved progressively station-by-station, and line-by-line, over the entire survey area. In this way all of the voltage differences measured would be relative to the single point at which the 'infinity' pot was located.

Self potential data obtained during induced polarisation surveys consist of individual readings of the voltage differences between the two non-polarising ceramic pots on a station-to-station, array-by-array basis, along each line. They may be plotted or contoured directly to give a self-potential station-to-station "gradient" map for each line for each of the five electrode separation arrays. These data may also be manipulated to accumulate the individual station-to-station voltage differences, again on a line-by-line basis, and they can be plotted and/or contoured, but relative to the south-western starting point on each line rather than relative to a single "infinite" point. Such accumulated readings could be used to approximate an old-fashioned self-potential survey if "base station-type" control readings were made to link line-to-line results. It is because of these difficulties that self-potential readings obtained in the course of induced polarisation are neither plotted nor discussed.

Crews employed by Amex Exploration Services of Kamloops repaired winter damage to the grid lines where necessary, ie, re-ribboning, re-tagging, removing winter-felled trees, and re-established the lines in areas logged during the winter. Louis Doyle administered and supervised the 1996 program. The writer, under contract, liased with the Vancouver office of Scott Geophysics, and was on site during the last half of the survey work, helping with the supervisory work during this period. Accommodation was partly at a trappers line cabin on Maeford Lake, partly at a convenient motel in Likely and partly at the rental trailer in Likely. Access was mainly by several 4x4 vehicles.

Barker Minerals experienced difficulties with Amex Exploration regarding invoices, timesheets, personnel, etc. None of these problems were mundane.

Results and Interpretations The results of the survey can be interpreted on the basis of the statistics tabulated in the following table, and on the field distribution of the readings that these statistics reflect:

ACE PROPERTY: CHARGEABILITY (mv/V) - STATISTICS

	n=1	*n=2*	*n=3*	*n=4*	*n=5*
no. of rdgs.	1040	1027	1013	1000	986
minimum	0.2	1	1.7	1.7	2.6
maximum	84.7	115.4	234.4	170.4	123.1
average	18.99	22.80	24.55	25.51	26.21
stand dev	13.04	13.4	14.09	12.77	11.96
variance	170	179.4	198.5	163.1	143.1
Pop 1 range	**3%**0.7- 3.5	**3%**1.3- 3.4	**10%**2.3-11	**7%**3.0-10	**6%**3.9-11
THRESHOLD *7 mv/V*					
Pop 2 range	**50%**2.7-24	**47%**3.8-31	**35%**8 –26	**38%**8 –29	**39%**9 -30
THRESHOLD 25 mv/V					
Pop 3 range	**47%**17-51	**50%**21-52	**55%**21-52	**55%**22-51	**55%**23-51

ACE PROPERTY: RESISTIVITY (ohm-m) - STATISTICS

	n=1	*n=2*	*n=3*	*n=4*	*n=5*
no. of rdgs.	1040	1027	1013	1000	986
minimum	7.8	3.8	5.1	5	4.5
maximum	9572	5663	5288	5465	5539
average	1385	1302	1268.9	894.1	1317.8
stand dev	1017	859.5	826.2	28.95	887.5
variance	1.0x1067	.4x105	6.8x105	8.0x105	7.8x105
Pop1 range	**1%** 7-119	**2%** 4-70	**2%** 5-60	**2%** 4-60	**3%** 5-64
THRESHOLD 60 ohm-m					
Pop2 range	**10%** 79-525	**21%** 67-1078	**20%** 60-911	**23%** 57-1147	**22%** 56- 999
THRESHOLD 800 ohm-m					
Pop3 range	**89%**439-3889	**77%**619-3374	**78%**611-3283	**75%**693-3466	**75%** 674-3462

ACE PROPERTY: SELF POTENTIAL (millivolts) - STATISTICS

	n=1	*n=2*	*n=3*	*n=4*	*n=5*
no. of rdgs.	1040	1027	1013	1000	986
minimum	-290	-275	-312	-292	-272
maximum	168	169	192	299	197
average	2.57	1.00	-0.49	2.35	-1.16
stand dev	25.61	24.20	28.35	28.95	24.83
variance	656	586	804	838	617

Discussion Chargeability has no mathematical units, but is described non-the-less in terms of mv/V. It is a measurable electrical response reflecting the amount of disseminated polarizable material in bedrock. Anomalies are usually self evident, being caused by irregular or unusual concentrations, or depletions, in the amounts of these disseminated materials. A wide range of materials are polarizable and may be disseminated in bedrock, but the main ones from the point of view of understanding induced polarization results are materials with polarizable electrical characteristics, at least on their surfaces. Sulphide minerals, magnetite, graphite, micas, dense glass-like silica, etc., are good examples of this kind of material.

Resistivity, measured in ohm-metres, as referred to in induced polarization surveys means exactly the same as it does in text books. It is the quotient obtained by dividing voltage (volts) by current (amperes), or more precisely in the case of geophysical surveys encompassing volumes of bedrock (rather than lengths of wires), it is the quotient obtained by dividing voltage/metre by amperes/metre^2. It is the resistance of bedrock to the passage of electricity. If a large current flows through a given volume of rock at a given voltage difference between electrodes, electrical resistivity of the rock is low, and conversely, electrical conductivity is high. If very little current flows through the same volume of rock at the same voltage difference between electrodes, resistivity is high, conductivity low. Consequently, resistivity being easily measured, can be used to classify rocks, but it is rendered somewhat ambiguous because of the wide overlapping range of resistivities exhibited by most rocks. Accordingly, interpretation of resistivity should be based on geological knowledge of local rock types. A list of resistivities of common rocks is attached on page 41, for reference.

As mentioned earlier, self-potential is a natural difference in voltage that occurs in the ground. It is measured in units of volts, or for more practicality, millivolts. Differences in electrical potential from point to point across the surface of the earth can have diverse and subtle causes, among which might be oxidising sulphides buried in bedrock, or in a variety of more subtle circumstances, such as the botanical difference between grassland (perhaps clear-cuts) and forest. In the case of oxidising sulphides, an electromotive cell is believed to envelope the mass of sulphides, with minute electrical currents flowing between bottom and top; the top becomes negatively charged, the bottom positively. Accordingly, large distinct negative self-potential anomalies should be examined to determine whether the cause is oxidising sulphides, or some other electrical phenomenon.

The data from the survey summary statistics, tabulated above, are portrayed spatially on the attached maps for three of the five electrode array separations, for both chargeability and resistivity. The geophysical data were analysed further by *ProbPlot*, which subdivided the data, generally, into three separate overlapping populations, and threshold values were arbitrarily chosen near the midpoint of the overlapping portions of the data. In essence, the statistics indicate three populations. The lower of the three, considered to be background, accounts for a small portion, say 5%, of the statistics. This means that approximately 95% of the area surveyed is reflected by the higher two of the three populations.

The separate populations may be caused, by something as simple and inherent as physical differences between three separate rock types. They may be caused, perhaps, by inherent physical differences between two different rock types that are complicated by third anomalous feature. They may be caused by a complex relationship of rock and soil within the first 100 metres of depth. The author interprets the first population to be caused by country rock, the second population to be caused by a graphitic stratigraphic horizon, and the third population to be caused by concentrations of graphite along fault zones.

General resistivity of the tested survey area can be subdivided into three overlapping populations - at levels of 65 and 800 ohm-metres. Resistivities lower than 65 ohm-metres are surely caused by abundant graphite;

RESISTIVITY OF COMMON ROCKS (ohm-metre)

Sandstone	1	to	640,000,000
Marble	100	to	250,000,000
Quartzite	10	to	200,000,000
Hornfels	8,000	to	60,000,000
Slate	600	to	40,000,000
Basalt	10	to	13,000,000
Limestone	50	tp	10,000,000
Gneiss	68,000	to	3,000,000
Quartz Diorite	20,000	to	2,000,000
Gabbro	1,000	to	1,000,000
Granite	300	to	1,000,000
Diorite	10,000	to	100,000
Tuff	2,000	to	100,000
Andesite	45,000	to	
Lava	100	to	50,000
Schists	20	to	10,000
Dolomite	350	to	5,000
Argillite	10	to	800
Graphitic Schists	10	to	100

RESISTIVITY OF COMMON MINERALS (ohm-metre)

Quartz	4,000	to	2.0×10^{14}
Muscovite	900	to	1.0×10^{14}
Diamond	10	to	1.0×10^{14}
Sphalerite	2	to	1.0×10^{7}
Biotite	200	to	1.0×10^{6}
Molybdenite	0.001	to	1.0×10^{6}
Magnetite	0.00005	to	5.7×10^{3}
Serpentine	200	to	3.0×10^{3}
Arsenopyrite	0.00002	to	1.5×10^{1}
Galena	0.00003	to	3.0×10^{2}
Marcasite	0.001	to	3.5×10^{0}
Pyrite	0.00003	to	1.5×10^{0}
Chalcopyrite	0.000015	to	3.0×10^{-1}
Pyrrhotite	0.000006	to	1.0×10^{-2}

RESISTIVITY OF WATER (ohm-metre)

Rain Water	30	to	1.0×10^{3}
Sea Water	0.2		

Coverage - Scott IP lines @ 200m spacing
Ace lines 700N thru 1900S, 26.4 line km.
"A" spacing 25m; n = 1 thru 5
Pseudo section depths of 25m, 50m, 75m, 100m & 125m.
Chargeability (mv/V) and Resistivity (ohm-m)
On claims Ace 37, 39-44, 57-59, 60-65, 70, 82-89, 90, 92, 106, Unlikely I & II, E4

Results - Chargeability and Resistivity Contour Maps:
"A" Spacing 25m – Dwg Nos 970407-01 & -02 (Pocket)
"A" Spacing 75m – Dwg Nos 970407-03 & -04 (Pocket)
"A" Spacing 125m – Dwg Nos 970407-05 & -06 (Pocket)
Alan Scott's Logistical Report - (Appendix II)

Interpretations The 1996 test induced polarization survey by Scott Geophysics Limited on Ace Property was done without any problem whatsoever. The work was well and ably done in early spring when there was maximum moisture (electrolyte) in the soil. The readings obtained with the 10 kW transmitter are considered to be of high quality and of high reliability.

Basically, the chargeability and resistivity results parallel stratigraphy, in similar fashion, in all 5 electrode separation arrays. Chargeabilities are very high and resistivities are very low across the entire area surveyed. It is clear that the results are from stratigraphy with an abundance of polarizable material that has a low resistance to the passage of electricity. As graphitic materials are commonly associated with chargeability and resistivity readings of the magnitude shown to be present across this portion of Ace Grid, it was readily apparent, and concluded that a graphitic stratigraphic horizon was the cause of the IP response. This has since been confirmed by backhoe trenching, which is reported on later in this report.

It is believed that the three separate populations of Ace results are best attributed to (1) country rock stratigraphy, (2) graphitic strata with iron sulphides, and (3) graphitic fault zones in both of the above.

Graphite causes the strongest electrical response from geophysical instruments relying on electrical conductivity; and graphite, by definition, is spread very widely and very broadly in a graphitic stratigraphic horizon. Therefore, its presence in this way in a horizon that coincides with Doyle's Float Train, constitutes a serious hindrance to exploration of this horizon by any electrical method, particularly electromagnetic methods; and also all methods depending upon electrical contact with the ground via wires, electrodes and porous pots. The response from the graphite is so strong and so broad, that it completely envelopes and masks-out the subtler responses and smaller areas of response that might be expected from mineralization. Important mineralization in such horizons would likely remain unrecognized, or undetected, by electrical methods. For this reason, these kind of geophysical responses must be analyzed in conjunction with other discriminating geological, geochemical or geophysical data. In the Ace case, with very sparse outcrop, Barker will have to rely heavily on geochemistry and magnetics to cost-effectively 'home in' on likely targets in this Downey Succession graphitic geological environment.

GSM-19 Mag & VLF-EM Surveys This geophysical work was done by field staff of Amex Exploration Services of Kamloops, under the supervision of A.A. Ablett, with an instrument owned and provided by Barker Minerals, and with the understanding that Barker Minerals would process, draft and report on the data. Excellent field work was done by Percy Cox of Amex.

Instrument and Transmitters The instrument used was manufactured by GemSystems Inc., Richmond Hill, Ont. It is known as the GSM-19 advanced magnetometer and VLF-EM system. It is a portable weather proof, battery powered, high sensitivity Overhauser-effect proton precession magnetometer-gradiometer with liquid crystal display and a 16-key keyboard. It has been designed for both hand held and base station operation, the latter requiring two instruments. Resolution is 0.01nT over a range of 20,000 to 120,000nT. The sensor may be mounted on backpack, as has been done on all of the Barker Minerals survey, or on a staff designed for the purpose. It is a microprocessor-based instrument with up to 2 megabytes of internal memory. For a single station it stores magnetics, and data from as many as three VLF-EM transmitters simultaneously, as follows: traverse, date, time, station, coordinates, magnetics; and for VLF-EM, vertical components of both In-Phase and Out-of-Phase, horizontal components with coil axis both vertical and parallel, and strength of the transmitter's field. Most of the summer work can be stored in the instruments memory. Alternatively, it can be downloaded to computer as often as desired.

VLF transmitters that that are commonly used in British Columbia are Seattle 24.8 kHz, Cutler 24.0 kHz, Annapolis 21.4 kHz and Hawaii 23.4kHz. VLF-EM work should be laid out in the field with the location of the transmitter in mind. Ideally the anticipated conductor should strike towards the transmitter, and this means that the survey grid's base line should also point towards the conductor. So, considering the orientation of the geological features, one normally chooses a transmitter that is located in an optimum position. However, of the four above stations, only Seattle comes in strongly; Cutler and Annapolis can be read just marginally, and Hawaii is too weak to be read reliably with the GSM-EM instrument, even with the large receptor.

Cutler and Annapolis are well located transmitters for checking stratigraphy at Little River Area for strata-bound conductors, and that is the type of target that the Ace and other grids have been laid out to check. The closer and thus stronger Seattle transmitter is well located to check for conductors that trend southwesterly towards it, but in the case of the Ace and other grids, the cross lines, rather than the base line point towards this transmitter. With this attitude a good conductor lying between the survey lines would probably escape detection. Accordingly, if one wanted to check for conductors that might be associated with the two southwest-trending GSC normal faults in the Little River Area, new grids will have to be cut.

Field and Office Procedures A continuously recording base station instrument was not used in the Barker Minerals surveys. Relatively large magnetic variations are expectable for VMS deposits, and these would be large relative to diurnal variations that would be expectable. Hence control of these small day to day variations in the earth's magnetic field was done by the well known method of looping back periodically to the starting point. In the Barker Minerals surveys, a main base station was established near the junction of "8400" haul road and the "F" spur (Base Station 02). All of the diurnal corrections relate to the magnetic intensity originally read at this station, and adopted for the standard. However, since the Ace Grid is large, and since there have been a number of subordinate surveys conducted, the field technician established a number of subordinate base stations to permit quicker and more frequent checks and control readings. Standard magnetic intensities at each subordinate station was established by quick closed looping, using a vehicle, reading the main base station, then the subordinate one, and back again to the main base, averaging out any small differences. All of these base stations are near roads. They are marked by a triangle marked on a tree, with the station number. The magnetic intensities established for the main and subordinate base stations in this manner are included at the beginning of the Appendix attached to this report.

In the course of the field work on grid lines, and on reconnaissance road traverses, the technician attempted to start and finish each day with a reading at the main base station, and otherwise as often as practical. When impractical, the technician checked as often as possible at known subordinate stations, and from time to time created new bases as required. Understandably, the number of check readings obtained on reconnaissance work was less than those obtained on grids. Grid stations are appropriately ribboned and labeled. Instrument stations along the road traverses are likewise ribboned and labeled. The labels are tyvex tags marked with traverse and station numbers.

Diurnal variations were computed with a spreadsheet, on the basis of assumed straight-line variations in readings within the range of time between each control reading. These are shown in the Appendices for each station, but the many control station readings (about 5% of the total readings taken) that permitted these corrections have been deleted, to enable uncluttered plotting.

This method is judged more than adequate to produce contours and plots of the accuracy required for this kind of survey, in the Barkerville Terrane. Diurnal variations rarely exceed ±25nT, and were commonly only ±15nT. Significant anomalies are orders of magnitude stronger that these small daily variations. Both raw and corrected readings for each station are shown in the Appendices for each of the surveyed areas.

No corrections are necessary for the VLF-EM data. The main item the operator needed to be conscious of was use of the transmitter to suits the assumed orientation of the target conductor, and also to be aware of times when particular stations were off-air for maintenance. VLF transmitters are obsolete now, more accurate satellite navigational aids being available, and it appears from time to time that certain transmitters, particularly Seattle, are casually left off-air for numbers of days at a time.

In all cases Surfer software has been used to contour the magnetic data. The VLF-EM data has been plotted as profile – one profile for one line - using Lotus 123 software for simplicity and convenience. Thus the vertical and horizontal scales are indicated on each of these profiles, but varies from profile to profile, depending on length of line, and magnitude of readings. With some additional time and effort, constant scales could be used for all profiles, but was not deemed necessary under the circumstances. Most of the mag and all of the VLF-EM profiles are shown in the Appendices.

Also in all cases, all profiles were studied, and interpreted for cross-overs indicative of buried conductors. A conductor was interpreted vertically under a station that had an In-Phase cross-over, and usually a correlating Out-of-Phase cross-over, at a place where the field strength was relatively increased. Apparent cross-overs at stations where field strength was low, were ignored. These cross-overs are assumed to be conductors, and have been plotted directly on AutoCAD base map for superimposition with other data, such as magnetics, for correlation purposes.

RESULTS - Ace Grid

Coverage – Scott IP lines @ 200m spacing; readings @ 25m spacing.
Lines 700N thru 1900S; 1172 readings; 29.3 line km
"F" Road Lines @ 100m spacing
Lines 2000S thru 5200S; 1920 readings; 48.0 line km
(missing Lines 2400S and 4700S
Total Line Kilometres 77.3 line km
On claims Ace 37, 39-44, 57-59, 60-65, 67-69, 70, 82-89, 90, 92, 106, Unlikely I & II, E4

Results - Dwg No 970315-01 (pocket) 25nT mag intensity contours
Line by Line Mag Profiles; (Appendix IA)
Line by Line VLF-EM Profiles; (Appendix IA)
Printout – Mag @ EM data; (Appendix IA)
NOTE: Cutler station just discernable on GSM-19

General Structural discontinuity indicated by offset in interpreted VLF-EM conductors, and similar discontinuity suggested by mag contours, but less convincingly, prompts southeast projection of GSC2 fault up the side of the mountain, along creek long suspected by L.Doyle as marking the line of a fault. Thus GSC2 (projected) cuts survey area in two, the northwest one-half containing the portion of Doyle's float train with enlarged width, ie., NW half and SE half.

NW Half Observations Area characterized by slightly larger, more continuous, higher intensity anomalies particularly along the northeast margin of the float train, paralleling suspected trend of stratigraphy. (This is the same area recognized the previous year as having a broad low-order mag high.) Narrow distribution of single station mag highs/lows, reminiscent of boulders, are concentrated along same northeast margin of float train, except northeast of Unlikely 2, where a few single station highs/lows also occur, particularly near a strange (and suspect) single line mag low of very deep relief – "Ace40 Black Hole Anomaly" (one of two such single line deep relief lows), and where a few could spill over from the up-ice direction, across GSC2 fault. Ace40 Black Hole Anomaly may reflect a mass of ankeritic dolomite that is exposed along the switch-back spur road. Many of the single station highs are bi-polar; lows mostly on north side of highs, but three or four scattered ones the other way around. Southwestern two-thirds of float train and portion on river side of the float train, characterized by low relief background intensity ~ 57550nT ± 50nT which does not clearly reflect suspected trend in stratigraphy. Axes of VLF-EM linear trends of cross-overs form three linear conductors, parallel with suspected trend of stratigraphy, two of which span NW half, one of these crossing backhoe trench 96-01; the other passes just north of Jim Road trench, T24, on southwest corner of Ace84.

Three other shorter but sub-parallel conductors, one at west end across Ace63, two at east end along north-east fringe of float train.

NW Half Interpretations The VLF-EM linear conductors are likely graphitic faults. General low-order mag high along northern third of float train is caused by increased quantities of magnetic minerals in bedrock, perhaps fairly deep in bedrock; anomaly parallels stratigraphy, is sizeable enough to be a VMS target; and geochemistry (1995) of overlying soils contains mpderately anomalous zinc – all indicate need for exploration follow-up.

Best looking mag anomalies on southeast side of GSC1 and northwest side GSC2, ie., in the hypothetical uplifted block, and being adequate in size, indicate need to GSM-19 survey GSC1 and GSC2 trends, for alternate definition using Seattle transmitter, on appropriately oriented grids.

SE Half Observations Area is characterized mainly by wide distribution of single station mag highs/lows over area surveyed, including swamps where same single station mag highs/lows are faint and of lower relief than the non-swamp ones, reminiscent also of boulders, but of ones more deeply buried than the non-swamp ones. Most of the single station anomalies are outside the float train envelope, on its southern side. Eastern end of float train toward river nearly devoid of single station highs/lows, and background there around 57600 nT. Many single station highs are bi-polar; most but not all have lows on north side of highs. Axes of three VLF-EM arcuate trends of cross-overs; two come up from vicinity of river, one from 2m LED14 quartz vein in river; another starts on Ace 22, projects parallel with stratigraphy under Ace36 swamp as far as GSC2 fault; another linear one on south side surveyed area, on mountain slope close to Struik's amphibolite. A second suspect single line deep negative relief anomaly - "Ace20 Black Hole Anomaly"; no obvious lithological correlations for this one. VLF-EM arcuate and linear conductors are likely graphitic faults.

SE Half Interpretations The VLF-EM conductors are likely graphitic faults. Better looking mag anomalies located between easternmost two arcuate faults, ie., under Ace19 general area, caused by increased content of magnetic minerals in bedrock; sizeable enough to be of exploration interest.

RESULTS - Cariboo (Maybe) Grid

Coverage - Five test lines @ 100m spacing, trending 045°
Lines 100S thru 500S; 293 readings @ 25m; 7.3 line km
Mag & Cutler VLF-EM
On claims Boo 1, Boo 2

Results - Dwg; Appendix IB
Line by line Mag Profiles (Appendix IB)
Line by line VLF-EM Profiles (Appendix IB)
Raw data Printout (Appendix IB)
NOTE: Cutler transmitter just discernable, Annapolis used in places!
(Results from Annapolis signals similar to those from Cutler)

Observations – Linear trend of VLF-EM cross-overs paralleling strata-bound Pb-Zn mineralization defined by Gibraltar exploration drilling. Background magnetic intensity 57550 nT ±100 nT relief. No correlating magnetic anomalies.

Interpretation - Character of Cariboo (Maybe) mineralization is adequate to be detected by VLF-EM, at least locally. Indicates need to trace possible strike extensions of Cariboo Pb-Zn strata-bound mineralization by thorough GSM-19 grid survey.

No interpretable magnetic trends are associated with conductor caused by the Pb-Zn mineralization, as would be expected.

RESULTS - Ace West Grid

Coverage - 22 short test lines @ 25m spacing; oriented 045°
Lines designated 6150N thru 6600N; 6750N thru 6800N
312 readings @ 25m spacing; 8.1 line km
Cutler VLF-EM transmitter.
On claims Ace West 1

Results -

Dwg No 970311-01 (Pocket)	
Line by line profiles	(Appendix IC)
Line by line VLF-EM profiles	(Appendix IC)
Raw data printout	(Appendix IC)

Observations - Two linear mag highs, paralleling suspected trend of stratigraphy, on immediate south side of nature and wet-lands preserve, @ elevation 1000-1020m. No VLF-EM cross-overs.

Extension of survey to southeast could help define stratigraphic, and possibly structural trends.

Interpretations - Linear mag highs correlate with disseminated magnetite observed at east end of drumlin, north edge of small swamp, in phyllitic quartzites.
Ace West mag anomaly not supported by structural conductors.
Anomaly not detected by government airborne mag; hence, mass too small.
No nearby geochemistry to help qualify this mag anomaly; however there are some nearby, local high zinc-in-soils indicated by preliminary road side work.
Detailed local mapping, with stream and soils geochemistry recommended, to enable definitive evaluation re: economic significance.

RESULTS - Badger Road Traverse

Coverage – Reconnaissance Road Traverse
647 readings @ 25m intervals; 16.2 road kilometres
On claims Jess 2, Jess 4, (Mass)

Results –

Sketch showing route followed	(Appendix ID)
Raw data printout	(Appendix ID)
Magnetic Intensity profile	(Appendix ID)
VLF-EM profiles (Annapolis)	(Appendix ID)

Observations – MAG - background level – 57400 nT
General mag geophysical noise - ±50nT, but mainly negative
1300 nT mag single station spike near 6625W on 'Line100'
probably culvert or logging debris
Single station mag spikes @2100W & 2050W on "Line200'

VLF-EM – atmospheric noise ±5%
Two strong crossovers – 2300W and 4425W on 'Line 100"

Recommendations: Field check single station mag spikes and VLF-EM crossovers by running short 200m long traverses on all sides of the particular stations to check for and define extent of continuity.
Check for any outcrop close at hand.
Single line road traverses preclude pragmatic interpretation!

RESULTS - Seller Creek Road Traverse

Coverage – Reconnaissance Road Traverse
522 readings @ 25m intervals; 13.1 road kilometres
On claims Sell 3, Sell 4, Sell 5, Amanda 4, Amanda 5, Amanda 7, Amanda2, Amanda 1

Results –		
	Sketch showing route followed	(Appendix IE)
	Raw data printout	(Appendix IE)
	Magnetic Intensity profile	(Appendix IE)
	VLF-EM profiles (Annapolis)	(Appendix IE)

Observations – Mag – noise variable; generally ±75 nT
Weak regional magnetic gradients present
Local spikes, some single station to ±300 nT

VLF-EM – atmospheric noise to ±5%
Several poor, doubtful poorly defined crossovers

Recommendations: Field check single station mag highs
Check for any nearby outcrop
Single line road traverses preclude pragmatic interpretation

RESULTS - Black Bear Creek Road Traverse

Coverage – Reconnaissance Road Traverse
670 readings @ 25m intervals; 16.8 road kilometres
On claims BB 2, BB 4, BB 5, BB 9, Amanda 6, Amanda 7

Results –		
	Sketch showing route followed	(Appendix IF)
	Raw data printout	(Appendix IF)
	Magnetic Intensity profile	(Appendix IF)
	VLF-EM profiles (Annapolis)	(Appendix IF)

Observations – Mag – Background 57300 nT with slight regional gradient
Geophysical noise ±50 nT
Occasional single station spikes to ±150 nT

VLF-EM – no well defined crossovers

Recommendations: Field check single station mag spikes
Check area for possible geological causes
Single line road traverses preclude pragmatic interpretation

RESULTS - Bruce Claims Road Traverse

Coverage – Reconnaissance Road Traverse
328 readings @ 25m intervals; 8.2 road kilometres
On claims Bruce 5. Bruce 6

Results –		
	Sketch showing route followed	(Appendix IG)
	Raw data printout	(Appendix IG)
	Magnetic Intensity profile	(Appendix IG)
	VLF-EM profiles (Annapolis)	(Appendix IG)

Observations – Mag - background around 58000 nT
Geophysical noise ~ 50-75 nT
Mag spikes to ±200 nT
VLF-EM crossover at 1500W on 'Line 2400'
Possible weak crossover – 0+10W on 'Line 2500'

Recommendations: Field check single station mag spikes
Field check crossover areas for geological causes
Single line road traverses preclude pragmatic interpretation

Government Aero-magnetics Four 1:50,000 produced from 1987 and 1988 data are pertinent: Cariboo Lake, Mitchell Lake, Spanish Lake and Quesnel Lake; or respectively NTS 93A15, 93A15, 93A11 and 93A10. Respective map numbers are: 9814G, 9815G, 9816G and 9817G. (Maps not included)

Background magnetic intensity is about 58,000nT near the center of the four sheets. A trough-like depression in the magnetic intensity occurs in the southwest corner, trending northwest from the mouth of Hobson Arm on Quesnel Lake. Magnetic intensity increases relatively rapidly to the southwest from the trough, undoubtedly reflecting increasing amounts of magnetic minerals in volcanics of Quesnel Terrane. Magnetic intensity also increases towards the northeast from the Hobson Arm trough, in the form of a gradually increasing regional magnetic gradient; increasing with distance northeast, or as you may like it, increasing across sedimentary deposits derived from the continent, towards the continent. This gradient averages 7.0nT/km for 45km, with variations as follows:

7.7 nT/km in the area northeast of Spanish Lake, then
11.1 nT/km across Cariboo Lake, and then
4.7 nT/km northeasterly form the north end of Cariboo Lake.

These are all remarkably flat and uniform magnetic features, compared with magnetic features from other parts of the province. It can be concluded that the arenites and pelites of the Barkerville Terrane have a very low magnetic susceptibility, and that amphibolites within it do not affect the regional airborne magnetics appreciably.

Of interest from an exploration point of view is the previously mentioned aero-magnetic high at the base of the amphibolite cliffs in Getsinger's cirque, on the north face of Three Ladies Mountain. It has a maximum aero-magnetic relief (flight line elevation not mentioned) of 60nT. Although this Three Ladies Anomaly is about 7km long, parallel to the stratigraphy, and about half that in width, the size of the causative body is much smaller, and more than likely attributable to the magnetite known, from Getsinger's description, to be in the strata there.

Also of interest is a smaller aeromag high – The Barkers Creek Aeromag High – centered midway between the mouth and headwaters of the creek and about 1.5km south of its mid point. It is a smaller anomaly, both in areal extent and in magnetic intensity, having a total relief of 25nT, a length of 4km approximately parallel with the stratigraphy, and a width of 3km. As with the Three Ladies anomaly, the causative body here is also much smaller that the dimensions of the anomaly as measured by the aircraft survey. Also as mentioned earlier, float consisting of near-massive magnetite has been found on the logging along the south side of the creek, immediately to the north of the center of the anomaly, and the source of this float is, in all probability, the source of the anomaly.

The lack of any aero-magnetic response over the Ace West grid, where disseminated magnetite occurs in phyllitic quartzite, indicates that the Ace West ground mag high is a small and local feature. It is insufficient in size for detection at the flight elevation, by the more sensitive airborne instrument. No doubt this small anomaly could be picked up by a similar helicopter-borne survey, at lower elevations. There are no geochemical indications suggesting any economic significance of this anomaly.

Reconnaissance Soil Geochemistry This soil geochemical field work was done by MinConsult, an exploration service company from Vernon, B.C. Analyses were by Acme Analytical Laboratories of Vancouver, by the conventional 30 element Inductively Coupled Plasma (ICP) along with a second more accurate wet geochemical (not fire assay) analyses for gold. Acme analyses were by conventional methods used in the industry – dilute aqua regia digestion for an hour at 95°C, then diluted. The resulting leach is partial for 12 characterizing metal, limited for another four. Another 15 metals, including the common base metals and commoner ore associated metals, were extracted from the leach with MIBK and analyzed directly by ICP. Acme routinely runs duplicate and control samples for quality control, and to enable clients to judge its work.

Areas covered include parts of the following claims:

Aaron; Abracad 1-2; Ace 62-65, 70-79; Ace West 1; Aubar 2-5, 7, 14; Bill 1; Boo 1-2; Bruce 1, 8; Chris 5, 7; Comet 5; Jim; King 1; Led 1-6, 15-24; Net 3; Prince 1-2; Queen 1; Rivy 1; Trachsel 2; and Tys 1, 3.

Field crews took samples, generally at rough 200m spacings along roads, in a number of widely separated parts of the property. Control in the field was photocopied portions of 1:20,000 forest interim maps showing logging roads. At day end, sample locations were plotted on master copies of these maps. Some months later, Lammle used these maps to prepare files that cross referenced sample numbers with UTM coordinates. These files then enabled Surfer conversion of the geochemical values to symbols, as 'layers' correct with respect to scale. These layers were subsequently superimposed on mineral claim-geographic base map, derived from the Quesnel Mining Recorder's maps and MOEP's TRIM data (via Safe Software's FME translator). Thirteen 1:20,000 sheets are involved – 93A054, 55, 63, 64, 65, 66, 74, 75, 76, 84, 85, 86, and 95, in north-progressing latitudinal tiers, as indicted by the increasing order of magnitude of each number, and in east-progressing longitudinal columns, as indicated by the last digit of each number.

The samples were taken with grub hoe and trowel, from near the top of the "B" soil horizon, or as near to that horizon as could be reasonably determined under field circumstance. Sample sites are marked in the field with labeled picket and ribbon. In the Little River Area, the soil profile consists of the forest floor, an organic-rich or humus horizon, a thin leached zone, and then red-brown mineral soil. It was the top of this mineral soil horizon that was sampled. It is generally regarded as the B horizon but in places, particularly at higher elevations in the mountains is very poorly developed, if at all, and in those circumstances a mixed B or C horizon samples was taken, thinking that a poor sample would be better than none. In swampy areas, the organic-rich A horizon may be more that a meter deep, and such areas were avoided. Generally speaking, the top of the B horizon was reached at depths varying between 0.2 and 0.7m.

In the field samples were placed in conventional Kraft paper envelopes, designed for the purpose, and carried in the field in back packs. On return to base camp in Likely, the samples were spread out under cover, to dry preliminarily prior to shipment to the Vancouver lab. At the lab the samples were oven-dried, then sieved to –80 mesh, aliquots taken for testing for digestion and testing, and the rejects sent to storage. Lab results were provided as printouts on paper for use in the field during the course of the summer, and on computer diskette in the form of comma delimited ASCII files. These data were processed by Lammle, firstly via Association of Exploration Geochemists ProbPlot software by Stanley (1987)after the methods described by Sinclair (1981). Geochemical levels thus determined for background, threshold and anomalous, were used to select size of symbols plotted on the accompanying maps for six different metals – Cu, Pb, Zn, Au, Ag and Bi.

The table of ProbPlot threshold and individual population boundaries generated to describe government BCRGSS data for NTS 93A and 93H, as discussed in the forgoing section describing Ace Grid Soil Geochemistry (Page 35) has been used for analysis of and selection of symbol size on the following maps (pockets):

Road Traverse Cu-in-Soil	1:40,000	Dwg No 950303-01
Road Traverse Pb-in-Soil	1:40,000	Dwg No 970306-01
Road Traverse Zn-in-Soil	1:40,000	Dwg No 970306-02
Road Traverse Au-in-Soil	1:40,000	Dwg No 970306-03
Road Traverse Ag-in-Soil	1:40,000	Dwg No 970306-04
Road Traverse Bi-in-Soil	1:40,000	Dwg No 970306-05

Threshold values used (and shown) on these maps are as follows:

Cu	70 ppm
Pb	30 ppm
Zn	100 ppm
Au	12 ppb
Ag	730 ppb
Bi	2.5 ppm

Pb-Zn-Cu The plots show widespread anomalous Pb-Zn samples and more restricted ones with anomalous Cu, on the lower slopes of the Cariboo (Maybe) Prospect. This is just as one would expect, knowing previously about the mineralization. They occur mainly on the Boo and adjoining claims but persist to the southeast to Aubar 3 and Aubar 4 claims.

The Pb and Zn in soils at Cariboo appear to be part of a northwest-trending zone of slightly anomalous Pb-Zn that runs across the property from beyond Cominco's Mae Property to beyond the Cariboo. This zone lies along the contact between Barkerville sub-Terrane and Cariboo Terrane. It correlates with the uppermost Barkerville Horizon – the Paleozoic Bralco Limestone, and with lowermost (locally) Cariboo horizon – the Hadrynian Cunningham Limestone and possibly Hadrynian Yankee Bell Formation. Similar enrichment of Pb-Zn, along this same general stratigraphic level is indicated in other Assessment Reports describing previous work in the district. Thus, the inference can be made that this stratigraphic level, and structural feature is regionally enriched in Pb-Zn.

A few scattered samples, well away from this trend, have weakly or moderately anomalous isolated, or single-station high amounts of either Pb, Zn or Cu. As the sample interval is generally 200m, there is room for important mineralization near these single-station highs. Accordingly, they should be checked by taking additional samples all around the single-station high for confirmation. A good way to do this is to define a square, 4m or 5m on a side, centered on the single station, and take eight samples for confirmation (or elimination) at the corners and mid-points of sides. If results are encouraging, additional organized follow-up would likely be advisable.

Slightly elevated amounts of Zn occur on the eastern one-half of Chris 5, and two of the Zn-bearing samples, also show correlating Pb and Cu. This area warrants some additional geological and geochemical investigation to determine the significance of this moderately anomalous area.

Au Three samples contain slightly anomalous amounts of gold, in the range between 25 ppb and 40 ppb. These samples are all of the single-station high type, as described above. They are on claims Aubar 3, Aubar 4 and Chris 1. All should be field checked with a tight 'grid' of eight additional samples around the single-station. If encouragement is obtained from the field checks, additional work would be planned, to fit the circumstances.

Ag Three areas have very slightly anomalous amounts (+0.7ppm) of silver. These area in clusters of a few samples each, one on the Cariboo and obviously reflection the known mineralization there; another on Aubar 5 and Aubar 7; and the last on Chris 5. These very low levels of silver are regarded as meriting additional individual follow-up if there are anomalous amounts of other correlating metals in the same general area. They are not regarded as justifying additional follow-up on their own merits.

Bi Three samples contain moderately anomalous bismuth in concentrations varying between 5 and 7 ppm. These are all of the individual single-station type. They are located on the Led claims, and on Chris 1 and Chris 5 claims. They merit follow-up as single-station highs, as described previously.

TRENCHING Backhoe trenching was done during 12Oct'96- 29Oct'96. Louis Doyle looked after the trenching, with help from Andy Doyle, heavy equipment operator. Lammle visited the site to give guidance at the beginning of the work and again at the time of the heavy snow that terminated the work. Other Barker employees helped by gathering specimens of rock from the trenches and holes and from the muck piles left at the holes that filled with water. Contractor was Rylant Construction, a logging contractor from Princeton, B.C. The backhoe was a Hitachi 200 diesel powered machine, equipped with 1 yd^3 bucket, bucket-thumb for grabbing slash, forestry guarding for safety, and tracks 0.7m wide for low unit pressure on the ground. It was operated capably by an employee of Rylant Construction - Andy Doyle. Material from the forest floor and humus was stockpiled on one side of the trench to enable resurfacing later with it; mineral soil, clay and till were stockpiled on the opposite side of the trench, for use first as backfill.

Some thirty-six prospecting holes were dug, mainly along ditches and on landings, 280 linear metres of trench were made. The cross-sectional profile of the holes and trenches was funnel shaped, the deepest portion, the spout, being about 1.5m deep generally, with the walls to the surface, the flared part of the funnel, graded at about 45° to prevent cave-ins. Deeper trenches reached 5.5m in depth; most were about 4m. Average depth was about 4m. As a funnel-shaped cross-section like this, 4m deep has an area of $10m^3$, the 280 lineal metres of trench would have a volume of $2800m^3$. The 36 test holes are estimated in this same way to have a volume of $900m^3$. Thus total volume of material moved by trenching is estimated to be $3700m^3$. The deeper trenches were backfilled, or partially backfilled to obviate dangerous condition that might affect wild life.

Specimens of rocks from the trenches, and from the rock piles left at the site, were gathered by Barker employees, placed in labeled plastic bags and boxes, etc., and taken to Likely, for storage in the garage at the residence owned by the company. These specimens were examined by company personnel, and later by Lammle after the work had been terminated, and then they were further broken up by hammer and pieces selected for character analysis. About 107 selected samples were taken in this fashion and sent to Acme Analytical Laboratories in Vancouver for ICP, Whole Rock, and Hydride analyses. These analyses of trench samples are attached on the following pages.

Results from the trench samples show low geochemical amounts of gold in four trenches:

Trench 30, (Ace Grid 375W; 1600S) near the "F" road. Here samples of specimens returned 1065 ppb, and 1386 ppb Au.

Trench A, (825E; 1350S) at the upper switch back on Colleen Road. Here specimens of siliceous rocks returned 296 ppb and 77 ppb Au.

Trench G, (475W; 200N) near the helipad on Hardychuk Road. A sample of specimens here contained 213 ppb and 50 ppb Au.

Trench C, (also numbered 14) (750E; 1250S), just uphill along Colleen Road from Trench A. Specimens sampled here returned 40 ppb Au. The attached sheets showing all of the analyses indicate that the better geochemical traces of gold show positive correlation with high Cu, Pb and Fe and silica, and to a smaller degree with higher geochemical traces of As, Bi and Hg. Where the rock

TRENCH
GEOCHEMICAL ANALYSES.

Explanatory Note:
Analyses
Acme Analytical Laboratories, Vancouver.

Geochemical analytical work during 1996 was done largely by Acme. Normally Acme does a standard 30 element ICP analysis which includes a poor estimate for gold, because of the relative insolubility of that noble metal. Frequently customers request a second gold analysis, and this is done with a more rigorous digestion; but not all gold is detected by this method either. More expensive fire assays are necessary to ensure extraction of all gold that might be encapsulated in silica, and other gangue. Acme, of course, provides many other laboratory services.

Among those services that Acme has provided Barker are the following types of geochemical analyses:

1) Conventional 30-element ICP

2) Ultra-Trace ICP Package: As indicated by the title, this package of analyses consists of more sensitive analyses for the conventional suite of, and it includes a few additional elements.

3) Hydride Geochemical Analyses: This type of analysis is a special sensitive analysis for 6 elements - As, Bi, Sb, Te, Se, and Ge - which are generally regarded as exploration pathfinders for precious metals exploration.

4) Whole Rock Analyses:This is the conventional package of analyses - major oxides along with Ba, Ni, Sr, Zr, Y, Nb, Sc and LOI, that is often done by academics and researchers, etc.

Note: Early in 1996, with advice from applied geochemists, Barker decided to send some rejects from soil samples taken during 1995 for additional testing. These rejects were prepared by EchoTech Laboratories in Kamloops. A split was sent To Becquerel for analyses by neutron activation, and another split was sent to Acme for analysis by its Ultra-Trace method. The new Ultra-Trace results are attached; the neutron activation results are not attached. Neither of these new sets of data have been reprocessed into new maps, at this stage, for on preliminary visual scanning, it appeared that any new maps prepared from these data, would not materially change the exploration targets defined by the previous soil geochemistry results.

Also, whole rock analyses were done in conjunction with reconnaissance geological mapping on the property (see Stephen Roach's Report). The whole rock analyses that he had done are included herein for the sake of completeness.

These whole rock analyses were also done on the samples obtained from the trenching. They have been scanned by the author in conjunction with this report, but detailed work on them, to allow for classification of rock types, has not been done.

Acme File Hyd5708.csv

ELEMENT	As	Sb	Bi	Ge	Se	Te	HYDRIDE
SAMPLES	ppm	ppm	ppm	ppm	ppm	ppm	
TRENCH-A 13+50S 8+25E	57.8	0.3	1.4	0.1	1	0.2	
TRENCH-B 8+00S 4+50E	0.7	0.2	5.4	0.1	0.6	0.3	
TRENCH-E 15+00S 5+50E	4.3	0.2	1.8	0.1	7.5	0.2	
TRENCH-G 2+00N 4+75W	7.9	0.2	1.5	0.1	2.9	0.2	
TRENCH-A COLLEEN RD. SPL.	87.3	2.8	4.5	0.1	0.9	0.2	
T-HOLE 30 15+90S 3+75W	1.9	0.9	125.8	0.1	2.9	5.4	
T-HOLE 33 3+75S 2+50W	27.2	0.2	2.2	0.1	2.4	0.2	
RE T-HOLE 33 3+75S 2+50W	26.4	0.3	1.8	0.1	2.4	0.2	
STANDARD C2	42.1	16.2	20.8	0.2	0.5	0.2	

Acme file # 96-6141 Page 1 Received: NOV 21 1996 * 102 samples in this disk file.

ELEMENT	As	Sb	Bi	Ge	Se	Te	HYDRIDE
SAMPLES	ppm	ppm	ppm	ppm	ppm	ppm	
F-001	31.1	2.7	2	0.1	1.2	0.2	
F-002	1.1	0.1	0.2	0.1	0.5	0.2	
F-003	0.7	0.3	20	0.1	0.3	0.9	
F-004	0.1	0.6	0.3	0.1	6.3	0.2	
T-A-A	1	0.1	0.3	0.1	0.6	0.2	
T-A-B	17	2.1	4.3	0.1	0.1	0.3	
T-A-C	119.4	1.8	4.4	0.1	0.1	0.3	
T-A-D	6.7	0.1	0.4	0.1	0.1	0.2	
T-A-E	1.2	1.3	403.5	0.1	5.7	4.7	
T-A-F	0.4	0.1	2.1	0.1	0.1	0.3	
T-B-A	2.1	0.6	4.3	0.1	0.6	0.2	
T-B-B	0.2	0.1	1.8	0.1	0.6	0.2	
T-B-C	0.1	0.1	1	0.1	0.1	0.2	
T-C-A	0.7	1.4	358.5	0.1	3.3	2.1	
T-C-B	0.1	0.1	1.8	0.1	0.3	0.2	
T-C-C	1.6	0.4	1.7	0.1	0.1	0.2	
T-C-D	0.3	0.1	4.4	0.1	0.8	0.6	
T-C-E	0.1	0.1	0.8	0.1	0.1	0.2	
T-C-F	3.1	0.1	2.1	0.1	0.1	0.2	
T-D-A	0.3	0.1	2.2	0.1	0.1	0.2	
T-D-B	0.2	0.1	0.5	0.3	0.3	0.3	
RE T-D-B	0.1	0.1	0.5	0.1	0.1	0.2	
T-E-A	16.8	0.1	1.1	0.1	2.3	0.2	
T-E-B	6.8	0.1	0.6	0.2	2.8	0.3	
T-E-C	4.1	0.1	1	0.2	1.3	0.3	
T-E-D	18.4	0.1	0.7	0.1	0.7	0.2	
T-F-A	0.3	0.1	0.7	0.1	3.8	0.2	
T-F-B	0.5	0.1	0.5	0.2	1.5	0.3	
T-F-C	0.3	0.1	0.8	0.1	4.9	0.2	
T-F-D	0.3	0.1	0.6	0.1	4.7	0.3	
T-F-E	1.1	0.1	0.2	0.2	1.4	0.2	
T-G-A	12.5	0.1	0.9	0.1	1.4	0.2	
T-G-B	1.3	0.2	18.5	0.2	0.4	0.7	
T-G-C	180.1	0.6	2.8	0.2	5.3	0.3	
T-G-D	19.8	0.2	0.9	0.2	1.3	0.2	
T-G-E	15.5	0.1	4.9	0.1	3.2	0.3	
STANDARD C2	39.9	18.3	19	0.1	0.1	0.2	
T-7-A	0.4	0.1	0.7	0.1	0.6	0.2	
T-7-B	0.1	0.1	0.2	0.1	0.8	0.2	
T-9-A	0.4	0.1	1	0.1	0.4	0.3	
T-9-B	0.1	0.1	0.2	0.1	0.6	0.2	
T-11-A	0.1	0.1	1.5	0.1	0.7	0.3	
T-11-B	0.1	0.1	0.1	0.1	0.1	0.2	
T-11-C	0.2	0.1	0.4	0.1	0.1	0.2	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

T-31-A	0.2	0.1	0.3	0.1	0.1	0.2
T-31-B	8.9	0.1	13.6	0.1	0.4	0.2
T-31-C	1.1	0.1	1	0.1	0.1	0.3
T-32-A	6.6	0.5	0.4	0.1	0.1	0.2
T-32-B	0.9	0.1	1.3	0.1	0.4	0.2
T-32-C	34.5	0.1	3.2	0.1	1.2	0.2
RE T-33-A	59.6	0.2	1.1	0.1	1.2	0.3
T-33-A	59.7	0.1	0.7	0.1	1	0.2
T-33-B	81.1	0.2	1.2	0.1	1.2	0.2
T-33-C	53.5	0.1	1.1	0.1	2.3	0.2
T-33-D	52.5	0.1	1.4	0.1	2.1	0.2
T-34	3.2	0.1	0.4	0.1	0.2	0.2
T-35	2.6	0.1	0.3	0.1	0.1	0.2
T-36	0.1	0.1	0.2	0.1	0.5	0.2
91551	0.1	0.1	0.7	0.1	2.1	0.2
91552	0.1	0.1	0.1	0.1	0.4	0.2
91558	0.1	0.1	0.4	0.1	0.5	0.2
91559A	0.1	0.1	0.3	0.1	0.1	0.2
91559B	0.2	0.1	3.6	0.1	0.1	0.3
91561	0.5	0.1	0.4	0.1	0.4	0.2
A9605A	1.3	0.1	0.1	0.1	0.2	0.2
A9605B	0.5	0.1	0.1	0.1	0.4	0.2
J9606A	0.5	0.1	0.5	0.1	0.2	0.2
J9606B	8.8	22.6	0.8	0.1	0.4	0.2
L9601	0.1	0.1	0.5	0.1	0.1	0.2
L9603	2.5	0.1	0.6	0.1	0.8	0.2

Acme file # 96-6165 Page 1 Received: NOV 22 1996 * 2 samples in this disk file.

ELEMENT	As	Sb	Bi	Ge	Se	Te	HYDRIDE
SAMPLES	ppm	ppm	ppm	ppm	ppm	ppm	
A-TR	4.9	0.1	0.3	0.1	0.1	0.2	
B-TR	0.7	0.1	0.1	0.1	1.1	0.2	
RE B-TR	0.6	0.1	0.1	0.1	1.1	0.2	

Page TH (2)

1996 TRENCHES

Acme file # 96-[illegible] Received: NOV 1 1996 * 8 sa[illegible] ICP

ELEMENT	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Tl	Hg	Au**	Pt**	Pd**
SAMPLES	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppb	ppb	ppb	ppb
TRENCH-A	3	82	16	27	0.3	29	22	160	4.31	63	5	2	2	10	0.2	2	2	3	0.27	0.02	6	22	0.2	38	0.01	3	0.27	0.01	0.18	7	5	40	19	1	1
TRENCH-B	2	52	167	108	0.8	59	27	727	4.42	2	5	2	11	16	0.2	2	7	53	0.44	0.15	51	48	0.89	82	0.11	3	1.5	0.04	0.53	2	5	10	3	1	1
TRENCH-E	14	233	42	456	0.3	136	46	1235	7.47	6	5	2	6	238	3.7	2	2	28	3.57	0.07	6	23	1.8	87	0.01	3	0.82	0.04	0.16	2	5	25	34	1	4
TRENCH-G	8	41	23	463	0.3	58	20	607	4.4	7	5	2	5	65	7.8	2	2	114	1.32	0.13	15	49	1.41	87	0.02	3	1.13	0.08	0.26	2	5	20	1	1	2
TRENCH-A	2	21	39	15	0.3	28	20	381	5.31	95	5	2	2	6	0.2	3	5	3	0.07	0.03	7	24	0.01	31	0.01	3	0.14	0.01	0.07	11	5	25	42	1	1
T-HOLE 30	7	213	150	9	4.1	22	21	191	5.68	2	5	2	2	5	0.2	2	155	2	0.17	0.00	2	20	0.06	6	0.01	3	0.07	0.01	0.01	3	5	10	1065	1	4
T-HOLE 33	1	90	5	55	0.3	49	22	965	4.49	31	5	2	7	99	0.3	2	2	16	1.82	0.06	11	16	0.95	101	0.01	3	0.57	0.05	0.17	2	5	10	7	1	1
RE T-HOLE	1	91	4	54	0.3	50	23	979	4.54	28	5	2	8	100	0.3	2	2	16	1.85	0.05	10	14	0.98	100	0.01	3	0.57	0.05	0.17	2	5	10	7	1	3
STANDARD	22	62	40	150	7.1	79	40	1270	4.27	47	16	9	37	54	20.9	18	20	78	0.6	0.11	41	68	1.05	209	0.08	27	2.04	0.07	0.15	13	5	475	49	46	46

Acme file # 96-6141 Page 1 Received: NOV 21 1996 * 1[illegible] ICP

ELEMENT	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Tl	Hg	Au**	Pt**	Pd**
SAMPLES	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppb	ppb	ppb	ppb
F-001	7	209	10283	75998	3.7	29	8	507	10.3	35	5	2	3	7	315	2	6	13	0.2	0.05	6	28	0.39	9	0.04	3	0.43	0.02	0.23	2	5	2285	17	8	12
F-002	1	1858	50	395	0.5	46	23	507	3.5	2	5	2	14	25	2.9	2	2	38	1	0.05	30	45	0.99	156	0.1	3	1.5	0.05	0.41	5	5	25	7	1	2
F-003	13	816	81	205	2.6	909	211	2098	37.4	2	5	2	2	10	0.2	2	39	109	0.33	0.07	3	24	0.27	5	0.01	3	0.46	0.01	0.01	2	12	45	36	23	70
F-004	6	99999	178	546	33.2	14	99	66	33.2	17	5	9	5	4	18.3	2	2	19	0.03	1.34	5	3	0.12	7	0.01	11	0.21	0.01	0.04	2	29	40	296	2	233
T-A-A	1	240	3	27	0.3	7	3	92	0.88	2	5	2	3	4	0.2	2	2	3	0.08	0.04	13	21	0.01	16	0.01	3	0.08	0.02	0.06	8	5	60	2	1	1
T-A-B	4	57	33	77	1.1	14	7	55	4.06	22	5	2	5	16	0.2	3	6	6	0.08	0.05	12	30	0.02	59	0.01	3	0.25	0.07	0.12	8	5	25	30	2	2
T-A-C	1	370	77	32	0.8	144	139	71	20.1	119	5	2	2	2	0.2	5	2	1	0.01	0.00	2	34	0.01	4	0.01	3	0.02	0.03	0.01	29	5	10	77	1	1
T-A-D	4	82	10	97	0.3	14	4	72	1.31	6	5	2	2	4	0.2	2	2	3	0.06	0.03	15	40	0.02	34	0.01	3	0.15	0.02	0.11	10	5	10	4	1	1
T-A-E	4	182	248	23	1	46	29	55	5.4	2	5	2	2	3	0.2	2	403	1	0.06	0.02	1	33	0.01	4	0.01	3	0.02	0.01	0.02	12	5	10	33	2	2
T-A-F	1	64	3	13	0.4	24	15	207	3.57	2	11	2	12	16	0.2	2	2	3	0.52	0.09	23	11	0.17	68	0.01	3	0.49	0.01	0.25	3	5	10	2	3	4
T-B-A	1	55	283	104	1.8	56	25	318	4.04	2	5	2	17	27	0.2	2	4	61	0.82	0.33	57	65	0.9	55	0.1	3	1.32	0.09	0.43	7	5	10	2	1	1
T-B-B	2	41	32	160	0.5	52	27	403	5.39	2	5	2	13	16	0.2	2	4	55	0.3	0.11	35	50	1.26	83	0.11	3	2.46	0.06	0.47	4	5	10	1	1	1
T-B-C	1	14	84	22	0.4	15	5	393	1.23	2	5	2	2	4	0.2	2	2	2	0.18	0.01	8	25	0.09	14	0.01	3	0.17	0.01	0.05	10	5	10	1	1	1
T-C-A	2	113	473	19	3.8	53	27	38	3.61	2	5	2	2	1	0.2	2	358	1	0.01	0.00	1	27	0.02	5	0.01	3	0.04	0.01	0.02	7	5	10	29	1	3
T-C-B	1	18	3	46	0.3	12	4	91	1.15	4	5	2	7	4	0.2	2	4	3	0.04	0.01	16	23	0.09	49	0.01	3	0.34	0.01	0.15	7	5	10	1	1	1
T-C-C	1	33	14	66	0.3	13	6	1766	3.03	2	5	2	3	137	0.3	2	2	3	3.24	0.01	5	21	1.17	23	0.01	3	0.25	0.04	0.05	10	5	15	2	1	1
T-C-D	3	420	7	12	0.6	115	85	72	12	2	5	2	3	6	0.2	2	3	1	0.07	0.01	3	30	0.01	12	0.01	3	0.06	0.01	0.04	12	5	15	3	1	2
T-C-E	2	20	20	32	0.3	14	5	176	1.26	2	5	2	3	11	0.2	2	2	7	0.24	0.01	7	34	0.25	47	0.01	3	0.2	0.04	0.11	12	5	10	1	2	1
T-C-F	1	58	14	62	0.5	31	16	631	2.8	5	5	2	8	26	0.2	2	2	4	0.65	0.03	10	23	0.38	43	0.01	3	0.4	0.07	0.06	7	5	10	4	2	2
T-D-A	1	51	30	186	0.3	58	34	762	6.06	2	5	2	12	46	0.2	2	6	112	1.55	0.14	36	89	1.48	163	0.19	3	1.99	0.04	1.03	4	5	10	4	1	1
T-D-B	1	43	11	159	0.5	50	27	227	5.18	2	5	2	10	13	0.2	2	2	37	0.35	0.1	26	41	1.24	74	0.09	3	2.45	0.02	0.43	2	5	10	1	1	1
RE T-D-B	1	42	7	154	0.3	48	27	222	5.07	2	5	2	8	13	0.2	2	2	37	0.33	0.1	26	37	1.21	72	0.09	3	2.39	0.02	0.42	2	5	10	1	1	1
T-E-A	2	75	38	443	0.3	157	30	1973	5.8	19	5	2	5	611	2.5	2	2	23	7.54	0.07	2	29	3.17	64	0.01	3	0.56	0.02	0.1	2	5	10	2	1	2
T-E-B	1	53	16	701	0.3	186	25	2167	6.38	4	5	2	4	495	4.5	2	2	38	7.7	0.1	3	72	3.67	175	0.01	3	0.73	0.06	0.23	2	5	10	3	2	2
T-E-C	15	75	14	219	0.3	73	15	674	3.12	5	7	2	6	228	1.2	2	2	27	2.46	0.06	7	19	0.99	74	0.01	3	0.36	0.07	0.1	2	5	15	2	1	3
T-E-D	3	43	10	1285	0.3	122	27	1605	4.66	20	5	2	6	378	9.6	2	2	25	6.16	0.07	4	28	2.56	84	0.01	3	0.64	0.05	0.12	2	5	20	2	1	2
T-F-A	1	88	8	136	0.3	56	23	497	3.71	2	5	2	13	94	0.9	2	2	17	1.91	0.08	7	11	0.73	46	0.01	3	0.68	0.03	0.22	2	5	10	4	2	1
T-F-B	5	44	13	266	0.3	38	11	1321	3.71	2	5	2	6	261	1	2	2	16	5.08	0.08	6	11	1.71	116	0.01	3	0.52	0.04	0.15	2	5	15	3	1	3
T-F-C	1	109	10	152	0.3	59	30	383	4.09	2	5	2	10	79	0.6	2	2	18	1.55	0.07	11	13	0.57	43	0.01	3	0.83	0.05	0.3	2	5	10	3	1	1
T-F-D	1	88	4	139	0.3	47	21	530	3.82	2	5	2	10	102	0.7	2	4	30	1.95	0.11	13	13	0.7	52	0.01	3	1.04	0.05	0.38	2	5	10	3	1	1
T-F-E	27	34	19	491	0.3	47	9	1469	4.12	2	5	2	9	304	2.1	2	2	37	6.39	0.15	8	20	2.36	108	0.01	3	0.68	0.06	0.2	2	5	10	1	2	4
T-G-A	5	44	3	18	0.3	40	15	421	3.14	16	5	2	4	19	0.2	2	2	11	0.26	0.03	14	12	0.34	87	0.01	3	0.7	0.05	0.19	4	5	10	4	1	1
T-G-B	6	138	19	99	0.5	19	8	138	2.6	2	5	2	2	12	0.2	2	20	4	0.22	0.01	2	42	0.08	21	0.01	3	0.1	0.04	0.03	13	5	10	213	1	1
T-G-C	1	113	39	11	0.3	84	17	74	8.24	180	5	2	5	9	0.2	2	2	16	0.09	0.05	7	12	0.02	11	0.01	3	0.28	0.08	0.08	3	5	10	50	1	1
T-G-D	38	46	17	661	0.3	66	8	1054	2.89	13	5	2	8	152	18.1	2	2	113	2.84	0.51	29	30	0.93	53	0.01	3	0.43	0.07	0.18	2	5	10	3	3	6
T-G-E	102	81	137	749	1.6	126	15	686	3.49	14	10	2	10	164	17.5	2	4	79	3.25	0.98	27	28	0.71	54	0.01	3	0.58	0.08	0.18	3	5	10	4	6	17
STANDARD	20	56	45	131	6.8	70	36	1054	3.79	44	21	8	34	48	19.8	18	21	68	0.51	0.1	38	62	0.92	184	0.08	25	1.89	0.06	0.13	14	5	455	51	49	49
T-7-A	4	34	9	54	0.3	29	17	502	3.76	2	5	2	3	17	0.2	2	5	36	0.36	0.06	16	27	0.55	105	0.1	3	0.77	0.04	0.45	2	5	30	18	1	1
T-7-B	1	18	20	157	0.3	36	19	228	4.86	2	6	2	8	25	0.2	2	4	141	0.53	0.2	25	90	1.45	167	0.41	3	2.14	0.09	1.62	2	5	35	1	1	1
T-9-A	2	83	38	165	0.3	58	27	153	6.08	2	5	2	8	23	0.2	2	5	102	0.31	0.08	34	90	1.36	44	0.23	3	1.92	0.11	1.09	2	5	15	1	1	1
T-9-B	1	28	15	129	0.3	39	22	610	4.51	2	5	2	4	125	0.2	3	2	115	1.86	0.1	19	91	1.24	55	0.32	3	1.61	0.12	1.26	2	5	20	1	1	1
T-11-A	1	65	119	193	0.9	14	12	5437	6.37	6	10	2	2	1202	2.4	2	2	126	22.2	0.01	4	13	2.55	155	0.25	3	2.1	0.02	1.78	2	5	40	2	1	1
T-11-B	1	36	7	123	0.3	27	18	423	4.22	2	5	2	7	80	0.2	2	3	95	1.36	0.17	24	61	1.16	66	0.27	3	1.53	0.09	1.19	2	5	10	1	1	1
T-11-C	7	5	5	35	0.3	35	8	1721	4.53	2	5	2	2	291	0.6	2	2	20	7.98	0.16	10	14	2.93	138	0.01	3	0.52	0.02	0.19	2	5	30	1	2	2
T-11-D	1	32	6	120	0.3	24	18	391	4.22	3	7	2	7	59	0.2	2	2	89	1.1	0.17	22	55	1.08	52	0.26	3	1.43	0.11	1.1	2	5	25	1	1	1
T-11-E	1	17	10	133	0.3	40	37	263	5.45	2	5	2	5	39	0.2	2	2	103	0.51	0.11	19	78	1.26	30	0.24	3	1.78	0.08	1.02	2	5	15	1	1	2
T-12	1	3	3	112	0.3	28	14	560	3.29	2	6	2	7	229	0.8	2	2	20	7.08	0.04	21	29	2.17	78	0.01	3	2.1	0.02	0.15	2	5	20	1	1	1
T-14-A	1	1452	5928	11	17.3	368	204	24	29	2	5	2	2	5	0.2	6	125	1	0.05	0.00	2	8	0.01	5	0.01	3	0.07	0.01	0.02	2	5	105	40	1	1
T-14-B	4	930	14658	9	41.2	58	64	68	11.2	2	5	2	3	7	3.1	2	88	3	0.11	0.00	6	14	0.03	3	0.01	3	0.17	0.03	0.08	3	5	170	6	2	1
T-16-A	8	85	306	16	0.7	26	9	279	2.21	2	5	2	20	22	0.2	2	5	5	0.53	0.02	67	35	0.16	32	0.01	3	0.35	0.02	0.12	10	5	10	3	1	1

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T-16-B	[illegible]	15	193	15	0.6	15	3	217	0.99	2	5	2	28	15	0.2	2	[illegible]	4	0.39	0.02	64	16	0.18	51	0.03	3	0.35	0.02	0.13	2	5	10	[illegible]	1	1
RE T-16-B	3	15	187	13	0.7	15	3	211	0.97	2	5	2	28	15	0.2	2	2	4	0.37	0.02	63	18	0.18	50	0.03	3	0.34	0.02	0.13	2	5	10	1	1	1
T-17	2	37	27	129	0.3	43	24	234	4.57	2	5	2	7	9	0.2	2	2	23	0.25	0.09	20	34	1.17	66	0.04	3	2.14	0.01	0.24	2	5	10	1	1	1
T-18-A	2	9	38	12	0.3	12	4	561	0.75	2	5	2	2	62	0.2	2	2	2	1.92	0.04	3	10	0.09	11	0.01	3	0.16	0.01	0.04	2	5	10	2	1	1
T-18-B	2	35	18	124	0.3	46	25	349	5.02	2	5	2	8	11	0.2	2	2	39	0.24	0.08	32	54	1.26	71	0.07	3	2.37	0.04	0.31	2	5	10	1	1	1
T-18-C	2	33	10	143	0.3	46	25	271	5.01	2	5	2	14	14	0.2	2	2	24	0.26	0.09	50	27	1.28	77	0.05	3	2.5	0.02	0.35	2	5	10	1	1	1
T-19	3	42	36	129	0.3	38	22	523	4.35	4	5	2	9	38	0.2	2	2	95	0.97	0.11	22	71	1.04	93	0.12	3	1.33	0.06	0.61	2	5	25	1	1	1
T-20	4	42	11	152	0.3	63	23	220	4.63	2	5	2	18	11	0.2	2	2	25	0.17	0.05	51	38	1.37	65	0.04	3	2.44	0.03	0.22	2	5	20	1	1	1
T-21-A	1	77	3	46	0.3	48	25	165	4.88	4	7	2	18	37	0.2	2	2	15	1.19	0.06	23	20	1.01	64	0.06	3	1.31	0.02	0.54	2	5	10	1	1	1
T-21-B	2	54	9	32	0.3	35	17	337	3.58	2	5	2	6	77	0.2	2	2	11	2.47	0.06	17	25	0.8	84	0.04	3	0.88	0.01	0.4	2	5	10	1	1	1
T-23	2	1	3	170	0.3	45	21	409	3.87	2	5	2	13	12	0.2	2	2	17	0.24	0.08	41	34	1.24	41	0.03	3	2.33	0.02	0.2	2	5	10	1	1	1
T-24-A	2	18	7	12	0.3	16	9	661	1.43	2	5	2	8	19	0.2	2	2	5	1.31	0.03	19	24	0.58	10	0.01	3	0.5	0.04	0.06	2	5	10	1	1	1
T-24-B	1	34	15	81	0.3	58	23	343	4.06	2	7	2	13	9	0.2	2	2	24	0.3	0.05	24	48	1.49	37	0.01	3	2.3	0.02	0.15	2	5	10	1	1	1
T-24-C	1	30	15	59	0.3	44	17	348	3.18	3	5	2	13	10	0.2	2	2	20	0.44	0.05	26	43	1.15	32	0.01	3	1.77	0.03	0.13	2	5	10	1	1	1
T-25-A	3	27	31	36	0.3	23	9	152	1.73	2	5	2	2	5	0.2	2	2	6	0.04	0.01	7	21	0.27	15	0.01	3	0.49	0.01	0.06	4	5	15	1	1	1
T-25-B	1	53	18	90	0.3	78	27	222	4.45	2	5	2	14	6	0.2	2	2	16	0.12	0.04	21	29	1.2	38	0.01	3	2.02	0.01	0.18	2	5	15	1	1	1
T-25-C	3	24	21	41	0.3	35	11	604	2.6	2	5	2	8	16	0.2	2	2	16	0.52	0.03	15	35	0.8	15	0.01	3	1.07	0.03	0.07	4	5	10	3	1	1
T-26-A	3	25	4	7	0.3	10	5	874	1.17	2	5	2	2	52	0.2	2	2	1	1.63	0.01	5	12	0.35	10	0.01	3	0.13	0.01	0.06	2	5	10	5	1	1
T-26-B	3	9	3	4	0.3	9	3	103	0.46	2	5	2	2	5	0.2	2	2	1	0.19	0.01	6	17	0.06	7	0.01	3	0.09	0.01	0.06	2	5	10	1	1	1
T-27	2	12	21	49	0.4	14	5	359	1.25	2	6	2	28	27	0.2	2	2	6	0.78	0.04	45	21	0.34	64	0.07	3	0.41	0.02	0.14	2	5	10	2	1	1
T-28	1	26	30	131	0.3	50	32	204	3.81	2	5	2	11	14	0.2	2	3	30	0.35	0.13	43	41	1.17	73	0.07	3	2.14	0.02	0.35	2	5	10	1	1	1
STANDARD	20	55	50	140	6.5	69	36	1074	3.8	43	16	6	33	48	19.4	16	17	68	0.51	0.1	39	63	0.96	183	0.07	24	1.96	0.06	0.13	16	5	465	46	43	45
T-29-A	1	35	10	125	0.3	52	27	472	5.15	2	5	2	13	17	0.2	2	4	40	0.39	0.11	37	55	1.13	66	0.07	3	2.17	0.05	0.26	2	5	15	1	1	1
T-29-B	2	27	6	101	0.3	45	23	350	4.21	2	5	2	13	10	0.2	2	5	29	0.18	0.07	29	39	0.89	60	0.05	3	1.74	0.05	0.21	2	5	15	1	1	1
T-30-A	3	576	116	3	2.2	28	29	110	6.98	2	5	2	2	5	0.2	2	158	1	0.14	0.03	1	17	0.02	4	0.01	3	0.05	0.01	0.01	6	5	20	1388	1	1
T-30-B	3	81	31	23	0.8	24	13	222	3.28	5	5	2	11	13	0.2	2	12	10	0.31	0.01	21	23	0.36	34	0.02	5	0.68	0.07	0.11	2	5	30	68	1	1
T-30-C	3	80	42	29	0.8	22	9	156	2.75	4	5	2	11	7	0.2	2	13	12	0.11	0.02	30	37	0.39	32	0.03	4	0.71	0.04	0.13	4	5	25	52	1	2
T-30-D	1	50	15	76	0.3	40	13	239	4.3	2	5	2	11	11	0.2	2	3	18	0.19	0.02	24	37	1.07	114	0.1	3	1.76	0.04	0.58	2	5	15	5	1	1
T-31-A	2	23	11	29	0.3	19	6	896	1.84	2	5	2	17	28	0.2	2	2	7	1.21	0.02	31	23	0.36	28	0.01	3	0.5	0.03	0.11	2	5	10	1	1	1
T-31-B	3	71	81	13	0.9	28	10	1123	2.69	4	5	2	12	20	0.2	2	20	4	0.76	0.02	25	1	0.25	50	0.01	3	0.37	0.01	0.22	433	5	10	3	1	1
T-31-C	1	35	19	31	0.3	16	6	747	1.85	2	5	2	18	22	0.2	2	2	5	0.81	0.02	33	15	0.41	36	0.03	3	0.48	0.01	0.24	17	5	15	2	1	1
T-32-A	1	21	9	144	0.3	55	27	453	5.21	2	5	2	10	20	0.2	2	3	21	0.36	0.07	30	42	1.3	78	0.02	3	2.56	0.02	0.2	23	5	10	1	1	1
T-32-B	5	68	26	121	0.4	39	33	822	5.62	6	5	2	6	64	0.4	2	3	49	1.37	0.06	14	30	1.51	69	0.01	3	1.48	0.09	0.1	3	5	25	3	1	1
T-32-C	233	12	235	29	1.3	46	13	546	3.83	38	5	2	7	238	0.2	2	4	40	5.33	0.87	6	30	1.11	72	0.01	3	0.37	0.11	0.12	13	5	10	1	3	4
RE T-33-A	2	31	6	31	0.4	45	17	1319	4.74	59	5	2	10	253	0.2	2	2	16	4.61	0.06	9	12	1.35	81	0.01	3	0.33	0.05	0.12	2	5	10	5	1	2
T-33-A	2	32	8	32	0.3	46	18	1330	4.76	71	7	2	10	255	0.2	2	2	16	4.65	0.07	9	11	1.36	82	0.01	3	0.33	0.05	0.11	2	5	15	5	1	1
T-33-B	6	53	12	32	0.3	56	22	1170	4.74	89	5	2	11	207	0.2	2	3	26	3.84	0.11	12	14	1.21	130	0.01	3	0.54	0.1	0.21	2	5	10	10	1	2
T-33-C	1	62	8	79	0.5	80	21	1756	4.94	59	5	2	11	212	0.4	2	2	12	4.53	0.07	16	11	1.55	119	0.01	3	0.49	0.05	0.19	2	5	15	5	1	1
T-33-D	1	96	5	32	0.3	55	27	1118	4.08	58	5	2	8	166	0.2	2	4	13	3.01	0.05	6	9	1.11	72	0.01	3	0.36	0.06	0.11	2	5	10	7	1	1
T-34	2	50	20	83	0.3	46	19	1334	4.31	2	5	2	7	54	0.2	2	2	17	1.74	0.03	7	44	1.41	32	0.01	3	1.58	0.03	0.14	3	5	25	1	1	1
T-35	2	44	8	37	0.3	40	15	832	2.79	2	5	2	10	33	0.2	2	2	18	1.94	0.03	17	41	0.88	40	0.04	3	1.13	0.07	0.17	3	5	10	1	1	1
T-36	1	37	3	104	0.3	61	22	312	4.75	2	5	2	10	8	0.2	2	2	23	0.21	0.07	26	59	1.46	25	0.02	3	2.16	0.03	0.13	2	5	20	1	1	2
91551	4	163	13	225	0.3	198	41	1233	10.6	2	5	2	7	164	0.8	2	2	131	4.43	0.15	24	224	3.91	89	0.01	3	4.55	0.02	0.19	2	5	30	3	1	1
91552	2	6	6	216	0.3	34	24	2193	8.68	2	5	2	4	179	0.7	2	2	54	7.2	0.26	10	34	3.13	15	0.01	3	4.3	0.01	0.03	2	5	55	1	1	1
91558	1	38	9	144	0.3	62	22	599	5.51	2	8	2	8	10	0.2	2	2	23	0.18	0.04	12	45	1.72	32	0.01	3	2.6	0.01	0.15	2	5	10	1	1	2
91559A	2	28	10	247	0.3	23	10	449	4.36	2	5	2	9	12	0.2	2	2	14	0.34	0.05	16	32	1.09	21	0.01	3	1.73	0.02	0.11	2	5	10	2	1	1
91559B	3	8	278	28	1.1	18	4	835	1.65	2	5	2	2	16	0.2	2	2	2	0.53	0.01	1	17	0.16	20	0.01	3	0.17	0.01	0.04	2	5	10	1	1	1
91561	1	59	12	123	0.3	87	31	396	5.99	2	5	2	16	14	0.2	2	2	24	0.22	0.04	31	54	1.6	46	0.01	3	2.72	0.01	0.23	2	5	35	1	1	2
A9605A	1	58	19	59	0.3	38	15	859	3.62	2	5	2	11	312	0.3	2	2	49	6.18	0.03	16	49	1.56	144	0.04	3	1.56	0.07	0.34	2	5	10	1	1	1
A9605B	1	2	32	20	0.5	2	1	500	0.33	2	5	2	3	966	0.2	4	2	1	43.7	0.04	2	4	0.21	30	0.01	3	0.04	0.01	0.02	2	5	25	3	1	1
J9606A	1	49	30	85	0.3	45	18	1095	4.32	2	5	2	10	59	0.2	2	2	34	1.48	0.05	21	42	1.33	42	0.01	3	1.65	0.08	0.18	2	5	20	2	1	3
J9606B	4	41	25428	13581	25	12	12	64	1.83	2	5	2	6	29	15.8	25	2	3	0.92	0.02	10	15	0.09	40	0.01	4	0.27	0.04	0.1	2	5	90	25	1	4
L9601	1	50	252	147	0.3	43	26	543	5.89	2	5	2	13	19	0.2	2	2	26	0.26	0.06	47	42	1.33	72	0.01	3	2.84	0.03	0.26	2	5	30	1	1	1
L9603	1	30	626	227	0.3	41	17	550	4.6	2	5	2	11	78	0.2	2	2	71	1.23	0.09	32	54	1.12	46	0.01	3	1.01	0.07	0.07	2	5	20	2	1	1
STANDARD	21	57	44	139	6.9	71	37	1122	3.96	43	23	10	33	50	19.7	19	23	69	0.53	0.11	39	62	0.93	194	0.08	26	1.88	0.06	0.14	14	5	470	47	48	45

Acme file # 96-6165 Page 1 Received: NOV 22 1996 ICP

ELEMENT	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Tl	Hg	Au**	Pt**	Pd**
SAMPLES	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppb	ppb	ppb	ppb
A-TR	1	11	17	78	0.3	20	12	2758	7.09	7	5	2	3	125	0.4	2	2	20	2.85	0.16	7	21	0.54	6	0.01	3	0.44	0.01	0.01	7	5	10	1	1	1
B-TR	1	4	12	46	0.3	5	1	76	0.46	2	5	2	2	52	0.3	2	2	1	4.71	0.00	4	28	0.06	8	0.01	3	0.07	0.01	0.03	9	5	10	1	1	1

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ICP 2

Acme file # 96-1750 Page 4 Received: MAY 13 1996 * 1 samples in this disk file. **WHOLE ROCK**

ELEMENT	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	Ba	Ni	Sr	Zr	Y	Nb	Sc	LOI	SUM
SAMPLES	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%
9645	41.65	2.84	8.32	43.2	2.25	0.25	0.05	0.04	0.05	0.11	0.324	11	1759	13	10	10	50	10	-0.2	99.13

Acme file # 96-6141 Page 1 Received: NOV 21 1996 * 102 samples in this disk file. **WHOLE ROCK**

ELEMENT	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	MnO	Cr_2O_3	Ba	Ni	Sr	Zr	Y	Nb	Sc	LOI	SUM
SAMPLES	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%
F-001	64.88	1.16	13.39	0.56	0.37	0.46	0.29	0.14	0.06	0.06	0.001	136	27	19	87	15	10	10	9	90.41
F-002	65.96	13.18	6.16	1.79	1.95	2.79	2.42	1.24	0.14	0.09	0.008	1198	45	188	319	31	12	11	2.8	98.81
F-003	20.84	2.42	52.3	0.71	0.69	0.14	0.04	0.16	0.13	0.89	0.006	5	470	12	62	21	10	10	21.1	99.5
F-004	4.52	0.76	39.01	0.21	0.13	0.23	0.05	0.07	0.27	0.01	0.001	5	20	10	29	10	10	10	15.3	60.57
T-A-A	94.22	1.09	1.22	0.09	0.31	0.4	0.37	0.11	0.08	0.01	0.001	110	20	10	95	11	10	10	1.8	99.74
T-A-B	83.16	3.92	5.43	0.16	0.76	1.23	1.8	0.34	0.11	0.01	0.004	615	20	31	117	16	10	10	2.4	99.45
T-A-C	49.43	0.06	32.65	0.01	0.15	0.27	0.05	0.01	0.01	0.01	0.001	5	23	10	23	10	10	10	17.2	99.83
T-A-D	92.75	2.25	1.86	0.16	0.2	0.28	0.7	0.18	0.07	0.01	0.005	232	20	10	124	13	10	10	1.5	100
T-A-E	88.52	0.1	6.78	0.02	0.1	0.14	0.06	0.02	0.08	0.01	0.001	11	34	10	29	10	10	10	4.2	100
T-A-F	67.19	15.49	5.37	1.09	0.7	0.34	4.57	0.85	0.21	0.03	0.009	1253	20	58	255	26	18	10	3.6	99.71
T-B-A	65.37	13.84	6.07	1.42	1.94	4.85	1.18	1.16	0.66	0.08	0.007	239	48	315	482	70	15	14	2	98.74
T-B-B	59.43	17.62	8.69	2.08	1.09	2.53	2.97	1.27	0.19	0.09	0.007	694	47	193	271	44	16	17	2.8	98.96
T-B-C	94.3	1.25	1.62	0.16	0.23	0.18	0.28	0.06	0.02	0.04	0.001	65	20	10	24	12	10	10	0.8	98.96
T-C-A	92.71	0.15	4.41	0.04	0.03	0.12	0.06	0.01	0.02	0.01	0.001	5	49	10	10	10	10	10	2.5	100.1
T-C-B	88.88	4.97	1.7	0.33	0.08	0.18	1.53	0.26	0.07	0.01	0.006	493	20	15	204	11	10	10	1.8	99.93
T-C-C	76.38	5.14	4.22	1.84	4.29	2.22	0.45	0.29	0.07	0.21	0.001	259	20	173	198	12	10	10	4.6	99.81
T-C-D	70.26	1.99	15.59	0.36	0.17	0.27	0.27	0.1	0.03	0.01	0.001	88	81	24	37	10	10	10	10	99.09
T-C-E	92.21	2.59	1.72	0.39	0.37	1.38	0.19	0.13	0.02	0.02	0.001	85	20	42	80	10	10	10	0.9	99.95
T-C-F	75.55	9.92	3.84	0.66	0.97	4.58	0.55	0.8	0.06	0.07	0.008	452	40	132	256	76	12	10	1.9	99.05
T-D-A	61.85	13.19	9.52	2.29	2.64	2.33	2.61	1.71	0.3	0.12	0.013	853	41	193	350	37	19	20	2.7	99.5
T-D-B	60.09	17.82	9.09	2.19	0.74	1.05	3.64	1.37	0.19	0.07	0.009	956	46	94	315	48	19	18	3.2	99.69
RE T-D-B	59.3	17.65	8.98	2.15	0.73	1.02	3.63	1.42	0.2	0.07	0.009	947	55	93	306	48	17	18	3.3	98.69
T-E-A	46.16	9.92	8.58	5.09	10.1	2.34	1.5	0.95	0.16	0.25	0.03	1139	148	741	94	24	12	13	14.5	99.94
T-E-B	42.46	10.38	8.97	5.6	10.1	2.26	1.7	1.29	0.21	0.27	0.031	1273	171	649	89	24	17	12	16.2	99.83
T-E-C	59.39	16.4	4.59	1.75	3.57	7.42	0.98	0.51	0.12	0.08	0.012	839	70	640	54	17	10	10	4.9	99.96
T-E-D	45.93	14.17	6.94	4.2	8.35	4.63	1.59	1.07	0.16	0.2	0.024	1179	128	654	84	20	11	14	12.2	99.78
T-F-A	55.71	18.79	6.19	1.91	2.9	3.41	3.64	1.11	0.19	0.07	0.012	3485	69	363	207	32	25	16	5.1	99.71
T-F-B	53.54	12.92	5.6	3.07	7.06	3.5	2.15	0.69	0.18	0.16	0.007	1501	49	506	118	26	13	10	10.1	99.32
T-F-C	53.68	20.07	6.82	1.73	2.41	3.76	3.86	1.08	0.19	0.05	0.012	3637	79	360	197	29	21	14	4.5	98.87
T-F-D	54.45	19.3	6.44	1.93	2.92	3.03	4.46	0.98	0.24	0.07	0.011	3782	53	327	173	30	17	17	4.6	99.15
T-F-E	48.63	11.88	6.16	3.97	8.94	3.7	1.48	0.82	0.37	0.19	0.008	844	60	499	150	30	15	10	12.7	99.09
T-G-A	64.77	16.81	4.72	1.12	0.43	4.7	2.71	0.89	0.11	0.05	0.004	2170	56	120	192	24	10	11	2.7	99.44
T-G-B	92.84	0.63	3.53	0.14	0.41	0.43	0.13	0.03	0.08	0.02	0.004	61	52	18	22	10	10	10	1.7	99.97
T-G-C	56.08	16.47	10.48	0.19	0.25	8.05	0.85	0.82	0.15	0.01	0.01	701	76	236	186	19	12	14	5.5	99.05

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T-G-D	64.37	11.76	4.19	1.58	3.98	5.62	0.72	0.52	1.07	0.13	0.006	861	81	276	149	35	10	10	4.6	98.76
T-G-E	62.46	12.88	5.01	1.23	4.43	6.08	0.75	0.6	1.97	0.08	0.008	781	116	295	95	62	10	10	4.3	100
STANDARD	49.29	12.61	7.04	7.29	5.82	2.46	1.9	1.61	2.48	1.34	0.919	2162	88	343	692	23	19	11	5.9	99.18
T-7-A	77.4	8.18	5.37	0.93	0.56	2.83	1.4	0.62	0.14	0.06	0.001	540	50	97	68	27	10	10	2	99.61
T-7-B	59.55	17.25	7.24	2.08	0.79	7.68	2.27	1.33	0.45	0.04	0.008	731	65	193	223	142	16	16	0.9	99.8
T-9-A	57.14	17.66	9.2	1.93	0.54	8.14	1.57	1.35	0.18	0.03	0.008	694	91	303	234	43	14	20	1.7	99.66
T-9-B	56.65	16.93	7.01	1.83	2.54	8.02	1.89	1.27	0.23	0.09	0.009	1092	65	332	190	31	10	17	3	99.73
T-11-A	21.64	5.72	8.3	3.44	31.7	1.22	2.44	0.53	0.06	0.59	0.001	3063	26	1522	38	115	10	15	23.7	100
T-11-B	63.66	13.93	7.07	1.75	1.89	6.55	1.74	1.1	0.37	0.07	0.003	959	53	193	285	43	10	16	2.4	100.8
T-11-C	46.53	9.39	6.51	4.29	10.5	1.3	2.04	0.58	0.35	0.21	0.008	879	63	390	91	22	11	10	17.8	99.77
T-11-D	67.08	12.66	6.74	1.62	1.5	5.9	1.67	1.02	0.37	0.06	0.005	934	59	160	301	44	10	15	1.9	100.8
T-11-E	56.54	18	8.54	1.89	0.73	7.43	2.5	1.23	0.24	0.05	0.009	1443	67	207	217	34	10	20	2.4	99.87
T-12	50.32	14.76	5.39	3.77	9.92	0.94	2.83	0.54	0.13	0.07	0.012	1424	58	389	106	13	10	12	11.6	100.6
T-14-A	37.33	0.48	41.78	0.06	0.08	0.1	0.12	0.07	0.01	0.01	0.002	41	89	14	39	10	10	10	19.3	99.35
T-14-B	70.61	1.43	14.51	0.11	0.36	0.38	0.39	0.23	0.05	0.01	0.001	131	95	23	253	10	10	10	11.4	99.55
T-16-A	87.13	3.74	3.05	0.4	0.71	0.44	0.93	0.74	0.08	0.03	0.003	180	48	55	529	12	14	10	2.3	99.67
T-16-B	88.58	4.58	1.77	0.41	0.54	0.6	1.1	0.76	0.06	0.03	0.002	485	41	53	669	24	10	10	1.9	100.5
RE T-16-B	87.69	4.56	1.78	0.4	0.54	0.61	1.11	0.73	0.04	0.03	0.005	484	24	53	714	25	10	10	2.1	99.79
T-17	59.72	18.96	8.04	2.03	0.54	0.93	4.29	1.3	0.18	0.06	0.013	1421	68	117	220	40	10	24	3.8	100.2
T-18-A	93.87	1.39	1.18	0.16	2.51	0.31	0.24	0.06	0.07	0.07	0.001	72	20	93	16	14	10	10	0.7	100.6
T-18-B	62.3	17.78	8.09	1.98	0.95	2.39	2.87	1.24	0.14	0.06	0.015	802	65	226	200	35	10	21	2.8	100.8
T-18-C	48.78	26.64	8.79	2.33	0.54	1.03	6.38	1.56	0.16	0.06	0.009	1365	63	170	430	84	14	30	4.4	101
T-19	59.31	18.12	6.88	1.54	2.39	6.66	1.53	1.37	0.2	0.08	0.011	385	50	547	235	38	10	24	1.9	100.2
T-20	55.27	22.45	7.13	2.14	0.65	1.92	4.22	0.91	0.08	0.04	0.014	1174	70	233	124	24	10	23	4.4	99.48
T-21-A	51.4	22.88	7.62	2.26	1.77	1.77	6.19	0.98	0.12	0.02	0.017	2382	53	317	129	25	10	25	4.6	100.1
T-21-B	68.61	12.41	5.4	1.62	3.34	0.98	3.33	0.4	0.1	0.04	0.005	1366	33	232	56	21	10	12	3.2	99.71
T-23	59.87	20.18	7.28	2.07	0.6	0.89	4.04	0.94	0.17	0.2	0.014	803	62	178	158	38	10	21	3.1	99.55
T-24-A	85.38	5.11	1.89	0.8	1.68	1.76	0.38	0.3	0.05	0.07	0.003	65	46	73	166	15	10	10	2.2	99.67
T-24-B	64.95	16.97	5.78	2.31	0.42	1.69	3.28	0.93	0.12	0.04	0.015	681	45	70	271	27	10	19	3.2	99.88
T-24-C	72.44	13.17	4.81	1.88	0.67	2.11	2.09	0.8	0.13	0.05	0.012	437	57	74	302	27	10	13	2.2	100.5
T-25-A	92.91	2.87	2.35	0.42	0.06	0.17	0.59	0.11	0.04	0.02	0.001	127	21	18	10	10	10	10	1.1	100.7
T-25-B	52.03	25.73	6.39	2.18	0.16	0.75	6.27	1.04	0.09	0.03	0.02	1244	95	97	211	38	10	27	4.5	99.46
T-25-C	84.37	6.47	3.58	1.18	0.75	1.64	0.59	0.41	0.07	0.07	0.004	129	57	95	213	14	10	10	1.5	100.7
T-26-A	92.4	1.11	1.59	0.54	2.01	0.12	0.28	0.1	0.04	0.1	0.001	63	20	65	76	10	10	10	2.1	100.4
T-26-B	97.29	1.11	0.72	0.12	0.25	0.14	0.29	0.04	0.01	0.01	0.001	46	20	10	39	10	10	10	0.9	100.9
T-27	86.32	4.75	2.25	0.6	1.01	0.71	1.04	0.73	0.08	0.05	0.003	521	20	105	816	31	10	10	2	99.76
T-28	62.9	17.64	7.08	2.06	0.56	1.79	3.7	1.55	0.27	0.06	0.011	1009	59	147	239	47	12	26	2.7	100.6
STANDARD	49.39	12.73	7.24	7.19	5.82	2.44	1.97	1.63	2.43	1.32	1.144	2168	90	424	736	23	10	13	5.9	99.74
T-29-A	59.55	18.34	8.02	1.91	0.86	3.4	2.87	1.43	0.22	0.09	0.012	718	33	227	357	51	18	20	2.8	99.72
T-29-B	67.62	15.08	6.44	1.53	0.43	2.33	2.56	1.22	0.13	0.07	0.01	663	47	151	277	39	15	16	2.4	100
T-30-A	87.94	0.24	8.14	0.05	0.19	0.13	0.06	0.01	0.11	0.01	0.003	13	20	10	20	10	10	10	2.8	99.69
T-30-B	76.61	10.46	4.5	0.93	0.81	2.95	0.88	0.35	0.06	0.03	0.001	286	24	174	162	12	10	10	2.1	99.78

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T-30-C	78.9	9.58	3.85	0.93	0.52	2.21	1.07	0.42	0.07	0.03	0.003	337	30	138	121	13	10	10	1.7	99.38
T-30-D	73.54	12.15	5.86	1.81	0.36	1.44	2.62	0.57	0.08	0.04	0.006	726	50	77	172	12	12	10	2.2	100.8
T-31-A	78.83	9.26	2.7	0.68	1.53	2.39	1.2	0.4	0.02	0.1	0.003	297	20	90	239	18	10	10	2.1	99.31
T-31-B	82.38	6.69	3.81	0.61	0.94	0.21	1.91	0.33	0.13	0.13	0.001	316	23	33	210	20	10	10	2.4	99.63
T-31-C	80.71	8.39	3.03	0.9	0.99	0.27	2.43	0.46	0.03	0.09	0.004	413	20	46	305	15	10	10	2.1	99.53
T-32-A	61.92	17.94	7.36	2.18	0.47	1.18	3.54	0.97	0.16	0.07	0.01	1212	43	104	163	36	17	17	3.4	99.46
T-32-B	56.67	18.75	7.56	2.47	1.92	6.8	1.2	0.84	0.1	0.09	0.006	857	39	377	72	124	12	13	3.9	100.5
T-32-C	66.18	7.51	4.97	1.77	6.61	3.71	0.3	0.37	1.85	0.06	0.005	213	48	329	85	39	12	10	7.4	100.8
RE T-33-A	51.95	16.63	6.34	2.25	5.76	7.09	1.24	0.63	0.16	0.15	0.009	1005	49	412	83	28	12	14	8.1	100.6
T-33-A	51.88	16.56	6.32	2.28	5.73	7.02	1.19	0.63	0.12	0.15	0.007	1075	40	411	74	26	12	13	8	100.1
T-33-B	52.48	16.96	5.99	2.03	4.59	6.73	1.57	0.7	0.2	0.13	0.009	1245	70	355	89	24	10	15	7.8	99.47
T-33-C	47.07	17.99	6.86	2.79	5.63	5.7	2.5	0.76	0.18	0.2	0.013	1711	73	343	110	31	10	17	9.5	99.56
T-33-D	53.66	17.55	5.41	1.9	3.75	7.37	1.37	0.96	0.14	0.12	0.007	939	55	336	120	29	14	15	7.1	99.57
T-34	71.3	10.1	5.61	2.22	2.07	1.38	1.62	0.5	0.09	0.14	0.006	358	61	108	120	12	12	10	4.6	99.74
T-35	75.03	8.72	4.21	1.46	2.53	2.12	1.01	0.49	0.1	0.1	0.008	250	42	80	151	13	10	10	3.9	99.76
T-36	69.25	13.34	6.75	2.42	0.32	1.8	1.73	0.89	0.16	0.05	0.01	369	48	62	193	21	11	10	2.7	99.53
91551	36.55	20.98	14.31	6.16	5.54	0.86	3.52	1.98	0.44	0.15	0.053	1421	204	236	125	38	35	22	8.6	99.47
91552	52.14	10.81	11.24	4.52	8.56	0.72	0.43	0.95	0.66	0.26	0.001	190	45	206	79	42	12	12	9.3	99.67
91558	56.9	20.76	7.92	3.11	0.23	0.96	4.16	0.85	0.13	0.07	0.009	812	57	75	127	31	12	18	4.1	99.38
91559A	78.58	8.6	5.57	1.72	0.42	1.16	1.07	0.48	0.16	0.05	0.001	202	29	54	250	22	10	10	2.4	100.3
91559B	94.28	1	2.15	0.26	0.61	0.11	0.19	0.05	0.05	0.09	0.001	54	32	15	10	10	10	10	1.1	99.91
91561	51.22	24.77	8.52	2.98	0.27	0.73	5.66	1.11	0.11	0.05	0.013	1003	97	79	154	39	11	22	4.6	100.3
A9605A	53.04	15.1	5.03	2.66	7.93	5.37	1.91	0.6	0.08	0.1	0.004	1432	50	421	69	15	15	10	8.6	100.7
A9605B	6.39	0.49	0.42	0.31	51.6	0.09	0.09	0.02	0.15	0.05	0.001	81	20	904	15	10	10	10	41	100.8
J9606A	70.1	11.8	5.82	2.17	1.98	3.1	1.1	0.57	0.09	0.13	0.001	252	52	156	135	21	13	10	3.7	100.7
J9606B	76.24	4.62	2.59	0.29	1.3	0.93	0.83	0.17	0.06	0.01	0.003	234	42	42	79	10	10	10	5.7	92.8
L9601	63.5	17.43	7.72	2.11	0.36	0.92	3.34	0.97	0.16	0.06	0.003	782	52	104	135	44	14	17	3.7	100.5
L9603	58.84	18.51	6.09	1.77	1.68	8.49	0.58	0.67	0.22	0.06	0.004	513	59	284	85	27	12	14	3.4	100.5
STANDARD	50	12.76	7.24	7.42	5.86	2.44	1.95	1.63	2.67	1.32	0.963	2150	71	380	654	24	18	12	5.9	100.7

Acme file # 96-6165 Page 1 Received: NOV 22 1996 * 2 samples in this disk file. **WHOLE ROCK**

ELEMENT	SiO2	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO	Cr2O3	Ba	Ni	Sr	Zr	Y	Nb	Sc	LOI	SUM
SAMPLES	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	%
A-TR	75.56	2.23	9.75	0.86	3.91	0.35	0.12	0.08	0.43	0.29	0.005	42	26	109	100	19	10	10	6.1	99.72
B-TR	86.44	1.53	1.14	0.14	5.73	0.21	0.19	0.15	0.02	0.01	0.004	42	20	44	138	10	10	10	5.2	100.8
RE B-TR	86.82	1.32	0.96	0.12	5.81	0.18	0.2	0.13	0.02	0.01	0.005	44	20	43	167	10	10	10	5.2	100.8

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contains higher geochemical amounts of Zn, gold is notably at or near the laboratory lower detection limit, this being a negative correlation of Au with Zn.

Galena Rock It was uncertain prior to trenching, whether this rock was float or outcrop. Trenching at Ace Grid 6+00W; 0+30N, on Ace 63 mineral claim, has proven that the rock is in place. This is an important outcrop because it contains nice galena mineralization. It is a rare exposure; it is one of the only significant showings of an economic mineral on the claims. There are a number showings elsewhere, of miniscule proportions, indicating economic minerals, mainly traces of chalcopyrite, with malachite. It should be noted in this regard that sphalerite in this general area can be expected to be light in colour – white and pale green varieties having been described in reports on Cominco's Mae Claims.

Frothy Quartz Rock The frothy quartz rock, like Galena Rock, was also doubtful regarding whether it was float or bedrock. It occurs at Ace Grid 6+70W; 0+40N, also on Ace 63 mineral claim. Unfortunately, the trenching has shown this rock to be float, and it is unfortunate because nice gold values have been obtained from it, by Barker, and by others. Hopefully the origin of this glacial erratic can be traced up-ice to its source.

The trenching work exposed widely scattered, small spots of bedrock over a broad central part of Doyle's Float train. None of the samples taken from the trench exposures are chip or channel samples; all are essentially prospector-style grab samples from the most interesting looking pyritized rocks exposed. It is believed that if careful chip or channel sampling is done, as it should be, that the concentrations of gold that can be obtained from the existing trenches will be more uniform, and lower. In general the overall results from the preliminary trenching are disappointing. Additional targets require similar testing, however.

CONCLUSIONS AND RECOMMENDATIONS

During 1996, Barker's exploration attention was concentrated, in large part, on acquisition of peripheral ground. Only a relatively small amount of work was done on the focus point, or core ground – the Ace Property. Furthermore, as it turns out, and as it was found out late in the season, much of this limited work did not receive field direction and supervision from the person hired for that purpose.

The Cariboo Prospect is, in part, a result of the additional staking, and it is a prospect of stand-alone substance, and it should now be considered either as part of the core property, or as a second core property. The minimal work done on it did not advance it much beyond the stage at which Gibraltar had relinquished its option.

The economic potential of both cores should be better evaluated. Both should now be regarded as the "reason for being" of the peripheral ground. The 1997 exploration season should be devoted mostly to Ace Property and Cariboo Prospect. Minimal wide ranging work that will allow optimum technical evaluation of the Peripheral Ground, at minimum expense, must now be work should be done on the Peripheral Claims.

PEPIPHERAL GROUND

Because of lack of supervision in the field, most of this work done on it did not get under way until late in the season, and then hurriedly. Accordingly much of the road-side soil geochemistry, and GSM-19 road traverses, were done along the roads because of the convenience of the roads, rather than on relative exploration merits, or demerits, of the claim group as a whole.

To allow preliminary technical appraisal of the peripheral ground, it is recommended that a reconnaissance stream sediment survey be undertaken. As much of the area as possible should be sampled with 4x4 or mud-bike transportation, with allowance for a couple of season-ending helicopter days. Samples should be analysed by conventional ICP methods, and results evaluated on the basis of drainage basin areas affected by the particular samples.

ACE PROPERTY - Phase One

Geological Mapping: The property should be mapped, with primary emphasis on the north side of Mount Barker. Because of the sparse distribution of outcrop, they should be sought out along streams. Outcrop along the river, and along selected ridges should be tied in.

Stream Sediments In conjunction with the property mapping, an assistant should take stream sediment samples at regular intervals along the streams, and along roads used in the work. Since the original discovery was made at the outlet of a culvert along a new logging spur, as many 'culvert' stream sediment samples as possible should be taken. These spots are accessible, and mappable. According the work will be practical, expedient and cost efficient. Culvert samples should be taken at the head-ends - from the pit-traps there, or from the first few corrugations. These act as sluice-box riffles. A portion of each sample should be used for heavy mineral separations and analyses, and a second portion should be panned for gold. Catchment basins of resulting heavy mineral suites should be studied. Hopefully, clues might be discovered that point to the target.

Stratigraphic Cross-Section An attempt to generate a good cross-section of the local stratigraphy should be made. Perhaps the best place for this would be in line with one of the creeks which crosses the stratigraphy, and one that may be well located with regards to the section and have good exposure. The valley of Ishkloo Creek crosscuts the stratigraphy and has some good exposures, as does the cirque and steep south side of Mount Barker, and the road network in vicinity of Cariboo Prospect. All of these could be used for this purpose.

Float Train Mapping Individual boulders of the float train should be studied for indications of their genesis, geology, mineralogy, source, host rock, and content of metals. Samples as representative of the boulders as possible should be taken; in the past samples were of a highly-selective, character type. In other words, a map of the float train should be made, with the former moraine and glacial flow-lines in mind. Hopefully the resulting map will be divisible into several distinct sub-trains, correlating with the several different types of float present, ie., massive or semi-massive sulphide, sulphide-rich quartz, tourmaline-graphite quartz, bull-quartz, deformation-related quartz augen, etc. To expedite this, guidance in the field from the original prospectors should be sought.

LED 14 Quartz Vein This 2m wide quartz vein exposed in the bed of Little River appears to project westerly, crossing "8400" road, becoming coincident perhaps with VLF-EM conductors on ACE22, and then projecting toward a large swamp. It may be the source of boulders that have been left on the surface by the glaciers. Float from this general area should be carefully studied in connection with the above mentioned mapping of Doyle's Float Train.

Trenches Existing trenches should be mapped in detail, and chip and channel sampled where pyritized, silicified or altered. A diamond saw should be available to allow good channel samples from the hard, hammer and moil resistant rocks.

GSC1 and GSC2 Normal Faults These structures could have caused dilation and other favourable features conducive to mineral deposition, particularly in areas where they crosscut the float train and the favourable stratigraphic horizon. Faults like these are related to ore zones near the former mines at Wells and Barkerville. As the orientation of these two structures obviates the used of electromagnetic fields from Cutler and Annapolis VLF-EM transmitters, and as the existing grid was not laid out for northeast-tending normal faults, two new grids will be required, one at each fault. Each should be oriented so that the Seattle VLF-EM transmitter can be used. In other words, the baseline at each should parallel the structure, thereby pointing generally towards Seattle. Cross lines should be at 100m separations, and stations at 25m intervals. At each a 1000m long base line is recommended, each with eleven 1000m cross lines, centered on the base line. Hence, the two new grids would entail 24km of grid line, and of course 22km of GSM-19 mag and VLF-EM work.

Cariboo Prospect Preliminary work an a test grid was done during 1996. This grid, and similar VLF-EM and mag work on it, should be expanded during 1997 to trace the structure as far along strike as possible. In conjunction with this grid work, additional geological mapping, accompanied by stream sediment sampling should be done on the prospect. The object of this work would be to completely delimit the strata-bound mineralization there.

'Black Hole' Anomalies (Ace 250W; 1700S & Ace 0+50E; 4200S) Additional work should be done to elucidate both of these peculiar mag-low anomalies. Both of these anomalies are confined to a single line, and then to just a few stations along those single lines. The first mag-low appears to be related to a mass of ankeritic carbonate rock, but nothing is known about the geology of the latter. Just as single station anomalies should be regarded with some suspicion until verified, so should single line anomalies be regarded with suspicion. However, one must have somewhat stronger faith in anomalies defined by multiple readings along a single line. For starters, some detail work with the GSM-19 should be done on mini-grids centered on these two peculiar locations, and once the anomalies are more clearly defined, additional work – geology, geochemistry, etc. - might be undertaken depending upon circumstances. If geochemical work is encouraging, some trenching will likely be justified.

ACE PROPERTY - Phase Two

Second Phase – Trenching, Drilling Second Phase work is always contingent on encouragement from the first phase. It would probably consist of additional trenching, and possibly preliminary diamond drilling. In this connection, it should be kept in mind that profiles of trenches should ideally be perpendicular to stratigraphy, just as possible fences of drill-hole should be. Ideally, cross-sections defined by trenches and by drilling should coincide, for purposes of cost effectiveness, efficiency and environmental pragmatism. Trenching at Ace and at Cariboo is envisioned.

Drilling, being a very expensive stage of exploration work, needs to be very carefully considered before collaring. All available data must be at hand, and with it, a program strategy must be formulated to optimize work and expenditures, so that in the event of continued encouragement, and continuing expensive work, no unnecessary repetition or work, or re-tracing of steps will be required. At this point in time, planning of a drilling program on the property is premature.

STATEMENT OF EXPENDITURES INCURRED

BARKER MINERALS LIMITED
22117 31A AVE. LANGLEY, B.C. V2Z 1N9

SOIL SAMPLING 1996

THE WORK WAS DONE FROM AUGUST 2 TO SEPTEMBER 11, 1996

THE WORK WAS DONE ON THE FOLLOWING CLAIMS: BRUCE 8, BRUCE 9, CHRIS 1, CHRIS 5, CHRIS 7, BB 8, BROWN 3, BIG GULP 2, BIG GULP 4, AUBAR 2 THRU 5, AUBAR 7, ABRACAD 1, ABRACAD 2, LED 1 THRU 24, NET 3, QUEEN 1, GAR 2, KING 1, PRINCE 1, PRINCE 2, ACE WEST 1, BILL 1, BOO 1, BOO 2, CARI 1 THRU 6, CARI 11, CARI 12, TYS 1, TYS 3, RIVY 1, COMET 5

93A/11E, 93A/11W, 93A/14E, 93A/14W, 93A/15W
CARIBOO MINING DIVISION

MINCONSULT LTD.

IAN CAMPBELL (crew chief)	
26 days x $325.00 (wages)	$ 8,450.00
2 days x $162.50 (mobe & demobe)	$ 325.00
26 days x $7.00 (equipment)	$ 182.00
27 days x $60.00 (room & board)	$ 1,620.00
IAN CAMPBELL (crew chief)	
6 days x $350.00 (wages)	$ 2,100.00
2 days x $175.00 (mobe & demobe)	$ 350.00
6 days x $7.00 (equipment)	$ 42.00
6 days x $60.00 (room & board)	$ 360.00
KELVIN KOPECK (soil sampling)	
27 days x $325.00 (wages)	$ 8,775.00
2 days x $162.50 (mobe & demobe)	$ 325.00
27 days x $7.00 (equipment)	$ 189.00
27 days x $60.00 (room & board)	$ 1,620.00
SCOTT MOSLEY (soil sampler)	
24 days x $250.00 (wages)	$ 6,000.00
2 days x $125.00 (mobe & demobe)	$ 250.00
24 days x $7.00 (equipment)	$ 168.00
25 days x $60.00 (room & board)	$ 1,600.00
STEVE WEBB (soil sampler)	
24 days x $260.00 (wages)	$ 6,240.00
2 days x $130.00 (mobe & demobe)	$ 260.00
24 days x $7.00 (equipment)	$ 168.00
25 days x $60.00 (room & board)	$ 1,500.00

Continued on the next page

BARKER
MINERALS LIMITED

EDWIN JAMES (VLF Operator)	
33 days x $275.00 (wages)	$ 9,075.00
2 days x $137.50 (mobe & demobe)	$ 275.00
33 days x $7.00 (equipment)	$ 231.00
34 days x $60.00 (room & board)	$ 2,040.00
SUSAN CHAYTOR (soil sampler)	
6 days x $350.00 (wages)	$ 2,100.00
2 days x $175.00 (mobe & demobe)	$ 350.00
6 days x $7.00 (equipment)	$ 42.00
6 days x $60.00 (room & board)	$ 360.00
PHIL CHIDZEY (VLF Operator)	
6 days x $350.00 (wages)	$ 2,100.00
2 days x $175.00 (mobe & demobe)	$ 350.00
Mobe cost	$ 69.57
Equipment freight	$ 86.83
6 days x $7.00 (equipment)	$ 42.00
6 days x $60.00 (room & board)	$ 360.00
CINDY CAMPBELL (cook)	
3 days x $175.00 (wages)	$ 525.00
2 days x $ 87.50 (mobe & demobe)	$ 175.00
3 days x $60.00 (room & board)	$ 180.00
CAMP MEALS (Groceries)	$ 281.09
CREW TRUCK : Mobe	$ 100.00
MOBE : costs : fuel & meals	$ 110.00
GST charged to above	$ 2,868.95
CREW TRUCK: MOBE	$ 200.00
CREW TRUCK :RENTAL	$ 1,050.00
CREW TRUCK : DELIVERY	$ 150.00
46 days x $65.00 (vehicle)	$ 2,990.00
CREW TRUCK : DEMOBE COOK	$ 153.39
CREW (5 men) Camp meals on arrival	$ 272.56
SAMPLE BAGS	$ 49.22

TOTAL SOILS COLLECTED 652 SAMPLES

ASSAYED:	
ACME: 415 x $27.00	$11,205.00
ACTIVATION : 415 x $24.00 (Enzyme leach)	$ 9,960.00
TOTAL	$88,302.61

Louis Doyle

BARKER MINERALS LIMITED

(7)

AMEX EXPLORATION SERVICES LTD.

A.A. (Ab) ABLETT — Confidential Work

Barker Minerals Limited
P.O. Box 24023
Lakefront Post Office
Kelowna, B.C.
V1Y 9P9

STATEMENT OF ACCOUNT

Re: IP Survey Grid Extensions and restoration, ACE mineral claims. This program completed during the period April 24 to May 15, 1996, Map Sheet 93A/14E, Cariboo Mining Division.

AMEX WAGES

G. Dean Hunt	5 days	@ $311.20/day	=$	1556.00
R.R. Robinson	2 "	@ 284.80/day		569.60
P.F. Cox	5 "	@ 311.20/day		1556.00
Will MacBurney	5 "	@ 258.40/day		1292.00
G. Hardychuk	4 "	@ 265.00/day		1060.00
Russ Graham	4 "	@ 278.20/day		1112.80
R. Vandervalk	3.5 "	@ 271.60/day		950.60
Ed Wolfe	4 "	@ 271.60/day		1086.40

(wages include HP, WC, CP, UI,
(profit, overhead, insurances, axes,
(clino's, chains, misc. protection
(equipment, etc.).

DIRECT COSTS

High Country Inn board and accommodation	= $ 864.00	
Vehicles 16 days @$65	1040.00	
Gasoline	270.00	
Tyveks and flagging	236.04	
Power saw	140.00	
	$ 2550.04	2550.04

GOV'T FEES

GST	694.08
	$ 11473.52
*17.5 x $60.00 = (room & board)	1,050.00
	$12,523.52 Total

Respectfully submitted,

A.A. Ablett, President,
Amex Exploration Services Ltd.
GST No. R100189430
Amex Job No. 96-27
AAA/cm

*17.5 m-d board and accommodation provided by Barker Minerals Limited.

AMEX EXPLORATION SERVICES LTD.

A.A. (Ab) ABLETT Confidential Work

Barker Minerals Limited
P.O. Box 24023
Lakefront Post Office
Kelowna, B.C.
V1Y 9P9

STATEMENT OF ACCOUNT

Re: Grid preparation-winter layout on frozen lake areas, lines 20S to 52S, ACE Group mineral claims, Little River Area, Map Sheet No. 93A/14E, Cariboo Mining Division. This work completed March 22 to April 17, 1996.

AMEX WAGES

Percy F. Cox	9 days @ $311.20/day	= $	2800.80
G. Dean Hunt	20 days @ 311.20/day		6224.00
Ryan Robinson	19 days @ 284.80/day		5411.20
Gerald Hardychuk	6 days @ 265.00/day		1590.00
Will MacBurney	6 days @ 258.40/day		1550.40

DIRECT COSTS

Vehicles 22 days@ $65/day	= $ 1430.00	
Gasoline	339.00	
Tyveks and flagging	911.50	
Skidoo	300.00	
	$ 2980.50	2980.50

GOV'T FEES

GST	1438.98
	$ 21995.88
*60 x $60.00 = (room & board)	3600.00
	25595.88 Total

Respectfully submitted

A.A. Ablett, President,
Amex Exploration Services Ltd.
GST No. R100189430
Amex Job No. 96-28
AAA/cm

* Board and accommodation provided by Barker Minerals Limited.

Wages include HP, WC, CP, UI, clinometers, axes, field protection, profit, overhead, insurances, field books, snowshoes, etc.

AMEX EXPLORATION SERVICES LTD.

A.A. (Ab) ABLETT Confidential Work

Barker Minerals Limited
P.O. Box 24023
Lakefront Post Office
Kelowna, B.C.
V1Y 9P9

June 16, 1996

STATEMENT OF ACCOUNT

Re: BOO Grid, Cari and Boo mineral claims, Little River Area, Map Sheet 93A/14E, Cariboo Mining Division. This work completed during the period May 13 to May 31, 1996.

AMEX WAGES

G. Dean Hunt	2.5 days @	$311.20/day	= $ 778.00
R. Vandervalk	3.5 days @	278.20 "	973.70
Russ Graham	4.0 days @	284.80 "	1139.20
Ed Wolfe	2.5 days @	284.80 "	712.00
Percy F. Cox	2.0 days @	311.20 "	622.40

DIRECT COSTS

Vehicles 7 days @ $65/day =	$ 455.00	
Gasoline	154.03	
Flagging & tyveks	84.00	
	$ 693.03	693.03

GOV'T COSTS

GST	344.28
	$ 5262.61
* 14.5 x $60.00 = (room & board)	$ 870.00
Total	$6132.61

Respectfully submitted

A.A. Ablett, President,
Amex Exploration Services Ltd.
GST No. R100189430
Amex Job No. 96-35
AAA/cm

* Board and accommodation provided by Barker Minerals Limited.

AMEX EXPLORATION SERVICES LTD.

A.A. (Ab) ABLETT Confidential Work

Barker Minerals Limited
P.O. Box 24023
Lakefront Post Office
Kelowna, B.C.
V1Y 9P9

STATEMENT OF ACCOUNT

Re: Grid improvement and refurbishing, and clearing of deadfall, Lines 29S to 50S, ACE group mineral claims, for **E-Scan Survey**, Little River Area, Likely, B.C., Cariboo Mining Division. This work completed during the period June 19 to July 5, 1996.

AMEX WAGES

G. Dean Hunt	1.0	day	@ $ 311.20	/day	= $	311.20
R.R Robinson	16.5	days	@ 298.00	"		4917.00
Terry Walch	1.0	"	@ 265.00	"		265.00
Richard Bartram	4.5	"	@ 245.20	"		1103.40
R. Vandervalk	3.5	"	@ 284.80	"		996.80
W. Gainer	2.0	"	@ 245.20	"		490.40
John Ablett	5.0	"	@ 317.80	"		1589.00
P.F. Cox	6.0	"	@ 311.20	"		1867.20

(wages include HP, CP, WC, UI, profit,)
(overhead, insurances, axes, clino's,)
(protection equipment, chains, etc.)

DIRECT COSTS

Vehicles 22 days @ $65/day	= $1430.00	
Gas & saw repairs	673.80	
Tyvek stn's and flagging	335.94	
Power saws 21 s/d @ $35/d	735.00	
	$3174.74	3174.74

GOV'T COSTS

GST	1030.03
	$ 15744.77
* 39.5 x $60.00 (room & board) =	2370.00
Total	$18,114.77

Respectfully submitted,

A.A. Ablett, President,
Amex Exploration Services Ltd.
GST No. R100189430
Amex Job No. 96-43
AAA/cm

* Board and accommodation provided by Barker Minerals Limited.

AMEX EXPLORATION SERVICES LTD.

A.A. (Ab) ABLETT Confidential Work

Barker Minerals Limited
P.O. Box 24023
Lakefront Post Office
Kelowna, B.C.
V1Y 9P9

STATEMENT OF ACCOUNT

Re: GSM 19 MAG-EM Survey winter layout on Frozen Lake areas, Lines 20S to 52S, Ace Group mineral claims, Little River area. Map Sheet 93A/14E, Cariboo Mining Division. This work was completed March 22 to April 17, 1996.

AMEX WAGES

G. Dean Hunt	1.5 days	@ $311.20/day	=	467.80
Percy F. Cox	11 "	" "		3423.20
Ryan Robinson	2 "	" 284.80/day		569.60
Gerald Hardychuk	1 "	" 265.00/day		265.00
Will MacBurney	5 "	" 258.40/day		1292.00

(includes HP, WC, UI, CP, profit, overhead)
(insurances, field requirements, etc.)

DIRECT COSTS

Vehicles 14 days @ $65/day	= $ 910.00		
Skidoo 6 " 50/day	300.00		
Gasoline	390.00		
	$1600.00	1600.00

GOVERNMENT FEES

GST 533.16

$ 8149.76

Respectfully submitted, * 20.5 x $60.00 = $ 1,230.00
Room + board.

$ 9,379.76

A.A. Ablett, President,
Amex Exploration Services Ltd.,
Amex GST NO.R100189430
Amex Job. No. 96-28M
AAA/cakm

*GSM-19, board, accommodation provided by Barker Minerals Limited.

Claim Staking, Line Cutting, Surveying, Property Management, etc.

BARKER
MINERALS LIMITED

22117 37A AVE. LANGLEY, B.C. V2Z 1N9

GEOLOGICAL

Work was performed from March 1996 – April 1997.
Work was performed on the following claims:

Bruce 2,5, 6, 8& 9	**Jess 1 thru 4**	**Big Gulp 2,4**	**Sell 2 & 3**
Amanda 2, 4 thru7	**Abracad 1, 2**	**Unlikely 1& 2**	**Rivy 1**
E – 4	**Boo 1, 2**	**Ace 9**	**Ace 11**
Ace 13 thru 28	**Ace 30**	**Ace 32**	**Ace 34, 35**
Ace 37	**Ace 39 thru 44**	**Ace 57 thru 70**	**Ace 83 thru 90**
Ace 92	**Comet 5**	**Bill 1**	**Prince 1 & 2**
King 1	**Queen 1**	**Tys 1, 3**	**Col 6**
LD 2	**Aubar 1 thru 8**	**Long 2**	**BB 1,3,4, 8, 9, 11**
Chris 1,5,7,9,11	**Led 1 thru 24**	**Brown 3**	**Cari 11, 12**
Net 3	**Gar 2**	**Ace West 1**	**Cari 1 thru 6**

Roy Lammle (Geologist)
Data digitization, map preparation, planning, research, report writing, etc.

Total of invoices	$114,264.34
10 days x $60.00 (room & board)	$ 600.00
TOTAL	**$114,864.34**

Louis Doyle

BARKER MINERALS LIMITED

BARKER
MINERALS LIMITED
22117 37A AVE. LANGLEY, B.C. V2Z 1N9

MAGNETOMETER SURVEY'S

DATE WORK WAS PERFORMED MARCH 22 TO JULY 11, 1996

WORK WAS PERFORMED ON FOLLOWING CLAIMS: BRUCE 5, BRUCE 9, JESS 1 thru 4, BIG GULP 2, SELL 2, SELL 3, AMANDA 2, AMANDA 4 thru 7, BB 9, BB 11, ABRACAD 2, UNLIKELY 1, UNLIKELY 2, E-4, BOO 1, BOO 2, ACE 9, ACE 11, ACE 13 thru ACE 28, ACE 30, ACE 32, ACE 34, ACE 35, ACE 37, ACE 39 thru ACE 44, ACE 57 thru ACE 70, ACE 83 thru ACE 90, ACE 92.

93A/11E, 93A/11W, 93A/14E, 93A/14W
CARIBOO MINING DIVISION

• **PERCY COX** (Amex Exploration- mag. Operator)	
• 29.5 days x $311.20 (wages)	$ 9180.40
• 29.5 days x $60.00 (room & board)	$ 1770.00
• 29.5 days x $85.00 (vehicle & gas)	$ 2507.50
• **PERCY COX** (Amex Exploration- mag. Operator)	
• 10.5 days x $320.00 (wages)	$ 3360.00
• 10.5 days x $60.00 (room & board)	$ 630.00
• 10.5 days x $85.00 (vehicle & gas)	$ 892.50
• **JIM DOYLE** (Barker Minerals – expeditor)	
• 29.5 days x $200.00 (wages)	$ 5900.00
• 29.5 days x $60.00 (room & board)	$ 1770.00
• 29.5 days x $85.00 (vehicle & gas)	$ 2507.50
• **GERALD HARDYCHUK** (Amex Exploration – expeditor)	
• 10.5 days x $320.00 (wages)	$ 3360.00
• 10.5 days x $60.00 (room & board)	$ 360.00
• **LOUIS DOYLE** (Planning, organizing & supervising)	
• 5 days x $300.00 (wages)	$ 1500.00
• 5 days x $60.00 (room & board)	$ 300.00
• 5 days x $85.00 (vehicle & gas)	$ 425.00
• **MAGNETOMETER RENTAL**	
• 40 days x $150.00	$ 6000.00
TOTAL	**$40,462.90**

Louis Doyle

BARKER

MINERALS LIMITED

22117 37A AVE. LANGLEY, B.C. V2Z 1N9

EXPLORATION EQUIPMENT AND SUPPLIES

PRO RATA (2720 CLAIM UNITS)

• **NEVILLE CROSBY:**	$ 8,778.49
• **DEAKIN EQUIPMENT:**	$ 874.00
• **McELHANNEY** (map preparation)	$48,600.00
• **EXTON AND DODGE** (air photo's)	$ 2,899.71
• **B.C. YUKON** (reports & maps)	$ 1,040.53
TOTAL	$62,192.73

Louis Doyle

BARKER MINERALS LIMITED

22117 37A AVE. LANGLEY, B.C. V2Z 1N9

SOIL COLLECTIONS 1996
DATES WORK WAS PERFORMED JULY 20th – OCT 31st

WORK WAS PERFORMED ON THE FOLLOWING CLAIMS: ACE 18, ACE 19, ACE 20, ACE 22, ACE 24, ACE 26, ABRACAD 2

93A/14E CARIBOO MINING DIVISION

BARKER EXPIDITING

• **STUART GIBSON** (collections)	
• 20 days x $200.00 (wages)	$ 4,000.00
• 20 days x $60.00 (room & board)	$ 1,200.00
• 20 days x $85.00 (vehicle & gas)	$ 1,700.00
• **RICK REDEKOP** (collections)	
• 20 days x $200.00 (wages)	$ 4,000.00
• 20 days x $60.00 (room & board)	$ 1,200.00
• **GRANT WHAN** (sample drying & preparation)	
• 10 days x $150.00 (wages)	$ 1,500.00
• 10 days x $60.00 (room & board)	$ 600.00

GENERAL

• **HUGH MacISAAC** (collections)	
• 14 days x $150.00 (wages)	$ 2,100.00
• 14 days x $60.00 (room & board)	$ 840.00
• 14 days x $85.00 (vehicle)	$ 1,190.00

ASSAY'S

ACME (ultra trace ICP, Au PGE'S)

• 207 samples x $27.72 per sample	$ 5,738.04
TOTAL =	$24,068.04
TOTAL COST FOR SAMPLING PROGRAM	$24,068.04
DIVIDED BY 207 SAMPLES =	$ 113.00

BARKER MINERALS LIMITED

BARKER MINERALS LIMITED

22117 37A AVE. LANGLEY, B.C. V2Z 1N9

***Assays on 1995 collected samples**

Becqueral – Neutron Activation Analysis = 403 samples	$12,858.72
Eco-Tech sample prep. = 403 samples	$ 1,157.29
Acme (ultra trace ICP) = 403 samples	$ 2,923.67
TOTAL	**$16,939.68**

Louis Doyle (President)

BARKER MINERALS LIMITED

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MINERALS LIMITED

22117 37A AVE., LANGLEY B.C. V2Z 1N9

GRID PREPARATIONS:

Work was done on the following claims: Big Gulp 2 & 4, Jess 3 & 4

The work was done from September 24 to September 30, 1996

93A/11 W Cariboo Mining Division

- **Twin Mountain Enterprises Ltd.** (line cutting)

• **Daniel Greene**	
• 3 days x $260.00 (wages)	$ 780.00
• 4 days x $160.00 (mobe & demobe)	$ 320.00
• 5 days x $60.00(room & board)	$ 300.00
• 7 days x $85.00 (vehicle & gas)	$ 595.00
• **David Riep**	
• 3 days x $260.00 (wages)	$ 780.00
• 4 days x $160.00 (mobe & demobe)	$ 320.00
• 5 days x $60.00 (room & board)	$ 300.00
• **Quin Guimond**	
• 3 days x $260.00 (wages)	$ 780.00
• 4 days x $160.00 (mobe & demobe)	$ 320.00
• 5 days x $ 60.00 (room & board)	$ 300.00
• 7 days x $85.00 (vehicle & gas)	$ 595.00
• **Charles Wagh**	
• 3 days x $260.00 (wages)	$ 780.00
• 4 days x $160.00 (mobe & demobe)	$ 320.00
• 5 days x $60.00 (room & board)	$ 300.00
• **Travel expenses** (fuel, meals and accommodations) GST included	$1,977.18
Total	**$8,767.18**

Louis Doyle

BARKER MINERALS LIMITED

BARKER

MINERALS LIMITED

22117 37A AVE. LANGLEY, B.C. V2Z 1N9

CAMP SET-UP
MAEFORD LAKE

WORK WAS DONE FROM MAY 21 TO MAY 24, 1996

• **Trevor Marshall**	
• 4 days x $311.20 (wages)	$1,244.80
• 4 days x $60.00 (room & board)	$ 240.00
• **John Ablett**	
• 4 days x $317.80	$1,271.20
• 4 days x $60.00 (room & board)	$ 240.00
• 4 days x $85.00 (vehicle & gas)	$ 340.00
• **Will MacBurney**	
• 3 days x $271.60 (wages)	$ 814.80
• 3 days x $$60.00 (room & board)	$ 180.00
• 3 days x $85.00 (room & board)	$ 255.00
• **Building & plumbing supplies**	$ 847.79
• **Camp supplies** (dishes, stove, misc. utensils)	$ 158.19
• **GST on above**	$ 363.54

Total **$5,955.32**

Louis Doyle

BARKER MINERALS LIMITED

22117 37A AVE. LANGLEY, B.C. V2Z 1N9

1996 TRENCHING

WORK PERFORMED FROM OCTOBER 1 TO NOVEMBER 15, 1996

WORK WAS PERFORMED ON THE FOLLOWING CLAIMS: ACE 37, ACE 39, ACE 57, ACE 59, ACE 62 ACE 63, ACE 82, ACE 84, ACE 86.
(93A/14E CARIBOO MINING DIVISION)

• **CONTRACTOR**	
• **RYLANT CONSTRUCTION** (Backhoe & Operator)	$22,389.75
• **OPERATOR**- ANDREW DOYLE (Room & Board) $60.00 x 21 days	$ 1,260.00
• **BARKER MINERALS LTD.**	
• **JIM DOYLE** (Expediter)	
• 21 days x $200.00 (wages)	$ 4,200.00
• 21 days x $60.00 (room & board)	$ 1,260.00
• 21 days x $65.00 (Vehicle & gas)	$ 1,365.00
• **GRANT WHAN** (Expediter)	
• 20 days x $150.00 (wages)	$ 3,000.00
• 20 days x $60.00 (room & board)	$ 1,200.00
• **LOUIS DOYLE** (Planning , organization)	
• 14 days x $300.00 (wages)	$ 4,200.00
• 14 days x $60.00 (room & board)	$ 840.00
• 14 days x $65.00 (vehicle & gas)	$ 910.00
• **ASSAYS**	
• **ACME** (Oct./Nov. 1996) 159 samples x $42.49 (whole rock hydride & ICP)	$ 5,954.04
• **GEOLOGICAL – MINERAL STUDIES** (NOV.1- DEC.31, 1996)	
• VANCOUVER PETROGRAPHICS/ JOHN PAYNE Ph.D.	
• MINEROLIGICAL STUDIES OF TRENCH SAMPLES.	$ 5,876.94
TOTAL	**$53,155.73**

Louis Doyle

BARKER MINERALS LIMITED

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Appendix II

THIN SECTION PETROGRAPHY

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Samples: **F-001, F-002, F-003, F-004**

Summary:

Sample F-001 is a moderately foliated quartz-plagioclase-biotite gneiss which was replaced strongly by patches of quartz, sphalerite, pyrrhotite, and lesser galena and ankerite, minor pyrite, and trace arsenopyrite, and chalcopyrite.

Sample F-002 is a fine grained gneiss dominated by plagioclase with much less abundant biotite, muscovite, chlorite, K-feldspar, pyrite, ilmenite, and chalcopyrite. Phyllosilicates are oriented parallel to foliation. A large, irregular vein is of quartz with a coarse patch of ankerite at one end of the section. A few veinlets cutting across foliation are of K-feldspar. Chalcopyrite is replaced by rims of hematite and copper set free by this reaction was deposited nearby as patches of malachite. Late veinlets parallel to foliation are of limonite.

Sample F-003 is a massive sulfide dominated by very fine grained pyrrhotite with less abundant quartz, porphyroblasts of garnet, clusters of tremolite, and patches dominated by each of chlorite and ankerite. Minor chalcopyrite is intergrown with pyrrhotite. Pyrrhotite is altered moderately to secondary pyrite and dusty, non-reflective material.

Sample F-004 is a massive vein dominated by coarse grained chalcopyrite with a patch of coarse grained quartz at one end. Chalcopyrite is fractured moderately and replaced along fractures and a few broader replacement patches extending outwards to connect adjacent fractures. In the alteration zone along a typical fracture, a thin selvage of covellite separate chalcopyrite from a broad core of bright red hematite. A few large fractures have cores of malachite, and malachite and hematite form a few intergrowths, mainly along the quartz-chalcopyrite border.

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Sample F-001 **Moderately Foliated Quartz-Plagioclase-Biotite Gneiss; Replacement by Quartz-Sphalerite-Pyrrhotite-Galena-Ankerite**

The rock is a strong replacement of a coarsely banded, plagioclase-quartz-biotite gneiss by quartz, sphalerite, pyrrhotite, and lesser galena and ankerite, minor pyrite, and trace arsenopyrite, and chalcopyrite.

quartz	60-65%	chlorite	0.2%
sphalerite	17-20	apatite	0.2
pyrrhotite	7- 8	sphene	0.1
plagioclase	4- 5	pyrite	minor
biotite	2- 3	chalcopyrite	trace
galena	2	arsenopyrite	trace
ankerite	1- 2	zircon	trace

Plagioclase is concentrated moderately in several patches up to 3 mm across in which it forms anhedral grains averaging 0.2-0.7 mm in size intergrown with sphalerite and quartz. In some grains it is replaced slightly to moderately by extremely fine grained biotite and sphalerite.

Biotite forms anhedral flakes averaging 0.1-0.25 mm in size, commonly bordering sulfide patches. It is concentrated moderately in one seam up to 0.7 mm wide as flakes averaging 0.15-0.3 mm long. In one plagioclase-rich patch, it forms two grains averaging 0.5-0.6 mm long. Pleochroism is from pale to light or medium orangish brown. Chlorite forms flakes up to 0.5 mm in size with a light greyish green colour. It probably is secondary after biotite.

Sphene forms a subhedral, rhombic grain 0.9 mm long. Apatite forms grains averaging 0.05-0.08 mm in size intergrown with plagioclase. Zircon forms equant grains averaging 0.02 mm in size.

Quartz forms anhedral grains averaging 0.1-0.5 mm in size, with a few patches of grains up to 1.5 mm in size. Coraser grains were recrystallized moderately to finer sub-grain aggregates.

Ankerite is concentrated in a few patches up to 3 mm in size as extremely fine to cryptocrystalline grains intergrown coarsely with sphalerite and quartz. Textures in some patches suggest that it is secondary after pyrrhotite.

Sphalerite forms patches up to several mm across, generally intergrown coarsely with pyrrhotite. Sphalerite is medium, reddish to orangish brown in colour.

Pyrrhotite forms grains averaging 0.05-0.3 mm in size intergrown coarsely with sphalerite. It is altered moderately to secondary pyrite and dusty non-reflective material. Pyrrhotite is non-magnetic. At one end of the section, pyrrhotite is altered strongly to red-brown hematite.

Galena forms patches averaging 0.05-0.3 mm in size enclosed in sphalerite and a few patches up to 1 mm across intergrown with one or more of sphalerite quartz, and pyrrhotite.

Pyrite forms minor disseminated euhedral grains averaging 0.1-0.15 mm in size and one elongate grain 0.5 mm long. Arsenopyrite forms a subhedral grain 0.2 mm in size enclosed in sphalerite. Chalcopyrite forms minor grains averaging 0.03-0.07 mm in size intergrown in a few patches of sphalerite.

A veinlet 0.04 mm wide is of ankerite with a few lenses up to 0.01 mm wide in the core of pyrite. Ankerite grains are extremely fine and oriented perpendicular to vein walls. A second, slightly braided veinlet up to 0.1 mm wide is of more massive ankerite vein; it also has minor lenses of pyrite in its core. Along a late ankerite veinlet, both ankerite and pyrrhotite which is cut by the veinlet are replaced by brown limonite.

Sample F-002 **Plagioclase-Biotite-Chlorite-K-feldspar-Pyrite Gneiss; Vein of Quartz-Ankerite-Pyrite; Veinlets of K-feldspar; Late Veinlets of Limonite**

The sample is a fine grained gneiss dominated by plagioclase with much less abundant biotite, muscovite, chlorite, K-feldspar, pyrite, ilmenite, and chalcopyrite. Phyllosilicates are oriented parallel to foliation. A large irregular vein is of quartz with a coarse patch of ankerite at one end of the section. A few veinlets cutting across foliation are of K-feldspar. Chalcopyrite is replaced by rims of hematite and copper set free by this reaction was deposited nearby as patches of malachite. Late veinlets parallel to foliation are of limonite.

plagioclase	35-40%	chalcopyrite	1%
biotite	4- 5	malachite	0.2
chlorite	4- 5	ankerite	0.1
K-feldspar	3- 4	apatite	0.1
pyrite	2- 3	zircon	trace
ilmenite	1- 2		
vein, veinlets			
1) quartz	35-40		
ankerite	5- 7		
2) K-feldspar	0.3		
3) limonite	2- 3		

Plagioclase forms anhedral, equant grains averaging 0.2-0.5 mm in size and a few up to 1 mm in size. Alteration is slight to extremely fine grained sericite.

Biotite, muscovite, and chlorite each forms slender flakes and clusters of flakes averaging 0.1-0.25 mm in length. Biotite is pleochroic from pale to medium, slightly reddish brown to orangish brown. Chlorite is weakly pleochroic with a pale green colour.

K-feldspar and lesser quartz form anhedral grains averaging 0.1-0.2 mm in size.

Pyrite forms disseminated, anhedral grains averaging 0.2-0.4 mm in size and a few from 1-1.5 mm long. It also forms a few lenses parallel to foliation from 1-2 mm long of two to four grains. A few pyrite grains contain a few inclusions of chalcopyrite averaging 0.01-0.03 mm in size. Some grains are fresh and some are altered moderately to strongly to hematite.

Ilmenite forms disseminated, tabular to equant grains averaging 0.1-0.25 mm in size.

Chalcopyrite forms equant patches up to 0.2 mm in size and irregular lenses up to 1.5 mm long. It is replaced moderately along grain borders and coarse fractures to hematite, in part intergrown with patches up to 0.15 mm in size of malachite. Away from chalcopyrite are a few disseminated patches up to 0.2 mm across are of radiating prismatic grains of malachite.

Apatite forms anhedral grains averaging 0.04-0.07 mm in size and a few up to 0.2 mm long. It is concentrated moderately in a few ragged lenses of anhedral, corroded grains averaging 0.05-0.1 mm in size.

Zircon forms anhedral grains averaging 0.03-0.06 mm in size.

(continued)

The main vein is of moderately to strongly interlocking quartz grains averaging 0.07-0.2 mm in size, with a few moderately strained grains up to 1.5 mm long. Textures suggest that many finer grains were recrystallized from coarser grains. Near the margins of the vein are ragged patches of extremely fine to very fine grained plagioclase averaging 0.2-0.8 mm in size. In the core of the vein are irregular patches of plagioclase, with grains ranging up to 1.5 mm in size.

Ankerite is concentrated near one end of the section in a patch several mm across as grains up to 2.5 mm in size.

The quartz vein is cut by a few irregular seams up to 0.05 mm wide of light yellowish green to medium emerald green, extremely fine grained malachite.

A few discontinuous veinlets up to 0.1 mm wide are of very fine grained K-feldspar.

Late veinlets parallel to foliation averaging 0.05-0.1 mm wide are of cryptocrystalline, orange-brown limonite.

Sample F-003 **Massive Sulfide: Pyrrhotite-Quartz-Garnet-Tremolite-Chlorite-Ankerite**

The sample is a massive sulfide dominated by very fine grained pyrrhotite with less abundant quartz, porphyroblasts of garnet, clusters of tremolite, and patches dominated by each of chlorite and ankerite. Minor chalcopyrite is intergrown with pyrrhotite. Pyrrhotite is altered moderately to secondary pyrite and dusty, non-reflective material.

pyrrhotite	65-70%
quartz	12-15
garnet	5- 7
tremolite	3- 4
chlorite	3- 4
ankerite	2- 3
chalcopyrite	0.2
ilmenite	0.1
magnetite	minor
carbonaceous opaque	minor

Pyrrhotite forms anhedral, equant grains averaging 0.03-0.05 mm in size. It is altered moderately to secondary pyrite intergrown with dusty non-reflective material.

Quartz forms anhedral grains averaging 0.03-0.07 mm in size and a few up to 0.5 mm across.

Garnet forms a few porphyroblasts up to 2.5 mm across and a few irregular to skeletal grains intergrown irregularly with quartz or pyrrhotite in patches up to 1.5 mm long. Porphyroblasts contain moderately abundant extremely fine grained patches and lenses of pyrrhotite.

Tremolite is concentrated in clusters up to 3 mm in size of prismatic grains up to 1 mm long. Some are intergrown with minor to moderately abundant quartz and minor ankerite.

Chlorite is concentrated in patches up to 1.5 mm in size as extremely fine to very fine grained flakes. Some patches contain moderately abundant dusty to cryptocrystalline carbonaceous(?)opaque. Some patches are adjacent to garnet grains.

Ankerite is concentrated moderately in patches up to 2 mm in size of grains averaging 0.05-0.2 mm in size.

Chalcopyrite is concentrated in one irregular lens 1.1 mm long in pyrrhotite. It also forms a few patches averaging 0.1-0.2 mm in size also intergrown with pyrrhotite. One patch 0.6 mm across consists of quartz and lesser ankerite and chalcopyrite grains averaging 0.02-0.04 mm in size.

Ilmenite forms a cluster 0.7 mm long of grains averaging 0.02-0.07 mm in size intergrown with pyrrhotite. It also forms a few single grains averaging 0.2-0.4 mm in size.

Magnetite forms anhedral grains averaging 0.07-0.2 mm across intergrown with pyrrhotite.

Sample F-004 **Chalcopyrite-Quartz Vein**
Secondary Hematite-Covellite-Malachite

The sample is a massive vein dominated by coarse grained chalcopyrite with a patch of coarse grained quartz at one end. Chalcopyrite is fractured moderately and replaced along fractures and a few broader replacement patches extending outwards to connect adjacent fractures. In the alteration zone along a typical fracture, a thin selvage of covellite separate chalcopyrite from a broad core of bright red hematite. A few large fractures have cores of malachite, and malachite and hematite form a few intergrowths, mainly along the quartz-chalcopyrite border.

chalcopyrite	75-77%
quartz	15-17
hematite	5- 7
covellite	1
malachite	1

Chalcopyrite forms a massive patch in much of the sample. Grain size is impossible to determine. It was fractured moderately, and replaced along fractures by zones of massive deep red hematite averaging 0.05-0.1 mm wide in larger ones and 0.01-0.03 mm wide in narrower ones. A few hematite patches are up to 0.5 mm wide. Between hematite and chalcopyrite are zones averaging 0.01-0.015 mm wide of cryptocrystalline covellite.

Malachite occurs in the cores of larger fractures as zones averaging 0.01-0.05 mm wide and locally up to 0.3 mm wide. It ranges from dense cryptocrystalline aggregates to subparallel clusters of elongate prismatic grains averaging 0.05-0.15 mm long. It probably was deposited in cavities.

Much of the quartz zone is one large grain which was strained slightly. One patch in the corner of the section 1 mm across is of extremely fine grained quartz with selvages of malachite, and contains a few coarser grained patches of malachite and of hematite.

Cutting the quartz vein is a veinlike zone averaging 0.1-0.3 mm wide of limonite/hematite probably after pyrite. A much smaller, subparallel veinlet is partly of similar limonite/hematite and partly of malachite.

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Samples: **L9601, L9603**
91551, 91552, 91558, 91559A, 91561
A9605A, A9605B, J9606B
T-6C, T-6E, T-7B, T-9B, T-11A, T-11B, T-11E, T-12, T-14A, T-14B,
T-16A, T-17, T-18B, T-19, T-20, T-21A, T-21B, T-23, T-24C, T-25B, T-25C,
T-26B, T-27, T-28, T-30B, T-31C, T-32C, T-33D, T-34, T-36,
T-A-C, T-A-F, T-B-A, T-B-C, T-C-B, T-C-D, T-C-F, T-D-A, T-D-B,
T-E-A, T-E-C, T-E-D, T-F-A, T-F-C, T-F-E

Summary:

The rocks are metamorphic rocks, many of which show evidence of more than one stage of penetrative deformation. They are classified petrographically into the following main groups which are defined on the basis of mineralogy and inferred parent rock.

A1 **Quartz-rich**: quartz sandstone, impure quartz sandstone
A2 Quartz-(plagioclase-micas): muddy arkosic quartz sandstone

B1 **Quartz-muscovite-rich** schist: mudstone-siltstone
B2 Same as B1 with biotite and garnet porphyroblasts

C **Muscovite-rich** schist, lesser quartz, plagioclase, carbonate, biotite, chlorite

D **Plagioclase-rich** rocks
D1 schist of uncertain origin
D2 very fine to extremely fine grained, probably latite, some dacite
D3 fine to very fine grained, probably hypabyssal diorite, quartz diorite

E **Strongly Altered** Rocks, origin uncertain

F **Sulfide, Quartz-Sulfide Veins**

Sample T-C-B is a well foliated metamorphosed quartz sandstone containing muscovite flakes oriented parallel to foliation and concentrated moderately in muscovite-rich seams parallel to foliation. Minor minerals include opaque and semi-opaque with much less abundant ankerite, chlorite, zircon, and biotite, and trace tourmaline. A few recrystallized patches elongated parallel to foliation are of fine grained quartz.

Sample J-9606-B is a well foliated quartz-muscovite schist containing a few porphyroblasts of plagioclase. Abundant replacement patches up to a few mm across are of galena and lesser sphalerite and minor pyrrhotite. Sulfides are replaced slightly to strongly by carbonates and oxides.

A2: Impure Arkosic Sandstone: Quartz-Chlorite-Muscovite-Plagioclase-Pyrite Schist

Sample 91559-A is interpreted as a metamorphosed, impure, arkosic quartz sandstone. It is a well foliated, slightly compositionally banded schist dominated by quartz with much less abundant chlorite, muscovite, plagioclase, and pyrite, and minor leucoxene. Plagioclase textures suggest that the original rock was a muddy, arkosic quartz sandstone. Quartz is concentrated moderately in quartz-rich lenses parallel to foliation. Limonite/hematite forms replacements of pyrite and occurs in secondary lenses and selvages.

B1: Muscovite-Quartz-rich (Mudstone/Siltstone)

Sample T-12 is a contorted schist dominated by quartz, muscovite, calcite, and lesser chlorite. It was folded tightly, and muscovite in muscovite-rich layers was recrystallized moderately along axial planes of the second stage of folds. A large replacement patch is of coarser grained quartz, less abundant calcite and minor muscovite and chlorite. It probably was a calcareous mudstone.

Sample T-17 is a well foliated, moderately compositionally banded schist dominated by muscovite and quartz with less abundant chlorite and minor disseminated grains of ilmenite, porphyroblasts of biotite, and lenses of pyrrhotite. A large patch formed by metamorphic segregation is dominated by slightly coarser grained quartz with much less abundant chlorite and pyrrhotite. The rock was folded strongly on a set of subparallel drag folds averaging 0.5-0.1 mm in wave length. The major limb of the drag folds is parallel to the major foliation.

Sample T-20 is a strongly folded schist dominated by muscovite and quartz with much less abundant chlorite and plagioclase, and minor ilmenite and carbonaceous opaque. Quartz is concentrated strongly in quartz-rich lenses parallel to foliation; some of these appear to be boudins. Abundant tight to open drag folds have axial planes and fold limbs parallel to the major cleavage; the wave length of folds ranges from 0.3-1 mm. A few microscopic kink folds warp this foliation.

Sample T-21B is a well foliated, compositionally banded schist, with layers dominated by one or more of quartz, muscovite, calcite/dolomite, and plagioclase. Several quartz-rich patches and lenses are parallel to foliation. Veins and veinlets are of pyrite, in part with envelopes of cryptocrystalline biotite/chlorite. A veinlet is of calcite/dolomite. Most of the veins and veinlets are perpendicular to the foliation in the rock.

A1: Quartz-rich (Quartz Sandstone, Impure Quartz Sandstone)

About half of **Sample T-14B** is dominated by quartz with a few elongate, strongly contorted, muscovite-opaque-rich seams. The other half is a zoned replacement patch of quartz and opaque (dominated by altered pyrrhotite with much less abundant pyrite) with minor muscovite.

Sample T-16A is a compositionally banded schist dominated by quartz with some bands containing abundant muscovite and/or plagioclase, and some containing abundant rutile and lesser zircon. The abundance of rutile, zircon, and opaque, and their concentration in a few seams indicates a detrital sedimentary origin.

Sample T-24C is a metamorphosed quartz sandstone dominated by quartz with much less abundant muscovite and chlorite, and minor opaque/semi-opaque, ankerite, and clinozoisite.

Sample T-25C is dominated by quartz with minor disseminated chlorite and seams rich in one or more of chlorite, ankerite, and muscovite; some of which contain concentrations of leucoxene and tourmaline. Pyrite forms very irregular patches. A few layers of coarser grained quartz were formed by metamorphic segregation. Later cataclastic deformation sub-perpendicular to the compositional banding caused recrystallization of quartz into subgrain aggregates with strongly sutured grain borders.

Sample T-26B is a very fine grained quartzite containing moderately abundant disseminated patches and seams of carbonaceous (and other) opaque and minor flakes of muscovite. A large vein or replacement zone is of medium to coarse grained quartz with a patch of medium grained ankerite and less abundant muscovite, biotite, opaque (pyrite) and chlorite. In the replacement patch, quartz was recrystallized slightly to moderately to finer subgrain aggregates.

Sample T-27 is a well foliated metamorphosed quartz sandstone containing muscovite flakes oriented parallel to foliation and minor detrital opaque, ankerite, epidote/allanite, chlorite, zircon, apatite, and tourmaline. A few bands parallel to foliation are dominated by fine to medium grained quartz.

Sample T-28 is a very fine grained schist dominated by quartz and lesser muscovite with lesser porphyroblasts of biotite and lenses of opaque, and disseminated flakes of chlorite. The rock contains kink folds averaging 0.3-0.5 mm between axial planes, with original foliation warped moderately to strongly along the axial planes of the second set of folds, and some muscovite flakes recrystallized along the axial planes of the kink folds.

Sample T-31C is a well foliated schist dominated by quartz with less abundant muscovite and ankerite, and minor biotite, pyrite, and pyrrhotite (altered to limonite/hematite). Garnet(?) forms scattered porphyroblasts, which were altered completely to muscovite-quartz-ankerite. Quartz is concentrated moderately in quartz-rich bands and lenses.

Sample T-36 is a well foliated schist dominated by quartz with much less abundant muscovite and chlorite. These are segregated moderately into bands richer in quartz and others richer in phyllosilicates. Minor minerals include Ti-oxide and opaque, and much less abundant apatite, tourmaline, plagioclase, and zircon.

Sample T-23 is a well foliated schist dominated by quartz and muscovite with much less abundant chlorite, several porphyroblasts of garnet, and minor disseminated ilmenite. Quartz and muscovite are concentrated moderately in quartz-rich and muscovite-rich layers averaging 0.3-1 wide. The rock was contorted strongly by a set of tight folds with axial planes parallel to the main foliation; these are outlined by muscovite flakes and seams.

Sample T-25B is a well foliated, strongly folded schist dominated by muscovite and quartz with lesser chlorite and plagioclase, and minor ilmenite/leucoxene and pyrite/pyrrhotite. Quartz is concentrated strongly in quartz-rich lenses. The main foliation is axial planar to tight folds whose axial planes are defined by seams of muscovite commonly containing moderately abundant dusty carbonaceous opaque.

Sample T-34 is a very fine grained muscovite-chlorite-(plagioclase-quartz-leucoxene-pyrite) schist which was folded moderately to tightly by kink folds. A large replacement patch of coarser grained quartz and much less abundant ankerite contains a few lenses and patches of micaceous schist and a few of plagioclase-rich, metamorphosed latite(?).

Sample T-A-F is a well foliated, slightly compositionally banded schist dominated by quartz and muscovite with moderately abundant ankerite and pyrrhotite. Quartz is concentrated moderately to strongly towards one end of the section, whereas muscovite and ankerite are concentrated moderately to strongly to wards the other end. Muscovite grains are oriented strongly parallel to foliation.

Sample 91558 is a well foliated, compositionally banded schist dominated by muscovite and quartz, with much less abundant chlorite, and minor pyrite and Ti-oxide. Muscovite is concentrated strongly in muscovite-rich layers up to a few mm wide.

Sample 91561 is a contorted schist dominated by muscovite with much less abundant quartz and chlorite. Lenses up to several mm long and a few mm wide are dominated by quartz with minor chlorite as patches and disseminated grains and locally moderately abundant disseminated ankerite.

Sample L-9601 is a well foliated, compositionally banded schist dominated by muscovite, quartz, and chlorite, with minor disseminated elongate ilmenite grains and patches of opaque (pyrite/ pyrrhotite). The original foliation (S_1) was warped strongly about a closely spaced, axial planar foliation (S_2) which is the main foliation in the rock.

B2: Same as B1 with Garnet and Biotite Porphyroblasts

Sample T-D-B is a tightly folded, slightly to moderately compositionally banded schist dominated by muscovite and quartz, with moderately abundant fine to medium grained biotite and ilmenite porphyroblasts, and minor medium to coarse grained garnet porphyroblasts. Layers range from muscovite-rich to quartz rich. Minor minerals include pyrite and chlorite. Tight kink folds are best developed in muscovite-rich layers, and some muscovite and dusty opaque are recrystallized along the axial planes of the kink folds.

C: Muscovite-rich Schist

Sample T-21A is a moderately compositionally banded schist, with coarser grained bands dominated by muscovite-(biotite), quartz, or calcite/dolomite, and finer grained bands dominated by plagioclase with minor to abundant muscovite. Some muscovite-rich layers show moderately developed kink folds.

D: Plagioclase-rich rocks

D1: Plagioclase-Muscovite-Quartz-Chlorite Schist; Biotite, Garnet Porphyroblasts

Sample T-18B is a compositionally banded schist dominated by plagioclase and muscovite with less chlorite and porphyroblasts of biotite and minor ones of garnet. Quartz is concentrated moderately to strongly in lenses parallel to foliation. The rock was contorted moderately by kink folds, and muscovite in muscovite-rich layers was recrystallized moderately into lenses along the axial planes of the kink folds.

D2: Metamorphosed Latite(?)/Dacite(?)
extremely fine to very fine grained; plagioclase-rich rock with little or no quartz = latite; plagioclase-rich rock with lesser quartz = dacite.

Sample T-7B is a moderately to well foliated, metamorphosed, very fine grained latite dominated by plagioclase with lesser biotite and minor apatite, pyrite, and ilmenite.

Sample T-9B is a moderately foliated, metamorphosed latite dominated by plagioclase with lesser biotite and minor pyrite. A few coarser grained, probably recrystallized patches are of plagioclase, biotite, and apatite. A few veinlets are of ankerite-K-feldspar.

Sample T-11A contains minor patches of metamorphosed latite enclosed in a replacement assemblage of fine to coarse grained calcite with lesser lenses of biotite, patches of each of quartz and plagioclase, and minor magnetite and pyrite. Trace sulfides include chalcopyrite and galena. The rock was strained moderately producing recrystallization in quartz, kink folds in some biotite patches, and twinning in some patches of calcite.

Sample T-11B is moderately foliated, moderately compositionally banded, metamorphosed dacite(?) tuff dominated by plagioclase with less abundant quartz, much less abundant biotite, and porphyroblasts of pyrite. Near one end of the section, a few layers up to 3 mm wide are dominated by quartz with less abundant ankerite; these are low in plagioclase and free of biotite. The rock is fresh. A few discontinuous veinlets are of ankerite.

Sample T-11E is a well foliated, metamorphosed latite(?) dominated by plagioclase and much less abundant biotite and muscovite, and scattered porphyroblasts of pyrite. A set of irregular veinlets is dominated by chlorite with minor K-feldspar and biotite. A discontinuous veinlet is of ankerite. A band of cataclastic deformation contains abundant chlorite in the groundmass.

Sample T-19 is a metamorphosed latite(?) dominated by plagioclase with lesser biotite and much less abundant muscovite, quartz, and opaque (ilmenite and pyrite/pyrrhotite). Quartz is segregated moderately into quartz-rich bands. A discontinuous veinlet is of ankerite.

Sample T-30B is a metamorphosed latite/dacite(?) dominated by extremely fine grained plagioclase and much less quartz with minor ilmenite, tourmaline, chlorite, and pyrrhotite. It was replaced strongly by patches of mainly coarser grained quartz and tourmaline, with much less abundant pyrrhotite and pyrite, and minor chlorite, non-reflective opaque, and chalcopyrite.

Sample T-32C is a metamorphosed latite/diorite dominated by interlocking fine to medium grained plagioclase with much less abundant ankerite, opaque (pyrite) and apatite. Late veins are of ankerite, and late patches are of quartz and minor plagioclase and ankerite.

Sample T-33D is a coarsely layered, metamorphosed latite/diorite(?) dominated by plagioclase with less abundant muscovite and ankerite. Grain size and texture ranges moderately between layers. Coarser grained layers up to 2 cm wide are dominated by plagioclase with lesser ankerite. Finer grained layers up to a few mm wide are dominated by plagioclase and muscovite. A few layers up to 1 mm wide are dominated by muscovite. Foliation is warped slightly to moderately about weak kink folds.

Sample T-B-A is an extremely fine grained, well foliated, compositionally banded, metamorphosed dacite/latite(?) dominated by plagioclase with less abundant quartz and much less abundant biotite, chlorite, muscovite, ilmenite, apatite, and pyrite. Apatite is concentrated strongly in a few layers. Quartz is concentrated in one much coarser grained lens, which probably is of replacement origin.

Sample T-C-A is a strongly compositionally banded foliate dominated by plagioclase, with lesser muscovite, biotite, quartz, apatite, and ankerite. The origin is uncertain; some off the plagioclase textures suggest that it was a diorite. The strong compositional banding suggests that it was a bedded tuff, but the variation in composition between layers is unusual for a primary feature. A few coarser grained replacement lenses are of quartz-ankerite-pyrite.

Sample T-C-F is a metamorphosed, compositionally banded felsic tuff(?) containing two main bands, one dominated by fine grained plagioclase with much less abundant muscovite and ankerite, and the other dominated by very fine grained plagioclase and quartz. A vein is of quartz with a border zone of pyrite-hematite. It is cut by a veinlet of sericite with a core of kaolinite. A few wispy veinlets are of cryptocrystalline clay/chlorite(?).

Sample T-G-E is a metamorphosed latite(?)/dacite(?) tuff(?). It is compositionally banded on the scale of 0.5-5 mm with variation in mineral abundances and grain size between layers. Most layers are dominated by extremely fine grained plagioclase (latite?). Apatite is concentrated strongly in a few of these. A few layers up to 1.2 mm wide are of very fine to fine grained quartz and plagioclase with less abundant plagioclase, ankerite, and muscovite (dacite?). Quartz and minor apatite are concentrated in a few coarser grained, recrystallized lenses parallel to foliation.

Sample 91551 is an extremely fine grained, metamorphosed latite(?) dominated by plagioclase with minor to moderately abundant muscovite and moderately abundant carbonaceous opaque. It was replaced strongly by a patchy replacement dominated by one or more of muscovite, ankerite, and chlorite with less abundant pyrite and quartz. A few veinlets of chlorite-ankerite-quartz cut the host rock.

Sample 91552 contains a few relic patches of metamorphosed porphyritic latite in which phenocrysts of plagioclase are set in a groundmass of extremely fine grained plagioclase with patches of chlorite and minor apatite and leucoxene. Very abundant replacement patches are dominated by chlorite with less abundant quartz and calcite, and minor leucoxene, muscovite, ankerite, and clinozoisite/epidote.

Sample L-9603 is a weakly foliated, metamorphosed latite(?) dominated by extremely fine grained plagioclase with disseminated grains and patches of flakes of muscovite and biotite/chlorite and lenses of opaque (pyrrhotite/pyrite). A few bands and patches up to a few mm across are dominated by coarser grained plagioclase with scattered patches of ankerite, pyrite, and chlorite. Minor veinlets up to 0.3 mm wide are of ankerite.

D3: Metamorphosed Diorite(?), minor Quartz Diorite(?)

fine to locally very fine or medium grained, dominated by plagioclase, commonly strongly altered to one or more of ankerite, chlorite, muscovite, and quartz.

Sample T-32C is a metamorphosed latite/diorite dominated by interlocking fine to medium grained plagioclase with much less abundant ankerite, opaque (pyrite) and apatite. Late veins are of ankerite, and late patches are of quartz and minor plagioclase and ankerite.

Sample T-E-A is a fine grained metamorphosed quartz diorite(?) dominated by plagioclase with lesser quartz, ankerite, and muscovite, and minor patches of apatite. It was replaced by abundant patches and lenses parallel to foliation dominated by quartz and much less abundant ankerite.

Sample T-E-C is a relatively massive metamorphosed diorite dominated by equant plagioclase grains with much less abundant disseminated ankerite and opaque, and scattered lenses and patches dominated by muscovite. A few coarser grained, recrystallized lenses are dominated by plagioclase with minor patches of sphalerite and pyrrhotite.

Sample T-E-D is a very fine grained to fine grained altered diorite(?) dominated by secondary ankerite and primary(?) plagioclase, with less abundant secondary muscovite, and minor quartz and Ti-oxide. A few replacement patches and veinlike zones are dominated by ankerite or quartz with scattered grains of sphalerite, plagioclase, and pyrite.

Sample T-F-A is a metamorphosed diorite(?) dominated by fine to medium grained plagioclase which was recrystallized to much finer grained plagioclase and replaced partly by muscovite and ankerite. Less abundant minerals are quartz, opaque (pyrite), and carbonaceous opaque. The rock was folded moderately on the scale of 1- 3 mm.

Sample T-F-C is a metamorphosed, altered diorite(?) containing patches of fine grained plagioclase intergrown with patches of much finer grained plagioclase, and with patches and seams of muscovite with lesser ankerite and quartz. Pyrite forms irregular replacement patches and lenses, and is altered in part to hematite/limonite. The rock was contorted moderately to strongly on the scale of 1- 3 mm.

Sample T-F-E is a metamorphosed, strongly altered, fine grained diorite containing relic fine grained plagioclase grains intergrown with irregular patches and seams of ankerite and lesser quartz and muscovite. Pyrite forms minor replacement patches and lenses. Quartz and minor ankerite occur in a few sygmoidal lenses up to a few mm across and 1 cm long.

Sample T-G-C is a fine to medium grained, metamorphosed, leucocratic diorite dominated by plagioclase with minor disseminated flakes of muscovite and lenses of rutile. Abundant replacement patches are of pyrite and minor chalcopyrite. Late replacement patches are of hematite. A wispy veinlet is of smectite(?).

Sample A-9605-A is a very fine grained, slightly compositionally banded, metamorphosed diorite or latite dominated by plagioclase with much less calcite, chlorite, muscovite, and biotite. Replacement patches and lenses are dominated by one or more of calcite/ankerite, chlorite, quartz, pyrite, and muscovite/sericite. K-feldspar forms a weak, pervasive replacement of plagioclase..

Sample A-9605-B contains a patch up to 4 mm across of metamorphosed diorite(?) which is dominated by plagioclase with less abundant muscovite. In the offcut block near the diorite patch is a patch several mm long of plagioclase replaced moderately along the margins of the patch by K-feldspar (this patch was not seen in the thin section). Most of the rock is a replacement zone dominated by very fine to fine grained calcite with much less abundant quartz and minor feldspar; this material has a texture suggesting that it was metamorphosed. Near one end of the section is a deformed quartz vein or replacement zone up to several mm wide. Elsewhere, a diffuse zone dominated by quartz was deformed cataclastically.

E: Strongly Altered Rocks, Uncertain Origin

Sample T-B-C is a quartz-rich schist with irregular lenses and seams of a variety of mineral assemblages and textures dominated by one or two of ankerite, chlorite, muscovite, opaque/hematite, or plagioclase. Textures of quartz are similar to those in replacement lenses in other samples, suggesting that this rock was silicified strongly prior to metamorphism.

F: Sulfide-Rich Samples

Sample T-14A is dominated by massive, medium to coarse grained pyrrhotite, which was altered moderately to strongly to secondary pyrite and non-reflective opaque. Minor phases are chalcopyrite and quartz.

Sample T-A-C is vein dominated by patches of very coarse grained quartz and patches of fine to medium grained pyrite, with minor chalcopyrite and trace galena. Pyrite commonly has euhedral crystal faces. Hematite forms minor patches bordering pyrite.

Sample T-C-D is a coarse grained vein dominated by patches of quartz and patches of pyrrhotite. Pyrrhotite is replaced completely by secondary pyrite showing delicate alteration growth textures. The vein shows only minor textures suggestive of deformation or recrystallization.

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Sample T-7B **Metamorphosed Latite**

The sample is a moderately to well foliated, metamorphosed, very fine grained latite dominated by plagioclase with lesser biotite and minor apatite, pyrite, and ilmenite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	75-80%	0.03-0.08	0.12	
biotite	17-20	0.07-0.25	0.5	light to dark reddish brown
apatite	2- 3	0.07-0.15	0.3	
pyrite	2- 3	0.3-0.7	1.3	
opaque (ilmenite?)	0.7	0.03-0.1	0.15	
chlorite	trace	0.02-0.03	0.05	pale to light green

Plagioclase forms anhedral, slightly interlocking to submosaic grains.

Biotite forms clusters of anhedral grains and is concentrated moderately in seams parallel to foliation. A few grains are ragged porphyroblasts with minor inclusions of plagioclase.

Apatite forms anhedral, subrounded grains, concentrated slightly to moderately in lenses parallel to foliation, in part associated with biotite.

Pyrite forms anhedral patches up to 0.5 mm in size and a few subhedral, porphyroblasts averaging 1-1.3 mm across. The porphyroblasts are concentrated near one end of the section, and contain scattered inclusions of plagioclase and minor biotite.

Ilmenite forms disseminated, skeletal clusters up to 1 mm in size of anhedral grains intergrown with plagioclase.

Chlorite forms one patch 0.17 mm across enclosed in biotite.

NOTE:
NO [illegible]
NO [illegible]

Sample T-9B **Metamorphosed Latite;**
Patches of Coarser Plagioclase-Biotite-Apatite;
Veinlets of Ankerite-K-feldspar

The sample is a moderately foliated, metamorphosed latite dominated by plagioclase with lesser biotite and minor pyrite. A few coarser grained, probably recrystallized patches are of plagioclase, biotite, and apatite. A few veinlets are of ankerite-K-feldspar.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	80-83%	0.07-0.12	0.2	
biotite	12-15	0.05-0.2	0.8	light to dark brown
pyrite	2- 3	0.3-0.7	1.3	
opaque (ilmenite?)	0.5	0.03-0.07	0.12	
ankerite	0.3	0.1-0.3	0.5	
apatite	0.1	0.07-0.15	0.3	
coarser grained patches				
plagioclase	4- 5	0.7-1.5	1.8	
biotite	1- 2	0.3-0.5	0.8	light to dark brown
apatite	0.5	0.3-0.5	0.8	
opaque	minor	cryptocrystalline	0.03	
veins, veinlets				
ankerite-K-feldspar	0.5	0.02-0.07	0.1	

Plagioclase forms anhedral, submosaic to slightly interlocking grains.
Biotite forms clusters of flakes.
Pyrite forms disseminated, anhedral grains.
Calcite forms anhedral to euhedral, porphyroblastic grains overgrown on plagioclase.
Ilmenite forms disseminated, anhedral to subhedral patches.
Apatite forms anhedral, equant grains, commonly associated with biotite.

A coarser grained patch several mm across is dominated by anhedral plagioclase. Biotite forms clusters of flakes intergrown coarsely with plagioclase. Some of these contain selvages and patches of cryptocrystalline to extremely fine grained opaque (probably ilmenite/leucoxene). Apatite forms one cluster 1.5 mm across of anhedral grains intergrown coarsely with biotite. .

A few, discontinuous veinlets up to 0.4 mm wide are of extremely fine to very fine grained ankerite and much less abundant K-feldspar. The distribution of K-feldspar in the veinlets is seen well in the stained offcut block. .

Sample T-11A **Metamorphosed Latite: Strong Replacement: Calcite-Biotite-Quartz-Plagioclase-(Magnetite-Pyrite)**

The sample contains minor patches of metamorphosed latite enclosed in a replacement assemblage of fine to medium grained calcite with lesser lenses of biotite, patches of each of quartz and plagioclase, and minor magnetite and pyrite. Trace sulfides include chalcopyrite and galena. The rock was strained moderately producing recrystallization in quartz, kink folds in some biotite patches, and twinning in some patches of calcite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	3- 4	0.05-0.08	0.12	
muscovite	1	0.07-0.2	0.3	
biotite	0.3	0.03-0.07	0.1	light to dark brown
replacement				
calcite	60-65%	0.3-1	4	
biotite	15-17	0.05-0.2	0.5	light to medium green; light to \ medium brownish green
quartz	7- 8	0.3-1	1.7	
plagioclase	7- 8	0.7-1.5	2	
magnetite	2- 3	0.05-0.3	0.9	
pyrite	1-1.5	0.2-0.5	1.5	
chalcopyrite	0.1	0.05-0.15	0.3	
galena	minor	0.02-0.05	0.2	
rutile	trace	0.2		

Plagioclase forms patches up to 2 mm in size of grains averaging 0.05-0.1 mm in size.

In one corner of the section is a patch of muscovite and much less plagioclase. Muscovite is folded tightly.

One patch of very fine grained plagioclase contains moderately abundant, disseminated biotite flakes.

Calcite forms patches of anhedral grains which range widely in size.

Biotite is concentrated strongly in patches and lenses. In part of the rock, pleochroism is from pale to medium, bright green. In other patches, it is from pale to medium greenish brown to brownish green. Some biotite patches were kinked irregularly.

Quartz is concentrated in a few patches up to 3 mm across. Coarser grains are strained moderately to strongly and recrystallized in part to much finer grained aggregates.

Plagioclase forms single grains and clusters of subhedral to anhedral, prismatic grains.

Magnetite forms disseminated, anhedral to euhedral grains enclosed in calcite. One coarse grains was fractured moderately and contains a lens of chalcopyrite in one of the fractures.

Pyrite forms anhedral to euhedral grains..

Chalcopyrite forms anhedral patches in calcite.

Galena forms anhedral grains associated with calcite and locally with chalcopyrite and pyrite.

Rutile forms a subhedral patch 0.2 mm in size enclosed in calcite.

Sample T-11B **Metamorphosed Dacite(?): Plagioclase-Quartz-Biotite-Pyrite Foliate**

The rock is moderately foliated, moderately compositionally banded metamorphosed dacite(?) tuff dominated by plagioclase with less abundant quartz, much less abundant biotite, and porphyroblasts of pyrite. Near one end of the section, a few layers up to 3 mm wide are dominated by quartz with less abundant ankerite; these are low in plagioclase and free of biotite. The rock is fresh. A few discontinuous veinlets are of ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	65-70%	0.03-0.1	0.15	
quartz	18-22	0.03-0.07	0.15	
biotite	7- 8	0.05-0.1	0.15	light to dark brown
pyrite	2- 3	0.1-0.5	1.7	porphyroblasts
opaque(ilmenite)	1	0.05-0.15	0.7	(may include some pyrite)
ankerite	0.7	0.05-0.15	0.25	
apatite	0.5	0.03-0.05	0.15	
zircon	trace	0.02-0.05	0.7	
coarser patches				
quartz	0.2	0.1-0.2	0.3	
veinlets				
ankerite	0.3			

Plagioclase forms equant grains which are distinguished from quartz by the presence of albite twins. Untwinned plagioclase is optically very similar to quartz.

Quartz forms anhedral grains intergrown slightly with plagioclase, mainly in quartz-rich layers. Quartz also forms a few patches up to 0.5 mm in size of grains averaging 0.15-0.3 mm in size. Ankerite forms disseminated, anhedral grain mainly in quartz-rich layers.

Biotite flakes commonly are oriented parallel to foliation. A few skeletal porphyroblasts up to 0.7 mm in size are oriented perpendicular to foliation.

Most opaque grains which can be positively identified as pyrite are subhedral to euhedral and porphyroblastic. One pyrite lens 1.8 mm long parallel to foliation consist of anhedral to subhedral grains up to 0.5 mm in size. Ilmenite forms tabular to irregular grains. Probably some of the finer grained, anhedral opaque also is pyrite.

Apatite forms anhedral to subhedral, disseminated grains.

A few discontinuous veinlets up to 0.4 mm wide of very fine grained ankerite are concentrated in quartz-rich layers in the rock; they cut foliation at a moderate angle.

Sample T-11E **Metamorphosed Latite(?): Plagioclase-Biotite-(Muscovite-Ilmenite); Chlorite-(K-feldspar-Biotite) Veinlets, Ankerite Veinlet, Zone of Cataclastic Deformation with Chlorite-(K-feldspar) Matrix**

The sample is a well foliated rock dominated by plagioclase and much less abundant biotite and muscovite, and scattered porphyroblasts of pyrite. A set of irregular veinlets is dominated by chlorite with minor K-feldspar and biotite. A discontinuous veinlet is of ankerite. A band of cataclastic deformation contains abundant chlorite in the groundmass.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	80-85%	0.02-0.07	0.1	
biotite	8-10	0.07-0.2	0.7	light to dark brown
muscovite	2- 3	0.05-0.1	0.2	
pyrite	2- 3	0.1-0.5	3	porphyroblastic
ilmenite	0.5	0.1-0.3	0.7	(may include some pyrite)
apatite	0.3	0.03-0.05	0.25	
coarser patches				
plagioclase	1	0.5-0.7	0.8	
biotite	0.3	0.3-0.5		
veinlets				
chlorite-(K-feldspar-biotite)	1- 2	cryptocrystalline	0.05	
ankerite	0.1	0.05-0.07		
cataclastic zone	(4- 5)			
chlorite matrix	1- 2			

Plagioclase grains are elongate slightly parallel to foliation. A few coarser grains up to 0.5 mm in size may represent original phenocrysts. A few patches and lenses parallel to foliation are of plagioclase grains averaging 0.5-0.7 mm in size with minor to moderately abundant biotite; these probably are metamorphic segregations.

Biotite forms disseminated flakes oriented parallel to foliation and single grains and clusters of coarser grains, in part porphyroblastic, from 0.3-0.7 mm in size. Porphyroblasts are concentrated in layers which contain muscovite and which generally are free of finer grained biotite. Some porphyroblasts contain moderately abundant to very abundant equant inclusions of plagioclase/quartz averaging 0.01-0.03 mm in size.

Muscovite is concentrated moderately in a few layers as disseminated flakes oriented parallel to foliation and intergrown with plagioclase.

Pyrite forms disseminated, subhedral to euhedral grains, including one large cubic grain. Ilmenite forms disseminated, subhedral, tabular grains. Apatite forms disseminated, anhedral grains.

Numerous veinlets up to 0.15 mm wide are of cryptocrystalline to extremely fine grained, pale to light green chlorite with minor biotite and patches of cryptocrystalline to extremely fine grained K-feldspar. Textures suggest that some of the chlorite is secondary after biotite. Most veinlets are irregular in outline and cut foliation at a high angle.

A wispy veinlet up to 0.1 mm wide is of ankerite.

In one corner of the section is a zone up to 3.5 mm wide of cataclastic deformation in which the rock was granulated strongly and fractures filled with cryptocrystalline chlorite. The stained offcut block also suggests that the matrix contains patches of K-feldspar. This zone and the veinlets of chlorite-K-feldspar probably are related genetically.

Sample T-12 **Contorted Banded Quartz-Muscovite-Calcite-Chlorite Schist; Replacement Patch: Quartz-Calcite-(Muscovite-Chlorite)**

The sample is a contorted schist dominated by quartz, muscovite, calcite, and lesser chlorite. It was folded tightly, and muscovite in muscovite-rich layers was recrystallized moderately along axial planes of the second stage of folds. A large replacement patch is of coarser grained quartz, less abundant calcite and minor muscovite and chlorite.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	20-25%	0.03-0.08	0.2	
calcite	20-25	0.1-0.2	0.5	
muscovite	17-20	0.05-0.15	0.25	
chlorite	7- 8	0.05-0.1	0.15	pale to light green
Ti-oxide	0.3	0.03-0.05	0.1	
pyrite	0.1	0.05-0.1	0.2	
tourmaline	trace	0.02-0.04	0.08	pale to light green
carbonaceous opaque	0.2	cryptocrystalline		
replacement lens				
quartz	15-17	0.1-0.8	1.5	
calcite	5- 7	0.1-0.3	0.5	
muscovite	0.3	0.1-0.2	0.3	
chlorite	0.2	0.05-0.15	0.2	pale to light green
carbonaceous opaque	minor	cryptocrystalline		

Quartz occurs in a variety of modes. In some bands, quartz grains averaging 0.01-0.02 mm in size are intergrown with extremely fine grained muscovite and moderately abundant dusty opaque. Coarser grained patches averaging 0.02-0.05 mm ingrain size are similar. Some of the transparent material in these bands may be plagioclase. In coarser grained layers and patches, quartz grains averaging 0.05-0.15 mm in size generally are free of dusty opaque inclusions.

Calcite forms equant grains mainly intergrown coarsely with muscovite in calcite-muscovite-rich bands.

Muscovite is concentrated moderately to strongly in muscovite-rich bands. Chlorite forms disseminated flakes, in part intergrown with muscovite, and in part alone.

Pyrite is concentrated in lenses up to 0.7 mm long parallel to foliation. It also forms a few euhedral grains up to 0.3 mm across.

Ti-oxide forms disseminated grains and clusters up to 0.5 mm in size.

Tourmaline forms disseminated, equant grains.

Cryptocrystalline opaque is concentrated moderately in muscovite-rich seams and in patches of extremely fine grained quartz/plagioclase.

In the replacement lens, quartz forms slightly interlocking grains, finer ones of which may have formed by recrystallization of coarser grains. Calcite forms patches of anhedral grains. Muscovite forms disseminated grains. Chlorite forms disseminated grains and clusters of a few grains, mainly near borders of the replacement patch. Dusty carbonaceous opaque is concentrated in some grains of calcite.

Sample T-14A **Massive Pyrrhotite-(Quartz-Chalcopyrite-Tourmaline)**

The sample is dominated by massive, medium to coarse grained pyrrhotite, which was altered moderately to strongly to secondary pyrite and non-reflective opaque. Minor phases are chalcopyrite and quartz.

pyrrhotite	
fresh	10-12%
altered	68-73
quartz	3- 4
chalcopyrite	0.3
chlorite, biotite/chlorite	0.1
Ti-oxide	trace
cavities	12-15

Pyrrhotite forms relic cores of grains averaging 0.5-1 mm in size. These are surrounded by secondary replacement zones of pyrite and non-reflective material. Adjacent to fresh pyrrhotite, the secondary material shows delicate, strongly serrated growth zones extending inwards from original grain borders and fractures. Further away from fresh pyrrhotite, this commonly grades sharply into massive secondary pyrite with minor dusty non-reflective material. Many irregular cavities up to 2 mm in size in the zones of secondary pyrite probably represent leached pyrrhotite.

Quartz forms an equant patch 8 mm across mainly of one anhedral grain, and a few interstitial patches and lenses up to 1.5 mm long of anhedral grains averaging 0.1-0.5 mm in size and locally up to 1.5 mm long.

Chalcopyrite forms a few patches from 0.1-0.5 mm in size and a few discontinuous veinlets up to 0.3 mm long and 0.02 mm wide in pyrrhotite.

Tourmaline forms a subhedral prismatic grain 0.3 mm long and an anhedral grain 0.05 mm across. Pleochroism is from colourless to light brownish green.

One interstitial patch 0.5 mm contains a patch 0.2 mm across of very fine grained, pale to light green chlorite, and a patch 0.5 mm of very fine grained biotite/chlorite(?) and quartz(?). The latter patch contains abundant dusty to cryptocrystalline limonite, which obscures the optical properties of the other minerals and makes their identification uncertain.

Ti-oxide forms a patch 0.1 mm in size of equant grains averaging 0.02-0.05 mm in size.

Muscovite forms a subhedral, slender flake 0.1 mm long.

Sample T-14B Deformed Quartz-Muscovite Schist; Quartz-Opaque Patch

About half the sample is dominated by quartz with a few elongate, strongly contorted, muscovite-opaque-rich seams. The other half is a zoned replacement patch of quartz and opaque (dominated by altered pyrrhotite with much less abundant pyrite) with minor muscovite.

	percentage	ave. grain size mm	max size mm	pleochroism
rock				
quartz	40-45%	0.03-0.08	0.15	
muscovite	3- 4	0.03-0.1	0.2	
opaque	0.3	0.03-0.07	0.2	
zircon	minor	0.04-0.06	0.1	
tourmaline	minor	0.03-0.05	0.3	pale to medium green/brownish green
replacement patch				
quartz	20-25	0.1-0.5	1	
opaque	20-25	0.1-1	2	
muscovite	0.3	0.02-0.07	0.15	

Muscovite forms disseminated flakes averaging 0.02-0.03 mm in size in quartz-rich zones. Seams averaging 0.1-0.3 mm wide rich in muscovite, commonly with moderately abundant to very abundant dusty opaque are contorted strongly. Zircon and tourmaline are concentrated moderately in a few seams.

Dusty opaque also is disseminated in quartz in the main rock.

In the replacement patch are two main subzones. Adjacent to the rock is a zone dominated by quartz in which grains range widely from 0.05-1.5 mm in size. Away from the rock, the replacement patch is dominated by opaque (probably mainly altered pyrrhotite) with much less abundant quartz. Pyrite forms disseminated grains averaging 0.5-1 mm in size intergrown with pyrrhotite. Muscovite forms minor flakes and clusters of flakes in both parts of the replacement patch.

Sample T-16A Banded Quartz-Muscovite-Plagioclase-Rutile Schist

The sample is a compositionally banded schist dominated by quartz with some bands containing abundant muscovite and/or plagioclase, and some containing abundant rutile and lesser zircon. The abundance of rutile, zircon, and opaque, and their concentration in a few seams indicates a detrital sedimentary origin.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	82-85%	0.07-0.2	0.5	
muscovite	7- 8	0.1-0.3	0.8	
plagioclase	3- 4	0.1-0.3	0.8	
rutile	2- 3	0.05-0.1	0.5	
ankerite	0.7	0.05-0.2	0.6	
opaque	0.7	0.1-0.2	0.7	
clinozoisite	0.2	0.1-0.15	0.4	
zircon	0.2	0.05-0.1	0.2	
biotite	0.2	0.1-0 2	0.3	pale to light brown
apatite	minor	0.03-0.05	0.07	

Quartz grains are strained moderately and some coarser grained patches are recrystallized moderately to finer subgrain aggregates. .

Plagioclase is concentrated moderately to strongly in a few bands up to 1.5 mm wide. Wider bands commonly are coarser grained, with grains averaging 0.3-0.6 mm in size. Alteration is slight to disseminated flakes of sericite, with moderately abundant seams of limonite along fractures.

Biotite occurs in two modes, as scattered flakes from 0.1-0.3 mm in size and as patches up to 0.3 mm across of cryptocrystalline aggregates. The latter occur in bands rich in plagioclase and/or muscovite.

Rutile and zircon are concentrated moderately to strongly in a few muscovite-rich and muscovite-ankerite-rich layers up to 3 mm wide. Rutile forms clusters up to 1 mm long of extremely fine to locally fine grains. Zircon forms anhedral grains ranging with outlines ranging from ragged to rounded.

Clinozoisite forms elongate grains and clusters of grains in a few layers associated with rutile.

Sample T-17 **Muscovite-Quartz-(Ilmenite-Pyrrhotite-Biotite) Schist; Lenses of Quartz-Chlorite-Pyrrhotite**

The sample is a well foliated, moderately compositionally banded schist dominated by muscovite and quartz with less abundant chlorite, and minor disseminated grains of ilmenite, porphyroblasts of biotite, and lenses of pyrrhotite. A large patch formed by metamorphic segregation is dominated by slightly coarser grained quartz with much less abundant chlorite and pyrrhotite. The rock was folded strongly on a set of subparallel drag folds averaging 0.5-0.1 mm in wave length. The major limb of the drag folds is parallel to the major foliation.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	50-55%	0.05-0.1	0.2	
quartz	30-35	0.07-0.2	0.5	
chlorite	5- 7	0.1-0.15	0.4	pale to light green
pyrrhotite	1- 2	0.1-0.2	0.4	
ilmenite	1- 2	0.15-0.25	0.5	
biotite	0.7	0.1-0 2	0.8	pale to medium reddish brown
tourmaline	minor	0.03-0.05	0.08	light to medium green
zircon	trace	0.03-0.05	0.07	
chalcopyrite	trace	0.03-0.05	0.07	

Muscovite is concentrated moderately in muscovite-rich seams, which show well the folded nature of the rock.

Quartz is concentrated strongly in a quartz-rich lens with much less abundant chlorite and ilmenite. It contains moderately abundant, dusty opaque inclusions.

Chlorite occurs as flakes intergrown intimately with muscovite in muscovite-rich bands. It forms disseminated flakes in quartz-rich patches.

Pyrrhotite forms disseminated lenses and patches averaging 0.3-1 mm long, mainly parallel to foliation, with a few up to 2 mm long.

Biotite forms disseminated flakes averaging 0.1-0.3 mm in size and a few porphyroblasts from 0.3-0.8 mm in size. The latter commonly are oriented at a moderate to high angle to foliation.

Ilmenite forms stubby to elongate tabular grains, many of which contain moderately abundant quartz inclusions averaging 0.01-0.03 mm in size.

Tourmaline and zircon form subhedral to euhedral grains and are concentrated in certain seams and layers with ilmenite. This distribution suggests a detrital sedimentary origin for the rock.

Chalcopyrite forms a few anhedral grains intergrown with pyrrhotite or silicates.

Sample T-18B **Plagioclase-Muscovite-Chlorite-Quartz-Biotite-Pyrite-Garnet Schist Quartz-rich Lenses**

The sample is a compositionally banded schist dominated by plagioclase and muscovite with less chlorite and porphyroblasts of biotite and minor ones of garnet. Quartz is concentrated moderately to strongly in lenses parallel to foliation. The rock was contorted moderately by kink folds, and muscovite in muscovite-rich layers was recrystallized moderately into lenses along the axial planes of the kink folds.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	25-30%	0.02-0.03	0.07	
muscovite	20-25	0.05-0.1	0.2	
chlorite	8-10	0.1-0.15	0.4	pale to light green
quartz	5- 7	0.05-0.08	0.1	
biotite	4- 5	0.1-0 3	1	pale to medium reddish brown
pyrite	3- 4	0.1-0.3	0.4	
ilmenite	1	0.15-0.2	0.4	
magnetite	0.5	0.1-0.2	0.2	
garnet	0.3	0.5-1.5		
apatite	minor	0.02-0.03	0.05	
quartz-rich lenses				
quartz	17-20	0.07-0.2	0.5	
chlorite	0.7	0.03-0.08	0.15	
plagioclase	0.5	0.05-0.1	0.15	
muscovite	0.3	0.03-0.05	0.08	
biotite	0.1	0.03-0.05	0.08	

Plagioclase forms equant, anhedral grains intergrown with flakes of muscovite and chlorite.

Muscovite is concentrated moderately in muscovite-rich bands in which it is intergrown with less abundant plagioclase, quartz, and chlorite.

Biotite forms disseminated grains, of which the coarser ones (over 0.5 mm in size) commonly are porphyroblastic

Garnet forms an equant porphyroblast containing moderately abundant lensy inclusions of quartz and much fewer ones of ilmenite.

Pyrite is concentrated moderately in patches up to 1.5 mm long elongated parallel to foliation.

Ilmenite forms disseminated, subhedral to anhedral, tabular grains. Magnetite was identified by the magnetism of the rock; it forms equant to tabular grains which are similar texturally to some of those of ilmenite.

Quartz-rich lenses up to 1.5 mm wide are dominated by slightly interlocking grains of quartz. In the largest quartz-rich lens, plagioclase forms disseminated anhedral grains containing moderately abundant dusty opaque inclusions. Disseminated flakes are of none or more of muscovite, chlorite, and biotite.

Sample T-19 Metamorphosed Latite(?); Minor Quartz Segregation; Ankerite Veinlet

The sample is dominated by plagioclase with lesser biotite and much less abundant muscovite, quartz, and opaque (ilmenite and pyrite/pyrrhotite). Quartz is segregated moderately into quartz-rich bands. A discontinuous veinlet is of ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	82-85%	0.05-0.08	0.15	
biotite	7- 8	0.05-0.3	0.7	pale to medium reddish orange
muscovite	3- 4	0.05-0.15	0.8	
quartz	3- 4	0.05-0.1	0.15	
opaque (pyrite/pyrrhotite)	2- 3	0.05-0.2	0.5	
opaque (ilmenite?)	1- 2	0.1-0.15	0.25	
chlorite	0.3	0.05-0.1	0.15	pale to very light green
apatite	0.2	0.02-0.03	0.1	
veinlet				
ankerite	0.1	0.2-0.3		

Plagioclase forms equant, anhedral grains, a few of which show albite twins.

Quartz is intergrown irregularly with plagioclase.

Biotite forms ragged flakes up to 0.15 mm in size and a few subhedral porphyroblasts up to 0.3 mm long. In is concentrated slightly in some seams parallel to foliation. A few disseminated flakes are replaced by pseudomorphic chlorite. A few clusters of biotite flakes associated with pyrite(?) are replaced completely by chlorite.

Muscovite is concentrated moderately in a few bands parallel to foliation.

Ilmenite forms disseminated, tabular grains.

Opaque (pyrite and/or pyrrhotite) forms irregular patches.

Apatite forms disseminated, anhedral, equant grains.

Quartz is concentrated in a few lenses and bands up to 1 mm wide.

A discontinuous veinlet up to 0.1 mm wide is of irregular ankerite grains averaging 0.2-0.3 mm long.

Sample T-20 **Muscovite-Quartz-(Chlorite-Plagioclase-Ilmenite) Schist; Strong Fold Deformation**

The sample is as strongly folded schist dominated by muscovite and quartz with much less abundant chlorite and plagioclase, and minor ilmenite and carbonaceous opaque. Quartz is concentrated strongly in quartz-rich lenses parallel to foliation; some of these appear to be boudins. Abundant tight to open drag folds have axial planes and fold limbs parallel to the major cleavage; the wave length of folds ranges from 0.3-1 mm. A few microscopic kink folds warp this foliation.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	55-60%	0.1-0.3	0.5	
quartz	25-30	0.1-0.3	1	
plagioclase	5- 7	0.01-0.02	0.03	
chlorite	4- 5	0.05-0.1	0.5	
ilmenite	1- 2	0.1-0.5	1.5	
carbonaceous opaque	0.5	cryptocrystalline		
biotite	minor	0.05-0.1	0.15	pale to medium orangish brown
apatite	minor	0.03-0.05	0.07	

Muscovite is concentrated moderately to strongly in seams up to 1 mm wide parallel to foliation. Intergrown with muscovite seams parallel to foliation is moderately abundant dusty opaque.

Chlorite is intergrown intimately with muscovite.

Plagioclase is concentrated in a few layers as anhedral grains intergrown with moderately abundant, dusty carbonaceous opaque and minor to moderately abundant muscovite.

Quartz is concentrated in lenses up to a few mm wide as interlocking grains. Textures suggest that in at least some lenses, originally coarser grains were recrystallized to smaller sub-grain aggregates. Disseminated in quartz-rich lenses are minor flakes of chlorite and muscovite.

Opaque (ilmenite and possibly minor pyrite/pyrrhotite) forms elongate lenses parallel to foliation.

Biotite forms disseminated flakes in quartz and locally intergrown with muscovite and chlorite.

Sample T-21A Muscovite-Plagioclase-Quartz-(Calcite/Dolomite-Biotite) Schist

The sample is a moderately compositionally banded schist, with coarser grained bands dominated by muscovite-(biotite), quartz, or calcite/dolomite, and finer grained bands dominated by plagioclase with minor to abundant muscovite. Some muscovite-rich layers show moderately developed kink folds.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	50-55%	0.05-0.2	0.5	
plagioclase	20-25	0.02-0.05	0.07	
quartz	12-15	0.1-0.5	0.8	
calcite/dolomite	3- 4	0.05-0.2	0.6	
pyrrhotite	2- 3	0.05-0.15	0.5	
biotite	1- 2	0.05-0 15	0.3	pale to light brown
chlorite	0.2	0.1-0.2	0.3	pale to very light green
clinozoisite	0.2	0.05-0.15	0.2	
Ti-oxide	0.2	0.02-0.03	0.05	

Muscovite is concentrated strongly in muscovite-rich layers as flakes ranging moderately in grain size from layer to layer.

Plagioclase is concentrated in plagioclase-rich layers up to a few mm wide, in which plagioclase is intergrown with minor to moderately abundant muscovite.

Quartz is concentrated strongly in quartz-rich lenses up to a few mm wide. Coarser grains are strained slightly to moderately. These contain minor to moderately abundant calcite and minor muscovite and biotite. A few patches were recrystallized strongly to aggregates of grains averaging 0.01-0.015 mm in size

Calcite/dolomite is concentrated in a few seams up to 0.3 mm wide as very fine to fine grains intergrown with minor to moderately abundant muscovite. It also forms anhedral grains in irregular patches, in quartz-rich lenses. The mineral has low relief (suggesting calcite) but much of it reacts very slowly with dilute HCl (suggesting dolomite).

Pyrrhotite is concentrated strongly in elongate lenses up to 3 mm long parallel to foliation.

Clinozoisite forms disseminated, equant, subhedral to euhedral grains averaging 0.05-0.1 mm in size.

Ti-oxide forms clusters of anhedral, equant grains, commonly associated with lenses of pyrrhotite.

Sample T-21-B Quartz-Muscovite-Ankerite-(Plagioclase) Schist; Quartz-rich Lenses

The sample is a well foliated schist dominated by quartz with lesser muscovite and much less abundant ankerite and plagioclase. A few quartz-rich patches and lenses are parallel to foliation. Veins and veinlets are of pyrite, in part with envelopes of cryptocrystalline biotite/chlorite. A veinlet is of calcite/dolomite. Most of the veins and veinlets are perpendicular to the foliation in the rock.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	65-70%	0.085-0.5	2	
muscovite	15-17	0.05-0.2	0.9	
calcite/dolomite	7- 8	0.05-0.2	0.7	
plagioclase	5- 7	0.03-0.05	0.07	
biotite	2- 3	0.05-0 15	0.4	pale to medium reddish brown
pyrite	1- 2	0.05-0.15	0.5	
biotite/chlorite	0.2	cryptocrystalline		light to medium brownish green
apatite	0.2	0.05-0.07	0.8	
chlorite	minor	0.1-0.2	0.3	pale to very light green
carbonaceous opaque	minor	cryptocrystalline		
veins, veinlets				
pyrite	3- 4	0.1-0.5	(in part with biotite/chlorite envelope)	
calcite/dolomite	0.2	0.05-0.1		

Quartz is concentrated moderately to strongly in quartz-rich layers and lenses up to several mm wide. In coarser grained lenses, grains are strained moderately and recrystallized partly to finer, sub-grain aggregates.

Muscovite, lesser biotite, and minor chlorite are concentrated in micaceous layers up to 1 mm wide.

Calcite/dolomite forms irregular patches, in part oriented parallel to foliation

Plagioclase is concentrated in plagioclase-rich layers in which grains are elongated slightly parallel to foliation and commonly contain moderately abundant, disseminated, dusty carbonaceous opaque inclusions. A few equant grains are up to 0.2 mm across.

Pyrite is concentrated in lenses up to 1 mm long It also occurs in irregular patches which form selvages on some flakes of muscovite and biotite.

A few irregular patches are of cryptocrystalline biotite/chlorite.

Apatite forms an anhedral grain 0.8 mm long enclosed in calcite/dolomite and pyrite.

A few veins up to 1.5 mm wide and veinlets averaging 0.03-0.2 mm wide are of very fine to fine grained pyrite. Some contain moderately abundant patches of cryptocrystalline to extremely fine grained biotite/chlorite rimming pyrite lenses. In places along some veins, similar biotite/chlorite forms irregular patches extending outwards from the vein into patches of biotite, muscovite, and calcite/dolomite.

An early veinlet cutting perpendicular across foliation and averaging 0.1 mm wide is of very fine grained calcite/dolomite. It was offset slightly by shearing along foliation planes.

Sample T-23   Strongly Contorted Quartz-Muscovite-(Garnet-Chlorite-Ilmenite) Schist

The sample is a well foliated schist dominated by quartz and muscovite with much less abundant chlorite, several porphyroblasts of garnet, and minor disseminated ilmenite. Quartz and muscovite are concentrated moderately in quartz-rich and muscovite-rich layers averaging 0.3-1 wide. The rock was contorted strongly by a set of tight folds with axial planes parallel to the main foliation; these are outlined by muscovite flakes and seams.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	45-50%	0.05-0.07	0.15	
muscovite	40-45	0.1-0.3	0.8	
chlorite	3- 4	0.07-0.15	0.3	pale to light green
garnet	3- 4	1-2	2.5	porphyroblastic
ilmenite	1- 2	0.07-0.2	0.25	
sphene	minor	0.1-0.2	0.2	
apatite	trace	0.02-0.04	0.05	
biotite	trace	0.02-0.03	0.05	pale to medium brown

Quartz forms equant grains with a submosaic texture.

Muscovite-rich seams in fold limbs parallel to foliation commonly contain moderately abundant dusty opaque, whereas muscovite in fold limbs generally is relatively free of such inclusions. .

Chlorite forms elongate flakes intergrown with muscovite and a few equant porphyroblasts up to 0.3 mm in size. It is concentrate din a few clusters up to 1 mm in size of flakes averaging 0.1-0.15 mm in size.

Garnet forms a few anhedral porphyroblasts in part with ragged outlines intergrown intimately with groundmass quartz and chlorite. Some have a strongly oriented texture of tiny silicate inclusions, with the plane of inclusions at a high angle to the present foliation. In some grains, the plane of inclusions is curved slightly to moderately. In one grain, a few elongate patches extending from the core of the grain are free of silicate inclusions. They have sharp edges against overgrowths with moderately abundant inclusions, and at the end of the inclusion-free core is a thin band containing abundant dusty opaque. Ilmenite forms a few tabular inclusions, mainly oriented parallel to the train of silicate inclusions.

Sphene forms a few anhedral grains intergrown with garnet.

Ilmenite forms subhedral, tabular grains.

Sample T-24C Metamorphosed, Deformed Quartz Sandstone

The sample is a metamorphosed quartz sandstone dominated by quartz with much less abundant muscovite and chlorite, and minor opaque/semi-opaque, ankerite, and clinozoisite.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz				
finer	10-12%	0.005-0.01	0.03	
coarser	75-80	0.05-0.15	0.3	
muscovite	2- 3	0.05-0.2	0.35	
chlorite	2- 3	0.1-0.15	0.2	pale to light green
opaque/semi-opaque	0.7	0.05-0.15	0.25	
ankerite	0.1	0.03-0.05	0.1	
clinozoisite	0.1	0.1-0.2	0.3	
plagioclase	minor	0.1-0.15		
apatite	minor	0.02-0.04	0.06	
tourmaline	minor	0.05-0.1	0.2	pale to medium brownish green/brown
zircon	trace	0.02-0.05	0.07	

Some coarser muscovite flakes are porphyroblastic in texture. Most are oriented parallel to foliation.

Many opaque/semi-opaque grains appear to be oxide grains (ilmenite?) which was replaced partly by leucoxene.

Plagioclase contains moderately abundant dusty opaque inclusions and is altered slightly to sericite.

Clinozoisite forms ragged, elongate grains.

During moderate cataclastic deformation, coarser grained quartz was strained and recrystallized moderately to much fine grained quartz grains in seams and irregular patches. Some coarser porphyroblastic muscovite grains may have been enlarged during this event.

Sample T-25B   Muscovite-Quartz-Chlorite-Plagioclase Schist

The sample is a well foliated, strongly folded schist dominated by muscovite and quartz with lesser chlorite and plagioclase, and minor ilmenite/leucoxene and pyrite/pyrrhotite. Quartz is concentrated strongly in quartz-rich lenses. The main foliation is axial planar to tight folds whose axial planes are defined by seams of muscovite commonly containing moderately abundant dusty carbonaceous opaque.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	65-70%	0.1-0.3	0.8	
quartz	12-15	0.03-0.07	0.2	
plagioclase	3- 4	0.005-0.02	0.03	
chlorite	5- 7	0.07-0.15	0.3	pale to light green
ilmenite/leucoxene	2	0.2-0.5	0.8	
opaque (pyrite?)	0.4	0.05-0.1	0.3	
epidote/clinozoisite	0.2	0.1-0.15	0.25	
tourmaline	0.2	0.02-0.05	0.15	pale to medium brownish green
apatite	minor	0.03-0.05	0.15	
biotite	trace	0.02-0.03	0.05	pale to medium brown
zircon	trace	0.03-0.04		

Muscovite and chlorite flakes are intergrown intimately. Commonly, finer grained sericite/muscovite flakes occur in tight fold noses of primary folds between seams of coarser grained muscovite along limbs of the same folds.

Quartz is concentrated moderately to strongly in quartz-rich lenses and patches as moderately to strongly interlocking grains. Textures indicate that the rock was deformed strongly, with finer grained aggregates formed by recrystallization of coarser grains.

Plagioclase is concentrated in bands and patches as equant grains intergrown with chlorite.

Ilmenite forms disseminated, slender, tabular grains which are altered strongly to completely to leucoxene/Ti-oxide.

Opaque (pyrite?) forms anhedral patches up to 0.6 mm in size, commonly surrounded by patches of extremely fine grained quartz.

Epidote/clinozoisite forms anhedral, equant grains with weak to moderate birefringence.

Tourmaline is concentrated moderately in some muscovite-rich layers as subhedral to euhedral, stubby to elongate prismatic grains.

Apatite, biotite, and zircon form minor anhedral grains.

Sample T-25C **Cataclastically Deformed Quartz-(Chlorite-Muscovite-Ankerite) Schist**

The sample is dominated by quartz with minor disseminated chlorite and seams rich in one or more of chlorite, ankerite, and muscovite; some of which contain concentrations of leucoxene and tourmaline. Pyrite forms very irregular patches. A few layers of coarser grained quartz were formed by metamorphic segregation. Later cataclastic deformation sub-perpendicular to the compositional banding caused recrystallization of quartz into subgrain aggregates with strongly sutured grain borders.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	83-85%	0.03-0.07	0.2	
chlorite	5- 7	0.05-0.07	0.1	pale green
muscovite	2- 3	0.03-0.07	0.15	
ankerite	1- 2	0.05-0.1	0.2	
pyrite	0.5	0.05-0.1	0.2	
leucoxene	0.4	0.07-0.1	0.3	
tourmaline	0.1	0.03-0.07	0.22	pale to medium brownish green
clinozoisite	minor	0.07-0.1	0.15	
apatite	minor	0.04-0.07	0.1	
zircon	trace	0.03-0.06	0.08	
coarser grained lenses				
quartz	7- 8	0.1-0.3	0.5	

Quartz forms irregular grains with strongly interlocking grain borders; the texture indicates that the rock was deformed and recrystallized. A few bands up to 0.3 mm wide are of quartz and chlorite grains averaging 0.01-0.02 mm in size.

Chlorite forms disseminated grains in quartz-rich layers, and is concentrated moderately in irregular lenses parallel to foliation, either alone or with muscovite, ankerite, and leucoxene.

Leucoxene forms anhedral patches, probably secondary after ilmenite.

Pyrite forms very irregular patches and lenses.

Ankerite forms very irregular, ragged grains, in part concentrated in seams parallel to compositional banding.

Tourmaline forms disseminated anhedral to subhedral grains, which are concentrated slightly to moderately in a few layers. Coarser grains commonly are colour zoned, with slightly bluish green cores enclosed in slightly brownish green rims.

Clinozoisite forms disseminated grains and clusters of a few grains.

Apatite and zircon form equant, anhedral grains.

Coarser grained quartz-rich lenses are up to 2 mm wide. In them, quartz was recrystallized to irregular grains elongated perpendicular to the lenses with strongly interlocking grain borders.

Sample T-26B   Carbonaceous Quartzite; Quartz-Ankerite Vein/Replacement

The sample is a very fine grained quartzite containing moderately abundant disseminated patches and seams of carbonaceous (and other) opaque and minor flakes of muscovite. A large vein or replacement zone is of medium to coarse grained quartz with a patch of medium grained ankerite and less abundant muscovite, biotite, opaque (pyrite) and chlorite. In the replacement patch, quartz was recrystallized slightly to moderately to finer subgrain aggregates.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	45-50%	0.05-0.15	0.25	
carbonaceous opaque	1- 2	cryptocrystalline		
muscovite	1	0.02-0.05	0.08	
pyrite	minor	0.05-0.07	0.1	
vein/replacement				
quartz	30-35	0.5-1	2	
ankerite	12-15	0.2-0.8	1.5	
muscovite	1	0.05-0.1	0.15	
biotite	0.7	0.1-0.2	0.3	pale to light brownish green to / orangish brown
opaque (pyrite?)	0.5	0.03-0.05	0.2	
chlorite	0.3	0.1-0.2	0.3	

Quartz forms slightly interlocking grains.

Muscovite is concentrated slightly to moderately in clusters of a few flakes, which are concentrated slightly in seams parallel to foliation.

Carbonaceous opaque (possibly including some extremely fine grained pyrite and opaque hematite) is concentrated moderately in wispy seams parallel to foliation.

Opaque (pyrite) forms anhedral, disseminated grains

In the vein/replacement, quartz grains have moderately interlocking grain borders and textures indicating that they were recrystallized from coarser grains.

Ankerite is concentrated in patches up to a few mm across of anhedral grains, in part with selvages of carbonaceous opaque. Coarser grains commonly are strained moderately.

Muscovite forms a few grains and clusters of flakes, mainly associated with ankerite.

Biotite forms a few flakes associated with ankerite and muscovite. Many are replaced moderately to strongly towards muscovite, and have a pale greenish brown colour..

Chlorite forms a few flakes from 0.3-0.5 mm long associated with ankerite.

Pyrite forms anhedral, equant grains and a few lenses up to 1 mm long, mainly associated with ankerite.

Sample T-28 **Quartz-Muscovite-(Chlorite-Biotite) Schist; Biotite Porphyroblasts; Recrystallized Quartz-Rich Lenses**

The sample is a very fine grained schist dominated by quartz and lesser muscovite with lesser porphyroblasts of biotite and lenses of opaque, and disseminated flakes of chlorite. The rock contains kink folds averaging 0.3-0.5 mm between axial planes, with original foliation warped moderately to strongly along the axial planes of the second set of folds, and some muscovite flakes recrystallized along the axial planes of the kink folds.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	65-70%	0.03-0.08	0.15	
muscovite	17-20	0.03-0.1	0.25	
chlorite	5- 7	0.1-0.15	0.25	pale to light green
biotite	3- 4	0.2-0.5	0.9	light to medium slightly reddish brown
opaque	1	0.02-0.05	0.2	
apatite	minor	0.02-0.04	0.07	
tourmaline	trace	0.02-0.03		pale to medium green
coarser lenses				
quartz	4- 5	0.1-0.5	1.2	
muscovite	0.1	0.03-0.05	0.07	
chlorite	0.1	0.03-0.1	0.3	pale to light green

Biotite forms subhedral to less commonly ragged porphyroblasts, commonly with irregular inclusions of quartz averaging 0.05-0.07 mm in size.

Opaque (probably ilmenite) forms disseminated grains mainly intergrown with phyllosilicates, and commonly elongated parallel to foliation.

Recrystallized lenses up to 1.5 mm wide parallel to foliation are dominated by quartz. Many coarser quartz grains are strained moderately and recrystallized towards finer grained aggregates. Some also contain minor disseminated flakes of muscovite and/or chlorite.

Sample T-27 Metamorphosed Quartz Sandstone; Coarser Quartz-Rich Lenses

The sample is a well foliated metamorphosed quartz sandstone containing muscovite flakes oriented parallel to foliation and minor detrital opaque, ankerite, epidote/allanite, chlorite, zircon, apatite, and tourmaline. A few bands parallel to foliation are dominated by fine to medium grained quartz.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	90-92%	0.03-0.08	0.15	
muscovite	2- 3	0.03-0.1	0.25	
opaque	1	0.03-0.07	0.2	
ankerite	1	0.03-0.07	0.2	
epidote/allanite	0.5	0.1-0.3	0.6	pale to light pinkish grey
chlorite	0.3	0.1-0.15	0.25	pale to light green
zircon	0.2	0.05-0.08	0.15	
apatite	0.1	0.02-0.03	0.05	
tourmaline	0.1	0.05-0.15	0.2	pale to medium green/brownish green
biotite	trace	0.02-0.03	0.05	light to medium brown
coarser lenses				
quartz	4- 5	0.2-0.5	0.8	
ankerite	minor	0.03-0.05		

Clinozoisite/allanite forms ragged, elongate grains.

Opaque (probably mainly oxide) forms equant, anhedral grains, in part replaced by leucoxene.

Zircon forms prismatic grains with subrounded to rounded outlines.

A few tourmaline grains are slightly zoned with darker green cores and thin paler yellowish-brownish green rims.

A few recrystallized bands up to 1.2 mm wide parallel to foliation are dominated by quartz with minor disseminated ankerite.

Sample T-30B **Metamorphosed Latite/Dacite(?); Quartz-Tourmaline-(Pyrrhotite-Pyrite) Replacement**

The sample is a metamorphosed latite/dacite(?) dominated by extremely fine grained plagioclase and much less quartz with minor ilmenite, tourmaline, chlorite, and pyrrhotite. It was replaced strongly by patches of mainly coarser grained quartz and tourmaline, with much less abundant pyrrhotite and pyrite, and minor chlorite, non-reflective opaque, and chalcopyrite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	17-20%	0.02-0.05	0.08	
quartz	5- 7	0.03-0.05	0.08	
tourmaline	0.3	0.1-0.2	0.25	pale to medium yellowish brownish green
ilmenite	0.3	0.03-0.05	0.1	
muscovite	0.3	0.1-0.15	0.2	
chlorite	0.2	0.03-0.07	0.1	very pale to pale green
pyrrhotite	0.2	0.03-0.07	0.15	
apatite	minor	0.02-0.03	0.07	
clinozoisite	minor	0.02-0.03	0.05	
zircon	trace	0.05-0.07	0.08	
biotite	trace	0.02-0.03	0.05	pale to light/medium orangish brown
replacement				
quartz	50-55	0.05-0.5	1	
tourmaline	12-15	0.05-0.5	1	pale to medium yellowish brownish green
pyrrhotite	3- 4	0.05-0.2	1.5	
pyrite	1- 2	0.1-0.7	1	
chlorite	0.3	0.03-0.07	0.1	very pale to pale green
opaque	0.3	0.02-0.03	0.05	non-reflective, soft
chalcopyrite	minor	0.03-0.05	0.2	

Plagioclase forms patches of extremely fine grains intergrown with minor to moderately abundant quartz of similar grain size. Alteration is slight to moderate to disseminated flakes of sericite/muscovite ranging from 0.02-0.15 mm long.

Quartz forms anhedral grains intergrown with plagioclase in some patches of host rock.

Chlorite forms flakes and clusters of flakes.

Ilmenite forms disseminated anhedral to subhedral grains and clusters of a few grains.

Clinozoisite forms disseminated grains and clusters of grains, probably as a replacement of plagioclase.

Tourmaline forms subhedral, commonly poikilitic porphyroblasts in plagioclase, probably related in origin to tourmaline in the replacement paches.

(continued)

In the replacement patches, quartz forms anhedral grains up to 1 mm in size. Many of these were strained moderately and recrystallized slightly to moderately to much finer subgrains with sutured grain borders.

Tourmaline forms in two main, proximal bands/patches with grains ranging from extremely fine felted masses to very fine to medium, subhedral to euhedral aggregates, commonly with selvages and interstitial patches of pyrrhotite.

Pyrrhotite forms disseminated fresh grains averaging 0.05-0.15 mm in size. A few coarser grained patches up to 1.5 mm across are of pyrrhotite which was replaced by secondary pyrite with moderately abundant dusty non-reflective material. Pyrrhotite also forms thin selvages among some very fine to fine grains of tourmaline.

Pyrite forms irregular grains associated with pyrrhotite.

Chalcopyrite forms disseminated grains associated with pyrrhotite and with pyrite.

Sample T-31C Quartz-Muscovite-Ankerite-(Biotite-Garnet-Pyrite) Schist

The sample is a well foliated schist dominated by quartz with less abundant muscovite and ankerite, and minor biotite, pyrite, and pyrrhotite (altered to limonite/hematite). Garnet(?) forms scattered porphyroblasts, which were altered completely to muscovite-quartz-ankerite. Quartz is concentrated moderately in quartz-rich bands and lenses.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	70-75%	0.05-0.15	0.7	
muscovite	12-15	0.1-0.15	0.4	
ankerite	10-12	0.1-0.25	1	
garnet (?)	1- 2	0.7-1	1.2	(altered to muscovite-quartz-ankerite)
pyrite	1- 2	0.05-0.15	0.25	
biotite	1- 2	0.05-0.15	0.4	pale to medium orangish brown
ilmenite	0.3	0.05-0.07	0.15	
chlorite	0.1	0.03-0.07	0.1	pale to light green
tourmaline	trace	0.05-0.1	0.15	pale to medium, slightly brownish green
apatite	trace	0.03-0.05	0.07	
zircon	trace	0.03-0.05	0.07	
limonite/hematite	0.5	cryptocrystalline		(possibly after pyrrhotite)

Quartz forms submosaic grains averaging 0.05-0.15 mm in size. In a few quartz-rich lenses parallel to foliation, moderately strained, interlocking grains up to 0.7 mm across were recrystallized from coarser grains.

Muscovite is concentrated moderately in muscovite-rich seams parallel to foliation.

Ankerite is concentrated in irregular patches of equant grains. One coarse grain 1.5 mm across has a strongly strained extinction.

A few rounded patches from 0.7-1.2 mm across of very fine grained, interlocking muscovite and lesser quartz and minor ankerite may be secondary after garnet porphyroblasts.

Pyrite is concentrated in irregular lenses up to 1.5 mm long parallel to foliation and forms disseminated, irregular grains

Biotite forms disseminated flakes oriented parallel to foliation and commonly intergrown with muscovite.

Ilmenite forms disseminated, subhedral, stubby tabular grains.

Chlorite forms minor disseminated flakes in quartz.

Tourmaline forms subhedral to euhedral prismatic grains, mainly intergrown with muscovite.

Apatite forms disseminated, anhedral, equant grains.

Zircon forms disseminated, subhedral prismatic grains mainly associated with muscovite.

Limonite forms ragged patches up to 0.7 mm in size; these may be secondary after pyrrhotite. One lens 0.6 mm long is of cryptocrystalline, red-brown hematite.

Sample T-32C **Metamorphosed Latite/Diorite; Ankerite Seams**

The sample is a metamorphosed latite/diorite dominated by interlocking fine to medium grained plagioclase with much less abundant ankerite, opaque (pyrite) and apatite. Late veins are of ankerite, and late patches are of quartz and minor plagioclase and ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	70-75	0.2-0.7	2.5	
ankerite	5- 7	0.2-0.5	1.5	
opaque	3- 4	0.1-0.25	0.9	
quartz	1- 2	0.005-0.02	0.05	
apatite	2- 3	0.03-0.05	0.1	
rutile	0.2	0.02-0.03	0.1	
muscovite	minor	0.05-0.1	0.15	
veins, lenses				
ankerite	5- 7	0.2-0.3	0.5	
quartz	2- 3	0.3-0.7	1	
plagioclase	1	0.2-0.5	0.7	

Plagioclase forms moderately interlocking grains averaging 0.1-0.5 mm in size with a few up to 1.7 mm across. Most have discontinuous albite twins. They commonly contain 2-7% rounded inclusions of quartz and/or plagioclase averaging 0.02-0.03 mm in size.

Ankerite forms ragged grains and seams.

Apatite is concentrated strongly in several bands parallel to foliation as anhedral grains intergrown with plagioclase. A few plagioclase grains in these zones contain very abundant apatite inclusions averaging 0.005 mm in size.

Pyrite is concentrated in clusters up to 1.5 mm in size. In many of these, original coarser pyrite grains were fractured strongly and fractures were healed by plagioclase.

Muscovite forms ragged flakes disseminated in plagioclase.

Rutile is concentrated in a few patches up to 1.2 mm in size of grains averaging 0.02-0.03 mm in size intergrown with ankerite and plagioclase and locally intergrown with pyrite.

A few fine grained, veinlike zones parallel to foliation up to 2 mm wide are dominated by quartz with less abundant ankerite and plagioclase.

Ankerite also forms a few veinlike zones up to 2 mm wide of grains averaging 0.2-0.5 mm in size.

Sample T-32C **Metamorphosed Latite/Diorite; Ankerite Seams**

The sample is a metamorphosed latite/diorite dominated by interlocking fine to medium grained plagioclase with much less abundant ankerite, opaque (pyrite) and apatite. Late veins are of ankerite, and late patches are of quartz and minor plagioclase and ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	70-75	0.2-0.7	2.5	
ankerite	5- 7	0.2-0.5	1.5	
opaque	3- 4	0.1-0.25	0.9	
quartz	1- 2	0.005-0.02	0.05	
apatite	2- 3	0.03-0.05	0.1	
rutile	0.2	0.02-0.03	0.1	
muscovite	minor	0.05-0.1	0.15	
veins, lenses				
ankerite	5- 7	0.2-0.3	0.5	
quartz	2- 3	0.3-0.7	1	
plagioclase	1	0.2-0.5	0.7	

Plagioclase forms moderately interlocking grains averaging 0.1-0.5 mm in size with a few up to 1.7 mm across. Most have discontinuous albite twins. They commonly contain 2-7% rounded inclusions of quartz and/or plagioclase averaging 0.02-0.03 mm in size.

Ankerite forms ragged grains and seams.

Apatite is concentrated strongly in several bands parallel to foliation as anhedral grains intergrown with plagioclase. A few plagioclase grains in these zones contain very abundant apatite inclusions averaging 0.005 mm in size.

Pyrite is concentrated in clusters up to 1.5 mm in size. In many of these, original coarser pyrite grains were fractured strongly and fractures were healed by plagioclase.

Muscovite forms ragged flakes disseminated in plagioclase.

Rutile is concentrated in a few patches up to 1.2 mm in size of grains averaging 0.02-0.03 mm in size intergrown with ankerite and plagioclase and locally intergrown with pyrite.

A few fine grained, veinlike zones parallel to foliation up to 2 mm wide are dominated by quartz with less abundant ankerite and plagioclase.

Ankerite also forms a few veinlike zones up to 2 mm wide of grains averaging 0.2-0.5 mm in size.

Sample T-33D **Metamorphosed Latite/Diorite(?)**
Banded Plagioclase-Ankerite-Muscovite Foliate

The sample is a coarsely layered foliate dominated by plagioclase with less abundant muscovite and ankerite. Grain size and texture ranges moderately between layers. Coarser grained layers up to 2 cm wide are dominated by plagioclase with lesser ankerite. Finer grained layers up to a few mm wide are dominated by plagioclase and muscovite. A few layers up to 1 mm wide are dominated by muscovite. Foliation is warped slightly to moderately about weak kink folds.

	percentage	ave. grain size mm	max size mm	pleochroism
coarser lenses				
plagioclase	45-50	0.2-0.7	2.5	
ankerite	15-17	0.2-0.5	1.5	
muscovite	2- 3	0.1-0.2	0.5	
pyrite	1- 2	0.1-0.2	0.5	
rutile	0.3	0.05-0.1	0.17	
finer grained lenses				
plagioclase	20-25	0.02-0.05	0.15	
muscovite	7- 8	0.03-0.1	0.2	
opaque	1	0.03-0.07	0.2	
rutile	0.5	0.03-0.07	0.1	
apatite	minor	0.02-0.03	0.05	

Plagioclase occurs in two main modes. In finer grained bands it forms slightly interlocking grains averaging 0.02-0.05 mm in size, in part intergrown with moderately abundant muscovite.

In coarser grained bands plagioclase forms slightly interlocking grains averaging 0.2-0.5 mm in size with a few from 1-2.5 mm across. Some coarser grains are strained moderately and recrystallized slightly to finer subgrain aggregates. Discontinuous albite twins indicate metamorphic recrystallization.

In coarser plagioclase-rich layers, ankerite forms anhedral to irregular grains averaging 0.05-0.2 mm in size with a few up to 0.7 mm long. Opaque forms anhedral grains.

Muscovite-rich layers commonly contain moderately abundant disseminated rutile. A few muscovite-rich zones extend from these bands and cut across foliation in coarser grained bands.

Pyrite is concentrated in coarser grained layers as clusters up to 0.9 mm across of subhedral to euhedral grains, and in finer grained layers as slender lenses up to 2 mm long parallel to foliation..

Rutile is concentrated strongly in clusters up to 1.5 mm long of grains averaging 0.02-0.07 mm in size; these are intergrown with moderately abundant plagioclase and minor ankerite and muscovite.

Sample T-34 **Folded Muscovite-Chlorite-(Plagioclase-Quartz) Schist; Major Lens of Quartz-Ankerite**

The rock is a very fine grained muscovite-chlorite-(plagioclase-quartz-leucoxene-pyrite) schist which was folded moderately to tightly by kink folds. A large replacement patch of coarser grained quartz and much less abundant ankerite contains a few lenses and patches of micaceous schist and a few of plagioclase-rich, metamorphosed latite(?).

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	17-20%	0.05-0.15	0.3	
chlorite	12-15	0.03-0.07	0.15	pale to light green
plagioclase	2- 3	0.05-0.15	0.3	
pyrite	2	0.1-0.5	1.5	
leucoxene	2	0.1-0.2	1.3	
quartz	1- 2	0.05-0.1	0.15	
biotite	0.3	0.07-0.2	0.3	pale to medium reddish orange
tourmaline	trace	0.03-0.05	0.18	pale to medium green/brownish green
apatite	trace	0.03-0.05	0.08	
zircon	trace	0.02-0.03	0.05	
replacement patch				
quartz	55-60	0.1-0.5	2	
ankerite	4- 5	0.1-0.3	0.5	
muscovite	1	0.05-0.08	0.5	
fragments				
latite	0.5			

The rock is dominated by intergrowths of muscovite and chlorite with much less abundant plagioclase and quartz. Plagioclase forms anhedral grains, a few of which show weak albite twins. Quartz forms anhedral grains.

Pyrite forms disseminated, anhedral to euhedral grains and is concentrated in a few lenses up to 3 mm long.

Leucoxene forms disseminated, subhedral to euhedral tabular grains mainly from 0.1-0.3 mm in size. A few coarse grains from 1-1.3 mm long contain moderately abundant inclusions of quartz and ankerite.

Biotite is concentrated along the border of one quartz-rich zone and in a few patches within the quartz-rich zone.

Tourmaline forms subhedral to euhedral, prismatic grains.

Apatite forms disseminated, anhedral grains.

Zircon forms equant, anhedral grains.

In the replacement patch, quartz forms anhedral grains which were strained moderately to strongly and recrystallized moderately to finer subgrain aggregates with moderately to strongly intergrown grain borders. Ankerite forms ragged patches of anhedral grains.

The quartz-rich zone contains a few seams up to 0.3 mm wide of very fine grained muscovite.

In the quartz-rich zone are a few ragged patches up to 1 mm in size of metamorphic latite(?) dominated by very fine grained plagioclase with minor to moderately abundant muscovite and minor chlorite and ankerite.

Sample T-36 **Metamorphosed Arkosic Quartz Sandstone: Quartz-(Plagioclase-Muscovite-Chlorite) Schist**

The sample is a well foliated schist dominated by quartz with much less abundant plagioclase, muscovite and chlorite. These are segregated moderately into bands richer in quartz-plagioclase and others richer in phyllosilicates. Minor minerals include Ti-oxide and opaque, and much less abundant apatite, tourmaline, plagioclase, and zircon.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	65-70%	0.03-0.08	0.15	
plagioclase	12-15	0.07-0.12	0.2	
muscovite	7- 8	0.03-0.1	0.2	
chlorite	5- 7	0.03-0.07	0.15	pale to light green
Ti-oxide	1- 2	0.05-0.1	0.3	
opaque (pyrite)	1- 2	0.05-0.15	0.4	
apatite	0.1	0.03-0.05	0.1	
tourmaline	0.1	0.03-0.05	0.1	pale to medium green/brownish green
zircon	minor	0.02-0.03	0.05	

Quartz and plagioclase form equant grains with submosaic to slightly interlocking grain borders. Some plagioclase have well developed albite twins. Otherwise, it is difficult to distinguish quartz from plagioclase. The chemical analysis suggests that there is more plagioclase present than indicated by the above modal analysis.

Opaque is concentrated in irregular patches and lenses, in part elongated parallel to foliation up to 1.2 mm long.

Ti-oxide forms equant patches of extremely fine grains intergrown with minor quartz.

A few quartz-rich patches may have once been coarser grained, but if so, they have been recrystallized to finer subgrain aggregates of similar to slightly coarser grain size as that of the groundmass quartz.

Sample T-A-C Quartz-Pyrite Vein

The sample is vein dominated by patches of very coarse grained quartz and patches of fine to medium grained pyrite, with minor chalcopyrite and trace galena. Pyrite commonly has euhedral crystal faces. Hematite forms minor patches bordering pyrite.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	60-65%	0.03-0.08	25	
pyrite	35-40	0.3-1.5	2	
chalcopyrite	trace	0.02-0.04	0.05	
galena	trace	0.01	0.01	
hematite	0.2	cryptocrystalline		

Quartz forms a few very coarse grains and minor very fine to fine grains. Most grains contain abundant dusty to cryptocrystalline inclusions, probably mainly of hematite. Bordering some of the pyrite grains, is a zone up to 0.05 mm wide in which quartz is free of hematite inclusions.

Pyrite forms aggregates of grains which commonly have subhedral to euhedral outlines. Chalcopyrite forms a few inclusions in pyrite up to 0.015 mm in size and minor grains bordering pyrite up to 0.05 mm across. Galena forms a few inclusions up to 0.01 mm in size.

Bordering one patch of pyrite against a cavity in the rock is an overgrowth up to 0.1 mm wide of colloform, red-brown hematite with a delicately banded, growth texture.

Sample T-A-F **Quartz-Muscovite-Ankerite-Opaque Schist**

The sample is a well foliated, slightly compositionally banded schist dominated by quartz and muscovite with moderately abundant ankerite and pyrrhotite. Quartz is concentrated moderately to strongly towards one end of the section, whereas muscovite and ankerite are concentrated moderately to strongly to wards the other end. Muscovite grains are oriented strongly parallel to foliation.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	45-50%	0.05-0.15	0.5	
muscovite	40-45	0.03-0.1	0.2	
ankerite	3- 4	0.07-0.15	0.4	
pyrrhotite	3- 4	0.05-0.15	0.5	
apatite	0.3	0.03-0.07	0.25	
siderite(?)	0.2	0.01-0.03	0.05	
epidote	0.2	0.1-0.2	0.6	
biotite	0.2	0.05-0.1	0.4	pale to light brown
rutile	0.1	0.03-0.07	0.1	
tremolite/actinolite	0.1	0.2-0.3	0.4	very pale to light yellowish green
tourmaline	trace	0.05-0.15	0.2	pale to medium brownish green

Some muscovite grains are slightly to moderately porphyroblastic, with rounded to lensy inclusions of quartz averaging 0.01-0.02 mm in size.

Pyrrhotite (magnetic) is concentrated moderately in elongate lenses parallel to foliation up to 2 mm long and a few irregular patches up to 3 mm across. .

Biotite is concentrated strongly near one end of the section as disseminated flakes oriented parallel to foliation.

Siderite(?) (a high-relief carbonate) occurs in a few patches up to 0.8 mm in size intergrown with muscovite and opaque.

Sample T-B-A Metamorphosed Dacite/Latite(?); Quartz-rich Bands

The sample is an extremely fine grained, well foliated, compositionally banded, metamorphosed dacite/latite(?) dominated by plagioclase with less abundant quartz and much less abundant biotite, chlorite, muscovite, ilmenite, apatite, and pyrite. Apatite is concentrated strongly in a few layers. Quartz is concentrated in one much coarser grained lens, which probably is of replacement origin.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	55-60%	0.01-0.03	0.05	
quartz	17-20	0.05-0.1	0.15	
biotite	2-3	0.03-0.1	0.3	pale to medium orangish brown
chlorite	2-3	0.07-0.2	0.5	colourless to very pale green
muscovite	1-2	0.03-0.1	0.2	
ilmenite/leucoxene	2	0.1-0.2	0.3	
pyrite	2	0.05-0.15	0.3	
apatite	1	0.02-0.04	0.1	
biotite/chlorite	0.5	cryptocrystalline		
hematite	0.3	cryptocrystalline		bright red
ankerite	0.2	0.05-0.1	0.15	
zircon	minor	0.02-0.05	0.1	
quartz-rich band				
quartz	8-10	0.2-1	7	

Plagioclase forms anhedral, slightly to moderately interlocking grains intergrown with disseminated flakes of biotite, chlorite, and muscovite.

Quartz is concentrated moderately to strongly in lenses up to 2 mm wide in which it is intergrown with minor muscovite, chlorite, and apatite..

Biotite occurs only on one side of the largest quartz-rich lens where it forms disseminated grains, mainly in plagioclase, and porphyroblasts up to 0.5 mm in size oriented at a moderate angle to the foliation. On the other side of the quartz lens, its place is taken by patches of medium greenish brown, cryptocrystalline chlorite/biotite and by flakes of muscovite. This zone also contains patches of anhedral ankerite.

Chlorite forms disseminated flakes and a few ragged to subhedral porphyroblasts.

Ilmenite/leucoxene forms disseminated, ragged to subhedral patches.

Pyrite forms irregular lenses up to 1.2 mm long oriented parallel to foliation of anhedral to subhedral grains.

Apatite is concentrated strongly in a few layers from 0.1-1 mm wide near one end of the section as equant, anhedral grains.

Hematite forms scattered patches up to 0.5 mm in size.

Zircon is concentrated in a few bands, commonly with biotite or apatite.

Quartz is concentrated in quartz-rich patches up to a few mm across. Coarser grains are strained moderately. Many finer grains with interlocking borders probably were formed by recrystallization of coarser grains. Bordering the main quartz-rich lens are a few patches of pyrite up to 1.5 mm long.

Sample T-B-C Quartz-(Ankerite-Chlorite-Muscovite-Pyrite/Hematite-Plagioclase) Schist

The sample is a quartz-rich schist with irregular lenses and seams of a variety of mineral assemblages and textures dominated by one or two of ankerite, chlorite, muscovite, opaque/hematite, or plagioclase. Textures of quartz are similar to those in replacement lenses in other samples, suggesting that this rock was silicified strongly prior to metamorphism.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	83-85%	0.1-0.5	2	
ankerite	4- 5	0.07-0.2	0.6	
chlorite	3- 4	0.1-0.5	1	light to medium green
muscovite	3- 4	0.07-0.2	0.4	
opaque/hematite	3- 4	0.05-0.15	1.5	
plagioclase	1- 2	0.01-0.03	0.05	
apatite	minor	0.3		
biotite	trace	0.05-0.08	0.1	pale to medium brown

Quartz forms slightly to moderately interlocking grains. In quartz-rich patches, grains are coarser than in intergrowths of quartz with other minerals. In quartz-rich patches, original medium to very coarse grains were strained moderately and recrystallized to finer subgrain aggregates with moderately to strongly interlocking grain borders.

Ankerite is concentrated in a few ankerite-rich seams and patches of anhedral grains, some of which are intergrown with very fine grained quartz, patches of chlorite, and patches of pyrite.

Chlorite is concentrated in a few lenses either alone or with ankerite-pyrite or muscovite-pyrite.

Muscovite is concentrated strongly in a few lenses up to 2 mm wide. In some of these it is intergrown with flakes of chlorite and/or patches and lenses of hematite (after pyrite or pyrrhotite).

Pyrite forms disseminated patches and lenses. The largest patch is replaced strongly by brownish-red hematite.

A few lenses up to 1 mm wide are of extremely fine to very fine grained plagioclase intergrown with very fine grained flakes of chlorite and biotite wit moderately abundant dusty opaque. Textures are similar to those in some of the metamorphosed latite samples.

Apatite forms two anhedral, corroded grains in a muscovite-rich band.

Biotite forms a few flakes in muscovite-rich lenses, intergrown with muscovite or with quartz, and scattered flakes in plagioclase-rich lenses. .

Sample T-C-A **Metamorphosed, Altered Latite/Diorite(?): Plagioclase-Muscovite-Biotite-Quartz-(Apatite-Ankerite-Chlorite-Ilmenite-Pyrite) Foliate; Quartz-Ankerite-Pyrite Replacement Patches**

The sample is a strongly compositionally banded foliate dominated by plagioclase, with lesser muscovite, biotite, quartz, apatite, and ankerite. The origin is uncertain; some off the plagioclase textures suggest that it was a diorite. The strong compositional banding suggests that it was a bedded tuff, but the variation in composition between layers is unusual for a primary feature. A few coarser grained replacement lenses are of quartz-ankerite-pyrite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	35-40%	0.07-0.3	1	
muscovite	15-17	0.07-0.1	0.4	
biotite	7- 8	0.1-0.3	1.5	pale to medium brown
quartz	5- 7	0.05-0.15	0.2	
ankerite	2- 3	0.07-0.2	0.6	
apatite	2- 3	0.05-0.15	0.6	
chlorite	1- 2	0.1-0.3	0.5	light to medium green
ilmenite	1- 2	0.1-0.2	0.8	
pyrite	1- 2	0.1-0.3	0.5	
clinozoisite	0.7	0.03-0.07	0.1	
replacement lenses, patches				
quartz	10-12	0.2-0.5	1.5	
ankerite	7- 8	0.1-0.3	0.5	
pyrite	2- 3	0.05-0.2	0.5	

Plagioclase forms anhedral, slightly interlocking grains, whose texture varies moderately from finer to coarser grained layers. Most common are very fine grained layers in which plagioclase is intergrown intimately and irregularly with moderately abundant biotite. In one layer, very irregular plagioclase grains averaging 0.3-0.7 mm in size are intergrown with finer grained quartz, ankerite, and biotite.

Muscovite is concentrated in a layer 5 mm wide as clusters of extremely fine to very fine grains containing disseminated, coarser grains of plagioclase, biotite, and ilmenite. The muscovite-rich layer is warped slightly on a set of weak kink folds.

Biotite forms ragged to subhedral flakes disseminated in plagioclase-rich layers.

Apatite forms anhedral, equant grains intergrown with plagioclase. At one end of the section is a lensy zone up to 2 mm wide dominated by apatite grains averaging 0.05-0.15 mm in size and ankerite grains averaging 0.3-1 mm in size, with less abundant, very fine grained biotite.

Chlorite forms disseminated flakes intergrown with biotite, and is concentrated in a few patches up to 2 mm in size in which it is intergrown with very fine grained plagioclase.

Ilmenite forms disseminated, subhedral to euhedral, tabular grains.

Pyrite forms irregular patches and lenses.

Clinozoisite forms anhedral to subhedral, equant to prismatic grains in and near biotite. Many grains in biotite have dark pleochroic halos up to 0.1 mm across.

In the replacement patches and lenses, all minerals form anhedral grains, with ankerite and pyrite in part interstitial to subrounded quartz grains.

Sample T-C-B Metamorphosed Quartz-(Muscovite) Sandstone

The sample is a well foliated metamorphosed quartz sandstone containing muscovite flakes oriented parallel to foliation and concentrated moderately in muscovite-rich seams parallel to foliation. Minor minerals include opaque and semi-opaque with much less abundant ankerite, chlorite, zircon, and biotite, and trace tourmaline. A few recrystallized patches elongated parallel to foliation are of fine grained quartz.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	94-95%	0.03-0.08	0.15	
muscovite	4- 5	0.05-0.1	0.15	
opaque	1	0.03-0.07	0.15	
semi-opaque	0.3	0.03-0.08	0.17	
hematite	0.1			
ankerite	minor	0.03-0.05	0.07	
chlorite	minor	0.07-0.1	0.15	pale to light green
zircon	minor	0.03-0.07	0.1	
biotite	minor	0.02-0.05	0.08	pale to light brown
tourmaline	trace	0.05-0.1	0.15	pale to medium green/brownish green
coarser grained patches, lenses				
quartz	trace	0.2-0.4	0.6	

Quartz contains minor dusty inclusions.

Muscovite is concentrated moderately in muscovite-rich seams up to 0.2 mm wide parallel to foliation. Some lenses contain moderately abundant dusty opaque inclusions.

Opaque (probably pyrite) forms lenses up to 0.4 mm long of grains averaging 0.02-0 05 mm in size.

Semi-opaque (leucoxene) forms patches of extremely fine grains, probably secondary after patches of ilmenite or rutile.

Minor coarser grains of quartz probably were formed by recrystallization.

A few seams and lenses parallel to foliation are of dusty hematite; this and the dusty disseminated opaque mainly associated with muscovite probably are responsible for the dark grey colour of this rock.

Sample T-C-D Quartz-Pyrrhotite Vein

The sample is a coarse grained vein dominated by patches of quartz and patches of pyrrhotite. Pyrrhotite is replaced completely by secondary pyrite showing delicate alteration growth textures. The vein shows only minor textures suggestive of deformation or recrystallization.

	percentage	ave. grain size mm	max size mm
pyrrhotite	50-55%	1-1.5	5(?) (obscured by alteration)
quartz	45-50	5- 7	10-15
chalcopyrite	trace	0.15	
limonite	0.1	cryptocrystalline	

Quartz forms very coarse, anhedral grains which were strained slightly and locally recrystallized to moderately finer subgrain aggregates.

Pyrrhotite forms grains averaging 1-2 mm in size. Alteration is complete in a variety of textures to secondary pyrite and dusty non-reflective material (possibly limonite), and a few patches of cryptocrystalline, medium brown limonite. Much of the pyrrhotite is replaced by pyrite and non-reflective material with a delicate growth structure which partly follows one main crystallographic direction in the original pyrrhotite grain. Several patches are replaced by massive to concentrically zoned pyrite containing dusty non-reflective inclusions, with a few narrow concentric bands of pyrite relatively free of such inclusions.

Chalcopyrite forms one patch on the border of a pyrrhotite patch against quartz.

Limonite occurs in some smaller patches

Sample T-C-F **Metamorphosed, Compositionally Banded Felsic Tuff(?)**
Quartz Vein; Sericite-Kaolinite Veinlet; Clay/Chlorite Veinlets

The sample is a metamorphosed felsic tuff(?) containing two main bands, one dominated by fine grained plagioclase with much less abundant muscovite and ankerite, and the other dominated by very fine grained plagioclase and quartz. A vein is of quartz with a border zone of pyrite-hematite. It is cut by a veinlet of sericite with a core of kaolinite. A few wispy veinlets are of cryptocrystalline clay/chlorite(?).

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase				
coarser	40-45%	0.2-0.5	1	
finer	20-25	0.07-0.2	0.4	
quartz	17-20	0.05-0.1	0.15	
muscovite	4- 5	0.07-0.15	0.25	
ankerite	4- 5	0.07-0.15	0.25	
opaque (pyrite)	1	0.03-0.07	0.2	
Ti-oxide	0.5	0.03-0.05	0.07	
biotite	0.1	0.1-0.15	0.25	pale to medium brown
hematite/limonite	0.1	cryptocrystalline		
zircon	trace	0.03-0.07	0.1	
vein, veinlets				
quartz-pyrite-hematite	4- 5		clay/chlorite(?)	0.5%
sericite-kaolinite	1- 2			

In one main band, plagioclase forms grains averaging 0.07-0.2 mm in size, and is intergrown with moderately abundant quartz grains averaging 0.05-0.1 mm in size. In these zones, quartz and plagioclase commonly are difficult to distinguish optically. In the coarser grained band quartz is rare. Plagioclase forms anhedral grains averaging 0.2-0.5 mm in size with a few up to 1 mm long, many of these contain broad albite twins.

Muscovite is concentrated moderately in muscovite-rich layers up to 0.6 mm wide of very fine to fine grains showing only weakly preferred orientation parallel to foliation. It also forms disseminated grains, mainly in the coarser grained plagioclase-rich layer.

Ankerite is concentrated mainly in the coarser grained, plagioclase-rich layer. Biotite forms a few flakes and clusters of flakes. Opaque (pyrite) forms disseminated, anhedral grains and clusters of grains. Ti-oxide forms anhedral to subhedral grains in clusters up to 0.4 mm across. Hematite/ limonite forms irregular patches and selvages.

The quartz vein is up to a few mm wide. Along the margin of the vein is a zone of very fine to fine grained pyrite enclosed in a zone 0.1-0.2 mm wide of deep red-brown hematite showing a delicate growth texture parallel to the border of the vein. Quartz grains average 0.05-0.5 mm in size with a few up to 3 mm across. Finer grains have moderately interlocking borders and probably were formed by recrystallization of coarser grains. At one end the vein contains a few megacrysts of plagioclase up to 1.7 mm in size, a few grains of muscovite up to 0.5 mm long, and a few clusters up to 0.3 mm across of extremely fine grained, subhedral pyrite.

Cutting the quartz vein is a veinlet up to 0.6 mm wide of cryptocrystalline to extremely fine grained sericite with a discontinuous core up to 0.15 mm wide of cryptocrystalline kaolinite.

A few late veinlets up to 0.05 mm wide are of cryptocrystalline, colourless to pale green clay/chlorite(?). A patch 0.5 mm across is of cryptocrystalline, neutral-coloured clay of uncertain composition.

Sample T-D-B **Strongly Folded Muscovite-Quartz Schist; Garnet, Biotite, Ilmenite Porphyroblasts**

The sample is a tightly folded, slightly to moderately compositionally banded schist dominated by muscovite and quartz, with moderately abundant fine to medium grained biotite and ilmenite porphyroblasts, and minor medium to coarse grained garnet porphyroblasts. Layers range from muscovite-rich to quartz rich. Minor minerals include pyrite and chlorite. Tight kink folds are best developed in muscovite-rich layers, and some muscovite and dusty opaque are recrystallized along the axial planes of the kink folds.

	percentage	ave. grain size mm	max size mm	pleochroism/colour
muscovite	45-50%	0.03-0.05	0.15	
quartz	35-40	0.03-0.1	0.15	
biotite	5- 7	0.15-0.4	0.8	pale to reddish medium brown
ilmenite	2- 3	0.15-0.4	0.8	
garnet	2- 3	1.5-2		
pyrite	1- 2	0.05-0.1	0.5	
chlorite	1- 2	0.05-0.07	0.1	pale to light green
carbonaceous opaque	minor	cryptocrystalline		
apatite	minor	0.03-0.05	0.07	
sphalerite	trace	0.02-0.03	0.05	medium orangish brown
tourmaline	trace	0.05		medium green
zircon	trace	0.02-0.03		

Muscovite is concentrated moderately to strongly towards one end of the section. Muscovite-rich layers are contorted strongly.

Quartz occurs in two main modes, as grains averaging 0.02-0.07 mm in size intergrown with muscovite and in quartz-rich lenses in which grains average 0.05-0.15 mm in size. A few quartz-rich lenses are of grains averaging 0.1-0.3 mm in size with strongly interlocking grain borders. Coarser grains are strained moderately, and textures indicate that finer grains were formed by recrystallization of coarser grains (probably during kink-fold deformation).

Biotite forms anhedral porphyroblasts which appear to have formed during or after the kink-fold deformation. A few are replaced slightly by pseudomorphic chlorite.

Ilmenite forms disseminated, stubby, subhedral, tabular grains.

Garnet forms equant to slightly elongate, anhedral to subhedral porphyroblasts, which contain a few inclusions of ilmenite and quartz, which commonly are in parallel orientation at a high angle to the foliation in the surrounding rock.

Pyrite is concentrated in lenses up to 1.5 mm long of anhedral grains. Many of the lenses are curved along folded bands of muscovite, suggesting that pyrite was present during deformation.

Chlorite forms disseminated flakes in quartz-rich layers and disseminated flakes and patches of flakes in muscovite-rich layers, commonly surrounding grains of ilmenite.

Carbonaceous opaque s concentrated in seams in muscovite-rich layers and forms moderately abundant disseminated patches in a few quartz-rich layers.

Apatite forms anhedral, equant grains.

Sphalerite forms a few equant grains associated with pyrite.

Zircon forms anhedral to subhedral prismatic grains enclosed in biotite. In a halo surrounding zircon grains, biotite has a dark pleochroism.

Tourmaline forms an equant grain.

Sample T-E-A **Metamorphosed Quartz Diorite(?); Quartz-Ankerite Replacement; Moderate Cataclastic Deformation**

The sample is a fine grained metamorphosed quartz diorite(?) dominated by plagioclase with lesser quartz, ankerite, and muscovite, and minor patches of apatite. It was replaced by abundant patches and lenses parallel to foliation dominated by quartz and much less abundant ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	30-35%	0.2-0.7	1.5	
quartz	7- 8	0.05-0.1	0.15	
ankerite	4- 5	0.05-0.1	0.15	
muscovite	1- 2	0.05-0.1	0.2	
pyrite	1- 2	0.1-0.3	0.7	
apatite	0.2	0.01-0.03	0.05	
vein, replacement				
1) quartz	35-40%	0.05-0.5	1.5	
ankerite	5- 7	0.05-0.15	0.3	
2) chlorite	0.2	0.005-0.01		

Plagioclase forms equant, untwinned grains which are altered slightly to sericite and ankerite. Some grains contain moderately abundant inclusions of quartz, which commonly are oriented in trains, and which probably were formed by silicification during metamorphism. Interstitial to plagioclase are patches of extremely fine to very fine grained quartz

Ankerite forms irregular grains and clusters of grains replacing plagioclase.

Muscovite forms disseminated, irregular flakes and clusters of flakes.

Pyrite forms subhedral to anhedral equant grains

Apatite is concentrate din clusters of rounded grains

Quartz is concentrated in lenses and patches moderately elongated parallel to foliation. Grains commonly are strained moderately to strongly and recrystallized strongly along their margins to much finer, subgrain aggregates whose textures suggest moderate cataclastic deformation. In a few patches, most coarser quartz grains were recrystallized to very fine subgrain aggregates with strongly sutured grain borders.

Ankerite forms patches up to a few mm across of anhedral grains. Some grains are recrystallized slightly along their margins to cryptocrystalline aggregates, probably formed during cataclastic deformation. Ankerite contain moderately abundant dusty inclusions giving the grains an apparent very high relief.

A few discontinuous veinlets up to 0.03 mm wide are of cryptocrystalline, pale green chlorite. A few patches up to 0.3 mm across are of similar chlorite.

Sample T-E-C **Metamorphosed Diorite(?): Plagioclase-(Muscovite-Ankerite-Pyrrhotite); Recrystallized Lenses Plagioclase-Sphalerite-Pyrrhotite**

The rock is a relatively massive metamorphosed diorite(?)dominated by equant plagioclase grains with much less abundant disseminated ankerite and opaque, and scattered lenses and patches dominated by muscovite. A few coarser grained, recrystallized lenses are dominated by plagioclase with minor patches of sphalerite and pyrrhotite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	75-80%	0.1-0.3	0.5	
muscovite	4- 5	0.07-0.2	0.3	
ankerite	2- 3	0.1-0.2	0.3	
pyrrhotite	1- 2	0.1-0.3	0.7	
chlorite	0.5	0.05-0.2	0.25	weak
rutile	0.3	0.05-0.1	0.15	
dusty opaque	0.3	cryptocrystalline		
apatite	0.2	0.02-0.05	0.07	
pyrite	0.1	0.1-0.2	0.5	
biotite	minor	cryptocrystalline		medium brownish green
veinlike zones				
plagioclase	7- 8	0.1-0.3	0.5	
sphalerite	0.3	0.1-0.5	1	
pyrrhotite	0.2	0.1-0.2	0.5	
apatite	0.1	0.07-0.15	0.5	

Plagioclase forms slightly interlocking grains averaging 0.1-0.3 mm in size with a few up to 0.5 mm in size. Many contain moderately abundant dusty opaque, concentrated moderately in the core of the grain. Alteration is very slight to disseminated flakes of sericite.

Muscovite forms disseminated ragged to subhedral flakes and is concentrated moderately in a few muscovite-rich seams up to 0.5 mm wide. Some of these seams contain patches of extremely fine grained sericite.

Ankerite forms disseminated, irregular grains averaging 0.1-0.2 mm in size and a few euhedral, rhombic grains averaging 0.05-0.08 mm in size.

Pyrrhotite is concentrated in patches and elongate seams, the latter commonly in muscovite-rich seams. Pyrite forms scattered subhedral to euhedral grains.

Biotite is concentrated in thin selvages on some pyrrhotite patches as unoriented cryptocrystalline aggregates with a medium brownish green colour.

A few diffuse, veinlike zones up to 2 mm wide are dominated by interlocking plagioclase grains which are free of dusty opaque inclusions. One contains a few coarse patches of red-brown sphalerite and lesser pyrrhotite). These zones probably were formed in part by recrystallization of the main rock.

Sample T-E-D **Altered Diorite(?); Ankerite-Plagioclase-Muscovite Rock; Ankerite-Quartz Replacement Patches and Veins**

The sample is a very fine grained to fine grained altered diorite(?) dominated by secondary ankerite and primary(?) plagioclase, with less abundant secondary muscovite, and minor quartz and Ti-oxide. A few replacement patches and veinlike zones are dominated by ankerite or quartz with scattered grains of sphalerite, plagioclase, and pyrite.

	percentage	ave. grain size mm	max size mm	pleochroism/colour
ankerite	35-40%	0.1-0.2	0.5	
plagioclase	30-35	0.03-0.2	0.3	
muscovite	10-12	0.1-0.3	0.8	
quartz	1- 2	0.05-0.1	0.15	
biotite/limonite	1	cryptocrystalline		medium brown
Ti-oxide	0.7	0.01-0.02	0.05	
pyrite	0.2	0.03-0.1	0.5	
replacement, veinlike zones				
ankerite	8-10	0.1-0.3	0.5	
quartz	4- 5	0.07-0.15	0.2	
sphalerite	minor	0.3		medium orange-brown
plagioclase	minor	0.08-0.15		
pyrite	trace	0.05-0.07	0.1	

Plagioclase forms anhedral grains averaging 0.1-0.3 mm in size.

Ankerite forms anhedral grains.

Muscovite forms disseminated flakes, and is concentrated slightly in a few wispy seams parallel to foliation.

Ti-oxide forms disseminated grains averaging 0.02-0.05 mm in size and is concentrated in irregular patches and seams of cryptocrystalline to extremely fine grains. The latter may also contain some dusty carbonaceous opaque.

At one end of the section, several irregular patches up to 0.2 mm in size are of cryptocrystalline biotite/limonite.

Pyrite forms disseminated, anhedral to euhedral grains.

Irregular replacement patches are of very fine to fine grained ankerite and extremely fine to very fine grained quartz in widely varying amounts. Quartz commonly has strongly sutured grain borders. Sphalerite forms one anhedral grain.

A few subparallel veinlike zones cut the rock. One zone 1-1.5 mm wide is dominated by anhedral ankerite grains with less abundant quartz grains averaging 0.2-0.4 mm in size. Plagioclase forms a few grains up to 0.15 mm in size. In a second zone averaging 0.5 mm wide, and composed of quartz and slightly less ankerite, most quartz grains are oriented perpendicular to the walls of the vein. In a third, discontinuous veinlet of ankerite-(quartz), pyrite forms a few subhedral grains up to 0.1 mm in size.

Sample T-F-A Metamorphosed Diorite(?)

The sample is dominated by fine to medium grained plagioclase which was recrystallized to much finer grained plagioclase and replaced partly by muscovite and ankerite. Less abundant minerals are quartz, opaque (pyrite), and carbonaceous opaque. The rock was folded moderately on the scale of 1- 3 mm.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	60-65%	0.2-0.7	1	(partly recrystallized)
muscovite	20-25	0.1-0.2	0.7	
ankerite	7- 8	0.1-0.2	0.9	
quartz	4- 5	0.07-0.15	0.3	
opaque(pyrite)	1- 2	0.07-0.3	0.5	
carbonaceous opaque	0.5	cryptocrystalline		
apatite	minor	0.02-0.05	0.1	

Plagioclase forms anhedral grains which are altered moderately to sericite/muscovite, ankerite, and dusty opaque. Moderately abundant plagioclase grains were recrystallized to extremely fine subgrain aggregates.

Muscovite rich patches and seams commonly are warped moderately to strongly and commonly contain moderately abundant, dusty opaque. Some dusty opaque seams occur along axial planes of kink folds.

Ankerite forms anhedral grains averaging 0.1-0.2 mm in size and a few subhedral porphyroblasts averaging 0.5-0.9 mm in size.

Quartz forms interstitial patches of slightly to moderately strained grains.

Opaque (pyrite) forms irregular patches up to 1 mm in size.

Sample T-F-C **Contorted, Metamorphosed, Altered Diorite(?)**
Plagioclase-Muscovite-Ankerite-Quartz-Pyrite

The sample contains patches of fine grained plagioclase intergrown with patches of much finer grained plagioclase, and with patches and seams of muscovite with lesser ankerite and quartz. Pyrite forms irregular replacement patches and lenses, and is altered in part to hematite/limonite. The rock was contorted moderately to strongly on the scale of 1- 3 mm.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	45-50%	0.3-0.8	1	(partly recrystallized)
muscovite	30-35	0.1-0.2	0.7	
ankerite	5- 7	0.07-0.15	0.3	
quartz	5- 7	0.05-0.08	0.1	
pyrite	3- 4	0.07-0.3	0.5	
hematite/limonite	1	cryptocrystalline		
clinozoisite(?)	0.1	0.08-0.15	0.2	
carbonaceous opaque	0.1	cryptocrystalline		

Plagioclase forms relic grains averaging 0.3-0.8 mm in size. These are altered moderately to muscovite, ankerite, quartz, and dusty, carbonaceous opaque. Some patches of plagioclase were recrystallized to extremely fine grained aggregates.

Muscovite is concentrated moderately in irregular seams up to 0.7 mm wide.

Quartz and ankerite occur mainly with muscovite-rich patches.

Pyrite forms irregular patches and lenses up to 1.5 mm long. One patch was replaced by medium reddish brown hematite. Limonite/hematite forms irregular patches of medium brown, cryptocrystalline grains

Clinozoisite(?) forms anhedral grains with a pale orange colour.

Sample T-F-E **Metamorphosed, Strongly Altered, Fine Grained Diorite; Ankerite-Quartz-Muscovite Alteration; Quartz-(Ankerite) Lenses**

The sample contains relic fine grained plagioclase grains intergrown with irregular patches and seams of ankerite and lesser quartz and muscovite. Pyrite forms minor replacement patches and lenses. Quartz and minor ankerite occur in a few sygmoidal lenses up to a few mm across and 1 cm long.

	percentage	ave. grain size mm	max size mm	pleochroism/colour
plagioclase	40-45%	0.2-0.4	0.6	
ankerite	30-35	0.05-0.15	0.5	
muscovite	7- 8	0.1-0.3	1	
quartz	7- 8	0.05-0.08	0.15	
pyrite	1- 2	0.07-0.2	0.6	
sphalerite	0.1	0.05-0.07	0.2	medium orange-brown
coarse grained patches				
quartz	10-12	0.1-0.5	1	
ankerite	1	0.05-0.1	0.15	
muscovite	trace	0.05-0.07		

Plagioclase forms equant, slightly to moderately interlocking grains which are replaced slightly to moderately by ankerite and sericite. Some patches are recrystallized slightly to moderately to much finer interlocking grains averaging 0.01-0.03 mm in size. A few patches up to 1 mm across are of grains averaging 0.07-0.2 mm in size.

Ankerite forms irregular replacement patches.

Quartz forms patches averaging 0.2-0.5 mm in size of moderately strained grains.

Muscovite forms disseminated, ragged to subhedral flakes and clusters of several flakes.

Pyrite forms disseminated, subhedral to euhedral grains and clusters of these grains.

Sphalerite forms anhedral, equant grains intergrown with ankerite and locally with pyrite.

Lenses up to 2 mm in size are dominated by anhedral, moderately strained quartz grains, in part intergrown with minor to moderately abundant ankerite. Quartz grains show a moderately preferred orientation sub-perpendicular to the length of the lenses. Smaller quartz grains probably were formed by recrystallization of coarser grains during deformation.

Sample T-G-C **Metamorphosed Leucocratic Diorite: Pyrite-(Chalcopyrite) Replacement**

The sample is a fine to medium grained, metamorphosed, leucocratic diorite dominated by plagioclase with minor disseminated flakes of muscovite and lenses of rutile. Abundant replacement patches are of pyrite and minor chalcopyrite. Late replacement patches are of hematite. A wispy veinlet is of smectite(?).

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	80-85%	0.2-0.7	1.5	
muscovite	4- 5	0.1-0.2	1.5	
rutile	0.3	0.05-0.07	0.1	dark orange brown to greenish brown
apatite	0.1	0.05-0.1	0.2	
replacement				
pyrite	8-10	0.2-1	3	
chalcopyrite	minor	0.02-0.05	0.1	
pyrrhotite	trace	0.01-0.02		
hematite	2- 3	cryptocrystalline		dark reddish brown
veinlet				
smectite(?)	trace	cryptocrystalline		

Plagioclase forms anhedral, submosaic grains with weakly developed, broad, commonly discontinuous albite twins. Some grains were crushed slightly to moderately. A few seams up to 0.2 mm wide are of grains averaging 0.02-0.03 mm in size; these may represent zones of recrystallization during weak cataclastic deformation.

Muscovite forms disseminated, commonly slightly warped flakes and a few clusters up to 2 mm long of similar flakes. A few curved to moderately warped flakes from 1.2-1.5 mm long are included in large pyrite patches. A few patches of very fine grained, probably fractured pyrite are enclosed in a groundmass of extremely fine grained muscovite/sericite.

Rutile forms subhedral grains in clusters, in part associated with pyrite. A few elongate skeletal patches intergrown with plagioclase are from 1.2-3 mm long. Some patches are fractured slightly and replaced slightly by red-brown hematite.

Apatite forms a few clusters of rounded grains enclosed in plagioclase.

Pyrite forms patches up to 15 mm across of subhedral to anhedral and locally euhedral grains. A few grains contain irregular inclusions of chalcopyrite and minor pyrrhotite up to 0.02 mm in size. Some grains are fractured strongly and replaced slightly to hematite along fractures. Bordering fractured pyrite grains, plagioclase grains contain seams of limonite on fractures.

Chalcopyrite forms anhedral grains interstitial to and along fractures in pyrite, and disseminated in plagioclase.

Hematite forms a few lenses up to 1.5 mm long associated with an in part interstitial to pyrite. It is medium to dark reddish brown in colour.

A wispy, discontinuous veinlet is of cryptocrystalline, pale green smectite(?).

Sample T-G-E **Metamorphosed Latite(?)/Dacite(?) Tuff(?): Plagioclase-Quartz-Muscovite-Apatite-Pyrite-Ankerite Schist**

The rock is banded on the scale of 0.5-1.5 mm with variation in mineral abundances and grain size between layers. Most layers are dominated by extremely fine grained plagioclase (latite?). A few layers up to 1.2 mm wide are of very fine to fine grained quartz and plagioclase with less abundant plagioclase, ankerite, and muscovite (dacite?). Apatite is concentrated strongly in a few layers with plagioclase. Quartz is concentrated in a few coarser grained, recrystallized lenses parallel to foliation.

	percentage	ave. grain size mm	max size mm	pleochroism/colour
plagioclase				
finer grained	70-75%	0.03-0.07	0.1	
coarser grained	5- 7	0.2-0.3	0.5	
quartz	7- 8	0.1-0.15	0.3	
muscovite	4- 5	0.07-0.2	1	
apatite	3- 4	0.03-0.07	0.35	
pyrite	2	0.1-0.5	1.3	
ankerite	2	0.1-0.2	0.5	
biotite	0.5	0.1-0.2	0.3	pale to light brown
biotite/chlorite	0.3	cryptocrystalline		medium brownish green
sphalerite	0.3	0.1-0.2	0.4	
rutile	0.3	0.05-0.1	0.15	
coarser grained lenses				
quartz	1- 2	0.1-0.5		
apatite	minor	0.2-0.3		

Many plagioclase-rich layers are dominated by grains averaging 0.02-0.04 mm in size, with grains oriented moderately parallel to foliation.

Plagioclase forms equant grains which have weakly developed albite twins.

Quartz is concentrated moderately in coarser grained bands in which it is intergrown coarsely with plagioclase, ankerite, and muscovite.

Muscovite forms flakes ranging widely in size. Larger flakes are slender and commonly bent.

Apatite is concentrated strongly in a few bands up to 1.7 mm wide near one end of the section, in which it forms 10-50% of the bands; much of the rest of the bands is very fine grained plagioclase.

Pyrite is concentrated in lenses up to 1.8 mm long oriented parallel to compositional banding. It also forms disseminated, subhedral to euhedral grains.

Sphalerite forms a few patches associated with opaque grains (probably pyrrhotite). It is deep orange-brown in colour suggesting a moderate iron content.

Rutile occurs in a few clusters up to 0.6 mm across of subhedral grains in some opaque-bearing bands.

Biotite is concentrated strongly in a few plagioclase-muscovite rich bands as patches up to 0.5 mm in size of cryptocrystalline grains with a pale to light greenish brown colour. These are intergrown with muscovite and opaque.

A few coarser grained, recrystallized lenses up to 1 mm wide and elongated parallel to foliation are dominated by quartz. One lens contain a patch of three apatite grains 0.2-0.3 mm in size.

Sample 91551 **Metamorphosed Latite(?); Plagioclase-Muscovite-Carbonaceous Opaque; Replaced Strongly by Muscovite-Chlorite-Calcite-Pyrite-(Quartz)**

The host rock is an extremely fine grained, metamorphosed latite(?) dominated by plagioclase with minor to moderately abundant muscovite and moderately abundant carbonaceous opaque. It was replaced strongly by a patchy replacement dominated by one or more of muscovite, calcite, and chlorite with less abundant pyrite and quartz. A few veinlets of chlorite-calcite-quartz cut the host rock.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	17-20%	0.01-0.02	0.03	
muscovite	5- 7	0.02-0.03	0.05	
carbonaceous opaque	1- 2	cryptocrystalline		
leucoxene	0.8	0.1-0.15	0.2	
pyrite	0.3	0.05-0.2	0.3	
sphene	minor	0.1-0.2		
tourmaline	minor	0.03-0.05	0.12	light to medium brownish green
replacement and veinlets				
muscovite	25-30	0.05-0.2	0.3	
chlorite	17-20	0.05-0.15	0.3	pale to light green
calcite	15-17	0.05-0.1	0.2	
pyrite	3- 4	0.05-0.3	0.5	
quartz	2- 3	0.05-0.1	0.3	
leucoxene	2	0.1-0.15	0.3	
carbonaceous opaque	0.3	cryptocrystalline		

Plagioclase forms equant, slightly interlocking grains.

Muscovite forms disseminated, mainly unoriented flakes. Towards the replacement patch, it becomes more abundant and coarser grained, as plagioclase becomes more strongly replaced (see below for more intense alteration of plagioclase).

Carbonaceous opaque forms disseminated, dusty grains, which give the rock its dark colour.

Leucoxene forms subhedral to euhedral, tabular grains after ilmenite. One coarse patch is 1 mm long.

Pyrite forms patches up to 1.5 mm long of very fine grains.

Sphene forms anhedral to subhedral porphyroblastic grains.

Tourmaline is concentrated moderately to strongly in a few patches as disseminated grains

In parts of the replacement patches, muscovite forms unoriented aggregates of extremely fine to very fine grains; these may represent strongly altered plagioclase. In a few isolated patches in the more-strongly altered material (see below), the muscovite-rich rock is warped tightly. Some of these folded zones are outlined by seams of carbonaceous opaque up to 0.03 mm thick.

Chlorite, ankerite, muscovite, and quartz occur in irregular, patchy intergrowths dominated by one or two of the minerals.

Pyrite forms disseminated lenses up to 3 mm long of anhedral to euhedral grains.

Leucoxene (after ilmenite) forms disseminated, tabular patches which probably represent relic Ti-oxide which was unaffected by the pervasive alteration of the silicates.

Sample 91552 **Metamorphosed Porphyritic Latite;**
Strong Replacement: Chlorite-Quartz-Calcite-Muscovite

In a few relic patches of host rock, phenocrysts of plagioclase are set in a groundmass of extremely fine grained plagioclase with patches of chlorite and minor apatite and leucoxene. Very abundant replacement patches are dominated by chlorite with less abundant quartz and calcite, and minor leucoxene, muscovite, ankerite, and clinozoisite/epidote.

	percentage	ave. grain size mm	max size mm	pleochroism
phenocrysts				
plagioclase	0.2%	0.3-0.5	0.7	
groundmass				
plagioclase	7- 8	0.01-0.02	0.03	
chlorite	2- 3	0.02-0.05		
leucoxene	0.3	0.1-0.15	0.2	
apatite	0.2	0.05-0.1		
pyrite	0.2	0.05-0.2	0.3	
replacement patches				
chlorite	30-35	0.08-0.2	0.5	pale to light green
quartz	25-30	0.1-0.3	1	
calcite	17-20	0.1-0.3	0.5	
leucoxene	4- 5	0.2-0.3	1.7	
muscovite	2- 3	0.05-0.1	0.2	
ankerite	1	0.5-1.5		
clinozoisite/epidote	0.7	0.1-0.2	1.2	
pyrite	0.2	0.05-0.2	0.3	
apatite	0.2	0.1-0.2	0.25	

Subhedral plagioclase phenocrysts are set in a groundmass of strongly interlocking plagioclase grains. In some patches, chlorite is moderately abundant as irregular very fine grained patches; these may part of the main replacement event. Apatite forms anhedral, equant grains. Leucoxene forms disseminated, equant patches.

In the replacement zones, chlorite is concentrated moderately in seams parallel to foliation.

Quartz is concentrated moderately in patches and lenses up to a few mm across parallel to foliation.

Calcite is concentrated moderately in lenses parallel to foliation. Associated with calcite are a few equant, in part corroded grains up to 1.5 mm in size of ankerite. These are stained pale to light brown along fractures and grain borders by limonite.

Muscovite is concentrated in a few bands as slender subparallel flakes averaging 0.05-0.1 mm long intergrown with chlorite. It also forms coarser grained flakes in irregular patches.

Leucoxene forms disseminated anhedral to subhedral patches, mainly intergrown with chlorite. Most patches in the replacement zone are larger than those in the host rock.

Clinozoisite/epidote forms elongate, subhedral prismatic grains, mainly included in chlorite. One elongate patch 1.2 mm long consist of a sheaf of a few prismatic grains.

Pyrite forms disseminated, anhedral to subhedral grains.

Apatite forms rounded grains which may be relics from the host rock.

Sample 91558 Muscovite-Quartz-(Chlorite-Pyrite-Ti-oxide) Schist

The sample is a well foliated, compositionally banded schist dominated by muscovite and quartz, with much less abundant chlorite, and minor pyrite and Ti-oxide. Muscovite is concentrated strongly in muscovite-rich layers up to a few mm wide.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	45-50%	0.05-0.2	0.3	
quartz	40-45	0.05-0.08	0.15	
chlorite	4- 5	0.05-0.2	0.9	pale to light green
pyrite	1	0.2-0.5	1	
Ti-oxide	0.7	0.05-0.2	0.4	
plagioclase	minor	0.3-0.5		
tourmaline	minor	0.02-0.05	0.1	pale to medium, slightly brownish green
clinozoisite	minor	0.05-0.15	0.2	
apatite	minor	0.03-0.05	0.07	

Quartz forms submosaic grains elongated slightly parallel to foliation.

Muscovite forms flakes oriented parallel to foliation. In muscovite-rich layers, the rock was sheared strongly, original foliation was warped, and a second closely spaced foliation was developed (= main foliation of the rock). Muscoovite vcontains minor to moderately abundant dusty opaque

Chlorite forms flakes intergrown with muscovite and also forms a few coarser grained lenses of flakes up to 0.9 mm in length.

Pyrite is concentrated strongly as subhedral to euhedral grains in lenses parallel to foliation.

Ti-oxide forms grains and clusters of grains averaging 0.2-0.5 mm in size and a few up to 1.3 mm long. Many grains are altered moderately to completely to semi-opaque leucoxene.

Plagioclase forms ragged grains which are recrystallized slightly to moderately to quartz.

Tourmaline forms anhedral to subhedral prismatic grains.

Clinozoisite forms ragged equant grains and clusters averaging 0.1-0.2 mm in size.

Apatite forms disseminated, anhedral, equant grains.

Sample 91559-A **Metamorphosed, Muddy, Arkosic Quartz Sandstone: Quartz-Chlorite-Plagioclase-Muscovite-Pyrite-(Leucoxene) Schist**

The sample is a well foliated, slightly compositionally banded schist dominated by quartz with much less abundant chlorite, muscovite, plagioclase, and pyrite, and minor leucoxene. Plagioclase textures suggest that the original rock was a muddy arkosic quartz sandstone. Quartz is concentrated moderately in quartz-rich lenses parallel to foliation. Limonite/hematite forms replacements of pyrite and occurs in secondary lenses and selvages.

	percentage	ave. grain size mm	max size mm	pleochroism
quartz	60-65%	0.05-0.15	0.2	
chlorite	5- 7	0.07-0.15	0.3	pale to light green
muscovite	4- 5	0.07-0.15	0.25	
plagioclase	4- 5	0.1-0.2	0.4	
pyrite	3- 4	0.1-0.3	0.5	
leucoxene	1- 2	0.02-0.05	0.07	
tourmaline	minor	0.05-0.1		medium brownish green
apatite	minor	0.03-0.05	0.1	
zircon	trace	0.03-0.05	0.1	
quartz-rich lenses				
quartz	8-10	0.15-0.5	0.7	
limonite	0.5	cryptocrystalline		
muscovite	minor	0.1-0.15	0.2	

Quartz forms anhedral, equant grains with submosaic to slightly interlocking textures.

Plagioclase forms angular to subangular grains, a few of which have well developed albite twins. Textures suggest that they are detrital grains.

Chlorite forms disseminated flakes oriented parallel to foliation in quartz and scattered flakes intergrown with muscovite.

Muscovite is concentrated moderately to strongly in muscovite-(chlorite)-rich seams parallel to foliation.

Pyrite forms disseminated grains and lenses up to 2.5 mm long of grains which range from anhedral to euhedral. Alteration is slight to complete to deep red hematite.

Leucoxene forms ragged patches up to 0.5 mm across of anhedral grains.

Tourmaline forms subhedral to euhedral grains, mainly intergrown with muscovite.

Apatite and zircon form disseminated, anhedral, equant grains.

Limonite forms wispy seams and lenses and a few patches associated with pyrite.

A few quartz-rich bands parallel to foliation are up to 2.5 mm wide. Grains are slightly interlocking. Wispy selvages of pale brown limonite are common along grain borders. Muscovite forms a few, disseminated, subhedral flakes.

Sample 91561 **Muscovite-(Chlorite-Quartz-Ilmenite) Schist; Quartz-(Ankerite-Chlorite) Lenses**

The sample is a contorted schist dominated by muscovite with much less abundant quartz and chlorite. Lenses up to several mm long and a few mm wide are dominated by quartz with minor chlorite as patches and disseminated grains and locally moderately abundant disseminated ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	65-70%	0.05-0.2	0.3	
chlorite	12-15	0.04-0.07	0.15	pale to light green
quartz	3- 4	0.03-0.05	0.08	
ilmenite/leucoxene	2	0.1-0.3	0.6	
pyrite	0.5	0.1-0.2	0.3	
clinozoisite	0.2	0.1-0.2	0.3	
tourmaline	0.1	0.02-0.03	0.13	pale to medium, slightly brownish green
apatite	minor	0.02-0.03	0.05	
quartz-rich segregations				
quartz	12-15	0.05-0.2	0.8	
chlorite	1- 2	0.05-0.15	0.3	
ankerite	0.5	0.03-0.08	0.2	
pyrite	0.3	0.1-0.3	0.5	
muscovite	0.1	0.05-0.1	0.15	

Muscovite and chlorite are intergrown intimately.
Quartz is concentrated moderately in some lenses and patches.
Ilmenite (opaque) forms stubby tabular to equant grains.
Pyrite forms anhedral grains commonly elongated parallel to foliation.
Clinozoisite forms anhedral, slightly elongate grains.
Tourmaline forms disseminated, subhedral to euhedral grains.

Quartz-rich lenses are elongated moderately parallel to foliation. A few patches consist of grains up to 0.8 mm in size, many of which were recrystallized slightly to moderately to finer grained aggregates with moderately interlocking grain borders. Chlorite is concentrated in patches up to 1 mm across along the borders of some lenses. Opaque (pyrite?) forms a few anhedral patches up to 0.5 mm in size. It also is concentrated in a few lenses up to 2 m long oriented parallel to foliation.

Sample A-9605-A Metamorphosed, Altered Diorite/Latite(?)
Calcite/Ankerite-Chlorite-Quartz-Muscovite-Pyrite-K-feldspar Alteration

The rock is a very fine grained, slightly compositionally banded, metamorphosed diorite or latite dominated by plagioclase with much less calcite, chlorite, muscovite, and biotite. Replacement patches and lenses are dominated by one or more of calcite/ankerite, chlorite, quartz, pyrite, and muscovite/sericite. K-feldspar forms a weak, pervasive replacement of plagioclase..

	percentage	ave. grain size mm	max size mm	pleochroism/colour
host rock				
plagioclase	50-55	0.1-0.5	0.5	
calcite	3-4	0.05-0.1	0.2	
chlorite	1-2	0.05-0.07	0.15	colourless to pale green
muscovite	1-2	0.05-0.1	0.5	
biotite	0.5	0.07-0.1	0.25	pale to medium brown
biotite/chlorite	0.3	cryptocrystalline		medium brownish green
replacement				
calcite/ankerite	17-20	0.2-0.7	1.5	
chlorite	5-7	0.05-0.2	0.3	pale green
quartz	2-3	0.05-0.1	0.3	
muscovite/sericite	1-2	0.03-0.07	0.1	
pyrite	2	0.2-0.5	0.7	
K-feldspar	1	0.1-0.2	0.3	

Plagioclase forms equant grains which range moderately in grain size between layers, with some layers averaging 0.03-0.07 mm in size and others are up to 0.1-0.15 mm in size. In some bands, plagioclase grains contain moderately abundant dusty carbonaceous opaque.

Calcite forms disseminated equant grains.

Chlorite forms irregular patches up to 0.5 mm in size.

Muscovite forms disseminated flakes and clusters of several flakes.

Biotite forms ragged flakes.

Biotite/chlorite forms irregular patches up to 0.3 mm in size of cryptocrystalline grains.

Replacement patches are dominated by calcite. One veinlike band 1.5 mm wide is of medium grained calcite. Some carbonate patches contain minor to moderately abundant, dusty limonite, suggesting that the parent is ankerite.

Chlorite is concentrated in a few seams up to 0.7 mm wide.

Muscovite/sericite forms a few patches up to 1 mm in size of extremely fine to very fine grains.

Pyrite is concentrated in a few lenses up to 2 mm long.

K-feldspar was not identified in thin section, but the stained offcut block indicates that it is widespread, probably as a replacement of plagioclase.

Sample A-9605-B **Minor: Metamorphosed Diorite(?);**
Major: Recrystallized Calcite-(Quartz) Vein/Replacement
Late: Deformed Quartz Vein

A patch up to 4 mm across of metamorphosed diorite(?) is dominated by plagioclase with less abundant muscovite. In the offcut block near the diorite patch is a patch several mm long of plagioclase replaced moderately along the margins of the patch by K-feldspar (this patch was not seen in the thin section). Most of the rock is a replacement zone dominated by very fine to fine grained calcite with much less abundant quartz and minor feldspar; this material has a texture suggesting that it was metamorphosed. Near one end of the section is a deformed quartz vein or replacement zone up to several mm wide. Elsewhere, a diffuse zone dominated by quartz was deformed cataclastically.

	percentage	ave. grain size mm	max size mm	pleochroism/colour
host rock				
plagioclase	2- 3	0.1-0.5	0.5	
muscovite	0.5	0.07-0.2	0.3	
biotite	0.3	cryptocrystalline		light brown
replacement				
calcite	85-88	0.2-0.7	1.5	
quartz	5- 7	0.05-0.1	0.5	
plagioclase	2- 3	0.1-0.2	0.3	
K-feldspar	1	0.1-0.2	0.3	
muscovite	trace	0.05-0.08	0.1	
quartz-rich patches, veins				
quartz	8-10	0.5-1.5	3	

In the fragment of host rock, plagioclase forms equant grains which are altered moderately to patches of muscovite and less abundant calcite. Biotite forms patches up to 0.5 mm across, in part as a replacement of plagioclase.

Calcite forms slightly interlocking grains with anhedral grain borders. Locally it was granular in irregular patches and seams to extremely fine, equant grains. Quartz forms single grains and lenses interstitial to calcite. In some lenses grains were deformed cataclastically and recrystallized to aggregates of grains averaging 0.01-0.02 mm in size. One large quartz-rich lens up to several mm long is of medium to coarse grains. Quartz commonly contains moderately abundant dusty inclusions. Some of these grains are strained moderately. A few are cut by veinlets of calcite up to 0.1 mm wide.

Muscovite forms disseminated, slender flakes.

The quartz-rich vein is dominated by medium to very coarse grains with moderately abundant dusty inclusions. It contains a centre-line lens up to 0.5 mm wide of coarse grained calcite.

A recrystallized zone up to 0.8 mm wide consists of recrystallized, cryptocrystalline to extremely fine grained quartz, with a few relic, slightly coarser grains and minor patches of extremely fine grained, granulated calcite. A smaller but similar recrystallized zone cuts the major quartz vein.

Sample L-9601 Muscovite-Quartz-Chlorite-(Ilmenite) Schist; Strongly Folded

The sample is a well foliated, compositionally banded schist dominated by muscovite, quartz, and chlorite, with minor disseminated elongate ilmenite grains and patches of opaque (pyrite/pyrrhotite). The original foliation (S_1) was warped strongly about a closely spaced, axial planar foliation (S_2) which is the main foliation in the rock.

	percentage	ave. grain size mm	max size mm	pleochroism
muscovite	40-45%	0.05-0.1	0.3	
quartz	30-35	0.05-0.08	0.2	
chlorite	17-20	0.05-0.1	0.3	
ilmenite/leucoxene	2	0.5-0.7	1.8	
opaque	1	0.07-0.2	0.3	(pyrrhotite and/or pyrite)
clinozoisite	0.4	0.1-0.2	0.4	
calcite	0.1	0.05-0.15	0.2	
tourmaline	0.1	0.02-0.07	0.15	pale to medium, slightly brownish green
apatite	trace	0.02-0.03	0.05	
carbonaceous opaque	minor	cryptocrystalline		

Muscovite and chlorite occur in intimate intergrowths.

Quartz is concentrated moderately in quartz-rich patches and lenses parallel to foliation; these contain minor to moderately abundant disseminated flakes of muscovite and lesser chlorite.

Ilmenite forms unoriented, elongate tabular grains which are altered slightly to moderately to leucoxene.

Chlorite forms flakes intergrown intimately with muscovite. It is concentrated with quartz in a few pressure shadows surrounding pyrite grains.

Opaque (pyrrhotite/pyrite) forms anhedral to subhedral patches up to 0.6 mm in size, in part associated with ilmenite.

Clinozoisite forms disseminated, euhedral to subhedral, prismatic grains.

Tourmaline forms disseminated, subhedral grains.

Calcite is concentrated in some quartz-rich patches as anhedral grains.

Carbonaceous opaque is concentrated with muscovite in seams parallel to the major foliation.

Sample L-9603 **Metamorphosed Latite(?): Plagioclase-Chlorite/Biotite-Muscovite; Coarser Bands of Plagioclase-(Ankerite-Pyrite-Chlorite); Ankerite Veinlets**

The sample is a weakly foliated rock dominated by extremely fine grained plagioclase with disseminated grains and patches of flakes of muscovite and biotite/chlorite and lenses of opaque (pyrrhotite/pyrite). A few bands and patches up to a few mm across are dominated by coarser grained plagioclase with scattered patches of ankerite, pyrite, and chlorite. Minor veinlets up to 0.3 mm wide are of ankerite.

	percentage	ave. grain size mm	max size mm	pleochroism
plagioclase	60-65%	0.02-0.04	0.07	
biotite/chlorite	5- 7	0.05-0.2	0.7	pale to medium reddish orange
muscovite	3- 4	0.07-0.15	0.5	
opaque	1	0.07-0.2	0.3	(pyrrhotite and/or pyrite)
ankerite	0.7	0.05-0.2	0.3	
ilmenite/leucoxene	0 7	0.2-0.3	0.5	
apatite	0.1	0.02-0.04	0.1	
coarser bands				
plagioclase	8-10	0.2-0.5	1	
ankerite	2- 3	0.2-0.5	0.8	
pyrite	1	0.2-0.5	2	
chlorite	0.3	0.2-0.4	0.5	pale to light green
veinlets				
ankerite	0.3	0.1-0.4	0.5	

Plagioclase forms anhedral megacrysts. In the groundmass, it forms submosaic to slightly interlocking equant grains.

Biotite forms ragged flakes with pleochroism from light to medium reddish-orange. Many grains are replaced strongly to completely by pale to light green, pseudomorphic chlorite. A few patches of chlorite contain very tight kink folds.

Muscovite is concentrated moderately in seams parallel to foliation.

Ankerite forms disseminated grains and a few lenses up to 1 mm long.

Apatite forms disseminated, anhedral, equant to stubby prismatic grains.

A few bands up to a few mm wide are dominated by plagioclase grains averaging 0.5-0.8 mm in size. Ankerite forms moderately abundant anhedral grains averaging 0.3-0.8 mm in size. Associated with some of these are patches of anhedral pyrite up to 2 mm in size.

Sample J-9606-B   Quartz-Muscovite Schist; Plagioclase Porphyroblasts; Abundant Replacement Patches of Galena-Sphalerite-(Pyrrhotite)

The sample is a well foliated quartz-muscovite schist containing a few porphyroblasts of plagioclase. Abundant replacement patches up to a few mm across are of galena and lesser sphalerite and minor pyrrhotite. Sulfides are replaced slightly to strongly by carbonates and oxides.

	percentage	ave. grain size mm	max size mm	pleochroism/colour
quartz	75-80%	0.05-0.2	0.5	
muscovite	8-10	0.057-0.1	0.2	
plagioclase				
porphyroblasts	1- 2	0.4-1.7		
groundmass	1- 2	0.1-0.2		
ilmenite	0 3	0.05-0.1	0.2	
chlorite	minor	0.1-0.15	0.2	pale to light green
biotite	minor	0.15-0.2	0.3	light to medium orangish brown
apatite	trace	0.05-0.07		
zircon	trace	0.03-0.05		
replacement patches				
galena	7- 8	0.3-1	1.5	
sphalerite	2- 3	0.1-0.3	0.5	medium orange brown
pyrrhotite	0.3	0.1-0.15	0.2	

Quartz forms anhedral grains averaging 0.1-0.3 mm in size. In an irregular seam up to 2 mm wide, quartz was deformed cataclastically into aggregates of equant, slightly interlocking grains averaging 0.01 mm in size.

Muscovite is concentrated moderately to strongly in seams up to 0.2 mm wide parallel to foliation.

Plagioclase forms a few ragged to subhedral porphyroblasts from 0.4-1.7 mm across. The largest grain has poorly developed albite twins and is cut by a few fractures which are filled by quartz as in the groundmass. Plagioclase also forms minor disseminated, equant grains, possibly of detrital origin.

Ilmenite forms disseminated, anhedral, equant grains.

Chlorite forms scattered single flakes in quartz-rich patches.

Biotite forms a few subhedral flakes, mainly intergrown with muscovite.

Apatite and zircon form disseminated, equant grains.

Replacement patches up to a few mm across are of galena and lesser sphalerite and pyrrhotite. Galena is replaced slightly to moderately by cerusite and limonite/hematite. Sphalerite is replaced slightly to moderately by smithsonite(?) and limonite/hematite. Pyrrhotite is replaced completely by opaque limonite/hematite showing a texture typical of secondary pyrite after pyrrhotite.

Appendix III

INDUCED POLARIZATION LOGISTIC REPORT

SCOTT GEOPHYSICS

LOGISTICAL REPORT

INDUCED POLARIZATION/RESISTIVITY SURVEY

MOUNT BARKER PROJECT

ACE PROPERTY

LIKELY AREA, BRITISH COLUMBIA

on behalf of

BARKER MINERALS LIMITED
P.O. Box 24023, Lakefront Post Office
Kelowna, B.C. V1Y 9P9

Field work completed: May 21 to June 6, 1996

by

Alan Scott, Geophysicist
SCOTT GEOPHYSICS LTD.
4013 West 14th Avenue
Vancouver, B.C. V6R 2X3

June 10, 1996

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1. INTRODUCTION

An induced polarization/resistivity survey (IP survey) was performed over portions of the Ace Property, Mount Barker Project, Likely Area, B.C. The survey was completed in the period May 21 to June 6, 1996. The survey was conducted by Scott Geophysics Ltd. on behalf of Barker Minerals Limited.

The pole dipole array was used on the survey, with an electrode spacing ("a" spacing) of 25 metres and at current pole to receiver dipole separations of 1 to 5 ("n"=1-5). The online current electrode was to the west of the receiving electrodes on all survey lines (array heading east).

This report describes the instrumentation and procedures, and presents the results of the survey.

2. SURVEY COVERAGE AND DATA PRESENTATION

A total of 26.4 line kms of IP survey was completed on the Ace Property. The chargeability and resistivity results are presented in standard pseudosection format and as contour plans for the first separation.

The floppy disk at the rear of this report contains edited ASCII format files of all survey data.

3. PERSONNEL

Ken Moir, geophysical technician, was the party chief on the survey on behalf of Scott Geophysics. Roy Lammle, geologist, was the representative on behalf of Barker Minerals Limited.

4. INSTRUMENTATION

A Scintrex IPR12 receiver and TSQ4 (10.0 kw) transmitter were used on the IP survey. Readings were taken in the time domain using a 2 second current pulse (0.125 Hz).

The chargeability plotted on the accompanying pseudosections and plan maps is for the interval 690 to 1050 milliseconds after shutoff.

5. RECOMMENDATIONS

A detailed interpretation of these results, and correlation to other work, is required before any specific recommendations could be made.

Respectfully Submitted,

Alan Scott, P. Geos.

Statement of Qualifications

for

Alan Scott, Geophysicist

of

4013 West 14th Avenue
Vancouver, B.C. V6R 2X3

I, Alan Scott, hereby certify the following statements regarding my qualifications, and my involvement in the program of work described in this report.

1. The work was performed by individuals sufficiently trained and qualified for its performance.

2. I have no material interest in the property under consideration in this report, nor in the company on whose behalf the work was performed.

3. I graduated from the University of British Columbia with a Bachelor of Science degree (Geophysics) in 1970, and with a Master of Business Administration degree in 1982.

4. I am a member of the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

5. I have been practicing my profession as a Geophysicist in the field of Mineral Exploration since 1970.

Respectfully submitted,

Alan Scott

Mr. Alan Scott
SCOTT GEOPHYSICS LTD.
4013 West 14th Avenue
Vancouver, B.C. V6R 2X3

June 10, 1996

Tel. (604) 228 0237
Fax. (604) 228 0254

Mr. Louis Doyle
BARKER MINERALS LIMITED
PO Box 24023, Lakefront Post Office
Kelowna, B.C. V1Y 9P9

Tel (604) 766 3894
Fax (604) 766 3884

Fax Note: 3 pages (including this one)

Invoice: IP Survey, ACE Property, B.C. (9616I02)

The following charges are due for work on the above project, per our agreement of March 27, 1996. Work performed in the interval May 21-31 was invoiced on June 1 (Invoice 9616I01 .. $18,800.00 + $1,316.00 GST).

Party chief, technician, vehicle, 3 kw system (sec 9.2 & 9.3)			
(Party chief - Ken Moir; Technician - Mitch Davies)			
June 1-5:	IP survey	5 survey days @ 995	4975.00
June 6:	demob (Vanc to jobsite)	1 travel day @ 715	715.00
Additional charge for 10 kw transmitter (per verbal agreement)			
(required due to very low resistivities)			
June 1-5:	IP survey	5 survey days @ 80	400.00
Travel and living expenses, gas and oil (sec 9.4)			
Per attached expense summary		(2992.35 - 91.20 GST)	2901.15
Plus 10 percent			290.11
Field assistants (sec 9.6)			
Brad Scott:	June 1-6	6 days @ 160	960.00
Eric Bailey:	June 1-6	6 days @ 160	960.00
Sean Mellows:	June 1-6	6 days @ 160	960.00
Additional presentation (sec 9.5)			
Vellums and blackline copies		31 sq. ft. @ 4.25	131.75
Total SCOTT charges this invoice:			$12293.01
Plus GST @ 7 percent (10475 4106 RT)			860.51
TOTAL THIS INVOICE:			$13153.52

Regards,

Alan Scott

Encl (production report and expense summary)

SCOTT GEOPHYSICS LTD.
4013 West 14th Avenue
Vancouver, B.C. V6R 2X3

tel. (604) 228 0237
fax. (604) 228 0254

PRODUCTION REPORT - IPR12/TSQ4 Survey (p-d; a=25m; n=1-5) page 1 of 1

Project: 9616 BARKER MINERALS LIMITED, ACE PROPERTY, B.C.

Date	Lines surveyed and comments	Production
Mon May 20	mob - Vancouver to Likely	travel
Tues May 21	setup equipment 1700S (950W-400E) dump 96160101	1350 m
Wed May 22	1700S (400E-1150E) 1500S (950W-200W) 96160102	1500 m
Thurs May 23	1500S (200W-1025E) 1300S (950W-425W) 96160103	1750 m
Fri May 24	1300S (425W-1025E) 1100S (950W-725W) 96160104	1900 m
Sat May 25	1100S (500W-1000E) 900S (950W-725W) 96160105	1700 m
Sun May 26	900S (725W-1075E) 96160106	1800 m
Mon May 27	700S (950W-1100E) 96160107	2050 m
Tues May 28	500S (950W-125E) .. move into camp .. 96160108	1075 m
Wed May 29	500S (125E-850E) 300S (950W-175W) 96160109	1500 m
Thurs May 30	300S (175W-825E) 100S (1400W-1025W) thunderstorms .. slow going 96160110	1375 m
Fri May 31	100S (1025W-675E) 100N (1400W-1025W) 96160111	2100 m
Sat June 1	100N (1000W-575E) 300N (1350W-1075W) 96160112	1850 m
Sun June 2	broken access wire .. moved to 1900S 1900S (950W-700E) 96160113	1650 m
Mon June 3	1900S (700E-1100E) 300N (1075W-474E) 96160114	1950 m
Tues June 4	500N (1325W-300E) 96160115	1625 m
Wed June 5	700N (1325W-125W) .. takedown equipment .. 96160116	1200 m
Thurs June 6	demob - jobsite to Vancouver	travel
	Total:	26375 m

Survey crew: Ken Moir (party chief)
Mitch Davies
Brad Scott
Eric Bailey
Scott Benson (May 20-31)
Sean Mellows (June 1-6)

Signed: [signature]

Date: June 10/96

Client: Barker Minerals Limited

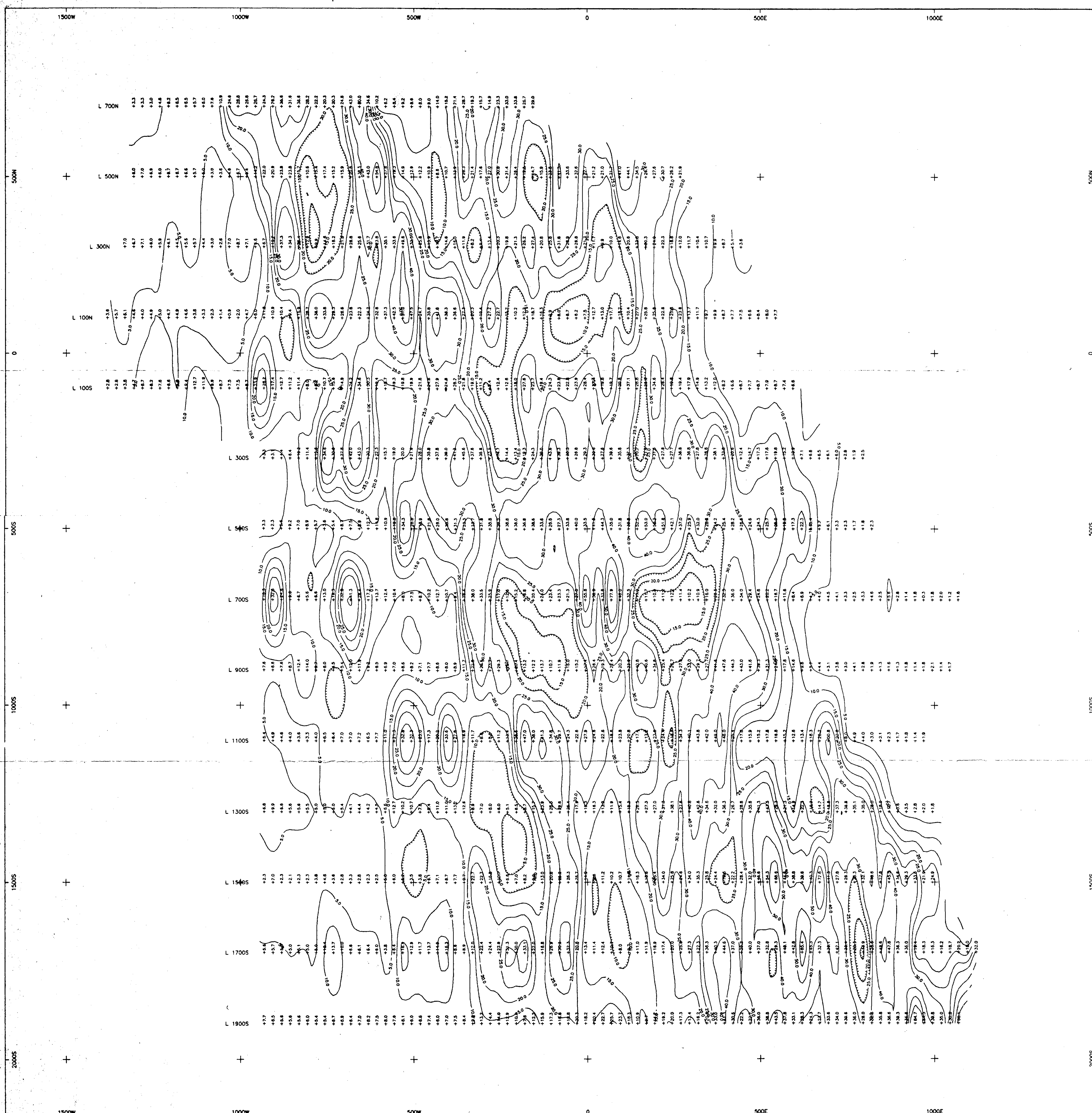
Property: Ace Property, B.C.

Project No.: 9616

Date	Item	Vendor and location	Amount	GST
May 20	gas	Chevron, Hope	74.93	4.90
May 20	meals	Kettle Valley Rest, Hope	50.24	
May 20	meals	Dairy Queen, 100 Mile House	9.69	0.63
May 20	meals	Fraser Inn, William's Lake	105.00	6.05
May 21	gas	Rolston's Lakeside Service, Likely	102.37	6.69
May 21	groc	Valley General Store, Likely	47.90	0.43
May 22	gas	Rolston's Lakeside Service, Likely	92.75	6.01
May 22	groc	Valley General Store, Likely	12.53	0.77
May 23	groc	Valley General Store, Likely	22.26	1.45
May 24	gas	Rolston's Lakeside Service, Likely	74.17	4.85
May 24	groc	Valley General Store, Likely	10.40	0.40
May 26	groc	Valley General Store, Likely	49.05	2.96
May 27	gas	Rolston's Lakeside Service, Likely	54.09	3.54
May 28	gas	Rolston's Lakeside Service, Likely	60.28	3.95
May 28	groc	Overwaitea, William's Lake	723.66	6.82
May 28	gas	Husky, William's Lake	78.72	4.59
May 28	rooms	Moorehead Lake Lodge	455.79	
May 31	gas	Rolston's Lakeside Service, Likely	176.29	11.53
May 31	groc	Valley General Store, Likely	207.85	0.40
May 31	meals	Quesnel Lake Lodge, Likely	60.00	
June 4	gas	Rolston's Lakeside Service, Likely	66.91	4.37
June 4	meals	Quesnel Lake Lodge, Likely	38.78	
June 5	meals	Three Amigos, William's Lake	160.38	8.83
June 6	gas/food	Chevron, 100 Mile House	97.63	3.47
June 6	meals	Dairy Queen, Dilworth Centre	20.07	1.37
June 6	gas	Petrocan, Westbank	50.00	3.27
June 6	toll	Coquihalla	10.00	
June 6	gas/food	Chevron, Hope	45.82	2.27
Total:		$Cdn	2992.35	91.20

Signed: [signature]

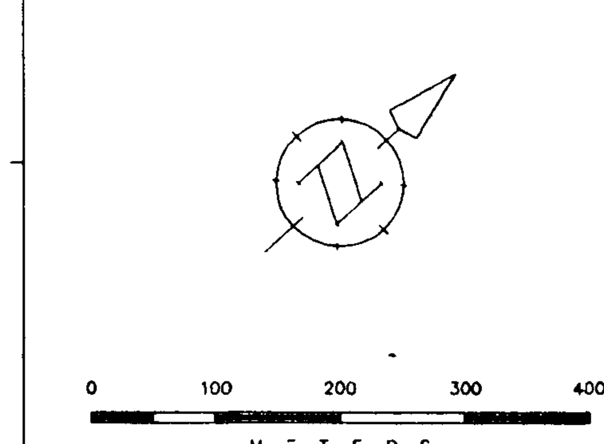
Date: Jun 10/96



SURVEY SPECIFICATIONS

receiver	Scintrex IPR12
transmitter	Scintrex TSQ4 (10 kw)
pulse time	2 seconds
Mx receive window	690–1050 msecs
mid point	870 msecs
array	pole dipole
a spacing	25 metres
n separations	1, 2, 3, 4, 5
contoured value	a=25 m n=1

contour intervals:
5.0, 10.0, 15.0, 20.0, 25.0,
30.0, 40.0, 50.0, 60.0 mV/V



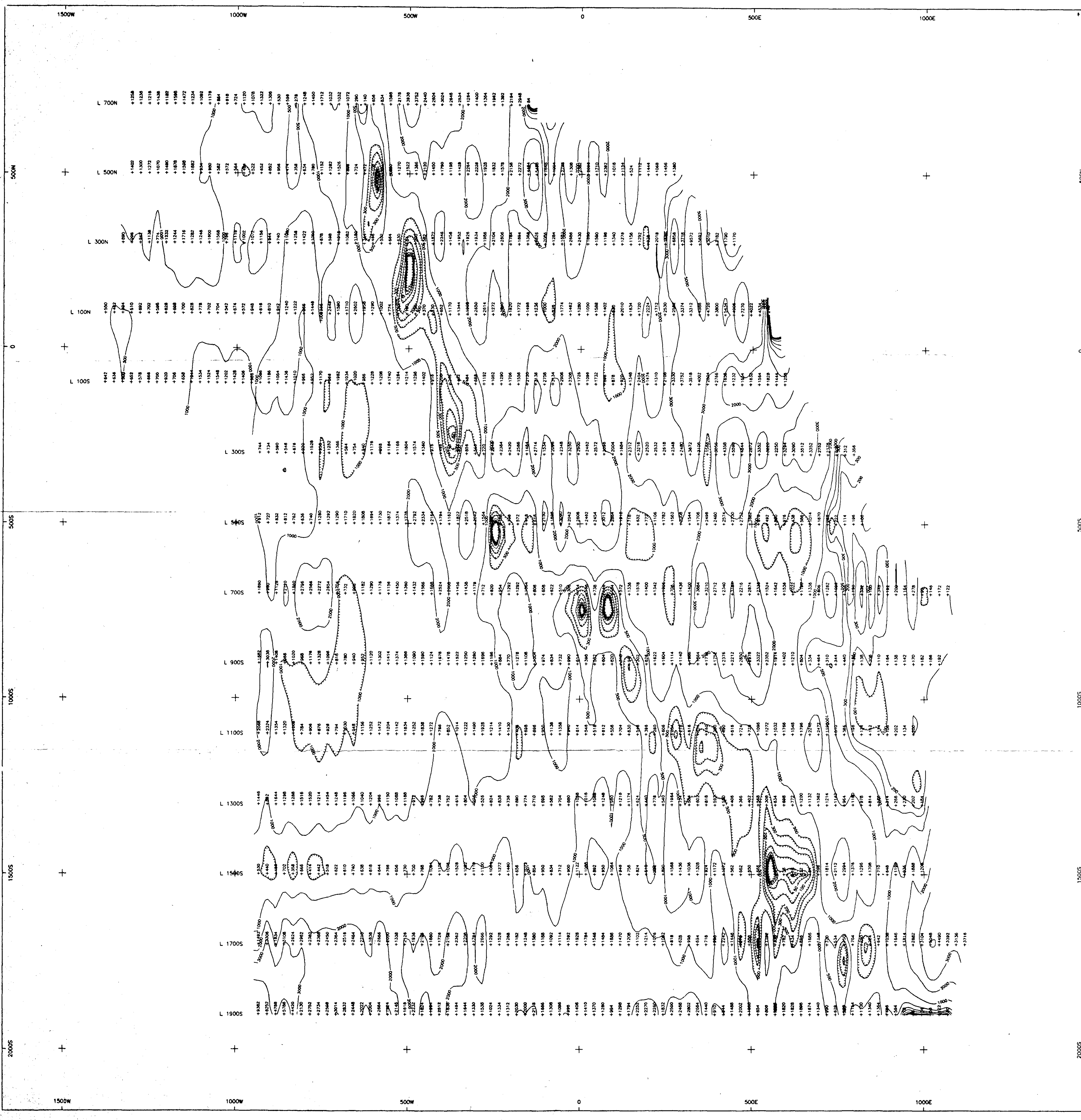
BARKER MINERALS LIMITED

MOUNT BARKER PROJECT

ACE PROPERTY
Chargeability Contour Plan
Electrode Spacing = 25 metres
First Separation (n=1)

DRAWN BY: ars | DATE: June/96

SCOTT GEOPHYSICS LTD.



SURVEY SPECIFICATIONS

receiver	Scintrex IPR12
transmitter	Scintrex TSQ4 (10 kw)
pulse time	2 seconds
Mx receive window	690-1050 msecs
mid point	870 msecs
array	pole dipole
a spacing	25 metres
n separations	1, 2, 3, 4, 5
contoured value	a=25 m n=1

contour intervals:
10, 20, 30, 50, 100, 200, 300, 1000, 2000, 3000, 5000 ohm-m

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

24,989

0 100 200 300 400
METERS

BARKER MINERALS LIMITED

MOUNT BARKER PROJECT

ACE PROPERTY
Resistivity Contour Plan
Electrode Spacing = 25 metres
First Separation (n=1)

DRAWN BY: ars	DATE: June/96

SCOTT GEOPHYSICS LTD.

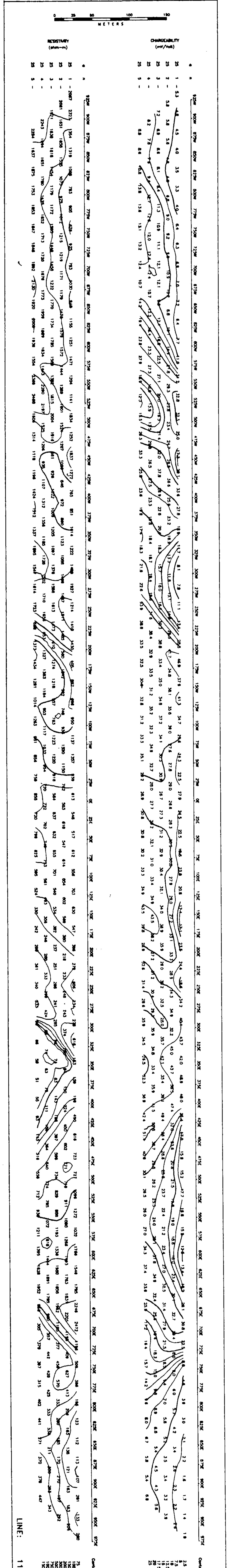
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 1100S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. — Scintrex IPR12
June/96 — Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



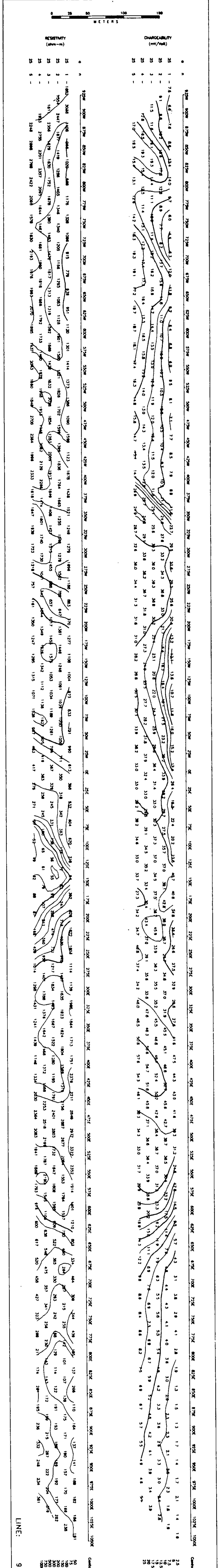
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 900S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. — Scintrex IPR12
June/96 — Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



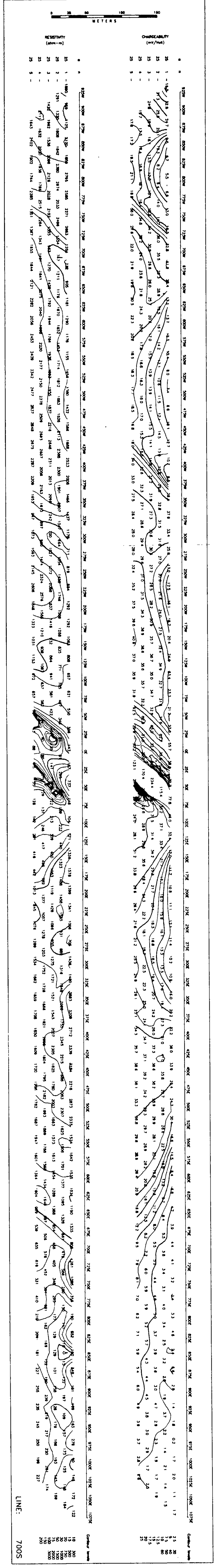
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 700S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. — Scintrex IPR12
June/96 — Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



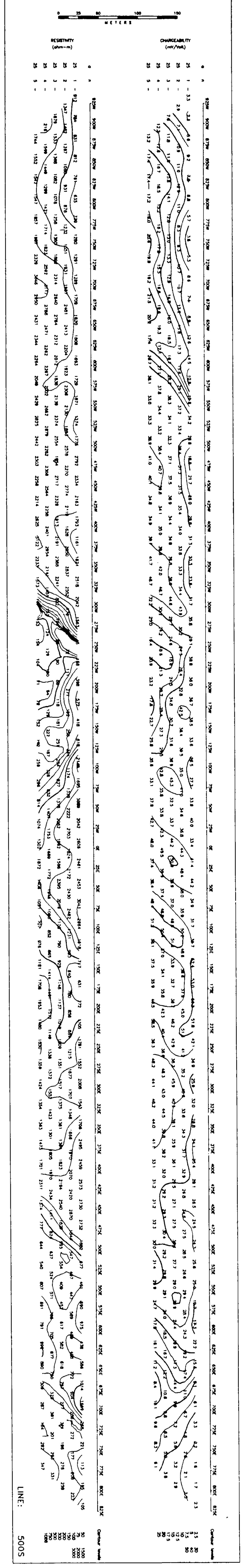
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 500S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. — Scintrex IPR12
June/96 — Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



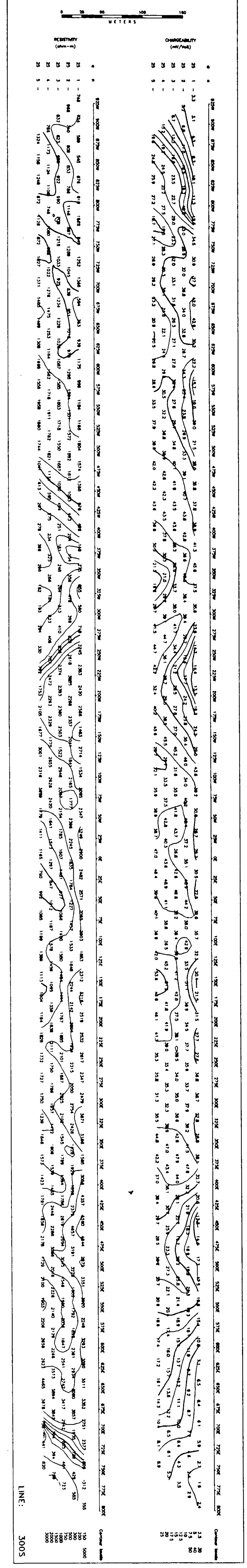
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 300S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. — Scintrex IPR12
June/96 — Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



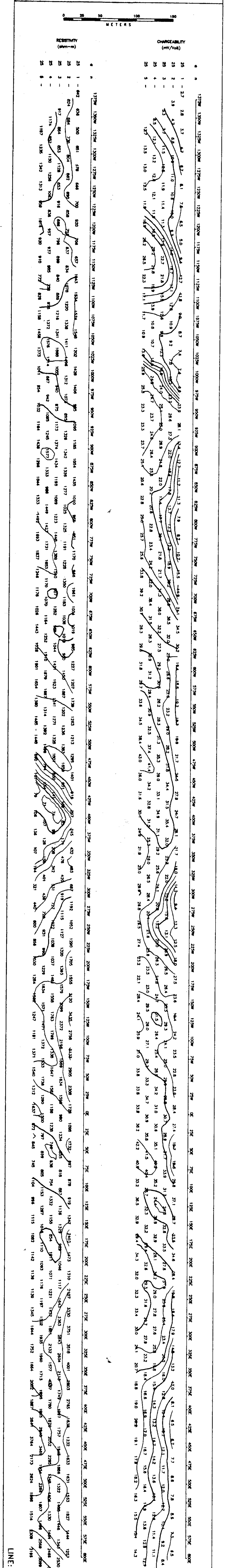
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 100S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



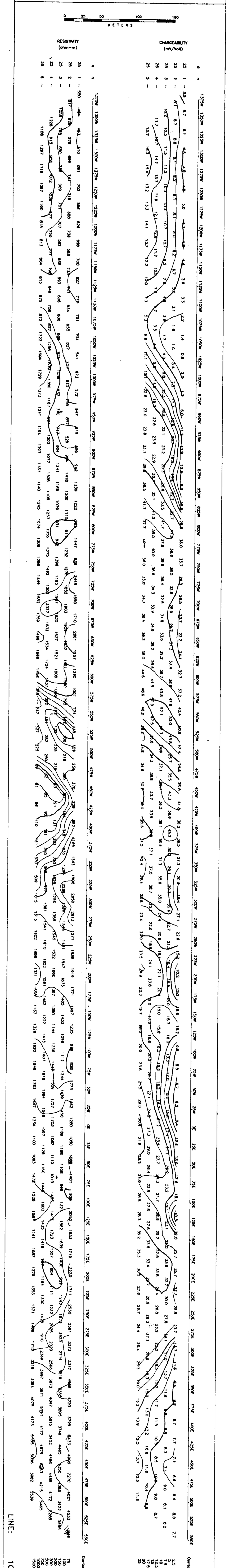
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 100N

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



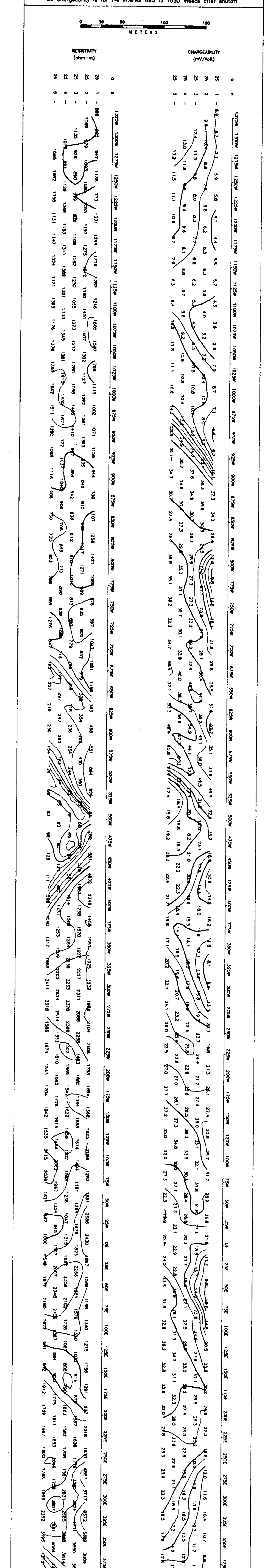
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 300N

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



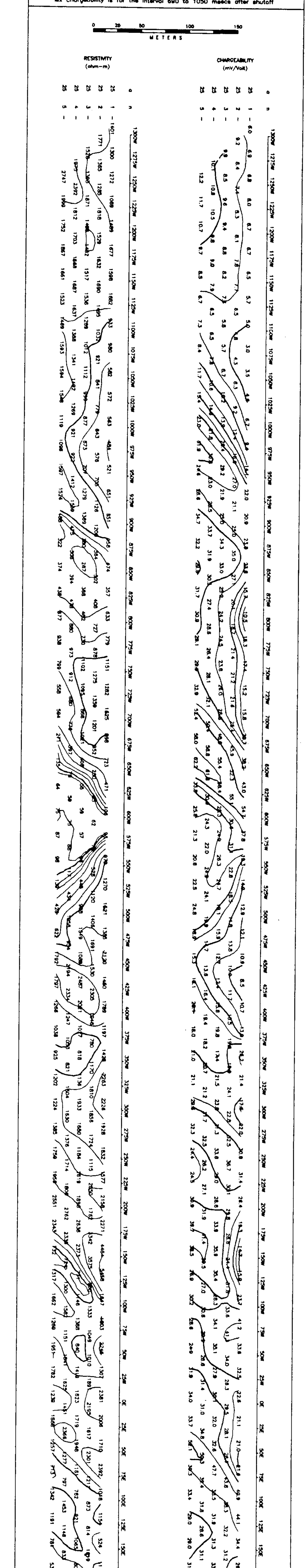
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 500N

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



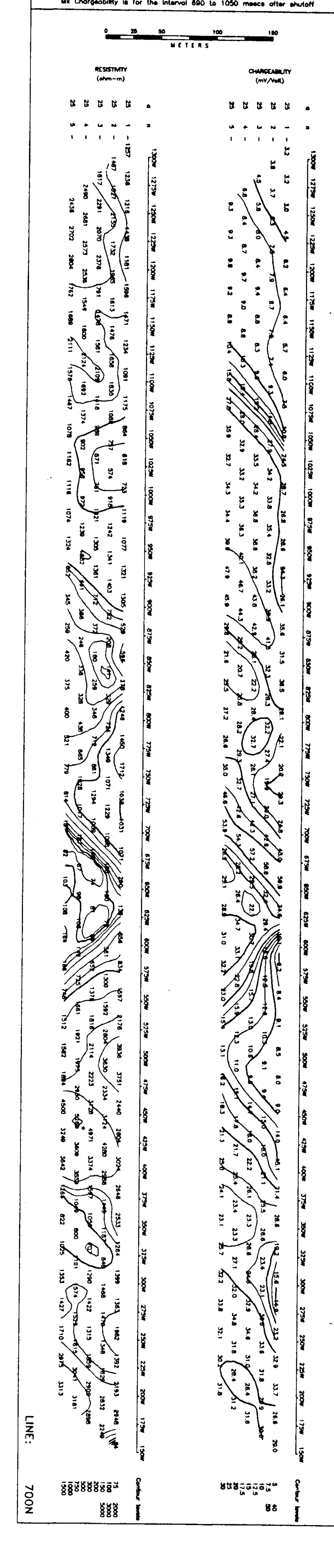
BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 700N

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec

Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



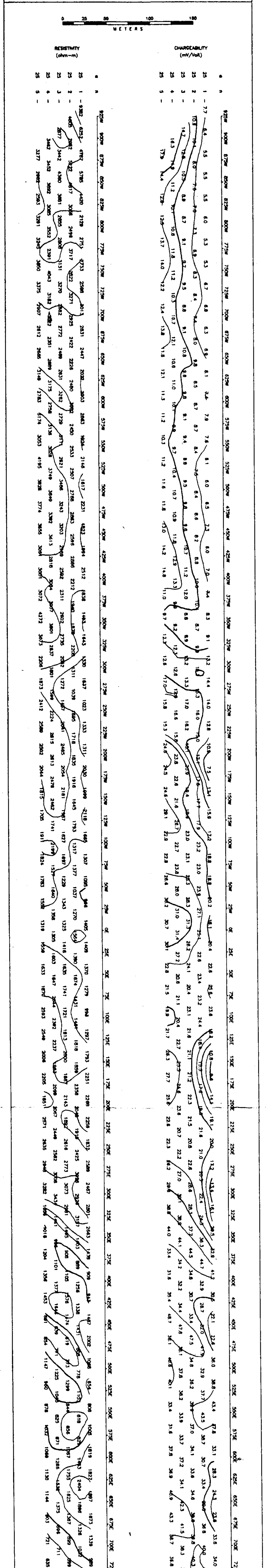
24,989

BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 1900S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec
Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff

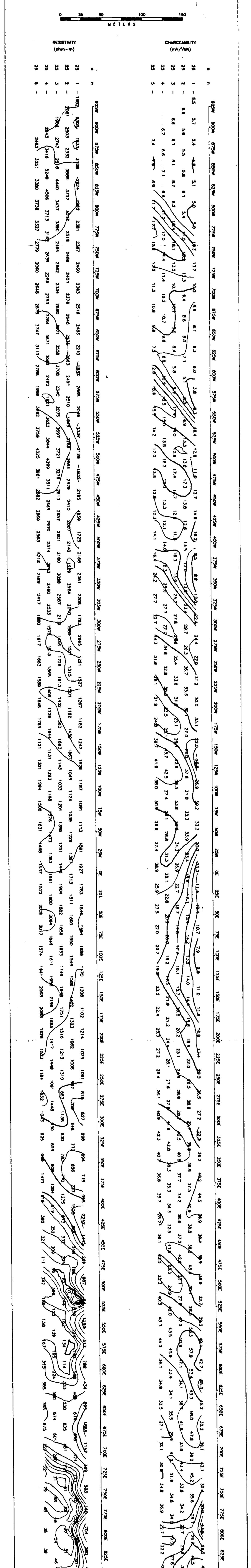


BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 1700S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec
Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff

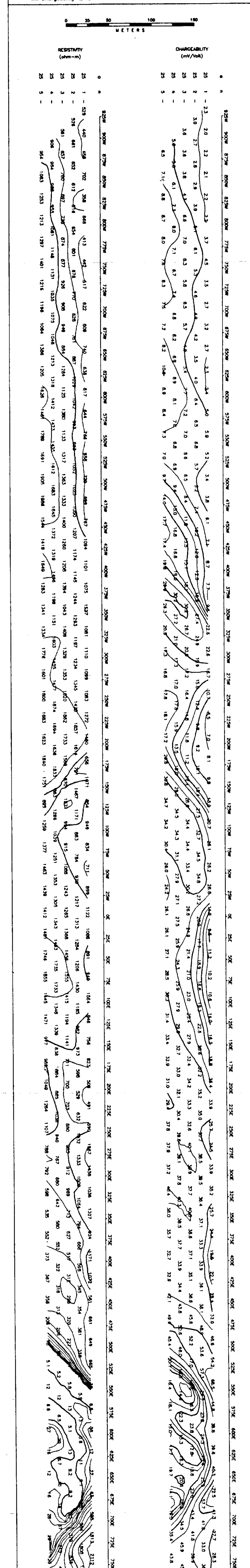


BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 1500S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec
Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff



BARKER MINERALS LIMITED

ACE PROPERTY, MOUNT BARKER PROJECT, B.C.

LINE: 1300S

INDUCED POLARIZATION SURVEY (Pole-Dipole Array)
SCOTT GEOPHYSICS LTD. Scintrex IPR12
June/96 Pulse Rate: 2 sec
Current Electrode West of receiving electrodes (array heading East)
Mx Chargeability is for the interval 690 to 1050 msecs after shutoff