

83-#966-12471
12/84

GEOCHEMICAL REPORT

On a

SILT AND SOIL SAMPLING SURVEY

over portions of the

KERR 1-5, KERR 7-10, KERR 12-35

KERR 38-44 and KERR 49-51 CLAIMS

SULPHURETS CREEK REGION

SKEENA MINING DIVISION

BRITISH COLUMBIA

KERR CLAIMS : 65 km North of Stewart, B.C.
: 56° 28' North Latitude
: 130° 15' West Longitude
: N.T.S. 104 B/8 and 104 B/9

WRITTEN FOR : Dale E. Wallster
Owner and Operator
981 West 17th Avenue
Vancouver, B.C. V5Z 1V5

WRITTEN BY : Dale E. Wallster
DATED : **GEOLOGICAL BRANCH**
ASSESSMENT REPORT

12,471

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INTRODUCTION

On July 11, July 22 to 25, and August 30 to 31, 1983, a 3 man crew performed a reconnaissance geochemical survey on the Kerr Claims. A total of 151 soil and stream sediment (silt) samples were collected and subsequently analyzed for Ag, Bi, As, Cu, Mn, Mo, Pb, Sb, Zn, and Ba by means of Inductively Coupled Argon Plasma analyses and geochemical atomic absorption (AA)-fire assay for Au. Geochemical data is outlined in Appendix A.

Two zones were deemed anomalous and worthy of follow-up work.

PROPERTY AND OWNERSHIP

The property consists of 43 non-contiguous, modified grid claims which are shown in Figure 2 and described as follows:

| Claim Name | Record No. | Record Date | No. of Units |
|-------------------|-------------------|--------------------|---------------------|
| Kerr 1 | 3657 | 17/12/82 | 20 |
| Kerr 2 | 3658 | 17/12/82 | 20 |
| Kerr 3 | 3659 | 17/12/82 | 2 |
| Kerr 4 | 3660 | 17/12/82 | 6 |
| Kerr 5 | 3661 | 17/12/82 | 18 |
| Kerr 7 | 3662 | 17/12/82 | 6 |
| Kerr 8 | 3663 | 17/12/82 | 16 |
| Kerr 9 | 3664 | 17/12/82 | 10 |
| Kerr 10 | 3665 | 17/12/82 | 9 |
| Kerr 12 | 3666 | 17/12/82 | 20 |
| Kerr 13 | 3667 | 17/12/82 | 20 |
| Kerr 14 | 3668 | 17/12/82 | 5 |
| Kerr 15 | 3669 | 17/12/82 | 16 |
| Kerr 16 | 3670 | 17/12/82 | 16 |
| Kerr 17 | 3671 | 17/12/82 | 8 |
| Kerr 18 | 3672 | 17/12/82 | 15 |
| Kerr 19 | 3673 | 17/12/82 | 20 |
| Kerr 20 | 3674 | 17/12/82 | 20 |
| Kerr 21 | 3675 | 17/12/82 | 18 |
| Kerr 22 | 3676 | 17/12/82 | 20 |
| Kerr 23 | 3677 | 17/12/82 | 16 |
| Kerr 24 | 3678 | 17/12/82 | 8 |
| Kerr 25 | 3682 | 20/12/82 | 16 |
| Kerr 26 | 3683 | 20/12/82 | 20 |
| Kerr 27 | 3684 | 20/12/82 | 5 |
| Kerr 28 | 3685 | 20/12/82 | 12 |
| Kerr 29 | 3686 | 20/12/82 | 20 |
| Kerr 30 | 3687 | 20/12/82 | 15 |
| Kerr 31 | 3688 | 20/12/82 | 18 |
| Kerr 32 | 3689 | 20/12/82 | 18 |
| Kerr 33 | 3690 | 20/12/82 | 18 |
| Kerr 34 | 3691 | 20/12/82 | 20 |
| Kerr 35 | 3693 | 20/12/82 | 18 |
| Kerr 38 | 3694 | 20/12/82 | 18 |
| Kerr 39 | 3695 | 20/12/82 | 18 |
| Kerr 40 | 3696 | 20/12/82 | 18 |
| Kerr 41 | 3697 | 20/12/82 | 20 |
| Kerr 42 | 3692 | 20/12/82 | 20 |
| Kerr 43 | 3698 | 20/12/82 | 20 |
| Kerr 44 | 3699 | 20/12/82 | 4 |
| Kerr 49 | 3700 | 20/12/82 | 20 |
| Kerr 50 | 3701 | 20/12/82 | 20 |
| Kerr 51 | 3679 | 17/12/82 | 16 |

TOTAL **663**
 ===

These claims are owned and operated by Dale E. Wallster of Vancouver, British Columbia.

LOCATION AND ACCESS

The ore mineral occurrences of the Sulphurets Creek area are approximately 65 kilometres north of Stewart, British Columbia. The property is peripheral to 56° 28' North Latitude and 130° 15' West Longitude.

National Topographic System (N.T.S.) map sheets for the region, at the 1:50,000 scale, are 104 B/9 (John Peaks) and 104 B/8 (Frank Mackie Glacier).

Sulphurets Creek is a westerly flowing tributary of the Unuk River. Historic access has been via boat and wagon trail following the river from tidewater at Burroughs Bay, Alaska. Present access is via helicopter only.

Helicopter charter is available at Stewart, B.C. or Wrangell, Alaska/ Seasonal charter is available at the Snippaker Airstrip or and Bob Quinn Lake (on the Stewart Cassiar Highway).

PHYSIOGRAPHY, TOPOGRAPHY AND GLACIATION

The property is within the Boundary Ranges of the Coast Mountains physiographic region. These ranges extend northwards from the Nass River along the British Columbia - Alaska border.

The Coast Mountains are sedimentary and volcanic rocks of middle Jurassic and older age that have been intruded by composite batholiths of granodiorite and quartz diorite composition (Coast Intrusions).

Holland, 1976, states that the Boundary Ranges have a core of granitic rocks which are flanked on the eastern margin by Triassic and Jurassic sedimentary and volcanic rocks. Within this greatly glaciated range, the sedimentary rocks tend to produce a sharper, more irregular topography than the intrusive rocks.

North of Stewart, in a region inclusive of the property, a high percentage of area is under glacial ice cover, through which isolated peaks project as nunatuks. In the ice-free zones, the high peaks have horn and arete forms whereas peaks and ridges below the 2,000 meter elevation are rounded and subdued by the effects of ice sheet erosion.

Major drainages, such as the Unuk River, previously served as conduits for the westward flow of glacial ice. Post-glacial features of these drainages and their tributaries include steep-walled, U-shaped valleys and associated truncated spurs, hanging valleys and prominent trim lines. These trim lines are evidence of the recent rapid ablation of glacial ice.

Kirkham (1963) states that glacial and glaciofluvial deposits are common in the Sulphurets Creek region.

Elevation on the property varies between 450 and 2,400 metres. Tree line is approximately 1,300 metres.

HISTORY

The Stikine River gold rushes to Telegraph Creek in 1861 and

to the Cassiar goldfields between 1873 and 1875 created the initial prospecting interest in the Boundary Ranges. However, it was not until 1893 that a prospector named O'Hara discovered placer gold in the upper reaches of the Unuk River. Subsequently, several prospectors entered the area in 1894. By 1898, F.E. Gringas, H.W. Ketchum and C.W. Mitchell had erected a cabin and made extensive cuts in bench-gravels at the mouth of Mitchell Creek, a tributary to Sulphurets (or Sulphide) Creek.

Also in 1898, Messrs. Ketchum and Lee Brant (in company with Messrs. Ceperby, Mackenzie and Rounsefell) located the first mineral claims in the area. These claims were the Cumberland and Globe groups.

Between 1898 and 1903 extensive physical work was performed on these claims. In 1900 the Unuk River Mining and Dredging Company purchased them and by 1901 had installed a small stamp mill on the Globe group.

During 1903, the Unuk River Mining and Dredging Company began construction of a road between Burroughs Bay and Sulphurets Creek. Construction of the road was never completed and mining equipment destined for the region was left abandoned.

In 1905, Dr. Frederick Eugene Wright, of the United States Geological Survey, explored the Unuk River drainage. He described the geology and prospects and concluded "that the area east of the granitic batholiths warranted careful examination which might reward careful prospecting ventures."

Between 1903 and 1929, little interest was shown in the area; no doubt a result of transportation problems.

In 1929, T. Terwilligen and T. McQuillan prospected the region and in 1930 Terwilligen and A. Skelhorne visited the Globe group for Mining Corp. of Canada. During 1931, 1932 and 1935 Ted Morris entered and examined the area by crossing the icefields to the south of the region.

The occurrence of placer gold and the extensive gossans in the upper reaches of Sulphurets Creek resulted in the staking of claims in this area by Bruce and Jack Johnson during 1935.

From the latter years of the 1930's until the early 1960's, the area was relatively inactive with respect to prospecting. The search for porphyry type copper deposits; however, rejuvenated interest in the region.

During 1960, Newmont Mines conducted helicopter-borne geophysical surveys (magnetic) and staked ground at the Sulphurets Creek headwaters on behalf of Granduc Mines Ltd. At this time preliminary geological and geophysical reconnaissance was performed. Also in 1960, D. Ross, S. Bishop, and W. Dawson located claims in the region.

Between 1961 and 1967, Newmont and Granduc continued geological and geophysical programs on their ground. The Ross, Bishop, Dawson-owned claims were optioned to Phelps Dodge Corp. of Canada Ltd. in 1962, to the Meridian Syndicate in 1965, and to Granduc Mines Limited in 1968. Exploration by Granduc Mines continued until 1970.

R.V. Kirkham completed a M.Sc. thesis on the geology and

mineral deposits of the region in 1963 and E.W. Grove completed a regional geological study in 1968 (Fig. 3).

With recent increases in precious metal values the area has received renewed attention. Texasgulf, Inc., in 1976 and 1977, explored the Prout plateau region, concentrating on the Mackay Lake gold occurrences. The Sulphurets Creek property was again explored by Granduc in 1975, 1976 and 1977, with the emphasis on molybdenum, and then optioned to Esso Resources Canada Limited in 1979.

Between 1979 and the present, Esso Resources Canada Limited has expended more than \$2 million in exploration for precious metals.

Most of the recent exploration, performed under the direction of D. Bridge, has occurred in the southern portions of the property in the immediate vicinity of Brucejack Lake.

LOCAL GEOLOGY

Ore mineral occurrences are hosted by intensely altered, Early Jurassic, andesitic volcanic and sedimentary rocks of the Unuk River Formation (Figure 3). Granitic and syenitic intrusive rocks cut the sequence and are also altered. Alteration products include sericite, potassium-feldspar, silica, carbonates and chlorite.

Three major styles of ore-mineralization occur on the Esso-Granduc property. These are:

1. Deep-seated porphyry-type copper, copper-molybdenum, and molybdenum mineralization associated with coarse-grained syenites and potassium-feldspar and sericite alteration products.

2. "Porphyry-type" gold mineralization associated with fine-grained syenite to syenodiorite intrusive rocks, intrusive breccias, and pyritization.
3. Structurally controlled, silver-gold-base metal, epithermal veins occurring within or adjacent to fine-grained syenodiorite intrusions and associated with large area of intense sericite-(quartz-pyrite) alteration. These veins may or may not have significant sulphide contents.

These ore mineral occurrences are possibly consanguineous and genetically related to intrusive activity. The nature of ore mineral occurrences is related to structural features and depth of emplacement. Regional doming, structural deformation, and depth of erosion enhance exposure of the occurrences originally deposited at deeper levels.

Gold values of 1 gm/ton occur sporadically over a five kilometre area. Peripheral to copper-molybdenum occurrences, gold values of 2 to 3 gm/ton occur in zones of intense (15 to 40%) pyritization and associated sericitic alteration and pervasive silicification. These porphyry-type gold occurrences received brief attention from Esso.

During 1982, extensive trenching, geological mapping, geochemical surveys and 53 diamond drill holes (totalling 4633 metres) performed by Esso outlined twelve gold and/or silver bearing structures. Most work was focussed on two epithermal zones located under and to the immediate west of Brucejack Lake (Figure 4).

The Peninsula (Near Shore) Zone is multiple quartz-calcite veins and stockworks containing an average of 5% sulphides. This mineralized zone consists of prominent vertical veins (with lesser horizontal and randomly oriented veins) in a sericitic wallrock which is transected by a weak quartz stockwork. Zones of "high-grade" Ag-Au have a greater sulphide content (approximately 15%) with ore mineralization consisting of pyrite and lesser sphalerite, tetrahedrite, galena, electrum, chalcopyrite, and argentite.

In 1982, drilling traced the Peninsula Zone for a strike length of 265 metres and a depth of 140 metres. It has an apparent true width, ranging from .3 to 9.8 metres, averaging 2.4 metres in 17 drill intersections each of which have at least .1 oz. Au/ton and .60 to 2.62 oz. Ag/ton. During 1983, a step-out diamond drill hole (located 120 metres northwest of 1982 drilling) cut 1.34 metres and 1.77 metres of 2.33 oz. Ag/ton and .73 oz. Au/ton, at a depth of 122.1 metres.

The West Zone is a multiple vein and stockwork zone containing trace to semi-massive sulphides. Ore mineralogy includes pyrite, tetrahedrite, sphalerite, galena, pyrargyrite, argentite and electrum. The silver chloride cerargyrite locally forms a distinctive purplish-gray rind on these veins at surface.

During 1982, the West Zone was outlined over a strike length of 310 metres and to a depth of 60 metres. Six of 21 drill holes had values ranging from 22.77 to 286 oz. Ag/ton and .1 to 3.81 oz. au/ton over true widths of .6 to 4 metres.

Drilling during 1983 extended this zone to a depth of 152.4 metres and another 30.5 metres to the south. Examples of drill results in the 1983 drilling are as follows:

| DDH | Depth (meters) | Length (meters) | Oz. Ag/ton | Oz. Au/ton |
|-----|-----------------------|-----------------|------------|------------|
| 101 | (Depth Extension) | | | |
| | 46.73 - 54.56 | 7.83 | 13.5 | .167 |
| | 65.75 - 69.74 | 3.99 | 1.89 | .351 |
| 102 | (Depth Extension) | | | |
| | 67.18 - 68.55 | 1.37 | 17.59 | .217 |
| | 83.21 - 86.23 | 3.02 | 55.86 | .466 |
| 103 | (Depth Extension) | | | |
| | 99.55 - 102.02 | 2.47 | 14.20 | .074 |
| | 157.31 - 158.47 | 1.16 | 12.05 | .342 |
| 104 | (Southerly Extension) | | | |
| | 74.28 - 75.29 | 1.01 | 127.95 | .518 |
| | 88.15 - 93.51 | 5.36 | 35.88 | .412 |
| 105 | (Southerly Extension) | | | |
| | 90.28 - 96.62 | 6.34 | 5.87 | .106 |
| | 114.76 - 115.70 | .94 | 14.34 | .486 |

Schroeter reported grab samples from the West Zone with values up to 275 p.p.m. Au, 67,525 p.p.m. Ag, 2.74% Cu, 2.5 pb, and 4.5% Zn.

SURVEY PROCEDURES

The total number of stream sediment silt samples collected was 51. One hundred soil samples, from the B horizon were collected. Where no B horizon samples could be taken, C horizon samples were

collected as an alternate. Soil sample collection lines are illustrated on Figure 2 and outlined by the beginning and ending numbers of that line. Samples were placed in Kraft envelopes and field locations were marked with fluorescent flagging.

Samples were submitted to Min-En Laboratories Ltd. of 705 West 15th Street, North Vancouver, B.C. Samples of the -80 mesh fraction were analyzed by Inductively Coupled Argon Plasma (ICP) techniques for Ag, As, Bi, Cu, Mn, Mo, Pb, Sb, Zn, and Ba and geochemical atomic absorption (AA) - fire assay for Au. Geochemical data for these elements are appended.

DISCUSSION AND CONCLUSION

In view of styles of mineralization outlined by Granduc and Esso geologists, several zones outlined by the reconnaissance geochemical survey are worthy of further follow-up.

These include results from soil samples 21000 to 21018 and K031 to K036. Such follow-up work should include further soil sampling, rock geochemistry and geological mapping.

Within the zone covered by samples 21000 to 21018, elevated gold values (up to 1950 ppb) in conjunction with enriched values for silver (up to 17.1 ppm), lead (up to 1240 ppm), zinc (up to 1170 ppm) and barite (up to 1620 ppm) suggest the possibility of the occurrence of silver-gold-base metal epithermal veins similar to those found on the Esso ground near Brucejack Lake (Figure 4). Results for soil samples K030 to K036 may also outline another zone of similar mineralization.

REFERENCES

- Bridge, D.A., Britten, R.M., Melnyk, W.D., and Simpson, T., 1983. Geology of the Mitchell-Sulphurets Property in Program with Abstracts - 1983 Annual Meeting of the Geological Association of Canada and Mineralogical Association of Canada, p. A-8.
- Bridge, D.A., Britten, R.M., Melnyk, W.D., and Ferreira, W.S., 1983. Epithermal Silver-Gold Veins, Mitchell-Sulphurets Property, British Columbia. Paper presented at 8th Annual Canadian Institute of Mining and Metallurgy, District 6 Meeting.
- Engineering and Mining Journal, 1983. Volume 184 - Number 1, p.27.
- Grove, E.W., 1971. Geology and Mineral Deposits of the Stewart Area, Northwestern British Columbia. B.C. Dept. Mines Petroleum Resources, Bull. 58.
- _____, 1968. Ted, Ray Claims. Minister of Mines, Ann. Repts., pp. 45-46.
- Holland, S.S., 1980 (Reprint). Placer Gold Production of British Columbia. B.C. Dept. of Mines Petroleum Resources, Bull. 28, pp. 57-59, p. 48.
- _____, 1976. Landforms of British Columbia. B.C. Dept. Mines Petroleum Resources, Bull. 48.
- Kirkham, R.V., 1963. The geology and mineral deposits in the vicinity of the Mitchell and Sulphurets Glaciers, Northwest British Columbia. Unpub. M.Sc. Thesis, The University of British Columbia.
- Schroeter, T.G., 1983. Brucejack Lake (Sulphurets) Prospect (104 B/8). B.C. Ministry of Energy, Mines and pet. Res., Geological Fieldwork, 1982, Paper 1983-1, pp. 171 - 174.
- George Cross Newsletter, December 12, 1983.

STATEMENT OF QUALIFICATIONS

I, DALE EVAN WALLSTER, of the City of Vancouver, Province of British Columbia, do hereby certify:

- (1) THAT I am currently a self-employed consulting geologist with offices at 981 West 17th Avenue, Vancouver, British Columbia.
- (2) THAT I am a graduate of the University of Western Ontario, 1979, and hold a Bachelor of Science Honours degree in Geology.
- (3) THAT since 1977 I have pursued my profession in geology. I have been employed, as a geologist, actively involved in the search for mineral deposits in the Canadian Shield and the Western Cordillera of both the United States and Canada.
- (4) THAT I am the author of this report titled **Geochemical Report on a Silt and Soil Sampling Survey over portions of the KERR 1-5, KERR 7-10, KERR 12-35, KERR 38-44, and KERR 49-51 claims.** This report is compiled from my colleagues' observations and the references cited.
- (5) THAT I consent to the use of this report either in its entirety, or in part, only by written permission.



Dale E. Wallster
Geologist

Dated at Vancouver, British Columbia, this 15th day of March, 1984.

AFFADAVIT OF EXPENSES

Expenditures itemized below were incurred on behalf of Dale E. Wallster in connection with a geochemical and geological exploration program performed on the Kerr 1-5, 7-10, 12-35, 38-44 and 49-51 claims, Skeena Mining Division.

FIELD WORK

| | |
|--|------------|
| Wages: Mobilization, demobilization, geological and geochemical reconnaissance (July 11, 1983, July 22 to 25, 1983 and August 30 to 31, 1983. 21 mandays @ \$300/day | \$6,300.00 |
|--|------------|

FIELD CREW EXPENSES

| | |
|---|----------|
| Travel to and from Snippaker Creek Airstrip | 1,453.80 |
| Camp Costs and meals | 490.00 |

GEOCHEMICAL ANALYSIS

| | |
|------------------------------|----------|
| 151 samples @ \$10.30/sample | 1,555.56 |
|------------------------------|----------|

HELICOPTER CHARTER

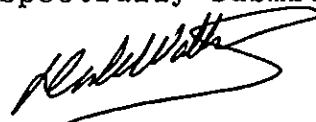
| | |
|--|----------|
| Travel to property and return from Snippaker Creek Airstrip and property reconnaissance | 7,060.75 |
|--|----------|

REPORT

| | |
|--|--------|
| Geologist | 750.00 |
| Secretarial Services | 150.00 |
| Report preparation, drafting, map printing, photocopying and disbursement costs | 650.00 |

| | |
|--------------|------------------------------------|
| TOTAL | <u>\$18,410.11</u> ----- |
|--------------|------------------------------------|

Respectfully submitted,



Dale Evan Wallster

March 15, 1984

APPENDIX A

GEOCHEMICAL DATA FOR KERR CLAIMS

(Ag, As, Bi, Cu, Mn, Mo, Pb, Sb, Zn, Ba, Au)

114

ATTENTION: CRIS GRAF

(604)980-5814 OR (604)988-4524

DATE: SEPTEMBER 26, 1983

| (REPORT VALUES IN PPM) | AG | AS | BI | CU | MN | MO | PB | SB | ZN | BA | AU-PPB | |
|------------------------|------|-----|-----|-----|-------|-----|------|----|------|------|--------|--|
| 220005 | 2.0 | 17 | 44 | 147 | 1670 | 54 | 121 | 20 | 84 | 77 | 10 | |
| 220018 | 1.0 | 57 | 39 | 95 | 981 | 52 | 104 | 21 | 60 | 110 | 5 | |
| 220025 | 1.4 | 47 | 48 | 106 | 1770 | 54 | 130 | 25 | 68 | 129 | 5 | |
| 220035 | 1.6 | 96 | 52 | 128 | 1290 | 60 | 101 | 24 | 50 | 90 | 10 | |
| 220045 | 2.0 | 92 | 44 | 102 | 1970 | 59 | 135 | 31 | 141 | 132 | 5 | |
| 220055 | 3.4 | 3 | 39 | 102 | 1680 | 52 | 417 | 25 | 94 | 226 | 10 | |
| 220065 | .4 | 69 | 40 | 51 | 1340 | 53 | 126 | 28 | 59 | 183 | 5 | |
| 220075 | 2.2 | 1 | 36 | 89 | 1260 | 41 | 116 | 16 | 137 | 152 | 5 | |
| 220085 | .6 | 9 | 39 | 88 | 1440 | 46 | 114 | 19 | 72 | 114 | 10 | |
| 220095 | .7 | 26 | 39 | 95 | 1180 | 55 | 128 | 22 | 94 | 201 | 5 | |
| 220105 | 4.5 | 30 | 36 | 105 | 2810 | 51 | 401 | 23 | 500 | 150 | 10 | |
| 220115 | .9 | 0 | 39 | 109 | 1250 | 49 | 134 | 24 | 157 | 112 | 5 | |
| 220125 | 1.2 | 43 | 36 | 104 | 1390 | 46 | 150 | 23 | 106 | 135 | 15 | |
| 220135 | 2.7 | 41 | 39 | 104 | 1280 | 53 | 153 | 20 | 129 | 156 | 30 | |
| 220145 | 7.1 | 264 | 37 | 88 | 1660 | 47 | 1210 | 24 | 877 | 127 | 10 | |
| 220155 | 7.2 | 306 | 26 | 125 | 960 | 43 | 218 | 18 | 446 | 160 | 25 | |
| 220165 | 11.1 | 0 | 48 | 180 | 12900 | 46 | 1680 | 33 | 815 | 91 | 5 | |
| 220175 | 1.4 | 0 | 28 | 21 | 607 | 27 | 72 | 10 | 23 | 18 | 5 | |
| 220185 | .9 | 18 | 32 | 109 | 818 | 35 | 127 | 21 | 70 | 57 | 60 | |
| 220195 | 2.4 | 109 | 34 | 133 | 564 | 39 | 225 | 24 | 481 | 87 | 63 | |
| 220205 | 2.8 | 113 | 45 | 169 | 1590 | 53 | 204 | 25 | 225 | 107 | 140 | |
| 220215 | .8 | 85 | 40 | 176 | 873 | 47 | 149 | 23 | 103 | 101 | 50 | |
| 210005 | 3.6 | 218 | 43 | 269 | 528 | 72 | 329 | 31 | 56 | 235 | 1950 | |
| 210015 | 2.0 | 46 | 28 | 346 | 145 | 47 | 70 | 17 | 31 | 379 | 450 | |
| 210025 | 1.8 | 47 | 22 | 63 | 47 | 100 | 94 | 10 | 15 | 323 | 710 | |
| 210035 | 17.1 | 746 | 126 | 381 | 0 | 115 | 282 | 98 | 66 | 87 | 15 | |
| 210045 | 9.9 | 468 | 77 | 280 | 513 | 77 | 876 | 56 | 112 | 214 | 220 | |
| 210055 | 7.7 | 55 | 45 | 251 | 1520 | 42 | 185 | 24 | 227 | 64 | 135 | |
| 210065 | 12.1 | 212 | 39 | 140 | 4430 | 38 | 1240 | 36 | 339 | 128 | 340 | |
| 210075 | 5.5 | 176 | 29 | 72 | 1610 | 30 | 612 | 25 | 123 | 129 | 115 | |
| 210085 | 13.6 | 101 | 72 | 164 | 22000 | 72 | 391 | 56 | 1170 | 1620 | 245 | |
| 210095 | 3.4 | 88 | 28 | 113 | 4330 | 27 | 139 | 23 | 172 | 260 | 115 | |
| 210105 | 1.7 | 71 | 32 | 122 | 3060 | 26 | 81 | 19 | 54 | 122 | 40 | |
| 210115 | .4 | 59 | 26 | 90 | 1190 | 30 | 81 | 19 | 84 | 142 | 15 | |
| 210125 | .6 | 53 | 30 | 87 | 1400 | 29 | 107 | 17 | 91 | 161 | 65 | |
| 210135 | .8 | 74 | 29 | 136 | 970 | 34 | 95 | 16 | 102 | 165 | 10 | |
| 210145 | .4 | 49 | 29 | 89 | 842 | 25 | 70 | 14 | 77 | 136 | 30 | |
| 210155 | .4 | 98 | 31 | 94 | 1060 | 36 | 121 | 28 | 126 | 421 | 5 | |
| 210165 | 1.3 | 84 | 26 | 109 | 1300 | 23 | 109 | 19 | 226 | 151 | 5 | |
| 210175 | .3 | 82 | 26 | 111 | 1010 | 32 | 89 | 19 | 91 | 139 | 5 | |
| 210185 | .7 | 95 | 48 | 143 | 2400 | 54 | 133 | 35 | 69 | 227 | 15 | |
| 20000X | 0 | 15 | 19 | 18 | 462 | 23 | 51 | 5 | 71 | 54 | 10 | |
| 1X | .5 | 37 | 25 | 51 | 944 | 34 | 103 | 11 | 175 | 171 | 10 | |
| 2X | 1.7 | 77 | 38 | 90 | 845 | 55 | 116 | 18 | 61 | 227 | 35 | |
| 3X | 2.1 | 39 | 36 | 102 | 936 | 50 | 99 | 16 | 76 | 269 | 25 | |
| 4X | 1.1 | 29 | 35 | 75 | 939 | 52 | 84 | 11 | 168 | 171 | 10 | |
| 5X | 1.6 | 19 | 36 | 116 | 1130 | 47 | 92 | 10 | 123 | 199 | 40 | |
| 6X | .8 | 71 | 70 | 165 | 414 | 60 | 76 | 15 | 37 | 142 | 5 | |
| 7X | .9 | 78 | 38 | 245 | 528 | 54 | 90 | 14 | 65 | 163 | 35 | |
| 8X | 1.1 | 40 | 36 | 165 | 442 | 46 | 65 | 13 | 49 | 168 | 70 | |
| 9X | 2.2 | 70 | 42 | 160 | 954 | 53 | 108 | 20 | 57 | 200 | 110 | |
| 10X | 1.1 | 33 | 15 | 64 | 383 | 24 | 44 | 8 | 36 | 109 | 5 | |
| 11X | 1.7 | 118 | 30 | 91 | 777 | 46 | 107 | 23 | 109 | 67 | 15 | |
| 12X | 1.7 | 39 | 26 | 76 | 619 | 42 | 76 | 12 | 82 | 125 | 10 | |
| 13X | 1.0 | 0 | 19 | 36 | 365 | 20 | 43 | 3 | 35 | 95 | 10 | |
| 14X | 2.1 | 50 | 26 | 77 | 638 | 42 | 103 | 13 | 179 | 108 | 5 | |
| 15X | 2.4 | 50 | 26 | 81 | 614 | 40 | 102 | 17 | 180 | 126 | 10 | |
| 16X | 1.1 | 31 | 31 | 75 | 731 | 45 | 101 | 14 | 152 | 52 | 5 | |
| 17X | 3.1 | 103 | 29 | 161 | 1160 | 51 | 123 | 27 | 224 | 249 | 10 | |
| 18X | 2.0 | 113 | 30 | 92 | 723 | 49 | 117 | 24 | 74 | 163 | 5 | |

SOIL SAMPLES

SOIL SAMPLES

COMPANY: .
 PROJECT No: SULFERETTES CREEK
 ATTENTION: CRIS GRAF

MIN-EN LABS ICP REPORT
 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2
 (604)980-5814 DR (604)988-4524

(ACT:GE03A+) PAGE 1 OF 1
 FILE No: 3-1010S/P3+4
 DATE: SEPTEMBER 26, 1983

| (REPORT VALUES IN PPM) | AG | AS | BI | CU | MN | MO | PB | SB | ZN | BA | AU-PPB | |
|------------------------|------|-----|----|------|-------|-----|------|-----|------|-----|--------|--|
| 19X | 1.6 | 33 | 29 | 110 | 762 | 32 | 90 | 10 | 50 | 154 | 60 | |
| 20X | 3.1 | 79 | 28 | 153 | 1260 | 51 | 152 | 28 | 950 | 131 | 5 | |
| 21X | 1.4 | 13 | 34 | 90 | 2020 | 42 | 157 | 18 | 160 | 227 | 25 | |
| 22X | 3.7 | 117 | 50 | 349 | 2660 | 62 | 210 | 31 | 353 | 291 | 150 | |
| 23X | 2.7 | 83 | 43 | 381 | 1560 | 68 | 144 | 33 | 91 | 650 | 70 | |
| 24X | 3.8 | 109 | 30 | 52 | 942 | 35 | 127 | 18 | 160 | 210 | 45 | |
| 25X | 1.7 | 163 | 34 | 134 | 1550 | 42 | 114 | 27 | 138 | 283 | 5 | |
| 26X | 7.1 | 124 | 46 | 633 | 1050 | 45 | 201 | 24 | 587 | 90 | 80 | |
| 27X | 4.0 | 233 | 46 | 57 | 676 | 42 | 111 | 33 | 67 | 89 | 10 | |
| 28X | .9 | 101 | 32 | 74 | 1230 | 34 | 106 | 25 | 190 | 191 | 10 | |
| 29X | 1.3 | 47 | 28 | 63 | 567 | 28 | 89 | 9 | 68 | 144 | 5 | |
| 30X | 7.9 | 197 | 42 | 98 | 19300 | 50 | 182 | 38 | 930 | 673 | 35 | |
| 31X | 5.1 | 308 | 51 | 462 | 1870 | 67 | 259 | 47 | 211 | 162 | 240 | |
| 32X | 2.8 | 140 | 40 | 696 | 1730 | 51 | 147 | 23 | 210 | 191 | 190 | |
| 33X | 3.0 | 87 | 37 | 661 | 1610 | 44 | 149 | 16 | 198 | 198 | 200 | |
| 34X | .9 | 29 | 23 | 27 | 684 | 28 | 85 | 9 | 59 | 184 | 50 | |
| 35X | .1 | 0 | 29 | 37 | 1260 | 38 | 102 | 15 | 118 | 196 | 5 | |
| 36X | .9 | 33 | 31 | 51 | 778 | 41 | 83 | 14 | 107 | 268 | 10 | |
| 37X | 1.5 | 55 | 39 | 1040 | 721 | 41 | 135 | 17 | 163 | 184 | 115 | |
| 38X | 2.6 | 136 | 29 | 173 | 417 | 165 | 175 | 31 | 151 | 365 | 860 | |
| 39X | 3.2 | 146 | 41 | 729 | 423 | 76 | 118 | 28 | 93 | 232 | 980 | |
| 40X | 4.0 | 189 | 50 | 487 | 506 | 93 | 150 | 38 | 156 | 105 | 430 | |
| 41X | 2.7 | 119 | 50 | 1250 | 1600 | 112 | 132 | 26 | 65 | 725 | 335 | |
| 42X | 4.4 | 122 | 52 | 1170 | 1220 | 77 | 140 | 24 | 86 | 544 | 390 | |
| 43X | 1.7 | 114 | 39 | 251 | 801 | 61 | 114 | 22 | 108 | 199 | 20 | |
| 44X | 1.3 | 46 | 32 | 65 | 648 | 43 | 80 | 4 | 39 | 95 | 5 | |
| 45X | 2.7 | 112 | 53 | 1580 | 1390 | 49 | 130 | 26 | 277 | 362 | 70 | |
| 46X 40MESH | 6.1 | 20 | 25 | 44 | 1550 | 37 | 121 | 14 | 85 | 285 | 5 | |
| 47X | 4.0 | 0 | 25 | 38 | 1360 | 31 | 94 | 9 | 70 | 336 | 5 | |
| 48X | 1.1 | 70 | 26 | 26 | 320 | 37 | 99 | 19 | 36 | 212 | 20 | |
| 49X N/S | | | | | | | | | | | | |
| 50X | .9 | 87 | 26 | 22 | 518 | 31 | 71 | 15 | 37 | 164 | 5 | |
| N1 | .6 | 0 | 27 | 157 | 2980 | 29 | 73 | 14 | 329 | 78 | 5 | |
| N2 | .6 | 53 | 37 | 235 | 1630 | 38 | 98 | 29 | 162 | 96 | 15 | |
| N3 | .2 | 61 | 41 | 131 | 555 | 44 | 101 | 20 | 90 | 103 | 5 | |
| N4 | .7 | 129 | 46 | 67 | 1360 | 63 | 184 | 36 | 414 | 54 | 10 | |
| N5 | 5.3 | 520 | 78 | 336 | 1110 | 131 | 734 | 93 | 2090 | 41 | 5 | |
| N6 | 4.6 | 45 | 37 | 25 | 1920 | 42 | 162 | 22 | 348 | 113 | 5 | |
| N7 | 1.5 | 248 | 50 | 25 | 554 | 56 | 181 | 49 | 225 | 202 | 10 | |
| N8 | 11.9 | 0 | 65 | 37 | 22900 | 106 | 965 | 53 | 2130 | 513 | 5 | |
| N9 | .2 | 0 | 29 | 20 | 2360 | 59 | 138 | 29 | 173 | 251 | 5 | |
| N11 | .8 | 230 | 49 | 29 | 402 | 49 | 206 | 40 | 185 | 103 | 10 | |
| N12 | 2.3 | 225 | 40 | 78 | 233 | 50 | 266 | 48 | 307 | 66 | 70 | |
| N13 | 8.1 | 156 | 59 | 66 | 1190 | 74 | 577 | 53 | 401 | 186 | 25 | |
| N14 | 7.8 | 177 | 61 | 51 | 1870 | 86 | 617 | 52 | 472 | 278 | 10 | |
| N16 | 5.1 | 212 | 51 | 32 | 775 | 70 | 564 | 39 | 238 | 328 | 5 | |
| N17 | 6.6 | 435 | 61 | 43 | 3780 | 83 | 414 | 50 | 1200 | 167 | 110 | |
| N18 | 10.1 | 239 | 61 | 232 | 3230 | 86 | 6460 | 117 | 1270 | 220 | 100 | |
| N19 | 2.6 | 311 | 46 | 58 | 110 | 40 | 407 | 53 | 328 | 62 | 10 | |
| N20 | 3.8 | 289 | 40 | 21 | 42 | 37 | 442 | 41 | 133 | 126 | 25 | |
| K001 | 1.7 | 53 | 30 | 147 | 851 | 42 | 114 | 17 | 285 | 190 | 15 | |
| K002 | 1.0 | 67 | 35 | 101 | 1020 | 50 | 107 | 19 | 495 | 236 | 5 | |
| K003 | 2.1 | 72 | 35 | 63 | 827 | 45 | 98 | 20 | 209 | 309 | 20 | |
| K004 | 1.6 | 41 | 26 | 27 | 586 | 37 | 103 | 15 | 154 | 158 | 50 | |
| K005 | .8 | 58 | 25 | 19 | 872 | 33 | 82 | 11 | 142 | 149 | 45 | |
| K006 | 1.2 | 74 | 38 | 35 | 1340 | 69 | 134 | 26 | 259 | 222 | 15 | |
| K007 | 1.3 | 66 | 24 | 18 | 757 | 33 | 90 | 18 | 139 | 194 | 10 | |
| K008 | 1.5 | 91 | 37 | 30 | 880 | 51 | 112 | 24 | 116 | 240 | 140 | |
| K009 | 1.3 | 60 | 40 | 43 | 1270 | 46 | 101 | 22 | 136 | 159 | 15 | |
| K010 | 1.3 | 76 | 35 | 28 | 1130 | 53 | 114 | 25 | 143 | 90 | 25 | |

SILT SAMPLES

SOIL SAMPLES

COMPANY:
 PROJECT No: SULFERETTES CREEK
 ATTENTION: CRIS GRAF

KIN-EN LABS ICP REPORT
 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2
 (604)980-5814 OR (604)988-4524

(ACT:6E03A+) PAGE 1 OF 1
 FILE No: 3-1010S5+6
 DATE: SEPTEMBER 26, 1983

| (REPORT VALUES IN PPM) | AG | AS | BI | CU | MM | MO | PB | SB | ZN | BA | AU-PPB |
|------------------------|------|-----|----|------|------|----|-----|----|------|-----|--------|
| K011 | 1.2 | 86 | 32 | 29 | 1210 | 43 | 117 | 23 | 168 | 88 | 15 |
| K012 | .8 | 96 | 40 | 46 | 1390 | 50 | 113 | 23 | 197 | 82 | 60 |
| K013 | 1.5 | 59 | 32 | 32 | 874 | 42 | 95 | 17 | 174 | 97 | 65 |
| K014 | 1.9 | 2 | 31 | 36 | 769 | 40 | 109 | 15 | 140 | 132 | 10 |
| K015 | 1.4 | 38 | 28 | 36 | 1270 | 37 | 86 | 15 | 226 | 156 | 5 |
| K016 | 1.5 | 24 | 34 | 42 | 544 | 41 | 120 | 13 | 140 | 102 | 5 |
| K017 | 7.0 | 53 | 26 | 36 | 496 | 32 | 151 | 12 | 118 | 174 | 10 |
| K018 | 2.5 | 75 | 29 | 15 | 209 | 36 | 128 | 29 | 73 | 146 | 20 |
| K019 | 1.7 | 165 | 35 | 9 | 79 | 36 | 85 | 29 | 36 | 76 | 70 |
| K020 | 3.8 | 202 | 50 | 43 | 462 | 62 | 143 | 39 | 118 | 61 | 45 |
| K021 | N/S | | | | | | | | | | |
| K022 | 2.3 | 131 | 38 | 16 | 169 | 45 | 96 | 26 | 38 | 61 | 25 |
| K023 | 1.6 | 117 | 50 | 67 | 1040 | 64 | 144 | 30 | 95 | 80 | 50 |
| K024 | 1.2 | 19 | 42 | 74 | 842 | 54 | 123 | 20 | 163 | 167 | 10 |
| K025 | 1.5 | 80 | 48 | 55 | 825 | 57 | 124 | 20 | 108 | 138 | 5 |
| K026 | 2.9 | 96 | 35 | 34 | 563 | 46 | 105 | 22 | 177 | 154 | 15 |
| K027 | 1.1 | 121 | 39 | 53 | 568 | 58 | 92 | 23 | 118 | 197 | 20 |
| K028 | 3.8 | 166 | 39 | 60 | 1720 | 57 | 143 | 39 | 645 | 146 | 5 |
| K029 | 3.2 | 193 | 51 | 545 | 1750 | 61 | 147 | 63 | 58 | 527 | 130 |
| K030 | 3.2 | 171 | 54 | 403 | 1420 | 46 | 132 | 52 | 32 | 708 | 125 |
| K031 | 5.0 | 190 | 78 | 840 | 4340 | 87 | 223 | 70 | 101 | 274 | 220 |
| K032 | 10.1 | 159 | 58 | 628 | 6580 | 55 | 189 | 70 | 421 | 976 | 190 |
| K033 | 8.5 | 130 | 67 | 949 | 7850 | 65 | 256 | 45 | 1460 | 830 | 310 |
| K034 | 14.1 | 157 | 75 | 1540 | 6250 | 59 | 183 | 49 | 561 | 433 | 245 |
| K035 | 6.4 | 173 | 78 | 675 | 5470 | 88 | 502 | 51 | 393 | 274 | 285 |
| K036 | 4.9 | 161 | 60 | 435 | 2690 | 65 | 275 | 49 | 630 | 159 | 335 |
| K037 | 4.6 | 32 | 37 | 136 | 1880 | 51 | 143 | 24 | 203 | 290 | 20 |
| K038 | 4.3 | 35 | 42 | 158 | 2540 | 56 | 185 | 26 | 168 | 271 | 10 |
| K039 | 3.9 | 43 | 33 | 130 | 1820 | 44 | 143 | 20 | 195 | 244 | 35 |
| K040 | 3.1 | 16 | 36 | 110 | 1540 | 43 | 97 | 24 | 167 | 243 | 15 |
| K041 | 2.4 | 43 | 39 | 109 | 1380 | 48 | 138 | 22 | 172 | 185 | 75 |

Soil Samples

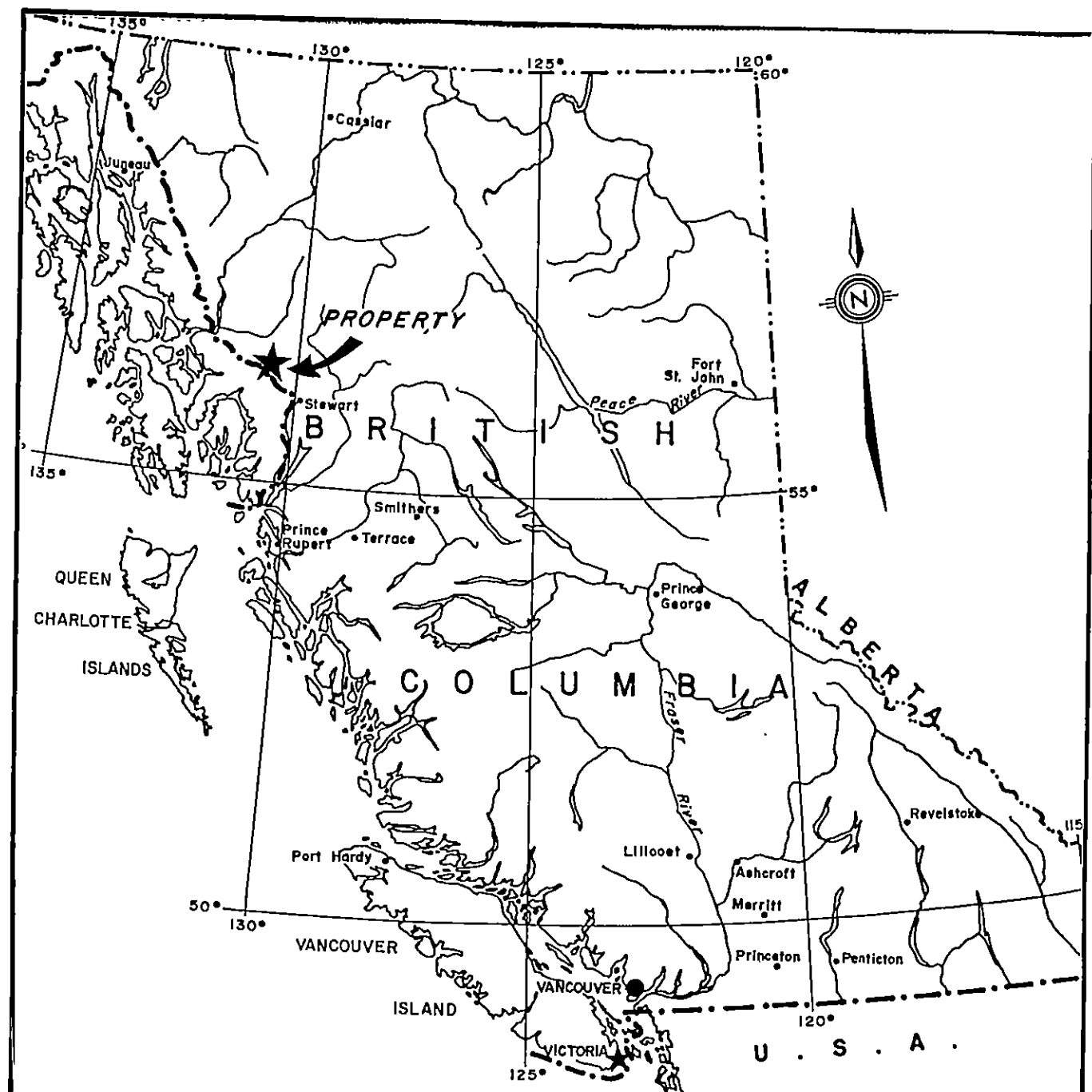
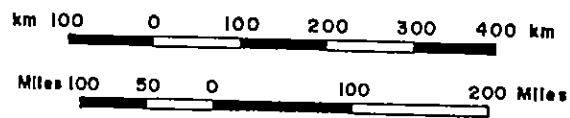


FIGURE 1
ALPHA JOINT VENTURE
SULPHURETS PROJECT
LOCATION MAP
 SCALE AS SHOWN
 DRAWN: D.W.



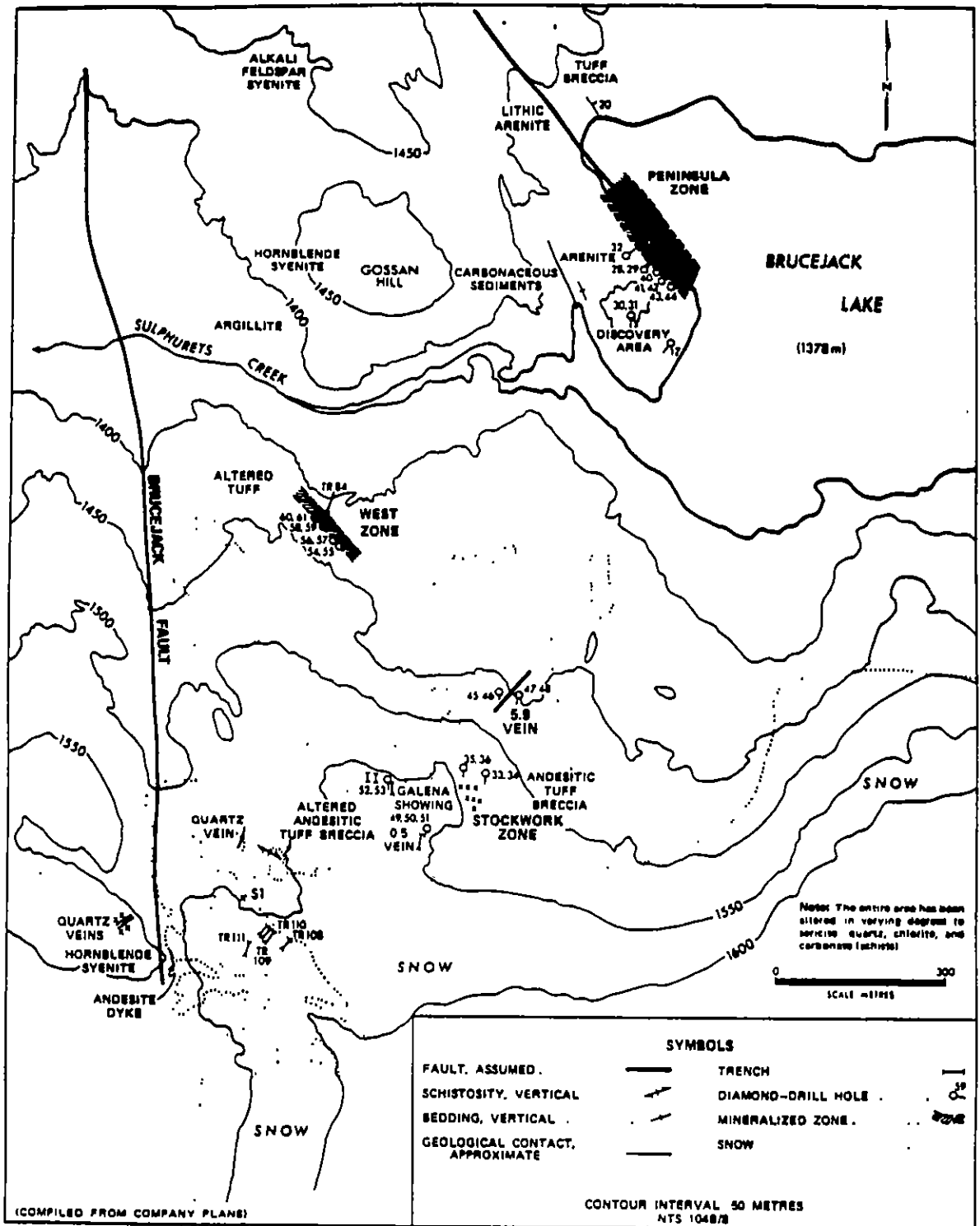


Figure 4 - Peninsula and West Zones - Brucejack Lake Area (compiled from company plans and after Schroeter, 1983)

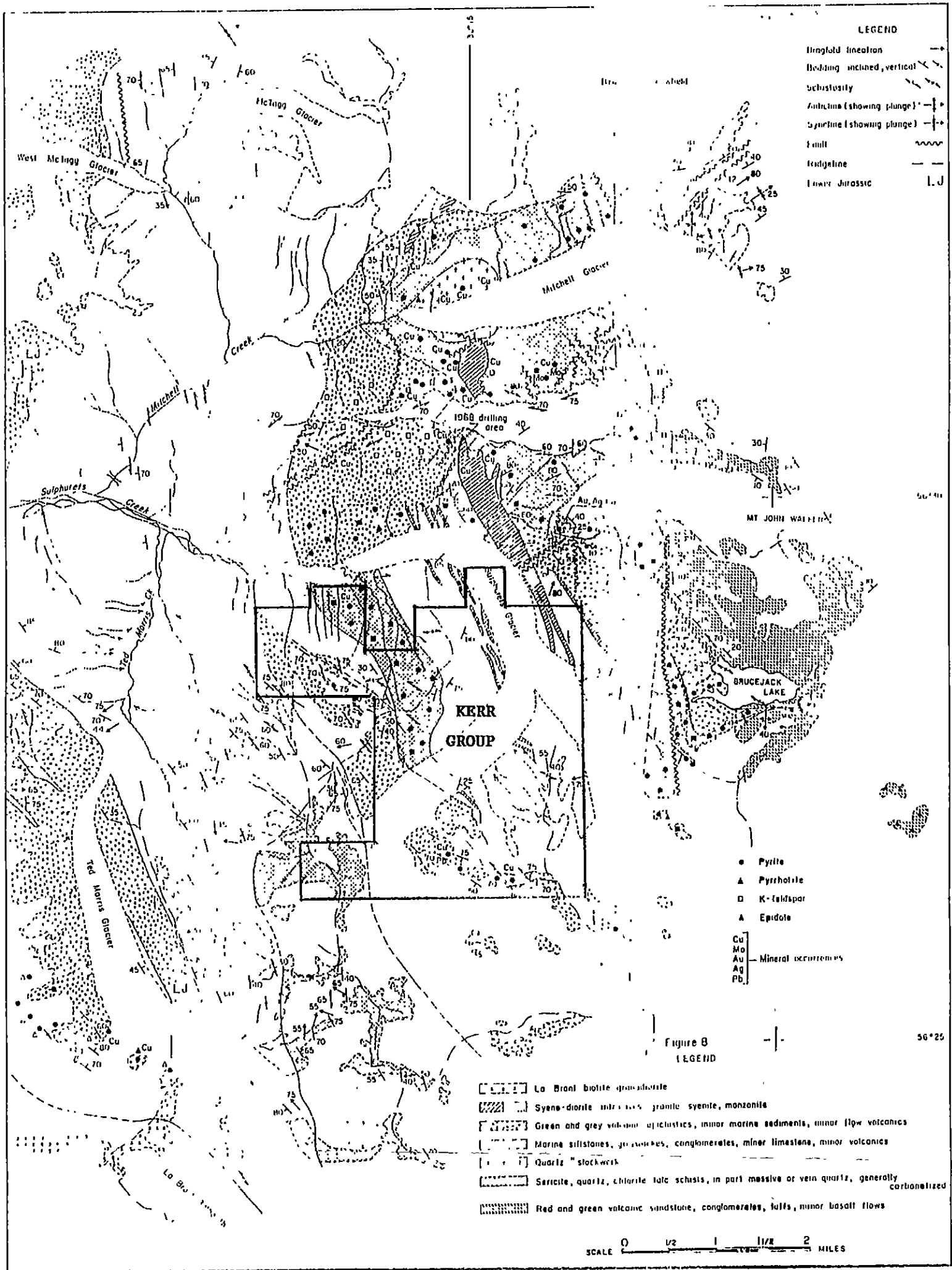
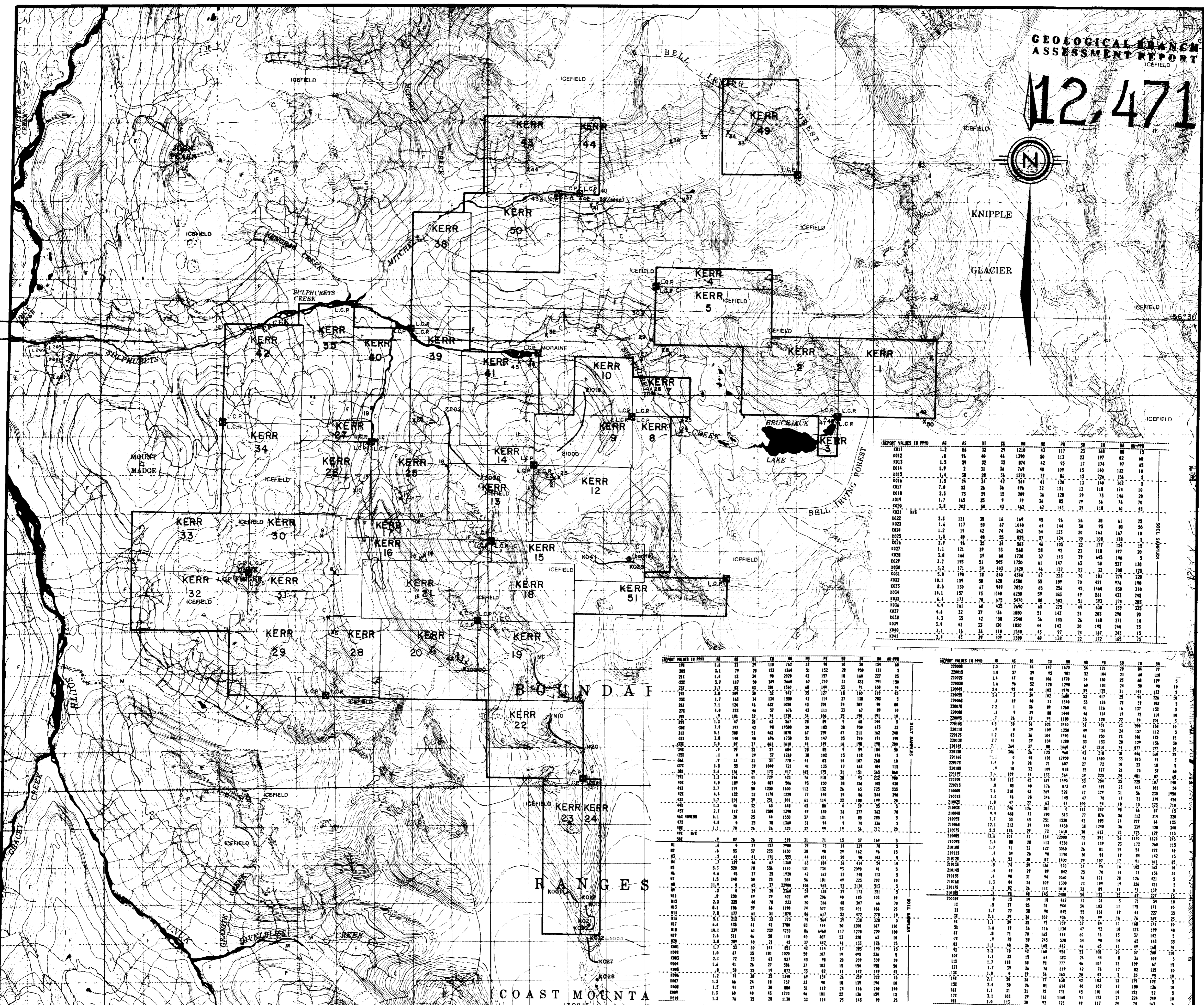


FIGURE 3: LOCATION AND GEOLOGY OF KERR GROUP (after Grove, 1968)



KNIPPLE
GLACIER



| | AS | BE | CA | CO | CR | CU | FE | FM | GM | MO | PH | PK | SE | SI | ZN |
|------|------|-----|----|------|------|----|-----|----|------|-----|-----|----|----|----|----|
| K011 | 1.2 | 64 | 32 | 29 | 1210 | 43 | 117 | 23 | 148 | 68 | 18 | | | | |
| K012 | .8 | 96 | 40 | 46 | 1390 | 50 | 113 | 23 | 197 | 82 | 40 | | | | |
| K013 | 1.3 | 59 | 32 | 32 | 874 | 42 | 95 | 17 | 174 | 97 | 45 | | | | |
| K014 | 1.9 | 2 | 31 | 36 | 749 | 40 | 109 | 15 | 140 | 132 | 10 | | | | |
| K015 | 1.4 | 78 | 38 | 24 | 1371 | 37 | 86 | 15 | 226 | 156 | 5 | | | | |
| K016 | 1.3 | 116 | 31 | 42 | 541 | 46 | 92 | 22 | 118 | 176 | 10 | | | | |
| K017 | 7.0 | 33 | 26 | 36 | 496 | 32 | 151 | 12 | 118 | 176 | 10 | | | | |
| K018 | 2.3 | 75 | 29 | 13 | 209 | 36 | 120 | 29 | 73 | 146 | 20 | | | | |
| K019 | 1.7 | 165 | 35 | 9 | 79 | 36 | 85 | 29 | 34 | 76 | 70 | | | | |
| K020 | 5.8 | 292 | 30 | 43 | 462 | 42 | 143 | 39 | 118 | 41 | 45 | | | | |
| K021 | AVE | | | | | | | | | | | | | | |
| K022 | 2.3 | 131 | 38 | 16 | 169 | 45 | 96 | 26 | 38 | 61 | 25 | | | | |
| K023 | 1.4 | 117 | 50 | 67 | 1040 | 64 | 144 | 30 | 95 | 60 | 50 | | | | |
| K024 | 1.2 | 19 | 42 | 74 | 842 | 54 | 123 | 20 | 143 | 167 | 10 | | | | |
| K025 | 1.1 | 80 | 40 | 35 | 825 | 37 | 121 | 20 | 108 | 138 | 5 | | | | |
| K026 | 2.5 | 81 | 38 | 38 | 551 | 46 | 99 | 22 | 117 | 187 | 20 | | | | |
| K027 | 1.1 | 121 | 39 | 53 | 548 | 58 | 58 | 23 | 118 | 177 | 20 | | | | |
| K028 | 3.0 | 144 | 39 | 66 | 1720 | 57 | 143 | 39 | 645 | 146 | 5 | | | | |
| K029 | 3.2 | 193 | 51 | 545 | 1750 | 61 | 147 | 63 | 58 | 327 | 130 | | | | |
| K030 | 3.2 | 171 | 34 | 493 | 1420 | 46 | 132 | 52 | 32 | 108 | 125 | | | | |
| K031 | 10.1 | 159 | 58 | 428 | 4580 | 55 | 189 | 70 | 101 | 274 | 220 | | | | |
| K032 | 10.1 | 159 | 58 | 428 | 4580 | 55 | 189 | 70 | 101 | 274 | 220 | | | | |
| K033 | 8.5 | 130 | 67 | 949 | 7850 | 55 | 254 | 45 | 1440 | 810 | 110 | | | | |
| K034 | 14.1 | 157 | 75 | 1540 | 4250 | 59 | 183 | 49 | 541 | 433 | 245 | | | | |
| K035 | 4.4 | 173 | 74 | 175 | 5170 | 88 | 502 | 51 | 393 | 274 | 285 | | | | |
| K036 | 14.1 | 167 | 60 | 435 | 2690 | 65 | 275 | 49 | 630 | 159 | 335 | | | | |
| K037 | 4.4 | 32 | 37 | 31 | 145 | 26 | 148 | 27 | 181 | 271 | 18 | | | | |
| K038 | 4.3 | 35 | 42 | 158 | 2540 | 54 | 185 | 26 | 193 | 244 | 35 | | | | |
| K039 | 3.9 | 43 | 35 | 130 | 1820 | 44 | 143 | 20 | 193 | 244 | 35 | | | | |
| K040 | 3.1 | 18 | 36 | 110 | 1540 | 43 | 97 | 24 | 167 | 243 | 15 | | | | |
| K041 | 2.4 | 45 | 39 | 109 | 1380 | 48 | 137 | 22 | 172 | 183 | 12 | | | | |

| | | |
|----------|----------|----------|
| 104 B/15 | 104 B/16 | 104 A/13 |
| 104 B/10 | 104 B/9 | 104 A/12 |
| 104 B/7 | 104 B/8 | 104 A/5 |
| 104 B/1 | 104 B/4 | 104 A/4 |

CONTOUR INTERVAL — 100 FEET
ELEVATIONS IN FT. ABOVE MEAN SEA LEVEL

- L E G E N D**
- SILT SAMPLE LOCATION & NUMBER
 - K028 — SOIL SAMPLE LOCATION & NUMBER
 - K022 — SAMPLE LINE — SOIL TRAVERSE END NUMBERS

FIGURE 2
ALPHA JOINT VENTURE
SULPHURETS PROJECT
SAMPLE LOCATION MAP

SCALE 1:50,000