

84-1016-13182
9/85

REPORT ON

MINERALOGICAL AND GEOCHEMICAL SOIL SURVEY

AUGUST 22, 23, 30 1984

SPOKANE GROUP

ASARCO EXPLORATION COMPANY OF CANADA LIMITED

(owner-operator)

LILLOOET MINING DIVISION

50°52'N

122°22'W

92J/16

by

M. Lancaster

November 8, 1984

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

13,182

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INTRODUCTION

A mineralogical study by Harris Exploration Services and a soil survey by Asarco personnel were carried out in August 1984 on the Spokane Group of mineral claims.

SUMMARY AND RECOMMENDATIONS

Mineralogical studies identified quartz containing usable fluid inclusions for a future fluid inclusion study. Two soil lines extend the known vein system to the east.

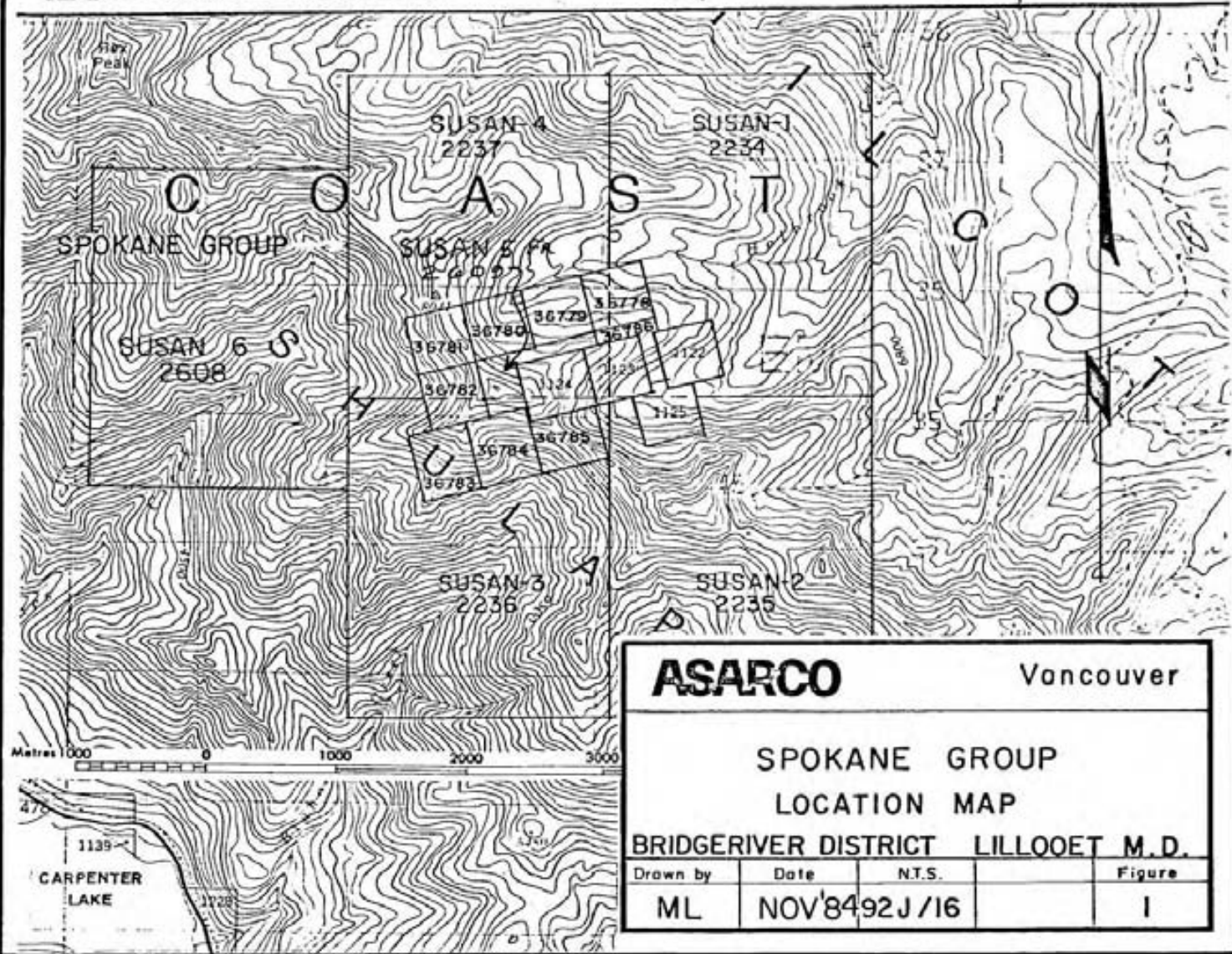
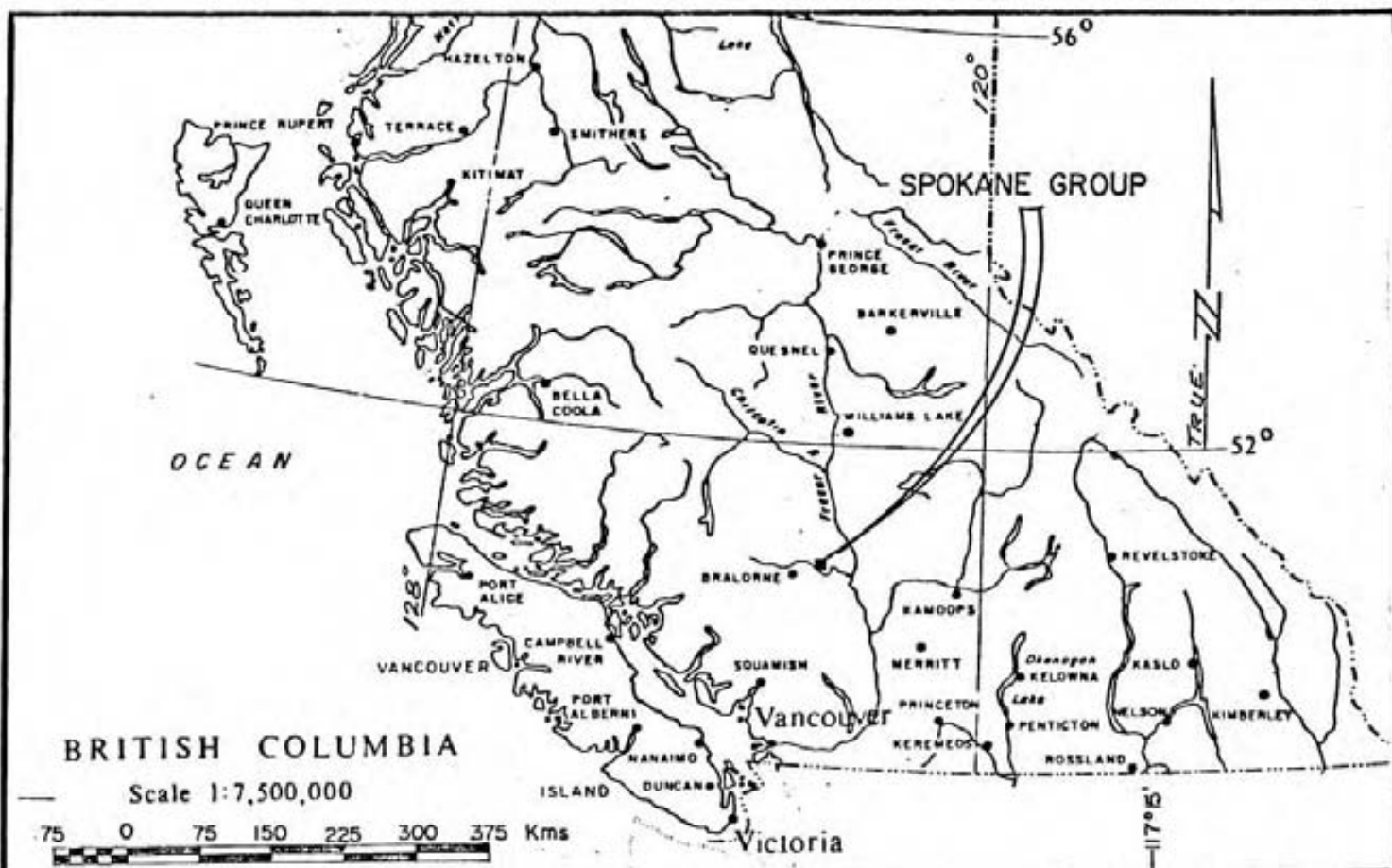
LOCATION AND ACCESS

The Spokane Group is located approximately 41 kilometers northwest of Lillooet and 33 kilometers northeast of Bralorne, B.C. in steep mountainous terrain varying from 1980 to 2500 meters in elevation. (Figure 1)

Access to the Spokane group is by helicopter from Pemberton approximately 68 kilometers southwesterly from the property or from Lillooet, approximately 40 kilometers easterly from the property.

CLAIMS

| <u>NAME</u> | <u>RECORD NO.</u> | <u>EXPIRY DATE</u> |
|--------------------|-------------------|-----------------------|
| Columbia C.G. | L1122 | Taxes Due 1 July 1985 |
| Shamrock C.G. | L1123 | Taxes Due 1 July 1985 |
| Golden Stripe C.G. | L1124 | Taxes Due 1 July 1985 |
| Mascot C.G. | L1125 | Taxes Due 1 July 1985 |
| Jah 1-3 | 36778 - 36780 | 27 August 1986 |
| Jah 4-8 | 36781 - 36785 | 27 August 1985 |
| Jah 9 Fr. | 36786 | 27 August 1985 |
| Susan 1-4 | 2234 - 2237 | 15 December 1985 |
| Susan 5 Fr. | 2609 | 23 September 1986 |
| Susan 6 | 2608 | 23 September 1985 |



HISTORY

Mineralization on the Spokane Group of claims has been known from approximately 1910 to the present time. Early work included 2 adits, now caved, 2 shallow shafts either sloughed or flooded and numerous pits and trenches all of which are now badly sloughed. Copper, gold and silver mineralization is contained in large quartz veins and shear zones. No shipments of these commodities are recorded.

In 1983 Asarco carried out Geological, Geochemical (soil), VLF and Magnetometer Surveys on the Spokane Group of claims. The data was filed for assessment credits on 29 August 1983 by D. H. Olson.

GEOLOGY

The Spokane Group is situated on the boundary between the Intermontaine Tectonic Belt to the east and the coast Crystalline Belt to the west. A series of granodiorite to quartz diorite plutons known as the Bendor Intrusions which range in age from 44-66 million years, mark the eastern limit of the Coast Crystalline Belt. The youngest of these intrusive plutons, underlies a portion of the Spokane Group. These intrusives are transgressive to the southwestern flank of a broad northwest trending antiform composed of Middle Triassic and Older Bridge River Group rocks. The Upper Triassic Shulaps Ultramafite consisting of serpentinite, periodotite, gabbro and pyroxenite underlies a large portion of the Spokane Group and is one of the largest intrusives of this type in B.C. More closely allied with the gold bearing quartz veins are extensive dacite porphyry dikes and sills of Miocene Age.

Major northwest trending fault zones border the area of interest to the northeast and southwest. To the northeast the Yalakom Fault Zone marks the northeast margin of the Shulaps Ultramafite while to the southwest the Marshall Creek, Taseko and Tchaikagan Fault Systems are strongly evident along the eastern margin of the Coast Crystalline Complex.

Locally, the area of interest within the central part of the claim group, is underlain by the rock units shown on Figure 2. The oldest rocks mapped (Unit 5) are the Middle Triassic and Older

Bridge River (Ferguson) Group which consist of an interbedded sequence of quartzite, silty quartzite, quartzose siltstone and siltstone with minor limestone. This group in general trends $80-110^{\circ}$ and dips $60-80^{\circ}$ northerly.

The Bridge River Group rocks have been intruded by the Shulaps Ultramafite complex which appears to sandwich the quartz veining and the younger igneous host rocks. Approximately half the area mapped in 1983 is underlain by this Unit 4. Gabbro and peridotite are most abundant. Pyroxenite occurs as dikes traversing other ultramafic rocks. Serpentinization is widespread within the ultramafic group of rocks.

Unit 3, which is a fine to medium grained biotite (10-15%) granodiorite, is generally unaltered and is displayed as an irregular east-west trending dike or sill-like pluton. This rock which contains xenoliths of ultramafic rock must be younger (44 my - GSC) than the ultramafic suite. In the valley floor at the most easterly vein exposure, the granodiorite hosts the precious metal-bearing quartz vein or veins.

As the principal host rock for the gold-silver-bearing quartz veins, Unit 2, a medium grained hornblende feldspar porphyry of Miocene age, is exposed as part of the Rexmount Porphyry which forms an irregular east-west trending dike-like pluton thru the area of interest and with extensions westerly of Rex Peak. Numerous other dikes and sills of Unit 2 are noted transecting all of the older rocks.

Interesting gold, silver, bismuth and tungsten values are contained in a quartz vein or veins over a mapped strike length of 700 meters and a vertical range of 250 meters. The vein which was well exposed by 2 adits, a shaft and numerous trenches and pits in the earlier years, is now poorly exposed because of the sloughed nature of the old workings.

Following within and along the footwall or south side of the hosting hornblende porphyry dike, Unit 2, the vein trends 105° and dips $50-70^{\circ}$ northerly. Westerly at approximately 2350 meters elevation the vein enters into and appears to dissipate within granodiorite host rock. East of the most easterly vein exposure in a large pit, at elevation 2070 meters, the vein is obscured by overburden and talus. Correlation of the vein or veins exposed by

these lower pits with vein exposures upslope from the lower adit may be somewhat conjectural.

The principal vein is predominately massive quartz but locally exhibits a ribboned appearance. The ribboned appearance is imparted by chlorite along subsidiary fractures parallel to the vein walls. Locally, vugs are readily noted in the vein quartz. Many of the vugs are lined with small quartz crystals and or sulfides of iron or copper. Blebs and disseminations of pyrite and chalcopyrite constitute 1-3% of the vein material. Sulfide distribution and associated precious metal values are unevenly distributed.

SOIL GEOCHEMISTRY

A total of 51 soil samples were collected at 10 meter intervals along 2 lines 100 meters apart.(Figure 2) The soils were analyzed for numerous elements as per Appendix B and the results plotted in Figures 3 to 8. This soil survey was undertaken with the objective of avoiding Bridge River ash which contaminated parts of the 1983 soil survey. To meet this objective, soil samples were taken at depths of 40 to 90 cm in the B horizon just below the ash layer.

MINERALOGY STUDY

A total of 9 thin sections were studied by Jeff Harris PhD of Harris Exploration Services during August. The objective of this work was to determine if quartz vein material from the Spokane Group of claims is usable for fluid inclusion studies. This data is included in Appendix C.

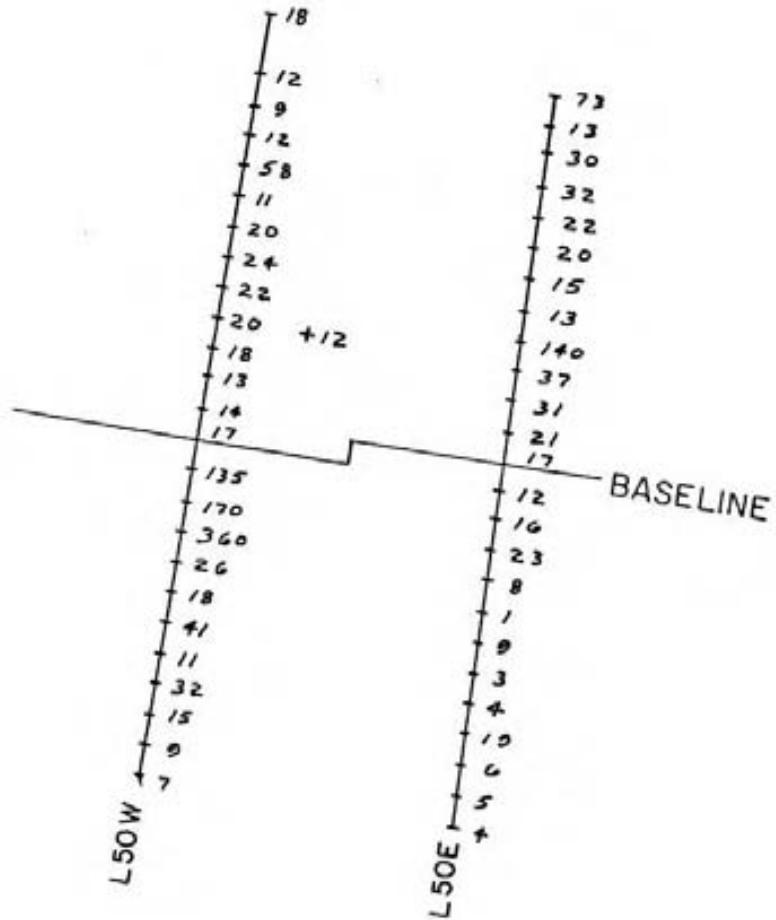
CONCLUSIONS

Geochemical soil sampling indicates an easterly extension to the known vein system. Possibly, two veins, one north and one south of the base line are present. Trenching or diamond drilling is required to confirm the number and position of individual veins. Quartz in the vein system contains usable fluid inclusions.

Michael Lancaster

Michael Lancaster

N



ASARCO

Vancouver

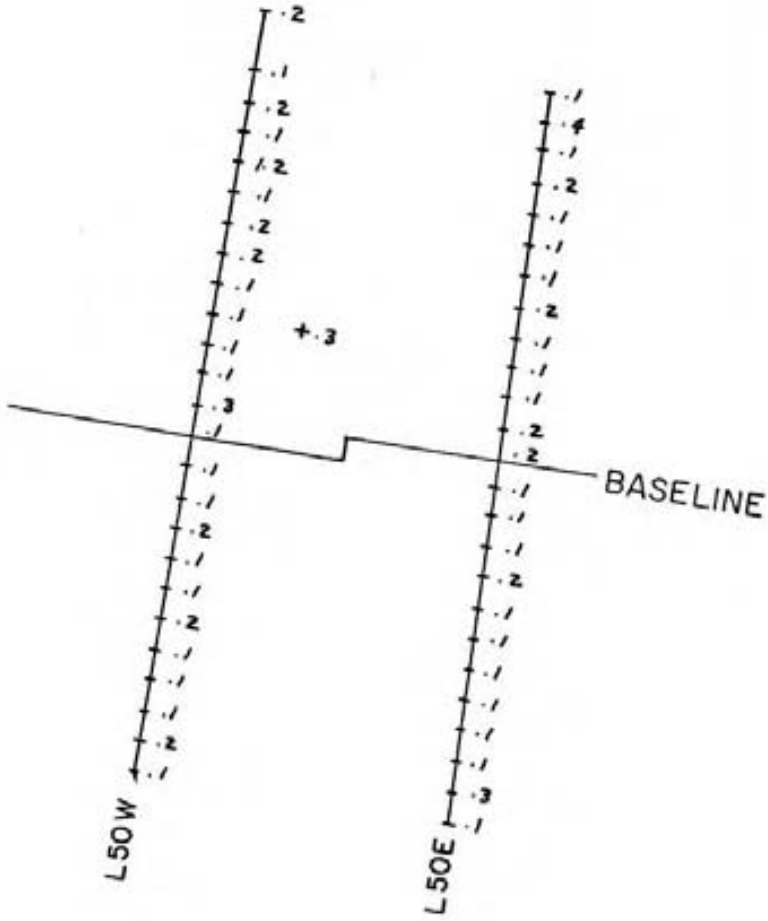
SPOKANE GROUP

Au pp.b

GEOCHEMISTRY

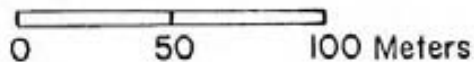
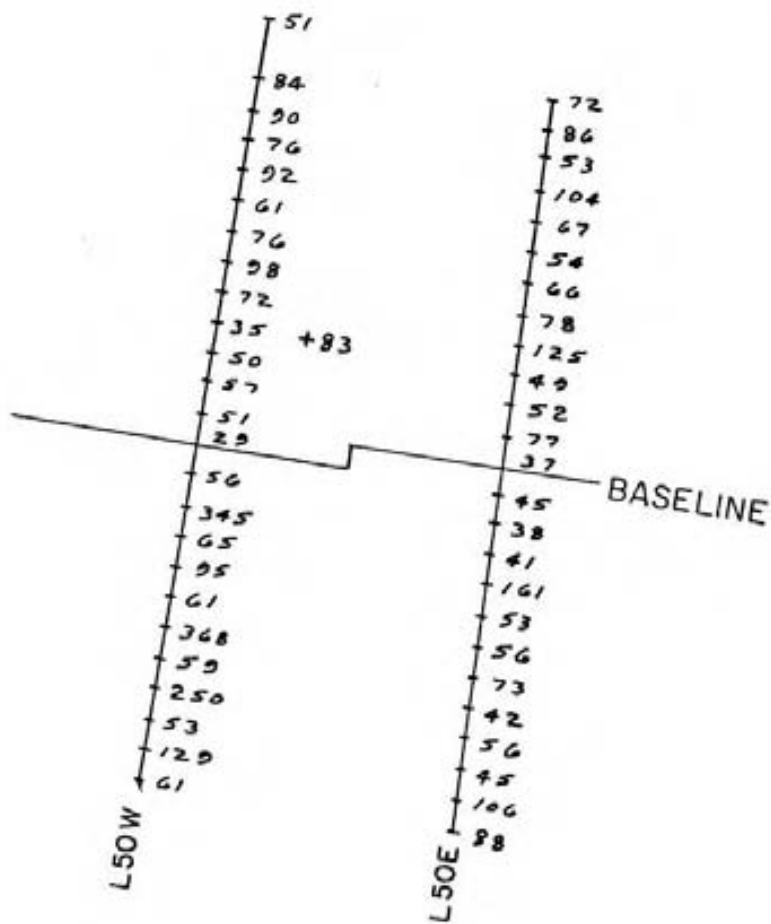
BRIDGERIVER DISTRICT LILLOOET M.D.

| Drawn by | Date | N.T.S. | | |
|----------|--------|--------|--------|--------|
| ML | NOV'84 | 92J16 | 1:2500 | FIG. 3 |



| | | | | |
|------------------------------------|--------|-----------|--------|--------|
| ASARCO | | Vancouver | | |
| SPOKANE GROUP | | | | |
| <i>Ag p.p.m.</i> GEOCHEMISTRY | | | | |
| BRIDGERIVER DISTRICT LILLOOET M.D. | | | | |
| Drawn by | Date | NTS. | | |
| ML | NOV'84 | 92J16 | 1:2500 | FIG. 4 |

N



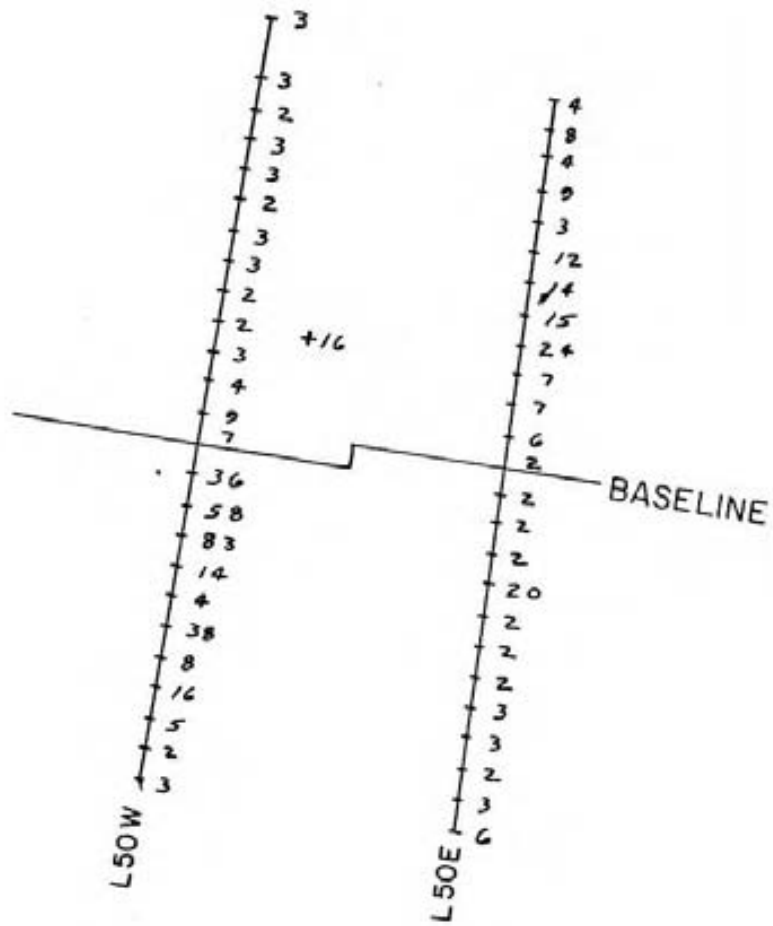
ASARCO

Vancouver

SPOKANE GROUP
Cu p.p.m. GEOCHEMISTRY
BRIDGERIVER DISTRICT LILLOOET M.D.

| Drawn by | Date | NTS. | | |
|----------|--------|-------|--------|--------|
| ML | NOV'84 | 92J16 | 1:2500 | FIG. 5 |

N



ASARCO

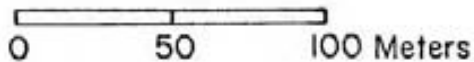
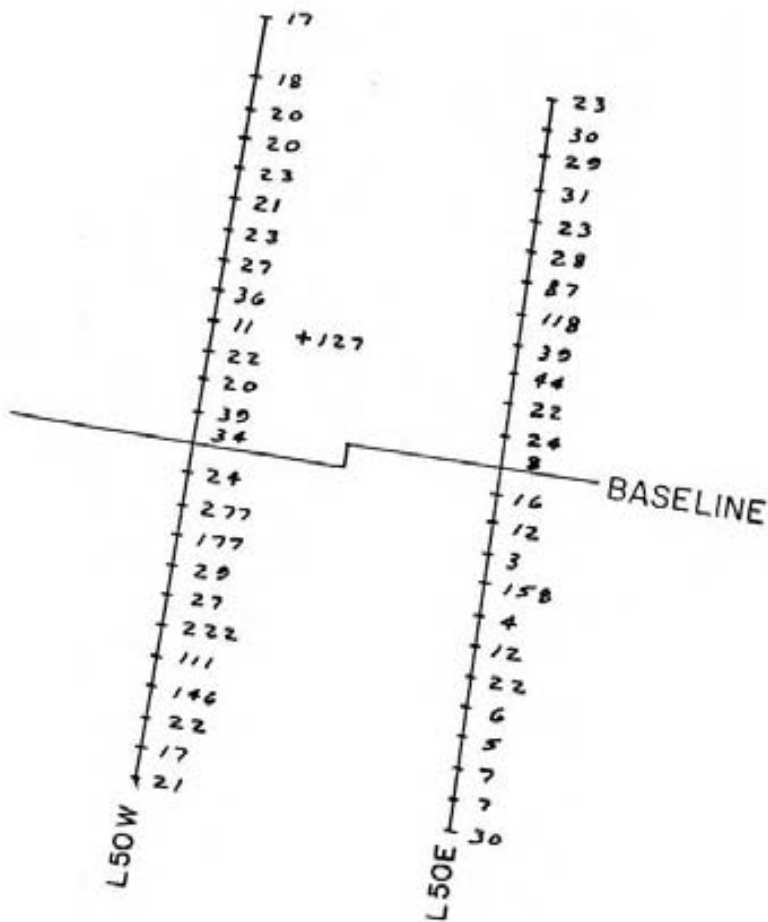
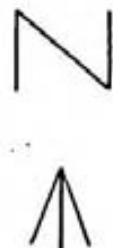
Vancouver

SPOKANE GROUP

W p.p.m. GEOCHEMISTRY

BRIDGERIVER DISTRICT LILLOOET M.D.

| Drawn by | Date | N.T.S. | | |
|----------|--------|--------|--------|--------|
| ML | NOV'84 | 92J16 | 1:2500 | FIG. 7 |



ASARCO

Vancouver

SPOKANE GROUP
As p.p.m. GEOCHEMISTRY
BRIDGERIVER DISTRICT LILLOOET M.D.

| Drawn by | Date | NTS | | |
|----------|--------|-------|--------|--------|
| ML | NOV'84 | 92J16 | 1:2500 | FIG. 8 |

APPENDIX "A"

EXPENDITURES - SPOKANE GROUP

WAGES

| | | |
|---|---|--------------|
| M. Lancaster - August 22,23/84 - 2 days @ \$170 | = | \$340.00 |
| A. Hamilton - August 22,23/84 - 2 days @ \$52 | = | 104.00 |
| D. Fletcher - August 22,23/84 - 2 days @ \$40 | = | 80.00 |
| A. Robertson - August 22,23/84 - 2 days @ \$40 | = | <u>80.00</u> |
| | | \$604.00 |

TRANSPORTATION

| | | |
|---|--|--------|
| Helicopter - Whitesaddle Helicopters | | 335.72 |
| Company Vehicles - Two 4 x 4 Trucks @ \$80/day including gas | | 160.00 |

MEALS

195.00

ACCOMMODATION

64.20

ASSAYING - ACME ANALYTICAL LABORATORIES LTD.

555.39

THIN SECTIONS - VANCOUVER PETROGRAPHICS LTD. 9 x \$7

63.00

HARRIS EXPLORATION SERVICES

200.00

TOTAL EXPENDITURES

\$2177.31
=====

APPENDIX "B"

GEOCHEMICAL ICP ANALYSIS

500 GRAM SAMPLE IS DIGESTED WITH 5 ML 3-1-3 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
 THIS LEACH IS PARTIAL FOR MN, FE, CA, P, CR, MS, BA, TI, B, AL, NA, K, W, S, ZN, CO, CU, Ni, MO AND TR. NO DETECTION LIMIT BY ICP IS 3 PPM.
 - SAMPLE TYPE: SOIL ANALYSIS BY FAHA FROM 10 GRAM SAMPLE.

DATE RECEIVED: AUG 24 1984 DATE REPORT MAILED: *Aug 28/84* ASSAYER: *D. J. [Signature]* DEAN TOYE, CERTIFIED B.C. ASSAYER

ASARCO FILE # 84-1086

PAGE 1

| SAMPLE# | MO | CU | FR | ZN | AS | 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 | AU# |
|-------------|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|----|------|-----|-----|-----|-----|
| | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | % | PPM | PPM | % | PPM | % | % | % | % | % | PPM | PPM |
| 50K 14N | 1 | 51 | 12 | 109 | .2 | 127 | 19 | 965 | 3.68 | 17 | 5 | ND | 2 | 21 | 1 | 2 | 2 | 69 | .23 | .10 | 7 | 157 | 1.57 | 281 | .07 | 2 | 2.24 | .01 | .20 | 3 | 18 |
| 50K 12N | 1 | 84 | 8 | 98 | .1 | 205 | 25 | 601 | 4.72 | 18 | 5 | ND | 2 | 14 | 1 | 2 | 2 | 95 | .23 | .11 | 4 | 209 | 2.37 | 309 | .15 | 2 | 2.66 | .01 | .41 | 3 | 12 |
| 50K 11N | 1 | 90 | 9 | 104 | .2 | 226 | 27 | 670 | 4.97 | 20 | 5 | ND | 2 | 14 | 1 | 2 | 2 | 102 | .25 | .11 | 4 | 236 | 2.64 | 345 | .15 | 2 | 2.92 | .01 | .46 | 2 | 9 |
| 50K 10N | 1 | 75 | 7 | 90 | .1 | 254 | 24 | 600 | 4.54 | 20 | 5 | ND | 2 | 16 | 1 | 2 | 2 | 91 | .31 | .12 | 4 | 242 | 2.67 | 312 | .14 | 2 | 2.57 | .01 | .41 | 3 | 12 |
| 50K 9N | 1 | 92 | 6 | 88 | 1.2 | 210 | 25 | 634 | 4.67 | 23 | 5 | ND | 2 | 17 | 1 | 2 | 4 | 93 | .37 | .13 | 3 | 225 | 2.50 | 309 | .09 | 2 | 2.58 | .01 | .40 | 3 | 58 |
| 50K 8N | 1 | 61 | 9 | 96 | .1 | 251 | 32 | 960 | 5.03 | 21 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 89 | .19 | .10 | 4 | 283 | 2.48 | 244 | .15 | 2 | 2.42 | .01 | .15 | 2 | 11 |
| 50K 7N | 1 | 76 | 5 | 79 | .2 | 344 | 29 | 707 | 4.56 | 23 | 5 | ND | 2 | 10 | 1 | 2 | 2 | 88 | .18 | .07 | 5 | 277 | 2.70 | 161 | .12 | 4 | 2.42 | .01 | .19 | 3 | 20 |
| 50K 6N | 1 | 98 | 5 | 95 | .2 | 399 | 31 | 759 | 4.90 | 27 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 103 | .27 | .12 | 4 | 312 | 3.29 | 324 | .14 | 4 | 2.77 | .01 | .38 | 2 | 24 |
| 50K 5N | 1 | 72 | 7 | 54 | .1 | 524 | 30 | 714 | 4.14 | 36 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 56 | .10 | .05 | 5 | 317 | 2.24 | 115 | .09 | 2 | 1.70 | .01 | .07 | 2 | 22 |
| 50K 4N | 1 | 35 | 7 | 45 | .1 | 244 | 23 | 895 | 2.76 | 11 | 5 | ND | 2 | 7 | 1 | 2 | 2 | 45 | .11 | .08 | 7 | 134 | 1.27 | 72 | .09 | 2 | 1.21 | .01 | .04 | 2 | 20 |
| 50K 3N | 1 | 50 | 6 | 69 | .1 | 325 | 26 | 690 | 4.42 | 22 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 59 | .10 | .07 | 5 | 264 | 2.39 | 138 | .07 | 4 | 1.51 | .01 | .04 | 3 | 18 |
| 50K 2N | 1 | 57 | 11 | 86 | .1 | 301 | 23 | 849 | 4.79 | 20 | 5 | ND | 2 | 10 | 1 | 2 | 2 | 76 | .09 | .05 | 9 | 294 | 2.23 | 168 | .11 | 4 | 2.30 | .01 | .05 | 4 | 13 |
| 50K 1N | 2 | 51 | 10 | 50 | .3 | 622 | 29 | 399 | 4.95 | 39 | 5 | ND | 2 | 15 | 1 | 2 | 2 | 56 | .20 | .06 | 6 | 316 | 1.93 | 67 | .07 | 4 | 2.22 | .01 | .05 | 9 | 14 |
| 50K 0N | 3 | 29 | 10 | 51 | .1 | 265 | 22 | 361 | 5.11 | 34 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 89 | .06 | .03 | 4 | 279 | 1.73 | 54 | .13 | 2 | 1.43 | .01 | .01 | 7 | 17 |
| 50K 1S | 1 | 56 | 8 | 64 | .1 | 325 | 26 | 369 | 4.83 | 24 | 5 | ND | 2 | 7 | 1 | 2 | 8 | 60 | .06 | .04 | 5 | 313 | 2.25 | 64 | .08 | 4 | 2.04 | .01 | .02 | 36 | 135 |
| 50K 2S | 7 | 345 | 9 | 81 | .1 | 632 | 42 | 3103 | 4.15 | 277 | 5 | ND | 2 | 43 | 1 | 3 | 14 | 48 | .64 | .13 | 7 | 216 | 1.73 | 114 | .05 | 5 | 2.14 | .01 | .08 | 58 | 170 |
| 50K 3S | 5 | 65 | 8 | 91 | .2 | 363 | 31 | 382 | 5.86 | 177 | 5 | ND | 2 | 18 | 1 | 2 | 11 | 84 | .22 | .06 | 4 | 286 | 1.36 | 51 | .11 | 2 | 2.01 | .01 | .04 | 83 | 360 |
| 50K 4S | 1 | 95 | 5 | 52 | .1 | 343 | 17 | 267 | 4.09 | 29 | 5 | ND | 2 | 5 | 1 | 2 | 4 | 75 | .08 | .04 | 3 | 316 | 2.43 | 36 | .12 | 5 | 1.88 | .01 | .01 | 14 | 26 |
| 50K 5S | 1 | 61 | 1 | 48 | .1 | 372 | 27 | 321 | 3.86 | 27 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 55 | .12 | .02 | 4 | 245 | 2.70 | 35 | .10 | 5 | 1.85 | .01 | .01 | 4 | 18 |
| 50K 6S | 7 | 368 | 13 | 122 | .2 | 433 | 23 | 1866 | 3.85 | 222 | 5 | ND | 2 | 37 | 1 | 2 | 2 | 61 | .57 | .12 | 10 | 238 | 1.52 | 90 | .06 | 4 | 2.37 | .01 | .07 | 38 | 41 |
| 50K 7S | 3 | 59 | 6 | 45 | .1 | 419 | 25 | 286 | 5.18 | 111 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 72 | .18 | .04 | 4 | 293 | 2.14 | 26 | .11 | 4 | 1.95 | .01 | .01 | 8 | 11 |
| 50K 8S | 2 | 250 | 4 | 56 | .1 | 637 | 42 | 729 | 3.81 | 146 | 5 | ND | 2 | 18 | 1 | 4 | 2 | 49 | .31 | .06 | 16 | 330 | 3.06 | 36 | .03 | 5 | 1.55 | .01 | .03 | 16 | 32 |
| 50K 9S | 4 | 53 | 6 | 78 | .1 | 150 | 24 | 1672 | 3.90 | 22 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 80 | .09 | .06 | 6 | 209 | 1.25 | 135 | .13 | 2 | 1.64 | .01 | .09 | 5 | 15 |
| 50K 10S | 1 | 129 | 5 | 61 | .2 | 282 | 26 | 333 | 4.68 | 17 | 5 | ND | 2 | 8 | 1 | 2 | 2 | 88 | .14 | .04 | 3 | 331 | 2.53 | 141 | .16 | 4 | 2.63 | .01 | .13 | 2 | 9 |
| 50K 11S | 4 | 61 | 11 | 68 | .1 | 174 | 40 | 1990 | 3.64 | 21 | 5 | ND | 2 | 22 | 1 | 2 | 2 | 71 | .37 | .10 | 8 | 164 | 1.05 | 159 | .05 | 2 | 1.56 | .01 | .07 | 3 | 7 |
| 20K 4N | 2 | 83 | 11 | 75 | .3 | 475 | 38 | 2449 | 4.65 | 127 | 5 | ND | 2 | 19 | 1 | 3 | 2 | 76 | .34 | .12 | 6 | 358 | 2.93 | 173 | .06 | 6 | 2.31 | .01 | .09 | 16 | 12 |
| 50E 12N | 2 | 72 | 11 | 64 | .1 | 288 | 25 | 510 | 4.74 | 23 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 76 | .15 | .07 | 6 | 252 | 2.17 | 105 | .07 | 2 | 2.30 | .01 | .10 | 4 | 73 |
| 50E 11N | 2 | 86 | 10 | 58 | .4 | 486 | 17 | 816 | 2.99 | 30 | 5 | ND | 2 | 22 | 1 | 2 | 2 | 49 | .50 | .09 | 9 | 169 | 1.26 | 101 | .06 | 2 | 1.83 | .01 | .08 | 8 | 13 |
| 50E 10N | 2 | 53 | 8 | 70 | .1 | 310 | 29 | 565 | 4.88 | 29 | 5 | ND | 2 | 7 | 1 | 2 | 2 | 74 | .06 | .06 | 6 | 290 | 1.92 | 92 | .07 | 2 | 2.11 | .01 | .06 | 4 | 30 |
| 50E 9N | 3 | 104 | 6 | 62 | .2 | 587 | 26 | 618 | 4.39 | 31 | 5 | ND | 2 | 15 | 1 | 2 | 3 | 67 | .34 | .07 | 6 | 306 | 2.22 | 105 | .07 | 2 | 2.90 | .01 | .11 | 9 | 32 |
| 50E 8N | 3 | 67 | 5 | 51 | .1 | 384 | 22 | 405 | 4.00 | 23 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 59 | .25 | .04 | 5 | 303 | 2.36 | 73 | .06 | 3 | 1.71 | .01 | .08 | 3 | 22 |
| 50E 7N | 3 | 54 | 8 | 54 | .1 | 367 | 27 | 338 | 3.62 | 28 | 5 | ND | 2 | 19 | 1 | 2 | 2 | 56 | .37 | .10 | 5 | 280 | 2.12 | 100 | .06 | 4 | 1.54 | .01 | .10 | 12 | 20 |
| 50E 6N | 12 | 66 | 12 | 77 | .1 | 757 | 38 | 1148 | 6.31 | 67 | 5 | ND | 2 | 21 | 1 | 2 | 2 | 60 | .39 | .11 | 3 | 279 | 2.40 | 128 | .05 | 4 | 1.86 | .01 | .06 | 14 | 15 |
| 50E 5N | 5 | 78 | 8 | 82 | .2 | 530 | 29 | 1532 | 4.54 | 118 | 5 | ND | 2 | 28 | 1 | 2 | 2 | 67 | .54 | .13 | 10 | 256 | 1.73 | 185 | .05 | 4 | 2.27 | .01 | .05 | 15 | 13 |
| 50E 4N | 3 | 125 | 7 | 50 | .1 | 955 | 38 | 381 | 4.56 | 39 | 5 | ND | 2 | 9 | 1 | 3 | 11 | 48 | .14 | .04 | 4 | 339 | 3.10 | 59 | .06 | 8 | 1.81 | .01 | .03 | 24 | 140 |
| 50E 3N | 1 | 49 | 8 | 51 | .1 | 491 | 35 | 501 | 4.64 | 44 | 5 | ND | 2 | 5 | 1 | 2 | 2 | 62 | .06 | .03 | 4 | 314 | 2.64 | 37 | .10 | 5 | 1.90 | .01 | .02 | 7 | 37 |
| 50E 2N | 1 | 52 | 4 | 46 | .1 | 438 | 29 | 489 | 4.23 | 22 | 5 | ND | 2 | 7 | 1 | 2 | 2 | 65 | .15 | .04 | 3 | 249 | 2.96 | 41 | .14 | 6 | 2.16 | .01 | .06 | 7 | 31 |
| STD C/FA-AU | 20 | 58 | 39 | 123 | 7.2 | 70 | 27 | 1054 | 3.92 | 40 | 16 | 8 | 38 | 49 | 18 | 17 | 20 | 58 | .44 | .14 | 39 | 57 | .88 | 176 | .05 | 40 | 1.62 | .06 | .13 | 15 | 51 |

ASARCO FILE # 04-2284

PAGE 2

| SAMPLE# | MO | CU | FE | ZN | AG | NI | CO | MN | FE | AS | U | AU | TH | SR | CD | SB | BT | V | CA | P | LA | CE | MG | BA | TI | S | AL | MS | K | W | AUM |
|-------------|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|-----|
| | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | PPM | % | % | PPM | PPM | % | PPM | % | PPM | % | % | % | PPM | PPM |
| 50E 1N | 1 | 77 | 1 | 38 | .2 | 484 | 27 | 417 | 3.89 | 24 | 5 | ND | 2 | 7 | 1 | 3 | 5 | 54 | .10 | .03 | 3 | 332 | 3.67 | 37 | .07 | 9 | 2.02 | .01 | .03 | 4 | 21 |
| 50E 0N | 3 | 37 | 7 | 43 | .2 | 199 | 15 | 216 | 3.89 | 8 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 95 | .08 | .04 | 4 | 191 | 1.97 | 35 | .16 | 2 | 1.89 | .01 | .01 | 2 | 17 |
| 50E 1S | 1 | 45 | 2 | 62 | .1 | 330 | 27 | 263 | 4.04 | 16 | 5 | ND | 2 | 6 | 1 | 3 | 2 | 73 | .09 | .03 | 4 | 246 | 2.64 | 33 | .12 | 5 | 1.94 | .01 | .02 | 2 | 12 |
| 50E 2S | 1 | 38 | 2 | 57 | .1 | 341 | 25 | 275 | 3.71 | 12 | 5 | ND | 2 | 6 | 1 | 2 | 2 | 68 | .09 | .03 | 4 | 274 | 2.55 | 43 | .11 | 5 | 1.93 | .01 | .02 | 2 | 13 |
| 50E 3S | 1 | 41 | 1 | 56 | .1 | 254 | 26 | 343 | 4.30 | 3 | 5 | ND | 2 | 8 | 1 | 2 | 2 | 95 | .17 | .04 | 2 | 204 | 2.34 | 40 | .17 | 5 | 1.86 | .01 | .02 | 2 | 23 |
| 50E 4S | 3 | 161 | 11 | 183 | .2 | 909 | 41 | 1500 | 4.49 | 158 | 5 | ND | 2 | 25 | 1 | 2 | 2 | 63 | .29 | .12 | 13 | 226 | 1.97 | 100 | .07 | 5 | 2.50 | .01 | .06 | 20 | 8 |
| 50E 5S | 1 | 53 | 1 | 60 | .1 | 252 | 28 | 500 | 4.86 | 4 | 5 | ND | 2 | 9 | 1 | 2 | 2 | 105 | .22 | .05 | 5 | 204 | 2.67 | 44 | .17 | 6 | 1.93 | .02 | .01 | 2 | 1 |
| 50E 6S | 1 | 58 | 3 | 61 | .1 | 253 | 29 | 405 | 5.01 | 12 | 5 | ND | 2 | 8 | 1 | 2 | 2 | 104 | .24 | .05 | 4 | 200 | 2.74 | 44 | .17 | 7 | 2.02 | .02 | .02 | 2 | 9 |
| 50E 7S | 1 | 73 | 1 | 60 | .1 | 340 | 32 | 384 | 4.36 | 22 | 5 | ND | 2 | 15 | 1 | 3 | 2 | 87 | .32 | .04 | 4 | 201 | 2.87 | 63 | .12 | 6 | 1.98 | .02 | .01 | 2 | 3 |
| 50E 8S | 2 | 42 | 6 | 63 | .1 | 129 | 13 | 279 | 3.85 | 6 | 5 | ND | 2 | 10 | 1 | 2 | 2 | 88 | .13 | .05 | 6 | 134 | 1.04 | 82 | .10 | 3 | 1.60 | .01 | .02 | 3 | 4 |
| 50E 9S | 2 | 56 | 8 | 78 | .1 | 215 | 23 | 473 | 3.70 | 5 | 5 | ND | 2 | 11 | 1 | 2 | 2 | 74 | .10 | .05 | 9 | 208 | 1.70 | 114 | .09 | 3 | 2.15 | .01 | .04 | 3 | 19 |
| 50E 10S | 2 | 45 | 9 | 60 | .1 | 105 | 14 | 586 | 3.05 | 7 | 5 | ND | 2 | 10 | 1 | 2 | 2 | 67 | .08 | .07 | 11 | 157 | 1.15 | 91 | .09 | 2 | 1.77 | .01 | .04 | 2 | 6 |
| 50E 11S | 3 | 106 | 9 | 89 | .3 | 127 | 26 | 950 | 3.67 | 7 | 5 | ND | 2 | 10 | 1 | 2 | 2 | 70 | .08 | .06 | 13 | 157 | 1.05 | 119 | .08 | 2 | 1.95 | .01 | .05 | 3 | 5 |
| 50E 12S | 2 | 98 | 5 | 78 | .1 | 309 | 24 | 725 | 4.30 | 30 | 5 | ND | 2 | 14 | 1 | 2 | 2 | 80 | .24 | .06 | 7 | 250 | 2.59 | 142 | .11 | 3 | 2.15 | .01 | .19 | 6 | 4 |
| STD C/FA-AU | 20 | 58 | 39 | 123 | 7.0 | 70 | 27 | 1036 | 3.82 | 37 | 22 | 8 | 35 | 48 | 18 | 17 | 16 | 58 | .44 | .14 | 38 | 57 | .88 | 175 | .06 | 39 | 1.65 | .06 | .12 | 14 | 55 |

APPENDIX "C"

Harris
EXPLORATION
SERVICES

MINERALOGY AND GEOCHEMISTRY

534 ELLIS STREET, NORTH VANCOUVER, B.C., CANADA V7H 2G6

TELEPHONE (604) 929-5867

Job #84-52

August 30th, 1984

Report for: Mike Lancaster,
Asarco Ltd.,
504-535 Thurlow St.,
Vancouver, B.C.
V6E 3L2

Introduction:

12 doubly polished thin sections of vein quartz were submitted for evaluation of suitability for heating/cooling measurements on fluid inclusions.

The samples consisted of 9 from the Bridge River area, numbered 74, 50, 52, 53, 54, 57, 59, 60A and 60B; and 3 from Bralorne, numbered N-1A, N-4B and N-10.

Each sample was scanned under 400X magnification and an appraisal made of the abundance and suitability of fluid inclusions. The findings are summarized below.

Results:

Bridge River suite:

- #47 Much of the slide is not quartz (fibrous amphibole?). Significant sulfides. The quartz has low transparency and will be hard to work with. One rectangular inclusion of 15 microns with a 4 micron bubble was seen - possibly associated with a fracture.
- #50 Quartz is mostly a granular mosaic, 0.05 - 0.2mm, with included patches of coarser grains. Fluid inclusions are rather abundant, 3 - 15 microns in size. Some have active bubbles. Considerable disparity in bubble size.
- #52 Slide contains considerable micas. Quartz is c. 50% fine granular, 50% coarse clumps. Abundant inclusions including usable ones to 10 microns, with active bubbles. Also many irregular, elongate ones, sometimes in swarms.
- #53 Similar grain size relations as 52. The coarse stuff has old healed fractures. Noticeable sulfides. Inclusions mostly small, irregular in shape. Usable ones to 12 microns are present.
- #54 Quartz is dominantly coarse grained (1 - 5mm). Abundant inclusions to 12.5 microns.
- #57 Quartz as in 54. Abundant usable inclusions to 15 microns. A few larger ones seen but a bit irregular in shape.

- #59 Patches of coarse quartz cemented by finer. Some areas strong recrystallization. Inclusions less common than in 54, 57, but usable ones can be found. Some have large bubbles. Others have 2 fluid phases.
- #60A (C 16) Mostly fine-grained quartz cementing a few patches of coarser. Inclusions mostly small, elongate and irregular. Usable ones of 5 - 7 microns size are present.
- #60B (C 12) Mainly coarse grained, brecciated, shadowy recrystallization. Inclusions sparse, poor - probably the worst of the Bridge River group. Even so, careful search would probably isolate a few usable ones.

Bralorne suite

- N-1A Coarse grained with multiphase brecciation and healed fractures. Considerable opaque (solid) inclusions. Fluid inclusions generally small, often strongly oriented. Rare usable(?) ones in size range 2 - 7 microns.
- N-4B Brecciated. Coarser patches cemented by very fine, cherty. Fluid inclusions are very small, not usable.
- N-10 Coarse grained, cut by parallel fractures. Inclusions small, often in oriented strings (related to the fracturing?). A few clearly defined 2-phase inclusions seen but probably too small to use (2 - 5 microns).

Conclusions:

Usable inclusions can be found in most of the Bridge River suite. #s 50, 52, 54, 57 are probably the best.

The Bralorne material will be difficult. Usable (but small) inclusions may be present in N-1A and N-10, but could be of secondary origin (related to fracturing).

Recommendations:

If you do go ahead and do fluid inclusion measurements yourself, the following general hints may be helpful:

Look for clearly defined, readily focussable inclusions (in one plane).

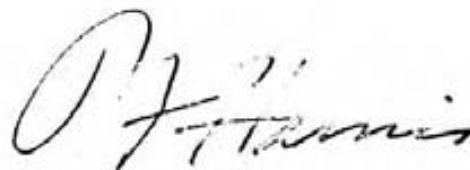
Go for inclusions of simple shape (rounded or rectangular). It is easy to lose sight of the bubble in corners.

Avoid inclusions close to fractures: they may have leaked.

Avoid lines or zones of small, oriented inclusions: they may be secondary.

Look for large individuals or groups of same: you can then do several measurements in the same area.

Work in the clearer, brighter areas of the sample where possible (easier on the eyes!).



J.F. Harris Ph.D.

APPENDIX "D"

CERTIFICATE

I, Michael Lancaster of 6835 Hycroft Road, West Vancouver, B.C. hereby certify:

1. I am a university graduate with a BSc (Hons) in Geology, University of British Columbia 1967.

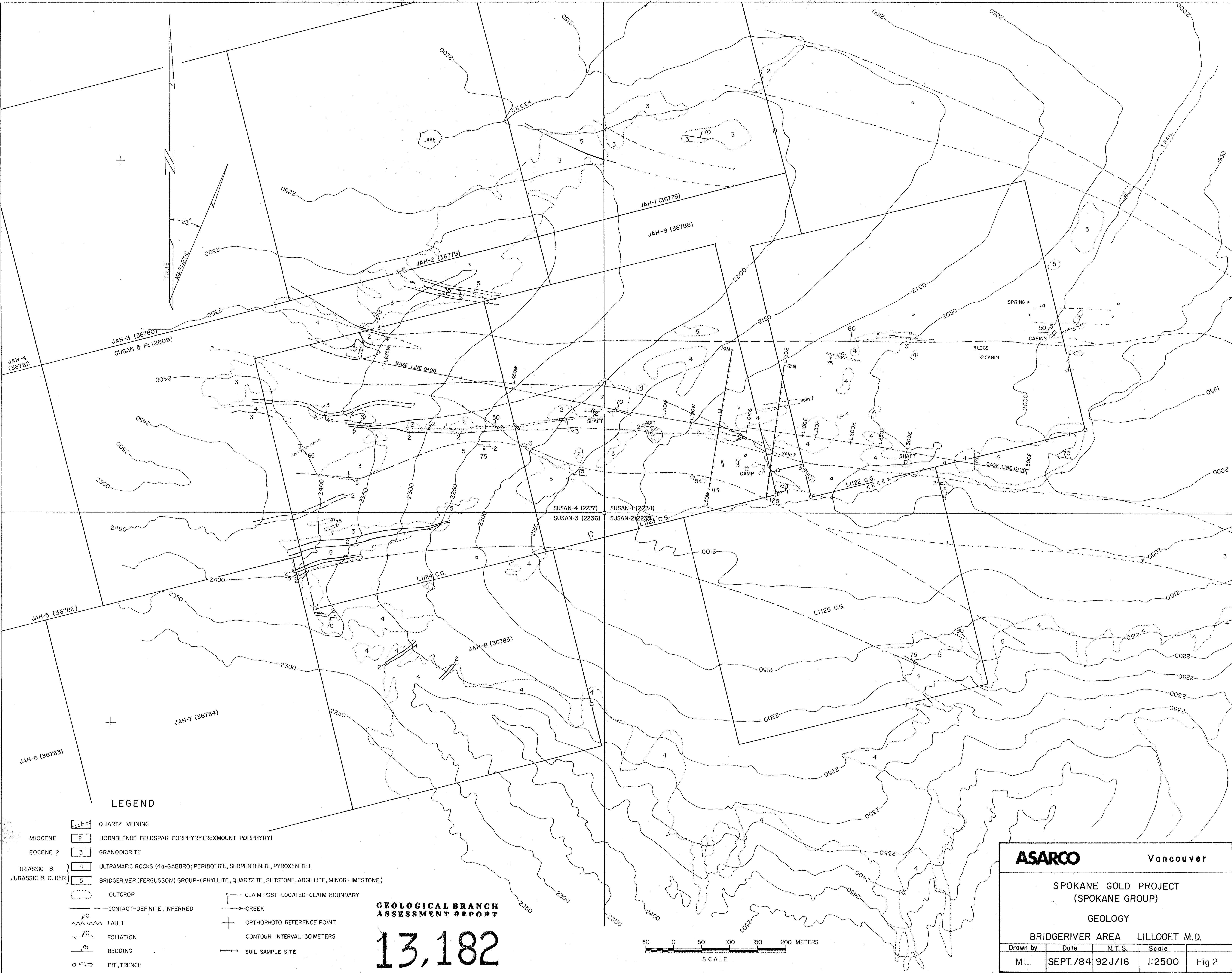
2. I have practiced my profession for the past 17 years.

3. I am presently employed as a Geologist with Asarco Exploration Company of Canada Limited.

4. The information contained in this report was compiled by myself and the sampling program was under my direct supervision.

Michael Lancaster

Michael Lancaster
Geologist
November 1984



LEGEND

- QUARTZ VEINING
- MIOCENE HORNBLENDE-FELDSPAR-PORPHYRY (REXMOUNT PORPHYRY)
- EOCENE ? GRANODIORITE
- TRIASSIC & JURASSIC & OLDER ULTRAMAFIC ROCKS (4a-GABBRO; PERIDOTITE, SERPENTINITE, PYROXENITE)
- BRIDGER RIVER (FERGUSSON) GROUP - (PHYLLITE, QUARTZITE, SILTSTONE, ARGILLITE, MINOR LIMESTONE)
- OUTCROP
- CLAIM POST-LOCATED-CLAIM BOUNDARY
- CONTACT-DEFINITE, INFERRED
- CREEK
- FAULT
- ORTHOPHOTO REFERENCE POINT
- FOLIATION
- CONTOUR INTERVAL=50 METERS
- BEDDING
- SOIL SAMPLE SITE
- PIT, TRENCH

GEOLOGICAL BRANCH ASSESSMENT REPORT

13,182

| | | | |
|---|----------|---------------|--------|
| ASARCO | | Vancouver | |
| SPOKANE GOLD PROJECT (SPOKANE GROUP) | | | |
| GEOLOGY | | | |
| BRIDGER RIVER AREA | | LILLOOET M.D. | |
| Drawn by | Date | N.T.S. | Scale |
| M.L. | SEPT./84 | 92J/16 | 1:2500 |
| | | | Fig 2 |

