

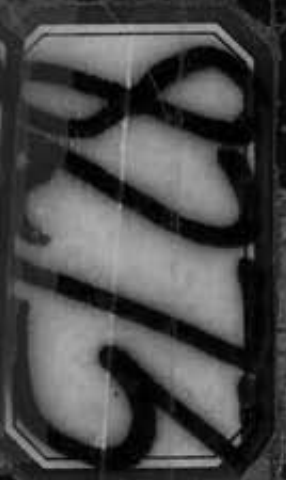
DIAMOND DRILLING REPORT FOR WORK DONE IN
1978 AND 1979 ON THE JEFF 92, 93 AND 94
MINERAL CLAIMS - LIARD MINING DIVISION

NTS 104I/1W

'80-#140-#

by

DANE A. BRIDGE
ESSO RESOURCES CANADA LIMITED
March 1980



DIAMOND DRILLING REPORT
FOR WORK DONE IN 1978
AND 1979 ON THE JEFF 92,
93 AND 94 MINERAL CLAIMS

LIARD MINING DIVISION
1041/1W
58°12'N 128°21W

for
ESSO MINERALS CANADA
314-1281 West Georgia Street
Vancouver, B.c.

by
DANE A. BRIDGE

March 1980

| |
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| MINERAL RESOURCES BRANCH ASSESSMENT REPORT No. _____ |
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8273

TABLE OF CONTENTSPage No.

| | | | | |
|--------------------------------|----------|--------|----------|----|
| INTRODUCTION | | | | 1 |
| DIAMOND DRILLING | | | | 1 |
| INDEX MAP NO. 1 | | | | 3 |
| INDEX MAP NO. 2 | | | | 4 |
| GEOLOGY | | | | 5 |
| COST STATEMENTS | | | | 8 |
| STATEMENT OF QUALIFICATIONS | | | | 13 |
| LEGEND FOR DETAILED DRILL LOGS | | | | 16 |
| APPENDIX: DETAILED DRILL LOGS | | | | |
| DDH 77 | 41 pages | DDH 88 | 36 pages | |
| 77B1 | 24 | 88B1 | 10 | |
| 79 | 50 | 88B2 | 12 | |
| 79B1 | 13 | 88B3 | 14 | |
| 79B2 | 16 | 88B4 | 16 | |
| 80 | 41 | 89 | 39 | |
| 80B1 | 8 | 89B1 | 14 | |
| 80B2 | 12 | 89B2 | 14 | |
| 81 | 46 | 89B3 | 12 | |
| 82 | 33 | 89B4 | 12 | |
| 82B1 | 16 | 89B5 | 14 | |
| 86 | 40 | 89B6 | 20 | |
| 86B1 | 10 | 89B7 | 10 | |
| 86B2 | 12 | 92 | 21 | |
| 86B3 | 14 | 92B1 | 8 | |
| | | 92B2 | 12 | |

MAPS:

DRILL HOLE LOCATION MAP

IN POCKET

INTRODUCTION

The Kutcho Creek property is located in mountainous terrain in the Cassiar Mountains. The exploration camp is located at an elevation of 1530 m on the south side of a tributary of Kutcho Creek. Exploration is done at or above tree line from elevations of 1500 to 1650 m.

The property is centered about 21 km south-south-east of Rainbow Lake and 9 km east-south-east of the Kutcho Creek airstrip. Access from the airstrip to camp is by helicopter. The location of Esso Minerals' claims is shown on Index Map No. 1.

The property is owned and operated by Esso Minerals Canada, a division of Esso Resources Canada Limited.

This report describes 7708.8 m of BQ diamond drilling done in 1978 and 1979 on the Jeff 92, 93 and 94 mineral claims. One hole and two wedged branch holes totalling 819.0 m were drilled on Jeff 92 in 1979. One hole and one wedged branch hole totalling 666.9 m was drilled on Jeff 93 in 1978. The Jeff 94 claim had 3639.0 m of drilling in 5 holes and three wedged branch holes in 1978, and 4069.8 m of drilling in two holes and sixteen wedged branch holes in 1979.

The core for all holes drilled by Esso Minerals on the Kutcho property is stored at the exploration camp. Massive sulphide intersections are stored in the B.C. Yukon Air Services' hanger at the Watson Lake, Yukon airport or Esso Minerals' office in Vancouver, B.C.

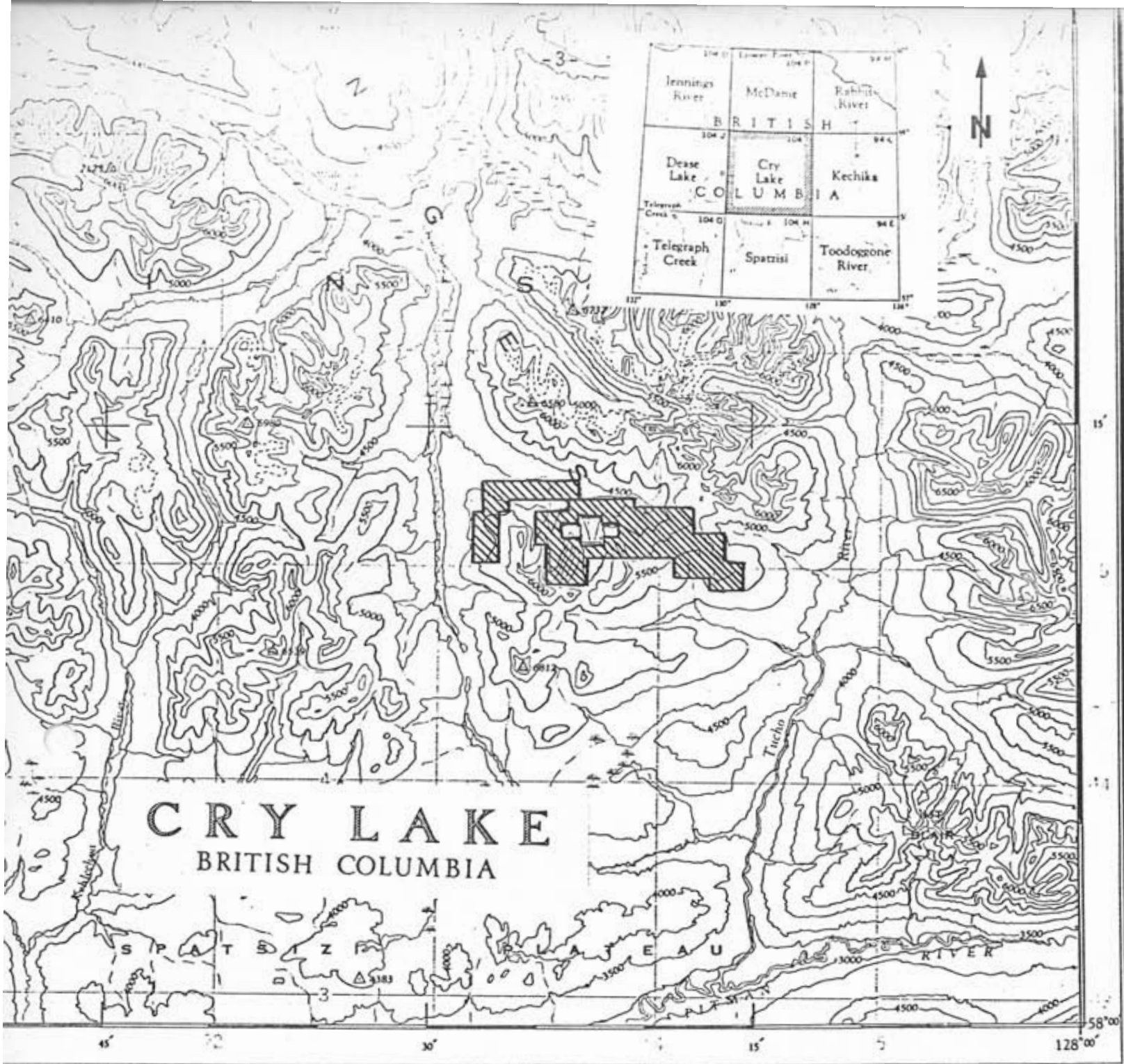
DIAMOND DRILLING

The thirty-one diamond drill holes described in this report all intersect the stratigraphy as described in the geology section. The massive sulphide horizon was intersected in all holes except DDH 89 which was abandoned slightly above the horizon.

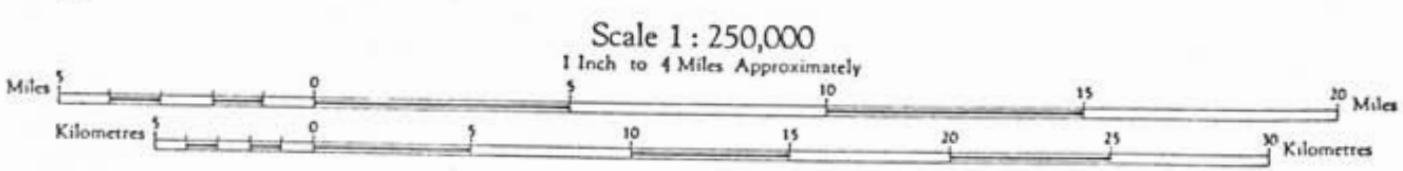
The detailed drill logs with all assays are in the Appendix.

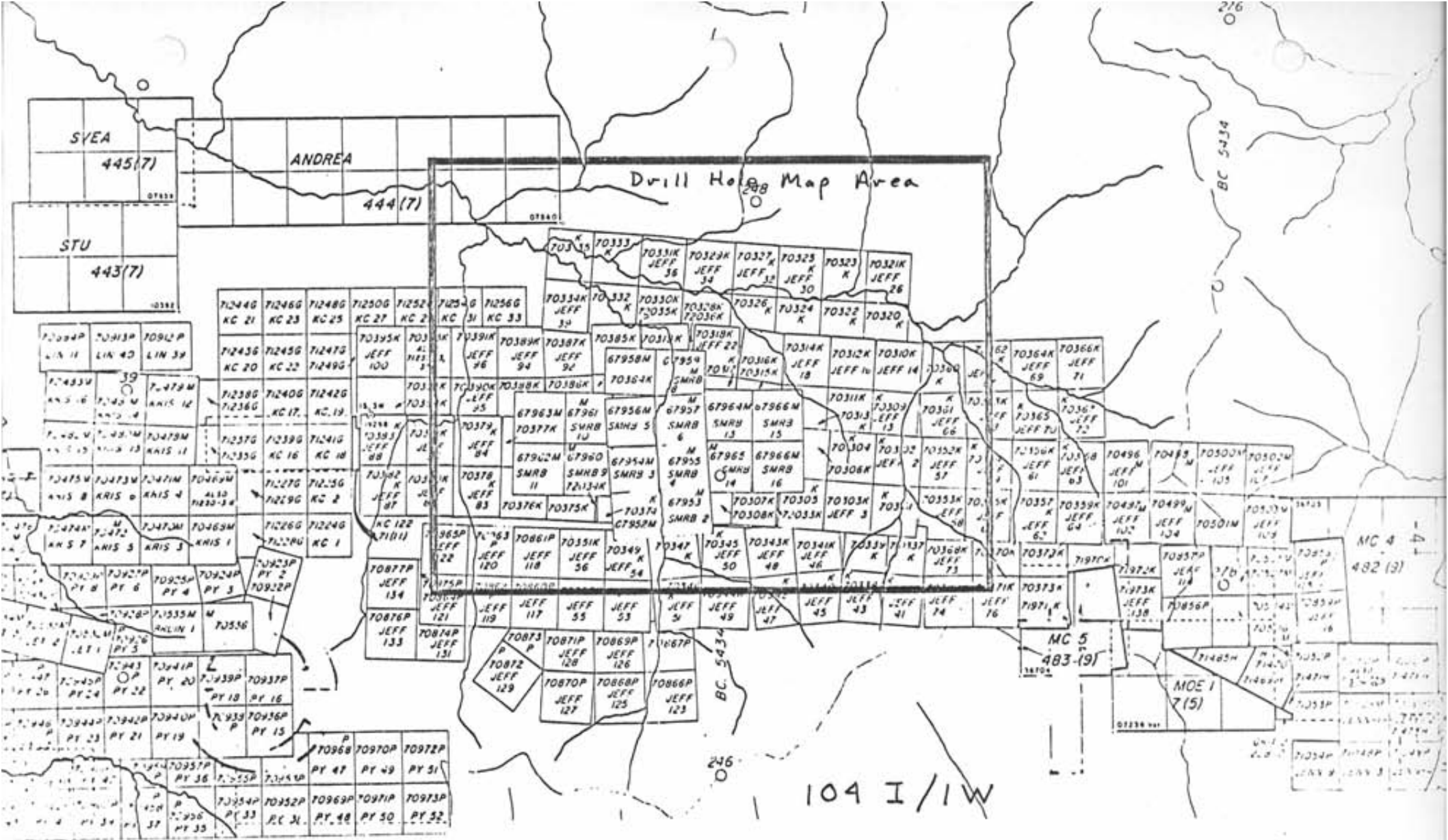
The following is a list of the drill holes with claim year and length of hole:

| <u>Claim</u> | <u>Hole</u> | <u>Year</u> | <u>Length of Hole</u> | |
|--------------|------------------|-------------|-----------------------|---------------|
| | | | <u>Feet</u> | <u>Meters</u> |
| 92 | 92 | 1979 | 1598 | 487.1 |
| | 92B1 | 1979 | 479 | 146.0 |
| | 92B2 | 1979 | 610 | 185.9 |
| | Total on Jeff 92 | | 2687 feet | 819.0 meters |
| 93 | 82 | 1978 | 1545 | 470.9 |
| | 82B1 | 1978 | 643 | 196.0 |
| | Total on Jeff 93 | | 2188 feet | 666.9 meters |
| 94 | 77 | 1978 | 1798 | 548.0 |
| | 77B1 | 1978 | 1046 | 318.8 |
| | 79 | 1978 | 2245 | 684.3 |
| | 79B1 | 1978 | 544 | 165.8 |
| | 79B2 | 1978 | 710 | 216.4 |
| | 80 | 1978 | 1806 | 550.5 |
| | 81 | 1978 | 2008 | 612.0 |
| | 80B1 | 1979 | 379 | 115.5 |
| | 80B2 | 1979 | 494 | 150.6 |
| | 86B1 | 1979 | 398.5 | 121.5 |
| | 86B2 | 1979 | 469 | 143.0 |
| | 86B3 | 1979 | 575.5 | 175.4 |
| | 88 | 1979 | 1578 | 481.0 |
| | 88B1 | 1979 | 434 | 132.3 |
| | 88B2 | 1979 | 486 | 148.1 |
| | 88B3 | 1979 | 622.5 | 189.7 |
| | 88B4 | 1979 | 700 | 213.4 |
| | 89 | 1979 | 2048 | 624.2 |
| | 89B1 | 1979 | 587 | 178.9 |
| | 89B2 | 1979 | 596 | 181.7 |
| | 89B3 | 1979 | 625 | 190.5 |
| | 89B4 | 1979 | 671 | 204.5 |
| | 89B5 | 1979 | 788 | 240.2 |
| | 89B6 | 1979 | 920 | 280.4 |
| | 89B7 | 1979 | 981 | 299.0 |
| | 86 | 1978 | 1782 | 543.2 |
| | Total on Jeff 94 | | 25,291.5 feet | 7708.8 meters |

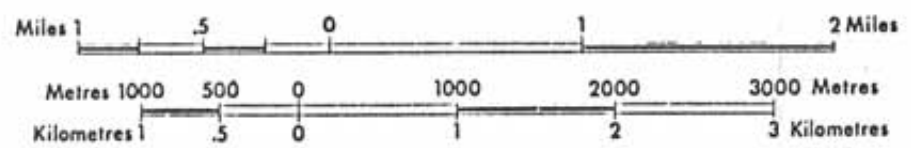


Index Map No. 1: Location of Esso Minerals Canada's Kutcho Creek Mineral Claims in 104 I.





104 I/IW



Index Map No. 2:
Location of Diamond Drill
Hole Map

GEOLOGY

Mineralization at Kutcho Creek consists of stratiform, volcanogenic massive pyrite with base metal sulphides. The sulphides occur near the transition from volcanic to mixed volcanic and sedimentary rocks within the Triassic or older Kutcho assemblage.

The following is a description of the lithologic units encountered in drilling on the Kutcho property. They are arranged from youngest to oldest which is the sequence in which they are encountered in drilling. The quoted thicknesses are the maximum apparent true thicknesses encountered in drilling prior to 1979 or an estimate:

Limestone, 125 m

Massive recrystallized limestone.

Conglomerate, 150-160 m

Strongly foliated polymictic conglomerate composed of predominately silicic clasts derived from the volcanic pile. The base of the conglomerate unit has been intersected in 6 holes. It is always underlain by rocks of the basic unit.

Tuff Argillite Unit, 350 m in area north of Esso's camp to 440 to 470 m thick 3 km west

This unit represents a conformable transition from the underlying silicic volcanic rocks to very fine-grained, silicic, graded water-lain tuffs, argillite, siltstone and epiclastic rocks. It consists mainly of tuffs and slightly argillaceous tuffs metamorphosed to quartz-chlorite-sericite-biotite schists. Fine laminations, graded bedding and quartz phenocrysts are unaffected by the development of foliation.

A black, calcareous, graphitic argillite commonly occurs a few meters above the base of the unit. A mixed unit of argillite and argillaceous tuff commonly occurs approximately 100 to 150 m above the base of the tuff-argillite unit. The main lithology in the upper portion of the unit is a silicic siltstone with minor megascopically visible biotite. Minor disseminated pyrrhotite + pyrite is ubiquitous in the tuff-argillite unit.

Basic Unit, Variable Thickness

Basaltic to andesitic flows and tuffs? occur from immediately below the ore horizon to the base of the conglomerate unit. They are most abundant within the stratigraphic interval of the tuff-argillite unit. Here they account for 33 to 82% of the section and generally make up >50% of the section directly overlying the ore horizon.

The basic unit rocks were previously called metagabbro. They include massive basalt, basic schists, amphibolitic flows, amphibolitic flows with plagioclase phenocryst, plagioclase porphyries and plagioclase porphyries with minor quartz phenocrysts. Variations from massive, amphibolitic units to plagioclase porphyries are the most common rocks in the basic unit.

The basic rocks are commonly weakly foliated and contain chlorite, epidote-clinozoisite and biotite. Locally they are intensely altered to carbonate-sericite.

Quartz Feldspar Crystal Tuff (QFCT), 200 m

The QFCT and Rhyolite Tuff units overlie the ore horizon. The ore zones occur slightly up-dip (south) of a facies change between the QFCT and Rhyolite Tuff units. The QFCT unit is graded and tuffaceous at the top but could be a flow.

Two main phases occur in the QFCT. The most abundant phase is a very homogeneous quartz-feldspar-sericite-chlorite-carbonate schist with abundant quartz phenocrysts, commonly up to 1 cm, and fewer plagioclase phenocrysts. The rock has a distinctive porphyritic or crystal tuff texture and is variably sericitic or chloritic. Immediately above ore it is intensely sericitized.

A coarse breccia phase occurs in the middle to upper parts of the unit but is not always present. It contains small to 1 m fragments texturally identical to the matrix and minor fine-grained chloritic fragments. The breccia phase is commonly heavily altered to epidote-clinozoisite.

Rhyolite Tuff, 135 m

This unit is facies equivalent with the QFCT unit. It develops along the down-dip (north) edge of the massive sulphide zones and commonly occupies most of the interval between the ore horizon and the Tuff-Argillite unit north of the sulphide zones.

The Rhyolite Tuff unit consists of quartz and sericite + chlorite and carbonate schists. It has a relict fragmental texture and minor, large quartz phenocrysts, commonly altered to carbonate. Colors vary from white to green and it commonly has a pink to purple tone due to hematite.

Sericite Schist, 300 m

A rhyolitic lapilli tuff metamorphosed to quartz + sericite + chlorite + carbonate schist. The unit consists of lustrous, white to medium green schists with a relict fragmental texture and rare, fine quartz phenocrysts.

A quartz-chlorite schist and a rhyolite breccia horizon have been observed near the middle of the sericite schist unit.

Dolomite lenses are common within the upper 30 m of the sericite schist and at the top of the massive sulphide horizon.

Massive Sulphide Horizon, 29 m

A main massive sulphide lens and thin, discontinuous, hanging wall lenses occur near or at the top of the sericite schist unit. Mineralization consists of massive and disseminated sphalerite, chalcopyrite, bornite and chalcocite.

Distal to the sulphide zones the ore horizon consists of minor, disseminated, sphalerite and chalcopyrite with pyrite in schist or carbonate.

Disseminated pyrite with a very minor base metal content occurs in the sericite schists below the massive sulphide body.

COST STATEMENT FOR WORK IN 1979 ON CLAIM JEFF 92

DDH 92, 92B1, 92B2 were drilled during August 22 - September 5, 1979 for a total length of 819.0 meters.

Direct Drilling Costs:

| | |
|-------------------------|------------|
| 500 ft. at \$12.90/ft. | \$6,450.00 |
| 572 ft. at \$13.40/ft. | 7,664.80 |
| 1383 ft. at \$13.90/ft. | 19,223.70 |
| 232 ft. at \$14.40/ft. | 3,340.80 |

Labour:

| | |
|--------------------------|----------|
| 260 hours at \$17.50/hr. | 4,450.00 |
|--------------------------|----------|

Machine Time:

| | |
|--------------------------|--------|
| 44.5 hours at \$9.50/hr. | 422.75 |
|--------------------------|--------|

Equipment Used:

| | |
|---------------------------------|----------|
| MiniDeve 1598 ft. at \$1.50/ft. | 1,997.50 |
| Casing and Shoe | 325.49 |
| Wedges and Packers | 882.06 |

Core Boxes:

| | |
|---------------|--------|
| 108 at \$5.00 | 540.00 |
|---------------|--------|

Assays:

| | |
|---------------|--------|
| 13 at \$38.90 | 505.70 |
|---------------|--------|

Fuel:

| | |
|-------------------------|----------|
| 860 gal. at \$2.50/gal. | 2,150.00 |
|-------------------------|----------|

Helicopter:

| | |
|-------------------------|----------|
| 30.4 hours at \$270/hr. | 8,208.00 |
|-------------------------|----------|

Helicopter Fuel:

| | |
|-------------------------|----------|
| 685 gal. at \$3.00/gal. | 2,055.00 |
|-------------------------|----------|

Geologist:

| | |
|-------------------------|----------|
| 15 man days at \$85/day | 1,275.00 |
|-------------------------|----------|

Assistant:

| | |
|-------------------------|--------|
| 75 man days at \$35/day | 262.50 |
|-------------------------|--------|

First Aid Attendant:

| | |
|-------------------------|--------|
| 75 man days at \$65/day | 487.50 |
|-------------------------|--------|

Camp Costs:

| | |
|---------------------------|--------------------|
| 97.5 man days at \$25/day | \$2,437.50 |
| TOTAL | <u>\$62,678.30</u> |
| Average Cost Per Foot | <u>\$23.32</u> |
| Average Cost Per Meter | <u>\$76.53</u> |

COST STATEMENT FOR WORK IN 1978 ON CLAIM JEFF 93

DDH 82 and 82B1 were drilled during August 28 - September 12, 1978 for a total length of 666.9 meters.

Direct Drilling Costs:

| | |
|------------------------|------------|
| 500 ft. at \$12.20/ft. | \$6,100.00 |
| 669 ft. at \$12.70/ft. | 8,496.30 |
| 974 ft. at \$13.20/ft. | 12,856.80 |
| 45 ft. at \$13.70/ft. | 616.50 |

Labour:

| | |
|--------------------------|----------|
| 152 hours at \$15.50/hr. | 2,356.00 |
|--------------------------|----------|

Machine Time:

| | |
|------------------------|--------|
| 43 hours at \$9.00/hr. | 387.00 |
|------------------------|--------|

Equipment Used:

| | |
|----------------------------------|----------|
| Mini Deve 1545 ft. at \$1.25/ft. | 1,931.25 |
| Casing and Shoe | 275.38 |
| Wedges and Packer | 452.63 |

Core Boxes:

| | |
|--------------|--------|
| 88 at \$5.00 | 440.00 |
|--------------|--------|

Assays:

| | |
|--------------|--------|
| 6 at \$28.90 | 173.40 |
|--------------|--------|

Fuel:

| | |
|-------------------------|----------|
| 700 gal. at \$2.25/gal. | 1,575.00 |
|-------------------------|----------|

Helicopter:

| | |
|-------------------------|----------|
| 21.9 hours at \$250/hr. | 5,475.00 |
|-------------------------|----------|

Helicopter Fuel:

| | |
|-------------------------|----------|
| 490 gal. at \$2.25/gal. | 1,102.50 |
|-------------------------|----------|

Geologist:

| | |
|-------------------------|----------|
| 16 man days at \$65/day | 1,040.00 |
|-------------------------|----------|

Assistant:

| | |
|------------------------|--------|
| 8 man days at \$35/day | 280.00 |
|------------------------|--------|

First Aid Attendant:

| | |
|------------------------|--------|
| 8 man days at \$53/day | 424.00 |
|------------------------|--------|

Camp Costs:

| | |
|--------------------------|----------|
| 104 man days at \$20/day | 2,080.00 |
|--------------------------|----------|

TOTAL

\$46,061.76

Average Cost Per Foot

\$ 21.05

Average Cost Per Meter

\$69.07

COST STATEMENT FOR WORK IN 1978 ON CLAIM JEFF 94

DDH 77, 77B1, 79, 79B1, 79B2, 80, 81 and 86 were drilled during August 8 - October 4, 1978 for a total of 3639.0 meters.

| | |
|---------------------------------------|---------------------|
| Direct Drilling Costs: | |
| 2500 ft. at \$12.20/ft. | \$30,500.00 |
| 2758 ft. at \$12.70/ft. | 35,026.60 |
| 3611 ft. at \$13.20/ft. | 47,665.20 |
| 2817 ft. at \$13.70/ft. | 38,592.90 |
| 253 ft. at \$14.20/ft. | 3,592.60 |
| Labour: | |
| 1285 hours at \$15.50/hr. | 19,917.50 |
| Machine Time: | |
| 306.5 hours at \$9/hr. | 2,758.50 |
| Equipment Used: | |
| Mini Deve 4051 ft. at \$1.25/ft. | 5,063.75 |
| Casing and Shoes | 1,586.70 |
| Wedges and Packers | 1,357.89 |
| Core Boxes: | |
| 478 at \$5.00 | 2,490.00 |
| Assays: | |
| 45 at \$28.90 | 1,300.50 |
| Fuel: | |
| 3820 gal. at \$2.25/gal. | 8,595.00 |
| Helicopter: | |
| 119.4 hours at \$250/hr. | 29,850.00 |
| Helicopter Fuel: | |
| 2685 gal. at \$2.25/gal. | 5,906.25 |
| Geologist: | |
| 58 man days at \$65/day | 3,770.00 |
| Assistant: | |
| 29 man days at \$35/day | 1,015.00 |
| First Aid Attendant: | |
| 29 man days at \$53/day | 1,537.00 |
| Camp Costs: | |
| 377 man days at \$20/day | 7,540.00 |
| TOTAL | <u>\$248,065.39</u> |
| Average Cost Per Foot | <u>\$20.78</u> |
| Average Cost Per Meter | <u>\$68.17</u> |

COST STATEMENT FOR WORK IN 1979 ON CLAIM JEFF 94

DDH 80B1, 80B2, 86B1, 86B2, 86B3, 88, 88B1, 88B2, 88B3, 88B4, 89, 89B1, 89B2, 89B3, 89B4, 89B5, 89B6 and 89B7 were drilled during July 1 - October 5, 1979 for a total length of 4069.8 meters.

Direct Drilling Costs:

| | |
|---------------------------|-------------|
| 1000 ft. at \$12.90/ft. | \$12,900.00 |
| 1610 ft. at \$13.40/ft. | 21,574.00 |
| 5804 ft. at \$13.90/ft. | 80,675.60 |
| 4682.5 ft. at \$14.40/ft. | 67,428.00 |
| 256 ft. at \$14.90/ft. | 3,814.40 |

Labour:

| | |
|---------------------------|-----------|
| 1328 hours at \$17.50/hr. | 23,240.00 |
|---------------------------|-----------|

Machine Time:

| | |
|---------------------------|----------|
| 480.5 hours at \$9.50/hr. | 4,564.75 |
|---------------------------|----------|

Equipment Used:

| | |
|----------------------------------|----------|
| Mini Deve 3626 ft. at \$1.50/ft. | 5,439.00 |
| Casing and Shoes | 860.40 |
| Wedges and Packers | 7,056.48 |

Core Boxes:

| | |
|---------------|----------|
| 535 at \$5.00 | 2,675.00 |
|---------------|----------|

Assays:

| | |
|---------------|----------|
| 73 at \$38.90 | 2,839.70 |
|---------------|----------|

Fuel:

| | |
|--------------------------|-----------|
| 4240 gal. at \$2.50/gal. | 10,600.00 |
|--------------------------|-----------|

Helicopter:

| | |
|------------------------|-----------|
| 150.9 hr. at \$270/hr. | 40,743.00 |
|------------------------|-----------|

Helicopter Fuel:

| | |
|-----------------------|-----------|
| 3395 gal. at \$3/gal. | 10,185.00 |
|-----------------------|-----------|

Geologist:

| | |
|--------------------------|-----------|
| 129 man days at \$85/day | 10,965.00 |
|--------------------------|-----------|

Assistant:

| | |
|---------------------------|----------|
| 64.5 man days at \$35/day | 2,257.50 |
|---------------------------|----------|

First Aid Attendant:

| | |
|-----------------------|----------|
| 64.5 days at \$65/day | 4,192.50 |
|-----------------------|----------|

Camp Costs:

| | |
|----------------------------|-----------|
| 838.5 man days at \$25/day | 20,962.50 |
|----------------------------|-----------|

TOTAL

\$332,972.83

Average Cost Per Foot

\$24.93

Average Cost Per Meter

\$81.81

TOTAL WORK PER CLAIM

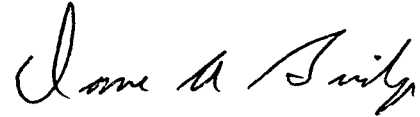
| | |
|-----------------------|---------------------|
| Jeff 92 (1979) | \$62,678.30 |
| Jeff 93 (1978) | 46,061.76 |
| Jeff 94 (1978) | 248,065.39 |
| Jeff 94 (1979) | 332,972.83 |
| Jeff 94 (1978 & 1979) | 581,038.22 |
| 1978 TOTAL | 294,127.15 |
| 1979 TOTAL | <u>395,651.13</u> |
| 1978 & 1979 TOTAL | <u>\$689,778.28</u> |

STATEMENT OF QUALIFICATIONS

I, Dane A. Bridge, of West Vancouver, British Columbia, hereby certify the following qualifications:

(a) I obtained a B.Sc. Hons., in 1969 and a M.Sc., in 1972 in geology from the University of Manitoba, Winnipeg, Manitoba.

(b) I have been practising my profession as a geologist in Canada for 11 years.




Dane A. Bridge
Esso Resources Canada Limited

STATEMENT OF QUALIFICATIONS

I, Terry R. Terriff of Vancouver, British Columbia hereby certify the following qualification:

I obtained a B.Sc. in 1975 in geology from the University of Calgary, Calgary, Alberta.

I have been practising my profession as a geologist in Canada for 5 years.



Terry R. Terriff
Esso Resources Canada Limited

STATEMENT OF QUALIFICATIONS

I am a bachelor of Science Honors graduate from the University of Manitoba (May 1977) and have been employed as an exploration geologist within the mining industry for five years.

Paul Godkin

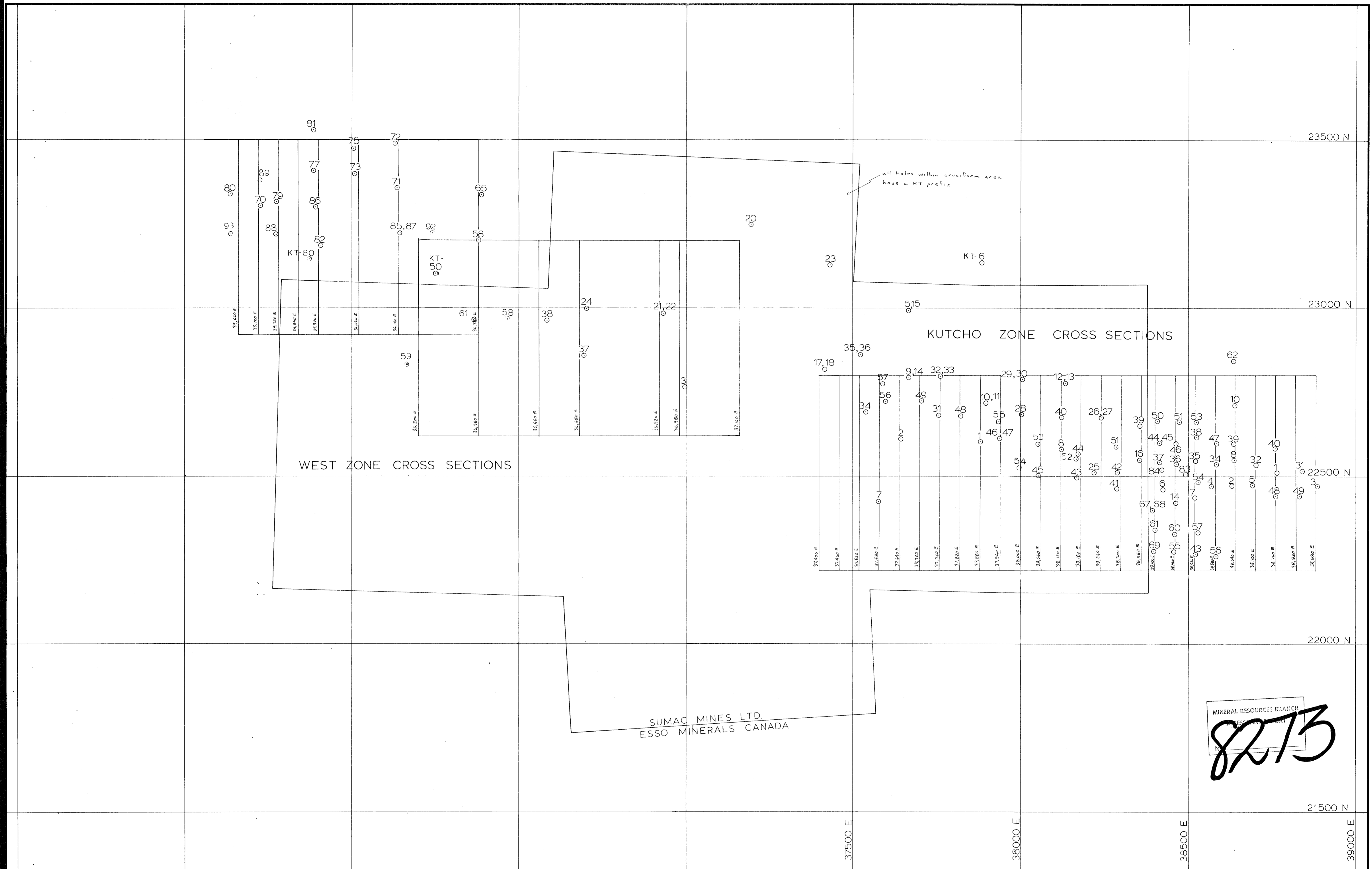
Paul Godkin

LEGEND FOR DETAILED DRILL LOGS - (D. Bridge)

The detailed drill logs are at a scale of 1 inch to 10 feet. All main units have been converted to metres.

The following is a list of abbreviations used in the drill logs:

| | | | |
|---------|----------------------------------|--------|----------------------------------|
| aph | aphanitic | ls | limestone |
| arg | argillite | med | medium |
| b | bedding | mgb | metagabbro |
| brn | bornite | pheno | phenocryst |
| bx | breccia | plag. | plagioclase |
| c > s | schist with chlorite > sericite | po | pyrrhotite |
| c > > s | schist with chlorite >> sericite | py | pyrite |
| cal | calcite, calcareous | QFCT | Quartz Feldspar Crystal Tuff |
| carb | carbonate | qz v | quartz vein |
| cgl | conglomerate | rhy | rhyolite |
| clino | clinozoisite | s > c | schist with sericite > chlorite |
| chl | chlorite | s >> c | schist with sericite >> chlorite |
| cp | chalcopyrite | s ^ c | schist with sericite ^ chlorite |
| dac | dacite | ser | sericite |
| dk | dark | sph | sphalerite |
| dolo | dolomite | trh | tetrahedrite |
| ep | epidote | v.f.g. | very fine-grained |
| fd | folded | w | with |
| feld | feldspar | xline | crystalline |
| f.g. | fine-grained | | |
| f | foliation | | |
| fr | fracture | | |
| frag | fragment | | |



SUMAC MINES LTD.
ESSO MINERALS CANADA

MINERAL RESOURCES BRANCH

8213

| REVISIONS | | | | REVISIONS | | | |
|-----------|---------|----------|----------|-----------|---------|----|----------|
| DATE | REV. NO | BY | APPROVED | DATE | REV. NO | BY | APPROVED |
| 20-03-98 | | D. G. J. | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

DIAMOND DRILL HOLE
LOCATION MAP and
CROSS SECTION INDEX
o DDH collar

SCALE: 1: 5000 DATE: 22-11-78
BY: RSD APPROVED:

ESSO MINERALS CANADA
A DIVISION OF ESSO RESOURCES CANADA LIMITED.

KUTCHO CREEK

DWG. NO