Office of the Supervising Mining Recorder
JUN 1 1979
WHITEHORSE
Yukon Territory

# KLINKIT JOINT VENTURE

## 1978 FIELD PROGRAMME

JUN - 1 1979

for

Duval International Corporation

and

Du Pont of Canada Exploration Limited

090470

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of
$ 81,300.00

Ruth Debicki
acting Resident Geologist or Resident Mining Engineer July 9/79

Considered as representation work under Section 53 (4) Yukon Quartz Mining Act.

B. R. BAXTER
Supervising Mining Recorder
for Commissioner of Yukon Territory

by

F.M. Smith, P.Eng.

MAY 1979

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## PONT(A) CLAIMS


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## SPECIFIC PROSPECT - PONT(A) CLAIMS (335-06)

### 1. LOCATION AND ACCESS

The PONT(A) claims are located north of Munson Lake and south of Hidden Lake on claim sheet 105-B-3, in the eastern edge of the Englishman Range, Cassiar Mountains, Yukon. The centre of the claim group is about 60°11'N and 131°20'W at the headwaters of Smart River.

The claims are only accessible via helicopter from Swift River, Yukon, 23 km south southeast of the PONT(A) group.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-73,74)

The PONT(A) claims cover a mountain ridge cut by three major creeks. The two southern creeks that flow into Munson Lake form the base of an inverted "Y" with the northern creek flowing to Hidden Lake as the top of the inverted "Y". The mountain enclosed by Munson Lake and the two south flowing creeks is a portion of a ridge that parallels the valley (that Munson Lake occupies in part) that swings northerly east of Munson Lake to Crescent Lake and southerly to the west towards Dorsey Lake.

The north faces of all ridges and mountains are particularly steep to sheer. Southerly and west facing slopes are usually gentle and covered with felsenmeer (talus).

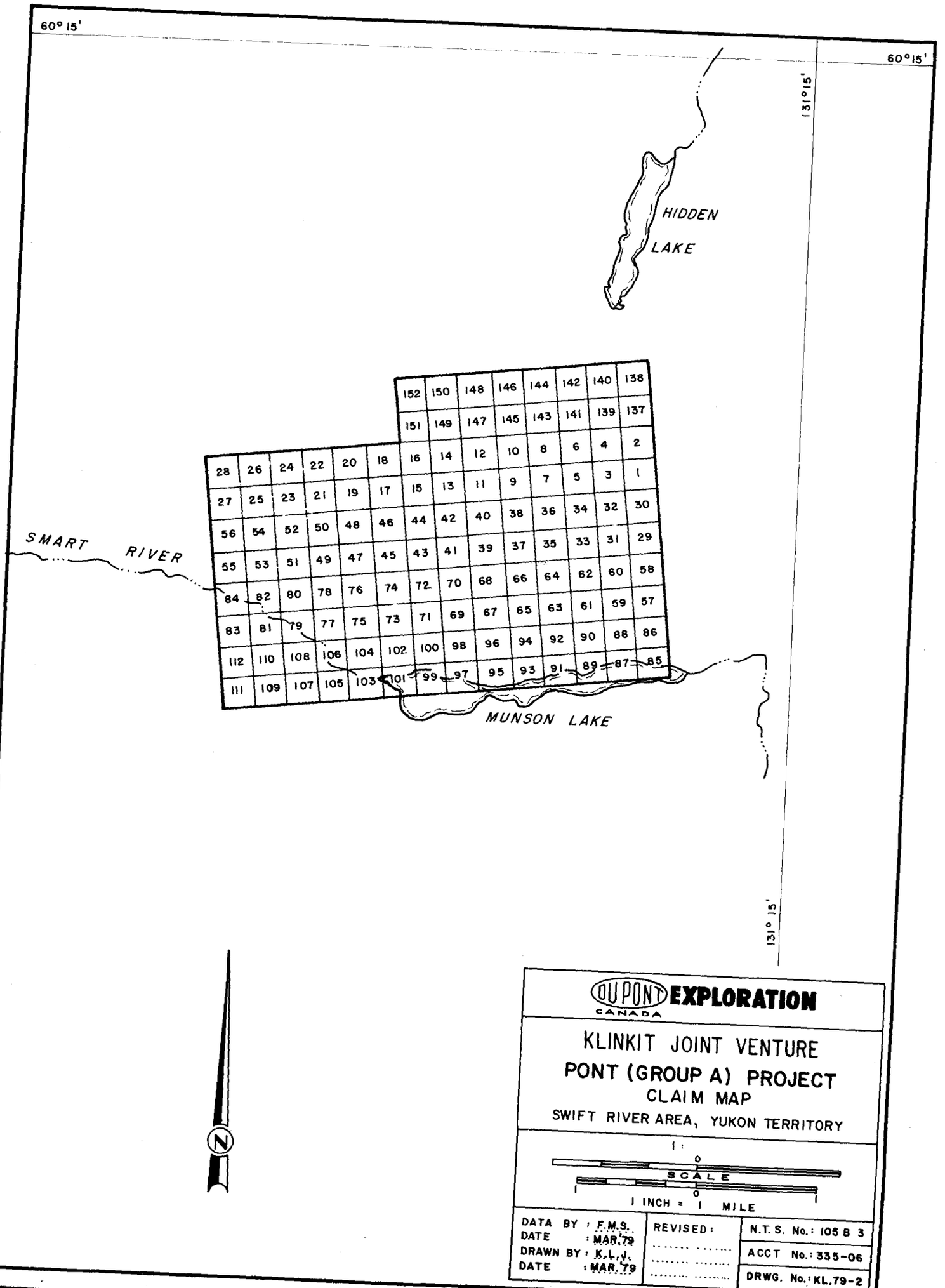
Vegetation is particularly thick in the two southern stream gullies and the lower portion of the south face above Munson Lake. The lowest valley areas and up to the 1400 m level are covered in up to 11 m tall black spruce, aspen, poplar and balsam. Above this the balsam is more diffuse and intergrown with 2 to 3 m tall ground birch. The upper elevation and most of the rest of the claims have scattered ground balsam, ground birch and sedges.

### 3. CLAIMS

The PONT(A) group consists of the following claims:

| Claim Name | Record Numbers | Date of Record |
|---|---|---|
| PONT 1-112 | YA29063 - YA29174 | 1978 06 09 |
| PONT 137-152 | YA29199 - YA29214 | 1978 06 09 |

The claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited.


60° 15'
60° 15'
131° 15'
HIDDEN
LAKE
152 150 148 146 144 142 140 138
151 149 147 145 143 141 139 137
28 26 24 22 20 18 16 14 12 10 8 6 4 2
27 25 23 21 19 17 15 13 11 9 7 5 3 1
56 54 52 50 48 46 44 42 40 38 36 34 32 30
55 53 51 49 47 45 43 41 39 37 35 33 31 29
84 82 80 78 76 74 72 70 68 66 64 62 60 58
83 81 79 77 75 73 71 69 67 65 63 61 59 57
112 110 108 106 104 102 100 98 96 94 92 90 88 86
111 109 107 105 103 101 99 97 95 93 91 89 87 85
SMART RIVER
MUNSON LAKE
131° 15'
N
DUPONT CANADA EXPLORATION
KLINKIT JOINT VENTURE
PONT (GROUP A) PROJECT
CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY
1 :
0
SCALE
0
1 INCH = 1 MILE
DATA BY : F.M.S.
DATE : MAR.'79
DRAWN BY : K.L.J.
DATE : MAR.'79
REVISED :
N.T.S. No.: 105 B 3
ACCT No.: 335-06
DRWG. No.: KL.79-2

## 4. HISTORY

The PONT(A) group is correlated with the Archer Cathro HIDDEN occurrence of skarn sulphides near Hidden Lake. Neither this occurrence nor the old claim posts were located during our traverses. We expect the zone is on the north and east side of the dioritic intrusive (Jqd - Unit 15 on the GSC map).

The nearby ground is the MUN, 4 km to the south of Munson Lake, with a scheelite skarn in Devono-Mississippian sediments and the STQ, 5 km to the east and southeast, where AMAX has drilled a pneumatolitic fluorite, cassiterite quartz breccia. There is no record of claims located or explored on the central portion of the PONT(A) group.

## 5. REGIONAL RESULTS

The PONT(A) group was located to cover a cluster of very anomalous tin values discovered in stream and side-hill sampling. The creek draining the southwestern portion of the property has six anomalous values, the southeastern creek two anomalous values and the side hill sampling on the southeast to south side has four anomalies. The analyses of the samples in Vancouver did not yield any further anomalous tin or any anomalous tungsten, uranium or molybdenum values.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The PONT(A) group was visited by Barr, Gunn and Smith on 1978 06 22 as part of the preliminary examination of the first phase of staking. During the three traverses on the property several gossans and unusual contact alteration zones were sampled. The following paragraph describes the early interpretation:

"Strong tin values in soils occur immediately north of Munson Lake - the source of which remain unexplained. A feldspathic skarn mineralized with galena, sphalerite, cassiterite(?) (DOX 2185, 2186) trends northerly, extending for about 30 m and across a maximum width of 1.5 m on a steep south-facing slope above a saddle. Similar material occurs 2 km north, on the north side of the batholith. Samples taken by the stakers of the claims of the northeast part of the property are combined into sample DOX 2062. Typical metasedimentary hornfels on the south side of the saddle is represented by sample DOX 3085. "

## 6.2 Geology

### 6.2.1 North Sheet PONT(A) Claims (Map KL 78-32)

The North half of the claim group is principally underlain by the Jura-Cretaceous quartz diorite (DFPQ) in contact with sediments of the Devono-Mississippian Sylvester group in the southern and western portions. Most of the sedimentary unit is an altered (hornfels) meta-argillite to tuffaceous argillite with major zones of bleached argillite as remnants between dykes and altered intrusive cusps.

The DFPQ is generally a monotonous medium to coarse crystalline diorite to granodiorite that weathers grey and is altered by later quartz, fluorite, feldspar porphyry and fine grained grey dykes (APLT ?). A gossanous zone noted by the stakers and analyzed as DOX 3062 appears to be an altered late substock into the DFPQ near the small tarn in the north central portion of the map sheet. This area will require detailed investigation as our reconnaissance geology failed to locate the source of this material.

### 6.2.2 South Sheet PONT(A) Claims

The principal rock unit underlying the south sheet is a strip of Sylvester group Devono-Mississippian age sediments between the Jura-Cretaceous quartz diorite on the north and a small substock of the Seagull Batholith Cretaceous age granite to quartz monzonite.

The contact of the two intrusive types and the sediments is not exposed due to heavy talus and felsenmeer cover. The DFPQ contact in the northeastern portion may be the cause of the skarn and moderate tin values noted in the headwaters of the eastern, south flowing creek.

A few anomalous side hill samples collected below the contact of the GCFB (Seagull Batholith substock) may be derived from this intrusive or alteration at the contact with the sediments. Due to lack of good exposure, the character and alteration of the GCFB is as yet only poorly defined. There appears to be at least two phases, a "Seagull" coarse phase

and white weathering subphase similar to the Jura-Cretaceous intrusive to the north.

Between the two intrusives, alteration of the limy phases and argillites to skarn and biotite and feldspathic gneiss is common. The lack of good bedding trends within the complex, folded, faulted and altered Sylvester sediments forced the mapping to be very preliminary in nature. Intruding the sediments are a series of quartz veins and possibly quartz rich aplites, but only the exposures in the extremely steep outcrop portions could be properly located. As these areas of quartz veins seem to be related to our anomalous tin values, the character, set and mineral constituents of the quartz veins must be analyzed before the economic significance can be understood.

For petrographic description, see Appendix.

## 6.3 Geochemistry

Side hill samples were collected mainly from the central portion of the claim group in an effort to try to locate the source area for the moderate to strongly anomalous side hill and stream tin values.

### 6.3.1 North Sheet PONT(A) Claims (Map KL 78-49)

A total of 72 samples were collected from the area covered by the north sheet. Of these samples only one area within the Jura-Cretaceous DFPQ is anomalous for tin and tungsten - all other results are background values. The anomalous area appears to be related to the "gossan" zone and mineralized area noted during the staking of the PONT(A) claims.

The values from the locality are not significantly anomalous for tin but will require field checking to determine if there are mineralized areas of economic interest.

### 6.3.2 South Sheet PONT(A) Claims (Map KL 78-50)

There are no significant tin values in the side hill samples from this area. There are several weak tungsten values on the western portion of the claims that are unexplained.

There is as yet no explanation for the moderate to anomalous tin values in the central and eastern portions of the sheet in streams and early side hill samples. The problem may be due to the effect noted at the SWIFT claims where side hill samples in areas of known 3000 ppm rock chip samples ran only slightly above background. We suspect the problem is due to the fineness of the cassiterite (as at SWIFT) and will re-sample streams in the area to determine the distribution of tin in the various size fractions.

### 6.4 Mineralization

No significant mineralization has been noted during any of the traverses and none of the grab samples analyzed for Sn and $WO_3$ ran more than background.

## 7. CONCLUSIONS AND RECOMMENDATIONS

There is as yet no explanation for anomalous tin values from the "first pass" geochemical sampling. The anomalous area on the North Sheet (for Sn and $WO_3$) may be of economic significance but insufficient information has been collected to determine the merits of this zone.

The PONT(A) area requires evaluation of the size fraction of the tin mineralization in the anomalous areas. All anomalous stations must be re-sampled with large volumes collected for a sieving test.

The anomalous area on the north sheet and the quartz/aplite dykes require some prospecting and evaluation to determine the economic significance.

If the small programme on the claims fails to indicate economically significant mineralization, the claims should be allowed to lapse on 1980 01 10.

# APPENDIX - PETROGRAPHIC DESCRIPTION

| | | |
|---|---|---|
| Sample Number: | PONT-3062 | |
| Mineralogy: | K-feldspar | 86 |
| | quartz | 4 |
| | sphalerite | 9 |
| | white mica | 0.5 |
| | carbonate | 0.5 |
| | zircon | tr |
| | monazite | tr |
| Classification: | altered granite | |
| Fabric and texture: | coarse-grained, porphyritic, holocrystalline, hypidiomorphic granular | |

Euhedral to subhedral K-feldspar is predominant in this section. It occurs in large (up to 1 cm) phenocrysts as well as in anhedral interlocking mosaic with quartz. Almost all the K-feldspar is perthitic; however, no graphic intergrowths are visible. The K-feldspar is strongly fractured. The fractures are either unhealed, or filled with K-feldspar and, less frequently, quartz. K-feldspar is in large part unaltered. White mica is occasionally visible as isolated shreds within the grains, or as small aggregates along the grain boundaries.

Quartz is anhedral, filling intersticies among the K-feldspar grains. It frequently poikiolitically encloses euhedral K-feldspar microphenocrysts. Undulatory extinction has not developed. Fine-grained quartzo-feldspathic groundmass is locally present filling intersticies among the feldspar grains. The quartz/K-feldspar ratio in the groundmass could not be determined, as the individual grains are too small for accurate identification. This groundmass is occasionally incipiently altered to aggregates of white mica.

Irregular patches of a dark brown, isotropic mineral, presumably sphalerite, are present throughout the section associated with zones of high fracture density (brecciation ?) Fine-grained, turbid mosaics of carbonate usually accompany the sphalerite peripheral to the grains. Rims of white mica are often visible around the sphalerite. Several grains of a mineral tentatively identified as monazite are present poikiolitically enclosed in the sphalerite.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## PONT(A) CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 289.74 |
| Camp Expenses | | 641.28 |
| Mapping, Gr. Surveys, Maps | | 3,440.55 |
| Freight, Hauling, Storage | | 54.24 |
| Assaying | | 1,194.54 |
| Salaries - Regular | | 1,360.32 |
| Salaries - Temporary | | 236.47 |
| Equipment Rental | | 145.73 |
| Stationery & Supplies | | 8.35 |
| Telephone | | 43.48 |
| Auto Expenses | | 16.82 |
| Repairs and Maintenance (Excl. Auto) | | 4.14 |
| Non Capital Equipment Purchases | | 73.32 |
| Depreciation Expenses | | 43.37 |
| TOTAL | $ | 7,552.35 |



60N
50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
70E
80E
Hidden Lake
Creek
Lake
DFPQ
ARGL
FGNS, BGNS
grey sediments
DBD
QF-PP
PONT 3062
PHOTO REGISTRATION
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
GEOLOGY
PONT (A) CLAIMS (NORTH)
SWIFT RIVER AREA, YUKON TERRITORY
m 300 200 100 0 10000 300 600 m
SCALE
MAPPED BY L.E., C.G., M.S.
DATE JUL.-AUG.'78
DRAWN BY K.L.J.
DATE OCT. '78
REVISED
N.T.S. No. 105 B
ACCT No. 335 - 6
DRWG No. KL.78 - 32

60N
50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
70E
80E
PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION
N
TALUS
METASEDS
TALUS - METASEDS - QV
FGNS/QV
QV
QTZT
No.1 PONT 69,70
No.2 PONT 67,68
QTZT/BGNS
QTZT/PY
QTZ
FGNS
TALUS
METASEDS
DFPQ
DFPQ/C\
TALUS
QTZT -
CHRT -
SKRN -
Lake
QTZT - PY - PO
Gossan
QTZT - SKRN
TALUS
QTZT - BGNS
QTZT - BGNS
GCFB
Minor DFPQ float
GCFB
FGNS
BGNS
BGNS
QTZT
FGNS
GCFB
GCFB
GCFB
BGNS - FGNS
QTZT
LAKE
LAKE

DUPONT EXPLORATION
CANADA

# KLINKIT PROJECT
# GEOLOGY
## PONT (A) CLAIMS (SOUTH)
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.-AUG. '78 | | ACCT No. 335 - 6 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78 - 33 |
| DATE | OCT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry, subphase intruding GCFB, cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS
CT = CASSITERITE
CP = CHALCOPYRITE
AG = AUGITE
GL = GALENA
GB = GARNET BERYL ( SKARN)
GD = GARNET DIOPSIDE
GM = GARNET MAGNETITE
GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)
HB = HORNBLENDE
HS = HULSITE
MG = MAGNETITE
MY = MALAYAITE
MS = MASSIVE SULFIDE
MU = MUSCOVITE
PG = PEGMATITE
PO = PYRRHOTITE
QC = QUARTZITE COBBLE
QT = QUARTZ TOURMALINE
QV = QUARTZ VEINS
SF = SERICITE FLUORITE
SL = SHEELITE
SP = SPHALERITE
WF = WOLFRAMITE
C\ = CONTACT ZONE
D\ = DYKE
EP = EPIDOTE
GP = GRAPHITIC
PP = PORPHYRY
TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)
CONTACT APPROIMATE OR ASSUMED
CONTACT OBSERVED
MORAINE ( edge of)
TALUS ( edge of)
FAULT
JOINTING, inclined, vertical
BEDDING, inclined, vertical
FOLIATION, inclined, vertical
AREA OF NUMEROUS GOSSANS
GOSSAN
OVERTURNED ANTICLINE
SKARN
ROCK SAMPE LOCATION
CHIP SAMPLE LOCATION
X FLOAT
Rock A / Rock B — ROCK A MORE COMMON THAN ROCK B
Rock A // Rock B — ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)
CLAIM POST
THIN SECTION LOCATION

DUPONT CANADA EXPLORATION

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
SWIFT RIVER AREA, B.C. & Y.T.

1 : 0
SCALE
0 1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : | 40 & 105B |
| DATE : SEPT. '78 | | ACCT No. : | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : | KL.78 - 35 |
| DATE : OCT. '78 | | | |

60N

50N

40N

30N

20N

10N

10E PHOTO REGISTRATION

20E

30E

40E

PHOTO REGISTRATION

50E

60E

PHOTO REGISTRATION

70E

80E

CLAIM BOUNDARY

8Ø2 2Ø2 26Ø2 4Ø2 1Ø2 1Ø2 1Ø2 1Ø2 12Ø2 1Ø2 1Ø2 1Ø2 4Ø2 1Ø2 3Ø6 2Ø6 8Ø6 2Ø4 2Ø8 6Ø6 7Ø6 14Ø6 4Ø4 10Ø8 16Ø6 9Ø6 7Ø2 8Ø18 56Ø2 7Ø2 2Ø55 64Ø4 75Ø2 16Ø2 7Ø2 3Ø2 7Ø6 5Ø2 5Ø2

1Ø2 1Ø2 1Ø2 3Ø4 3Ø4 2Ø2 1Ø2 1Ø2 2Ø2 1Ø4 2Ø2

5Ø2 1Ø2 2Ø2 2Ø2 2Ø2 2Ø2 1Ø2 5Ø2 9Ø2 3Ø2 6Ø2 2Ø2 4Ø2 2Ø2 4Ø2 3Ø2 15Ø2 2Ø2 1Ø2 2Ø2 2Ø2

## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M → 15 Ø 2.5 ← TUNGSTEN VALUE IN P.P.M.

6.5 URANIUM VALUE IN P.P.M.

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## PONT (A) CLAIMS (NORTH)
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 : 10000 300 600 m

SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No. 105 B |
| DATE | AUG-SEPT '78 | | ACCT. No. 335-6 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78-49 |
| DATE | NOV. '78 | | |

60N

50N

40N

30N

20N

10N

10E PHOTO REGISTRATION

20E

30E

40E

PHOTO REGISTRATION

50E

60E

PHOTO REGISTRATION

70E

80E

CLAIM BOUNDARY

## LEGEND

| | TIN | | TUNGSTEN |
|---|---|---|---|
| MEAN | = 4.52 P.P.M. | MEAN | = 3.72 P.P.M. |
| MEAN + 0.5 S.D. | = 8.55 P.P.M. | MEAN + 0.5 S.D. | = 6.00 P.P.M. |
| MEAN + 1.0 S.D. | = 16.21 P.P.M. | MEAN + 1.0 S.D. | = 9.65 P.P.M. |
| MEAN + 1.5 S.D. | = 30.70 P.P.M. | MEAN + 1.5 S.D. | = 15.53 P.P.M. |
| MEAN + 2.0 S.D. | = 58.16 P.P.M. | MEAN + 2.0 S.D. | = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M. — 15 (R) 25 — TUNGSTEN VALUE IN P.P.M.

6.5 — URANIUM VALUE IN P.P.M.

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## PONT (A) CLAIMS (SOUTH)
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m

SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No 105 B |
| DATE | AUG-SEPT '78 | | ACCT. No 335-6 |
| DRAWN BY | K.L.J. | | DRWG No KL.78-50 |
| DATE | NOV. '78 | | |




DU PONT EXPLORATION

# KLINKIT PROJECT
# PHOTOMAP
## PONT (A) CLAIMS (NORTH)

SWIFT RIVER AREA, YUKON TERRITORY

SCALE m 300 200 100 0 1:10 000 300 600 m

| | | | |
|---|---|---|---|
| | L.E., C.G., M.S. | | 105 B |
| DATE | JUL.-AUG.'78 | ACCT. No. | 335 - 6 |
| DRAWN BY | K.L.J. | DRWG. No. | KL.78 - 73 |
| DATE | SEPT.'78 | | |


50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
70E
PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION
0
1000 m
1:10 000
N
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
PHOTOMAP
PONT (A) CLAIMS (SOUTH)
SWIFT RIVER AREA, YUKON TERRITORY
1:10 000
m 300 200 100 0 300 600 m
SCALE
MAPPED BY L.E., C.G., M.S.
DATE JUL.-AUG.'78
DRAWN BY K.L.J.
DATE SEPT.'78
105 B
ACCT No. 335-6
DRWG No. KL.78-74

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DU CLAIMS


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## DU CLAIMS


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## SPECIFIC PROSPECT - DU CLAIMS (335-07)

### 1. LOCATION AND ACCESS

The large DU claim block covers a complex of ridges, aretes, cirques and stream-glaciated valleys. The claim group is centred on a northeast-trending 'U'-shaped valley crossing from Dorsey Lake in the southwest to a tributary of Ram Creek in the northeast. The southern portion of the claims covers the south-facing hillside above Dorsey Lake and Smart River. The northern portion covers the headwaters of an unnamed creek flowing into Morley River to the northwest. The claims are principally in 105-B-4 with the northern portion of the claims in 105-B-5, Watson Lake MD, Yukon. The central area of the group is at about 60°12'N and 131°35'W.

The claims are at present only accessible by helicopter from Swift River, Yukon, about 35 km to the southeast. Dorsey Lake, to the southwest, is usable by fixed-wing float aircraft for staging to the project area; a "winter" road to the west runs within 4 km of Dorsey Lake.

### 2. PHYSIOGRAPHY AND VEGETATION (Maps KL 78-57,58,59,60,61)

The southern portion of the claim block is the only part with thick vegetation, especially on the south and southwest-facing hillsides above Dorsey Lake. Black spruce covers all lower slopes in this area and the valley floor in the northwestern portion of the claims. Thick balsam, with almost impenetrable ground birch (2 to 3 m tall), cover the intermediate portions of the south-facing slope with scattered patches of ground birch with minor ground balsam covering the lower alpine areas and the cirque floors elsewhere on the claims. Alpine areas are restricted to patches of sedges and wild flowers with scattered areas of low ground birch.

The complex physiography can best be described as a plateau incised by several ages of cirque valleys, the youngest north-to-northeast trending, with all southern slopes of subdued topography. The alpine areas are felsenmeer-covered in the plateau, southern slopes and bases of cliffs. Cirque headwalls consist of extremely steep to sheer faces.

131° 45'

131° 30'

60° 15'

60° 10'

SLIDE

MC

SLIP

SWIFT

DU

JILL

239 FR.

110 Fr. 19 Fr.

11 Fr.

SMART RIVER

DORSEY LAKE

N

OU PONT CANADA EXPLORATION

KLINKIT JOINT VENTURE

DU, SLIP & SWIFT PROJECTS

CLAIM MAP

SWIFT RIVER AREA, YUKON TERRITORY

SCALE

1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No.: 105 B4,5 |
| DATE : MAR.'79 | ..... ..... | ACCT No.: 335-00 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No.: KL.79-1 |
| DATE : MAR.'79 | ..... ..... | |

## 3. CLAIMS

The DU group consists of the following claims:

| Claim Name | Record Numbers | Date of Record |
|---|---|---|
| DU 1-160 | YA28903 - YA29062 | 1978 06 09 |
| DU 160-167 | YA34223 - YA34230 | 1978 07 20 |
| DU 168 Fr. | YA34231 | 1978 07 20 |
| DU 169-208 | YA34232 - YA34270 | 1978 07 20 |
| DU 210 | YA34272 | 1978 07 20 |
| DU 215-225 | YA34277 - YA34287 | 1978 07 20 |
| DU 232-238 | YA34294 - YA34300 | 1978 07 20 |
| DU 239 Fr. | YA34301 | 1978 07 20 |

All claims are recorded in the Watson Lake MD, Yukon, in the name of Du Pont of Canada Exploration Limited.

## 4. HISTORY

The DU claims (1-160) were located to cover the area of extremely anomalous tin in stream and side hill samples. Samples were analyzed for tin by wet colourimetric method at a field lab at Swift River. The pulps from the samples were then analyzed by Min-En Laboratories for $MoS_2$, $WO_3$, U, and Sn to check for further anomalous sites. This second suite of results indicated the DU claims should be expanded to the south and southeast to protect anomalies above Dorsey Lake.

Previous staking in the area consisted of the CAN claims to the east of the southern portion and a small block of JC claims to the west in an area of old trenches and the winter road. After the DU 1-160 claims were located, Cam Stephen on behalf of the DC Syndicate (owners of the JC and CAN claims), located the ZINC claims and expanded the JC claims. During this activity, Welcome North was staking the MC, SLIDE and SWIFT group to overlie the ZINC, western edge of the DU's and bound the SLIP group on the south and west. Len Peever and A. Johnson staked the FUR group on the south-eastern edge of the JC claims at the same time (but before) the location of the extension of the DU claim block to the south.

Cam Stephen located the CAN, JC, etc. claims to cover skarn tungsten (tin) mineralization in the Sylvester sediments at or near the contact with the Seagull Batholith. Welcome

North staked the original SLIDE, SWIFT and MC claims to cover air-magnetic anomalies of unknown cause and gossans similar in colour to gossans on the DU claims. Welcome North analyzed a few rock samples collected by the stakers and came up with very anomalous tin values in altered sediments and intrusives.

Mineralization has been known to occur in the area since work in the late 1940's when Hudson Bay Mining & Smelting explored for massive sulphide/vein silver, lead and zinc to the west of the DU area. There has been no known physical exploration for mineralization on the DU claims but several ages of sample flags were noted in major creeks draining the property.

## 5. REGIONAL RESULTS

Approximately 85 samples were collected from the general area of the DU group in our reconnaissance programme. Half of these samples were collected as side hill "break of slope" samples to attempt to determine the relation of the "DU" gossan to the first extremely anomalous value determined from our first pass. The anomalies all appeared to be related to an orange/red to orange red/brown gossaned granite intrusion ("DU" intrusion) into any of the sediments or granite of the Englishman Range. This gossan zone was noted in all anomalies on the DU, VAL(B), SLOUCE and PONT(A). Due to snow cover, we could not determine the cause of the anomalies in all areas of the DU project; hence, a large block of ground was located.

The analysis of samples at Min-En Laboratories in Vancouver indicated there were more anomalies to the south, especially for tungsten, with three streams very anomalous in tin. Thus the DU group was enlarged to protect the tin/tungsten anomalous areas to the south and southeast.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

Several traverses were made in the area of the DU claims by Barr, Gunn and Smith on 1978 06 22. The "DU" intrusive, greisen zones, the headwall of DU cirque (roof pendant) and the eastern edge of the southern plateau were traversed. Tin mineralization was noted and sampled in the area of the "DU" intrusive (GMDQ) in veins with quartz in altered granite. A 30 cm chip from the greisen ran 0.21% Sn. Tungsten mineralization was located in the southeastern area in gossanous granite. Huebnerite (determined by powder

diffraction) crystals occur in quartz veins in areas of alteration above and lateral to the contact of a GMDQ intruding the Seagull phase (GCFB). Representative vein shards assayed 1.78% $WO_3$ and 0.035% Mo.

## 6.2 Geology

### 6.2.1 Northwest Map, DU Claims (Map KL 78-16)

The oldest units in this quadrant of the DU claims are argillites (ARGL), quartzites (QTZT) and limestones (LMST) of the Devono-Mississippian Sylvester Group. The sediments are drag folded and napped in the southeast into a tight anticline at the top and north face of a sharp arete. Although stratigraphic correlation throughout this area of the Seagull Batholith has only been attempted in a few localities, there is evidence for overturning of the sediments in the roof of the batholith. The argillites in the area of the limestone appear to be the more volcanowacke-rich upper portion of the Sylvester in the Joint Venture area, and the limestone unit appears to be the "thick" lime member noted in other claimed areas in the region. The thin remnant of argillite in the nose of the nap is probably lower Sylvester argillite. The remaining outcrops of sediments are altered argillites, arenaceous argillites and volcanowackes. Folding, faulting and pyrometasomatic alteration have complicated the geology of the sedimentary sequence so as to hinder the definition of individual units and their exact sequence in this area of the DU claims.

At least two phases (GCFB and GMDQ) of the Cretaceous granitic Seagull Batholith intrude the Sylvester sequence. In the northern portion of the map sheet, the top of the Seagull phase (GCFB) is in contact with a thick zone of extensively altered sediments. The Seagull phase in this area is a fresh, coarse-grained granite with equigranular K-feldspar, grey quartz and plagioclase, and minor finer-grained black biotite and K-feldspar. The central portion of the map sheet is the type locality of the "DU" intrusive phase (GMDQ), exhibiting preserved roof xenoliths of sediment, sediment in contact with altered Seagull phase, and highly altered Seagull phase

directly above "DU" phase. The alteration of the roof consists of greisen veins, quartz-sericite (chlorite) vein envelopes, clay-mottling of Seagull phase, and pervasive sericite replacement of plagioclase (and to a lesser degree K-feldspar) of Seagull phase granite.

The GMDQ granite has phenocrysts of black (anhedral) quartz eyes and zones of black quartz eyes and microcline phenocrysts in a groundmass of fine-grained alkali feldspar, black quartz and minor biotite. The rock is commonly orange/red to red/brown-stained on weathered surfaces, and orange on "fresh" hand specimen surfaces. Parallel east-west greisen veins (0.5 cm to 2 cm wide) and quartz-sericite-chlorite vein envelopes (0.5 m to 5 m wide) occur in the exposed portions of the intrusive, both near its roof contact (in sets several metres apart) and in the lower portions (in sets usually tens of metres apart). Cassiterite, tourmaline, fluorite and quartz fill the core of greisen veins and occur in patches in the pegmatitic roof of the intrusive.

The enclosed appendix contains copies of petrographic work on samples of greisen and granite (B through J and Du-B8) from this map area. The following are the relationships of petrographic descriptions to field identification:

| Sample | Field Name |
|---|---|
| B(1,2,3) | Greisen - magnetic variety after GMDQ. |
| C | Typical "DU" intrusive, i.e. GMDQ dark quartz-eye porphyry. |
| D | Altered GMDQ, quartz-feldspar porphyry. |
| E | Greisen after GMDQ. |
| F | Weak greisen after GMDQ. |
| G | Strongly altered GMDQ related to greisen. |
| H | Strongly altered GMDQ related to greisen. |

| Sample | Field Name |
|---|---|
| I | Greisen after GMDQ. |
| J | Greisen after GMDQ. |
| DU B8 | Greisen after GMDQ. |

6.2.2 Northeast Map, DU Claims (Map KL 78-17)

Only one traverse was completed on the northeast quadrant. The purpose of the traverse was to attempt to explain a red/brown gossan on a small spur in the central portion of the sheet to the northwest of "Ice Rink Lake". The gossan is due to a fahlband zone in the basal portion of what is probably the volcanowacke to argillite package in the youngest portion of the Sylvester sedimentary assemblage. At the northeastern end of the ridge complex in the headwaters of Ram Creek is the western edge of the Jurassic quartz diorite (DFPQ) intrusive. This unit is very coarse-grained with large plagioclase, interstitial quartz and chlorite after hornblende or biotite. In the contact zone, small amounts of malayite(?) (yellow-green fluorescent mineral) and scheelite were noted on joint faces.

6.2.3 Southeast Map, DU Claims (Map KL 78-19)

The Seagull Batholith underlies most of the claimed ground in the area of the southeast quadrant of the DU claims. In the northern portion of the map, the Cretaceous batholith is in contact with the "thick" lime of the Devono-Mississippian Sylvester Group. Skarn and malachite gossans are developed in this area on ground probably controlled by the owners of the CAN claims. On the extreme southern portion of the map, a small roof pendant of the central member of the Sylvester group is preserved by block faulting. This altered sedimentary assemblage is the "thin" limestone, argillite, chert-quartzite series above the thick limestone and below the argillaceous volcanowacke member.

The folded, faulted and highly altered sediments have skarn zones after some of the limy members, gneiss and schist after most of the

argillite, and beds of relatively unaltered chert to quartzite. The skarns are massive garnet-diopside to garnet-magnetite with no known scheelite. Cutting the sediments are a series of vertical, randomly spaced veins carrying quartz, fluorite and huebnerite (or cassiterite).

The Seagull Batholith can be seen in this area to consist of three distinct subphases and a fourth mapped apparent subphase without distinct contact zones.

The proposed oldest granitic rocks are the Seagull phase (GCFB) of the batholith. This monotonous, medium to coarse crystalline granite to quartz monzonite commonly has large plagioclase and microcline (or K-feldspar) in a finer-grained groundmass of two feldspars, quartz and biotite. The granite varies from virtually equigranular, to K-feldspar porphyry, with the different textures all occurring in one small outcrop or in outcrops over several hundreds of metres. There are two defined intrusives into the Seagull phase. The proposed older of the two (however, no cross-cutting contacts have been located yet) is the "DU"-type (GMDQ), consisting of a gossanous, orange-weathering, black quartz eye or black quartz eye and K-feldspar porphyry granite with a fine grained groundmass of two feldspars, quartz and metallic black biotite (lepidomelane?). This intrusive has sharp contacts with a GCFB and probably with the questionable subphase called "grey granite" (MPFP). The GMDQ is greisened and appears to greisen the Seagull phase with quartz-tourmaline-fluorite-wulframite veins (see petrography for DU-5 QSP and 3056).

The third subphase is called GMQP. It is a light coloured, grey quartz-eye porphyry granite to quartz monzonite that in the southeast corner of the claims appears to cut and alter the Seagull phase. In the northwest, GMQP appears to be mixed with and cross-cut the Seagull phase. GMQP may be a late variant of the Seagull phase which formed while GCFB was still relatively plastic with fully crystallized portions. There does not appear to be any mineralization of interest in the contact of these two types of granite, nor is GMQP greisened.

The final intrusive phase mapped (possible subphase) is the MBFP. This monzonite may be intruded by the gossanous "DU" intrusives (GMDQ) and the GMQP, but no contacts have been located. The unit causes unusual alteration of the Seagull phase over a large area of the map. GCFB is in contact with sediments, shifting from a gneissic texture at the sediment contact to typical crowded porphyry granite, then becoming black for ten to twenty metres above the presumed contact with the MBFQ. Although the proposed contact is probably fully covered by talus, the alteration of the Seagull phase increases markedly from the cliff outcrops to the edge of the scree. Amongst scree lower down on the hillside, fresh MBFP outcrops in scattered small patches and in the valley floor in the headwall of the cirque.

In the contact alteration zone, the blackened zone has parallel north-south vertical vein greisen sets. Most are filled with fluorite, quartz and carbonate, with minor sulphides. Alteration of the Seagull phase produces several colours of rock, including a pervasive light yellow and a light green as apparent overprints on the "black" alteration. In the scree below this area of greisen, a 2 cm thick vein of cassiterite, quartz, fluorite, sericite and carbonate was found as float (see petrographic description for S-23-1-3). From the same scree, several pieces of vein quartz with fluorite and huebnerite were collected. The source has not been found for the float but is presumed to be from the sheer cliff outcrop of metasediments.

6.2.4 South Extension, DU Claims (Map KL 78-20)

Only two traverses have been completed on the area of the southern portion of the DU claims. The first traverse covers the south and eastern area in and around the FUR claims to determine if the anomalous tin values in the area are derived from the cusp area on these claims (which were offered for acquisition at the time of examination). The principal unit on this portion of the DU claims is the Seagull phase of the batholith. Only very minor pegmatite was noted at or near the contact

with the altered sediment (schist) which occurs as a small circular roof pendant on the FUR claims.

On the northeast, the felsenmeer-covered area is Seagull phase of the Seagull Batholith with a small dyke of GMQP in an area of quartz veins, pegmatite and greisen. The remainder of the area has not been traversed, but from the helicopter, the felsenmeer-covered area appears to be all granite. The soil samplers brought back several rock chip samples from the un-mapped areas and all appeared to be granite of the Seagull phase.

6.2.5 Southwest Quadrant, DU Claims (Map KL 78-18)

This portion of the DU claims (and the mapped eastern portion of the SWIFT claims) covers the sedimentary roof pendants and thin preserved roof of the Seagull Batholith and intruded sediments.

To the northeast is a northwest-trending ridge that is cut by the fault on the DU northwest map sheet in the area of the "DU"-type intrusive. This ridge consists of the chert and quartzite to argillite unit of the middle Sylvester sequence of the Joint Venture project area. The thin roof pendant of argillite in the east-central area, and the crest of the east-west cirque headwall zone of argillite terminating in the east central portion of the map area are both probably part of the basal member of the Sylvester sequence. Due to the alteration and preliminary nature of mapping of the sedimentary rocks in this area, the definition of an exact sedimentary sequence is not possible at this time.

The cirque floors and lower portions of arete side-walls contain outcrops of the Seagull phase (GCFB) of the Cretaceous Seagull Batholith. Because of the steepness of cirque walls, few of the contact zones (GCFB to Sylvester sediments) have been mapped on north-facing walls. Scree float (probably derived from the contact) consists of pegmatite, greisen (vein and pervasive alteration), aplite and adamellite. The adamellite appears to be a young granitic unit contained totally

within the Seagull phase in the area of the sharp northwest-trending arete in the northeast to east-central portion of the map. All samples collected of this material contain considerable cassiterite (see sample E-78-8-15-129 petrography). Alteration related to tin mineralization appears to be of the "rapakivian" type, i.e., soda feldspar overprint on existing K-feldspar. Late carbonate and fluorite occupies interstices between quartz and feldspar cyrstals. This adamellite has not been noted anywhere else in the Seagull Batholith. Immediately south of the exposure of this unit is a small roof pendant of argillite with aplite dykes. Further south in the large 'U'-shaped valley leading to "Ice Rink Lake Pass" is a complex swarm of aplite (FBQP) dykes in the GMPQ phase. This subphase of the Seagull Batholith appears to alter the Seagull phase but contacts were not visible in this principally felsenmeer-covered slope.

Further south, in the south-central portion of the map, is the extreme north end of a "DU"-type intrusive and related alteration of the Seagull phase (GCFB/SF-QV). The cirque basin on the SWIFT claims between this ridge area and the ZINC/DU claim boundary has not been traversed.

## 6.3 Geochemistry

### 6.3.1 Northwest Quadrant, DU Claims (Map KL 78-37)

There are no major geochemical anomalies amongst the 69 samples collected on the northwest sheet. Sampling done before the locating of the DU claims was not repeated during our evaluative project, nor were the locations of the samples sufficiently accurate to allow comparison to the plotted values. The stream draining the cirque on the east side of the GMDQ ran 255 ppm Sn; most of the tin is in the +40 mesh fraction. Side hill samples, from the gossanous east-west fault zone in the east central portion, collected in the reconnaissance programme were considerably anomalous in spot highs. Of 45 samples, eight were 60 ppm or higher with three samples of 190, 195, 230 ppm Sn.

The exposed area of the GMDQ appears to have an extremely variable amount of tin in restricted zones. The tin probably is related to small patches of pegmatite in the roof of the late "DU" phase or in greisen zones both within the "DU" granite and in the capping Seagull phase or Sylvester sediments.

6.3.2 Northeast Quadrant, DU Claims (Map KL 78-36)

There are no anomalies amongst the 39 samples collected in this quadrant of the DU claims. As most of the outcrop is sedimentary, the low background is normal for Sylvester sediments.

6.3.3 South Extension, DU Claims (Map KL 78-39)

This map covers any traverses made in the eastern and southern portion of the geology map, southeast quadrant, DU claims, and includes 212 samples collected from both areas. The cirque in the northeast portion of the map has several single sample anomalies in the area of the greisen which were produced by either the "DU" zone or MBFP. Even though vein cassiterite grading several percent Sn and large veins with patches of huebnerite (or wulframite) have been collected from this area, the overall tin and tungsten values are not generally anomalous. The grain size of economically significant mineralization, the lack of chemical dispersion of tin and tungsten, and the possible restricted number of veins carrying cassiterite and/or wulframite are probable controls of the geochemical results.

The source of anomalous tin geochemistry zones within the remainder of the sampled area are as yet unlocated. The anomalies are of sufficient magnitude and character (number of hits, slope and local geology) to indicate that there are zonesof mineralization in the felsenmeer-covered plateau area that require further sampling to locate precise source areas.

### 6.3.4 Southwest Quadrant, DU Claims (Map KL 78-58)

This portion of the geochem sampling (278 samples collected) of the DU claims has the most intense and the highest background for tin in major portions of the Seagull Batholith. The anomaly in the central portion of the map on the north face of the complex cirque is of extremely high intensity for at least 800 m along the face of the cirque. The anomaly in the southeast corner of the sheet appears to be related to the complex intrusive zone of aplites and late phases of the Seagull Batholith. The cause of the anomalies in the west and southwest portions of the map (actually part of the SWIFT project) have not been determined. This area appears to have a mixture of zone, spot and high background for tin and/or tungsten values. As part of the subcrop in this area is sedimentary with known limy horizons, the possibility of tin-tungsten skarns requires evaluation.

## 6.4 Mineralization

All samples grading better than 0.10% Sn and 0.10% $WO_3$ have been plotted on the appropriate map. The vein sample (S-23-1-3) from the southeast quadrant cannot be taken as representative for the area, as a greisen chip along 1 m ran (S-8-3-16) 0.01% Sn. Sample E-78-8-15-129 appears to be a representative sample from a large area of mineralization requiring size and average grade determination. The Jurassic quartz diorite with scheelite and a yellow fluorescent mineral graded (E-78-7-31-65) 0.03% $WO_3$ and less than 0.01% Sn.

On the northwest map sheet, cassiterite crystals have been recovered from pegmatitic portions of the roof of GMDQ and from greisen in the granite; however, chip samples in the anomalous fault zone in the east-central portion all were less than 0.1% Sn. To date no economic zone of tin mineralization has been found on this portion of the DU claims.

All geochemically anomalous areas have not been sampled for tin or tungsten mineralization as all results for the project area were not available before time and 1978 budget limitations ran out.

## 7. CONCLUSIONS AND RECOMMENDATIONS

Significant zones of anomalous geochemistry and mineralization have been discovered on the DU claims as a result of preliminary reconnaissance mapping and sampling. All described geochemical anomalies and mineralized areas require careful sampling and mapping along with trenching of mineralization grading over 0.2% Sn or 0.4% $WO_3$. The evaluation of anomalies in the south extension area requires more detailed reconnaissance sampling; most other areas require grid and/or topographically-controlled sampling. Bulk samples will be required from all varieties of mineralized areas grading over 0.2% Sn or 0.4% $WO_3$ for evaluation of recoverable metals, grain size of mineralization, and type of minerals with tin and tungsten values.

Vancouver Petrographics Ltd.

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PHONE (604) 533-1155

1 August, 1978

Mr. F.M. Smith
c/o Gerghaty Lodge
General Delivery
Swift River
Yukon Territory

Dear Sir:

Enclosed are the following thirteen of sixteen petrographic descriptions:

| | |
|---|---|
| B (1,2,3) | greissen/vein quartz |
| C | granite (quartz eye porphyry) |
| D | quartz monzonite/granite |
| E | monzonite |
| F | orthosyenite |
| G | orthosyenite |
| H | quartz diorite/granodiorite |
| I | greissen/vein quartz |
| J | tourmalinized monzonite |
| PONT-3062 | granite |
| SK-12 | greissen/silicification |

Identification of the three remaining samples is as follows:

| | |
|---|---|
| SK-9 | biotite-cordierite-garnet schist (?) |
| DU-S-3056 | greissen/vein quartz |
| DU-S-3060 | tourmalinized granite |

These samples are being held pending completion of scanning electron microscope (SEM) scans and analyses to ascertain the locus of anomalous Sn-W assays and/or confirm mineral identification. We regret the unavoidable delay which results from limited access to the SEM. In the future, petrographic descriptions will be forwarded immediately upon completion, and a follow-up memorandum will give the results of additional analyses.

The thin section, prepared reject slices, and sample remnants will be returned directly to Mr. D. Barr in Vancouver as soon as possible. Please direct any questions regarding these descriptions or the SEM analyses to Mark Bloom c/o Vancouver Petrographics. Thank you for using our services.

Very truly yours,

Mark S. Bloom

| Sample Number: | B | 1 | 2 | 3 |
|---|---|---|---|---|
| Mineralogy: | quartz, K-feldspar | 88 | 86 | 87 |
| | opaque | 7 | 5 | 10 |
| | muscovite/sericite | 2 | 4 | 2 |
| | carbonate | 3 | 3 | 1 |
| | zircon | tr | tr | tr |

Classification: greissen or vein quartz

Fabric and texture: The three sections cut from B differ primarily in the mode of the accessory constituents, and will thus be combined in this description. Minor textural and modal variations will be pointed out in the following discussion.

Quartz and K-feldspar are the primary constituents of the sections. They occur in an interlocking mosaic with exceedingly irregular grain boundaries. Quartz predominates over the K-feldspar in a ratio of approximately 10:1. The K-feldspar is not twinned, does not show cleavage, and is not significantly more altered than quartz. A more accurate estimate of the quartz/K-feldspar ratio cannot be made without staining for the K-feldspar. B1 has been cut to show the vein and selvedge. The vein and host differ most distinctly in alteration, and in the mineralogy and habit of the opaques. Alteration consists of muscovite/sericite and carbonate. The white mica most frequently occurs in small, randomly-oriented shreds located along the grain margins. It also occurs in large, optically continuous flakes which may be of primary igneous origin. Carbonate partially replaces the muscovite flakes but is intergrown with the fine-grained white mica. The carbonate characteristically occurs as irregular patches in the host. Moreover, it is confined to the host and does not appear in the vein. The opaques are predominantly iron-titanium oxides (magnetite-hematite-ilmanite). In the host the opaques occur as aggregates of laths which may appear as irregular patches in hand specimen. Pyrite is present, and is confined to, the host. It occurs in microveinlets and occasional euhedral grains which appear to have been present before growth of the oxides. Within the vein, and adjacent to the vein wall, the oxides are finer grained and irregualr in outline. They again become more lath-shaped and larger inward into the vein.

B2 is cut to show large patches of the magnetic opaque. It also appears to cut the vein. The relationships of the primary constituents, opaques, and alteration are consistent with B1; however, several features merit consideration. Several grains of an unidentified mineral are intergrown with the opaques in the vein. It is colourless, non-pleochroic, of high relief and low birefringence, and is uniaxial positive. In all respects except the low birefringence, it resembles zircon. It may be a tin silicate; the same mineral occurs in other sec-

tions, and will be scanned with the SEM to ascertain its composition. Also of interest is the carbonate associated with the opaques in the vein. It is coarse, stained red, and fills intersticies among the opaque laths. The texture suggests contemporaneous or slightly later growth with respect to the opaque. Although carbonate is also associated with opaques in the host, the texture there is interpreted as superimposed alteration. As in B1, but more clearly shown, carbonate replaces large flakes of muscovite.

B3 is cut to show a banded zone as well as a concentration of opqaue laths. Both vein and host are present in this section. The relationships previously discussed are also visible in this section. Several observations are worthy of note. The "banded" zone appears to be a a coarse-grained quartz-opaque-carbonate vein, possibly later than the veins in B1 and B2. The quartz often shows two or more growth zones. The innermost zone is clear and practically devoid of inclusions. The outer (or intermediate, if more than two growths zones are present) is crowded with minute solid and/or fluid inclusions. The nature of the inclusions could not be determined. If additional growths zones are present, they are once again low in inclusion content. The center line of this vein may have been vuggy. These vugs are now filled with coarse-grained carbonate similar to the carbonate associated with the opaques in the B1 and B2 veins. Adjacent to the coarse-grained quartz on one side is presumably another vein. The grainsize is distinctly smaller, but the opaque-carbonate association typical of veins in B1 and B2 is present as well as the absence of carbonate alteration. On the opposite side of the coarse-grained vein is host similar in all respects to the host in B1 and B2. The overall texture in this sample may represent superimposed quartz veining in a silica-flooded (greissen) environment.

Sample Number: C

| Mineralogy: | | |
|---|---|---|
| | quartz | 32 |
| | K-feldspar | 38 |
| | plagioclase | 28 |
| | biotite | 2 |
| | white mica/clay | tr |
| | zircon | tr |
| | opaques | tr |

Classification: granite (quartz-eye porphyry)

Fabric and texture: coarse-grained, porphyritic, holocrystalline, hypidiomorphic-granular

Quartz, K-feldspar, and plagioclase are present in subequal proportions in a typical granitic texture. Quartz is generally anhedral, filling intersticies among the feldspar. It also occurs as rounded phenocrysts. The phenocrysts poikiolitically enclose minute grains of feldspar and occasional flakes of muscovite. Undulatory extinction has not developed in any of the quartz. K-feldspar is subhedral in outline. It is coarsely perthitic. Quartz inclusions are common, and the larger grains show some graphic intergrowths (distinguished from individual quartz inclusions by optical continuity of all quartz within the grain). Plagioclase occurs as euhedral to subhedral laths. Albite twinning is characteristic, and some combined carlsbad-albite twins are visible. The plagioclase composition, determined by the Michel-Levy technique, is oligoclase-andesine ($An_{29}$ to $An_{31}$). Normal zoning is present in the plagioclase, and visible in grains cut normal to the C axis as selective replacement of the more calcic cores. Some of the plagioclase shows antiperthitic texture and myrmekitic intergrowths with quartz. Incipient alteration affects both feldspars. It is present as a uniform dusting of clays and shreds of white mica lining cleavage traces and fractures.

Biotite is pleochroic dark brown and subhedral in outline. Grain margins and cleavage traces are incipiently altered to white micas and opaques. Inclusions of euhedral opaques and zircon with pleochroic haloes are common. Zircon is also randomly scattered throughout the section.

Sample Number: D

| Mineralogy: | | |
|---|---|---|
| | K-feldspar | 38 |
| | plagioclase | 18 |
| | quartz | 24 |
| | biotite | 8 |
| | tourmaline | 6 |
| | zircon | tr |
| | opaques | 1 |
| | white mica/clay | 3 |
| | carbonate | 2 |

Classification: altered quartz monzonite/granite

Fabric and texture: coarse-grained, in part porphyritic, holocrystalline, hypidiomorphic-granular

The principal constituents K-feldspar, quartz, and plagioclase are present in a typical granitic texture. K-feldspar is subhedral, occurring in equant grains truncated by plagioclase and adjacent to anhedral quartz filling intersticies. It is coarsely perthitic and in some portions of the section graphic intergrowns are common. Twinning according to the carlsbad law is frequent, but other twinning types are not visible. Incipient alteration to white mica, which is present as minute shreds along cleavage traces and grain margins, and clays, which uniformly dust the grains, is characteristic. Plagioclase occurs as euhedral to subhedral laths as well as irregular patches in K-feldspar (perthite). Albite twinning is characteristic of both textures. The plagioclase composition is andesine ($An_{36}$, by the Michel-Levy technique). Normal zoning is often visible with selective alteration of the more calcic cores. Dusting by clays and shreds of white mica alteration are more frequent than in the K-feldspar. The incipient feldspar alteration is considered to be of deuteric (or supergene) origin, although it may also be a product of the greissen-type alteration.

Biotite occurs as subhedral to anhedral laths and aggregates. Two colours are presnet which distinguish two generations of biotite. The earlier form is igneous in origin. It is pleochroic dark brown and bound by euhedral to anhedral grains of feldspars and quartz. Minute inclusions of zircon with pleochroic haloes are common. Zircon is also disseminated throughout the feldspars in larger, euhedral prismatic grains.

Biotite is also present in the greissen-type alteration. Irregular aggregates of biotite and sericite shreds, tourmaline, and carbonate are scattered throughout the section replacing the feldspars. The centers of these aggregates generally appears to be along grain margins. The micas and tourmaline are faintly to strongly green in colour and pleochroic. Opaque minerals have been introduced with this alteration. Iron oxides are the predominant opaque, with subordinate pyrite.

Sample Number: E

| Mineralogy: | | |
|---|---|---|
| | plagioclase | 70 |
| | K-feldspar | 26 |
| | quartz | tr |
| | sphalerite | 0.5 |
| | fluorite | 0.5 |
| | opaques | 1 |
| | zircon | tr |
| | carbonate | 2 |
| | white mica | tr |

Classification: altered monzonite

Fabric and texture: medium-grained, equigranular, holocrystalline, hypidiomorphic-granular

Euhedral to anhedral plagioclase makes up slightly less than three-fourths of this rock. Albite twinning is characteristic. The plagioclase composition, determined by the Michel-Levy technique, is andesine ($An_{34}$). Much of the plagioclase texture, particularly the twinning habit and the irregular grain outlines, are not typical of igneous fabric. The granular texture suggests that the rock may have been subjected to thermal metamorphism subsequent to crystallization. The texture may also have been imparted by partial recrystallization in a high-strain environment. The only significant alteration of the plagioclase is fine-grained, turbid mosaics and medium-grained, clear rhombs or carbonate.

K-feldspar is subhedral to anhedral in outline, filling intersticies among plagioclase grains. It is in part recrystallized, as evidenced by irregular extinction caused by the development of smaller grains having slightly different optical orientations within the original grains. An occasional anhedral grain of quartz is visible filling interstices among the feldspars, but are quite rare. No myrmekitic or graphic textures are visible. The K-feldspar is affected by carbonate replacement to approximately the same extent as the plagioclase. In addition, minute shreds of white mica are present along grain boundaries. Zircon is an igneous accessory randomly scattered throughout the section.

The more unusual accessory minerals (sphalerite and fluorite) are intimately associated with the opaque minerals and presumably the carbonate alteration. The opaques are primarily pyrite and magnetite/hematite. Pyrite occurs as small, euhedral grains disseminated throughout the section, as irregular dendritic patches which generally follow feldspar grain boundaries, and as large irregular grains frequently peripheral to the magnetite/hematite. Iron oxide is present in large, bladed and irregualr aggregates. Neither the oxides nor the sulfides clearly replace one another.

Several grains of sphalerite (deep red and isotropic) are present associated with the oxides. In one instance, it occurs as an isolated grain bound on one side by oxides and on the other by fluorite. The fluorite appears to be filling intersticies presumably created by the alteration. In other cases, the sphalerite is rimmed on all sides by the iron oxide.

Sample Number: F

| Mineralogy: | | |
|---|---|---|
| | K-feldspar | 84 |
| | plagioclase | 7 |
| | quartz | tr |
| | opaque | 1 |
| | carbonate | 6 |
| | white mica | 2 |
| | zircon | tr |

Classification: altered orthosyenite

Fabric and texture: medium-grained, equigranular, holocrystalline, hypidiomorphic-granular

Subhedral K-feldspar, the primary constituent, occurs in mosaic of interlocking grains. Although the grain boundaries are irregular, the texture is more typical of igneous orthosyenite than in G. Much of the K-feldspar is coarsely perthitic, with albite-twinned plagioclase enclosed in the K-feldspar. Anhedral quartz is occasionally visible filling intersticies among the K-feldspar grains, but not graphic intergrowths are present. The K-feldspar is incipiently altered to white mica and carbonate. Sericite is present along grain margins as minute shreds, and in occasional larger flakes. The fine-grained sericite appears to be earlier than the carbonate, and the flakes of muscovite are of presumed igneous origin. Carbonate occurs in irregular patches and continuous veinlets throughout the section, and appears to replace the K-feldspar. It is usually associated with sericite; white mica alteration presumably slightly preceeded and continued during the carbonate alteration. Quartz is present in some of the carbonate veinlets; however, monomineralic quartz veins are not visible. The opaque minerals are invariably associated with the sericite-carbonate alteration. Two opaques, pyrite and magnetite/hematite, are present. The pyrite occurs as minute, euhedral grains associated with sericite. Magnetite/hematite is present in anhedral masses and irregualr patches. It is more clearly related to the carbonate alteration, but does not clearly replace pyrite.

Plagioclase is present as subhedral grains, and rarely as euhedral laths. The plagioclase composition is andesine ($An_{34}$, determined by the Michel-Levy technique). Albite twinning is predominant, and the laths are often deformed. Untwinned plagioclase is also present, suggesting that the twinning may in part result from strain. Antiperthitic textures are visible, but it is not clear whether they are related to the crystallization process or replacement by K-feldspar. The plagioclase is affected by the sericite-carbonate alteration to approximately the same extent as the K-feldspar. Zircon occurs as minute, euhedral grains disseminated throughout much of the section.

Sample Number: G

| Mineralogy: | | |
|---|---|---|
| | K-feldspar | 76 |
| | plagioclase | 12 |
| | quartz | 2 |
| | carbonate | 5 |
| | opaque | 3 |
| | white mica | 2 |
| | zircon | tr |

Classification: altered orthosyenite

Fabric and texture: fine/medium-grained, equigranular, holocrystalline, hypidiomorphic-granular

Approximately three-fourths of this section consists of anhedral K-feldspar occurring in an interlocking aggregate with exceedingly irregular grain boundaries. No twinning is visible, and only the larger grains are perthitic. Undulatory extinction has developed in the K-feldspar. The texture is not ypical of igneous orthosyenites. It more resembles the granular texture of hornfels, although the igneous parentage of the rock is clear. The texture may represent recrystallization caused either by thermal metamorphism or hydrothermal (deuteric ?) alteration/replacement. The correct interpretation cannot be ascertained from the mineralogy and texture of this section alone.

Plagioclase is present in subhedral laths surrounded by the K-feldspar. Albite twinning is preserved in most of the grains. The plagioclase composition is andesine ($An_{34}$ by the Michel-Levy technique). Large plagioclase grains are characterized by composite albite twinning. This texture may result from partial recrystallization. Plagioclase and K-feldspar are equally affected by two types of alteration; the alteration types, however, are largely confined to separate areas of the section. In the area characterized by abundant opaques, white mica alteration predominates. Randomly oriented shreds and aggregates of white mica replace feldspars along the grain margins. Carbonate is present but associated with the opaques. In the remainder of the section, carbonate alteration predominates. The carbonate alteration occurs as anhedral mosaics to euhedral aggregates along grain boundaries and superimposed over the feldspars. Much of the carbonate is stained red, presumably by oxidation of opaques. White mica is also present in this area, but in much smaller quantities. Quartz content of the rock is generally quite low, present as an occasional anhedral grain interstitial to the feldspars.

Opaques are present throughout the section, although visibly concentrated below two en echelon pyrite veins. The concentration of opaques is entirely magnetite/hematite, whereas the irregularly disseminated opaques are intergrowths of pyrite and magnetite/hematite. Microveinlets and dendritic patterns which follow grain boundaries and fractures are pyrite; larger patches are intergrowths. The pyrite microveinlets intersect the magnetite/hematite, and pyrite is visible rimming the magnetite/hematite. Pyrite may in part replace the magnetite. The hematite is interpreted as late-stage oxidation.

| | | |
|---|---|---|
| Sample Number: | H | |
| Mineralogy: | plagioclase | 67 |
| | K-feldspar | 11 |
| | quartz | 15 |
| | opaque | 3 |
| | carbonate | 4 |
| | zircon | tr |
| | white mica | tr |
| Classification: | quartz diorite/granodiorite | |
| Fabric and texture: | medium-grained, equigranular, holocrystalline, hypidiomorphic granular | |

Euhedral to anhedral plagioclase is the primary constituent. Euhedral laths with sharp albite twinning are visible but more frequently subhedral to anhedral grains predominate. The twinning in these grains is not continuous, but appears to be a composite of smaller, diffusely-twinned grains. The composition of the euhedral laths is andesine ($An_{32}$), determined by the Michel-Levy technique. The anhedral aggregates are somewhat more sodic in composition. Untwinned grain margins are commonly visible, and portions of the untwinned grains are often K-feldspar. The texture suggests possible albitization or antiperthitic fabric. Shreds of white mica are freqently present along grain margins or within the plagioclase; however, carbonate is the most common alteration mineral. It occurs in anhedral mosaics of interlocking grains filling intersticies among feldspar grains, and in part replacing the plagioclase. The carbonate almost always encloses the opaque minerals and is often iron stained. Presumably the carbonate and opaques were introduced during the same alteration event. The opaques occur in three textural variations: 1) euhedral to subhedral distinct grains with sharp grain boundaries (pyrite in hand specimen), 2) subparallel or radiating aggregates of laths (magnetite/hematite), and 3) irregular interstitial fillings among the felsic constituents.

K-feldspar and quartz are subhedral to anhedral in outline. They fill intersticies among the plagioclase laths and grains. The K-feldspar is untwinned and not perthitic. It is in part replaced by carbonate but does not appear to be affected by white mica alteration. The quartz is unstrained and unaltered; it has not developed undulatory extinction. Zircon is randomly disseminated throughout the section.

Sample Number: I

| Mineralogy: | |
|---|---|
| quartz | 95 |
| magnetite/hematite | 3 |
| chalcopyrite | 1 |
| carbonate | 0.5-1 |
| sphalerite | tr |
| zircon | tr |
| tourmaline | tr |
| white mica | tr |

Classification: vein quartz/greissen

Fabric and texture:

Quartz is the only constituent present in significant proportions. It is euhedral to anhedral in outline, most frequently occurring as subhedral grains in an interlocking mosaic. The grain boundaries are generally slightly irregular. The texture is typical of randomly-oriented vein and/or replacement quartz. Growths zoning is visible in the larger grains cut perpendicular to the C axis. The inner portion of such grains is optically continuous and crowded with minute solid and fluid inclusions. Two-phase (liquid and vapour) fluid inclusions are the only variety observed. The solid inclusions are too fine-grained for optical identification. The outer zone consists of quartz which has developed undulatory extinction in a pattern which resembles radiating crystals, and which is relatively low in inclusion content.

Opaques in this section are magnetite/hematite and chalcopyrite. In polished section, these opaques are intimately intergrown. Neither appears to replace the other. Sphalerite is present associated with the opaques, usually as euhedral grains along the rims of the opaques. Carbonate is invariably associated with the opaques as an interstitial filling, and also occurs in microveinlets and patches in the quartz.

Minor accessory minerals include tourmaline, zircon, and sericite. Only a few grains of tourmaline are visible, all as irregular grains of deep green to blue colour and pleochroism in quartz. Zircon is randomly disseminated throughout the section. Sericite is generally present along grain boundaries in the quartz, and in cross-cutting micro-fractures.

Sample Number: J

Mineralogy:

| | |
|---|---|
| tourmaline | 24 |
| plagioclase | 18 |
| K-feldspar | 9 |
| quartz | 7 |
| biotite (brown) | 1 |
| biotite (green) | 40 |
| carbonate | 0.5 |
| opaque | 0.5 |
| white mica | tr |
| zircon | tr |

Classification: tourmalinized monzonite (?)

Fabric and texture: medium-grained, equigranular, holocrystalline, hypidiomorphic-granular in part crystalloblastic

Strongly pleochroic tourmaline and biotite (green) are the primary constituents. They are present in a dark-coloured aggregate throughout most of the section. Biotite occurs in euhedral to subhedral, equant laths which are randomly oriented. Zircon inclusions with pleochroic haloes are visible. Minor white mica is present along the margins of some grains, particularly adjacent to the relic quartz and feldspars within the aggregates, but the biotite is more generally unaltered. Tourmaline is present as anhedral grains intergrown with the green biotite. In some occurrences the tourmaline is interstitial to the biotite laths, but more frequently it is contemporaneous. Quartz, K-feldspar, and plagioclase occur within the tourmaline-biotite aggregates. The quartz is anhedral and has developed undulatory extinction. The feldspars are generally subhedral and usually enclosed in quartz rather than in contact with the tourmaline and biotite. This is presumably a replacement texture with the tourmaline and biotite replacing the original igneous constituents, especially the feldspars. Two generations of biotite are thus implied. In support of this conclusion, fine-grained green biotite is occasionally visible enclosing coarser-grained, optically continuous brown biotite. Dark brown, euhedral igneous biotite is visible in some ares of the section not strongly affected by the tourmalinization.

Quartz, K-feldspar, and plagioclase are present in a typical igneous texture in unaltered areas. Plagioclase is euhedral to subhedral. Albite twinning is characteristic. The plagioclase composition, andesine ($An_{35}$), was determined by the Michel-Levy technique. It is in part replaced by the K-feldspar (deuteric), shreds of white mica and microveinlets of carbonate (hydrothermal). The biotite-tourmaline clearly

replaces plagioclase in these areas. Myrmekitic textures are locally visible. K-feldspar is subhedral to anhedral, filling intersticies among plagioclase laths. It is untwinned and not perthitic. The K-feldspar is also weakly altered to white mica and carbonate, and is also replaced by green biotite-tourmaline. Quartz is anhedral, filling intersticies among the feldspars. Weak undulatory extinction is visible in some grains.

Opaque minerals have been introduced with the biotite-tourmaline alteration. They generally have opaque cores and transparent red margins, and are presumably magnetite/hematite. Silicates are frequently stained red in the vicinity of the opaques. Carbonate is often associated with the opaques as a rim or as a fracture filling. Zircon is randomly scattered throughout the section. Its distribution does not appear to be affected by the biotite-tourmaline alteration.

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2 November, 1978

Mr. F. Marshall Smith
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Dear Sir:

Enclosed are textural descriptions of samples E-78-8-15-129 and S-23-1-3, and eight photomicrographs which show the significant textural relationships. Features to note in the photomicrographs are as follows. All photomicrographs are at 25X.

E-1: Plane light showing the relationship of cassiterite to intrusive rock. Note the combined sector and concentric zoning of the cassiterite. This portion of the vein is from the center line area.

E-2: Crossed nicols showing the relationship of cassiterite to intrusive rock in the intermediate zone. Note the euhedral outlines of the plagioclase and somewhat interstitial character of the cassiterite, and the general absence of K-feldspar and quartz. Interstitial aggregates of sericite are visible which may represent the location of former feldspar grains.

E-3: Plane light showing the separation of vein selvedge and intrusive rock. Note the abrupt appearance of quartz and K-feldspar on the right side of the photograph.

E-4: Plane light showing interstitial fluorite. Note the apparently opaque area which occurs near the center of the fluorite; this is the concentration of minute euhedral grains mentioned in the description.

S-1: Plane light showing the contact of vein and cassiterite with host rock. Note the euhedral cassiterite projecting into the vein and becoming granular and finer-grained moving into the host. Also shown is fluorite adjacent to the cassiterite and separating the cassiterite from quartz. The quartz is slightly embayed by the fluorite.

S-2: Crossed nicols of S-1 showing plagioclase poikiolitically enclosed in perthitic K-feldspar. The granular interlocking mosaic typical of the quartz is visible in the lower left of the photomicrograph.

S-3: Plane light showing brecciation of cassiterite and penetration of quartz into the cassiterite aggregates.

S-4: Crossed nicols showing carbonate associated with fluorite-quartz boundaries and minor sericite. Also visible in the lower central area of the photomicrograph are the unidentified acicular needles in the quartz.

In order to allow more flexibility with regard to your choice of enlargements, etc, we have chosen to use 4X5 photomicrographs which yield negatives rather than polaroid shots which provide only positives.

The sections, prepared slices, and remnant sample material follow under separate cover. Please direct any enquiries regarding these descriptions to Mark Bloom c/o Vancouver Petrographics. Thank you for using our services.

Very truly yours,

Mark S. Bloom

Mark S. Bloom

Sample Number: E-78-8-15-129

| Mineralogy (%): | | |
|---|---|---|
| | cassiterite | 10 |
| | quartz | 28 |
| | K-feldspar | 32 |
| | plagioclase | 30 |
| | fluorite | tr |
| | sericite/clay | tr |
| | opaques | tr |
| | sericite/clay | tr |
| | zircon | tr |

Texture: Medium-grained, equigranular, hypidiomorphic-granular; subequal proportions of euhedral to subhedral plagioclase, subhedral to anhedral K-feldspar, and anhedral quartz in an interlocking mosaic of equidimensional grains averaging 1mm in length/diameter. The section is cut to show a symmetrical(?) cassiterite vein at one end. The center line of the vein consists of mixed euhedral cassiterite and subordinate euhedral plagioclase. Moving normal away from the center line, the cassiterite diminishes rapidly and is replaced (not in a textural sense) by plagioclase. The zone of cassiterite-plagioclase is approximately 1cm in width from the center line. A bimineralic zone of quartz-plagioclase approximately one half cm in width envelopes the quartz-plagioclase zone. The K-feldspar content increases abruptly at approximately 1½cm from the center line and remains constant throughout the remaining fabric.

Plagioclase: Generally subhedral laths of plagioclase in the igneous fabric are intergrown with quartz and K-feldspar along the margins; however, there is no significant myrmekitic or anti-perthitic texture. The plagioclase shows a variety of twin forms, with albite most common followed by carlsbad, combined carlsbad-albite, and rare pericline. The average plagioclase composition, determined by the Michel-Levy technique, is sodic andesine ($An_{32}$). The plagioclase is weakly to moderately clouded by clay alteration. Minute shreds of sericite also dust the plagioclase surfaces, and aggregates of sericite flakes replacing the plagioclase are common but not ubiguitous.

K-feldspar: Definitely anhedral with respect to plagioclase, but less so than quartz. The K-feldspar is generally irregular in outline, but many grains also show equant crystal outlines. Some-but not all-of the K-feldspar is perthitic, either as irregular untwinned patches or as blocky twinned areas of plagioclase within the grains. No graphic/granophric intergrowths with quartz are visible. The K-feldspar is affected by clay alteration in approximately the same degree as plagioclase. Sericite alteration is also present dusting the surfaces, and aggregates of sericite flakes are common along K-feldspar-quartz boundaries.

Quartz: Anhedral, filling intersticies among the feldspars. Undulatory extinction has not developed. The quartz grains are unusually low in fluid inclusion content. The inclusion present

are fairly uniform in liquid-vapor ratio, and many are crowded with daughter minerals, suggesting a highly saline solution associated with crystallization/mineralization.

Fluorite: Anhedral, purple fluorite occurs filling intersticies at the opposite end of the section from the cassiterite vein. The fluorite-quartz and fluorite-plagioclase margins are sharp, whereas the fluorite-K-feldspar boundaries are somewhat irregular. An irregular patch of K-feldspar is also poikiolitically enclosed in the fluorite. This suggests that fluorite may in part replace K-feldspar. The central area of the fluorite grain is occupied by minute dark-coloured, euhedral grains for which a composition could not be determined. Relatively large, euhedral microphenocrysts of zircon are visible adjacent to the fluorite.

Vein texture: Euhedral grains and aggregates of cassiterite occupy intersticies among plagioclase laths. The vein is devoid of K-feldspar, and only small amounts of interstitial quartz are present. Cassiterite shows well-developed concentric and sector zoning. Some intersticies are filled with closely-packed aggregate of sericite. The sericite alteration of plagioclase does not differ significantly from the igneous fabric. Two possible modes or origin are suggested for the cassiterite: 1) the euhedral character suggests it may have crystallized directly from magmatic eminations shortly after crystallization of the igneous fabric, or 2) the cassiterite may pervasively replace K-feldspar, suggested by the absence of K-feldspar and the interstitial sericite which may occupy K-feldspar sites. Either hypothesis must take into consideration the absence of intense plagioclase alteration and the abrupt drop in K-feldspar content. The outer unmineralized zones of the selvedge support the first hypothesis.

Rock type: The mineralogy, mode, and texture are consistent with adamellite (quartz monzonite). The alteration, although weak, is typical of greissen.

Sample Number: S-23-1-3

Mineralogy (%):

| | |
|---|---|
| cassiterite | 50 |
| quartz | 34 |
| fluorite | 6 |
| carbonate | 4 |
| tourmaline(?) | tr |
| plagioclase | 2 |
| K-feldspar | 2 |
| sericite | 2 |
| biotite/chlorite | tr |
| topaz | tr |
| opaque | tr |

Texture/paragenesis: The earliest minerals present are plagioclase and K-feldspar, present in the section only as a thin sliver along one side, and presumably represent the intrusive rock which serves as host to the vein. Both occur as subhedral to euhedral phenocrysts at least 6mm in length (they are truncated by the edge of the section). The plagioclase occurs as euhedral phenocrysts poikiolitically enclosed in K-feldspar. Albite twinning is the only visible twin form. The average plagioclase composition is oligoclase ($An_{28}$), determined by the Michel-Levy technique. The K-feldspar is coarsely perthitic, with numerous patches of twinned plagioclase; casual observation might suggest that only plagioclase is present. Minor anhedral quartz is associated with the feldspars. Both K-feldspar and plagioclase are dusted with minute shreds of sericite, but are affected only weakly by clay alteration. Both feldspars are also strongly replaced along cleavage traces and fractures by aggregates of dark brown opaques and sheaves of chlorite. This alteration resembles replacement by opaques visible within the vein, and is assumed to be an extension of this alteration into the host. This alteration increases in intensity on one end of the sliver of host rock until no feldspar remains - only a mosaic of chlorite, opaques, and sericite. Quartz and cassiterite are unaffected by this alteration.

Cassiterite lines the vein walls immediately adjacent to the host. It occurs as euhedral grains diminishing in size and frequency into the feldspar. The texture suggests partial replacement of the feldspars in this zone. The bulk of the cassiterite along the vein walls is an aggregate of subhedral grains which grade into larger euhedral concentrically - and sector-zoned grains projecting into the vein. Deposition of cassiterite occurred throughout the vein sequence, as it is present within the vein as well as along the margins. Cassiterite within the vein is texturally similar to that adjacent to the host, with several notable exceptions. First, this cassiterite is often larger and more euhedral in outline; zonation is more prominant. Secondly, cassiterite within the vein is often brecciated, with small angular fragments surrounded by quartz. Frequently associated with the brecciated cassiterite, and often occurring along the margins of intact grains, is a fine-grained granular opaque, identified in reflected light as hematite. The opaque was presumably introduced by fluids after cassiterite deposition, and may be genetically related to the opaques occurring in the host.

Within the vein, cassiterite shares grain boundaries with a variety of minerals, most frequently quartz and fluorite. Quartz is considered to have followed and accompanied cassiterite deposition, although in some areas they are not in direct contact. The quartz occurs in an anhedral interlocking mosaic with grain size varying from less than 1mm to 10mm in diameter. Coxcomb texture typical of quartz beins emplaced in high-level environments under essentially hydrostatic pressure is not visible, suggesting vein formation at depth while still under a combination of lithostatic and hydrostatic pressure. Undulatory extinction in the quartz supports this hypothesis. The quartz contains a variety of solid inclusions. Topaz is randomly scattered throughout the quartz as euhedral microphenocrysts less than 1mm in length. Where quartz and cassiterite share a common boundary, minute, radiating, accicular aggregates of needlelike crystals frequently occur. A positive identification is not possible owing to the fine grain size, but tourmaline (schorlite) is suggested. Fluid inclusions in the quartz are relatively large and numerous. Those which appear to be of primary origin often contain daughter minerals, inferring high salinity of the solutions.

Fluorite follows quartz in the paragenesis. It fills intersticies and voids among the quartz grains. The position of fluorite in the paragenetic sequence is not everywhere apparent from the mineral associations. Where fluorite and quartz are in contact, however, the fluorite ubiguitously embays the quartz; the two minerals are clearly out of equilibrium with fluorite later than quartz. The fluorite locally contains angular fragments of cassiterite derived from the earlier brecciation; however, cassiterite did not precipitate during fluorite deposition. Primary fluid inclusions in the fluorite almost always contain liquid $CO_2$, suggesting a progressive change in the fluid composition to $CO_2$- rich solutions. Mosaics of carbonate along fluorite-cassiterite boundaries support this conclusion. The carbonate mosaics often penetrate the quartz aggregates, but are clearly related to the fluorite. Sheaves of sericite may be associated with the carbonate in quartz.

Aug 22/78 → CBG FMS.

AUG 2 3 1978

D.A. Barr, Vice President
Du Pont of Canada Exploration Limited
Suite 102, 1550 Alberni Street
Vancouver, British Columbia

Dear Mr. Barr:

Results of X-ray analyses to determine the composition of the unknown minerals submitted earlier this month are as follows:

A conventional X-ray powder pattern was run on crushed material from the balck-coloured area of the small sample. The enclosed diffraction pattern shows that the area is actually a composite of several minerals; however, the predominant constituent is wolframite. The highest intensity peaks are in agreement with the ASTM card for synthetic huebnerite. No additional analyses were preformed to determine the minor constituents of the mineral aggregate or to establish the iron-manganese ratio of the wolframite.

The composition of the orange mineral was determined by Debye-Scherre powder camera analysis. The five lines of highest intensity are in agreement with ASTM card 4-864 for fluorite. Lower intensity lines are also consistent with this identification.

Sufficient amounts of the green fluorescent mineral were not available for positive identification. Single crystal Gondolfe camera analyses were attempted (film enclosed) but the results were inconclusive. During sample preparation, three good directions of cleavage were observed. This cleavage and the textural relationships of the mineral suggest that this mineral is also fluorite.

Thank you.

Very truly yours,

Mark S. Bloom

Mark S. Bloom

AUG 1 1978

# Vancouver Petrographics Ltd.

JAMES VINNELL. Manager
JOHN G. PAYNE. Ph. D. Geologist

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY, B.C.
VOX 1JO

PHONE (604) 533-1155

24/7/78

Christopher B. Gunn
Du Pont of Canada Exploration Limited
c/o Gerghaty Lodge
General Delivery
Swift River, Yukon

Dear Sir:

Please find enclosed petrographic descriptions for the following sections:

| | |
|---|---|
| Du-S QSP | greissen |
| Du-B 8 | greissen/quartz vein |
| T10C | peralkaline granite |
| JC-1 | calc-silicate skarn |
| T7 | endoskarn/saussurite |
| SK-11 | quartz porphyry granite |

Thin sections, reject slices, original sample material, and copies of the descriptions will be returned to Mr. Barr in the Vancouver office upon completion of Sn and W scans (on samples T10C, T7, and JC-1) on the scanning electron microscope (SEM). SEM results to date confirm the presence of minute grains of cassiterite in the greissen and intrusive rock; however, scans on JC-1 fail to show the presence of any Sn- or W-bearing minerals. Scans for Sn and W will also be completed on T10C and T7. A more complete report of the SEM results will be forthcoming upon completion of the scans.

Also enclosed is the X-ray powder pattern for JC-1. Peaks for the following minerals are present: diopside, garnet, idocrase, and quartz. Low intensity peaks may also indicate the presence of minor calcite and feldspar. No spurrious peaks are present which might correspong to Sn or W minerals. The mineral which fluoresces yellowish-green in hand specimen corresponds to the locus of idocrase in thin section. No minerals were observed which might be malayite.

Very truly yours,

Mark S. Bloom

Mark S. Bloom
Vancouver Petrographics

Sample Number: DU-S QSP

| Mineralogy: | | |
|---|---|---|
| | quartz | 69 |
| | tourmaline | 25 |
| | fluorite | 1 |
| | cassiterite | tr-1 |
| | topaz | tr |
| | opaque | 1 |
| | muscovite | 3 |

Classification: greissen

Fabric and texture:

Quartz and tourmaline (schorlite) are the primary constituents. Quartz occurs in an interlocking mosaic of anhedral grains with irregular boundaries. Adjacent to granular aggregates of tourmaline, the quartz frequently becomes more euhedral in outline. Undulatory extinction has developed in the larger irregular quartz grains, but is not apparent in the more regular crystals. This suggests a relic texture in the irregular grains inherited from the original rock, and recrystallization in the vicinity of the tourmaline aggregates. Numerous healed fractures lined by fluid inclusions are present in the quartz. The fluid inclusions generally consist of a small vapor bubble (10 volume percent) and a liquid. Some inclusions also contain a third phase, presumably halite.

Tourmaline is present as anhedral interstitial fillings among the quartz grains, and as euhedral to subhedral granlar aggregates with interstitial quartz. Both textural variations are pleochroic blue and/or greenish brown. Zonal structure is visible in some grains, with blue tourmaline in the center and peripheral greenish-brown tourmaline. The centers of the granular aggregates are often vuggy.

Muscovite is present as anhedral grains filling interstices among the quartz grains. It occurs both as relatively large, optically continuous flakes and as aggregates of minute shreds. A variety of accessory minerals are associated with the quartz and muscovite. Fluorite occurs as an interstitial filling among quartz grains and is usually adjacent to muscovite aggregates. Rounded grains of topaz are locally visible with the same mineral association. An opaque mineral is intimately intergrown with quartz, tourmaline and muscovite. It is euhedral to anhedral in outline. The general outline of the opaque is often euhedral; the grains are strongly fractured, and the fractures are filled with an exceedingly fine-grained birefringent material, possibly a combination of white mica and clays. Cassiterite occurs as fine-grained, subhedral to anhedral crystals. Zoning is visible in some grains. The cassiterite is most closely associated with euhedral quartz and granular tourmaline. The dark colour of the tourmaline masks cassiterite in hand specimen.

Sample Number: DU-B8

| Mineralogy: | | |
|---|---|---|
| | quartz | 75 |
| | opaque | 12 |
| | cassiterite | 0.5-1 |
| | topaz | 0.5-1 |
| | carbonate | 8 |
| | white mica | 4 |

Classification: vein quartz

Fabric and texture:

Three-fourths of the vein material present is quartz. It varies from anhedral to euhedral in outline. Most frequently, the quartz occurs in an interlocking mosaic of anhedral crystals. The grain boundaries are not markedly irfegular. The texture is typical of vein quartz in which randomly-oriented crystals are cut by the section. Hexagonal sections are visible throughout, but are concentrated in vuggy areas. These cross sections show well-developed growth zoning characterized by a clear inner zone practically devoid of inclusions, an intermediate zone crowded with inclusions, and an outer zone once again low in inclusion content. The nature of the inclusions could not be determined. Saccaroidal quartz fills the intersticies between some of the largest single crystals. Much of the quartz is crowded with with minute solid inclusions which include sericite, chlorite (?), opaques, topaz, and cassiterite (?). Not all of the solid inclusions could be identified mineralogically.

Carbonate is present as a vug- and vein-filling. Small vugs occur throughout the section and are almost always filled with carbonate. The carbonate is turbid and significantly iron stained. Several late quartz-carbonate veins are visible in the section. The carbonate in these veins is euhedral to anhedral in outline and less clouded and stained than the vug carbonate.

Sericite occurs as randomly oriented aggregates and individual flakes concentrated along quartz boundaries. It is also strongly affected by staining. In one instance, a mosaic of randomly-oriented sericite shreds occurs as a vug filling.

Topaz and cassiterite are the two most frequently-occurring accessory minerals. Both are disseminated throughout the vein quartz, and do not have any apparent relationship to vein stage or mineralogy. Topaz occurs as infrequent, somewhat rounded grains. The higher relief, biaxial interference figure, and cleavage distinguish it from quartz. Cassiterite occurs as minute, euhedral, prismatic grains with pyrimidal terminations. It is in large part too fine grained for satisfactory optical identification; this identification should be considered tentative subject to verification.

Large blades of an opaque mineral are associated with the vuggy quartz. Adjacent minerals are usually heavily stained. The opqaue is often surrounded by carbonate in the vug filling. The opaque minerals are iron-titanium oxides (magnetite-hematite-ilmenite-rutile). Cassiterite is not immediately apparent associated with the oxides, nor is it visible in hand specimen.

APPENDIX

STATEMENT OF EXPENDITURES

(Exclusive of Regional Programme)

As at December 31, 1978

DU CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 678.33 |
| Camp Expenses | | 1,944.68 |
| Mapping, Gr. Surveys, Maps | | 7,995.65 |
| Freight, Hauling, Storage | | 168.04 |
| Assaying | | 3,522.41 |
| Salaries - Regular | | 3,130.62 |
| Salaries - Temporary | | 956.36 |
| Equipment Rental | | 451.53 |
| Stationery & Supplies | | 25.87 |
| Telephone | | 134.71 |
| Auto Expenses | | 52.11 |
| Repairs and Maintenance (Excl. Auto) | | 12.82 |
| Non Capital Equipment Purchases | | 227.16 |
| Depreciation Expenses | | 134.38 |
| TOTAL | $ | 19,434.67 |

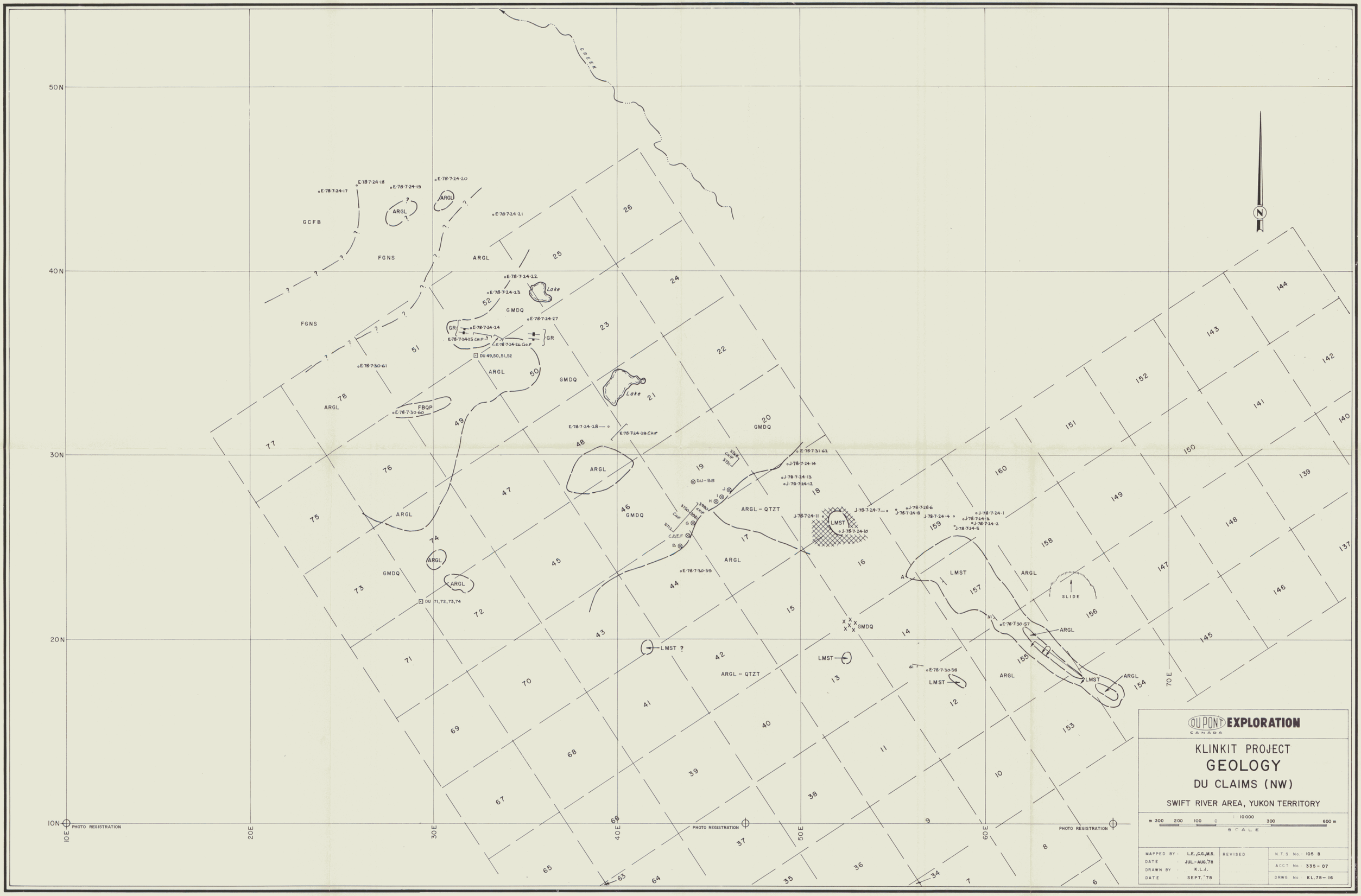
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PHOTO REGISTRATION
CREEK
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E-78-7-24-21
E-78-7-24-22
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E-78-7-24-28
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E-78-7-31-62
J-78-7-24-1
J-78-7-24-2
J-78-7-24-3
J-78-7-24-4
J-78-7-24-5
J-78-7-24-6
J-78-7-24-7
J-78-7-24-8
J-78-7-24-10
J-78-7-24-11
J-78-7-24-12
J-78-7-24-13
J-78-7-24-14
J-78-7-28-6
DU 49,50,51,52
DU 71,72,73,74
DU-88
Lake
Lake
LMST
LMST ?
LMST
LMST
LMST
SLIDE
GCFB
FGNS
FGNS
ARGL
ARGL
ARGL

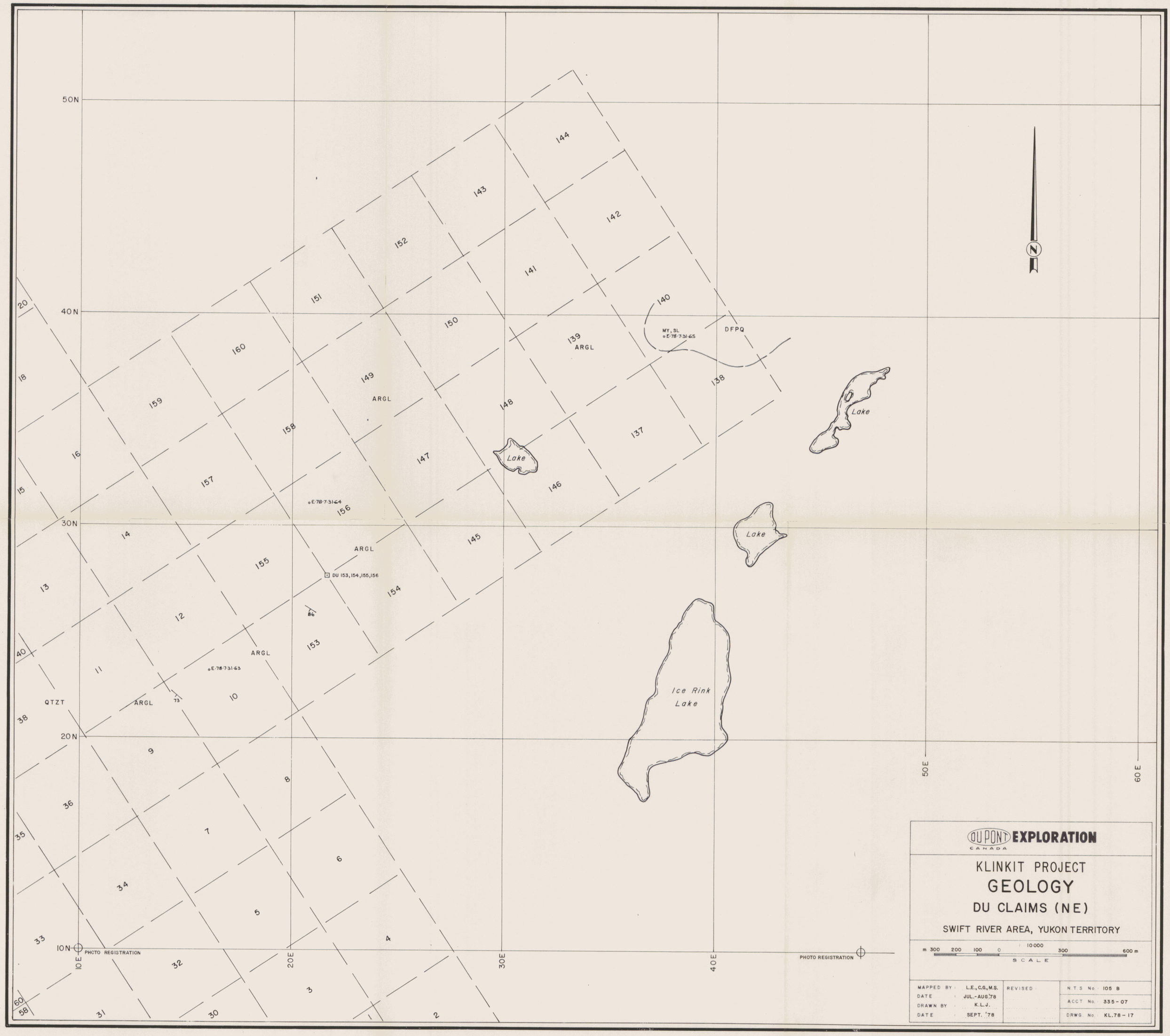

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PHOTO REGISTRATION
PHOTO REGISTRATION
Lake
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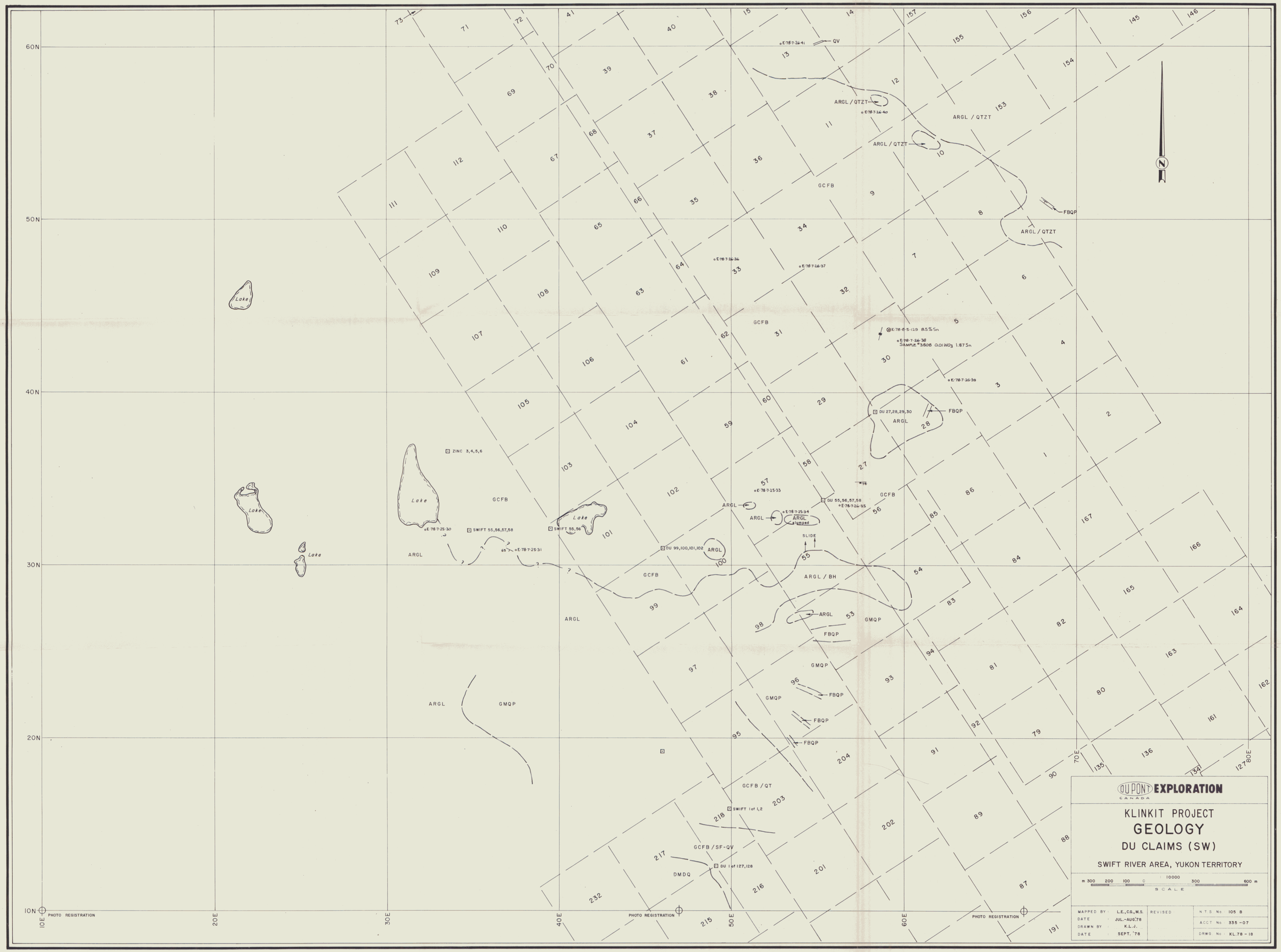
Lake
Ice Rink Lake
ARGL
QTZT
DFPQ
MY, SL
E-78-7-31-65
E-78-7-31-64
E-78-7-31-63
DU 153,154,155,156
N
DU PONT EXPLORATION
CANADA
KLINKIT PROJECT
GEOLOGY
DU CLAIMS (NE)
SWIFT RIVER AREA, YUKON TERRITORY
1:10000
m 300 200 100 0 300 600 m
SCALE
MAPPED BY: L.E., C.G., M.S.
DATE: JUL.-AUG.'78
DRAWN BY: K.L.J.
DATE: SEPT. '78
REVISED:
N.T.S. No.: 105 B
ACCT. No.: 335-07
DRWG. No.: KL.78-17




DU PONT EXPLORATION
CANADA

KLINKIT PROJECT
GEOLOGY
DU CLAIMS (SW)

SWIFT RIVER AREA, YUKON TERRITORY

SCALE 1:10000

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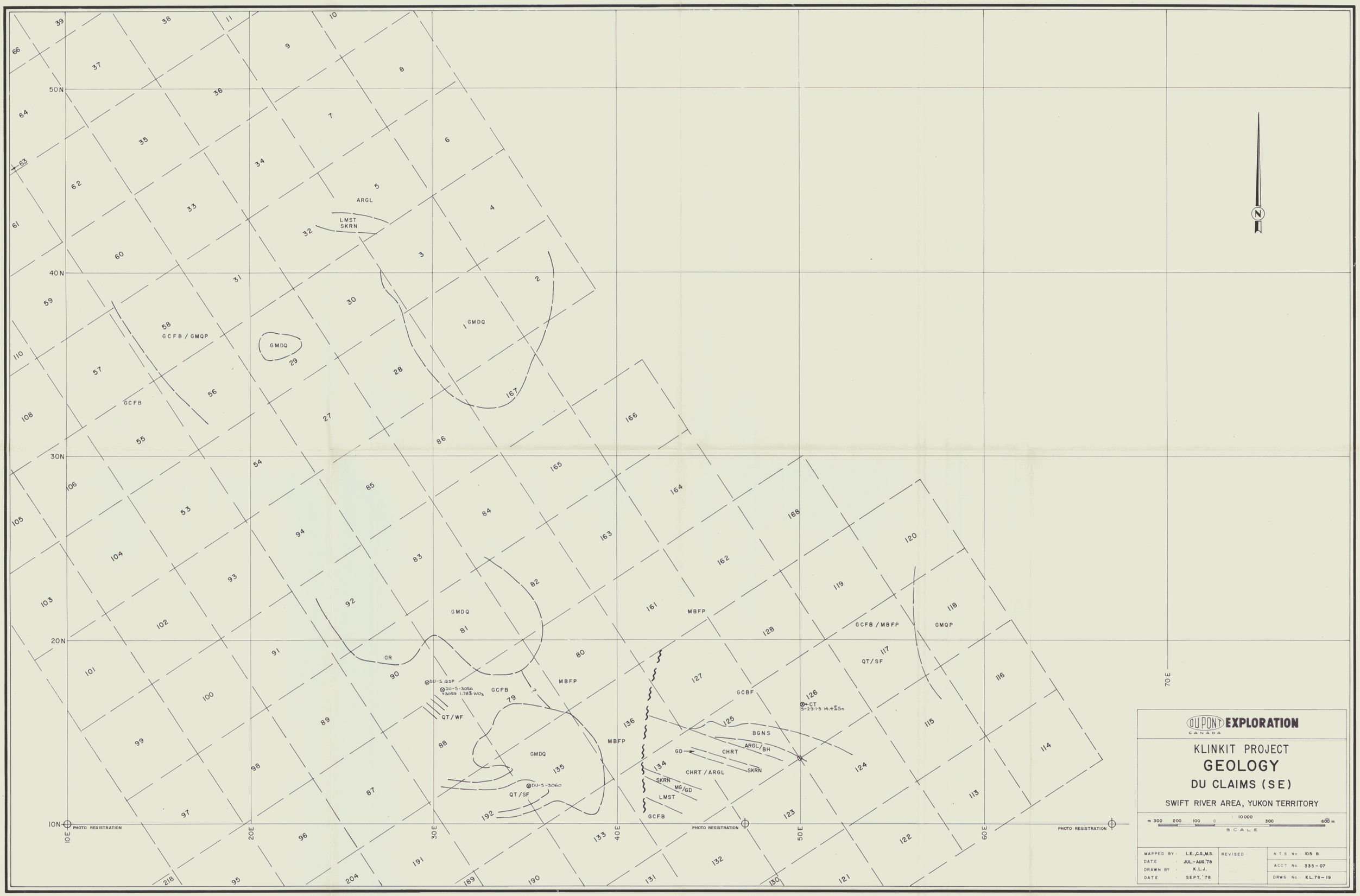
| MAPPED BY: | L.E., C.G., M.S. | REVISED | N.T.S. No: 105 B |
| DATE: | JUL.-AUG.'78 | | ACCT. No: 335-07 |
| DRAWN BY: | K.L.J. | | DRWG. No: KL.78-18 |
| DATE: | SEPT. '78 | | |




DU PONT EXPLORATION
CANADA

KLINKIT PROJECT

# GEOLOGY

## DU CLAIMS (SE)

SWIFT RIVER AREA, YUKON TERRITORY

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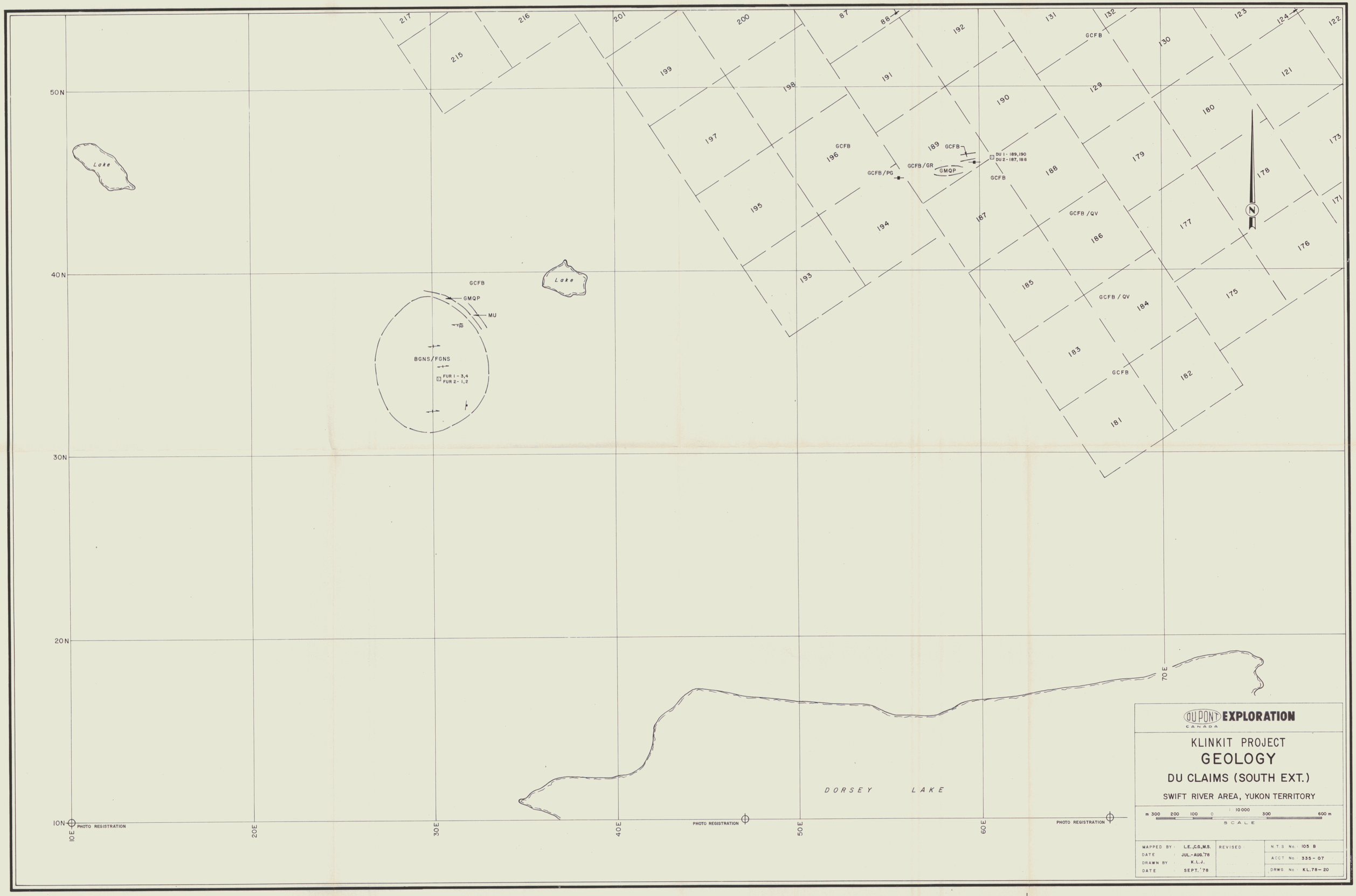
| MAPPED BY : L.E., C.G., M.S. | REVISED : | N.T.S. No. : 105 B | |
| DATE : JUL.-AUG.'78 | | ACCT No. : 335-07 | |
| DRAWN BY : K.L.J. | | | |
| DATE : SEPT.'78 | | DRWG No. : KL.78-19 | |



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70E
Lake
Lake
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GMQP
MU
BGNS/FGNS
FUR 1 - 3,4
FUR 2 - 1,2
GCFB
GCFB/PG
GCFB/GR
GMQP
GCFB
DU 1 - 189,190
DU 2 - 187,188
GCFB
GCFB/QV
GCFB/QV
GCFB
DORSEY LAKE
PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION
N
DU PONT EXPLORATION
CANADA
KLINKIT PROJECT
GEOLOGY
DU CLAIMS (SOUTH EXT.)
SWIFT RIVER AREA, YUKON TERRITORY
1:10000
m 300 200 100 0 300 600 m
SCALE
MAPPED BY: L.E., C.G., M.S.
DATE: JUL.-AUG.'78
DRAWN BY: K.L.J.
DATE: SEPT.'78
REVISED:
N.T.S. No.: 105 B
ACCT No.: 335-07
DRWG. No.: KL.78-20

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry, subphase intruding GCFB, cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS
CT = CASSITERITE
CP = CHALCOPYRITE
AG = AUGITE
GL = GALENA
GB = GARNET BERYL ( SKARN)
GD = GARNET DIOPSIDE
GM = GARNET MAGNETITE
GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)
HB = HORNBLENDE
HS = HULSITE
MG = MAGNETITE
MY = MALAYAITE
MS = MASSIVE SULFIDE
MU = MUSCOVITE
PG = PEGMATITE
PO = PYRRHOTITE
QC = QUARTZITE COBBLE
QT = QUARTZ TOURMALINE
QV = QUARTZ VEINS
SF = SERICITE FLUORITE
SL = SHEELITE
SP = SPHALERITE
WF = WOLFRAMITE
C\ = CONTACT ZONE
D\ = DYKE
EP = EPIDOTE
GP = GRAPHITIC
PP = PORPHYRY
TU = TOURMALINE

## SYMBOLS

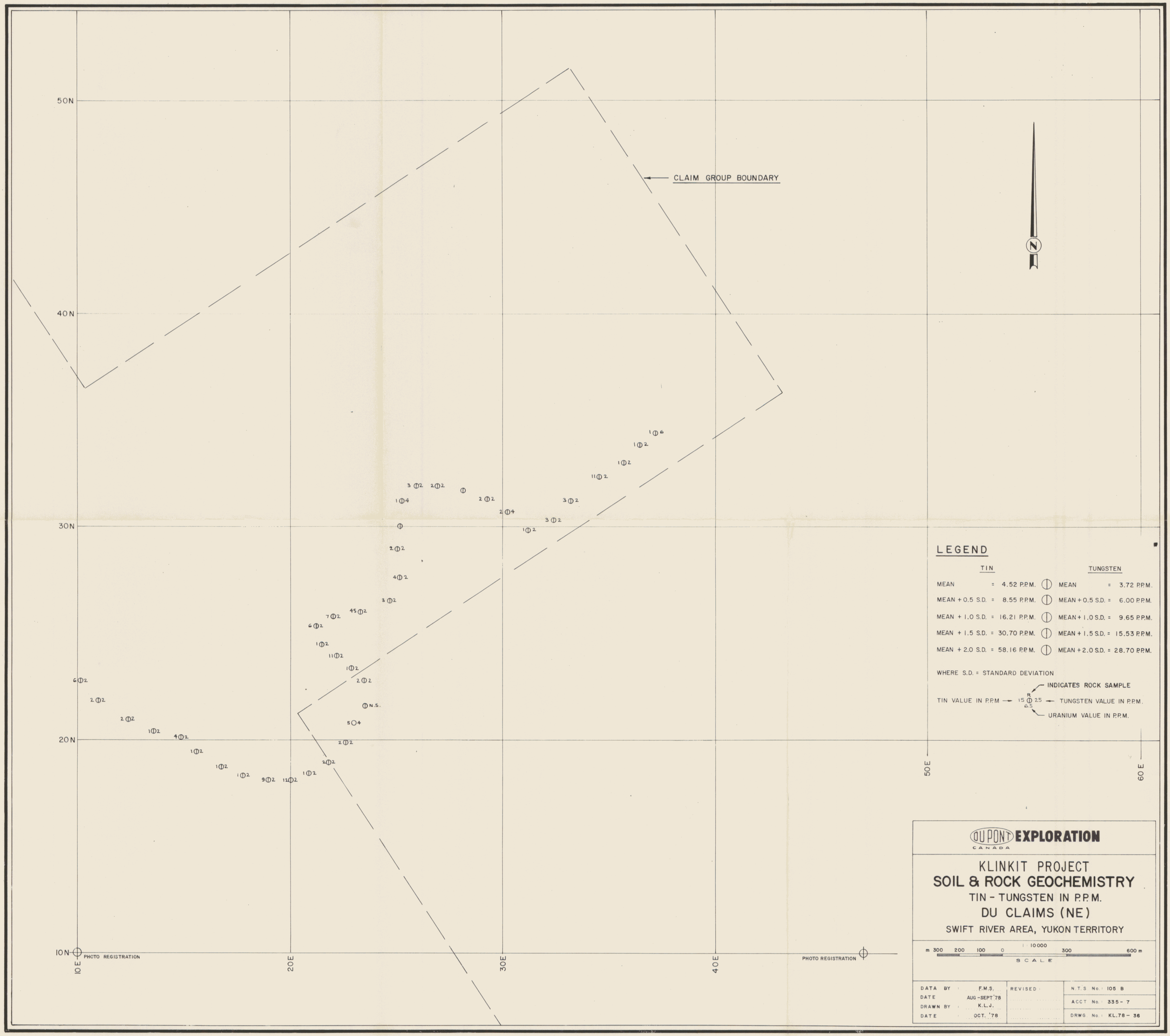
OUTCROP (edge of)
CONTACT APPROIMATE OR ASSUMED
CONTACT OBSERVED
MORAINE (edge of)
TALUS (edge of)
FAULT
JOINTING, inclined, vertical
BEDDING, inclined, vertical
FOLIATION, inclined, vertical
AREA OF NUMEROUS GOSSANS
GOSSAN
OVERTURNED ANTICLINE
SKARN
ROCK SAMPE LOCATION
CHIP SAMPLE LOCATION
X FLOAT
Rock A / Rock B — ROCK A MORE COMMON THAN ROCK B
Rock A // Rock B — ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)
CLAIM POST
THIN SECTION LOCATION

DUPONT CANADA EXPLORATION

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
SWIFT RIVER AREA, B.C. & Y.T.

SCALE
1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : | 40 & 105B |
| DATE : SEPT. '78 | | ACCT No. : | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : | KL.78 - 35 |
| DATE : OCT. '78 | | | |




## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M — 15 R 2.5 — TUNGSTEN VALUE IN P.P.M.
6.5

URANIUM VALUE IN P.P.M.

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## DU CLAIMS (NE)
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 : 10 000 300 600 m
SCALE

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| DATA BY | F.M.S. | REVISED | N.T.S No. 105 B |
| DATE | AUG-SEPT '78 | | ACCT No. 335-7 |
| DRAWN BY | K.L.J. | | DRWG No. KL.78-36 |
| DATE | OCT. '78 | | |

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10E PHOTO REGISTRATION
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PHOTO REGISTRATION
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60E
PHOTO REGISTRATION
70E

CLAIM GROUP BOUNDARY

## LEGEND

| | TIN | TUNGSTEN |
|---|---|---|
| MEAN | = 4.52 P.P.M. | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. | = 8.55 P.P.M. | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. | = 16.21 P.P.M. | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. | = 30.70 P.P.M. | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. | = 58.16 P.P.M. | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

TIN VALUE IN P.P.M → 15 (R, 6.5) 2.5 ← TUNGSTEN VALUE IN P.P.M.

R = INDICATES ROCK SAMPLE

URANIUM VALUE IN P.P.M.

DU PONT CANADA **EXPLORATION**

# KLINKIT PROJECT
## SOIL & ROCK GEOCHEMISTRY
### TIN - TUNGSTEN IN P.P.M.
### DU CLAIMS (NW)
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1:10 000 300 600 m
SCALE

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| DATA BY | F.M.S. | REVISED | N.T.S. No. 105 B |
| DATE | AUG-SEPT '78 | | ACCT. No. 335 - 7 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78 - 37 |
| DATE | OCT. '78 | | |

60N

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

70E

80E

CLAIM GROUP BOUNDARY

PHOTO REGISTRATION

PHOTO REGISTRATION

PHOTO REGISTRATION

## LEGEND

| | TIN | | TUNGSTEN |
|---|---|---|---|
| MEAN | = 4.52 P.P.M. | MEAN | = 3.72 P.P.M. |
| MEAN + 0.5 S.D. | = 8.55 P.P.M. | MEAN + 0.5 S.D. | = 6.00 P.P.M. |
| MEAN + 1.0 S.D. | = 16.21 P.P.M. | MEAN + 1.0 S.D. | = 9.65 P.P.M. |
| MEAN + 1.5 S.D. | = 30.70 P.P.M. | MEAN + 1.5 S.D. | = 15.53 P.P.M. |
| MEAN + 2.0 S.D. | = 58.16 P.P.M. | MEAN + 2.0 S.D. | = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M → 15 (R) 25 ← TUNGSTEN VALUE IN P.P.M.

6.5 ← URANIUM VALUE IN P.P.M.

DU PONT CANADA **EXPLORATION**

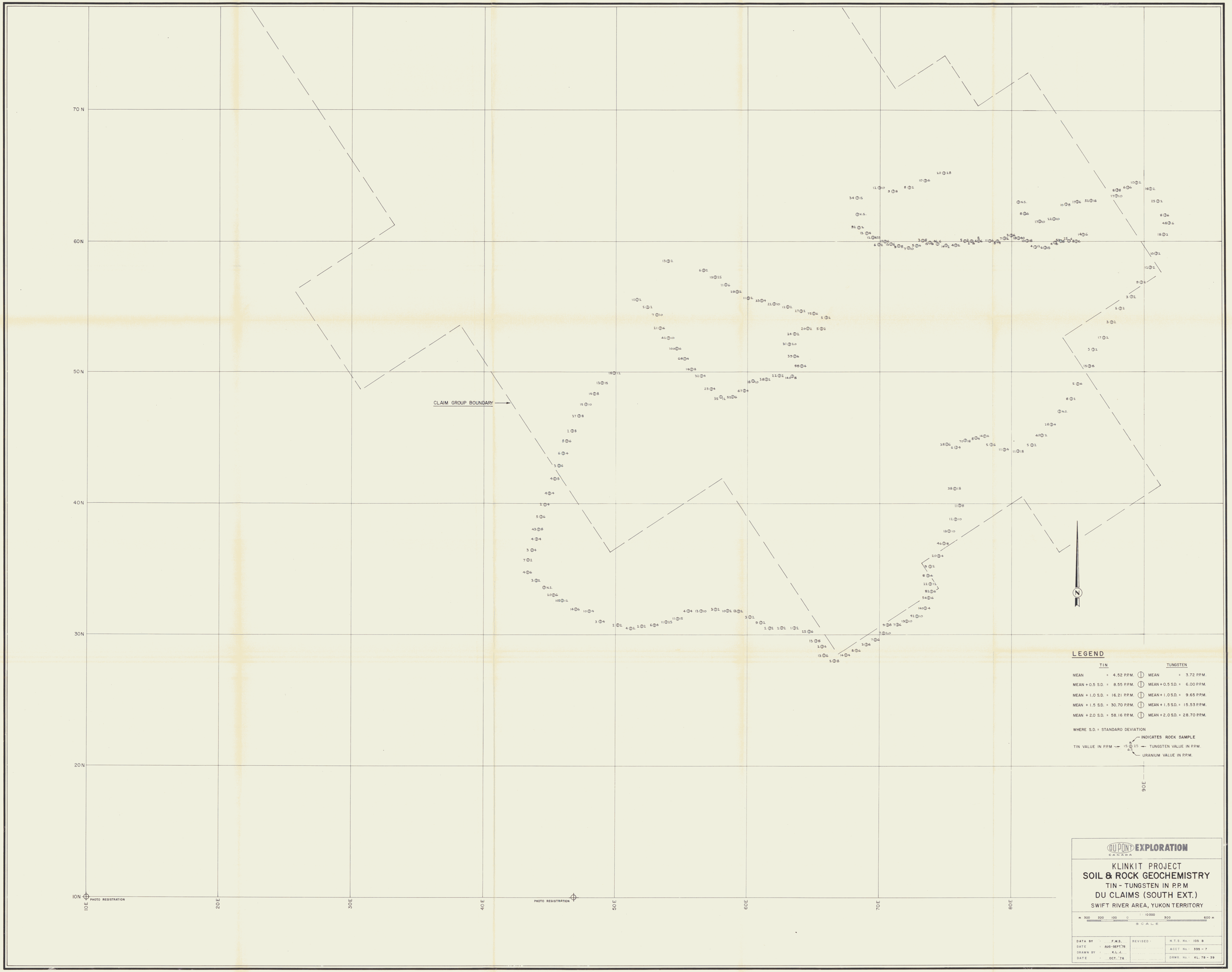
# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## DU CLAIMS (SW)

SWIFT RIVER AREA, YUKON TERRITORY

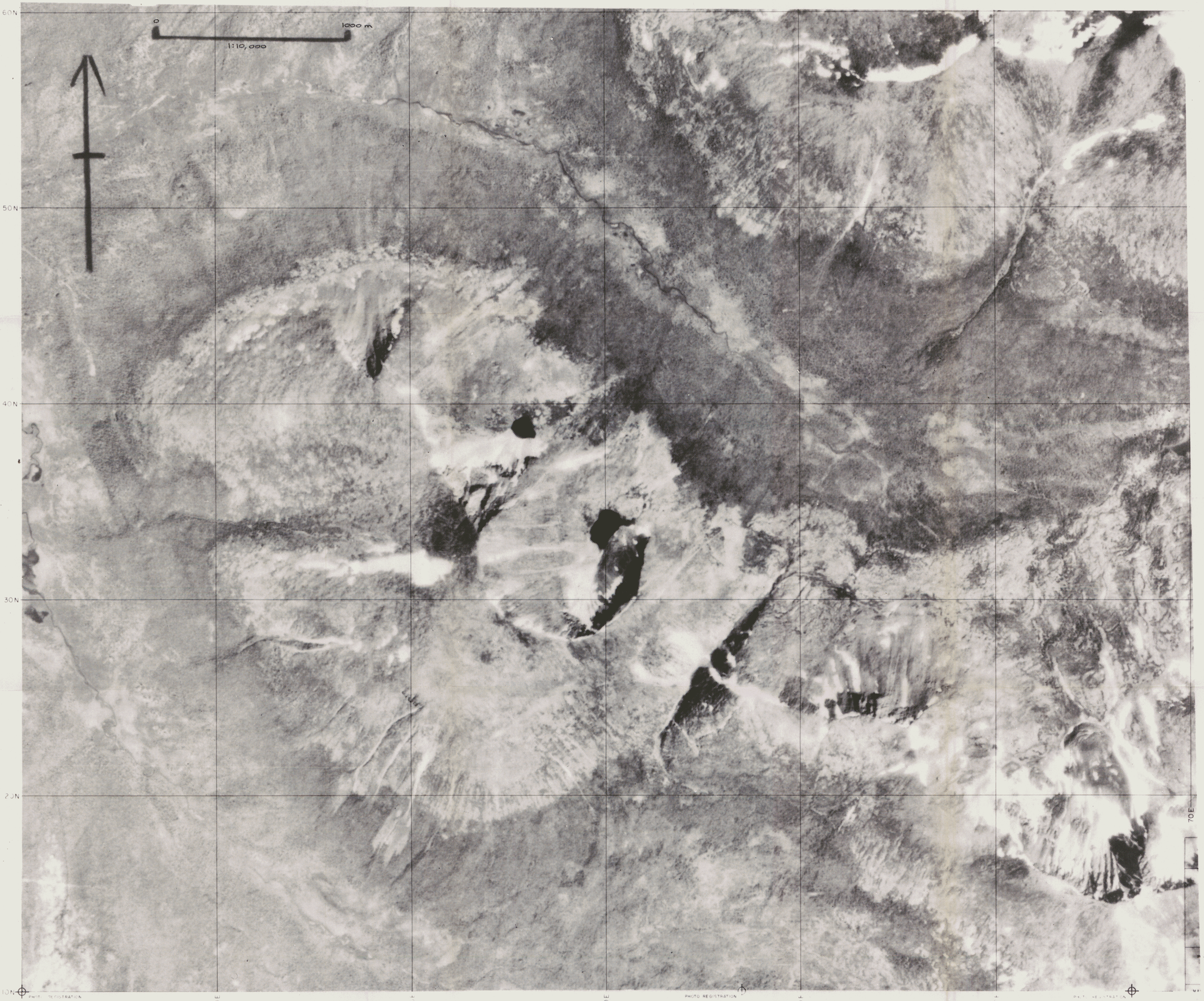
m 300 200 100 0 10000 300 600 m

SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No. 105 B |
| DATE | AUG-SEPT '78 | | ACCT. No. 335 - 7 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78 - 38 |
| DATE | OCT. '78 | | |



70 N
60 N
50 N
40 N
30 N
20 N
10 N
10 E
20 E
30 E
40 E
50 E
60 E
70 E
80 E
90 E
CLAIM GROUP BOUNDARY
PHOTO REGISTRATION
PHOTO REGISTRATION
N
LEGEND
TIN
TUNGSTEN
MEAN = 4.52 P.P.M.
MEAN = 3.72 P.P.M.
MEAN + 0.5 S.D. = 8.55 P.P.M.
MEAN + 0.5 S.D. = 6.00 P.P.M.
MEAN + 1.0 S.D. = 16.21 P.P.M.
MEAN + 1.0 S.D. = 9.65 P.P.M.
MEAN + 1.5 S.D. = 30.70 P.P.M.
MEAN + 1.5 S.D. = 15.53 P.P.M.
MEAN + 2.0 S.D. = 58.16 P.P.M.
MEAN + 2.0 S.D. = 28.70 P.P.M.
WHERE S.D. = STANDARD DEVIATION
INDICATES ROCK SAMPLE
TIN VALUE IN P.P.M.
15 25
R
6.5
TUNGSTEN VALUE IN P.P.M.
URANIUM VALUE IN P.P.M.
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
SOIL & ROCK GEOCHEMISTRY
TIN - TUNGSTEN IN P.P.M
DU CLAIMS (SOUTH EXT.)
SWIFT RIVER AREA, YUKON TERRITORY
1 : 10000
m 300 200 100 0 300 600 m
SCALE
DATA BY : F.M.S.
DATE : AUG-SEPT.'78
DRAWN BY : K.L.J.
DATE : OCT.'78
REVISED :
N.T.S. No.: 105 B
ACCT No.: 335 - 7
DRWG. No.: KL. 78 - 39



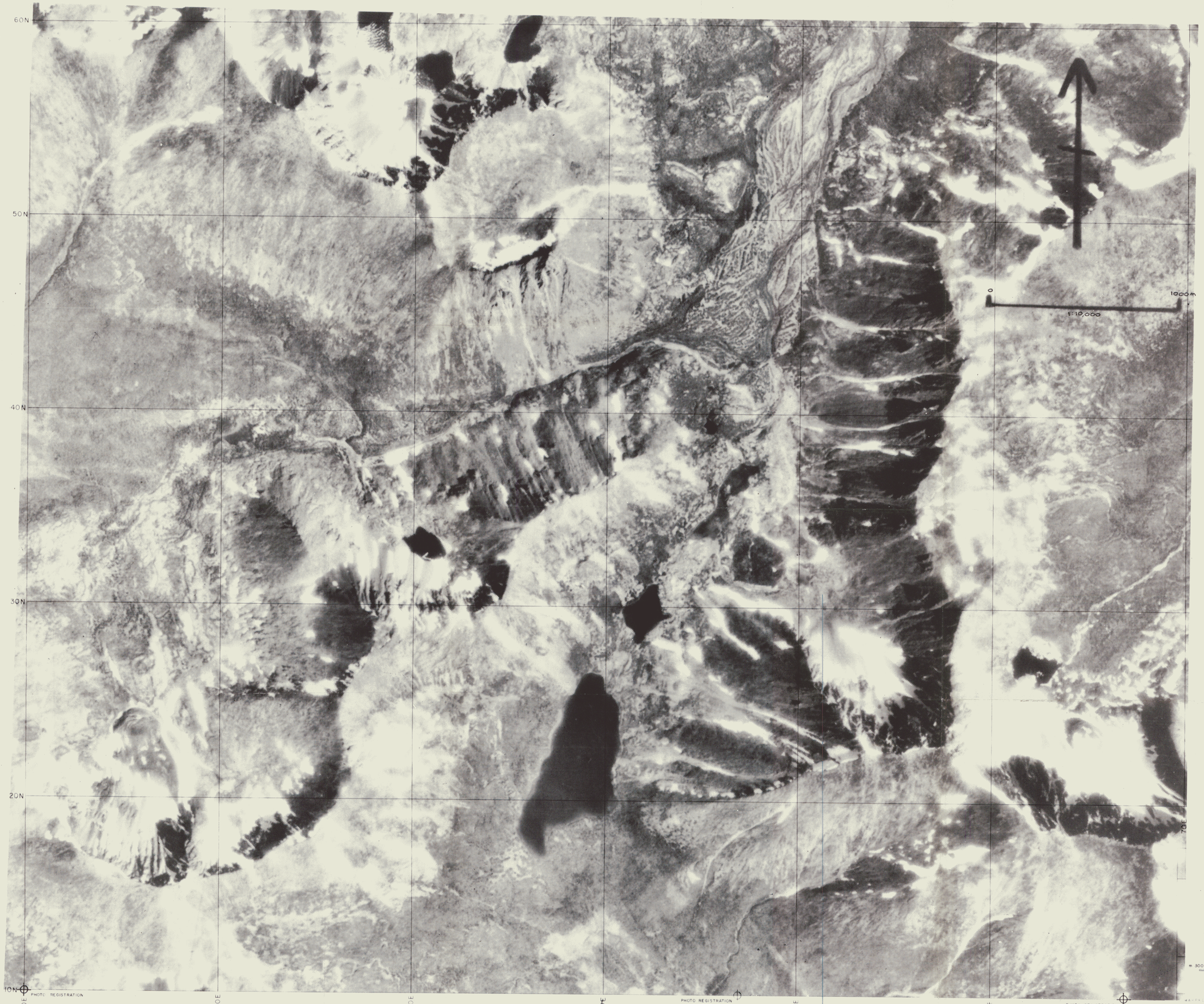

DUPONT EXPLORATION
CANADA

# KLINKIT PROJECT
# PHOTOMAP
## DU CLAIMS (NW)

SWIFT RIVER AREA, YUKON TERRITORY

1:10000

| | |
|---|---|
| L.E., C.G., M.S. | 105 B |
| JUL.-AUG. '78 | 335 - 07 |
| K.L.J. | |
| SEPT. '78 | KL.78 - 57 |




DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# PHOTOMAP
## DU CLAIMS (NE)

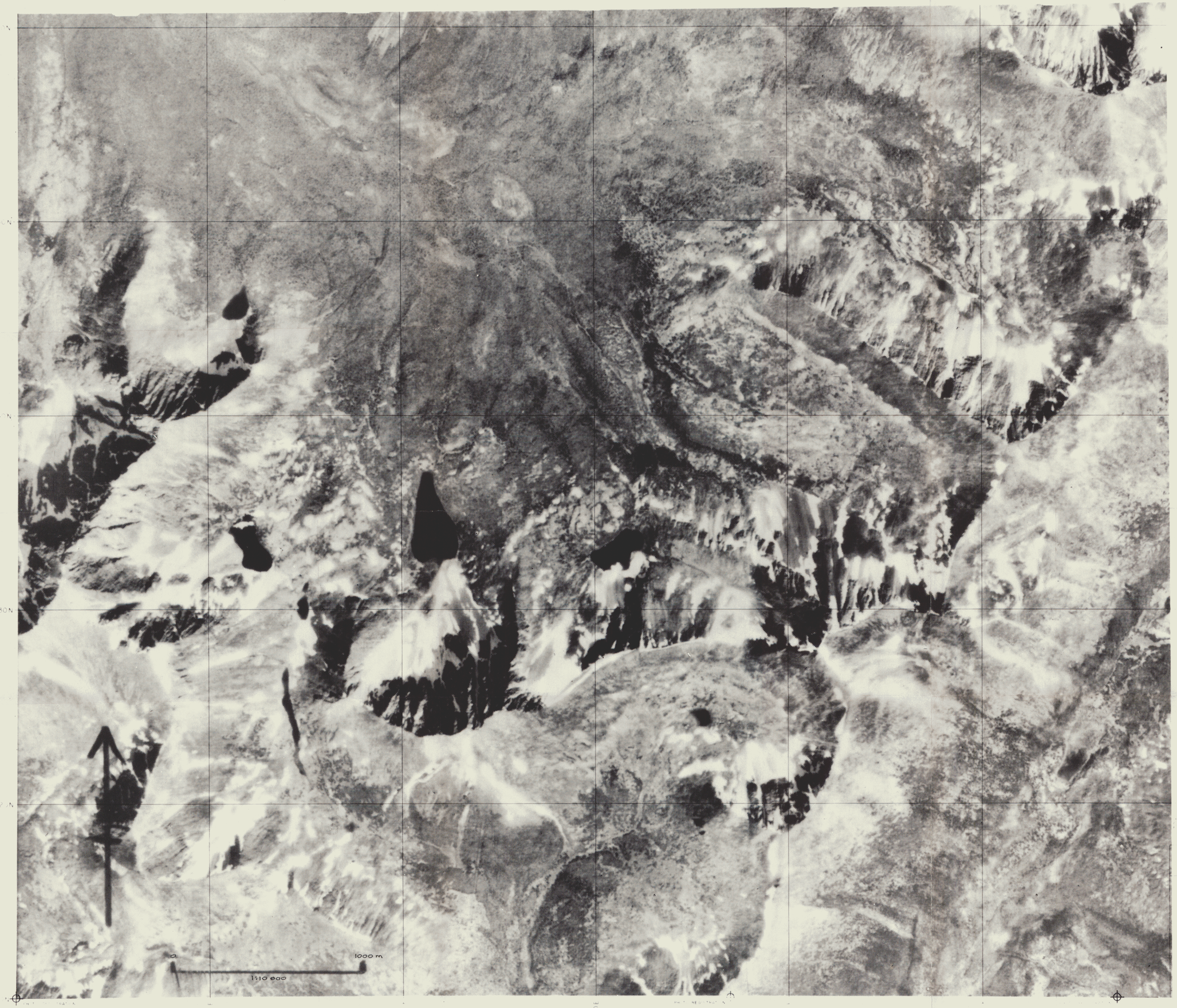
SWIFT RIVER AREA, YUKON TERRITORY

10000

m 300 200 100 0 300 600 m

SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.-AUG. '78 | | ACCT. No. 335 - 7 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78 - 58 |
| DATE | SEPT. '78 | | |




N

DU PONT EXPLORATION
CANADA

# KLINKIT PROJECT
# PHOTOMAP
## DU CLAIMS (SW)

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No 105 B |
| DATE | JUL.-AUG.'78 | | ACCT. No 335 - 7 |
| DRAWN BY | K.L.J. | | DRWG. No KL.78 - 59 |
| DATE | SEPT. '78 | | |



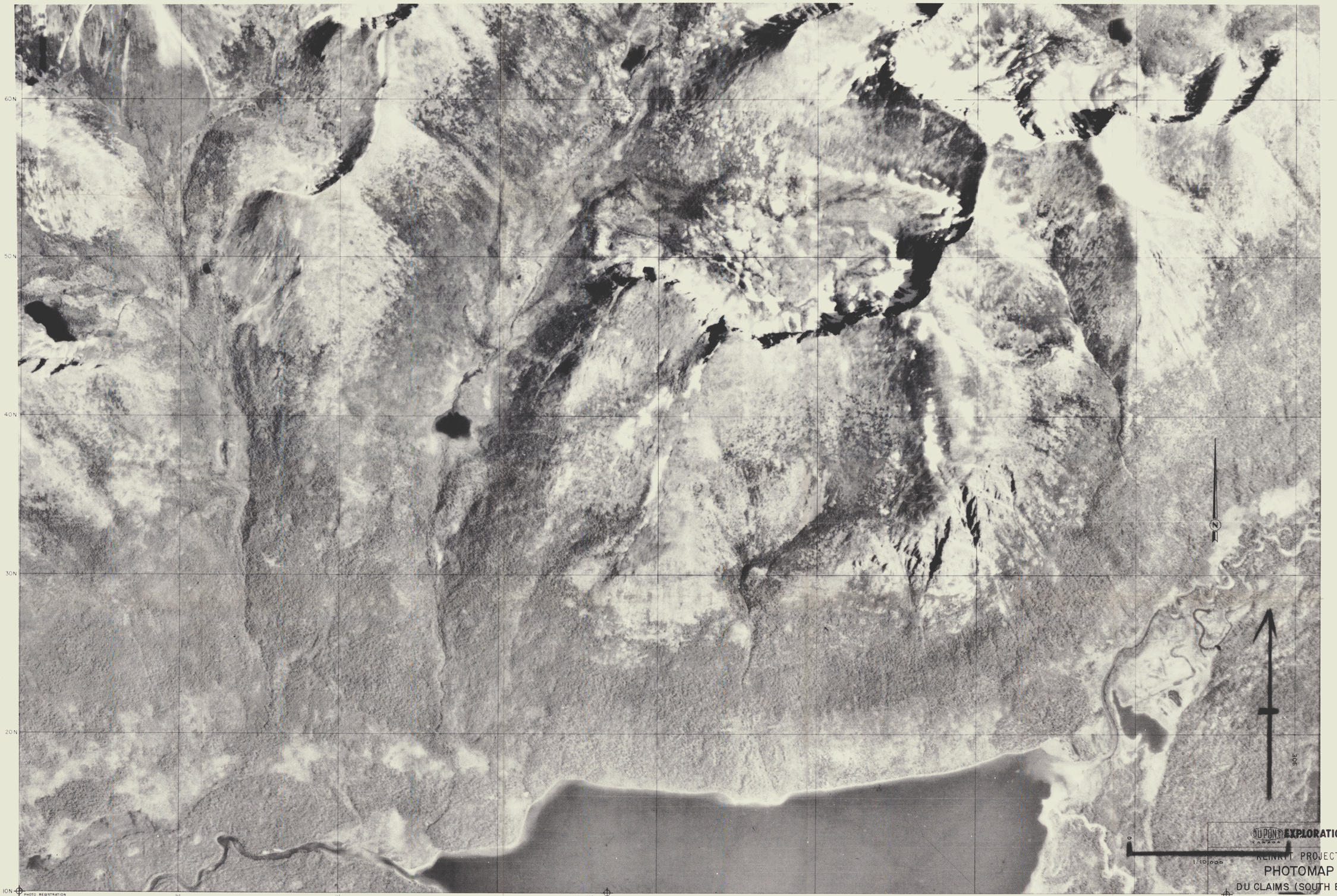

DU PONT EXPLORATION
CANADA

# KLINKIT PROJECT
# PHOTOMAP
## DU CLAIMS (S E)

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No: 105 B |
| DATE | JUL.-AUG.'78 | | ACCT No: 335 - 7 |
| DRAWN BY | K.L.J. | | DRWG No: KL.78 - 60 |
| DATE | SEPT. '78 | | |




1:10 000

DUPONT EXPLORATION
CANADA

KLINKIT PROJECT

# PHOTOMAP

## DU CLAIMS (SOUTH EXT.)

SWIFT RIVER AREA, YUKON TERRITORY

SCALE 1:10 000

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No. 105 B |
| DATE | AUG-SEPT.'78 | | ACCT No. 335-7 |
| DRAWN BY | K.L.J. | | DRWG No. KL. 78-61 |
| DATE | OCT. '78 | | |

TABLE OF CONTENTS

VAL(A) CLAIMS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|---|---|---|
| 1. | LOCATION AND ACCESS | 1 |
| 2. | PHYSIOGRAPHY AND VEGETATION | 1 |
| 3. | CLAIMS | 1 |
| 4. | HISTORY | 1 |
| 5. | REGIONAL RESULTS | 2 |
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| | 6.1 Preliminary | 2 |
| | 6.2 Geology | 3 |
| | 6.3 Geochemistry | 3 |
| | 6.4 Mineralization | 4 |
| 7. | CONCLUSIONS AND RECOMMENDATIONS | 4 |

APPENDIX

STATEMENT OF EXPENDITURES

# LIST OF FIGURES

## VAL(A) CLAIMS


| | | |
|---|---|---|
| KL 79-6 | Claim Map | Foll. P.1 |
| KL 78-23 | Geology | In Pocket |
| KL 78-35 | Geology Legend | " |
| KL 78-40 | Soil & Rock Geochem, Tin and Tungsten PPM | " |
| KL 78-64 | Photo Map | " |

## SPECIFIC PROSPECT - VAL(A) CLAIMS (335-08)

### 1. LOCATION AND ACCESS

The VAL(A) claim group, commonly known as "little" VAL, is located in the southern portion of the Seagull Batholith between Seagull(E) and Goddart (W) Creeks, on claim sheet 105-B-3, Watson Lake MD, Yukon. The central portion of the group is at about 60°06'N and 131°15'W. Access is only possible by helicopter from Swift River, Yukon, 12 km to the southeast.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-64)

The VAL(A) group covers an east trending ridge that lies between two alpine creeks that flow into Seagull Creek to the east. The north facing slope is steep with the south facing consisting of "angel of repose" slope covered in felsenmeer. The easterly trending ridge terminates in the west as a north-south arete as the head walls of the two cirques. Almost all the claims are traversable except for some portions of the north and east facing cirque wall.

Vegetation is limited to minor clumps of balsam and ground birch on the eastern portion of the claims with diffuse patches of sedges and wildflowers.

### 3. CLAIMS

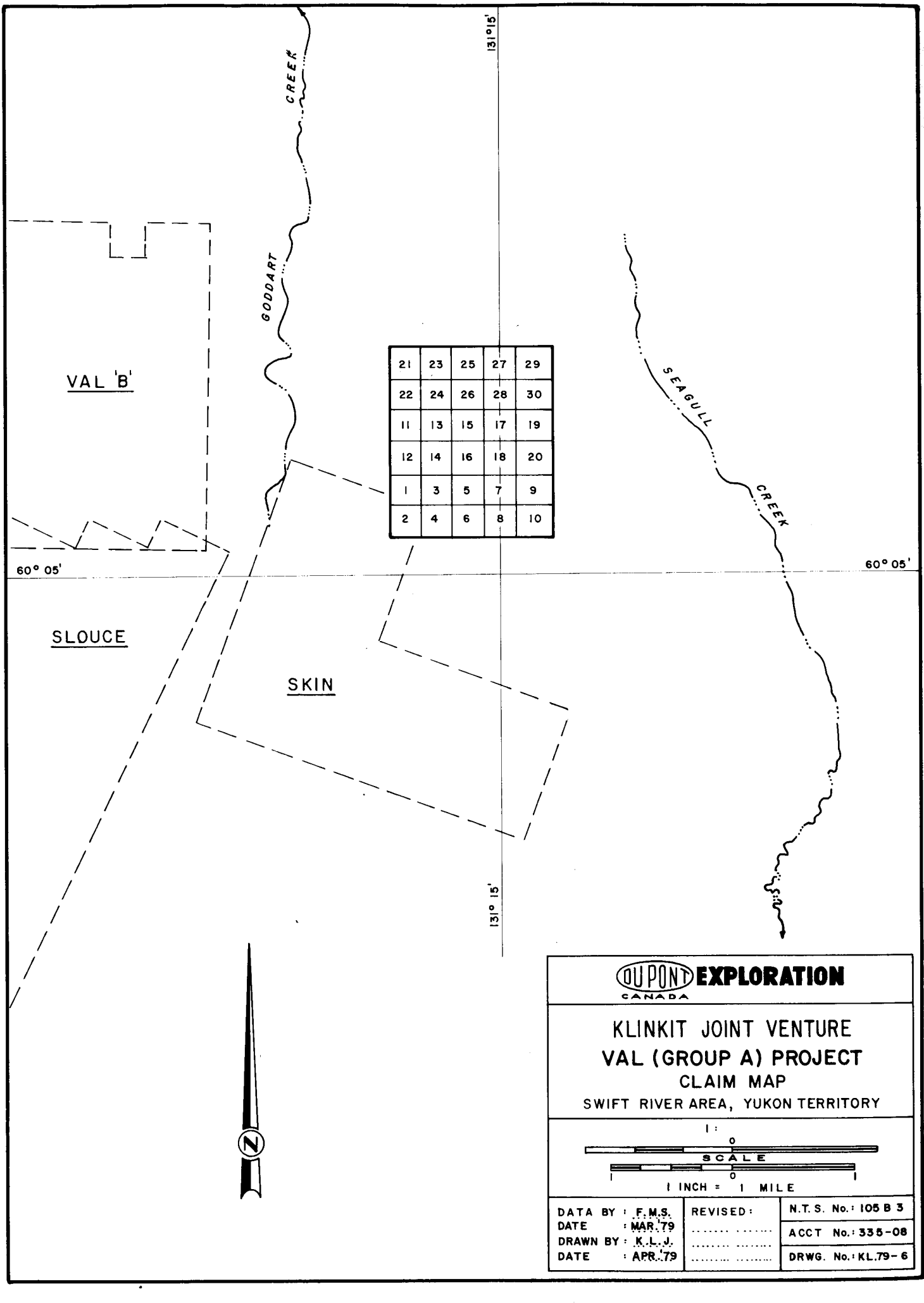
The VAL(A) group consists of the following claims:

| Claim Name | Record Numbers | Date of Record |
|---|---|---|
| VAL 1-30 | YA28773 - YAZ8804 | 1978 06 09 |

The claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited.

### 4. HISTORY

The VAL(A) claims cover the area of the GSC "occurrence" of float with tin mineralization. At the time of the acquisition of DU, PONT(B) and VAL(A) claims, we noted that the best tin values were in areas that had small roof pendants (based on GSC mapping) and had several orange/red to dark red/brown gossans. The VAL(A) area was not geochemically sampled but appeared to be similar to the DU etc. claimed areas and hence the ground was acquired on a speculative basis. We were aware of the reported GSC float and Archer Cathro Mineral Inventory write-up of the GSC area and considered this along with the small roof pendant and the


CREEK
131°15'
GODDART
VAL 'B'
21 23 25 27 29
22 24 26 28 30
11 13 15 17 19
12 14 16 18 20
1 3 5 7 9
2 4 6 8 10
SEAGULL
CREEK
60° 05'
60° 05'
SLOUCE
SKIN
131° 15'
N
DUPONT EXPLORATION
CANADA
KLINKIT JOINT VENTURE
VAL (GROUP A) PROJECT
CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY
1 : 0
SCALE
0 1
1 INCH = 1 MILE
DATA BY : F.M.S.
DATE : MAR.'79
DRAWN BY : K.L.J.
DATE : APR.'79
REVISED :
N.T.S. No.: 105 B 3
ACCT No.: 335-08
DRWG. No.: KL.79-6

multiple gossans to be sufficient justification for the acquisition of the small claim groups.

AMAX optioned the Minex 1977 STQ claims to the north of the VAL(A) group and enlarged the STQ group by staking southward to the north edge of the VAL(A) claims. The SKIN claims merge with the southwest boundaries of the VAL(A) claim group.

## 5. REGIONAL RESULTS

The VAL(A) claims were not located on the basis of regional sampling results. There were no samples collected within or near the VAL(A) group during our exploration programme.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

D.A. Barr examined the VAL(A) area on 1978 06 22 and described and sampled the skarn zone in the small roof pendant on VAL(A) claims as follows:

"The little VAL claim group lies about 5 km east of the VAL claim group and covers a small roof pendant consisting of crystalline limestone which dips gently to the south and which is well-exposed on an easterly trending ridge between elevations of 1640 and 1700 m. At its contact with the Seagull Batholith quartz monzonite skarn is developed which is mineralized with considerable magnetite but no visible base metal sulphides. Two samples were taken at the west and east contacts (DOX 2068, 2069).

| Sample No. | Sn | $WO_3$ | U | $MoS_2$ | Remarks |
|---|---|---|---|---|---|
| DOX 2068 | 42 | 2 | 8.0 | 6 | El 5600' - 20' wide zone. Diop.skarn with mag. |
| DOX 2069 | 2375 | 255 | 4.8 | 2 | El 5380' - 2-4' wide zone. Diop.skarn with mag. " |

## 6.2 Geology (Map KL 78-23)

The oldest rocks in the VAL(A) area are portions (as a roof pendant) of the Devono-Mississippian limestones, cherts and argillites. The small central roof pendant is totally surrounded by unaltered Seagull or Hake phase of the Seagull Batholith. The northern portion of the claims has the Seagull Batholith in the floor of the cirque and argillites of the lower sequence of the Devono-Mississippian assemblage in the cirque walls.

The central roof pendant is 920 m long and 450 m wide with most of the outcrop as relatively sand-free limestone. The northern portion has the interlayered chert sequence in contact with the roof of the batholith and in faulted contact with the overlying limestone of virtually E-W strike and 52° dip to the south.

L.K. Eccles mapped skarny material that had no visible scheelite or cassiterite at the easternmost end of the roof pendant in the general area of the three-way contact of granite, chert and limestone. Ms. Eccles noted a vein or narrow vertical magnetite skarn zone in the northwestern portion of the roof pendant that had no visible cassiterite or scheelite. There are no other alteration zones and the granite appears to be relatively homogenous with no visible sub-phases.

## 6.3 Geochemistry (Map KL 78-40)

A total of 79 samples were collected and analyzed for tin and tungsten. There is one major anomaly immediately down hill from the mineralized skarn material in the east end of the roof pendant.

The most unusual aspect of the area is a rather elevated background value in tin throughout most of the sampled area. Variations on the background on the high side of the frequency curve tend to be anomalous when compared to the overall sample statistics for the project area.

The weak to moderate values especially in the south-west and northwest may indicate greisen zones that require examination.

## 6.4 Mineralization

Samples from the roof pendant were assayed as below:

| Tag | Field No. | $WO_3$ % | Sn % | Description |
|---|---|---|---|---|
| 3831 | E78-8-4-85 | 0.01 | 0.63 | Skarn zone. |
| 3832 | E78-8-4-85 | 0.04 | 1.04 | Skarn zone. |
| 3833 | E78-8-4-87 | 0.01 | 0.13 | Magnetite chalcopyrite vein in LMST. |

The tin mineralization may be totally hosted in garnet. Thin section and similar studies planned for 1979 will determine whether this skarn zone has a significant economic worth.

# 7. CONCLUSIONS AND RECOMMENDATIONS

The mineralization on the VAL(A) appears to grade sufficiently rich to be of interest but the size of the mineralized zone may be too small for economic viability and the tin may be hosted in garnets.

The cause of the elevated background in tin should be determined, as this area, VAL(A) and SKIN, has alteration zones and small zones of tin mineralization that may relate to late substocks with their cusps in the weakly mineralized Seagull or Hake phase of the batholith.

The mineralization on the VAL(A) and the anomalous tin areas should be examined to determine the tin minerals and the economic viability of the zones.

The alteration on VAL(A) should be carefully examined to determine if it relates to buried tin zones on the basis of our 1979 "Geological Model" for the Seagull Batholith.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## VAL(A) CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 187.43 |
| Camp Expenses | | 298.12 |
| Mapping, Gr. Surveys, Maps | | 2,463.60 |
| Freight, Hauling, Storage | | 24.27 |
| Assaying | | 581.66 |
| Salaries - Regular | | 891.66 |
| Salaries - Temporary | | 143.92 |
| Equipment Rental | | 65.22 |
| Stationery & Supplies | | 3.74 |
| Telephone | | 19.46 |
| Auto Expenses | | 7.53 |
| Repairs and Maintenance (Excl. Auto) | | 1.85 |
| Non Capital Equip. Purchases | | 32.81 |
| Depreciation Expenses | | 19.41 |
| TOTAL | $ | 4,740.68 |

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

PHOTO REGISTRATION

PHOTO REGISTRATION

ARGL

GCFB

E-78-8-4-91

21

23

25

27

29

30

28

26

24

22

CREEK

No.2 VAL 25,26
No.1 VAL 27,28

CHRT

E-78-8-4-88

E-78-8-4-86

E-78-8-4-90

E-78-8-4-89

52°

17

SKRN

19

MG

E-78-8-4-87
0.01 $WO_3$ 0.13 Sn
SAMPLE #3633

15

LMST

SAMPLE #3831 0.01 $WO_3$ 0.63 Sn
SAMPLE #3832 0.04 $WO_3$ 1.04 Sn

E-78-8-4-85

13

11

E-78-8-4-83

16

GCFB

18

20

CREEK

14

12

9

E-78-8-4-83

7

5

3

1

GCFB

10

Lake

No.2 VAL 3,4
No.1 VAL 5,6

8

6

4

2

GCFB

DUPONT EXPLORATION
CANADA

# KLINKIT PROJECT
# GEOLOGY
## VAL (A) CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1:10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY : | L.E., C.G., M.S. | REVISED : | N.T.S. No. : 105 B |
| DATE : | JUL.-AUG.'78 | | ACCT No. : 335-08 |
| DRAWN BY : | K.L.J. | | DRWG No. : KL.78-23 |
| DATE : | SEPT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite , quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE : ( coarse grained ) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB ) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous ) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous ) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS

CT = CASSITERITE

CP = CHALCOPYRITE

AG = AUGITE

GL = GALENA

GB = GARNET BERYL ( SKARN)

GD = GARNET DIOPSIDE

GM = GARNET MAGNETITE

GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE )

HB = HORNBLENDE

HS = HULSITE

MG = MAGNETITE

MY = MALAYAITE

MS = MASSIVE SULFIDE

MU = MUSCOVITE

PG = PEGMATITE

PO = PYRRHOTITE

QC = QUARTZITE COBBLE

QT = QUARTZ TOURMALINE

QV = QUARTZ VEINS

SF = SERICITE FLUORITE

SL = SHEELITE

SP = SPHALERITE

WF = WOLFRAMITE

C\ = CONTACT ZONE

D\ = DYKE

EP = EPIDOTE

GP = GRAPHITIC

PP = PORPHYRY

TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)

CONTACT APPROIMATE OR ASSUMED

CONTACT OBSERVED

MORAINE ( edge of)

TALUS ( edge of)

FAULT

JOINTING, inclined , vertical

BEDDING, inclined , vertical

FOLIATION, inclined , vertical

AREA OF NUMEROUS GOSSANS

GOSSAN

OVERTURNED ANTICLINE

SKARN

ROCK SAMPE LOCATION

CHIP SAMPLE LOCATION

X FLOAT

Rock A / Rock B ROCK A MORE COMMON THAN ROCK B

Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B ( ie minor lentils in rock A )

CLAIM POST

THIN SECTION LOCATION

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT

# GEOLOGICAL LEGEND

TO ACCOMPANY DRWG Nos. KL.78-16 TO 34

SWIFT RIVER AREA, B.C. & Y.T.

SCALE

1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 40 & 105B |
| DATE : SEPT. '78 | | ACCT No. : 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : KL.78 - 35 |
| DATE : OCT. '78 | | |

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

70E

PHOTO REGISTRATION

PHOTO REGISTRATION

PHOTO REGISTRATION

CLAIM BOUNDARY

1Ⓣ8 3Ⓣ6 1Ⓣ10 5Ⓣ30 7Ⓣ60 1Ⓣ10 2Ⓣ2 7Ⓣ4 11Ⓣ2 6Ⓣ2 9Ⓣ4 5Ⓣ4 25Ⓣ15 19Ⓣ22 35Ⓣ25 43Ⓣ12 2Ⓣ6 16Ⓣ8 11Ⓣ6 9Ⓣ35 6Ⓣ4 11Ⓣ4 11Ⓣ6 14Ⓣ4 7Ⓣ2 22Ⓣ2 >1000Ⓣ300 1Ⓣ2 8Ⓣ2 7Ⓣ2 2Ⓣ2 3Ⓣ2 7Ⓣ2 13Ⓣ2 25Ⓣ2 7Ⓣ6 4Ⓣ6 7Ⓣ8 15Ⓣ8 13Ⓣ6 14Ⓣ18 24Ⓣ8 11Ⓣ12 7Ⓣ12 7Ⓣ14 30Ⓣ15 24Ⓣ15 10Ⓣ2 3Ⓣ2 14Ⓣ15 20Ⓣ2 15Ⓣ10 9Ⓣ8 13Ⓣ6 16Ⓣ25 36Ⓣ10 5Ⓣ8 5Ⓣ30 14Ⓣ12 8Ⓣ6 1Ⓣ4 1Ⓣ4 2Ⓣ20 6Ⓣ15 6Ⓣ20 8Ⓣ2 12Ⓣ15 ⓉN.S. 2Ⓣ8 17Ⓣ8

N

## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | Ⓘ | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | Ⓘ | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | Ⓘ | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | Ⓘ | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | Ⓘ | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

R INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M → 15Ⓣ2.5 ← TUNGSTEN VALUE IN P.P.M.
6.5

URANIUM VALUE IN P.P.M.

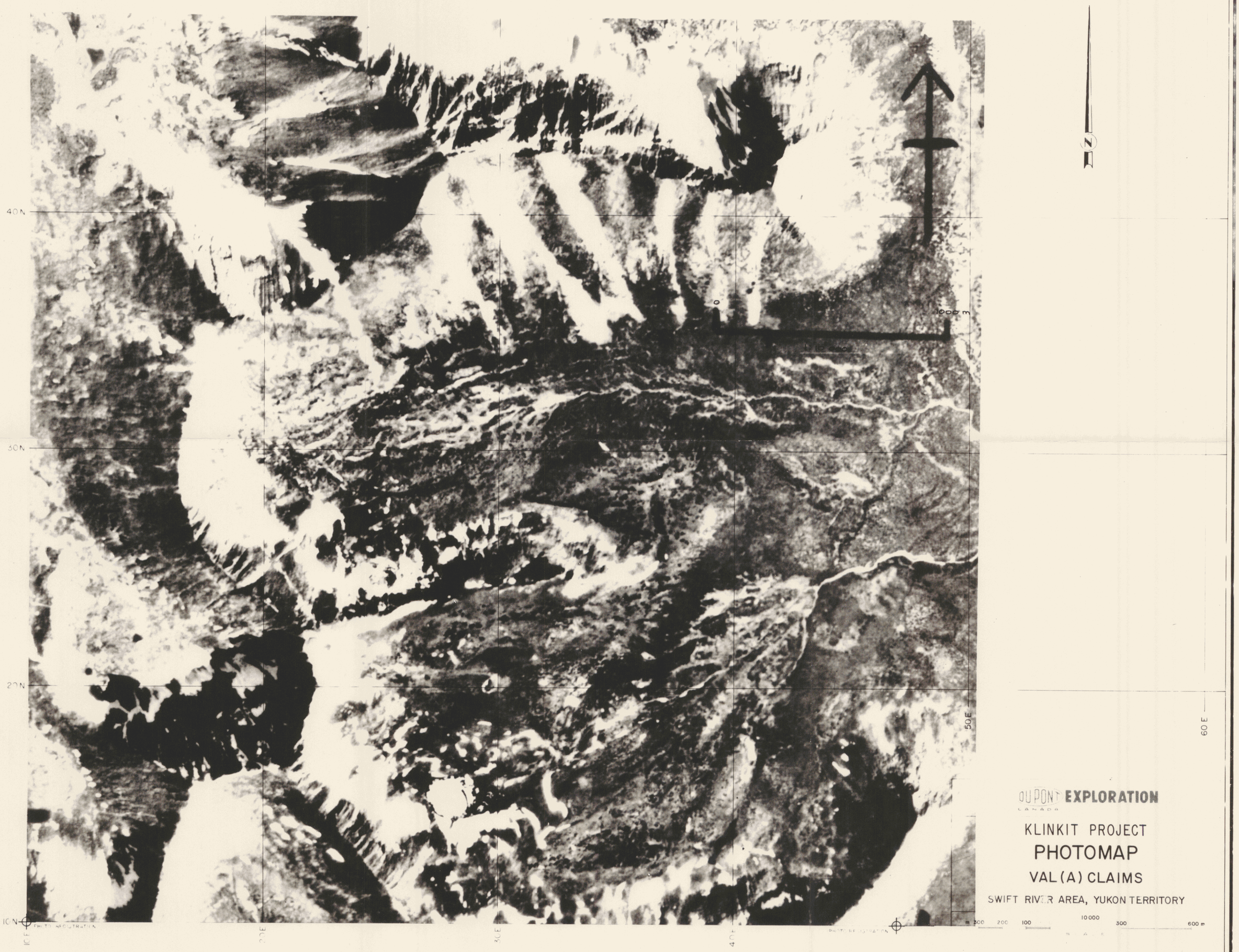
DU PONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## VAL (A) CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 : 10000 300 600 m

SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No.: 105 B |
| DATE | AUG-SEPT '78 | | ACCT No.: 335 - 8 |
| DRAWN BY | K.L.J. | | DRWG. No.: KL.78-40 |
| DATE | OCT. '78 | | |




DU PONT EXPLORATION
CANADA

KLINKIT PROJECT

# PHOTOMAP

## VAL (A) CLAIMS

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 10 000 300 600 m

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | 105 B |
| DATE | JUL.-AUG.'78 | | 335 - 8 |
| DRAWN BY | K.L.J. | | |
| DATE | SEPT. '78 | | KL.78 - 64 |

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APPENDIX

PETROGRAPHIC DESCRIPTIONS

STATEMENT OF EXPENDITURES

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## SKIN CLAIMS


| | | |
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| KL 78-48 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-72 | Photo Map | " |

## SPECIFIC PROSPECT - SKIN CLAIMS (335-09)

### 1. LOCATION AND ACCESS

The SKIN group covers the headwaters of two small creeks flowing easterly to Seagull Creek and the east wall of the valley at the headwaters of Goddart and Partridge Creeks. The SKIN group is on claim sheet 105-B-3 at about 60°04'N and 131°17'W, Watson Lake MD, Yukon. The claims are in the south central portion of the Seagull Batholith, Englishman Range, Cassiar Mountains.

Access is only possible by helicopter from Swift River, Yukon about 9 km southeast of the centre of the project area.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-72)

The SKIN project area consists of an ESE trending pair of aretes terminating in the west against a northerly trending arete on the east side of the Partridge/Goddart Creek valley. The northern arete is part of the southern portion of the VAL(A) group with north facing slopes steep and south facing covered in felsenmeer at the angle of repose. The central ridge is broken into five small sub-cirques/ hanging valleys that face north with the two largest having tarns in the valley floors. These cirques have sheer walls facing north and northwest with subdued topography in all other directions. The south facing portion of the ridge (and almost all other areas) are felsenmeer covered of moderate to angle of repose slopes, with little if any outcrop. The valley floors have one principal and many tens of small creeks flowing into the Seagull Creek drainage.

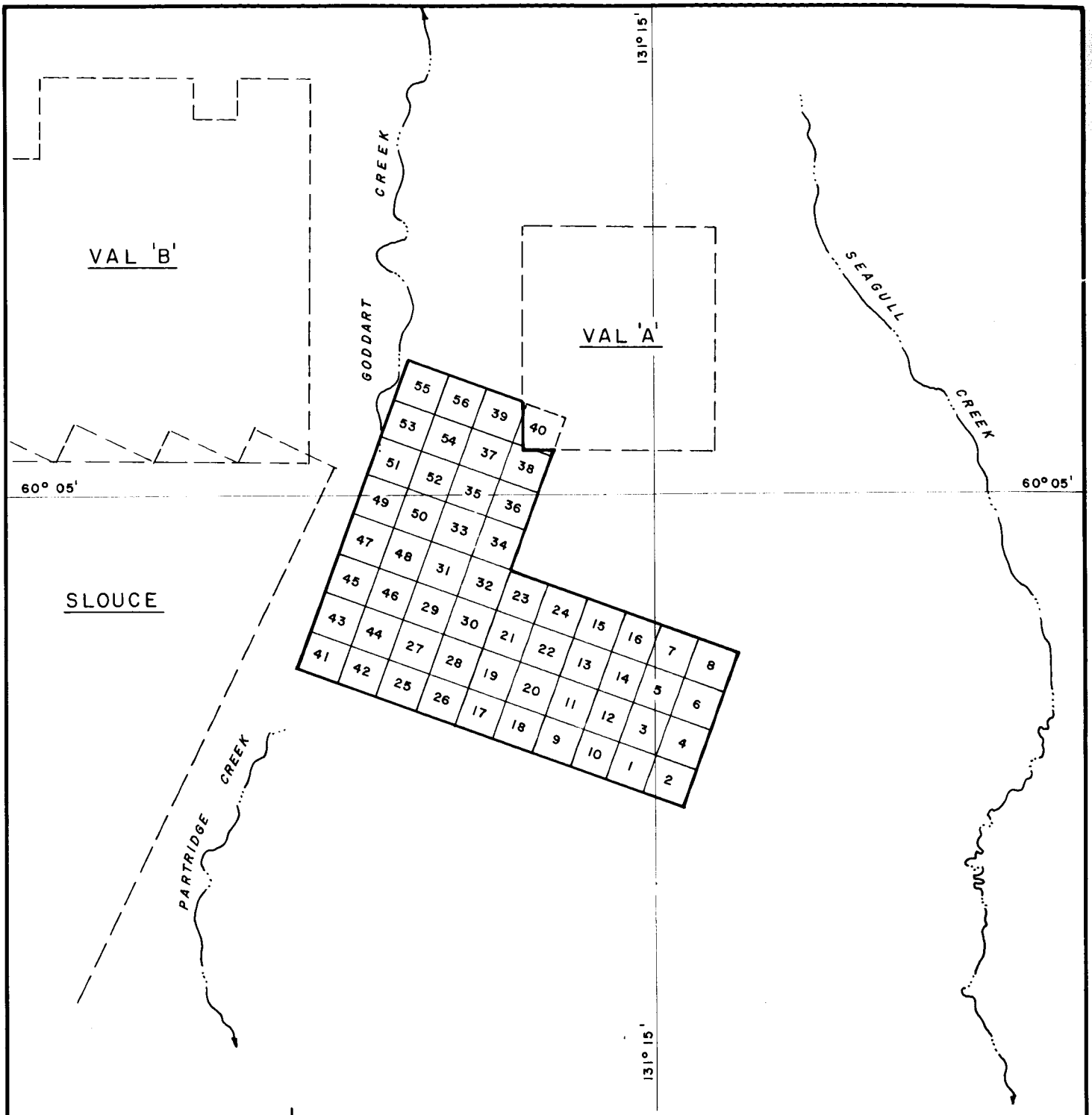
Vegetation is limited to minor alpine sedges, scattered low ground birch and wildflowers. The northern east draining creek has a few large patches of moderate ground birch and the lower levels of the west facing wall of Goddart and Partridge Creeks have mixed balsam and moderate ground birch. Most of the surface area is without vegetation other than lichen.

### 3. CLAIMS

The SKIN group consists of the following claims:

| Claim Name | Record Numbers | Date of Record |
|---|---|---|
| SKIN 1-56 | YA29215 - YA29270 | 1978 06 09 |

All claims are recorded in the Watson Lake MD in the name of Du Pont of Canada Exploration Limited.




DUPONT CANADA **EXPLORATION**

# KLINKIT JOINT VENTURE
## SKIN PROJECT
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0

SCALE

0 1

1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B 3 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-09 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-7 |
| DATE : APR.'79 | ..... ..... | |

## 4. HISTORY

The SKIN claims were staked for two reasons

(a) there are strong anomalies in Goddart and Partridge Creeks that appeared to relate to orange-red gossans (like the anomalous DU gossan) on the east wall of the common valley, and

(b) there is a prominant gossan that was only partly exposed in the eastern of the two small cirques in the central east trending arete.

As the VAL(A) group to the north was staked to cover a roof pendant, the SKIN group was located to cover the area between the VAL(A) and the prominant gossans. After locating the SKIN group, AMAX located the south extension of the STQ claims south to overlap the VAL(A) and the northwest corner of the SKIN group.

During the traverses no old posts, sample flags or camps were noted in the area of the SKIN claims. To the best of our knowledge there have been no claims recorded in the area prior to the location of the SKIN group.

## 5. REGIONAL RESULTS

As noted above, there are two anomalous values in Partridge and Goddart Creeks which appear to be related to the prominant gossans on the SKIN claimed area. No sampling was done on the Seagull Creek drainage due to time and budget constraints for the first pass. The analysis of the sample pulps in Vancouver showed tungsten and uranium anomalies related to the southern gossan on SKIN.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The western portion of the SKIN claims was traversed the day after staking to check the gossans and determine their possible relationship to the tin geochemistry. A swarm of greisen was noted during the traverse including unusual red-brown chalcedony dykelets with dark brown minerals with considerable pyrite and minor chalcopyrite.

During the examination of the Klinkit project area in June 1978 by Barr, Gunn and Smith, the latter spent a short time traversing in the area of the eastern gossan. Samples collected from this traverse (SK 1-14)

indicated an unusual alteration of the Seagull Batholith.

6.2 Geology (Map KL 78-31)

The whole claimed area is underlain by Seagull Batholith of the Seagull phase with alteration zones as overprints on the rather monotonous Cretaceous age granite to quartz monzonite.

The Seagull phase consists of two distinct varieties which appear to occur together without any contacts discernable. The first is an equigranular potassic and sodic feldspar, quartz-rich rock with minor biotite and very minor accessories. The other variety appears to be of the same composition but is a "crowded porphyry" with a groundmass of finer-grained feldspars and quartz which is of the same composition as the medium to coarse feldspars and quartz and constitutes only about 10 to 20% of the rock volume.

The alteration types are

(a) proposed pneumatolitic fluorite, uranium, arsenopyrite, quartz, lepidomelane mica zones and

(b) greisen quartz-tourmaline zones.

The first type appears to have no tin or tungsten associated but does appear to be a vertical "pipe" like body. As the alteration in the gossanous east cirque appears to change from vertical to sub horizontal at the top of the cirque it may be that the volatiles boiled in the pipe in this area. The lepidomelane, arsenopyrite and fluorite are intimately associated with the quartz/clay alteration (See SK 11, 12 petrography).

The greisen zone is a very complex area that is poorly exposed (talus covered) but does appear to have moderate tin associated with the chalcedony areas. The significance of this area is not sufficiently understood due to lack of traverses over the gossan area. The greisen usually consists of tourmaline, quartz, minor sulphides (pyrite, chalcopyrite, pyrrhotite) and several unidentified brown minerals that probably are ilmenite, hematite, wulframite or cassiterite.

For petrographic descriptions, see Appendix.

### 6.3 Geochemistry (Map KL 78-48)

A total of 172 samples were collected from the project area at the "break of slope" on most of the hillsides. The samples were analyzed for tin and tungsten and plotted on the accompanying map.

The anomalous areas for tin and tungsten are related to the principal gossanous areas in the northwest and northeast. The source for these values has not been located. As expected, the pipelike gossan in the central eastern portion has no tin or tungsten associated with it but the lack of tin related to the greisen is not understood. Again the problem with the sampling may be due to the grain size of the tin-bearing minerals (as at SWIFT) and the areas of the gossans should be re-sampled to check if the tin is only in the fine fraction in the soils.

### 6.4 Mineralization

No mineralization of economic significance has been discovered on the SKIN group.

## 7. CONCLUSIONS AND RECOMMENDATIONS

Two areas of anomalous tin and tungsten require checking to determine the character of the source area and the greisen zones on the west central portion of the claims require sampling to determine grain size of the tin minerals. Although no economic zone of tin or tungsten has so far been discovered the alteration styles in the area of the claims may indicate the presence of buried cusps of late phase intrusives.

The significance of these alteration zones will depend on the 1979 field work in the VAL(B), DU and SWIFT claim areas.

The claims should be retained for the above reasons until such time as the economic implications of the greisen and pipe alteration zones is understood. The geochemically anomalous areas require preliminary prospecting and mapping of the potential source areas.

Sample Number: SK-11

| Mineralogy: | | |
|---|---|---|
| | quartz | 45 |
| | orthoclase | 30 |
| | muscovite | 24 |
| | fluorite | 1 |
| | tourmaline | tr |
| | zircon | tr |
| | opaques | tr |

Classification: pervasively altered quartz porphyry granite

Fabric and texture: coarse-grained, porphyritic, holocrystalline, hypidiomorphic-granular

Quartz, K-feldspar, and muscovite/sericite are the only constituents present in significant proportions. Quartz and K-feldspar occur in a mosaic of anhedral, irregular interlocking grains. Quartz is present both as individual and aggregate grains intergrown with the K-feldspar, and as larger composite grains which presumably were quartz phenocrysts in the original granite. Undulatory extinction has developed in much of the quartz, and deformation bands are visible in some grains. Where a quartz grain protrudes into a vug, the proximal portion of the grain is heavily strained whereas the distal (inner) end of the grain may not show undulatory extinction. This texture suggests possible recrystallization of the quartz during the alteration event. K-feldspar, besides occurring with quartz in the general fabric, is also present in larger phenocrysts. The phenocrysts are rarely preserved in the section, but are pervasively altered to coarse-grained sericite. The K-feldspar in the matrix is invariably perthitic. Graphic intergrowths with quartz were not observed. No plagioclase feldspar is visible in the section.

Coarse-grained sericite has replaced K-feldspar in variable intensities. Most of the sericite occurs as randomly oriented shreds partially to completely replacing K-feldspar and to a lesser extent quartz. Occasionally, large, optically continuous grains of muscovite are visible. Minute opaques line the cleavage traces; presumably, these muscovite grains represent original biotite which has been completely replaced.

Vugs are related to the most pervasive sericite alteration. Fluorite generally is present as a vug filling, although many vugs are empty. Tourmaline is also present in the vicinity of the vugs, although it is rare. The mineralogy and texture of the alteration suggests late magmatic or transitional magmatic-hydrothermal origin.

The only accessory mineral visible which might account for uranium assays is zircon; however, although present in unusually large euhedral crystals, it accounts for less than one percent of the rock. A yellow earthy coating is visible in hand specimen, and a local staining of sericite is visible in thin section. This suggests that a secondary uranium mineral, possibly uranophane, may be present. Uranophane is of supergene origin. It occurs as coating along joint planes, crevices, and other open spaces in granitic igneous rocks without clear association with primary uranium minerals.

Sample Number: SK-12

Mineralogy:

| | |
|---|---|
| quartz | 92 |
| muscovite | tr |
| white mica/clays | 6 |
| opaque | 2 |
| K-feldspar | tr |

Classification: pervasively silicified intrusive

Fabric and texture:

The original rock fabric is entirely obscured by fragmentation and/or silicification. The section is predominantly composed of quartz. The greatest proportion may be described as a very fine-grained groundmass of anhedral, interlocking grains. This texture may be variously interpreted, but appears to result from complete replacement of the original rock constituents by quartz as well as filling of voids and interstices created by intense fragmentation. Occasionally quartz is visible as euhedral crystals protruding inward into miriolitic cavaties. The level of emplacement is presumed to be quite shallow. The quartz also occurs in large fragments which may be single grains (phenocrysts ?) or composites of numerous grains. Undulatory extinction has developed in the larger fragments and is presumably inherited from the original rock.

Fragments of what may have been feldspars are randomly scattered throughout the section. They are generally pervasively altered to aggregates of white mica/clays. The grain size of the replacement minerals is so fine-grained that identification of individual minerals is not possible. The feldspar (?) fragments are strongly fractured; quartz "groundmass" frequently occupies these fractures. Several grains of unaltered K-feldspar are visible in the section. They are perthitic and untwinned. Microphenocrysts of quartz are occasionally visible in the altered feldspar (?) fragments.

White mica is ubiquitous throughout. Most frequently it is visible as minute shreds intergrown with the fine-grained quartz. Occasional larger euhedral flakes are also visible. The texture suggests that the white mica was introduced with the pervasive silica replacement. Opaques are visible throughout the section both as large irregular clots, which appear in thin section as aggregates of smaller euhedral to anhedral grains, and as finer disseminations. There is no obvious control to the location of the opaques. They appear to have been introduced with the quartz and sericite.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## SKIN CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 215.67 |
| Camp Expenses | | 392.82 |
| Mapping, Gr. Surveys, Maps | | 2,582.56 |
| Freight, Hauling, Storage | | 32.54 |
| Assaying | | 750.81 |
| Salaries - Regular | | 741.31 |
| Salaries - Temporary | | 174.01 |
| Equipment Rental | | 87.44 |
| Stationery & Supplies | | 5.01 |
| Telephone | | 26.09 |
| Auto Expenses | | 10.09 |
| Repairs and Maintenance (Excl. Auto) | | 2.48 |
| Non Capital Equipment Purchases | | 43.99 |
| Depreciation Expenses | | 26.02 |
| TOTAL | $ | 5,090.84 |

60N
50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
70E
80E

GCFB
GCFB
GCFB
GCFB
GCFB

E-78-8-13-126
E-78-8-13-127
CHRT-QTDY-SF
QT
QT

SK1
SK2
SK3
SK4
SK5
SK6
SK7
SK8
SK9
SK10a
SK11
SK12
SK13
Pond
SF-QT

Lake
Lake

PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION

N

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# GEOLOGY
## SKIN CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

1 : 10000
m 300 200 100 0 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY : | L.E., C.G., M.S. | REVISED : | N.T.S. No. : 105 B |
| DATE : | JUL.-AUG. '78 | | ACCT No. : 335-9 |
| DRAWN BY : | K.L.J. | | DRWG. No. : KL.78-31 |
| DATE : | NOV. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS
CT = CASSITERITE
CP = CHALCOPYRITE
AG = AUGITE
GL = GALENA
GB = GARNET BERYL ( SKARN)
GD = GARNET DIOPSIDE
GM = GARNET MAGNETITE
GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)
HB = HORNBLENDE
HS = HULSITE
MG = MAGNETITE
MY = MALAYAITE
MS = MASSIVE SULFIDE
MU = MUSCOVITE
PG = PEGMATITE
PO = PYRRHOTITE
QC = QUARTZITE COBBLE
QT = QUARTZ TOURMALINE
QV = QUARTZ VEINS
SF = SERICITE FLUORITE
SL = SHEELITE
SP = SPHALERITE
WF = WOLFRAMITE
C\ = CONTACT ZONE
D\ = DYKE
EP = EPIDOTE
GP = GRAPHITIC
PP = PORPHYRY
TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)
CONTACT APPROIMATE OR ASSUMED
CONTACT OBSERVED
MORAINE ( edge of)
TALUS ( edge of)
FAULT
JOINTING, inclined, vertical
BEDDING, inclined, vertical
FOLIATION, inclined, vertical
AREA OF NUMEROUS GOSSANS
GOSSAN
OVERTURNED ANTICLINE
SKARN
ROCK SAMPE LOCATION
CHIP SAMPLE LOCATION
X FLOAT
Rock A / Rock B — ROCK A MORE COMMON THAN ROCK B
Rock A // Rock B — ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)
CLAIM POST
THIN SECTION LOCATION

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
## TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
## SWIFT RIVER AREA, B.C. & Y.T.

SCALE
1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | | N.T.S. No.: 40 & 105B |
| DATE : SEPT. '78 | | | ACCT No.: 335 - 00 |
| DRAWN BY : K.L.J. | | | DRWG. No.: KL.78 - 35 |
| DATE : OCT. '78 | | | |

60N

50N

40N

30N

20N

10N

10E PHOTO REGISTRATION

20E

30E

40E PHOTO REGISTRATION

50E

60E PHOTO REGISTRATION

70E

80E

CLAIM GROUP BOUNDARY

## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | ⏀ | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | ⏀ | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | ⏀ | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | ⏀ | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | ⏀ | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M → 15 ⏀ 2.5 ← TUNGSTEN VALUE IN P.P.M.
(URANIUM VALUE IN P.P.M. = 6.5)

DU PONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## SKIN CLAIMS

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No. 105 B |
| DATE | AUG-SEPT'78 | | ACCT. No. 335-9 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78-48 |
| DATE | NOV. '78 | | |




DUPONT EXPLORATION
CANADA

KLINKIT PROJECT
PHOTOMAP
SKIN CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

SCALE
1:10000
300 600 m

MAPPED BY: L.E. COLME REVISED:
JUL-AUG.78
K.L.J.
SEPT. 78

105 B
335 -9
KL.78 - 72

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SLOUCE CLAIMS


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| 3. | CLAIMS | 1 |
| 4. | HISTORY | 2 |
| 5. | REGIONAL RESULTS | 2 |
| 6. | PROPERTY EVALUATION | 2 |
| | 6.1 Preliminary | 2 |
| | 6.2 Geology | 3 |
| | 6.3 Geochemistry | 3 |
| | 6.4 Mineralization | 4 |
| 7. | CONCLUSIONS AND RECOMMENDATIONS | 4 |

APPENDIX

STATEMENT OF EXPENDITURES

# LIST OF FIGURES

## SLOUCE CLAIMS


| | | |
|---|---|---|
| KL 79-8 | Claim Map | Foll. P.1 |
| KL 78-29 | Geology | In Pocket |
| KL 78-35 | Geological Legend | " |
| KL 78-46 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-70 | Photo Map | " |

SPECIFIC PROSPECT - SLOUCE CLAIMS (335-10)

1. LOCATION AND ACCESS

The SLOUCE group covers a portion of the southwest contact of the Cretaceous age Seagull Batholith with the Sylvester group metasediments at the headwaters of Screw Creek and an unnamed creek flowing into Dorsey Lake to the northwest. The eastern portion of the claims cover the west wall of Partridge and Goddart Creek. The mountains are part of the Englishman Range, Cassiar Mountains, Yukon. The claim sheet is 105-B-3 and the centre of the group is at about 60°04'N and 131°23'W.

The claims are as yet only acccessible via helicopter from Swift River, Yukon about 13 km southeast. Part of the road network into the old "Logjam Creek" property to the southwest passes within 8 km.

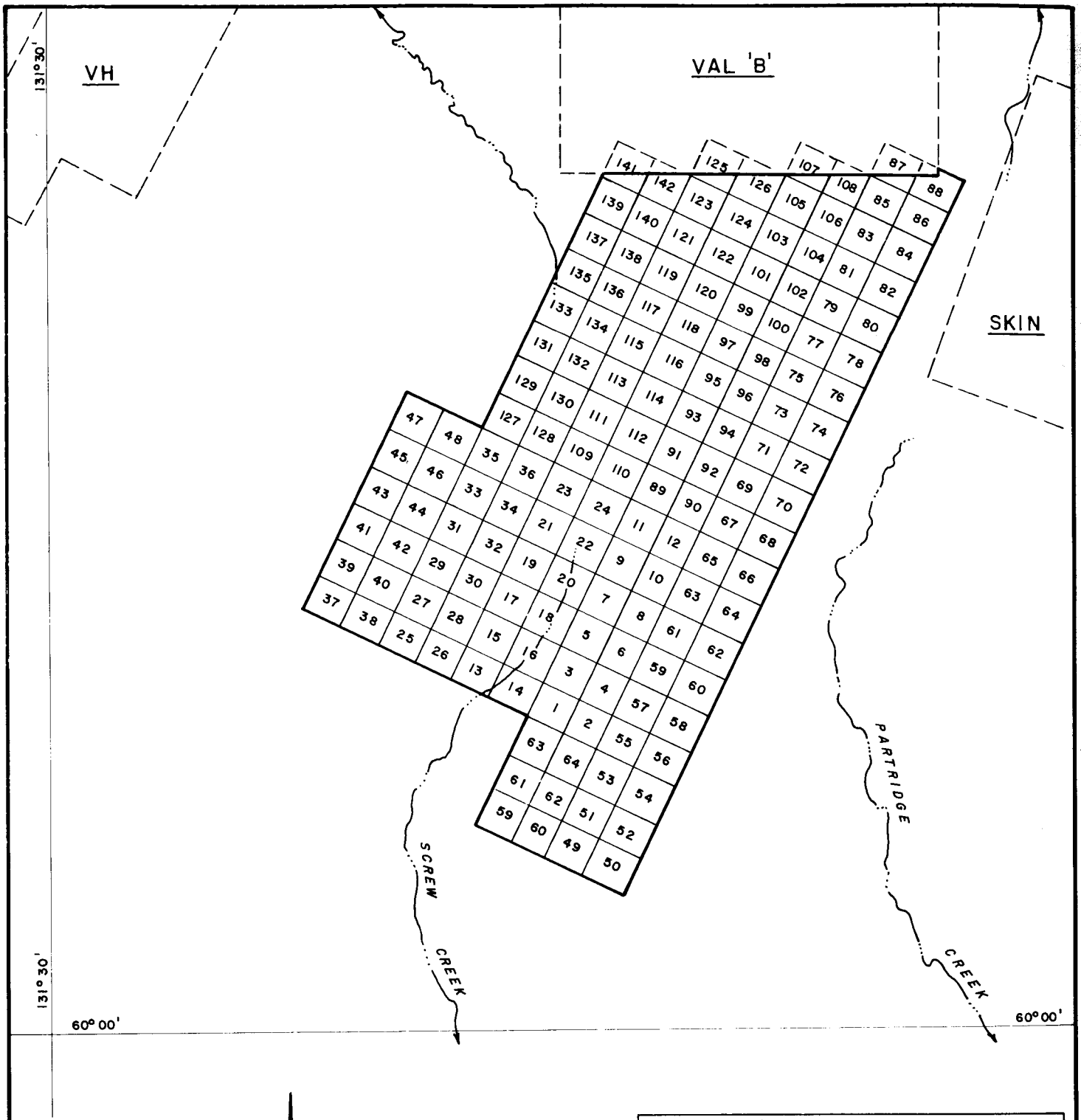
2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-70)

The SLOUCE claim area covers a complex physiographic area of mountains, cirque basins and major stream headwaters. The two large streams are the south flowing Screw Creek draining the southern portion of the claims and the unnamed creek flowing north, then northwest to Dorsey Lake. The eastern side of the claims are drained by Partridge Creek to the south and southeast. The complex arete, horn and mountain ridges between Partridge and Screw Creek generally trend northerly and join the large horn at VAL(B) group. The west side of Screw Creek headwaters is an east-west ridge that joins the northwest trending complex ridge through the southside of the VH group. All northerly slopes are extremely steep to sheer cliffs and southerly slopes more subdued. Most of the claim group is felsenmeer covered with the large valley floor in the north a mixture of felsenmeer and outcrop.

Vegetation is generally sparse except for the headwaters of Screw Creek where alpine grassy slopes and meadows merge into ground birch and balsam cover southwards. The northern area has sparse patches of willow, ground birch and minor sedges. Most of the project area is free of vegetation cover.

3. CLAIMS

The SLOUCE group consists of the following claims:




DUPONT CANADA **EXPLORATION**

# KLINKIT JOINT VENTURE
## SLOUCE PROJECT
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0

SCALE

1 0 1

1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B 3 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-10 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-8 |
| DATE : APR.'79 | ..... ..... | |

| Claim Name | Record Number | Date of Record |
|---|---|---|
| SLOUCE 1-64 | YA29271 - YA29334 | 1978 06 09 |
| SLOUCE 59-138 | YA34107 - YA34186 | 1978 07 20 |
| SLOUCE 139-142 | YA34400 - YA34403 | 1978 08 01 |

There are two sets of SLOUCE 59-64 claims with different record numbers, thus the total group consists of 148 rather than 142 claims.

The claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited

## 4. HISTORY

There is no record of past work nor were any old posts noted in the area of the SLOUCE group. The SLOUCE group ties on to the south edge of the VAL(B) group where previous work was reported for the exploration for massive sulphides in the fahlband zone of the Sylvester group sediments.

After locating the SLOUCE 1-64 the DC Syndicate located the MW group on the southwestern edge of the project area. They apparently were following up on a tungsten anomaly from their 1977 field work.

## 5. REGIONAL RESULTS

The SLOUCE group was acquired to cover an area of

(a) anomalous tin from the north drainage,

(b) anomalous tin on the southeast side of VAL(B),

(c) anomalous tungsten on the southeast side, and

(d) many orange/red gossans in granite and contact areas throughout the current group.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The prominant gossan at the contact of Sylvester group metasediments (fahlband zone) with the Seagull phase in the south central portion of the project was traversed on June 22 by C.B. Gunn. At this time we learned that some of the gossans were due to the fahlband zone and like the SLIP claim area there was

no tin mineralization associated with the sulphide schist.

6.2 Geology (Map KL 78-29)

The oldest units in the SLOUCE project area are the arenaceous limestone and cherts of the Sylvester group exposed in the southwestern portion of the claims at and near the contact with the Cretaceous age granite of the Seagull phase of the Seagull Batholith.

The limestone and chert has been chevron folded, napped and pyrometasomatically altered by the granite in the area of the north facing cirque walls in the westernmost portion of the central part of the group. Although not found in place, there is float from this sheer cliff of greisen tourmaline veins with tin values (sample E-78-7-29-55). To the southeast of this locality on the east side of Screw Creek the upper portions of the Sylvester group are preserved with the tuffaceous argillite as the dominant member. Alteration in this area consists of aplite dykes too small to plot and as at PONT(B) they appear to be related to the top of the Seagull phase of the batholith. There is no exposure of pegmatite in this locality with the contact usually vertical to steeply dipping to the south or southeast.

The Cretaceous age Seagull Batholith is usually a monotonous single phase throughout the claimed area. Variations on the crowded porphyry to coarse grained phase are late quartz tourmaline greisen in the near contact area on the southeast, minor pegmatite dykes in the extreme eastern portion and a poorly mapped micro-granite late phase in the central to eastern portion. The central to northern portion of the claims have had only geochemical traverses but the area appears to be only subcropping granite of the Seagull Batholith.

6.3 Geochemistry (Map KL 78-46)

A total of 279 samples were collected in the area of the SLOUCE claims. There are no significant anomalies for tin or tungsten. There are moderate anomalies in the east central to eastern portion of the claims for tungsten possibly related to the pegmatites or the late micro granite (as at DU claims). The intensity of these anomalies may explain the tungsten stream anomaly near Partridge Creek.

There are also scattered tin and tungsten moderate anomalies down slope from the limestone outcrop and in the area of the mineralized float on the west and southwestern portion of the claims. The magnitude of these anomalies does not appear to explain the very anomalous value in the stream draining the central portion of the claims. This major anomaly will require checking forthe size fraction of the tin to determine if our soil sampling could have missed a significant zone of mineralization.

### 6.4 Mineralization

Only six samples were analyzed for tin and tungsten. Of these, only two from the area of the contact of the Seagull Batholith with Sylvester age limestones showed any appreciable tin. Sample E-78-7-29-55 ran 0.62% Sn and DOX 2979 ran 0.90% Sn. The latter was collected by one of the soil samplers to the north of the cirque wall and is probably float. The 'E' sample, from talus derived from the sheer walls of the cirque, consists of occelative bands of tourmaline and quartz in a greisen vein.

No areas of economic mineralization have so far been discovered in the SLOUCE claim area.

## 7. CONCLUSIONS AND RECOMMENDATIONS

The regional geochemical anomalies have not been fully explained nor has the northern portion of the claims been fully sampled, prospected or mapped. There may be a problem (as at SWIFT claims) of the grain size of the tin mineralization in relation to sample location and preparation.

The SLOUCE evaluation must be completed before the economic significance of the area can be determined. The alteration zones and late phase intrusives require additional examination to determine if there is a potential tin or tungsten mineralized zone. A minor amount of sampling, prospecting and mapping is required in the area of the moderate tungsten geochemical anomalies to determine the source and character of the mineralization.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## SLOUCE CLAIMS, YT

| | |
|---|---|
| Travel Expenses | $ 345.30 |
| Camp Expenses | 827.63 |
| Mapping, Gr. Surveys, Maps | 5,500.24 |
| Freight, Hauling, Storage | 70.51 |
| Assaying | 1,527.37 |
| Salaries - Regular | 1,533.98 |
| Salaries - Temporary | 351.27 |
| Equipment Rental | 189.45 |
| Stationery & Supplies | 10.85 |
| Telephone | 56.52 |
| Auto Expenses | 21.87 |
| Repairs and Mtce (excl. Auto) | 5.38 |
| Non Capital Equipment Purchases | 95.31 |
| Depreciation Expenses | 56.38 |
| TOTAL | $ 10,592.06 |

80N
70N
60N
50N
40N
30N
20N
10N

10E
20E
30E
40E
50E
60E
70E
80E

PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION

XFLOAT SAMPLE #2979 0.01% WO3 0.90% Sn
SLOUCE 43,44,45 & 46

SAMPLE #3817 2 0.01% WO3 0.62% Sn

E-78-7-29-50
E-78-7-29-51
E-78-7-29-55
E-78-7-29-43
E-78-7-29-48
E-78-7-29-47
E-78-7-29-46
E-78-7-29-45
E-78-7-29-44
E-78-7-29-43
E-78-7-29-42

J-78-7-26-5/6
J-78-7-26-3/4

No.1 SLOUCE 3,4
No.2 SLOUCE 1,2

Lake
Lake
Lake

GCFB
LMST
(folded) LMST
ARGL-CHRT
ARGL
CHRT
ARGL-CHRT
CONG/QC
ARGL-CHRT
LMST
CHRT
QT-SF
QT
GCFB
ARGL-CHRT
CHRT
TUFF-ARGL-CHRT
QT-SF
GCFB
GMDQ
QT-PG
QT-PG
GCFB-QT
Talus
GCFB
Talus
GCFB
Talus
Moraine
GCFB

KLINKIT PROJECT
# GEOLOGY
## SLOUCE CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

DUPONT CANADA EXPLORATION

m 300 200 100 0 1:10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No.: 105 B |
| DATE | JUL.-AUG.'78 | | ACCT No.: 335-10 |
| DRAWN BY | K.L.J. | | DRWG. No.: KL. 78-29 |
| DATE | OCT.'78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained ) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB ) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous ) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous ) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS
CT = CASSITERITE
CP = CHALCOPYRITE
AG = AUGITE
GL = GALENA
GB = GARNET BERYL ( SKARN)
GD = GARNET DIOPSIDE
GM = GARNET MAGNETITE
GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE )
HB = HORNBLENDE
HS = HULSITE
MG = MAGNETITE
MY = MALAYAITE
MS = MASSIVE SULFIDE
MU = MUSCOVITE
PG = PEGMATITE
PO = PYRRHOTITE
QC = QUARTZITE COBBLE
QT = QUARTZ TOURMALINE
QV = QUARTZ VEINS
SF = SERICITE FLUORITE
SL = SHEELITE
SP = SPHALERITE
WF = WOLFRAMITE
C\ = CONTACT ZONE
D\ = DYKE
EP = EPIDOTE
GP = GRAPHITIC
PP = PORPHYRY
TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)
CONTACT APPROIMATE OR ASSUMED
CONTACT OBSERVED
MORAINE ( edge of)
TALUS ( edge of)
FAULT
JOINTING , inclined , vertical
BEDDING , inclined , vertical
FOLIATION , inclined , vertical
AREA OF NUMEROUS GOSSANS
GOSSAN
OVERTURNED ANTICLINE
SKARN
ROCK SAMPE LOCATION
CHIP SAMPLE LOCATION
X FLOAT
Rock A / Rock B ROCK A MORE COMMON THAN ROCK B
Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A )
CLAIM POST
THIN SECTION LOCATION

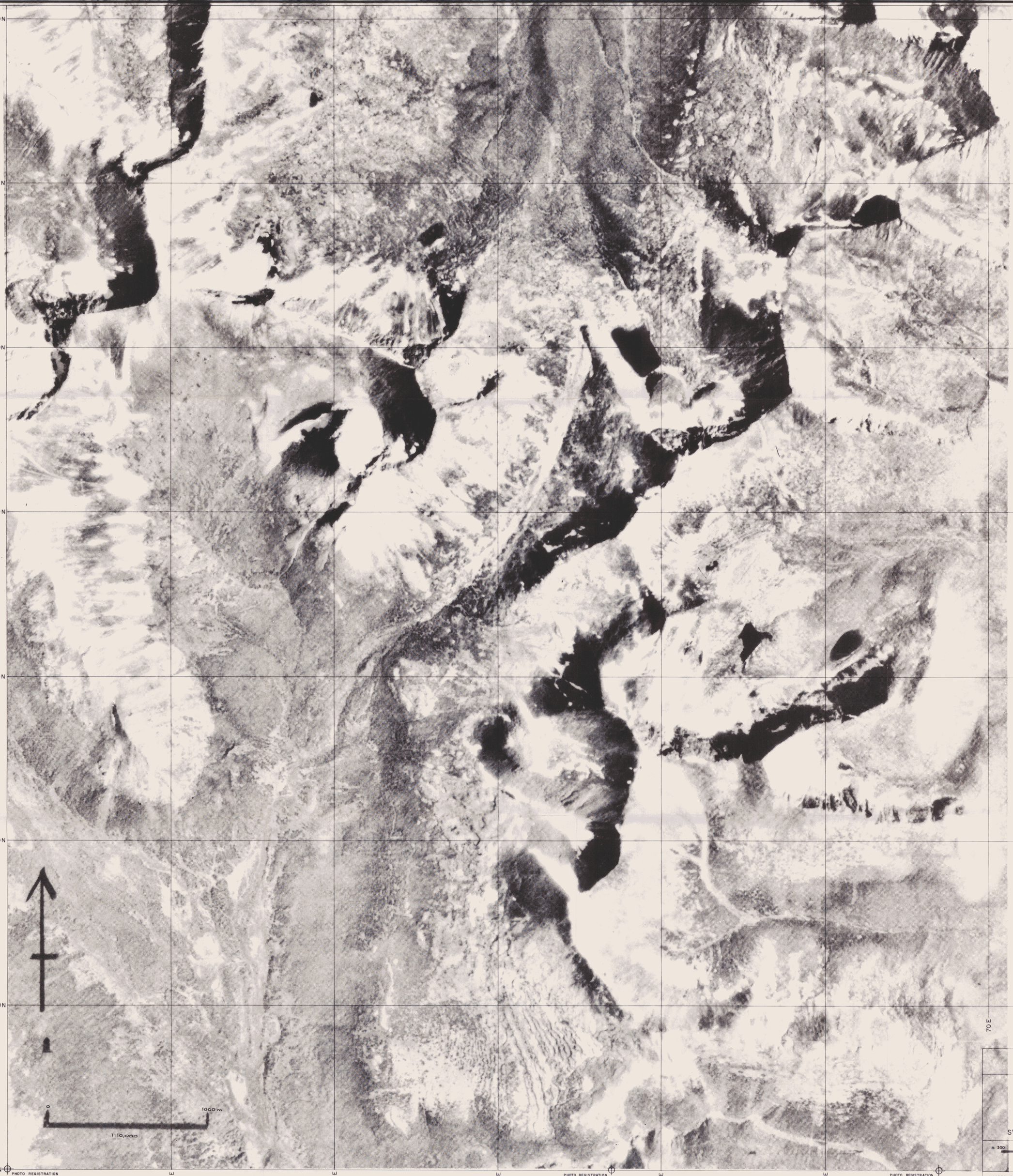
DU PONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
## TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
## SWIFT RIVER AREA, B.C. & Y.T.

SCALE
1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No.: | 40 & 105B |
| DATE : SEPT. '78 | | ACCT No.: | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No.: | KL.78 - 35 |
| DATE : OCT. '78 | | | |


80N
70N
60N
50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
70E
80E
PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION
CLAIM GROUP BOUNDARY
N
LEGEND
TIN
TUNGSTEN
MEAN = 4.52 P.P.M. MEAN = 3.72 P.P.M.
MEAN + 0.5 S.D. = 8.55 P.P.M. MEAN + 0.5 S.D. = 6.00 P.P.M.
MEAN + 1.0 S.D. = 16.21 P.P.M. MEAN + 1.0 S.D. = 9.65 P.P.M.
MEAN + 1.5 S.D. = 30.70 P.P.M. MEAN + 1.5 S.D. = 15.53 P.P.M.
MEAN + 2.0 S.D. = 58.16 P.P.M. MEAN + 2.0 S.D. = 28.70 P.P.M.
WHERE S.D. = STANDARD DEVIATION
INDICATES ROCK SAMPLE
TIN VALUE IN P.P.M
TUNGSTEN VALUE IN P.P.M.
URANIUM VALUE IN P.P.M.
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
SOIL & ROCK GEOCHEMISTRY
TIN - TUNGSTEN IN P.P.M.
SLOUCE CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY
m 300 200 100 0 10 000 300 600 m
SCALE
DATA BY F.M.S.
DATE AUG-SEPT'78
DRAWN BY K.L.J.
DATE OCT.'78
REVISED
N.T.S. NO. 105 B
ACCT. NO. 335-10
DRWG. NO. KL. 78-46




DUPONT CANADA EXPLORATION

# KLINKIT PROJECT
# PHOTOMAP
## SLOUCE CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1:10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED : | N.T.S. No.: 105 B |
| DATE | JUL.- AUG.'78 | | ACCT No.: 335-10 |
| DRAWN BY | K.L.J. | | DRWG. No.: KL.78-70 |
| DATE | SEPT.'78 | | |

TABLE OF CONTENTS

SLIP CLAIMS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| 2. | PHYSIOGRAPHY AND VEGETATION | 1 |
| 3. | CLAIMS | 1 |
| 4. | HISTORY | 1 |
| 5. | REGIONAL RESULTS | 1 |
| 6. | PROPERTY EVALUATION | 2 |
| | 6.1 Preliminary | 2 |
| | 6.2 Geology | 2 |
| | 6.3 Geochemistry | 2 |
| | 6.4 Mineralization | 2 |
| 7. | CONCLUSIONS AND RECOMMENDATIONS | 2 |

APPENDIX

STATEMENT OF EXPENDITURES

## LIST OF FIGURES

## SLIP CLAIMS


| | | |
|---|---|---|
| KL 79-1 | Claim Map | Foll. P.1 |
| KL 78-26 | Geology, SWIFT Claims | In Pocket |
| KL 78-35 | Geological Legend | " |
| KL 78-43 | Soil & Rock Geochem, SWIFT claims Tin and Tungsten PPM | " |
| KL 78-67 | Photo Map, SWIFT claims | " |

SPECIFIC PROSPECT - SLIP CLAIMS (335-11)

1. LOCATION AND ACCESS

The SLIP group is located on a northwest trending ridge at the north end of the Seagull Batholith 38 km northwest of Swift River, Yukon. The claim group is on claim sheet 105-B-4 at about 60°~~06~~13'N and 131°~~29~~15'W.

Access is now only by helicopter from Swift River, Yukon but a good 4-wheel road is located to the south on the MC/SWIFT claims that connects through the LOGTUNG property to the Alaska Highway (about 45 km).

2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-67)

The claims cover a portion of a long north-west trending ridge where the ridge changes topography from an arete in the southeast to felsenmeer covered subdued topography in the north. In the centre of the group a steep-walled east-west fault-controlled gully cuts the ridge at the break of topographic styles.

Vegetation is limited to very minor grass, sedges and scattered clumps of ground birch.

3. CLAIMS

The SLIP group consists of the following claims:

| Claim Name | Record Number | Date of Record |
|---|---|---|
| SLIP 1-16 | YA29335 - YA29350 | 1978 06 09 |

The claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited.

4. HISTORY

The claim group area probably has never been staked before but there has been considerable prospecting in the general area for massive sulphides during the mid to late 1960's and for skarn tungsten mineralization several times since 1968.

5. REGIONAL RESULTS

The SLIP group was staked to cover a gossan in the headwaters of a creek that produced an anomalous result for tin in our 'first pass' geochemistry. The gossan on the MC claims (part of the SWIFT group) to the west of the SLIP gossan was covered by snow at the time of locating the SLIP claims. We

131° 45'

131° 30'

60° 15'

60° 10'

SLIDE

MC

SLIP

SWIFT

DU

JILL

239 FR.

166

110 Fr. 19 Fr.

11 Fr.

SMART RIVER

DORSEY LAKE

N

DUPONT EXPLORATION
CANADA

KLINKIT JOINT VENTURE
DU, SLIP & SWIFT PROJECTS
CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

SCALE
1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105B4,5 |
| DATE : MAR.79 | | ACCT No. : 335-00 |
| DRAWN BY : K.L.J. | | DRWG. No. : KL.79-1 |
| DATE : MAR.79 | | |

were at this point (1978 06 02) covering all gossans in areas of high tin geochemistry as there was a direct association of the red-brown gossan on the DU claims (to the east) with major tin anomalies.

The claims have now been tied onto on the southeast by the DC Syndicate (ZINC group) and on the southwest, west and north by Welcome North Mines (MC, SWIFT, SLIDE etc. claims).

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The SLIP group was visited by Barr, Gunn and Smith on 1978 06 23 to determine the potential of the claim group for tin mineralization. The gossan is related to a fahlband of disseminated pyrite, pyrrhotite and minor chalcopyrite in altered volcano-wacke of the Sylvester Group. Immediately up sequence is a "crystalline limestone" which represents the "thick lime" as noted in the AP and PONT(B) areas. No explanation for the tin geochemical anomalies was found during our preliminary visit.

### 6.2 Geology (Map KL 78-26)

The SLIP claims geology is included in the SWIFT project description.

### 6.3 Geochemistry (Map KL 78-43)

The SLIP geochemistry results are described within the SWIFT project results.

### 6.4 Mineralization

No mineralization of economic significance has been located on or near the SLIP claims.

## 7. CONCLUSIONS AND RECOMMENDATIONS

The weak geochemical side hill anomaly in probably open ground will be examined to check for SWIFT dyke swarm type of mineralization. If the area warrants acquisition all claims will be carefully checked in the area for open ground and fractions and any available ground will be staked.

The SLIP claims should be retained as protection for the DU and SWIFT project areas.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## SLIP CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 197.15 |
| Camp Expenses | | 330.70 |
| Mapping, Gr. Surveys, Maps | | 1,042.26 |
| Freight, Hauling, Storage | | 27.12 |
| Assaying | | 639.87 |
| Salaries - Regular | | 626.42 |
| Salaries - Temporary | | 98.68 |
| Equipment Rental | | 72.87 |
| Stationery & Supplies | | 4.18 |
| Telephone | | 21.74 |
| Auto Expenses | | 8.41 |
| Repairs and Mtce (excl. Auto) | | 2.07 |
| Non Capital Equipment Purchases | | 36.66 |
| Depreciation Expenses | | 21.69 |
| TOTAL | $ | 3,129.82 |

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## SLIP & SWIFT CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 607.11 |
| Camp Expenses | | 1,375.22 |
| Mapping, Gr. Surveys, Maps | | 5,127.18 |
| Freight, Hauling, Storage | | 116.57 |
| Assaying | | 2,554.61 |
| Salaries - Regular | | 2,495.83 |
| Salaries - Temporary | | 619.72 |
| Equipment Rental | | 313.21 |
| Stationery & Supplies | | 17.95 |
| Telephone | | 93.45 |
| Auto Expenses | | 36.15 |
| Repairs & Mtce (Excl. Auto) | | 8.89 |
| Non Capital Equip. Purchases | | 157.57 |
| Depreciation Expenses | | 93.22 |
| TOTAL | $ | 13,616.68 |

| SAMPLE No. | $WO_3$ % | Sn % | DISTANCE |
|---|---|---|---|
| T1 | 0.01 | <0.01 | |
| T2 | <0.01 | <0.01 | |
| T3 | <0.02 | 0.07 | |
| T3(Sulf) | 0.02 | <0.01 | |
| T5 | 0.04 | 0.31 | |
| T6 | 0.02 | 0.76 | |
| T7 | 0.02 | 0.28 | |
| T8 | <0.01 | 8.33 | |
| T8(Sulf) | 0.02 | 0.10 | |
| T9 | 0.01 | 0.24 | |
| T5 2mm chip | 0.02 | 0.56 | |
| 2952 | 0.03 | <0.01 | 0 - 3 m |
| 2953 | 0.03 | <0.01 | 3 - 6 m |
| 2954 | 0.03 | <0.01 | 6 - 9 m |
| 2955 | 0.03 | <0.01 | 9 - 12 m |
| 2956 | 0.04 | <0.01 | 12 - 15 m |
| 2957 | 0.02 | <0.01 | 15 - 18 m |
| 2958 | 0.03 | <0.01 | 18 - 21 m |
| 2959 | 0.02 | <0.01 | 21 - 24 m |
| 2960 | 0.03 | <0.01 | 24 - 27 m |
| 2961 | 0.03 | <0.01 | 27 - 30 m |
| 2962 | 0.02 | <0.01 | 30 - 33 m |
| 2963 | 0.02 | <0.01 | 33 - 36 m |
| 3774 | | 0.25 | 0 - 3 m |
| 3775 | | 1.03 | 3 - 6 m |
| 3776 | | 0.48 | 6 - 9 m |
| 3777 | | 0.27 | 9 - 12 m |
| 3778 | | 0.48 | 12 - 15 m |
| 3779 | | 0.02 | 15 - 18 m |
| 3780 | | 0.12 | 18 - 21 m |
| 3781 | | <0.01 | 21 - 24 m |
| 3782 | | 0.04 | 22 - 27 m |
| 3783 | | 0.04 | 27 - 30 m |
| 3784 | | 0.05 | 30 - 33 m |
| 3785 | | 0.06 | 33 - 36 m |
| 3788 | | 0.04 | 42 - 45 m |
| 3789 | | 0.06 | 45 - 48 m |
| 3790 | | 0.16 | 48 - 51 m |
| 3791 | | 0.26 | 51 - 54 m |
| 3792 | | 0.18 | 54 - 57 m |
| 3793 | | 0.11 | 57 - 60 m |
| 3794 | | 0.09 | 60 - 63 m |
| 3795 | | 0.08 | 63 - 66 m |
| 3796 | | 0.17 | 66 - 69 m |
| 3797 | | 0.24 | 69 - 72 m |
| 3798 | | 0.04 | 72 - 75 m |
| 3799 | | 1.66 | 75 - 78 m |
| 3800 | | 0.08 | 78 - 81 m |
| 3960 | | 0.09 | 81 - 84 m |
| 3961 | | 0.02 | 84 - 87 m |
| 3962 | | 0.02 | 87 - 90 m |
| 3963 | | 0.02 | 90 - 93 m |
| 3964 | | 0.03 | 93 - 96 m |
| 3965 | | 0.03 | 96 - 99 m |

DU PONT EXPLORATION CANADA

# KLINKIT PROJECT
# GEOLOGY
## SWIFT CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 : 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY : L.E., C.G., M.S. | REVISED : | N.T.S. No. : 105 B |
| DATE : JUL.-AUG.'78 | | ACCT No. : 335 - 20 |
| DRAWN BY : K.L.J. | | DRWG. No. : KL.78 - 26 |
| DATE : OCT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry, subphase intruding GCFB, cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
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## DEVONO - MISSISSIPPIAN

| | |
|---|---|
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| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

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CT = CASSITERITE

CP = CHALCOPYRITE

AG = AUGITE

GL = GALENA

GB = GARNET BERYL ( SKARN)

GD = GARNET DIOPSIDE

GM = GARNET MAGNETITE

GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)

HB = HORNBLENDE

HS = HULSITE

MG = MAGNETITE

MY = MALAYAITE

MS = MASSIVE SULFIDE

MU = MUSCOVITE

PG = PEGMATITE

PO = PYRRHOTITE

QC = QUARTZITE COBBLE

QT = QUARTZ TOURMALINE

QV = QUARTZ VEINS

SF = SERICITE FLUORITE

SL = SHEELITE

SP = SPHALERITE

WF = WOLFRAMITE

C\ = CONTACT ZONE

D\ = DYKE

EP = EPIDOTE

GP = GRAPHITIC

PP = PORPHYRY

TU = TOURMALINE

## SYMBOLS

OUTCROP (edge of)

CONTACT APPROIMATE OR ASSUMED

CONTACT OBSERVED

MORAINE (edge of)

TALUS (edge of)

FAULT

40 JOINTING, inclined, vertical

45 BEDDING, inclined, vertical

50 FOLIATION, inclined, vertical

AREA OF NUMEROUS GOSSANS

GOSSAN

OVERTURNED ANTICLINE

SKARN

ROCK SAMPE LOCATION

CHIP SAMPLE LOCATION

X FLOAT

Rock A / Rock B ROCK A MORE COMMON THAN ROCK B

Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)

CLAIM POST

THIN SECTION LOCATION

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT

# GEOLOGICAL LEGEND

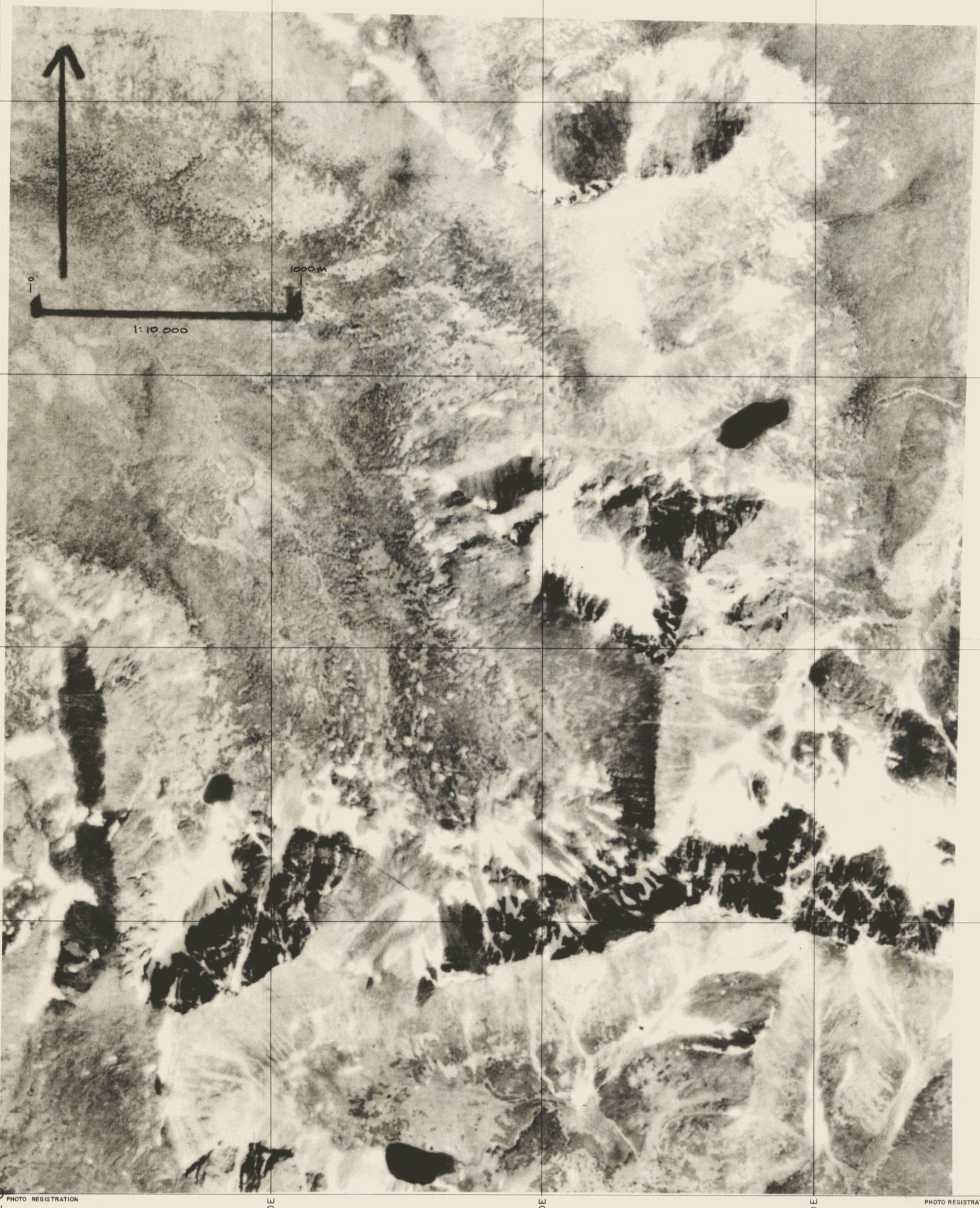
TO ACCOMPANY DRWG Nos. KL.78-16 TO 34

SWIFT RIVER AREA, B.C. & Y.T.

1 : 0 SCALE 0 1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : | 4 0 & 105 B |
| DATE : SEPT. '78 | | ACCT No. : | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : | KL.78 - 35 |
| DATE : OCT. '78 | | | |


MC CLAIM GROUP BOUNDARY
SLIP CLAIM GROUP BOUNDARY
SWIFT CLAIM GROUP BOUNDARY
MC CLAIM GROUP BOUNDARY
JILL CLAIM GROUP BOUNDARY
PHOTO REGISTRATION
PHOTO REGISTRATION
50N
40N
30N
20N
10N
10W
0
10E
20E
30E
40E
50E
60E
N
LEGEND
TIN
TUNGSTEN
MEAN = 4.52 P.P.M.
MEAN = 3.72 P.P.M.
MEAN + 0.5 S.D. = 8.55 P.P.M.
MEAN + 0.5 S.D. = 6.00 P.P.M.
MEAN + 1.0 S.D. = 16.21 P.P.M.
MEAN + 1.0 S.D. = 9.65 P.P.M.
MEAN + 1.5 S.D. = 30.70 P.P.M.
MEAN + 1.5 S.D. = 15.53 P.P.M.
MEAN + 2.0 S.D. = 58.16 P.P.M.
MEAN + 2.0 S.D. = 28.70 P.P.M.
WHERE S.D. = STANDARD DEVIATION
INDICATES ROCK SAMPLE
TIN VALUE IN P.P.M.
TUNGSTEN VALUE IN P.P.M.
URANIUM VALUE IN P.P.M.
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
SOIL & ROCK GEOCHEMISTRY
TIN - TUNGSTEN IN P.P.M.
SWIFT CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY
m 300 200 100 0 1:10000 300 600 m
SCALE
DATA BY : E.M.S.
DATE : AUG-SEPT '78
DRAWN BY : K.L.J.
DATE : OCT. '78
REVISED
N.T.S. No.: 105 B
ACCT No.: 335-20
DRWG. No.: KL-78-43




50N
40N
30N
20N
10N

10E
20E
30E
40E
50E
60E

PHOTO REGISTRATION
PHOTO REGISTRATION

N

DUPONT EXPLORATION
CANADA

# KLINKIT PROJECT
# PHOTOMAP
## SWIFT CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

1 : 10000
m 300 200 100 0 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S No. 105 B |
| DATE | JUL.-AUG.'78 | | ACCT No. 335-20 |
| DRAWN BY | K.L.J. | | |
| DATE | SEPT. '78 | | DRWG No. KL.78-67 |

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## VH CLAIMS


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| 4. | HISTORY | 1 |
| 5. | REGIONAL RESULTS | 2 |
| 6. | PROPERTY EVALUATION | 2 |
| | 6.1 Preliminary | 2 |
| | 6.2 Geology | 2 |
| | 6.3 Geochemistry | 3 |
| | 6.4 Mineralization | 3 |
| 7. | CONCLUSIONS AND RECOMMENDATIONS | 3 |

APPENDIX

STATEMENT OF EXPENDITURES

## LIST OF FIGURES

## VH CLAIMS


| | | |
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| KL 79-9 | Claim Map | Foll. P.1 |
| KL 78-27 | Geology | In Pocket |
| KL 78-35 | Geological Legend | " |
| KL 78-44 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-68 | Photo Map | " |

## SPECIFIC PROSPECT - VH CLAIMS (335-14)

### 1. LOCATION AND ACCESS

The VH claims are located on the west central portion of the Seagull Batholith, 19 km northwest of Swift River, Yukon. The claims are on claim sheet 105-B-3 at 60°06'N and 131°29'W.

Access is only possible via helicopter from Swift River at present. The road access to the old Logjam Creek property passes within 5 km of the southwest end of the VH claims.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-68)

The central, western and southwestern portions of the property are above the level of any ground birch or conifer. The southeastern and eastern portions have thick cover in ground birch, ground balsam, balsam and black spruce.

The alpine areas consist of cirque faces (northeast facing) with two parallel aretes on the central and northern portions trending east northeast. Some portions of the cirques and aretes are sheer walls but most of the claims can be traversed.

### 3. CLAIMS

The VH group consists of the following claims:

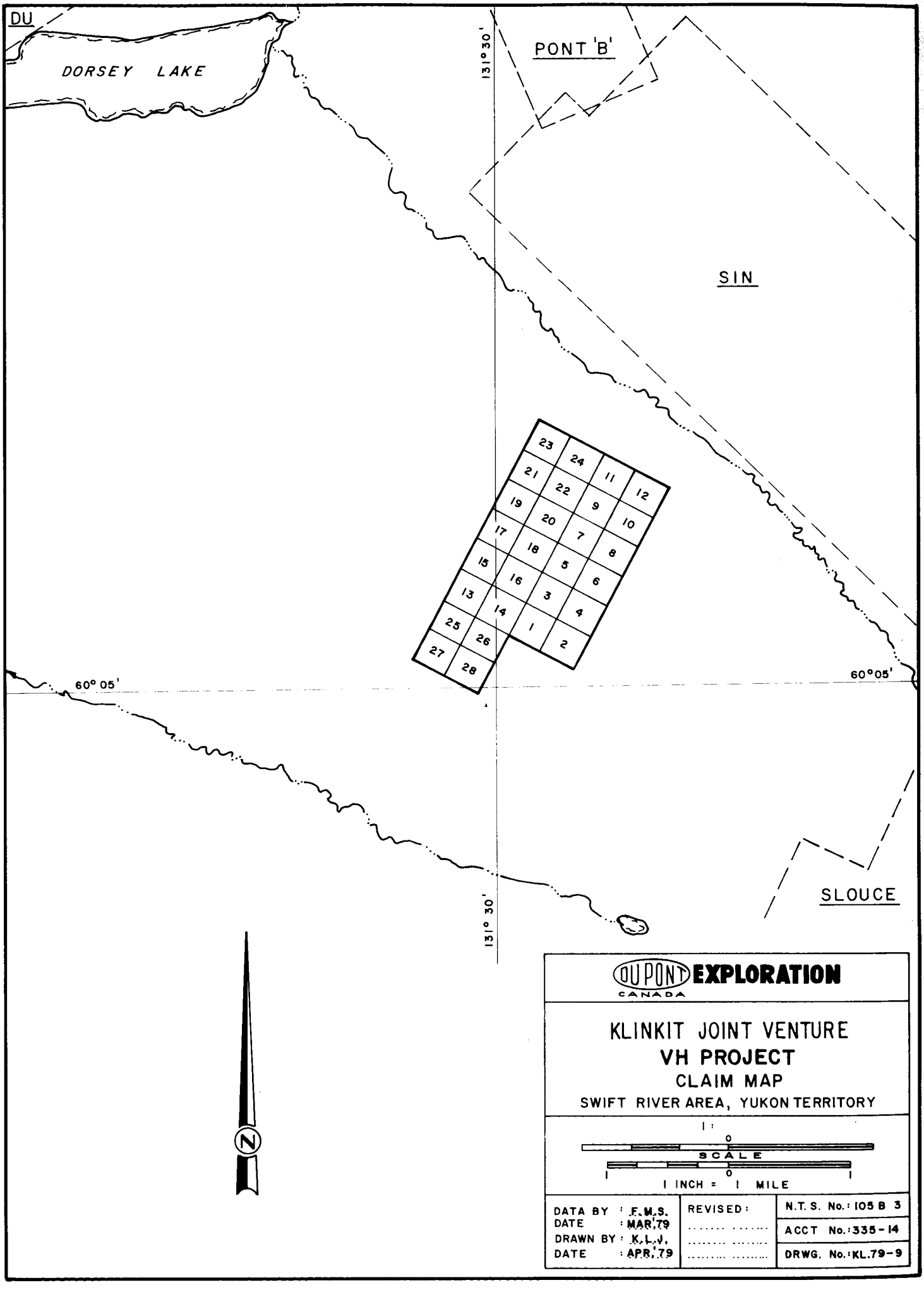
| Claim Name | Record Number | Date of Record |
|---|---|---|
| VH 1-28 | YA34079 - YA34106 | 1979 07 20 |

All the claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited.

### 4. HISTORY

The VH claims were located to cover the headwaters of two creeks that ran anomalous in tungsten. After these claims were located the DC Syndicate located the MW claims on the southwest side of the VH claims, covering the contact area of the Seagull Batholith between the SLOUCE group and the VH group.

There is no record of work done in the area of the VH claims nor were any old posts located. The streams draining the area have been sampled several times as flags




DUPONT CANADA **EXPLORATION**

# KLINKIT JOINT VENTURE
## VH PROJECT
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0
SCALE
0
1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B 3 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-14 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-9 |
| DATE : APR.'79 | ..... ..... | |

of various ages and colours were noted in the main drainage to the north.

## 5. REGIONAL RESULTS

The VH claims cover the headwaters of two creeks that ran 110 and 40 ppm $WO_3$. The 110 ppm $WO_3$ creek also had a moderate tin and weak uranium anomaly.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The VH claims were located after the preliminary visit to the Seagull Batholith (1978 06 20) by Barr, Gunn and Smith, on the basis of analysis of samples collected from the regional geochemical survey for tin, tungsten, molybdenum and uranium.

### 6.2 Geology (Map KL 78-27 - see maps, SIN claims)

The predominant rock type outcropping in all but the extreme southwestern portion of the claims is "Seagull Phase" of the Seagull Batholith. This portion of the Englishman Range potassic quartz monzonite to granite has roof pegmatite zones, minor greisens (tourmaline), and no visible sub-phases of the 'DU' type of intrusives. Portions of the gossanous areas (in sheared zones) have the weathered chroma of the 'DU' type intrusive and may represent fluid discharge from a buried sub-phase.

The southern and southwestern portion were not mapped in detail as they are sheer cliffs of sediments of the Sylvester Group as a portion of the roof/side wall cover on the batholith. Float from the floor of the southern head wall cirque consisted of andradite garnet and wollastonite with a large solitary crystal of scheelite. This sample J-78-7-29-3 was analyzed for $WO_3$ and Sn yielding 0.14% $WO_3$ and 0.18% Sn. The source of this material has not been located.

The Sylvester group sediments are an extension of the bedding attitude as located on the northwest side of the SLOUCE group. The principal units are white weathering arenites to cherts and limestone capped by volcano-wackes with minor intercalated sandy limestones in all units. The principal lime member is the "thick" lime at the PONT(B), DB and SLOUCE groups. This unit is rich in arenite and forms the thickest skarn members.

### 6.3 Geochemistry (Map KL 78-44)

No anomalous tin or tungsten values were found in the 48 samples located over the northern and central portion of the claim group. There is no explanation in side hill sampling for the stream anomaly in the lower portions of the northern or the two stream anomalies.

The pulps and rejects of the stream samples should be checked for scheelite.

### 6.4 Mineralization

There is no exposure of tungsten mineralization on the mapped portion of the claim group. The western and southwestern portions (above the float scheelite occurrence) of the VH claims must be prospected for scheelite if any is noted in the rejects from the stream samples.

## 7. CONCLUSIONS AND RECOMMENDATIONS

No explanation exists as yet for the tungsten geochemical anomaly.

The VH claims should have minimal assessment filed to 1980 01 01. During the 1979 field season the source of the scheelite float should be located, the type of tungsten mineralization determined from the reject from the "first pass" sampling and the area between the VH and MW/SLOUCE claims prospected for the source (if any) of the tungsten mineralization. This work may result in abandoning the northern portion of the VH block and enlarging on the south and west to cover possible skarn scheelite zones.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## VH CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 74.08 |
| Camp Expenses | | 248.46 |
| Mapping, Gr. Surveys, Maps | | 625.41 |
| Freight, Hauling, Storage | | 21.69 |
| Assaying | | 443.75 |
| Salaries - Regular | | 536.61 |
| Salaries - Temporary | | 118.05 |
| Equipment Rental | | 58.29 |
| Stationery & Supplies | | 3.34 |
| Telephone | | 17.39 |
| Auto Expenses | | 6.73 |
| Repairs and Mtce (excl. Auto) | | 1.66 |
| Non Capital Equipment Purchases | | 29.33 |
| Depreciation Expenses | | 17.35 |
| TOTAL | $ | 2,202.14 |

90N
80N
70N
60N
50N
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20N
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10E
20E
30E
40E
50E
60E
70E
PHOTO REGISTRATION
PHOTO REGISTRATION

SKRN
GCFB
ARGL / CHRT
ENSK
LMST
GM
BGNS
CHRT
QV
ARGL
GABR
SLIDE
QTZT
QTZT / SKRN
GMQP / PG
Sericite Altn
CHERTY HORNFELS
SKRN / PURPLE HORNFELS
MINOR PO, CP ? Bi
QTZT / SKRN FLOAT
WHITE QTZT FLOAT
No.1 SIN 56
No. SIN 53,54
No.2 SIN 103, 104
No.1 SIN 105, 106
ARGL + BH + SKRN
FBQP
X TU
DMDQ
QT
GCFB / QT
Talus
Talus - Moraine
Multi textured banded granites with aplitic veins
X PG-MY?
SKRN /SF
Slight gossons developed on sericitised shears
Pond
Lake
Creek
SIN CLAIMS
VH CLAIMS

E-78-8-3-75
E-78-8-3-76
E-78-8-3-77
E-78-8-3-78
E-78-8-3-79
E-78-8-3-80
E-78-8-3-81
E-78-8-3-82
E-78-8-10-112
E-78-8-10-117 SAMPLE# 3815 0.12 $WO_3$ <0.01 Sn
E-78-8-10-118
E-78-8-10-119
E-78-8-10-120
E-78-8-10-121
E-78-7-22-1
E-78-7-22-2
E-78-7-22-3
E-78-7-22-4 SAMPLE# 3815 0.12 $WO_3$ <0.01 Sn
E-78-7-22-5
E-78-7-22-6
E-78-7-22-7
E-78-7-22-8
E-78-7-22-9
E-78-7-22-10
E-78-7-22-11
E-78-7-22-12
E-78-7-22-13
E-78-7-22-14
E-78-7-22-15
E-78-7-22-16
E-78-7-22-17
E-78-7-22-18
G-78-8-15-1
G-78-8-15-2
G-78-8-15-3
G-78-8-15-4
J-78-7-22-5
J-78-7-22-6
J-78-7-22-7
J-78-7-22-8
J-78-7-22-9
J-78-7-22-10
J-78-7-22-11
J-78-7-22-12
J-78-7-22-13
J-78-7-22-14
J-78-7-25-1
J-78-7-25-2
J-78-7-25-3
J-78-7-25-4
J-78-7-25-5
J-78-7-25-6
J-78-7-25-7
J-78-7-25-8
J-78-7-29-1f
J-78-7-29-2f
J-78-7-29-3f
Sample# 3701 0.13 $WO_3$ 0.18 Sn




DUPONT EXPLORATION CANADA

KLINKIT PROJECT
GEOLOGY
SIN & VH CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S No. 105 B |
| DATE | JUL.- AUG.'78 | | ACCT No. 335 - 21 & 14 |
| DRAWN BY | K.L.J. | | DRWG No. KL. 78 - 27 |
| DATE | OCT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained ) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB ) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous ) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous ) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS

CT = CASSITERITE

CP = CHALCOPYRITE

AG = AUGITE

GL = GALENA

GB = GARNET BERYL ( SKARN)

GD = GARNET DIOPSIDE

GM = GARNET MAGNETITE

GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE )

HB = HORNBLENDE

HS = HULSITE

MG = MAGNETITE

MY = MALAYAITE

MS = MASSIVE SULFIDE

MU = MUSCOVITE

PG = PEGMATITE

PO = PYRRHOTITE

QC = QUARTZITE COBBLE

QT = QUARTZ TOURMALINE

QV = QUARTZ VEINS

SF = SERICITE FLUORITE

SL = SHEELITE

SP = SPHALERITE

WF = WOLFRAMITE

C\ = CONTACT ZONE

D\ = DYKE

EP = EPIDOTE

GP = GRAPHITIC

PP = PORPHYRY

TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)

CONTACT APPROIMATE OR ASSUMED

CONTACT OBSERVED

MORAINE ( edge of)

TALUS ( edge of)

FAULT

40 JOINTING, inclined , vertical

45 BEDDING, inclined , vertical

50 FOLIATION, inclined , vertical

AREA OF NUMEROUS GOSSANS

GOSSAN

OVERTURNED ANTICLINE

SKARN

ROCK SAMPE LOCATION

CHIP SAMPLE LOCATION

X FLOAT

Rock A / Rock B ROCK A MORE COMMON THAN ROCK B

Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A )

CLAIM POST

THIN SECTION LOCATION

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT

# GEOLOGICAL LEGEND

TO ACCOMPANY DRWG Nos. KL.78-16 TO 34

SWIFT RIVER AREA, B.C. & Y.T.

0 1

SCALE

0

1 INCH = FEET

| | | | |
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| DATA BY : F.M.S. | REVISED : | N.T.S. No. : | 40 & 105B |
| DATE : SEPT. '78 | | ACCT No. : | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : | KL.78 - 35 |
| DATE : OCT. '78 | | | |

90N

80N

70N

60N

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

70E

PHOTO REGISTRATION

PHOTO REGISTRATION

SIN CLAIM GROUP BOUNDARY

VH CLAIM GROUP BOUNDARY

## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | ⊕ | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | ⊕ | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | ⊕ | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | ⊕ | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | ⊕ | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

TIN VALUE IN P.P.M. → 15 ⊕ 2.5 ← TUNGSTEN VALUE IN P.P.M.
(R) INDICATES ROCK SAMPLE
6.5 ← URANIUM VALUE IN P.P.M.

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## SIN & VH CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REV. SEP | NTS NO. 105 B |
| DATE | AUG-SEPT.'78 | | ASS. NO. 335 - 21 & 14 |
| DRAWN BY | K.L.J. | | DRWG. NO. KL. 78 - 44 |
| DATE | OCT. '78 | | |




DUPONT EXPLORATION
CANADA

KLINKIT PROJECT

# PHOTOMAP

## SIN & VH CLAIMS

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10 000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.- AUG. '78 | | ACCT No. 335 - 21 & 14 |
| DRAWN BY | K.L.J. | | DRWG No. KL. 78 - 68 |
| DATE | SEPT. '78 | | |

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| 2. | PHYSIOGRAPHY AND VEGETATION | 1 |
| 3. | CLAIMS | 1 |
| 4. | HISTORY | 1 |
| 5. | REGIONAL RESULTS | 2 |
| 6. | PROPERTY EVALUATION | 2 |
| | 6.1 Preliminary | 2 |
| | 6.2 Geology | 2 |
| | 6.3 Geochemistry | 3 |
| | 6.4 Mineralization | 3 |
| 7. | CONCLUSIONS AND RECOMMENDATIONS | 3 |

APPENDIX

STATEMENT OF EXPENDITURES

# LIST OF FIGURES

## DB CLAIMS


| | | |
|---|---|---|
| KL 79-10 | Claim Map | Foll. P.1 |
| KL 78-24 | Geology | In Pocket |
| KL 78-35 | Geological Legend | " |
| KL 78-41 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-65 | Photo Map | " |

## SPECIFIC PROSPECT - DB CLAIMS (335-15)

### 1. LOCATION AND ACCESS

The DB claim group is located at the headwaters of English Creek on the west central portion of the Englishman Range about 63 km northwest of Swift River, Yukon. The claims are on claim sheet 105-C-8, Watson Lake MD, at about 60°22'N and 132°05'W.

Access is only possible via helicopter with the nearest base as Swift River, Yukon.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-65)

The DB claims cover two parallel westerly trending ridges with a "hanging valley" glacial trough between the aretes. The southern of the two aretes has two northwest facing cirque basins, also as hanging valleys, over the main east-west valley. Cirque walls and north facing ridges are usually sheer cliffs. The remainder of the area covered by the claims is traversable.

Vegetation is restricted to the valley floor and lower portions of south facing hills. Most of the vegetation is sedges and wildflowers with minor ground birch with a very thin cover of conifer in the valley floor.

### 3. CLAIMS

The DB group consists of the following claims:

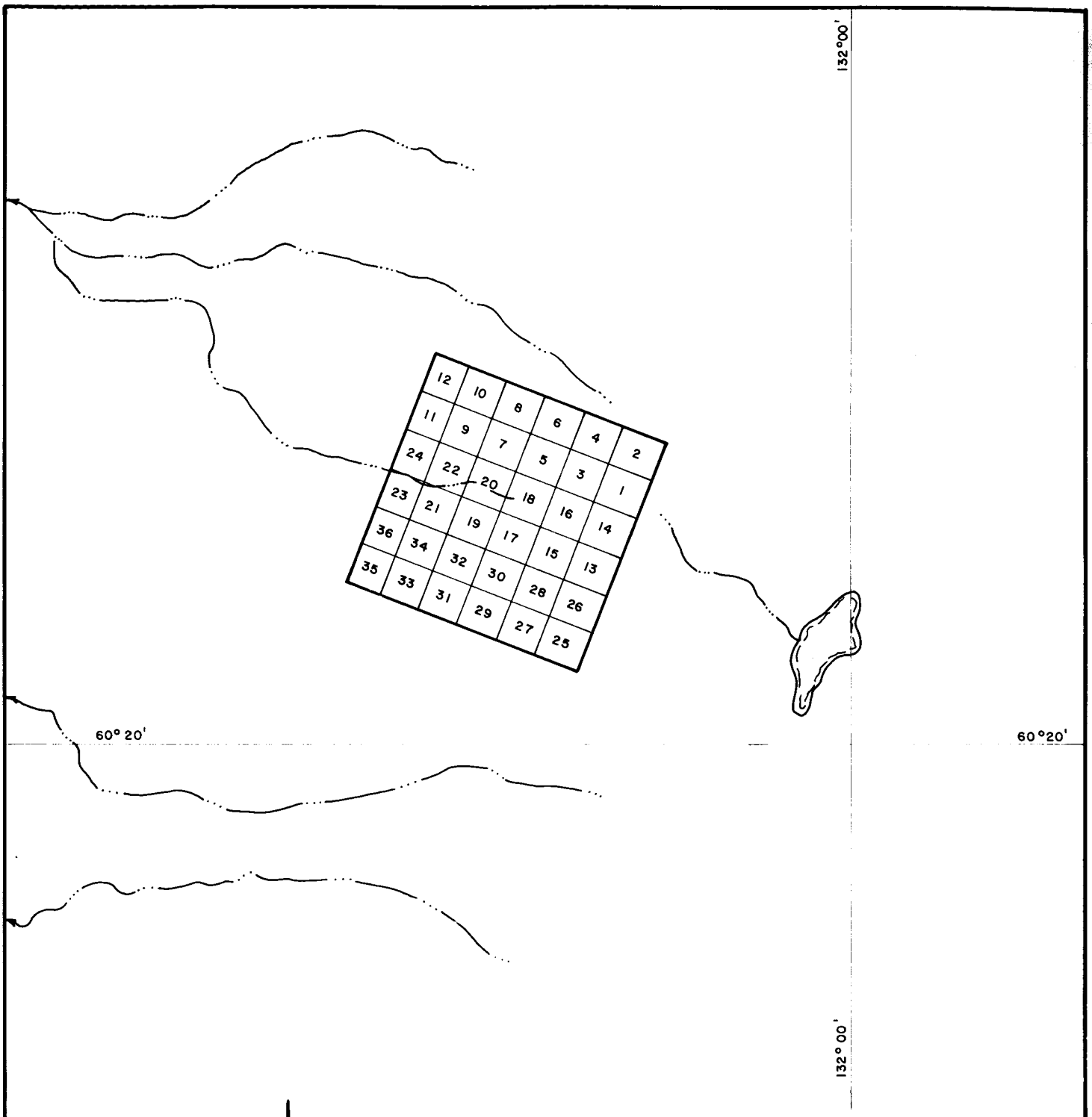
| Claim Name | Record Number | Date of Record |
|---|---|---|
| DB 1-8 | YA34420 - YA34427 | 1978 08 01 |
| DB 9-16 | YA34302 - YA34309 | 1978 07 20 |
| DB 17-36 | YA34428 - YA34447 | 1978 08 01 |

All claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited.

### 4. HISTORY

The DB group was located to cover the common ridge between two anomalous geochemical stream samples for tungsten. There is no indication of past work on the claim group nor were any sample flags noted in the main creeks.

A small claim group (SURETHING and JACKALOO) lies about




DUPONT CANADA **EXPLORATION**

# KLINKIT JOINT VENTURE
## DB PROJECT
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0

SCALE

0 1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 C 8 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-15 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-10 |
| DATE : APR.'79 | ..... ..... | |

3 km southwest of the DB claims. The mineral occurrences are in "highly deformed limestone and clastics of the Mississippian Englishman's Group (unit 3c) cut by Cretaceous granite and granodiorite. Chalcopyrite and bornite occur as pods along tension fractures in a skarn-hornfels zone at the contact. Gangue minerals include pyrrhotite, pyrite, magnetite, specularite and fluorite" (Archer Cathro mineral inventory, Occurrence No. 29, McCleery, 105-C/8).

## 5. REGIONAL RESULTS

The northern east-west ridge has anomalous tungsten values from east of the streams draining the north and south flank (and parallel to the ridge). The source for the southern anomaly is proposed as the contact area of the Hake phase of Seagull Batholith with the "thick" arenaceous limestone of Devono-Mississippian age. After the regional results were available for all four elements, F.M. Smith spent a morning traversing the northern ridge on the day of locating the claims. The exposure of limestone on the north face of the southern ridge gave some indication of the possibility for skarn host rock but no limy rocks were noted in the valley of the northern stream. The DB claims were thus located to cover the contact area of the arenaceous limestone and the Hake phase of the batholith.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The DB claims were not located at the time of the visit by Barr, Gunn and Smith.

### 6.2 Geology (Map KL 78-24)

The two groups of rocks within the DB claims are the roof/side wall volcano-sedimentary to sedimentary Devono-Mississippian age units on the Cretaceous granitic Hake phase of the Seagull Batholith.

The Devono-Mississippian units (called Englishman group - unit 3c on Teslin, 105-C map) are argillites to argillaceous-tuff or volcano-wacke overlying and underlying a limestone, arenaceous-limestone to chert horizon similar to the bedding at PONT(B), SLOUCE, VH and in British Columbia the AP group. Although there are gossans on the northern portion of the claim no sulphide zones were noted in the initial mapping.

The arenaceous limestone contact with the Hake phase is probably extensive in length of potential exposure

and depth extent in the area of the small tarn in the western of the two northwest facing cirques of the southern arete.

There is some exposure of skarn at the contact of the arenite and arenaceous-limestone beds in the south central portion of the claims. This garnet, diopside and magnetite zone has some large crystals of scheelite in the limy portion of the skarn. The relationship of this zone with the contact of the limy horizon with the intrusive is unknown but would appear to indicate potential for a skarn at or near the contact.

6.3 Geochemistry (Map KL 78-41)

The principal geochemical anomaly is below the area where Ms. Eccles located the skarn zone in the contact area between arenites and arenaceous limestones of the Devono-Mississippian group sediments. This anomaly shows the lateral extent of the skarn and the intimate relation of exposed skarn to side-hill geochemistry.

There were 109 samples collected, all from the southern valley. No work has been carried out to find the source of the anomaly in the northern valley.

6.4 Mineralization

One piece of skarn from the two-sediment contact area was analyzed. The sample E8-8-105 graded 0.76% $WO_3$ and 0.30% Sn. The grade and character of the skarn indicate it probably is not of economic merit at this time but it does indicate there may be skarn alteration to the east near the small tarn.

## 7. CONCLUSIONS AND RECOMMENDATIONS

Although no zone of scheelite mineralization of size and grade worth trenching or drilling has been discovered, indirect evidence indicates there may be a potentially economic scheelite zone buried by talus on the southern and southwestern cirque walls in the southeastern portion of the claims.

The DB claims require careful stratigraphic mapping for predicting the contact area between Hake phase granite and the favourable arenaceous limestone bed.

Detail magnetometer survey, prospecting and mapping are required in the proposed contact area in the southeastern portion of the claims.

Preliminary evaluation is required to locate the source of the northern tungsten geochemical anomaly.

All claims should be retained until the economic potential of the proposed skarn zone is understood.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As of December 31, 1978

## DB CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 74.08 |
| Camp Expenses | | 248.46 |
| Mapping, Gr. Surveys, Maps | | 335.85 |
| Freight, Hauling, Storage | | 21.69 |
| Assaying | | 443.75 |
| Salaries - Regular | | 408.72 |
| Salaries - Temporary | | 134.53 |
| Equipment Rental | | 58.29 |
| Stationery & Supplies | | 3.34 |
| Telephone | | 17.39 |
| Auto Expenses | | 6.73 |
| Repairs and Maintenance (Excl. Auto) | | 1.65 |
| Non Capital Equipment Purchases | | 29.33 |
| Depreciation Expenses | | 17.35 |
| TOTAL | $ | 1,801.16 |



50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
PHOTO REGISTRATION
PHOTO REGISTRATION
N
ARGL
GCFB
LMST
QTZT
GM SKRN
SKRN
Lake
E-78-8-8-110
E-78-8-8-109
E-78-8-8-108
E-78-8-8-107
E-78-8-8-106
E-78-8-8-105
E-78-8-8-104
E-78-8-8-103
E-78-8-8-102
E-78-8-8-101
SAMPLE #3841 0.10% WO3 0.10% Sn
SAMPLE #3843 0.76% WO3 0.30% Sn
No.2 DB 13,14
No.1 DB 15,16
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
GEOLOGY
DB CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY
1:10000
m 300 200 100 0 300 600 m
SCALE
MAPPED BY : L.E., C.G., M.S.
DATE : JUL.-AUG.'78
DRAWN BY : K.L.J.
DATE : SEPT. '78
REVISED :
N.T.S No. : 105 C 8
ACCT No. : 335-15
DRWG. No. : KL.78-24

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry, subphase intruding GCFB, cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS

CT = CASSITERITE

CP = CHALCOPYRITE

AG = AUGITE

GL = GALENA

GB = GARNET BERYL ( SKARN)

GD = GARNET DIOPSIDE

GM = GARNET MAGNETITE

GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)

HB = HORNBLENDE

HS = HULSITE

MG = MAGNETITE

MY = MALAYAITE

MS = MASSIVE SULFIDE

MU = MUSCOVITE

PG = PEGMATITE

PO = PYRRHOTITE

QC = QUARTZITE COBBLE

QT = QUARTZ TOURMALINE

QV = QUARTZ VEINS

SF = SERICITE FLUORITE

SL = SHEELITE

SP = SPHALERITE

WF = WOLFRAMITE

C\ = CONTACT ZONE

D\ = DYKE

EP = EPIDOTE

GP = GRAPHITIC

PP = PORPHYRY

TU = TOURMALINE

## SYMBOLS

OUTCROP (edge of)

CONTACT APPROIMATE OR ASSUMED

CONTACT OBSERVED

MORAINE (edge of)

TALUS (edge of)

FAULT

JOINTING, inclined, vertical

BEDDING, inclined, vertical

FOLIATION, inclined, vertical

AREA OF NUMEROUS GOSSANS

GOSSAN

OVERTURNED ANTICLINE

SKARN

ROCK SAMPE LOCATION

CHIP SAMPLE LOCATION

X FLOAT

Rock A / Rock B — ROCK A MORE COMMON THAN ROCK B

Rock A // Rock B — ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)

CLAIM POST

THIN SECTION LOCATION

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT

# GEOLOGICAL LEGEND

TO ACCOMPANY DRWG Nos. KL.78-16 TO 34

SWIFT RIVER AREA, B.C. & Y.T.

SCALE

1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | | N.T.S. No. : 40 & 105B |
| DATE : SEPT. '78 | | | ACCT No. : 335 - 00 |
| DRAWN BY : K.L.J. | | | DRWG. No. : KL.78 - 35 |
| DATE : OCT. '78 | | | |




## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | ⊕ | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | ⊕ | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | ⊕ | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | ⊕ | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | ⊕ | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

TIN VALUE IN P.P.M — 15 R ⊕ 2.5 — TUNGSTEN VALUE IN P.P.M.
6.5

R — INDICATES ROCK SAMPLE

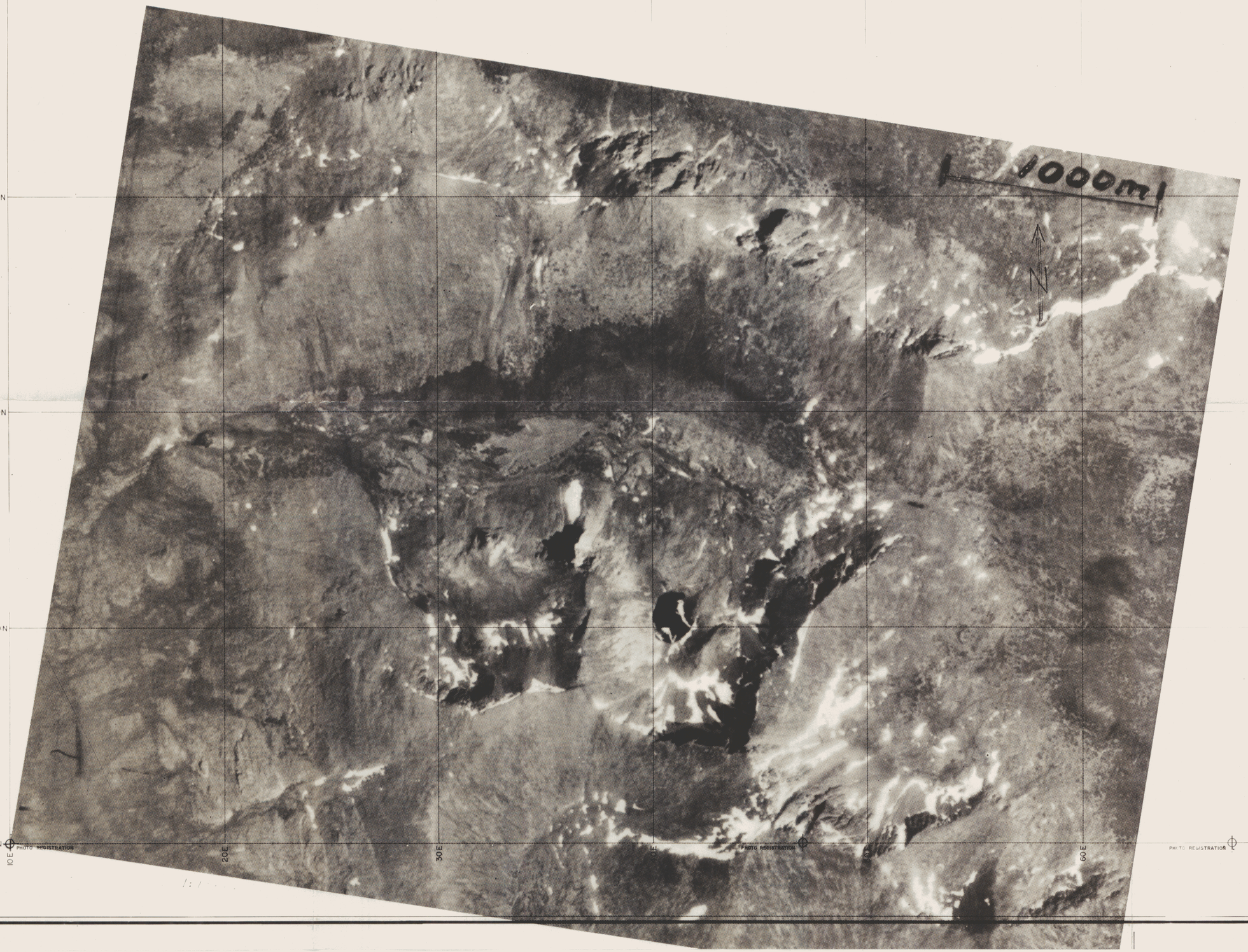
6.5 — URANIUM VALUE IN P.P.M.

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN – TUNGSTEN IN P.P.M.
## DB CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 300 600 m
1 : 10 000
SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No. 105 C 8 |
| DATE | AUG-SEPT.'78 | | ACCT. No. 335-15 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78-41 |
| DATE | OCT. '78 | | |




DUPONT EXPLORATION
CANADA

# KLINKIT PROJECT
# PHOTOMAP
## DB CLAIMS

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10 000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No 105 C 8 |
| DATE | JUL.-AUG. '78 | | ACCT. No 335-15 |
| DRAWN BY | K.L.J. | | DWG. No KL.78-65 |
| DATE | SEPT. '78 | | |

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## PONT(B) CLAIMS


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| 2. | PHYSIOGRAPHY AND VEGETATION | 1 |
| 3. | CLAIMS | 1 |
| 4. | HISTORY | 1 |
| 5. | REGIONAL RESULTS | 2 |
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| | 6.1 Preliminary | 2 |
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| | 6.3 Geochemistry | 4 |
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| 7. | CONCLUSIONS AND RECOMMENDATIONS | 5 |

APPENDIX

STATEMENT OF EXPENDITURES

# LIST OF FIGURES

## PONT (B) CLAIMS


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| KL 78-30 | Geology | In Pocket |
| KL 78-35 | Geological Legend | " |
| KL 78-47 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-71 | Photo Map | " |

## SPECIFIC PROSPECT - PONT(B) CLAIMS (335-18)

### 1. LOCATION AND ACCESS

The PONT(B), usually referred to as the "Little PONT" claimed area is approximately 8 km east of Dorsey Lake in the north central portion of the Seagull Batholith. The PONT(B) group is on claim sheet 105-B-3 at about 60°10'N and 131°29'W.

Access is only possible via helicopter from Swift River, Yukon, approximately 23 km to the southeast.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-71)

The PONT(B) claims cover a northerly trending arete with a solitary cirque to the west and complex multiple headwall cirque to the east. The west and south facing slopes are "angle of repose" felsenmeer with east and north facing slopes as sheer cliffs to extremely steep faces.

Vegetation is limited to very minor balsam and ground birch in the northeast on the cirque floor with sedges and wild flowers covering most of the gentler slopes.

### 3. CLAIMS

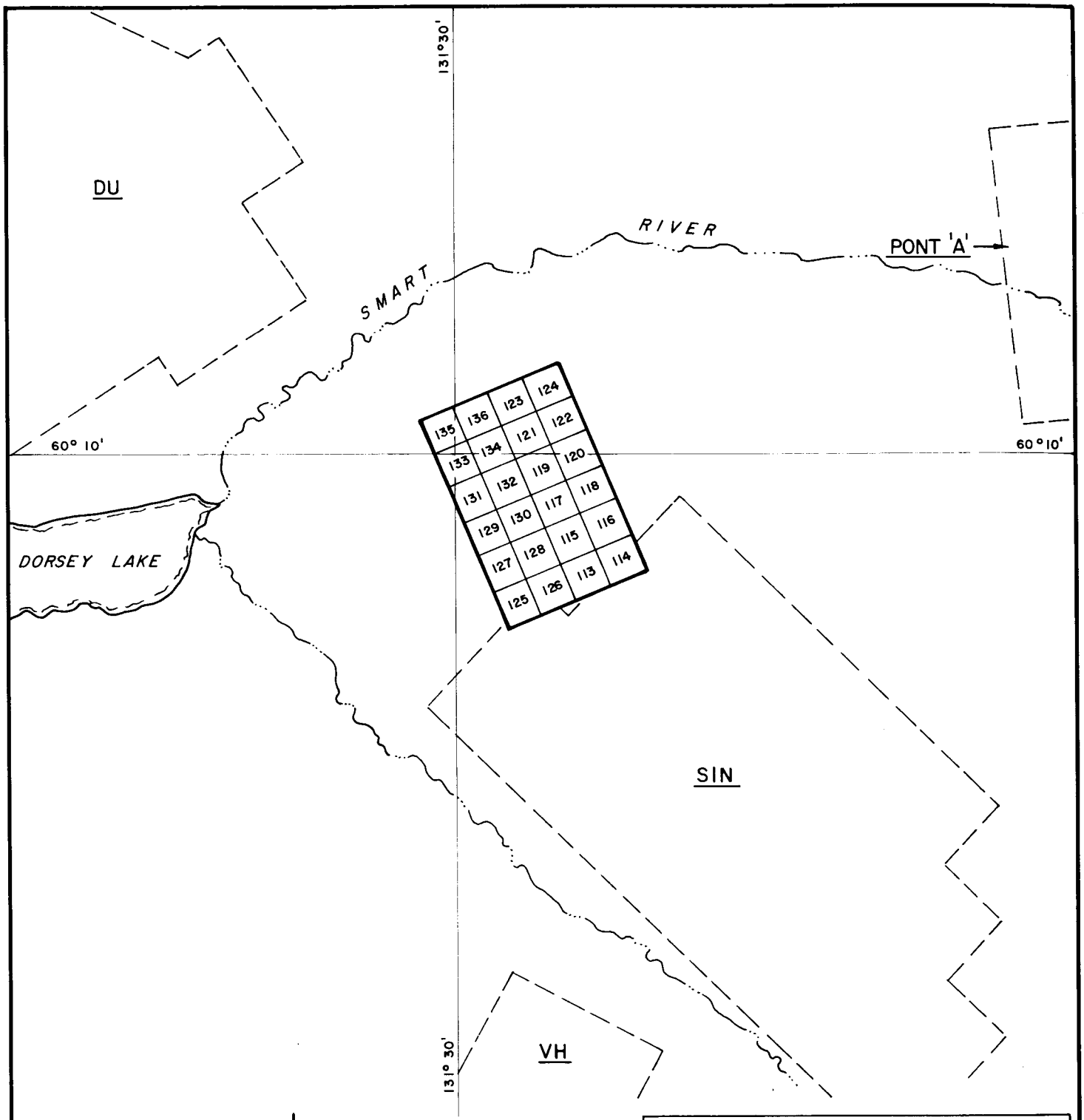
The PONT(B) group consists of the following claims:

| Claim Name | Record Number | Date of Record |
|---|---|---|
| PONT 113-136 | YA29175 - YA29198 | 1978 06 09 |

All claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited.

### 4. HISTORY

The PONT(B) claims were located to cover a possible source of two tin anomalies in the creeks to the east (main anomaly) and west (weak anomaly). During our exploration of the claims we noted considerable evidence of old work in the area. Some of the skarn zones had been blasted (pophole sampling), there is an old camp site in the east cirque floor, and there are several ages of plastic sample flags in the main drainage. We were not able to locate any old posts and there is no record of past work nor claims located in this area. Mr. Cam Stephen said the DC Syndicate was based in the cirque floor, examining the skarn zones for scheelite, and they found no significant tungsten mineralization.




DUPONT EXPLORATION
CANADA

# KLINKIT JOINT VENTURE
## PONT (GROUP B) PROJECT
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0
SCALE
0
1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B 3 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-18 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-3 |
| DATE : MAR.'79 | ..... ..... | |

Welcome North Mines staked the ground between the PONT(B) group and the VAL(A) claims to the southeast as the SIN group. The SIN claims appear to cover the southeast corner of the PONT(B) group.

## 5. REGIONAL RESULTS

The eastern creek ran 180 ppm Sn with no anomalous $WO_3$, $MoS_2$ or U. The proposed source for the Sn values, at the time of staking, was the cusp of the Seagull Batholith, particularly in areas of small roof pendants and orange/red gossans. As the northern stream was anomalous and there is a GSC-mapped roof pendant with many orange/red gossans to the east, west and south of the roof pendant, we acquired the claims. The stream draining the south side of the PONT(B) block ran only 35 ppm Sn with no tungsten, molybdenite or uranium anomalies. Thus the block was restricted to the exposed "roof pendant" area.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The property was visited during a 15 min. traverse by F.M. Smith as part of the brief visit to the area by Barr, Gunn and Smith on 1978 06 22. At this time the strong gossan to the west was noted (it was almost totally snow covered at date of staking) and the prominant gossans on the SIN claims were also becoming more exposed from the snow cover. The only observations on the geology were that the central ridge consisted of metavolcanics and sediments, with granite in most of the cirque floors and the west ridge.

### 6.2 Geology (Map KL 78-30)

The oldest units in the claimed area are the Devono-Mississippian volcano-wacke, chert, argillite and arenaceous limestone. The basal member exposed is a thin altered remnant of the tuffaceous-argillite as the member immediately under the "thick" limestone bed. The alteration to a biotite-muscovite hornfels is due to the proximal contact with the Cretaceous age fine to medium grained feldspar porphyry granite of the Seagull phase of the Seagull Batholith. The true thickness of this unit is unknown but is exposed in several localities in BC as plus 1000 m thick.

The overlying unit, "thick" limestone, is approximately 900 m thick and although lime (calcite and dolomite)

exceeds arenite and alumina in the bed, the whole unit is a complex interbedded series of limestone, dolostone, cherty to sandy carbonate, and limy chert to sandy chert members. The amount of alumina (as white clay partings and thin white to light coloured argillites) is extremely variable from member to member and along the extent of any one member.

Overlying the "thick" limestone is a predominantly interbedded chert and limy chert to limestone in which the lime content is considerably less than the lower unit. The beds of arenite are thicker (from 0.2 m common in the lower to 15. to 20. m in the upper unit). At the top of this 400 m thick unit is a fahlband that forms the contact with the argillaceous unit above.

The fahlband is composed of tuffaceous to carbonate rich altered rock (to chlorite sulphide phyllite) with disseminated pyrrhotite, pyrite, with minor sphalerite, chalcopyrite and galena. This 0.2 m thick member produces a bright orange red gossan similar to several seen in BC and Yukon (e.g. AP, SLOUCE and SLIP).

The cover on the fahlband zone is a meta tuff with argillite and chert interbeds. This horizon is rich in sulphides (1-5% pyrite common) and produces a dark red gossan. The tuff is andesitic in composition with alteration to hornblendite near granitic contacts. This unit is approximately 270 m thick but may be thinner due to folding in the crest of the arete of the traverse line.

The mixed sediment-tuff bed is capped by a horizon of meta-tuff of unknown thickness that is almost totally altered to hornblendite in the southern portion of the claims.

The whole Devono-Mississippian volcanic and sedimentary formation is a long thin roof pendant in the Seagull Batholith. The principal intrusive phase is the "Seagull" phase with several variations on the texture and accessory minerals to form the contact zone, the roof pegmatite zone in the south, and the biotite-rich fine grained groundmass, feldspar porphyry phase (MBFP) in the north.

The MBFP in the side wall of the western arete of the small single cirque appears to be transgressive to the ubiquitous Seagull phase. The relationship of these two units will be researched during the 1979 field season as much of the tin geochemical zones are related to areas where these two phases are in contact.

A swarm of narrow aplite dykes cut the hornblendite of the volcanic member (youngest known) of the Devono-Mississippian with an ENE strike and 80° dip to the north. These aplites appear to be derived from the fine grained border phase of the Seagull phase and cut the pegmatitic cap on the intrusive.

There are a few thin gneissic sheets within the coarse grained Seagull phase that deserve note. The gneissic members appear to be the more basic of the argillites that have been only partly granitized. The relict bedding is preserved as oscillations of composition of the gneiss with large members of the original argillite completely granitized to GCFB. This granitization indicates that the Seagull phase (unlike the older phase) was sufficiently rich in volatiles so as to be able to stope the roof of the batholith. We have noted the Hake and gabbroic phases (DB, VAL(A), SIN, etc) all show no alteration of their roofs other than skarn (pyrometasomatic with low volatiles) and very weak phyllitization.

6.3 Geochemistry (Map KL 78-47)

A total of 130 samples were collected and analyzed for tin and tungsten. All samples were collected from "break of slope" consisting of weathered rock as grit.

The principal anomalies are

(a) in the headwall (SE) of the western cirque immediately below the maximum aplite intrusion and the thickest pegmatite zone in the granite. This zone appears to pass through the mountain (to the SE) and is exposed in the large anomalous zone on the SIN claims.

(b) in the skarn zone on the extreme eastern portion of the PONT(B) (or possibly the SIN claims) where there is weak to moderate tin immediately north of the major tin anomaly on SIN claims, and

(c) moderate to anomalous tin with three major tungsten anomalies on both sides of the central ridge related probably to the contact of limy members and the Seagull phase intrusive.

There is also one unsubstantiated anomaly at the north end of the traverse line on the east wall of the complex east cirque. This tin and tungsten value requires some check sampling.

### 6.4 Mineralization

No samples were analyzed from the PONT(B) zone as no geochemical values were available during our field work and we did not see any mineralization worthy of analysis. All samples were lamped and several tens of rock samples are available for further work.

## 7. CONCLUSIONS AND RECOMMENDATIONS

The source of the major tin anomaly in the eastern creek has not definitely been located. It is possible weathering of the SIN geochemical anomaly could be the source but the magnitude of the anomaly in the northern watershed is distinctly less than the PONT(B) anomaly.

A possible zone of economic interest on the PONT(B) has been located by side hill sampling. The pegmatitic roof/ cusp zone will require careful evaluation and sampling to determine grade, character and continuity of mineralization.

The large skarn zone and possible buried skarn zones require detail sampling and mapping to determine grade and extent of any tungsten and tin mineralization.

The PONT(B) claims should be retained with all applicable work filed as part of the SIN and VAL(A) claim assessment.

The east cirque should be further evaluated to determine if there is another source for the tin found in the anomalous creek.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## PONT(B) CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | | $ 271.22 |
| Camp Expenses | | 579.17 |
| Mapping, Gr. Surveys, Maps | | 1,029.42 |
| Freight, Hauling, Storage | | 48.81 |
| Assaying | | 1,083.61 |
| Salaries - Regular | | 1,192.43 |
| Salaries - Temporary | | 367.03 |
| Equipment Rental | | 131.16 |
| Stationery & Supplies | | 7.51 |
| Telephone | | 39.13 |
| Auto Expenses | | 15.14 |
| Repairs & Mtce (Excl. Auto) | | 3.72 |
| Non Capital Equipment Purchases | | 65.98 |
| Depreciation Expenses | | 39.03 |
| | TOTAL | $ 4,873.36 |

APPENDIX

STATEMENT OF EXPENDITURES

(Exclusive of Regional Programme)

As at December 31, 1978

PONT(B), VAL(B) & SIN CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 838.45 |
| Camp Expenses | | 2,151.16 |
| Mapping, Gr. Surveys, Maps | | 7,747.53 |
| Freight, Hauling, Storage | | 184.31 |
| Assaying | | 3,940.41 |
| Salaries - Regular | | 3,669.06 |
| Salaries - Temporary | | 1,116.41 |
| Equipment Rental | | 495.25 |
| Stationery & Supplies | | 28.37 |
| Telephone | | 147.76 |
| Auto Expenses | | 57.16 |
| Repairs and Mtce (excl. Auto) | | 14.06 |
| Non Capital Equip. Purchases | | 249.15 |
| Depreciation Expenses | | 147.38 |
| TOTAL | $ | 20,786.46 |

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

PHOTO REGISTRATION

PHOTO REGISTRATION

N

MBFP

SKRN-ARGL

GD - GM BH

LMST // CHRT

LMST / CHRT

TUFF - ARGL - CHRT

TUFF

TUFF

APLT

GMQP

GCFB

MBQF - MBFP

GCFB

GCFB

GCFB

BGNS

ARGL - BH

BGNS

ARGL

ARGL

124

123

122

121

120

119

118

117

116

115

114

113

136

135

134

133

132

131

130

129

128

127

126

125

80

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# GEOLOGY
## PONT (B) CLAIMS

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1:10000 300 600 m

SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S No. 105 B |
| DATE | JUL.-AUG.'78 | | ACCT No. 335-18 |
| DRAWN BY | K.L.J. | | DRWG No. KL.78-30 |
| DATE | OCT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE : (coarse grained ) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB ) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous ) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous ) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS
CT = CASSITERITE
CP = CHALCOPYRITE
AG = AUGITE
GL = GALENA
GB = GARNET BERYL ( SKARN)
GD = GARNET DIOPSIDE
GM = GARNET MAGNETITE
GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE )
HB = HORNBLENDE
HS = HULSITE
MG = MAGNETITE
MY = MALAYAITE
MS = MASSIVE SULFIDE
MU = MUSCOVITE
PG = PEGMATITE
PO = PYRRHOTITE
QC = QUARTZITE COBBLE
QT = QUARTZ TOURMALINE
QV = QUARTZ VEINS
SF = SERICITE FLUORITE
SL = SHEELITE
SP = SPHALERITE
WF = WOLFRAMITE
C\ = CONTACT ZONE
D\ = DYKE
EP = EPIDOTE
GP = GRAPHITIC
PP = PORPHYRY
TU = TOURMALINE

## SYMBOLS

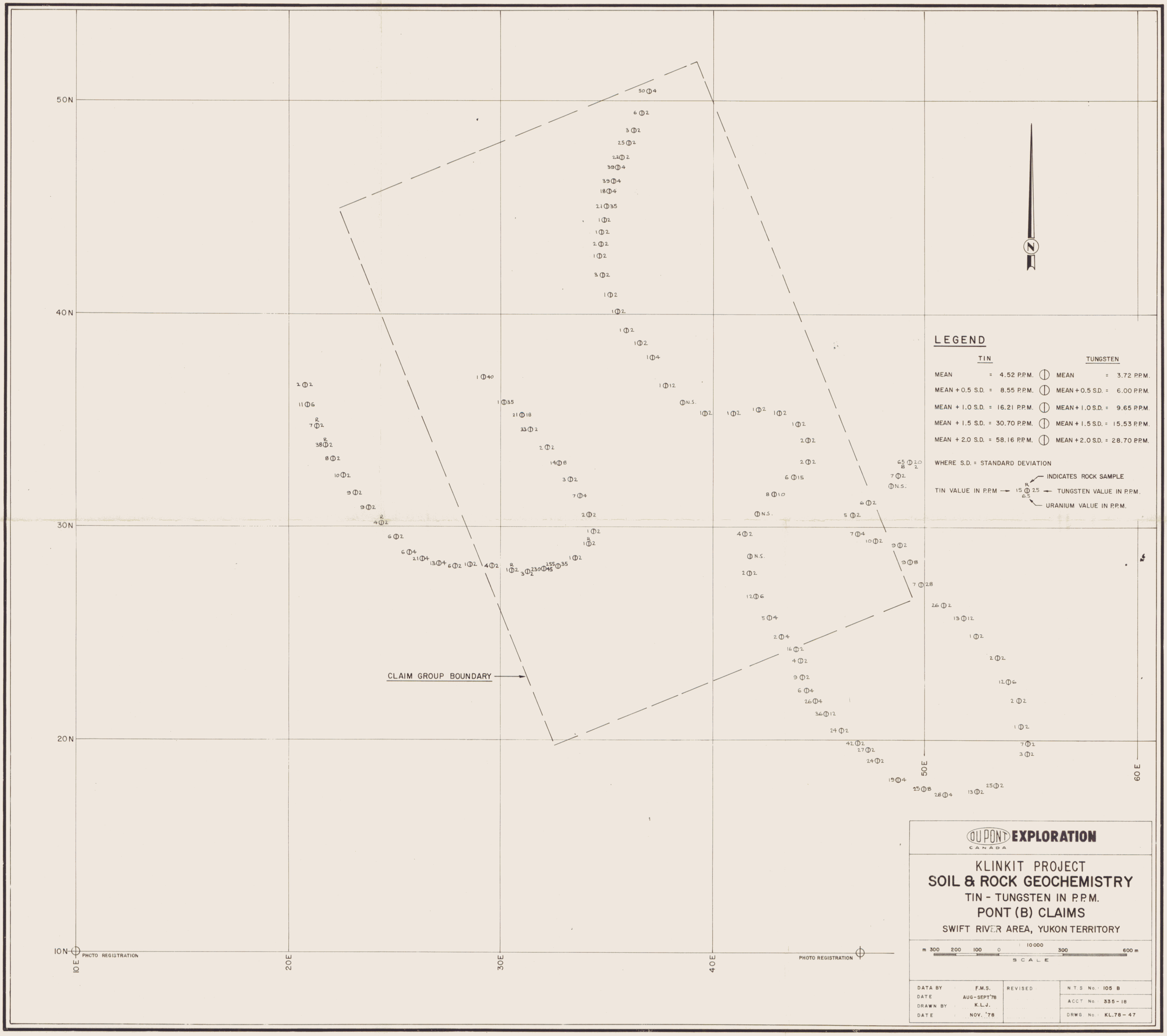
OUTCROP ( edge of)
CONTACT APPROIMATE OR ASSUMED
CONTACT OBSERVED
MORAINE ( edge of)
TALUS ( edge of)
FAULT
JOINTING, inclined , vertical
BEDDING, inclined , vertical
FOLIATION, inclined , vertical
AREA OF NUMEROUS GOSSANS
GOSSAN
OVERTURNED ANTICLINE
SKARN
ROCK SAMPE LOCATION
CHIP SAMPLE LOCATION
X FLOAT
Rock A / Rock B — ROCK A MORE COMMON THAN ROCK B
Rock A // Rock B — ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A )
CLAIM POST
THIN SECTION LOCATION

DU PONT CANADA EXPLORATION

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
## TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
## SWIFT RIVER AREA, B.C. & Y.T.

SCALE
0 0
1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | | N.T.S. No. : 40 & 105B |
| DATE : SEPT. '78 | | | ACCT No. : 335 - 00 |
| DRAWN BY : K.L.J. | | | DRWG. No. : KL.78 - 35 |
| DATE : OCT. '78 | | | |



50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
PHOTO REGISTRATION
PHOTO REGISTRATION
CLAIM GROUP BOUNDARY
N
LEGEND
TIN
TUNGSTEN
MEAN = 4.52 P.P.M.
MEAN + 0.5 S.D. = 8.55 P.P.M.
MEAN + 1.0 S.D. = 16.21 P.P.M.
MEAN + 1.5 S.D. = 30.70 P.P.M.
MEAN + 2.0 S.D. = 58.16 P.P.M.
MEAN = 3.72 P.P.M.
MEAN + 0.5 S.D. = 6.00 P.P.M.
MEAN + 1.0 S.D. = 9.65 P.P.M.
MEAN + 1.5 S.D. = 15.53 P.P.M.
MEAN + 2.0 S.D. = 28.70 P.P.M.
WHERE S.D. = STANDARD DEVIATION
INDICATES ROCK SAMPLE
TIN VALUE IN P.P.M
TUNGSTEN VALUE IN P.P.M.
URANIUM VALUE IN P.P.M.
DUPONT EXPLORATION
CANADA
KLINKIT PROJECT
SOIL & ROCK GEOCHEMISTRY
TIN - TUNGSTEN IN P.P.M.
PONT (B) CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY
m 300 200 100 0 10 000 300 600 m
SCALE
DATA BY F.M.S.
DATE AUG-SEPT '78
DRAWN BY K.L.J.
DATE NOV. '78
REVISED
N.T.S. No. 105 B
ACCT No. 335-18
DRWG No. KL.78-47




DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# PHOTOMAP
## PONT (B) CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.-AUG.'78 | | ACCT No. 335-18 |
| DRAWN BY | K.L.J. | | DRWG No. KL.78-71 |
| DATE | SEPT. '78 | | |

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VAL(B) CLAIMS


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## VAL(B) CLAIMS


| | | |
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| KL 78-22 | Geology (South) | " |
| KL 78-35 | Geological Legend | " |
| KL 78-51 | Soil & Rock Geochem, North Tin & Tungsten PPM | " |
| KL 78-52 | Soil & Rock Geochem, South Tin & Tungsten PPM | " |
| KL 78-62 | Photo Map, North | " |
| KL 78-63 | Photo Map, South | " |

## SPECIFIC PROSPECT - VAL(B) CLAIMS (335-19)

### 1. LOCATION AND ACCESS

The VAL(B) group is located in the south central to eastern portion of the Seagull Batholith and includes peak '6828' in the southern portion of the claimed area. The mountains are part of the Englishman Range, Cassiar Mountains, Yukon in claim sheet 105-B-3 at about 60°06'N and 131°22'W.

The claims are accessible only by helicopter from Swift River, Yukon about 15 km to the southeast.

### 2. PHYSIOGRAPHY AND VEGETATION (Maps KL 78-62 and KL 78-63)

The claimed area covers a complex of mountain peaks with U-shaped valleys cutting the central peaks from all quadrants. The principal cirques are "Barr" trending west from the southwest side, three parallel east trending cirques as hanging valleys on the Partridge Creek and Goddart Creek valley, "Mun" cirque facing north to Munson Lake and "Sin" cirque starting northwest and finally trending west on the SIN project area. The two horn peaks are on the north and south headwall of "Barr" cirque with the south peak as '6828' on the government topographic maps.

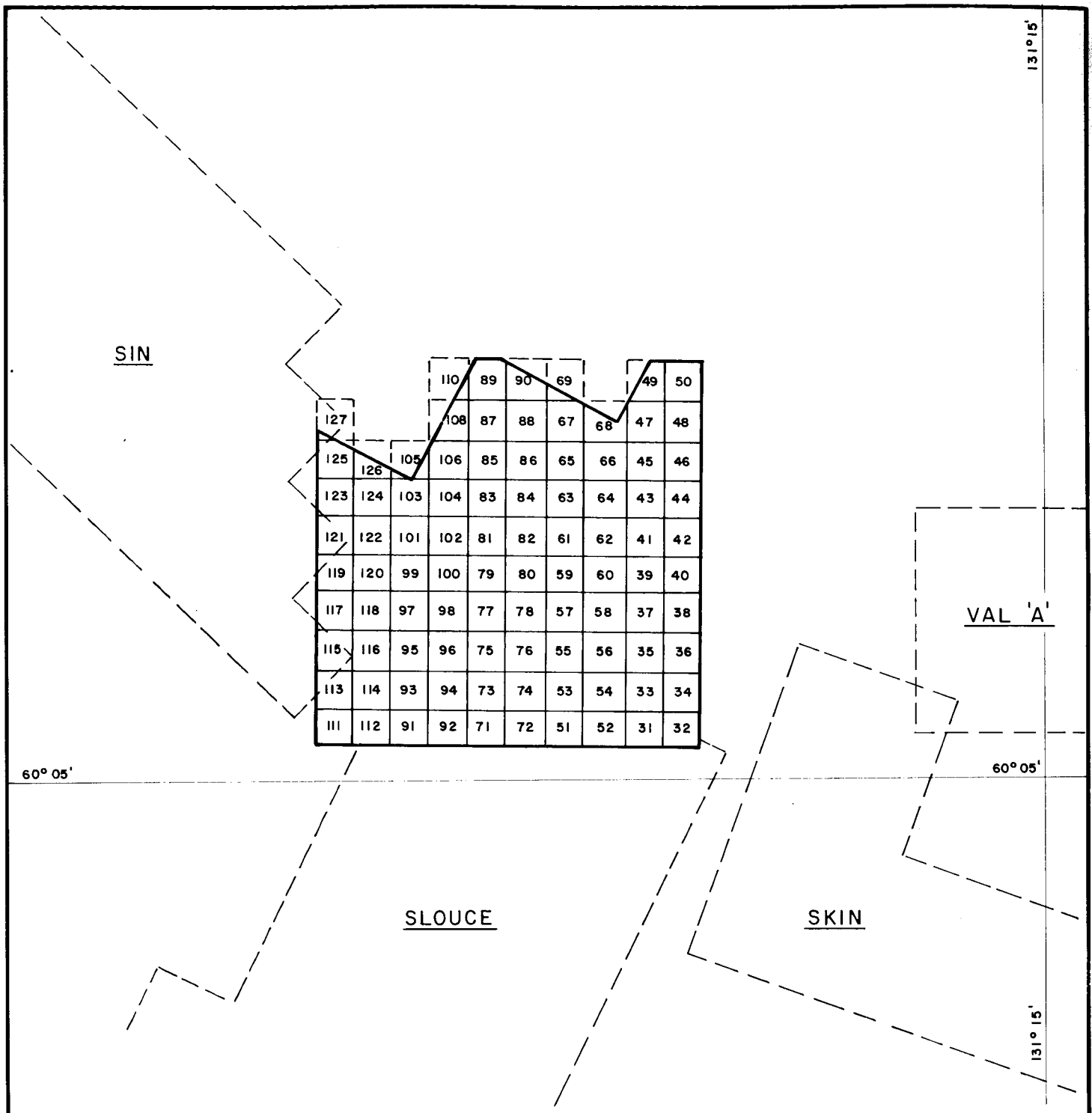
All north and east facing slopes are sheer to very steep with south and west facing of more subdued topography.

Vegetation is generally limited to south or west facing slopes with ground birch in patches to near the arete tops and becoming dominant cover by the 1700 m level. At lower levels ground balsam is dispersed in the ground birch and becomes dominant just above the main drainage levels. Alpine meadows are common on all cirque floors and most of the north and east facing lower slopes.

### 3. CLAIMS

The VAL(B) group consists of the following claims:

| Claim Name | Record Number | Date of Record |
|---|---|---|
| VAL 31-69 | YA28804 - YA28841 | 1978 06 09 |
| VAL 71-106 | YA28843 - YA28878 | 1978 06 09 |
| VAL 108 | YA28880 | 1978 06 09 |
| VAL 110-127 | YA28882 - YA28899 | 1978 06 09 |




DUPONT EXPLORATION
CANADA

# KLINKIT JOINT VENTURE
## VAL (GROUP B) PROJECT
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0
SCALE
0
1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B 3 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-19 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-5 |
| DATE : MAR.'79 | ..... ..... | |

The VAL(B) group consists of 84 claims recorded in the Watson Lake MD, Yukon, in the name of Du Pont of Canada Exploration Limited.

## 4. HISTORY

According to the Archer Cathro mineral inventory, the northern portion of the VAL(B) group (or southern portion of the MUN group of DC Syndicate) has had several years of exploration for massive sulphides in the fahlband zone in the Sylvester group. The last known work dates from 1969 when an El Paso subsidiary sampled two areas of sphalerite mineralization on the contact zone of the Cassiar Batholith and Sylvester limy sediments. During our recce work we did not find any evidence of this previous work on the VAL claims and suggest the sulphide horizon is further north in the area of the DC Syndicate MUN claims. To the best of our knowledge, no physical exploration work has been undertaken on the VAL(B) claim area in the past. Several ages of sample flags and old cans were noted throughout the northern portion of the claims but no posts or line grid stations were seen.

The MUN claims to the north of the VAL(B) group were located in 1977 to cover several zones of scheelite bearing limy skarns. The VAL(B) group probably fully covers the southern end of this group but no MUN posts were noted in any of our field work.

The SLOUCE project was enlarged from the original 64 claims to protect the southern portion of the VAL(B) claims.

After locating the VAL(B) group, Welcome North Mines Ltd. located the SIN claims from the western side of the VAL(B) project to the PONT(B) project. Field work in the area of VAL(B), SIN and PONT(B) claims was done considering the claims as a large group thus assessment is filed on these claims on a shared basis.

## 5. REGIONAL RESULTS

Three major tin anomalies and one major tungsten and tin anomaly were found in the VAL(B) area on the basis of our first pass sampling. As there were several gossans similar to the DU project anomalous gossans and the GSC mapping indicated the central peak areas to be a roof pendant on the Seagull Batholith, we covered the roof pendant and the gossanous zones from the already located MUN claims in the north to the base of "Barr" cirque and the eastern anomalous tin tungsten cirque.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

During the visit to the area in June 1978, Barr, Gunn and Smith made three traverses on Barr cirque, the tin-tungsten anomalous cirque and Sin cirque respectively. Although no mineralization of economic significance was located the variation of rock types and of intrusive ages and the unusual alteration zones were noted and sampled. The only conclusion that should be drawn from this preliminary work was that the best tin values in creeks appeared to be related to the roof pendant in the centre of the claim block.

### 6.2 Geology

#### 6.2.1 VAL(B) claims, north half (Map KL 78-21)

The oldest rocks in the north sheet are the middle to basal portions of the Sylvester group metasediments in contact with various phases of the Seagull Batholith. The oldest member of the Sylvester appears to be the weakly tuffaceous argillite of the lower monotonous argillaceous package. This unit is overlain by the lower of the limestones usually referred to as the "thick" lime member. The basal limestone member is capped by oscillating lime and chert to quartzite members with variable silica and lime contact (called QTZT).

The Cretaceous Seagull Batholith in the mapped area consists of five phases: the oldest phase is the "Gabbro", hornblendite, essexite roof remnant of the Seagull Batholith. The evidence for this relationship is based on

(a) limy sediments preserved above the gabbro are skarned, and

(b) the contact with the granite in many areas is a gradual shift from calcic feldspar to potassic feldspar and hornblendite to biotite with the grain size shifting from extremely coarse in the gabbro to medium grained in the transitional phases.

The contact shift is several tens of metres

thick with no sign of pegmatite, or alteration of the mineral assemblage (e.g. chlorite after hornblendite, etc). Other portions of the contact area appear to be cusp-like with pegmatite, micro granite, aplites and felsite dykes in the roof or cusp of the Seagull phase.

Although considerable field and laboratory research is required to prove/disprove our hypothesis the present evidence for fractionation of the Seagull Batholith from the VAL gabbro through HAKE, SEAGULL, DU and APLITE phases agrees with known worldwide occurrences of this type of batholith and the chemical fractionation both from theoretical considerations and current thin section evidence are in agreement with the hypothesis.

The pegmatite phase noted in the north central (PG/DHCF and DHCF) are stockscheider zones similar to the PONT(B) pegmatitic roof area. The aplites (APLT) appear to be related to either a younger phase than the Seagull (GCFB) i.e. the GMQP, or they are related to the cooling history of the GCFB. In all areas of the Seagull Batholith the aplites appear to be marginal but related to tin or tin/tungsten mineralization.

6.2.2 VAL(B), south half (Map KL 78-22)

The preserved roof remnant of gabbro occupies the tops of the main horns and aretes in the south sheet similar to the exposure in the north. The principal variations are the eastern exposure of sediments in contact with the Seagull phase of the batholith indicating that absorption of the roof appears to be dependent on a nearly horizontal plane of the Seagull phase whereas the gabbro appears to have folded and stoped the sedimentary roof during the early emplacement of the batholith.

Stockscheider, aplitic dykes (adamellite) called GMQP and related alteration appear to be related to geochemically anomalous areas noted below. The apparent pipe-like intrusive (in the north central area) on the geology map is in effect a low col zone between the two main horns. Thus it probably represents

the contact (gradational) between the Seagull (GCFB) phase and VAL gabbro phase.

## 6.3 Geochemistry

The initial pass soil sampling was carried out at the "break of slope" area on all cirque walls. Due to the extremely slow turn-around of data, anomalies were not known to exist in the area until the field work was terminated in 1978.

### 6.3.1 VAL(B) Claims, north (Map KL 78-51)

A total of 115 samples were collected and analyzed for tin and tungsten. The major anomalies are:

(a) Tin and tungsten values on the northeast side which, due to geological considerations, appear to pass through the arete to the north-central portion of the claims, and

(b) moderate tin and tungsten values on the south side of Sin cirque in the area of gossanous granite.

The 6.3.1(a) anomaly appears to be related to the roof (cusp) zone of the late-stage granite, particularly in areas of pegmatite in the roof. The 6.3.1(b) anomaly appears to relate to the 6.3.2(a) anomaly to the south.

### 6.3.2 VAL(B) Claims, south (Map KL 78-52)

A total of 187 samples were collected and analyzed for tin and tungsten from the area of the south map. The principal anomalies are:

(a) Major tin values on the north flank, west end of "Barr" cirque with very low tungsten values. This anomaly is at least 700 m long (E-W).

(b) Major tin values on the south side, central to western end of "Barr" cirque and passing through the arete in the extreme western end.

(c) Major tin values on southeast end of claim block near the edge of the SLOUCE claims.

(d) Many moderate to strong single station anomalous values for tin throughout the claim area require back-up samples for definition of size and importance of anomalous area.

As noted earlier, the 6.3.2(a) is probably related to anomaly 6.3.1(b) to the north through the arete. The 6.3.2(b) anomaly may be related to the few anomalous values to the southwest on the SLOUCE claims. Due to photo overlap and exact sample location problems, the relationship between these two anomalous areas must be determined by more detailed sampling with mosaics for control.

As noted for the north sheet, the contact area of the cusps of the Seagull or younger phase with the older roof of the batholith (or sediments) appears to have a high background in tin, and pegmatite or late phase exposures appear to be anomalous for tin.

There are no major tungsten anomalous zones on the VAL(B) claims even though arenaceous limestone is in contact with several phases of the batholith.

## 6.4 Mineralization

A total of 15 samples were assayed for tin and tungsten from the samples collected during geological traverses. The following table lists the relevant information.

| Assay No. | Sample No. | $WO_3$ % | Sn % | Location |
|---|---|---|---|---|
| 2980 | G-78-8-6-5 | 0.54 | <0.01 | VAL(B) S½ in area of north-eastern skarn - float. |
| 2981 | G-78-8-6-5 | 0.16 | <0.01 | VAL(B) S½ float same area as 2980. |
| 2992 | G-78-8-10-12 | 0.02 | 0.10 | VAL(B) N½ Skarn body as location G-78-8 11/12. |

All other assays yielded background values in tin and tungsten.

## 7. CONCLUSIONS AND RECOMMENDATIONS

Major areas of anomalous tin values have been found on the VAL(B) claims. Sampling and mapping are required to determine source area and grade of the source zones. The areas on the southwest where late phases have intruded the Seagull phase require comparison to other known alteration zones and phase types to determine economic potential for the source area of the tin geochemical anomalies.

Due to the rugged nature of the area, a complete mosaic of the area (included in the SIN and PONT(B) claim areas) is required for control of geology and topography. Although no specific localities have been investigated for source of tin geochemical anomaly as yet, portions of the project may require pencil line contour maps for more detailed sampling and geological mapping.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## VAL(B) CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 298.85 |
| Camp Expenses | | 671.83 |
| Mapping, Gr. Surveys, Maps | | 2,293.70 |
| Freight, Hauling, Storage | | 56.90 |
| Assaying | | 1,249.11 |
| Salaries - Regular | | 1,065.08 |
| Salaries - Temporary | | 234.86 |
| Equipment Rental | | 152.90 |
| Stationery & Supplies | | 8.76 |
| Telephone | | 45.62 |
| Auto Expenses | | 17.65 |
| Repairs & Mtce (excl. Auto) | | 4.34 |
| Non Capital Equipment Purchases | | 76.92 |
| Depreciation Expenses | | 45.50 |
| TOTAL | $ | 6,222.02 |

APPENDIX

STATEMENT OF EXPENDITURES

(Exclusive of Regional Programme)

As at December 31, 1978

PONT(B), VAL(B) & SIN CLAIMS, YT

| | |
|---|---|
| Travel Expenses | $ 838.45 |
| Camp Expenses | 2,151.16 |
| Mapping, Gr. Surveys, Maps | 7,747.53 |
| Freight, Hauling, Storage | 184.31 |
| Assaying | 3,940.41 |
| Salaries - Regular | 3,669.06 |
| Salaries - Temporary | 1,116.41 |
| Equipment Rental | 495.25 |
| Stationery & Supplies | 28.37 |
| Telephone | 147.76 |
| Auto Expenses | 57.16 |
| Repairs and Mtce (excl. Auto) | 14.06 |
| Non Capital Equip. Purchases | 249.15 |
| Depreciation Expenses | 147.38 |
| TOTAL | $ 20,786.46 |

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

70E

PHOTO REGISTRATION

PHOTO REGISTRATION

PHOTO REGISTRATION

Lake

Lake

Lake

LMST

SKRN / MG

Δ-78-8-6-18

Δ-78-8-6-19

ARGL

E-78-8-6-100

GCFB

QTZT

?

?

110

89

90

69

49

50

GCFB

127

108

87

88

67

G-78-8-10-1

G-78-8-6-17

G-78-8-6-16

68

47

48

QTZT / FGNS

GABR

GCFB

G-78-8-10-13 F

GABR

No.1 VAL 67,68

No.2 VAL 65,66

DHCF

E-78-8-6-99

PG/DHCF

G-78-8-10-3

GCFB

125

126

105

106

85

86

65

66

45

46

Lake

E-78-8-6-98

J-78-8-6-6(f)

J-78-8-6-7(f)

GABR

GCFB

GMDQ ?

SF/QV

123

124

103

104

83

84

63

64

43

44

GMQP

J-78-8-6-9

J-78-8-6-8(f)

GCFB

APLT

G-78-8-10-6

G-78-8-10-7

G-78-8-10-8

GABR / QTZT

J-78-8-6-10

121

122

101

102

81

82

61

62

41

42

GMDQ

SKRN

G-78-8-11/12

SAMPLE #2992 0.02 W03 0.10 Sn

No.1 VAL 81,82

No.2 VAL 79,80

G-78-8-10-9

APLT

GBRO

G-78-8-10-10

GABR / CHRT - ARGL

GCFB

GMDQ/D

119

GCFB

120

GCFB

99

100

LMST

79

80

59

60

39

40

CHRT/ARGL

117

118

97

98

77

78

57

58

37

38

115

116

95

96

75

76

55

56

35

36

N

DU PONT CANADA EXPLORATION

# KLINKIT PROJECT
# GEOLOGY
## VAL (B) CLAIMS (NORTH)

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 : 10000 300 600 m

SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S No.: 105 B |
| DATE | JUL.-AUG.'78 | | ACCT No.: 335 - 19 |
| DRAWN BY | K.L.J. | | DRWG No.: KL.78 - 21 |
| DATE | SEPT.'78 | | |

60N
50N
40N
30N
20N
10N

10E
20E
30E
40E
50E
60E
70E
80E

PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION

106
85
86
65
66
45
46

123 124 103 104 83 84 63 64 43 44
121 122 101 102 81 82 61 62 41 42
119 120 99 100 79 80 59 60 39 40
117 118 97 98 77 78 57 58 37 38
115 116 95 96 75 76 55 56 35 36
113 114 93 94 73 74 53 54 33 34
111 112 91 92 71 72 51 52 31 32

SKRN
LMST
CHRT – ARGL
GCFB
GBRO
GBRO/GCFB
G-78-8-5-2,3,6,7,8,9,10,11
ARGL / QTZT
SKRN
80
X FLOAT SAMPLE # 2980 0.54 WO3 < 0.01 Sn
SAMPLE # 2981 0.16 WO3 < 0.01 Sn
No.1 VAL 57,58
No.2 VAL 55,56
GCFB
G-78-8-8-5
G-78-8-8-12,13
LMST
G-78-8-5-17
G-78-8-5-19
+30
GCFB
G-78-8-5-18,20,21
GCFB/SF
GCFB/PG,QV
SKRN
45
G-78-8-5-24,25
QTZT
GBRO
LMST
10
GBRO
G-78-8-5-23
G-78-8-5-22
GMQP
GMQP
SKRN
GCFB

N

DUPONT EXPLORATION
CANADA

# KLINKIT PROJECT
# GEOLOGY
## VAL(B) CLAIMS (SOUTH)
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 1 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.-AUG. '78 | | ACCT. No. 335 – 19 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78 – 22 |
| DATE | SEPT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry, subphase intruding GCFB, cut by GMDQ |
| GCFB | BIOTITE GRANITE : ( coarse grained ) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB ) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE ( in part tuffaceous ) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous ) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS

CT = CASSITERITE

CP = CHALCOPYRITE

AG = AUGITE

GL = GALENA

GB = GARNET BERYL ( SKARN)

GD = GARNET DIOPSIDE

GM = GARNET MAGNETITE

GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE )

HB = HORNBLENDE

HS = HULSITE

MG = MAGNETITE

MY = MALAYAITE

MS = MASSIVE SULFIDE

MU = MUSCOVITE

PG = PEGMATITE

PO = PYRRHOTITE

QC = QUARTZITE COBBLE

QT = QUARTZ TOURMALINE

QV = QUARTZ VEINS

SF = SERICITE FLUORITE

SL = SHEELITE

SP = SPHALERITE

WF = WOLFRAMITE

C\ = CONTACT ZONE

D\ = DYKE

EP = EPIDOTE

GP = GRAPHITIC

PP = PORPHYRY

TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)

CONTACT APPROIMATE OR ASSUMED

CONTACT OBSERVED

MORAINE ( edge of)

TALUS ( edge of)

FAULT

JOINTING, inclined, vertical

BEDDING, inclined, vertical

FOLIATION, inclined, vertical

AREA OF NUMEROUS GOSSANS

GOSSAN

OVERTURNED ANTICLINE

SKARN

ROCK SAMPE LOCATION

CHIP SAMPLE LOCATION

X FLOAT

Rock A / Rock B ROCK A MORE COMMON THAN ROCK B

Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)

CLAIM POST

THIN SECTION LOCATION

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT

# GEOLOGICAL LEGEND

TO ACCOMPANY DRWG Nos. KL.78-16 TO 34

SWIFT RIVER AREA, B.C. & Y.T.

SCALE

1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : | 40 & 105B |
| DATE : SEPT. '78 | | ACCT No. : | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : | KL.78 - 35 |
| DATE : OCT. '78 | | | |


60N
50N
40N
30N
20N
10N
10E
20E
30E
40E
50E
60E
70E
80E
PHOTO REGISTRATION
PHOTO REGISTRATION
PHOTO REGISTRATION
CLAIM GROUP BOUNDARY
LEGEND
TIN
TUNGSTEN
MEAN = 4.52 P.P.M.
MEAN = 3.72 P.P.M.
MEAN + 0.5 S.D. = 8.55 P.P.M.
MEAN + 0.5 S.D. = 6.00 P.P.M.
MEAN + 1.0 S.D. = 16.21 P.P.M.
MEAN + 1.0 S.D. = 9.65 P.P.M.
MEAN + 1.5 S.D. = 30.70 P.P.M.
MEAN + 1.5 S.D. = 15.53 P.P.M.
MEAN + 2.0 S.D. = 58.16 P.P.M.
MEAN + 2.0 S.D. = 28.70 P.P.M.
WHERE S.D. = STANDARD DEVIATION
INDICATES ROCK SAMPLE
TIN VALUE IN P.P.M
TUNGSTEN VALUE IN P.P.M.
URANIUM VALUE IN P.P.M.
DU PONT CANADA EXPLORATION
KLINKIT PROJECT
SOIL & ROCK GEOCHEMISTRY
TIN - TUNGSTEN IN P.P.M.
VAL (B) CLAIMS (NORTH)
SWIFT RIVER AREA, YUKON TERRITORY
m 300 200 100 0 1:10000 300 600 m
SCALE
DATA BY : F.M.S.
DATE : AUG-SEPT '78
DRAWN BY : K.L.J.
DATE : NOV. '78
REVISED :
N.T.S. No. : 105 B
ACCT No. 335 - 19
DRWG. No. : KL.78 - 51

60N

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

70E

80E

PHOTO REGISTRATION

PHOTO REGISTRATION

PHOTO REGISTRATION

CLAIM GROUP BOUNDARY

## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

INDICATES ROCK SAMPLE

TIN VALUE IN P.P.M. → 15 (25 / 6.5) ← TUNGSTEN VALUE IN P.P.M.

URANIUM VALUE IN P.P.M.

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## VAL (B) CLAIMS (SOUTH)
### SWIFT RIVER AREA, YUKON TERRITORY

1 : 10000

m 300 200 100 0 300 600 m

SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REVISED | N.T.S. No.: 105 B |
| DATE | AUG-SEPT'78 | | ACCT No.: 335 - 19 |
| DRAWN BY | K.L.J. | | DRWG. No.: KL.78 - 52 |
| DATE | NOV. '78 | | |

50N

40N

30N

20N

10N

10E

20E

30E

40E

50E

60E

70E

PHOTO REGISTRATION

PHOTO REGISTRATION

PHOTO REGISTRATION

N

0 1000 m

1:10 000

m 300 200 100 0 10 000 300 600 m

SCALE

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# PHOTOMAP
## VAL (B) CLAIMS (NORTH)

SWIFT RIVER AREA, YUKON TERRITORY

| | | | |
|---|---|---|---|
| | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.-AUG. '78 | | A.R. No. 335-19 |
| DRAWN BY | K.L.J. | | |
| DATE | SEPT. '78 | | DRG. No. KL.78-62 |




# EXPLORATION

KLINKIT PROJECT

## PHOTOMAP

VAL(B) CLAIMS (SOUTH)

WIFT RIVER AREA, YUKON TERRITORY

10 000

200 100 300 600 m

| | | | |
|---|---|---|---|
| | L.E.,C.G.,M.S. | | 105 B |
| | JUL.-AUG.'78 | | 335 - 19 |
| | K.L.J. | | |
| | SEPT.'78 | | KL.78- 63 |

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SWIFT CLAIMS


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| 4. | HISTORY | 2 |
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APPENDIX

STATEMENT OF EXPENDITURES

## LIST OF FIGURES

## SWIFT CLAIMS


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| KL 79-1 | Claim Map | Foll. P.1 |
| KL 78-26 | Geology | In Pocket |
| KL 78-35 | Geological Legend | " |
| KL 78-43 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-67 | Photo Map | " |

## SPECIFIC PROSPECT - SWIFT CLAIMS (335-20)

### 1. LOCATION AND ACCESS

The project is centred on and about peak 6321 (ft) in the Wolf Lake map sheet (105-B) between Morley River to the north and west, Smart River to the south, and Cabin Creek to the southwest, in the west central portion of the Englishman Range, Cassiar Mountains, Yukon. The project consists of several claim groups on sheet 105-B-4 centred on about 60°12'N and 131°45'W.

Dorsey Lake, located 6 km southeast, is usable by float plane as a staging point to the project area. A winter road crosses Smart River downstream from Dorsey Lake, traverses the southern portion of the project and terminates on the JC claims 2 km south of peak "6321". This winter road interconnects with several roads used as access to the "Logjam Creek/Pure Silver" properties from the Alaska Highway west of Swift River. Currently the only reasonable access is by helicopter from Swift River, Yukon approximately 38 km to the southeast.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-67)

The project covers a horn peak with several ages of valley glacier incisions of the mountainous area. The north and northeast facing cirque areas have extremely steep headwalls with subdued topography less than 1 km downstream.

South facing slopes are of more subdued topography with angle of repose slopes in the central portion and undulating slopes to Smart River, Cabin Creek and Morley River.

Vegetation is particularly thick in the southern portion of the claims (MC claims in southeast area) where black spruce, balsam and ground birch cover most of the slopes. Intermediate south slopes and all north facing lower slopes are covered in ground birch with patches of ground balsam. The alpine areas, cirque floors and subdued aretes are covered in either sedges and scattered low ground birch or felsenmeer or outcrop.

131° 45'

131° 30'

60° 15'

60° 10'

SLIDE

MC

SLIP

SWIFT

DU

JILL

239 FR.

110 Fr. 19 Fr.

11 Fr.

SMART RIVER

DORSEY LAKE

N

DUPONT EXPLORATION
CANADA

# KLINKIT JOINT VENTURE
## DU, SLIP & SWIFT PROJECTS
### CLAIM MAP
SWIFT RIVER AREA, YUKON TERRITORY

1 : 0

SCALE

0 1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B4,5 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-00 |
| DRAWN BY : K.L.J. | ..... ..... | DRWG. No. : KL.79-1 |
| DATE : MAR.'79 | ..... ..... | |

## 3. CLAIMS

The SWIFT project consists of the following claims:

| Claim Name | Record Numbers | Date of Record |
|---|---|---|
| MC 1-8 | YA33303-YA33310 | 1978 06 26 |
| MC 9-16 | YA34392-YA34399 | 1978 08 01 |
| MC 17-32 | YA33597-YA33612 | 1978 07 10 |
| MC 50 | YA33614 | 1978 07 10 |
| MC 52 | YA33616 | 1978 07 10 |
| MC 54 | YA33618 | 1978 07 10 |
| MC 56-105 | YA33620-YA33669 | 1978 07 10 |
| MC 107 | YA33671 | 1978 07 10 |
| MC 109-118 | YA33673-YA33682 | 1978 07 10 |
| SLIDE 1-24 | YA33319-YA33342 | 1978 06 26 |
| SWIFT 1-8 | YA33223-YA33230 | 1978 06 26 |
| SWIFT 29-54 | YA33231-YA33256 | 1978 06 26 |
| SWIFT 57 | YA33259 | 1978 06 26 |
| SWIFT 59 | YA33261 | 1978 06 26 |
| SWIFT 61-78 | YA33263-YA33280 | 1978 06 26 |
| SWIFT 83 | YA33285 | 1978 06 26 |
| SWIFT 85-100 | YA33287-YA33302 | 1978 06 26 |
| JILL 1-8 | YA34381-YA34388 | 1978 08 01 |
| JILL 9 Fr.-11 Fr. | YA34389-YA34391 | 1978 08 01 |

All claims are recorded in the Watson Lake MD, Yukon in the name of Du Pont of Canada Exploration Limited and are subject to agreement between the Joint Venture (Duval International Corporation and Du Pont of Canada Exploration Limited) and Welcome North Mines Ltd. and McCrory Holdings (Yukon) Ltd.

## 4. HISTORY

The claim groups of the SWIFT project tie-on to the north of the JC claims and north, south and east of the PLUG claims controlled by the DC Syndicate managed by J.C. Stephen Explorations Ltd. The JC claims cover an area that has had intermittent exploration including trenching, mapping and several geochemical and geophysical surveys. The past operators were examining the massive sulphide/vein

potential of the fahlband zones in the central member of the Devono-Mississippian Sylvester Group. The "winter" road into the area of the JC claims was constructed in the late 1960's or early 1970's for a cat-tractor trenching programme on the area of the JC claims.

During our initial sampling pass through the area we noted the gossan on the SLIP claim area (bordered on the south and west by the SWIFT project) and located the SLIP claims to protect the gossan. The streams to the east of the SLIP claims are extremely anomalous for tin but the stream to the west (and draining the SWIFT project) is only weakly anomalous in tin. No other gossans were noted in the area of the SWIFT project due to snow cover.

After SLIP and DU claims were located, Cam Stephen commenced expanding the JC claims and located the ZINC and PLUG claims. At the same time Welcome North/McCrory were locating the SLIDE, SWIFT and MC claims. During the claim location, McCrory noted a gossan on the west side of the large cirque north of peak 6321 and expanded the claims to cover this zone. Rock samples collected by McCrory and Graham Scott of Welcome North were analyzed for tin with several samples in the assay range of tin content (i.e. plus 1000 ppm Sn). Welcome North expanded the MC group to the west and southwest surrounding on three sides the PLUG group of DC Syndicate. SWIFT and SIN projects were offered to the Joint Venture for examination during this latter staking.

There is no history of physical exploration on most of the SWIFT project area. The winter road and two trenches from the early exploration are covered by the southwestern portion of the MC claims.

The SWIFT project claims were optioned by the Joint Venture in September 1978.

## 5. REGIONAL RESULTS

Only seven samples were collected and all are from streams draining the area of the SWIFT project. The weak value from the northern creek was 25 ppm Sn with only the lower level of the stream draining the JC/DU claimed area being anomalous at 125 ppm Sn. All other samples yielded background or very weak values for tin. The stream draining the western portion and the 125 ppm Sn creek were weakly anomalous to anomalous for tungsten. All other creeks yielded background values for $WO_3$, Mo and U.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The SLIP and SWIFT claims were briefly visited by Barr, Gunn and Smith on 1978 06 22 and 23 as part of the evaluation of existing claimed ground for the Joint Venture.

Samples collected from both areas did not yield any significant tin values. The gossan area on the MC claims was not examined in this preliminary survey. The gossan on SLIP and in the base of peak 6321 appeared to be related to sulphides in the fahlband zone below a prominant arenaceous limestone. A small stock of grey granite to granodiorite was located in the lower flank of peak 6321 on the SWIFT claims. This intrusive ran 225 ppm Sn but gossanous sediments (hornfels) collected from the talus in the area only ran 8 ppm Sn.

### 6.2 Geology (Map KL 78-26)

The oldest mappable unit in the portion of the SWIFT project traversed is the "middle" portion of the Devono-Mississippian Sylvester Group sediments. The middle unit consists of argillite (volcanowacke-rich), limestone, arenites, mafic volcanic tuffs, sulphide schists (fahlband) and thin massive sulphide lenses. Capping this unit elsewhere in the Seagull Batholith area is a monotonous volcanowacke-rich argillaceous unit. The lower portion of the Sylvester "middle" sequence is a thick limestone not located in the SWIFT area.

The limestone (LMST) mapped in the cirque headwalls north and south of the arete east of peak 6321 is the "thin" limestone (marker horizon) near the top of the "middle" portion of the Sylvester Group. This arenaceous unit is intercalated with argillites and arenites, becomes skarned proximal to intrusives and is folded and faulted throughout the mapped area.

The fahlband zones are both above and below the thin limestone member. During prospecting on ridge crests, Welcome North personnel noted several sphalerite-rich pods or lenses in the gossanous zones stratigraphically above the tin limestone in the area of peak 6321.

Fahlband has also been mapped stratigraphically below the "thin" limestone as very volcanowacke (andesite tuff) horizons in the argillaceous arenites and

calcareous argillite beds. The principal sulphides are pyrrhotite and pyrite usually as blebs and thin pods (2 cm thick) in the bedding plane with one massive pyrrhotite zone near T10C sample consisting of a bed (or replacement pod?) 3 m thick apparently conformable to the bedding of the enclosing volcanowacke.

Intruding the sedimentary sequence are a series of dykes of aplite to altered peralkaline granite (see petrography for T7 and T10C). These dykes appear to be related to small stocks of the "grey granite" (MBQF) located to the east and west of the mapped area. The dykes have been highly altered by late solutions causing a marked darkening of the granite (to the colour of the enclosing volcanowacke), and although they are mineralized do not seem to be related directly to the mineralizing event. The dykes wander up the face of the cirques, changing direction at bedding composition boundaries, appear to be related to the skarn zones in the limy horizons and do not parallel the quartz vein set over-print. None of the dykes appear to cross each other or branch to sub sets. The dykes may have a "set" of NNE/SSW, but few of the aplites can be shown on this scale of mapping. Most of the intrusive bodies do not necessarily follow the large dyke trend and are 1 m or less in width, but as shown on the map, the larger DHCF dykes can be up to 10 to 20 m thick.

The larger dykes appear to follow the trend of major fault zones (defined by air photo work) but no contact fault gouge was noted in any of the intrusives. None of the faults appeared to offset dykes, but the sedimentary sequence has been offset with at least several tens of metres vertical movement noted on the southwestern portion of the map.

A prominent east-west vein swarm of quartz with tourmaline, fluorite and cassiterite cores appears to alter sediments, volcanics and aplites. The zone is not sufficiently well-mapped to be certain of the exact dimensions, but the sets were located for 150 m along strike in the small arete in the southwestern portion of the map (sample T7 area) and followed for 90 m down the face of the cirque wall on the east side. See petrographic descriptions T10C and T7.

Further mapping and sampling is required to define the extension (if any) to this zone. On the north side preliminary mapping indicates the vein swarm

continues for at least 50 m north of the northernmost chip sample (in the area of T7).

6.3 Geochemistry (Map KL 78-43)

A total of 247 samples were collected on this area of the SWIFT with an additional 60 samples on the DU southwest quadrant (Map KL 78-38) which are described in the geochemical report for that area.

The most intense and consistent anomaly is located north and down slope from the known tin mineralized areas. The two sample traverses on the west side of the map, i.e., west of 10E are not located against air photo maps, thus the plotted locations may be somewhat different from the true locations. These samples were controlled by topographic maps at 1:50 000 scale and transferred to the 1:10 000 scale map.

The remaining tin anomalous areas appear to be north of the known mineralized area (north of T10C), to the west in the cirque floor and downstream to the north. There are no anomalous areas for tungsten in the area sampled.

The soil sampling over chip samples in the area of chip samples 3774-3800 and 3960-3965 ran only 7 ppm to 2 ppm Sn. The stream draining this area was sampled 3 km north and ran only 25 ppm Sn. Thus, there is considerable discrepancy between soil and stream values in this area and rock chip, thin section and electron probe results. Research on appropriate sample location, and size fraction for analysis in relation to grain size of cassiterite, is required in the SWIFT area to help determine if other portions of the project may also appear to be sub-economic by current soil sampling, but which may, in fact, contain mineralized zones of possible economic significance.

6.4 Mineralization (Map KL 78-26)

Chip sampling of "fresh" rock in the face of the cirque in the southwestern corner of the map yielded the following results:

| Sample No. | Type | Direction | Length | Av.Grade | Rock/alteration |
|---|---|---|---|---|---|
| 1. 3774-3778 | Linear Chip | N/S | 15 m | 0.50% Sn | Sediments/greisen. |
| 2. 3790-3799 | Linear Chip | N/S | 30 m | 0.30% Sn | Sediments/greisen. |
| 3. 2965 | Panel Chip | Flat | 5mx5m | 0.78% Sn | Skarn. |
| 4. 2951 | Linear Chip | EW | 2 m | 0.56% Sn | DHCF/greisen. |

Zones 6.4.1 and 6.4.2 have been mapped as 150 m east to west and 90 m of back in the east wall of the cirque. Trenching and detail sampling will be required to confirm the grade and dimensions of the mineralized zone.

## 7. CONCLUSIONS AND RECOMMENDATIONS

A significant zone of tin as cassiterite mineralization on the SWIFT project has been indicated by preliminary chip sampling. The remainder of the claimed area has several anomalous zones that require further sampling to locate the source areas. Soil sampling in the area of the known mineralization below the T7 area in the cirque wall, and stream samples from all creeks draining the cirque, are required to determine the characteristics of geochemical dispersion of the known mineralization.

Trenches are required from the area of the known mineralization and along the strike extension and lower in the cirque face to define the geological controls, grade, and dimensions of the mineralized zones.

Soil sampling and mapping surveys are required to evaluate the unexplored portions of the property.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## SWIFT CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | | $ 409.96 |
| Camp Expenses | | 1,044.52 |
| Mapping, Gr. Surveys, Maps | | 4,084.92 |
| Freight, Hauling, Storage | | 89.45 |
| Assaying | | 1,914.74 |
| Salaries - Regular | | 1,869.41 |
| Salaries - Temporary | | 521.04 |
| Equipment Rental | | 240.34 |
| Stationery & Supplies | | 13.77 |
| Telephone | | 71.71 |
| Auto Expenses | | 27.74 |
| Repairs and Mtce (excl. Auto) | | 6.82 |
| Non Capital Equipment Purchases | | 120.91 |
| Depreciation Expenses | | 71.53 |
| | TOTAL | $10,486.86 |

APPENDIX

STATEMENT OF EXPENDITURES

(Exclusive of Regional Programme)

As at December 31, 1978

SLIP & SWIFT CLAIMS, YT

| | |
|---|---|
| Travel Expenses | $ 607.11 |
| Camp Expenses | 1,375.22 |
| Mapping, Gr. Surveys, Maps | 5,127.18 |
| Freight, Hauling, Storage | 116.57 |
| Assaying | 2,554.61 |
| Salaries - Regular | 2,495.83 |
| Salaries - Temporary | 619.72 |
| Equipment Rental | 313.21 |
| Stationery & Supplies | 17.95 |
| Telephone | 93.45 |
| Auto Expenses | 36.15 |
| Repairs & Mtce (Excl. Auto) | 8.89 |
| Non Capital Equip. Purchases | 157.57 |
| Depreciation Expenses | 93.22 |
| TOTAL | $ 13,616.68 |

AUG 1 1978

# Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph. D. Geologist

P.O. BOX 39
8887 NASH STREET
FORT LANGLEY, B.C.
VOX 1JO

PHONE (604) 533-1155

24/7/78

Christopher B. Gunn
Du Pont of Canada Exploration Limited
c/o Gerghaty Lodge
General Delivery
Swift River, Yukon

Dear Sir:

Please find enclosed petrographic descriptions for the following sections:

| | |
|---|---|
| Du-S QSP | greissen |
| Du-B 8 | greissen/quartz vein |
| T10C | peralkaline granite |
| JC-1 | calc-silicate skarn |
| T7 | endoskarn/saussurite |
| SK-11 | quartz porphyry granite |

Thin sections, reject slices, original sample material, and copies of the descriptions will be returned to Mr. Barr in the Vancouver office upon completion of Sn and W scans (on samples T10C, T7, and JC-1) on the scanning electron microscope (SEM). SEM results to date confirm the presence of minute grains of cassiterite in the greissen and intrusive rock; however, scans on JC-1 fail to show the presence of any Sn- or W-bearing minerals. Scans for Sn and W will also be completed on T10C and T7. A more complete report of the SEM results will be forthcoming upon completion of the scans.

Also enclosed is the X-ray powder pattern for JC-1. Peaks for the following minerals are present: diopside, garnet, idocrase, and quartz. Low intensity peaks may also indicate the presence of minor calcite and feldspar. No spurrious peaks are present which might correspong to Sn or W minerals. The mineral which fluoresces yellowish-green in hand specimen corresponds to the locus of idocrase in thin section. No minerals were observed which might be malayite.

Very truly yours,

Mark S. Bloom

Mark S. Bloom
Vancouver Petrographics

Sample Number: T10C

| Mineralogy: | | |
|---|---|---|
| | quartz | 11 |
| | K-feldspar | 39 |
| | plagioclase | 21 |
| | pyroxene | 11 |
| | amphibole | 2 |
| | biotite | 7 |
| | opaque | 2 |
| | white mica/clay | 4 |
| | chlorite | 2 |
| | cassiterite | 0.5-1 |
| | zircon | tr |

Classification: altered peralkaline granite

Fabric and texture: medium-grained, equigranular, holocrystalline, hypidiomorphic-granular

Feldspars constitute approximately two-thirds of this granite. K-feldspar occurs in subhedral, equant grains incipiently altered to white mica/clays. It is not perthitic. Vermicular intergrowths of quartz are common along the grain boundaries, particularly in fine-grained areas. In addition to the light dusting of white mica/clays, coarser-grained sericite and chlorite alteration are frequently visible. Plagioclase is euhedral to subhedral in outline. Albite twins are common. The plagioclase composition, determined by the Michel-Levy technique, is andesine ($An_{44}$). Normal zoning is visible in many grains; calcic cores are preferentially altered to sericite. Shreds of white mica and clays ubiquitously dust the plagioclase. Anhedral quartz fills intersticies among the feldspars. Undulatory extinction has developed in the larger grains.

Phlogopitic biotite and pyroxene are the chief mafic minerals. Biotite occurs in two textural variations. Minute inclusions of zircon with pleochroic haloes are occasionally visible in the earliest euhedral form. Cleavage lamellae are frequently bent. The later biotite is present in fine-grained aggregates of randomly oriented flakes. Sericite, chlorite, and opaque alteration products are associated with this biotite. Granular aggregates of pyroxene coexist with both biotite textures. Individual pyroxene grains are subhedral crystals of short prismatic habit. It is diopsidic to diopsidic augite in composition. Opaques are associated with the pyroxene; however, alteration products which are clearly of hydrothermal origin are not visible with the pyroxene.

Cross-cutting veins, as well as scattered clots, of amphibole-chlorite-opaques are visible throughout the section. The amphibole is pleochroic green. It is frequently associa-

ted with, and may partially replace, the pyroxene. The texture and occurrence suggest that the amphibole is a deuteric and/or hydrothermal alteration product rather than magmatic in origin.

Associated with the late deuteric (hydrothermal ?) event are euhedral to subhedral grains of cassiterite. It is weakly pleochroic bown, and occasionally shows zonal growth lines. The cassiterite strongly resembles calcite. Both are uniaxial and have extreme birefringence. The interference colours mask the sign of the interference figure. The high relief, zoning pleochroism and occurrence as discrete euhedral grains are the criteria used to identify the mineral as cassiterite. The cassiterite is not apparent in hand specimen. The opaques with which it is associated (pyrite) occur in hairline fractures and veinlets with a relatively dark center line and bleached haloes.

Sample Number: T7

| Mineralogy: | | |
|---|---|---|
| | clinozoisite | 44 |
| | K-feldspar | 20 |
| | quartz | 24 |
| | epidote | 2 |
| | cassiterite | 2 |
| | opaque | 4 |
| | sericite | 3 |
| | sphene | 1 |
| | topaz | tr |

Classification: endoksarn or saussurite

Fabric and texture: crystalloblastic

The original rock fabric has been erased from this section and replaced by mineral assemblages typical of saussuritization. Two episodes of alteration are suggested, one confined to subparallel vein swarms and another of a more pervasive nature. The mineralogy and texture do not uniquely define the nature of the original parent rock. It may either have been a quartzo-feldspathic sediment or an intrusive rock. The late vein assemblage suggests that the rock is proximal to a granitic intrusive. This rock has been tentatively classified as an endoskarn.

Clinozoisite is the principal constituent. It occurs in granular, xenoblastic aggregates and columnar idioblastic crystal groups. The columnar groups often radiate from relic K-feldspar phenocrysts. Minerals frequently associated with the clinozoisite include quartz, an opaque, and sericite. The quartz and opaque are xenoblastic, filling intersticies between laths of clinozoisite. Acicular growths are frequent within the -uartz; the identity of these needles has not been determined. Sericite is more commonly present as radiating shreds near grain boundaries, fractures, etc. It is presumably a later alteration than the clinozoisite.

Neglecting vein, accessory, and alteration minerals, the remainder of the section is primarily an interlocking mosaic of quartz and feldspars. Individual minerals are generally xenoblastic, touching adjacent grains along irregualr boundaries, and are too fine-grained for reliable identification or accurate estimation of the relative proportions. Slightly larger grains of both quartz and K-feldspar were identified; however, no twinned plagioclase was visible. K-feldspar stain may partially resolve the unanswered question of feldspar ratios. The general texture suggests either a low plagioclase content in the original rock, or nearly complete replacement of original plagioclase during the alteration event.

Accessory minerals in the quartz-feldspar mosaic are of pervasive alteration or vein-introduced origin. Sphene (?) is exceedingly fine-grained and occurs in elongated trains throughout tne mosaic. This texture could either have been inherited from the original rock or superimposed as a result of the alteration. Topaz occurs as a few isolated grains in the mosaic, often related to clusters of sericite. Epidote is present in greensih pleochroic, radiating sprays of columnar crystals. It is occasionally associated with somewhat larger aggregates of K-feldspar in the mosaic. The vein assemblage quartz-opaque-sericite-cassiterite cross-cuts most textural features. Many of the veinlets are entirely quartz and opaque without adjacent alteration effects. In some instances, pervasive alteration consisting of sericite and cassiterite is present as a vein selvage. The cassiterite is pleochroic red to brown, of high relif and berefringence, and occasionally shows growth zones. Sericite often surrounds the cassiterite, but has also been introduced throughout the section without associated cassiterite. In hand specimen, the cassiterite is visible associated with quartz-pyrite-sericite veins as a reddish-brown granular mineral either adjacent to the vein or within the vein, and has adamantine luster.

Sample Number: JC-1

| Mineralogy: | | |
|---|---|---|
| | garnet | 29 |
| | idocrase | 18 |
| | diopside | 41 |
| | quartz | 7 |
| | carbonate | 5 |
| | opaques | tr |

Classification: calc-silicate skarn

Fabric and texture: crystalloblastic

Diopside, garnet, and idocrase (vesuvianite), in decreasing oder of abundance, are the principal constituents. Diopside occurs as neutral- to pale-green coloured subhedral crystals of short prismatic habit. It is poikiolitically enclosed in garnet and idocrase, confined to subparallel "veins" which may represent original bedding, and/or present in randomly oriented granular aggregates. Garnet occurs in subparallel tabular and lensoidal aggregates. The colour and refractive index suggest that it is closer to grossular than andradite in composition. Idocrase is present in granular and columnar aggragates associated with garnet. The idocrase fluoresces yellowish green in hand specimen and thin section. An X-ray diffraction powder pattern was made on a concentrate of the fluorescent material hand-picked from a coarsely-crushed sample. Peaks are present on the diffraction pattern for idocrase as well as garnet, diopside, and quartz; however, no additional or spurious peaks are present which would suggest the presence of tin, tungsten, or other unidentified minerals.

Quartz occurs in thin section as an interlocking mosaic of anhedral grains. The quartz is most frequently present in tabular and lensoidal aggregates which are parallel to the diopside and garnet. Occasionally, the quartz also occurs as individual isolated grains associated with the other calc-silicates. Carbonate is present in fine-grained, turbid mosaics of anhedral interlocking grains. It usually occurs in lenses interlayered with the garnet and diopside.

The rock is typical of thermally-metamorphosed and metasomatized carbonate. The alternated layers of calc-silicate minerals, corresponding to interlayered calcium-aluminum and calcium-magnesium silicates, suggests that the original rock was finely interlayered, impure siliceous limestone and dolomite.

| SAMPLE No. | $WO_3$ % | Sn % | DISTANCE |
|---|---|---|---|
| T1 | 0.01 | <0.01 | |
| T2 | <0.01 | <0.01 | |
| T3 | <0.02 | 0.07 | |
| T3 (Sulf) | 0.02 | <0.01 | |
| T5 | 0.04 | 0.31 | |
| T6 | 0.02 | 0.76 | |
| T7 | 0.02 | 0.28 | |
| T8 | <0.01 | 8.33 | |
| T8 (Sulf) | 0.02 | 0.10 | |
| T9 | 0.01 | 0.24 | |
| T5 2mm chip | 0.02 | 0.56 | |
| 2952 | 0.03 | <0.01 | 0 - 3 m |
| 2953 | 0.03 | <0.01 | 3 - 6 m |
| 2954 | 0.03 | <0.01 | 6 - 9 m |
| 2955 | 0.03 | <0.01 | 9 - 12 m |
| 2956 | 0.04 | <0.01 | 12 - 15 m |
| 2957 | 0.02 | <0.01 | 15 - 18 m |
| 2958 | 0.03 | <0.01 | 18 - 21 m |
| 2959 | 0.02 | <0.01 | 21 - 24 m |
| 2960 | 0.03 | <0.01 | 24 - 27 m |
| 2961 | 0.03 | <0.01 | 27 - 30 m |
| 2962 | 0.02 | <0.01 | 30 - 33 m |
| 2963 | 0.02 | <0.01 | 33 - 36 m |
| 3774 | | 0.25 | 0 - 3 m |
| 3775 | | 1.03 | 3 - 6 m |
| 3776 | | 0.48 | 6 - 9 m |
| 3777 | | 0.27 | 9 - 12 m |
| 3778 | | 0.48 | 12 - 15 m |
| 3779 | | 0.02 | 15 - 18 m |
| 3780 | | 0.12 | 18 - 21 m |
| 3781 | | <0.01 | 21 - 24 m |
| 3782 | | 0.04 | 22 - 27 m |
| 3783 | | 0.04 | 27 - 30 m |
| 3784 | | 0.05 | 30 - 33 m |
| 3785 | | 0.06 | 33 - 36 m |
| 3788 | | 0.04 | 42 - 45 m |
| 3789 | | 0.06 | 45 - 48 m |
| 3790 | | 0.16 | 48 - 51 m |
| 3791 | | 0.26 | 51 - 54 m |
| 3792 | | 0.18 | 54 - 57 m |
| 3793 | | 0.11 | 57 - 60 m |
| 3794 | | 0.09 | 60 - 63 m |
| 3795 | | 0.08 | 63 - 66 m |
| 3796 | | 0.17 | 66 - 69 m |
| 3797 | | 0.24 | 69 - 72 m |
| 3798 | | 0.04 | 72 - 75 m |
| 3799 | | 1.66 | 75 - 78 m |
| 3800 | | 0.08 | 78 - 81 m |
| 3960 | | 0.09 | 81 - 84 m |
| 3961 | | 0.02 | 84 - 87 m |
| 3962 | | 0.02 | 87 - 90 m |
| 3963 | | 0.02 | 90 - 93 m |
| 3964 | | 0.03 | 93 - 96 m |
| 3965 | | 0.03 | 96 - 99 m |

DU PONT EXPLORATION CANADA

# KLINKIT PROJECT
# GEOLOGY
## SWIFT CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

SCALE 1 : 10000 — m 300 200 100 0 300 600 m

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.-AUG.'78 | | ACCT. No. 335 - 20 |
| DRAWN BY | K.L.J. | | DRWG. No. KL.78 - 26 |
| DATE | OCT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey ; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE : ( coarse grained ) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB ) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous ) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS
CT = CASSITERITE
CP = CHALCOPYRITE
AG = AUGITE
GL = GALENA
GB = GARNET BERYL ( SKARN)
GD = GARNET DIOPSIDE
GM = GARNET MAGNETITE
GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)
HB = HORNBLENDE
HS = HULSITE
MG = MAGNETITE
MY = MALAYAITE
MS = MASSIVE SULFIDE
MU = MUSCOVITE
PG = PEGMATITE
PO = PYRRHOTITE
QC = QUARTZITE COBBLE
QT = QUARTZ TOURMALINE
QV = QUARTZ VEINS
SF = SERICITE FLUORITE
SL = SHEELITE
SP = SPHALERITE
WF = WOLFRAMITE
C\ = CONTACT ZONE
D\ = DYKE
EP = EPIDOTE
GP = GRAPHITIC
PP = PORPHYRY
TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)
CONTACT APPROIMATE OR ASSUMED
CONTACT OBSERVED
MORAINE ( edge of)
TALUS ( edge of)
FAULT
40 JOINTING , inclined , vertical
45 BEDDING , inclined , vertical
50 FOLIATION , inclined , vertical
AREA OF NUMEROUS GOSSANS
GOSSAN
OVERTURNED ANTICLINE
SKARN
ROCK SAMPE LOCATION
CHIP SAMPLE LOCATION
X FLOAT
Rock A / Rock B ROCK A MORE COMMON THAN ROCK B
Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)
CLAIM POST
THIN SECTION LOCATION

DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
SWIFT RIVER AREA, B.C. & Y.T.

0 1:
SCALE
0 1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : | 4 0 & 105 B |
| DATE : SEPT. '78 | | ACCT No. : | 335 - 00 |
| DRAWN BY : K.L.J. | | DRWG. No. : | KL.78 - 35 |
| DATE : OCT. '78 | | | |

MC CLAIM GROUP BOUNDARY

SLIP CLAIM GROUP BOUNDARY

SWIFT CLAIM GROUP BOUNDARY

MC CLAIM GROUP BOUNDARY

JILL CLAIM GROUP BOUNDARY

PHOTO REGISTRATION

PHOTO REGISTRATION

50N

40N

30N

20N

10N

10W

0

10E

20E

30E

40E

50E

60E

## LEGEND

| TIN | | TUNGSTEN |
|---|---|---|
| MEAN = 4.52 P.P.M. | ⊕ | MEAN = 3.72 P.P.M. |
| MEAN + 0.5 S.D. = 8.55 P.P.M. | ⊕ | MEAN + 0.5 S.D. = 6.00 P.P.M. |
| MEAN + 1.0 S.D. = 16.21 P.P.M. | ⊕ | MEAN + 1.0 S.D. = 9.65 P.P.M. |
| MEAN + 1.5 S.D. = 30.70 P.P.M. | ⊕ | MEAN + 1.5 S.D. = 15.53 P.P.M. |
| MEAN + 2.0 S.D. = 58.16 P.P.M. | ⊕ | MEAN + 2.0 S.D. = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

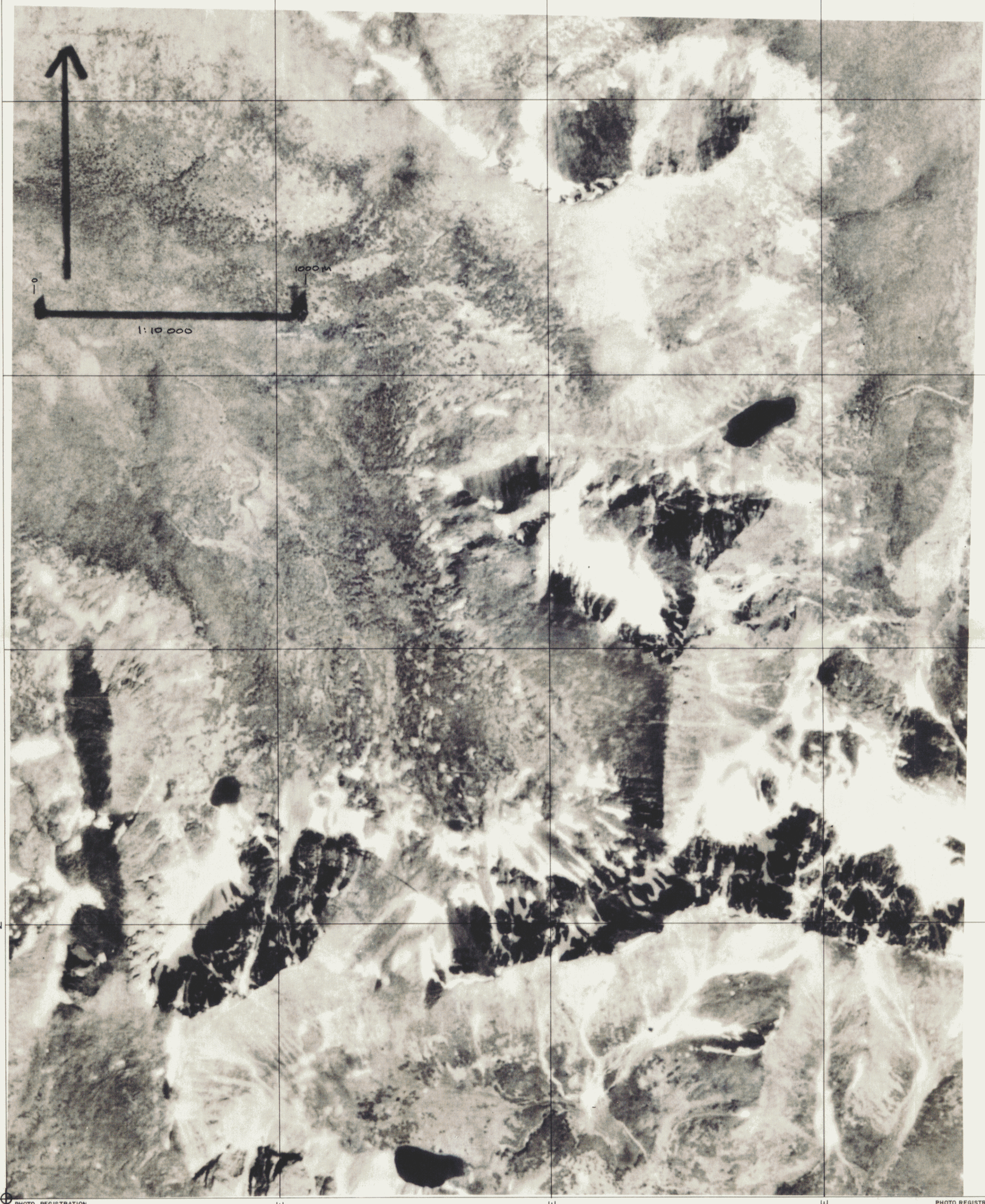
TIN VALUE IN P.P.M. — 15 (R) 25 — TUNGSTEN VALUE IN P.P.M.
65
(R) INDICATES ROCK SAMPLE
URANIUM VALUE IN P.P.M.

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## SWIFT CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

SCALE 1 : 10000
m 300 200 100 0 300 600 m

| | | | |
|---|---|---|---|
| DATA BY | E.M.S. | REVISED | N.T.S. No. 105 B |
| DATE | AUG-SEPT'78 | | ACCT No. 335-20 |
| DRAWN BY | K.L.J. | | DRWG No. KL.78-43 |
| DATE | OCT. '78 | | |




DUPONT EXPLORATION CANADA

# KLINKIT PROJECT
# PHOTOMAP
## SWIFT CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

1 : 10 000

m 300 200 100 0 300 600 m

SCALE

| | | | |
|---|---|---|---|
| MAPPED BY : L.E., C.G., M.S. | REVISED : | N.T.S. No. : 105 B | |
| DATE : JUL.-AUG.'78 | | ACCT No. : 335-20 | |
| DRAWN BY : K.L.J. | | DRWG. No. : KL.78-67 | |
| DATE : SEPT. '78 | | | |

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SIN CLAIMS


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APPENDIX

STATEMENT OF EXPENDITURES

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## SIN CLAIMS


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| KL 78-35 | Geological Legend | " |
| KL 78-44 | Soil & Rock Geochem<br>Tin and Tungsten PPM | " |
| KL 78-68 | Photo Map | " |

## SPECIFIC PROSPECT - SIN CLAIMS (335-21)

### 1. LOCATION AND ACCESS

The SIN group is located on the north and east side of an unnamed creek flowing northwest into Dorsey Lake in the south central portion of the Seagull Batholith, Englishman Range, Cassiar Mountains. The claims are on sheet 105-B-3 at about 60°07'N and 131°26'W, Watson Lake MD, Yukon.

Access is only possible by helicopter from Swift River, Yukon, approximately 19 km to the southeast.

### 2. PHYSIOGRAPHY AND VEGETATION (Map KL 78-68)

The mountain peak, arete, cirque and valley area of the SIN claims includes two major cirques trending easterly into the unnamed creek flowing into Dorsey Lake to the northwest and one large cirque trending north to Smart River. The southern cirque is the lower portion of the VAL(B) claim area "SIN" cirque. Brock Cirque occupies the central portion of the claimed area.

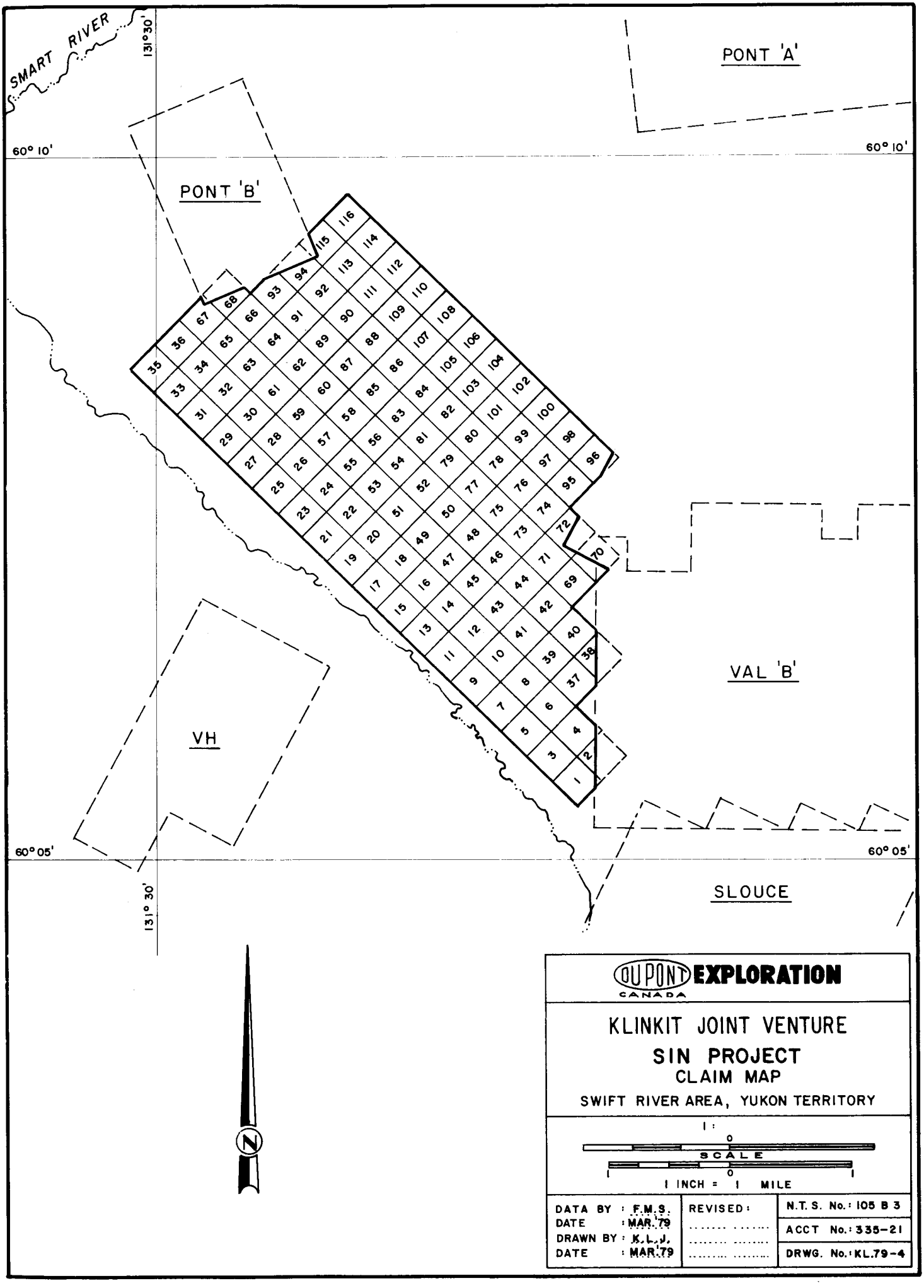
Vegetation on the southwest facing slopes of the main drainage consists of black spruce, balsam and ground birch. This changes upward to scattered ground balsam with thick ground birch and finally into alpine sedges with patches of low ground birch. All cirque floors are covered in alpine sedges and patches of ground birch. Most of the aretes, peaks and cirque walls and any northerly or easterly faces are bare of vegetation or have only minor patches of alpine meadows.

### 3. CLAIMS

The SIN group consists of the following claims:

| Claim Name | Record Number | Date of Record |
|---|---|---|
| SIN 1-116 | YA33343 - YA33456 | 1978 06 26 |

All claims are recorded in Watson Lake, Yukon in the name of Du Pont of Canada Exploration Limited. The claims are optioned from Welcome North Mines Ltd and McCrory Holdings (Yukon) Ltd by Du Pont and form part of the Klinkit Joint Venture with Duval International Corporation.




DUPONT EXPLORATION
CANADA

# KLINKIT JOINT VENTURE

## SIN PROJECT

### CLAIM MAP

SWIFT RIVER AREA, YUKON TERRITORY

1 : 0

SCALE

0

1 INCH = 1 MILE

| | | |
|---|---|---|
| DATA BY : F.M.S. | REVISED : | N.T.S. No. : 105 B 3 |
| DATE : MAR.'79 | ..... ..... | ACCT No. : 335-21 |
| DRAWN BY : K.L.J. | ..... ..... | |
| DATE : MAR.'79 | ..... ..... | DRWG. No. : KL.79-4 |

## 4. HISTORY

Welcome North Mines Ltd and McCrory Holdings (Yukon) Ltd located the SIN claims after the VAL(B) and PONT(B) groups were located. According to the principals of Welcome North, the claims were located on the basis of gossans similar in colour to the DU, VAL(B), PONT(B) and the small linear air-magnetic anomaly in the central portion of the claims.

There is no history of exploration work in the area of the SIN claims previous to the Klinkit regional programme. The joint venture considered the tin anomaly in SIN cirque drainage as derived from the VAL(B) roof pendant area and the weak-moderate tin anomaly in Brock cirque as too low a value to enlarge the PONT(B) group southward.

The SIN claims tie on to the MUN claims of the DC Syndicate in the extreme southeastern corner of the SIN claim block.

## 5. REGIONAL RESULTS

As mentioned above, there were several stream samples collected from drainage in the SIN area. SIN cirque ran 280 ppm Sn, 9 ppm $WO_3$; Brock cirque 35 ppm Sn, 4 ppm $WO_3$, the small drainage on the southwest end of PONT(B) ran <5 ppm Sn and 65 ppm $WO_3$, and the northerly cirque ran 180 ppm Sn and 3 ppm $WO_3$.

There were no side hill samples collected in the first pass sampling from this area. Due to budget restrictions the gossans that appeared to be related to the contact area of the Seagull Batholith were not acquired by the Klinkit Joint Venture.

## 6. PROPERTY EVALUATION

### 6.1 Preliminary

The SIN claimed area was not examined during the preliminary property visits by Barr, Gunn and Smith on 1978 06 22.

### 6.2 Geology

The SIN claims cover the contact of the Cretaceous Seagull Batholith with the Devono-Mississippian Sylvester Group sediments. The sediments in the contact area vary from the "thick" limestone in the northeast to the overlying "thin" limestone/chert/argillite in the south. Most of the limy portions of the arenaceous "thin" limestone members are all of

the limy arenites or limy argillites are altered to skarn to varying degrees. The skarns are garnet (andradite), diopside with minor actinolite, actinolated quartz, wollastonite, serpentine, magnetite, beryl and tourmaline.

On the south side of the central cirque (Brock Cirque) the gossanous patches are fahlbands in the cherty argillites to skarned limy arenites. These sulphide schists are common throughout the project area from the PONT(B) claims to the north through to the MUN and VAL(B) claims to the south.

The Seagull Batholith consists of several phases in the project area. The proposed oldest phase is preserved in a portion of the roof as gabbro (GABR) in the central portion of the south wall of Brock cirque. This unit varies from extremely coarse diorite to essexite, massive lepidomelane mica, and pyroxenite.

The primary unit exposed in all valley floors and the northern portion of the claims is the Seagull phase of the Seagull Batholith. This unit is medium to coarse grained granite to quartz monzonite with accessory biotite that is usually very black. The large feldspars are usually perthite to orthoclase with mixture of finer alkali feldspars in the groundmass. The common rock texture is a crowded porphyry of grey quartz and alkali feldspar with a fine groundmass of biotite, quartz and alkali feldspar. The cusp/contact areas with the Sylvester sediments are of several varieties. The most common is a finer grained version to feldspar porphyry zone for several metres with weak thermal alteration of the roof. Stockscheider zones (pegmatite in the roof) occur in the southwest and on the south wall of Brock cirque. Endoskarn (altered granite) occurs in the northern portion especially in areas of limy units in the Sylvester sediments. This alteration causes the granite to be clayed, calcite rich (calcium feldspars common) with minor mafics preserved and colour changes to yellow, green or pale grey white "granite". The alteration back into the Seagull phase is evident especially in areas of high tin background. This (ENSK) endoskarn may be a version of the greissen process but insignificant tourmaline, quartz veining, cassiterite and fluorite was noted.

The ENSK dykes are thought to be related to the large zone of ENSK in the cusp of the batholith, but they may

represent a variation of the (APLT) aplite type dykes noted elsewhere in the Seagull Batholith.

6.3 Geochemistry (Map KL 78-44)

A total of 180 geochemical soil and rock samples were collected and analyzed from the area of the SIN claims. The major anomaly is in the ENSK zone on the arete on the common head wall of the "north" cirque and "Brock" cirque. This zone is 1500 m long and of unknown width. As the results of the first line of soil samples taken in this area were returned before we had to terminate the programme for 1978, the back-up lines were completed and analyzed. There is good correlation between the different samplers/sample times/sample elevations in the cirque wall (south face). No systematic sampling has been tried in the north face due to the extremely steep face and time constraints.

The other anomalies have had no back-up data but are of size or intensity to require further work. The anomalies are:

6.3.1 - located at southwest corner of SIN claims at or near common boundary with SLOUCE and VAL(B) projects (this tin and tungsten anomaly may, in part, explain the very anomalous stream sample at the mouth of SIN Creek), and

6.3.2 - located on the northwest corner of Brock cirque in the area of the "endoskarn" dykes and the contact with the Seagull phase (GCFB).

There are also a few scattered moderately to strongly anomalous tin, tin/tungsten and tungsten samples throughout the project area particularly in areas of known skarn.

6.4 Mineralization

Eighteen samples were analyzed for tin and tungsten. Of these samples only three are above background values and are plotted on the geology map. The samples were as follows:

| DOX No. | Sampler No. | $WO_3$ | Sn | Description |
|---|---|---|---|---|
| 3815 | E 78-7-22-4 | 0.12 | 0.01 | Skarn with scheelite. |
| 3847 | E 78-8-10-117 | 0.39 | 0.08 | Greisen in granite. |
| 3769 | J 78-7-22-8 | N/A | 0.12 | Tourmaline vein. |

## 7. CONCLUSIONS AND RECOMMENDATIONS

At least two major anomalous zones have been defined in favourable geological areas. The anomalies are both of size and intensity to justify further work. There are several areas of minor anomalies that require substantiation and size definition with prospecting to find the source areas.

The 6.3.1 anomaly in the northeastern portion of the claims requires detailed sampling, definition of tin mineral(s), and type of mineralization, with trenching and chip/panel sampling of all areas grading greater than 0.20% Sn.

The 6.3.2 anomaly requires several sample lines to determine source and size of the anomaly along with detail geology and possibly trenching of the tin/tungsten zone.

All claims should have all applicable assessment work from 1978 filed to a common anniversary date of 1981 01 10.

# APPENDIX

## STATEMENT OF EXPENDITURES

## (Exclusive of Regional Programme)

## As at December 31, 1978

## SIN CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 268.38 |
| Camp Expenses | | 900.16 |
| Mapping, Gr. Surveys, Maps | | 4,424.41 |
| Freight, Hauling, Storage | | 78.60 |
| Assaying | | 1,607.69 |
| Salaries - Regular | | 1,411.55 |
| Salaries - Temporary | | 514.52 |
| Equipment Rental | | 211.19 |
| Stationery & Supplies | | 12.10 |
| Telephone | | 63.01 |
| Auto Expenses | | 24.37 |
| Repairs and Mtce (excl. Auto) | | 6.00 |
| Non Capital Equipment Purchases | | 106.25 |
| Depreciation Expenses | | 62.85 |
| TOTAL | $ | 9,691.08 |

APPENDIX

STATEMENT OF EXPENDITURES

(Exclusive of Regional Programme)

As at December 31, 1978

PONT(B), VAL(B) & SIN CLAIMS, YT

| | | |
|---|---|---|
| Travel Expenses | $ | 838.45 |
| Camp Expenses | | 2,151.16 |
| Mapping, Gr. Surveys, Maps | | 7,747.53 |
| Freight, Hauling, Storage | | 184.31 |
| Assaying | | 3,940.41 |
| Salaries - Regular | | 3,669.06 |
| Salaries - Temporary | | 1,116.41 |
| Equipment Rental | | 495.25 |
| Stationery & Supplies | | 28.37 |
| Telephone | | 147.76 |
| Auto Expenses | | 57.16 |
| Repairs and Mtce (excl. Auto) | | 14.06 |
| Non Capital Equip. Purchases | | 249.15 |
| Depreciation Expenses | | 147.38 |
| TOTAL | $ | 20,786.46 |

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PHOTO REGISTRATION
PHOTO REGISTRATION

SKRN
GCFB
ARGL/CHRT
E-78-8-3-76
E-78-8-3-75
SKRN
E-78-8-3-77
ENSK
SKRN
LMST
SKRN
GM E-78-8-3-78
LMST E-78-8-3-79
GCFB
E-78-8-3-80
ENSK
ARGL / CHRT
LMST
63
ENSK
67
ENSK
E-78-8-3-81
E-78-8-3-82
ARGL / CHRT
GCFB
ENSK
QV
ENSK
65
64
66
68
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Creek
SKRN
LMST
SKRN
BGNS
CHRT
LMST
SKRN
GCFB
ARGL / CHRT
94
97
ENSK
ENSK
ENSK
ENSK
ARGL / CHRT
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96
95
GCFB
ENSK
J-78-7-22-5
J-78-7-22-6
J-78-7-22-3
J-78-7-22-4
J-78-7-22-7
J-78-7-22-8
J-78-7-22-11
J-78-7-22-10
J-78-7-22-9
J-78-7-22-1
SAMPLE #3849 0.12 Sn
E-78-8-10-120
E-78-8-10-121
E-78-8-10-119
E-78-7-22-1
E-78-7-22-2
E-78-8-10-118
E-78-8-10-117 SAMPLE #3847 0.39 $WO_3$ 0.08 Sn
E-78-7-22-3
GCFB
E-78-7-22-4 SAMPLE #3815 0.12 $WO_3$ <0.01 Sn
E-78-7-22-5
No.2 SIN 103,104
No.1 SIN 105,106
E-78-7-22-6
E-78-7-22-7
ARGL
E-78-8-10-122
ARGL + BH + SKRN
E-78-7-22-14
E-78-7-22-13
E-78-7-22-15
E-78-7-22-12
GCFB
E-78-7-22-8
E-78-7-22-9
E-78-7-22-10
E-78-7-22-11
SLIDE
GCFB
E-78-7-22-16
E-78-7-22-17
E-78-7-22-18
GABR
X CHERTY HORNFELS
SKRN / PURPLE HORNFELS
MINOR PO, CP ? Bi
QTZT / SKRN FLOAT
WHITE QTZT FLOAT
No.1 SIN 56
No. SIN 53,54
GCFB
QTZT
G-78-8-15-4
53
G-78-8-15-3
Sericite Altn
G-78-8-15-2
QTZT / SKRN
45
GMQP / PG
GCFB
SIN CLAIMS
VH CLAIMS
J-78-7-23-7
J-78-7-23-8
X TU
FBQP
GCFB
60
J-78-7-23-6
23
GCFB
?
24
21
Talus
DMDQ
22
19
QT
Talus - Moraine
GCFB
9
20
17
GCFB / QT
Multi textured banded granites with aplitic veins
25
18
45
70
X PG-MY?
SKRN /SF
5
GCFB
Slight gossons developed on sericitised shears
15
GCFB / QT
16
Pond
J-78-7-23-5
J-78-7-23-4
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28
2
J-78-7-23-3
SAMPLE #3701 0.13 $WO_3$ 0.18 Sn
J-78-7-23-2
J-78-7-23-1
Lake

N

DU PONT CANADA EXPLORATION

KLINKIT PROJECT
GEOLOGY
SIN & VH CLAIMS
SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL. - AUG. '78 | | ACCT. No. 335 - 21814 |
| DRAWN BY | K.L.J. | | DRWG. No. KL. 78 - 27 |
| DATE | OCT. '78 | | |

## CRETACEOUS OR TERTIARY (Kqm)

| | |
|---|---|
| FBQP | FELSITE (DYKE) : biotite (quartz) porphyry |
| GMDQ | GRANITE OR MONZONITE : quartz and/or feldspar in fine grained ground mass ( DU type intrusive) |
| MBQF | MONZONITE : grey; biotite, quartz, feldspar |
| MBFP | MONZONITE : biotite ; feldspar porphyry , subphase intruding GCFB , cut by GMDQ |
| GCFB | BIOTITE GRANITE :(coarse grained) with feldspar phenocrysts |
| GMQP | MICRO GRANITE : grey quartz porphyry (phase of GCFB) |
| DHCF | HORNBLENDE (CHLORITE) DIORITE : fine grainded dark grey green |
| APLT | APLITE |

## JURA - CRETACEOUS (JKqd)

| | |
|---|---|
| DFPQ | FELDSPAR PORPHYRY : QUARTZ DIORITE |

## PERMIAN TO JURASIC

| | |
|---|---|
| GABR | GABBRO |
| TUFF | TUFF |
| ARGL | ARGILLITE (in part tuffaceous) |
| HB | HORNBLENDE ; almost hornblendite |
| BGNS | GNEISS (biotite) |

## DEVONO - MISSISSIPPIAN

| | |
|---|---|
| ARGL | ARGILLITE (in part tuffaceous) |
| CHRT | CHERT |
| SHLE | SHALE ( may be in part tuffaceous ) |
| QTZT | QUARTZITE |
| CONG | CONGLOMERATE |
| FGNS | FELDSPAR GNEISS |
| SKRN | SKARN |
| LMST | LIMESTONE |

## AGE UNKNOWN

| | |
|---|---|
| ENSK | ENDOSKARN : altered intrusive, calcified |
| DBD\ | DIABASE : dykes |

## ABBREVIATIONS

BH = BIOTITE HORNFELS

CT = CASSITERITE

CP = CHALCOPYRITE

AG = AUGITE

GL = GALENA

GB = GARNET BERYL ( SKARN)

GD = GARNET DIOPSIDE

GM = GARNET MAGNETITE

GR = GREISEN (CHLORITE, TOURMALINE, MAGNETITE, ILMENITE, FLUORITE, QUARTZ, TOPAZ, MUSCOVITE)

HB = HORNBLENDE

HS = HULSITE

MG = MAGNETITE

MY = MALAYAITE

MS = MASSIVE SULFIDE

MU = MUSCOVITE

PG = PEGMATITE

PO = PYRRHOTITE

QC = QUARTZITE COBBLE

QT = QUARTZ TOURMALINE

QV = QUARTZ VEINS

SF = SERICITE FLUORITE

SL = SHEELITE

SP = SPHALERITE

WF = WOLFRAMITE

C\ = CONTACT ZONE

D\ = DYKE

EP = EPIDOTE

GP = GRAPHITIC

PP = PORPHYRY

TU = TOURMALINE

## SYMBOLS

OUTCROP ( edge of)

CONTACT APPROIMATE OR ASSUMED

CONTACT OBSERVED

MORAINE ( edge of)

TALUS ( edge of)

FAULT

40 JOINTING, inclined, vertical

45 BEDDING, inclined, vertical

50 FOLIATION, inclined, vertical

AREA OF NUMEROUS GOSSANS

GOSSAN

OVERTURNED ANTICLINE

SKARN

ROCK SAMPE LOCATION

CHIP SAMPLE LOCATION

X FLOAT

Rock A / Rock B ROCK A MORE COMMON THAN ROCK B

Rock A // Rock B ROCK A MUCH MORE COMMON THAN ROCK B (ie minor lentils in rock A)

CLAIM POST

THIN SECTION LOCATION

DUPONT CANADA **EXPLORATION**

# KLINKIT PROJECT
# GEOLOGICAL LEGEND
## TO ACCOMPANY DRWG Nos. KL.78-16 TO 34
## SWIFT RIVER AREA, B.C. & Y.T.

SCALE

1 INCH = FEET

| | | | |
|---|---|---|---|
| DATA BY : F.M.S. | REVISED : | | N.T.S. No. : 40 & 105B |
| DATE : SEPT. '78 | | | ACCT No. : 335 - 00 |
| DRAWN BY : K.L.J. | | | |
| DATE : OCT. '78 | | | DRWG. No. : KL.78 - 35 |

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PHOTO REGISTRATION
PHOTO REGISTRATION

SIN CLAIM GROUP BOUNDARY

VH CLAIM GROUP BOUNDARY

## LEGEND

| TIN | | TUNGSTEN | |
|---|---|---|---|
| MEAN | = 4.52 P.P.M. | MEAN | = 3.72 P.P.M. |
| MEAN + 0.5 S.D. | = 8.55 P.P.M. | MEAN + 0.5 S.D. | = 6.00 P.P.M. |
| MEAN + 1.0 S.D. | = 16.21 P.P.M. | MEAN + 1.0 S.D. | = 9.65 P.P.M. |
| MEAN + 1.5 S.D. | = 30.70 P.P.M. | MEAN + 1.5 S.D. | = 15.53 P.P.M. |
| MEAN + 2.0 S.D. | = 58.16 P.P.M. | MEAN + 2.0 S.D. | = 28.70 P.P.M. |

WHERE S.D. = STANDARD DEVIATION

TIN VALUE IN P.P.M. → 15 (R) 25 ← TUNGSTEN VALUE IN P.P.M.
6.5

(R) INDICATES ROCK SAMPLE

URANIUM VALUE IN P.P.M.

DUPONT CANADA EXPLORATION

# KLINKIT PROJECT
# SOIL & ROCK GEOCHEMISTRY
## TIN - TUNGSTEN IN P.P.M.
## SIN & VH CLAIMS
### SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| DATA BY | F.M.S. | REV. SEP. | N.T.S. NO. 105 B |
| DATE | AUG-SEPT.'78 | | ACCT. NO. 335 - 21 & 14 |
| DRAWN BY | K.L.J. | | DRWG. NO. KL. 78 - 44 |
| DATE | OCT. '78 | | |




DUPONT EXPLORATION
CANADA

KLINKIT PROJECT

# PHOTOMAP

## SIN & VH CLAIMS

SWIFT RIVER AREA, YUKON TERRITORY

m 300 200 100 0 10 000 300 600 m
SCALE

| | | | |
|---|---|---|---|
| MAPPED BY | L.E., C.G., M.S. | REVISED | N.T.S. No. 105 B |
| DATE | JUL.- AUG. '78 | | ACCT No. 335 - 21 & 14 |
| DRAWN BY | K.L.J. | | DRWG No. KL. 78 - 68 |
| DATE | SEPT. '78 | | |