# 1981 EXPLORATION REPORT ON THE SULPHURETS PROPERTY SKEENA MINING DIVISION, B.C.

104B/8E, 8W, 9E, 9W

OWNED BY:

GRANDUC MINES, LIMITED (NPL)

ESSO RESOURCES CANADA LIMITED

SIDNEY F. ROSS

BY

DANE BRIDGE AND WALTER MELNYK

ESSO MINERALS CANADA

#600 - 1281 WEST GEORGIA STREET

VANCOUVER, B.C.

Bucyrus and Sulphurets Old Zones only

Snowfield

February 15, 1982

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# PART I

## INTRODUCTION

The Sulphurets Creek property consists of disseminated or porphyry-type Au and Cu-Mo-Au-Ag mineralization of alkaline affinity and epithermal Au-Ag veins. Potential exists for economic Au-Ag vein deposits and bulk mineable Au and Au-Cu deposits.

Exploration has been conducted since 1960 over an area up to 10 km north-south by 3 km east-west. Early work on the property was directed towards locating Cu and Cu-Mo mineralization. Esso optioned the property in 1980 from Granduc Mines Limited and six claims from Sidney Ross. Esso's work on the property was initially directed towards Mo and Au-Ag mineralization. In 1981 exploration was oriented to locating disseminated Au and associated Cu-Mo and Au-Ag vein mineralization.

This report discusses the five areas and two deposit types which were the main targets in 1981. It includes all the areas where significant precious metal values were located and all the areas which are being recommended for further work.

A forthcoming report will present general geology using a new base map, exploration on ground adjacent to the Sulphurets property claims, alteration studies, pathfinder elements and correlations between Au and other metals in the chip sampled areas and a comparison of Granduc assay lab and commercial assay lab analytical results.

## OBJECTIVES

The objectives of the 1981 field program were to sample and evaluate two main areas of Au mineralization which had been located in 1980 but only briefly evaluated. Drilling would be concentrated in structures or zones which contained $>$ 0.2 oz/t Au.

The areas called the Sulphurets Gold Zone and Sulphurets Lake Gold Zone would be explored for bulk mineable disseminated Au mineralization and higher grade structures. In the Brucejack Lake area surface showings and float would be examined to locate the areas which have the best grades or combination of grades and consistent structures.

RESULTS

The following is a brief summary of the more significant results of the 1981 exploration program (Au and Ag in oz/ton):

Brucejack Peninsula area: This area has one to three structures, possibly 320m to more than 580m long, with drilled intersections of:

| | | | |
|---|---|---|---|
| 1.49 Au, | 1.89 Ag | over 3.0m | (DDH 28) |
| 0.10 Au, | 0.79 Ag | over 16.19m | (DDH 29) |
| 0.28 Au, | 5.90 Ag | over 3.0m | (DDH 30) |
| 0.58 Au, | 3.53 Ag | over 6.0m | (DDH 28) |

A trenched showing with 0.063 Au and 46.2 Ag over 2.0m is possibly related to one of the above core intersections. (These are 1981 discoveries from areas of silification observed in 1980).

South Brucejack area: Vein and vein stockworks of unknown potential occur here. Best values are 0.48 Au over 2.15m in DDH 34, 0.18 - 0.50 Au and 8.0 - 13.9 Ag over 1 - 2.0m in trenches and 5.9 Au and 543.0 Ag in a grab sample. A new electrum-bearing quartz vein was also found in float probably sourcing from under the ice field further to the south. (These are 1981 discoveries from following a 1980 float discovery).

367 Area: The 367 area is a small zone of epithermal breccia infilling and veining, with one vein assaying 0.89 Au and 0.59 Ag over 1.0m. (A 1980 grab sample from this previously unknown area assayed 0.367 Au).

Breccia Zone of the Sulphurets Gold Zone: 1981 drilling provided intersections of 30.0m of 0.077 Au (DDH 39), 57.6m of 0.063 Au (DDH 19), local higher values of 6.0m of 0.201 Au (DDH19) and 15.0m of 0.115 (DDH 39) Au and up to 0.62% Cu, 0.02% Mo and 0.026 Au over 51.9m in DDH 37. The area has potential for in excess of 20,000,000 tons of 0.05 - 0.07 Au. (The eastern edge of this area had been explored by Granduc).

Canyon Zone of the Sulphurets Gold Zone: The Canyon Zone appears to have poor potential for ore with the best intersection being 127.6m of 0.029 Au including 45.0m of 0.041 in DDH 25. (This area was observed in 1980 but not sampled or drilled until 1981).

Snowfield Gold Zone: This is an area of disseminated mineralization with open pit mineable potential. Trench sampling indicates grades in the 0.04 to 0.08 Au range. (Discovered by lithogeochemical sampling in 1980).

New Float: Quartz vein float from the valley of Brucejack Fault, east of the Snowfield Gold Zone, assayed 3.01 Au and 323.0 to 326.0 Ag.

## RECOMMENDATIONS

Mapping, trenching and sampling is required in the Brucejack Lake areas and the Snowfield Gold Zone. The following diamond drilling is recommended:

First Priority Targets - Vein structures with drill or surface indicated potential for ≥0.5 oz/t Au:

Epithermal veins in the Brucejack Pennisula - 28 Area:

2250 feet in 7 holes at five locations and an additional 700 feet contingent upon the drilling results.

Epithermal Veins in the South Brucejack Area:

2500 feet in 7 holes at four locations and an additional 700 feet contingent upon the drilling results.

Second Priority Targets - The first stage of the total recommended drilling on disseminated Au zones which have drill or surface indicated potential for ≥20,000,000 tons of 0.05 to 0.07 oz/t Au:

Breccia Zone of the Sulphurets Gold Zone: 1300 feet in 2 holes at one location

Snowfield Gold Zone: 2000 feet in 2 holes at one location

Third Priority Targets - Vein structures with drill and surface indicated average grades of about 0.1 oz/t Au:

Epithermal Veins in the Iron Cap Area:

550 feet in 2 holes at 1 location (The Iron Cap area is discussed in the 1980 report.)

Total Drilling:

| | |
|---|---|
| First Priority | 4700 feet |
| Second Priority | 2300 feet |
| Third Priority | 550 feet |
| Total | 8600 feet |

It is estimated that the 4700 feet of first priority drilling, 1000 feet of second or third priority drilling, ongoing mapping, trenching and sampling and preparation of orthophotographs could be done for $500,000. Since almost all the work is at high elevations, the best time for it would be late June to Mid September. It would probably be necessary because of elevations and weather conditions to do the second priority drilling before the first priority drilling.

# PART II

## LOCATION AND ACCESS

The property is located approximately 32 km north-northwest of the Granduc mill. The claim area is centered approximately at 130° 15', 56° 30' on N.T.S. sheets 104B/8E, 8W, 9E and 9W.

A camp has been established above the north bank of Mitchell Creek a few hundred metres east of the junction of McTagg Creek. The camp consists of one 18' X 24' insularch kitchen-mess hall, on 12' X 16' portahut wash house, six 14' X 16' frame tents and three 12' X 15' weatherports.

Access is by helicopter from Stewart, B.C. Equipment is mobilized to the camp by helicopter from the Tide airstrip at the Granduc mill site.

## PROPERTY HISTORY

Placer Operations: The Unik River and Sulphurets Creek have been known as a source of gold since the 1880's. A Keystone (McQuillan) drill was probably flown into Sulphurets Creek below its junction with Mitchell Creek around 1933 to test gravels for placer gold. Gold has been panned in Mitchell Creek 1000 feet

above its junction with Sulphurets Creek. There are no production figures for placer operations in the Mitchell-Sulphurets Creek area.

1935: Prospectors located copper mineralization in the location now called the Main Copper Zone.

1955: Prospecting was done in the Sulphurets Creek area.

1959: Au, Ag values found in Brucejack Lake area by prospectors.

1960: Staking of main claim area by Granduc Mines Ltd. and independant prospectors from Ketchikan, Alaska. Airborne magnetometer surveying, a few ground reconnaissance magnetic lines and reconnaissance geology.

Copper mineralization found in Mitchell-Sulphurets Ridge and Au, Ag at the base of the Iron Cap area.

1961: Drilling of 736 feet of packsack core in 32 holes in four locations to test copper mineralization. Au, Ag values found in Hanging Glacier area and molybdenite observed on the south side of Mitchell Glacier.

1962: Two holes drilled on molybdenite mineralization in the Stockwork Zone.

1961-1963: Masters thesis done by R. V. Kirkham based on mapping in Mitchell-Sulphurets area.

1968: Six holes drilled in the Main Copper Zone area. The area below the Hanging Glacier was mapped.

1970: Plane table mapping from Hanging Glacier to south edge of Mitchell Glacier.

1974: Bedrock geochemical sampling started and geological reconnaissance.

1975: Prospecting in the Brucejack Lake area.

1980: Esso's work was concentrated in the area around the Mitchell Glacier. Three holes were drilled for Mo in the Moly Zone and Iron Cap area and four holes were drilled for Au-Ag in the Iron Cap veins.

One hole was drilled in the Sulphurets Gold Zone for disseminated Au and one was drilled on the Brucejack Peninsula for Au-Ag in vein zones.

Mapping, sampling and drilling indicated that the best potential on the property for economic deposits was in Au-Ag veins or areas of disseminated, bulk mineable Au mineralization.

## GENERAL GEOLOGY

The general geology of the Sulphurets area is discussed in some detail in the 1980 report, pages 10 to 45. The mineralized zones are summarized on pages 45 to 49 and the geology of specific areas is described on pages 76 to 150. Map 2153-1 in the 1980 report shows the location of all the areas described.

The Sulphurets property lies at the western edge of the Bowser Basin, about 20 km east of the main Coast Crystalline Complex. Lower Jurassic Unuk River Formation and Middle Jurassic Betty Creek Formation volcanic, epiclastic and minor sedimentary strata are unconformably overlain by Middle Jurassic Salmon River Formation flyshoid rocks. The Unuk River and Betty Creek Formation rocks and locally the Salmon River Formation rocks are intruded by the Mitchell intrusive rocks. The Mitchell intrusive rocks are high-level, Jurassic, alkaline intrusives which vary from predominately diorites and syenites to alaskites.

Generally the silicic end members are the youngest phases. Fresh and altered rocks of the intrusive stages and multiple cross-cutting relationships indicate that intrusive events and accompanying alteration were multistage. Mineralization and alteration is mainly closely related to the Mitchell intrusives,

developed over an abnormally long time period, did not form normal silicate and sulphide zoning patterns, and contains the assemblage Cu, Mo, Au and Ag in unusual proportions and high F.

Six stages of alteration and mineralization are recognized on the Sulphurets property. The stages are initially co-magmatic with Lower Jurassic Unuk River Formation and affect unconformably overlying Middle Jurassic Betty Creek Formation and unconformably overlying Middle Jurassic Salmon River Formation. The following is a listing of the stages in paragenetic sequence, with a brief characterization of each, the economically significant elements associated with each, the general locations or areas involved, and the formations that are affected by each stage. This paragenetic sequence is simplified and probably inaccurate. It is meant to be a working model to help understand geological relationships, alteration and mineralization, and to aid in exploration.

Stage 1: Syngenetic or exhalitive iron formation.
Cu
Southwestern corner of Iron Cap area and possibly the Waterfall Zone
Unuk River Formation

Stage 2: Main stage of disseminated sulphide deposition and porphyry environment hydrothermal alteration.
Essentially a potassic assemblage in terms of porphyry-type silicate zoning.
Cu, Mo, Au, Ag
Westerly Iron Cap area, Mitchell area, and Kirkham Zone
Unuk River Formation and lower Betty Creek with some dikes into Salmon River Formation.

Stage 3: Quartz-pyrite-Au-Ag veins
Au, Ag
Iron Cap Veins
Unuk River Formation and possibly lower Betty Creek Formation.

Stage 4: Quartz-barite-calcite-Au-Ag-Pb-Zn veins.
Au, Ag
Brucejack Lake area
Unuk River Formation

Stage 5: Intense K-feldspar-pyrite-silica alteration
Au, minor Cu, Mo, Ag.
Sulphurets Gold Zone, Breccia Zone, Canyon Zone, Sulphurets Lake Gold Zone and Snowfield Gold Zone
Unuk River Formation and possibly Salmon River Formation

Stage 6: Intense sericite-quartz-chlorite-K-feldspar alteration of all rock types. This stage may be a retrograde sericitization accompanying the continued cooling of Stage 2 and caused by a major influx of non-magmatic waters.
Mo, Au
Most of the area between Mitchell-Sulphurets Ridge and the Mitchell Glacier, locally north of the nose of Mitchell Glacier and the South Cirque.
Unuk River Formation and Salmon River Formation (this stage should also affect Betty Creek Formation rocks but none have been distinguished).

Some Qualifications:

Stage 3 is closely related to Stage 2.

Stage 4 may be related to or post date Stage 6.

Stage 5 may be contemporaneous with or post date Stage 6.

Stage 1

Syngenetic mineralization occurs in Unuk River Formation volcanogenic cherts and volcanic and sedimentary rocks. Horizons of pyrite, pyrite-chalcopyrite and pyrite-magnetite-chlorite-carbonate-chalcopyrite occur. The

mineralization is generally in thin bands, rarely reaching 1 m thick, is very discontinuous and is intensely offset by faulting. Copper is the only significant economic component of the syngenetic mineralization based on sampling the limited exposures.

Syngenetic mineralization occurs in the southerly Iron Cap area and below the nose of the Hanging Glacier.

Minor disseminated primary chalcopyrite also occurs in Unuk River rocks in the Waterfall Zone and possibly in the Sulphurets Gold Zone.

Stage 2

Stage 2 is part of the disseminated sulphide or porphyry environment on the Sulphurets property. It is an alkaline, high-level, long-lived, multistage porphyry system initially co-magmatic with Unuk River Formation volcanic and volcaniclastic rocks. It is in part contemporaneous with or post Betty Creek Formation volcaniclastic and sedimentary rocks. Related intrusive phases cut Middle Jurassic Salmon River Formation rocks.

Rocks associated with, or affected by, Stage 2 appear to (with minor exceptions) lie above the Sulphurets Fault on

Mitchell-Sulphurets Ridge or above a similar low-angle fault on the north side of Mitchell Glacier. Generally, Stage 2 rocks overlie a phyllic alteration assemblage (Stage 5) which may be a product of phyllic overprinting of Stage 2 potassic alteration.

Stage 2 mineralization occurs in low mafic or mafic-free intrusive phases rather than phases with approximately 5% hornblende, in multistage intrussive areas rather than major areas of syenites, in both altered and fresh intrusive rocks and in both intrusive and country rock.

One major and two minor alteration and mineralization types accompany Stage 2. They are:

2-1) K-Feldspar - quartz-pyrite

2-2) Intense quartz veining

2-3) Albite - magnetite

(The intense quartz veining type may also be related to Stage 4 and 5.)

2-1) K-Feldspar-quartz-pyrite: This is the major alteration phase associated with Stage 2. It consists of pervasive K-felds-pathization, silicification and disseminated pyrite centered on areas of alkaline intrusives. Both intrusive and country rock are affected to the extent that original rock types are often indistinguishable. The economically significant elements

present are Cu, Mo, Ag and Au. The mineralization assemblage and also that of the intense quartz veining type are characterized by high Ag:Cu ratios (30-50:1 using Ag in g/t) and very high Ag:Au ratios (30-40:1). The main areas of K-feldspar-quartz-pyrite assemblage are west of the Iron Cap vein area and the Kirkham Zone.

2-2) Intense quartz veining: Intense quartz veining cutting syenite and country rock occurs in two areas. The Mitchell Zone has quartz veining in fresh syente and biotitized? metasedimentary rocks. Locally fresh alaskites contain disseminated chalcopyrite. Cu is present with very minor values in Au, Ag and probably Mo.

The Ridge Zone has isolated patches of quartz veining in syenite and andesite with minor chalcopyrite-pyrite-magnetite and trace amounts of epidote and chlorite.

2-3) Albite-magnetite: Two relatively insignificant areas of albite-magnetite with minor Cu or Cu-Au mineralization have been incompletely examined. They occur locally in the Bishop Zone and the Bornite Zone.

Stage 3

Occurrences of major quartz-pyrite-Au-Ag veins and the Iron Cap vein system occur in an N-S fracture set cutting altered volcaniclastic rocks. These occurrences appear along the eastern margin of the main area of Stage 2 alteration and mineralization and are approximately parallel to the Brucejack Fault. Mineralogically and spacially the veins and wall rock are closely related to Stage 2. The veins cut Stage 2 and were probably deposited immediately after the main Stage 2 event. Generally the vein wall rock, over a few metres to 75 m, is more intensely sericitzed than the surrounding Stage 2 alteration assemblage.

Stage 3 veins are quartz with approximately 10% pyrite, minor tetrahedrite, specularite and magnetite, and rare molybdenite, chalcopyrite, sphalerite and galena.

Stage 4

The Stage 4 veins occur in the Brucejack Lake area and may occur elsewhere along the 10 km section of the Brucejack Fault north of the lake. These veins are related to the Brucejack Fault and its numerous splay faults. Volcanic, volcaniclastic and sedimentary rocks in the area are altered to chlorite-sericite-quartz-feldspar rocks. Quartz-barite veins

with minor or erratic Au-Ag-Pb-Zn and possibly tellurides occur generally in areas of intense faulting and shearing with pervasive silicification, sericitization and pyritization.

Stage 5

Intense K-feldspathization-silicification-pyritization occurs discontinuously over a 3.5 km distance from the vicinity of DDH 2, 4, 5 and 6 (Granduc's Main Copper Zone) to Sulphurets Lake. It is associated with an andesite breccia or high and low angle faults and zones of intense fracturing in andesites and locally in flow banded rhyolites. Andesite breccia and fault bounded zones have been altered and mineralized with up to 40% pyrite and low Au contents. Some pyritic and weakly pyritic zones contain minor Cu and Mo.

The area of Stage 5 alteration is overlain by the low-angle Sulphurets Fault and Stage 2 syenites. Minor areas of pyritic intrusive breccia, quartz veining and Stage 5 alteration occur in a linear trend along Mitchell-Sulphurets Ridge and post date Stage 2 intrusive rocks.

Stage 6

Previous workers have described Stage 6 alteration as a quartz-sericite schist with zones of intense quartz stockwork or silicification and local chloritization. In general, Stage

6 displays intense sericite-quartz-chlorite-K-feldspar alteration in varying proportions and associated with well developed foliation. This is a pervasive alteration of all rock types and probably is essentially an intrusive-related phyllic alteration assemblage. It does not, however, appear to be related to Stage 2, either in terms of discernable silicate zoning or proximity. In three areas the source intrusive for the 'phyllic assemblage' is not known and in one area the source may be barely recognizable altered intrusive rocks within the zone.

Stage 6 alteration occurs in four areas. Almost all the rocks on the south side of Mitchell Glacier to the snowfields along Mitchell-Sulphurets Ridge are affected by Stage 6. Rocks located at the glacier level at the toe of Mitchell Glacier along its north side are similarly altered.

In these two areas the Stage 6 rocks are underlying the low angle Sulphurets Fault and apparently underlying the fresh syenites and areas affected by Stage 2 events. The area south of Mitchell Glacier is the only region of Stage 5 with known, possibly significant, concentrations of Mo and Au. It is also the only Stage 6 area containing intrusive rocks.

Two areas of Stage 6 altered rocks occur south of Sulphurets Glacier. Here the alteration has affected both Unuk

River and Salmon River rocks. One band of Stage 6 rock, between the westerly head and nose of Sulphurets Glacier, called the South Cirque area, contains minor Au and Cu values. South of the westerly head of Sulphurets Glacier, Stage 6 altered rocks extend for 15 km and are discontinuously exposed along the north arm of Frank Mackie Glacier.

The genetic relationships between Stage 2 and 6 are poorly understood. Both Stage 2 and 6 are probably related to a similar intrusive-hydrothermal system. The stages may represent the exposed character or products of the one system. The two phases are essentially a potassic (Stage 2) and a phyllic (Stage 6) alteration assemblage.

Stage 5 areas locally contain the same intrusive rocks as Stage 2 but Stage 6 definitely post dates the main Stage 2 event. Stage 2 areas structurally overlie Stage 6 but locally have gradational boundaries with Stage 6 alteration. Stage 6 alteration may be a phyllic overprinting on original Stage 2 related, potassic alteration. The superimposed alteration or retrograde sericitization was probably caused by influxes of non-magmatic water accompanying late structual adjustments.

## CLAIMS

As of September 29, 1981, the Sulphurets property consists of 226 units. Granduc owns 106 units, S. Ross owns 6 units and Esso owns 114 units. Eight new claims, Ice 4 and 5, Tedray 20 and 21 and Red River 6, 7, 8 and 9 were staked in 1981.

The following is a list of claims with current expiry dates. The expiry dates assume that all of the assessment work which has been filed is accepted.

| Claim | Record No. | Units | Date of Record | Expiry Date |
|---|---|---|---|---|
| Arbee 35 | 19124 | 1 | June 016/60 | 1991/06/16 |
| Arbee 39 | 19128 | 1 | June 016/60 | 1991/06/16 |
| Arbee 54 | 19143 | 1 | June 014/60 | 1991/06/14 |
| Arbee 55 | 19144 | 1 | June 16/60 | 1991/06/16 |
| Dawson-Ross 1 | 19887 | 1 | July 24/61 | 1992/07/24 |
| Dawson-Ross 3 | 19889 | 1 | July 24/61 | 1992/07/24 |
| Ed 1 | 150 | 2 | Aug 26/75 | 1982/08/26 |
| Ed 2 | 151 | 1 | Aug 26/75 | 1982/08/26 |
| Ice 1 | 2411 | 2 | June 30/80 | 1991/06/30 |
| Ice 2 | 2412 | 3 | June 30/80 | 1992/06/30 |
| Ice 3 | 2647 | 2 | Nov 3/80 | 1985/11/03 |
| Ice 4 | 3111 | 12 | June 30/81 | 1985/06/30 |
| Ice 5 | 3112 | 12 | June 30/81 | 1985/06/30 |
| Iron Cap 1 | 315 | 2 | Sept 7/76 | 1991/09/07 |
| Iron Cap 2 | 316 | 1 | Sept 7/76 | 1991/09/07 |
| Iron Cap 3 | 317 | 2 | Sept 7/76 | 1991/09/07 |
| Iron Cap 4 | 2409 | 1 | June 30/80 | 1991/06/30 |

| Claim | Record No. | Units | Date of Record | Expiry Date |
|---|---|---|---|---|
| Iron Cap 5 | 2410 | 1 | June 30/80 | 1991/06/30 |
| Iron Cap 6 | 2584 | 2 | Sept 23/80 | 1991/09/23 |
| Iron Cap 7 | 2585 | 2 | Sept 23/80 | 1991/09/23 |
| Red River | 314 | 14 | Sept 15/76 | 1991/09/15 |
| Red River 2 | 2555 | 4 | Sept 2/80 | 1991/09/02 |
| Red River 3 | 2556 | 2 | Sept 2/80 | 1991/09/02 |
| Red River 4 | 2649 | 12 | Nov 3/80 | 1991/11/03 |
| Red River 5 | 2650 | 2 | Nov 3/80 | 1991/11/03 |
| Red River 6 | 3109 | 12 | June 30/81 | 1991/06/30 |
| Red River 7 | 3110 | 4 | June 30/81 | 1991/06/30 |
| Red River 8 | 3236 | 2 | Sept 29/81 | 1982/09/29 |
| Red River 9 | 3237 | 2 | Sept 29/81 | 1982/09/29 |
| Sulphurets 1 Fr. | 2582 | 1 | Sept 23/80 | 1991/09/23 |
| Sulphurets 2 Fr. | 2583 | 1 | Sept 23/80 | 1991/09/23 |
| Sulphurets 3 Fr. | 2648 | 1 | Nov 3/80 | 1991/11/03 |
| Tedray 1 | 153 | 2 | Aug 26/75 | 1991/08/26 |
| Tedray 2 | 154 | 1 | Aug 26/75 | 1991/08/26 |
| Tedray 3 | 155 | 3 | Aug 26/75 | 1991/08/26 |
| Tedray 6 | 158 | 15 | Aug 26/75 | 1992/08/26 |
| Tedray 7 | 159 | 2 | Aug 26/75 | 1992/08/26 |
| Tedray 8 | 160 | 1 | Aug 26/75 | 1992/08/26 |
| Tedray 9 | 161 | 9 | Aug 26/75 | 1992/08/26 |
| Tedray 10 | 162 | 3 | Aug 26/75 | 1992/08/26 |
| Tedray 11 | 163 | 4 | Aug 26/75 | 1991/08/26 |
| Tedray 12 | 164 | 15 | Aug 26/75 | 1991/08/26 |
| Tedray 13 | 165 | 8 | Aug 26/75 | 1992/08/26 |
| Tedray 14 | 2413 | 2 | June 30/80 | 1985/06/30 |
| Tedray 15 | 2586 | 4 | Sept 23/80 | 1991/09/23 |
| Tedray 16 | 2643 | 12 | Nov 3/80 | 1991/11/03 |
| Tedray 17 | 2644 | 4 | Nov 3/80 | 1991/11/03 |
| Tedray 18 | 2645 | 4 | Nov 3/80 | 1991/11/03 |
| Tedray 19 | 2646 | 2 | Nov 3/80 | 1991/11/03 |

| Claim | Record No. | Units | Date of Record | Expiry Date |
|---|---|---|---|---|
| Tedray 20 | 3113 | 4 | June 30/81 | 1985/06/30 |
| Tedray 21 | 3114 | 2 | June 30/81 | 1985/06/30 |
| Xray 1 | 1861 | 1 | Oct 12/79 | 1991/10/12 |
| Xray 2 | 1862 | 2 | Oct 12/79 | 1991/10/12 |
| Xray 3 | 1863 | 2 | Oct 12/79 | 1990/10/12 |
| Xray 4 | 1864 | 6 | Oct 12/79 | 1990/10/12 |
| Xray 5 | 1865 | 2 | Oct 12/79 | 1991/10/12 |
| Xray 6 | 1866 | 2 | Oct 12/79 | 1990/10/12 |
| Xray 7 | 1867 | 2 | Oct 12/79 | 1992/10/12 |
| Xray 8 | 1868 | 2 | Oct 12/79 | 1992/10/12 |
| Xray 9 | 1869 | 2 | Oct 12/79 | 1992/10/12 |

## EXPENDITURES

The total expenditures on the Sulphurets property for the period 1960 to 1977 were 336,600. Expenditures are summarized in the Granduc Summary Reports, Sulphurets Creek Project, 1960-1974 and 1976.

Esso's expenditures on the property were $553,000 in 1980 and $814,000 in 1981.

## WORK DONE

### Diamond Drilling

A total 12,000 feet (3,657.6m) of diamond drilling was done in 22 holes, DDH 18 to 39 inclusive. The following is a list of the holes by area:

| | | | |
|---|---|---|---|
| Breccia Zone | DDH 19 | 558 feet | 170.1m |
| | " 20 | 506 " | 154.2m |
| | " 37 | 696 " | 212.1m |
| | " 38 | 667 " | 203.3m |
| | " 39 | 637 " | 194.2m |
| Canyon Zone | DDH 18 | 548 " | 167.0m |
| | " 23 | 324 " | 98.8m |
| | " 24 | 552 " | 168.2m |
| | " 25 | 457.5" | 139.4m |
| | " 26 | 740 " | 225.6m |
| | " 27 | 562 " | 171.3m |
| Sulphurets Lake Gold Zone | DDH 21 | 237.5 feet | 72.4m |
| | " 22 | 438 " | 133.5m |
| Brucejack Peninsula - Discovery Area | DDH 30 | 706 feet | 215.2m |
| | " 31 | 517 feet | 157.6m |
| Brucejack Peninsula - 28 Area | DDH 28 | 446 feet | 135.9m |
| | " 29 | 606 " | 184.7m |
| | " 32 | 586 " | 178.6m |
| South BruceJack Area | DDH 33 | 547 feet | 166.7m |
| | " 34 | 586 " | 178.6m |
| | " 35 | 516 " | 157.3m |
| | " 36 | 567 " | 172.8m |

## Geology

Mapping was mainly concentrated in the Sulphurets Gold Zone, Sulphurets Lake Gold Zone, Brucejack Lake and 367 Areas. Work was also done in areas adjacent to and west to south west of the property and on the South Cirque located south of the lake at the nose of the Sulphurets Glacier.

## Sampling

About 900 samples were collected for analysis. These were mainly chip samples from the areas of disseminated Au values. The results of these samples will be reported in a forthcoming report. Trenching and chip sampling was done in the Snowfield, Brucejack and 367 Areas. Ninety-nine soil samples were collected in a forested area in the Sulphurets Gold Zone and silts were collected from streams southwest of the property.

## Claim Staking

Esso staked eight claims in 1981. Red River 6, Ice 4 and Tedray 21 provide protection adjacent to mineralized areas. Ice 5 and Tedray 20 claimed the previously open Snowfield Gold Zone and provide peripheral protection. Red River 7 covers a silicified zone with low Au values along the Brucejack Fault and Red River 8 and 9 protect possible down dip extensions of the Brucejack Peninsula - 28 area.

Ed Kruchkowski staked a single unit in 1980 between Red River and Tedray 12 based on his knowledge of the actual location of the Tedray 12 Legal Corner Post. He has thus acquired a narrow fraction but it is 2 to 3 km north of the

portion of the Brucejack area that Esso is actively exploring. No other overstaking or tie-on staking has occurred at the Sulphurets property.

Dupont staked the SOB claim across Mitchell Creek in 1980 within .5 to 1.0 km of the northwest corner of the Sulphurets property. However, Dupont has not explored the ground and intends to allow the claim to lapse.

Assessment Work

Claims that were staked as peripheral protection to mineralized areas had 3 years of assessment work filed on them. All other claims which were grouped or could be regrouped had the maximum amount of available assessment work filed on them. Reports were filed for the following Statements of Exploration and Development:

- Statement for Central 1 Group, filed July 15, 1981, Mining Receipt 161861E.
- Statement for Sulphurets 1 Group, filed July 17, 1981, Mining Receipt 161905E.
- Two Statements for Red River 1 Group, both filed August 26, 1981, Mining Receipt 162318E.

- Two statements for Red River, Red River 2-7 and Tedray 12, and Central 2 Group (Ed 2; Ice 1, 3-5 --- Xray 1, 2, 5), both filed September 15, 1981, Mining Receipt 171367E.

Airphotography

Airphotography was flown in the Sulphurets area in August of 1981 under the direction of Burnett Resource Surveys Ltd. The photographs were of good quality and were accepted by Esso.

Student Studies

The following reports have been submitted to Esso:

- Egan, D.M., 1981, The Petrography of the Iron Cap Mitchell-Sulphurets Area, B.Sc. Thesis, University of Manitoba, 59 p.

- Fortin, G., 1981, The Brucejack Lake Gold Deposit, Term Project, University of British Columbia, 35 p.

T. Simpson is currently doing post-graduate research on the alteration and mineralogy of the Sulphurets Gold Zone at the University of Idaho, Moscow, Idaho.

## PART III

## RESULTS OF 1981 DRILLING ON THE SULPHURETS PROPERTY

The following is a tabulation of significant assay results for DDH 18 to 39. The gold values are all fire assays performed by the Granduc assay lab of Canada Wide Mines. Check assays by Min-En Labs indicates that the gold assays are reliable but commonly slightly high.

The distribution of drill holes is as follows:

Disseminated Gold Zones:
- Breccia Zone DDH 12, 19, 20, 37, 38, 39
- Canyon Zone DDH 18, 23 - 27
- Sulphurets Lake Gold Zone DDH 21, 22

Epithermal Gold-Silver Vein Areas:
- Brucejack Peninsula:
  - 28 Area DDH 28, 29, 32
  - Discovery Area DDH 30, 31
  - South Brucejack Area DDH 33-36

The location of these and some other zones are shown on Figure 1. Accurate locations of the zones and drill holes are shown on Maps 2R1 and 3R1.

Summary of Significant Assays for Holes in the Disseminated Gold zones

The cut-off for the reported intervals is 0.025 oz/ton or 0.86 g/tonne. Intervals of 0.025 over 3.0m are included if the adjacent value provides an average of 0.025 over 6.0m. Long assay intervals which include some sections with 0.025 over 6.0m are indicated by an asterisk.

Rock with 0.025 oz/t Au has a gross value of $12.50/t with Au at $500/oz Canadian. Using Au at $500/oz Canadian and Cu at $1.00/lb Canadian, .025 oz/t Au is equivalent to 0.625% Cu.

The Au values in brackets on the right are the highest assays in the interval on the left.

| HOLE<br>Interval | BEARING | DIP<br>oz/t Au | |
|---|---|---|---|
| DDH 12 | 180° | -75% | |
| 5.00 - 14.00 = | 9.00m | 0.072 | (.083/3m) |
| 41.00 - 50.00 = | 9.00m | 0.030 | (.040/3m) |
| 50.00 - 98.00 = | 48.00m | 0.023* | |
| 98.00 - 146.00 = | 48.00m | 0.060 | (.143/3m) |
| 146.00 - 166.24 = | 20.24m | 0.027 | (.033/3m) |
| 98.00 - 166.24 = | 68.24m | 0.050 | |
| 41.00 - 166.24 = | 125.24m | 0.039* | |
| Cu section: | | | |
| 147.10 - 166.24 = | 19.14m | 0.56%Cu, 0.026 oz/t Au | |
| DDH 18 | nil | -90° | |
| 3.00 - 27.00 = | 24.00m | 0.043 | (0.089/3m) |
| 35.65 - 51.00 = | 15.35m | 0.045 | (0.098/3m) |
| 3.00 - 51.00 = | 48.00m | 0.039* | |
| 85.10 - 90.63 = | 5.53m | 0.041 | (0.060/.85m) |
| 96.00 - 98.19 = | 2.19m | 0.078 | (0.280/.43m) |
| 115.30 - 125.55 = | 10.25m | 0.041 | (0.056/3.82m) |
| Cu section: | | | |
| 125.55 - 162.00 = | 36.45m | 0.19% Cu, 0.004% Mo<br>0.007 oz/t Au | |
| DDH 19 | nil | -90° | |
| 17.58 - 75.15 = | 57.57m | 0.063 | (0.290/3m) |
| 114.00 - 127.50 = | 13.50m | 0.031 | (0.039/3m) |
| Cu section: | | | |
| 108.0 - 127.5 = | 19.5m | 0.68% Cu, 0.024% Mo, 0.027 oz/t Au | |

| HOLE | | | BEARING | DIP | |
|---|---|---|---|---|---|
| | Interval | | | Oz/t Au | |
| DDH 20 | | | 070° | -43° | |
| 18.90 - | 30.00 = | 11.10m | | 0.051 | (0.068/3m) |
| 54.00 - | 81.00 = | 27.00m | | 0.037 | (0.049/3m) |
| 18.90 - | 81.00 | 62.10m | | 0.033* | |
| Cu section: | | | | | |
| 109.50 - | 118.75 = | 9.25m | | 0.22% Cu, 0.008 oz/t Au | |
| DDH 21 | | | 090° | -45° | |
| 6.00 - | 12.00 = | 6.00m | | 0.245 | (0.460/3m) |
| DDH 22 | | | | | |
| 108.00 - | 114.00 = | 6.00m | | 0.038 | (0.049/3m) |
| DDH 23 | | | 090° | -45° | |
| 6.00 - | 21.00 = | 15.00m | | 0.049 | (0.079/1.95m) |
| 27.00 - | 39.00 = | 12.00m | | 0.033 | (0.047/3m) |
| 51.00 - | 62.08 = | 11.08m | | 0.071 | (0.110/3m) |
| 75.00 - | 87.00 = | 12.00m | | 0.035 | (0.044/3m) |
| 6.00 - | 96.93 = | 90.93m | | 0.034* | |
| DDH 24 | | | nil | -90° | |
| 5.24 - | 36.00 = | 30.76m | | 0.040 | (0.096/3m) |
| 93.00 - | 99.00 = | 6.00m | | 0.042 | (0.046/3m) |
| 153.00 - | 159.00 = | 6.00m | | 0.026 | (0.026/3m) |

| HOLE Interval | | BEARING | DIP oz/t Au | |
|---|---|---|---|---|
| DDH 39 | | 180° | -70% | |
| 5.10 - 15.30 = | 10.20m | | 0.047 | (0.062/4.45m) |
| 54.00 - 60.00 = | 6.00m | | 0.094 | (0.120/3.0m) |
| 66.00 - 71.55 = | 5.55m | | 0.039 | (0.053/3.0m) |
| 87.00 - 111.00 = | 24.00m | | 0.027 | (0.038/3.0m) |
| 120.00 - 126.00 = | 6.00m | | 0.036 | (0.044/3.0m) |
| 141.00 - 171.00 = | 30.00m | | 0.077 | (0.175/3.0m) |
| Cu section: | | | | |
| 185.57 - 194.16 = | 8.59m | | 0.27% Cu, 0.005% Mo, 0.014 oz/t Au | |

| HOLE | BEARING | DIP | |
|---|---|---|---|
| Interval | | oz/t Au | |
| DDH 25 | 090° | -63° | |
| 4.42 - 36.00 = | 31.58m | 0.027 | (0.036/3m) |
| 48.00 - 57.00 = | 9.00m | 0.035 | (0.157/.46m) |
| 87.00 - 132.00 = | 45.00m | 0.041 | (0.061/3m) |
| 4.42 - 132.00 = | 127.58m | 0.029* | |
| DDH 26 | 045° | -45° | |
| 3.66 - 10.70 = | 7.04m | 0.111 | (0.265/1.7m) |
| 36.00 - 54.00 = | 18.00m | 0.040 | (0.075/3m) |
| 153.00 - 159.00 = | 6.00m | 0.036 | (0.042/3m) |
| 3.66 - 54.00 = | 50.34m | 0.033* | |
| DDH 27 | | | |
| 27.00 - 33.00 = | 6.00m | 0.068 | (0.104/3m) |
| 81.00 - 96.00 = | 15.00m | 0.032 | (0.040/3m) |
| DDH 37 | nil | -90° | |
| 130.5 - 156.1 = | 25.6m | 0.028* | (0.073/2.7m) |
| 163.0 - 181.0 = | 18.0m | 0.033* | (0.042/1.3m |
| 196.0 - 199.1 = | 3.1m | 0.043 | |
| Cu sections: | | | |
| 126.55 - 163.00 = | 36.45m | 0.49% Cu, 0.016% Mo, 0.023 oz/t Au | |
| 163.00 - 178.50 = | 15.5m | 1.02% Cu, 0.030% Mo, 0.033 oz/t Au | |
| 126.55 - 178.50 = | 51.95m | 0.62% Cu, 0.020% Mo, 0.026 oz/t Au | |
| DDH 38 | 230° | -70° | |
| 3.66 - 15.00 = | 11.34m | 0.087 | (0.129/3.0m) |
| 36.00 - 40.80 = | 4.80m | 0.041 | (0.060/1.8m) |
| 66.00 - 81.00 = | 15.00m | 0.041 | (0.075/3.0m) |
| 90.00 - 123.00 = | 33.00m | 0.028 | (0.036/3.0m |
| 138.00 - 168.00 = | 30.00m | 0.068 | (0.280/3.0m) |

## Sections with 0.01 oz/t Au over 3.0m

| HOLE | Interval | | oz/t Au |
|---|---|---|---|
| DDH 12 | 107 - 113 = | 6m | .126 |
| | 119 - 122 = | 3m | .113 |
| | 128 - 131 = | 3m | .117 |
| DDH 19 | 54 - 60 = | 6m | .201 |
| | 72 - 75.15= | 3.15m | .105 |
| DDH 21 | 6 - 12 = | 3m | .460 |
| DDH 23 | 51 - 54 = | 3m | .110 |
| | 57 - 60 = | 3m | .102 |
| DDH 26 | 7.7 - 10.7 = | 3m | .173 |
| DDH 27 | 30 - 33 = | 3m | .104 |
| DDH 38 | 12 - 15 = | 3m | .129 |
| | 159 - 162 = | 3m | .280 |
| DDH 39 | 57 - 60 = | 3m | .120 |
| | 144 - 147 = | 3m | .107 |
| | 153 - 159 = | 6m | .160 |

## Summary of Significant Assays for Holes in the Epithermal Veins

Values are reported for $\geq$.1 oz/t Au and/or $\geq$ 5.0 oz/t Ag. In a few instances lower values are reported if Au + Ag/50 is $\geq$ .1. (Ag is factored by 50 because Au is currently worth about 50 times as much as Ag.) Intervals which average a number of Au values with some values $<$ .1 but $>$ .025 are indicated by an asterisk. Weighted averages which include $<$ .025 oz/t Au are indicated by a double asterisk.

| HOLE | BEARING | DIP | |
|---|---|---|---|
| Interval | | oz/t Au | oz/t Ag |
| DDH 28 | 015° | -45° | |
| 70.13 - 70.60 = | 0.47m | 8.90 | 8.60 |
| 69.00 - 72.00 = | 3.00m | 1.49* | 1.89 |
| 63.00 - 72.00 = | 9.00m | 0.52** | 1.50 |
| 120.00 - 126.00 = | 6.00m | 0.58 | 3.53 |
| 120.00 - 129.00 = | 9.00m | 0.40* | 2.46 |
| DDH 29 | 015° | -70° | |
| 160.81 - 162.59 = | 1.78m | 0.27 | 2.54 |
| 168.00 - 169.90 = | 1.90m | 0.26 | 0.85 |
| 174.00 - 177.00 = | 3.00m | 0.11 | 0.63 |
| 160.81 - 177.00 | 16.19m | 0.10** | 0.74 |
| DDH 30 | 170° | -45° | |
| 73.90 - 74.98 | 1.08m | 0.04** | 9.39 |
| 99.84 - 100.20 | 0.36m | 0.27 | 0.58 |
| 107.37 - 107.90 | 0.53m | 0.15 | 1.67 |
| DDH 31 | | | |
| No significant assays | | | |
| DDH 32 | 015° | -45° | |
| 78.00 - 81.00 | 3.00m | 0.28 | 5.90 |
| 93.00 - 93.55 | 0.55m | 0.22 | 23.60 |
| 110.60 - 111.00 | 0.40m | 0.05** | 12.90 |

| HOLE | | | BEARING | DIP | |
|---|---|---|---|---|---|
| | Interval | | | oz/t Au | oz/t Ag |
| DDH 33 | | | 180° | -45° | |
| 24.00 | - 27.00 | = | 3.00m | .14 | 0.17 |
| 33.00 | - 33.50 | = | 0.50m | .10 | 1.34 |
| 40.50 | - 42.30 | = | 1.80m | .11 | 1.52 |
| 58.00 | - 60.60 | | 2.60m | .33 | 0.54 |
| 58.00 | - 66.00 | | 8.00m | .13* | 0.40 |
| 69.00 | - 72.00 | | 3.00m | .25 | 0.43 |
| 58.00 | - 72.00 | | 14.00m | .13** | 0.33 |
| DDH 34 | | | 180° | -70° | |
| 52.30 | - 54.45 | | 2.15 | .48 | 1.60 |
| 52.30 | - 61.60 | | 9.30 | .16* | 0.89 |
| 52.30 | - 64.60 | | 12.30 | .13* | 0.76 |
| 52.30 | - 70.60 | | 18.30 | .11** | 0.95 |
| DDH 35 | | | 180° | -45° | |
| 58.70 | - 59.60 | = | 0.9m | .17 | .62 |
| 70.00 | - 70.50 | = | 0.5m | .39 | 4.50 |
| 68.00 | - 70.50 | = | 2.5m | .11* | 1.24 |
| DDH 36 | | | 180° | -70° | |
| 9.00 | - 15.60 | | 6.6m | .08* | 1.96 |
| 50.80 | - 51.80 | | 1.0m | .27 | 1.77 |
| 60.00 | - 66.00 | | 6.0m | .14* | 1.35 |

PART IV

## EPITHERMAL DISSEMINATED GOLD ZONES

### General

Four areas of significant low-grade Au mineralization occur at Sulphurets. These areas occur mainly in andesites but are probably related to underlying or adjacent syenite bodies. Mineralization has spread along structures such as faults or quartz veins or been concentrated in andesite breccias. The mineralization occurs with a high pyrite content in feldspar-stable, potassium silicate alteration zones. The gold mineralization commonly overlies zones of Cu + Mo.

### General Conclusions

It appears that the disseminated Au zones will not be economic on their own. The best grades over 30 to 58m intervals are .060 to .077 oz/t Au. Considerable exploration potential exists but there is no indication that better grades will exist. The disseminated Au zones should be considered as second priority exploration targets at Sulphurets.

However, drilling should continue on the Snowfield and Breccia areas if first priority targets at Sulphurets are being explored. The Snowfield area in particular should be drill tested because it may have an extremely low stripping ratio.

General Grades

The following is a summary of the best grades or thickest sections obtained in the disseminated gold zones. Au values are in oz/t:

Sulphurets Gold Zone Breccia Zone

| | | | | |
|---|---|---|---|---|
| DDH 19: | 57.6m | of | 0.063 Au | |
| DDH 39: | 30.0m | of | 0.077 Au | |
| DDH 39: | 165.9m | of | 0.033 Au | |
| DDH 19: | 6.0m | of | 0.201 Au | |
| DDH 39: | 15.0m | of | 0.115 Au | |
| DDH 37: | 51.9m | of | 0.62% Cu | 0.026 Au |
| DDH 37: | 15.5m | of | 1.02% Cu | 0.033 Au |

Canyon Zone

| | | | |
|---|---|---|---|
| DDH 25: | 45.0m | of | 0.041 Au |
| DDH 25: | 127.6m | of | 0.029 Au |
| DDH 26: | 7.m | of | 0.111 Au |

Sulphurets Lake Gold Zone

| | | | |
|---|---|---|---|
| DDH 21: | 6.0m | of | 0.245 Au |

Snowfield Zone

0.030 to 0.116 Au from chip samples in trenches.

Exploration Model

The Sulphurets epithermal disseminated gold zones are intrusive related (porphyry-type) or epithermal volcanic deposits. The general geology of the Sulphurets area supports a porphyry-type environment but locally a subvolcanic environment is inferred as in the Iron Cap area.

For either the intrusive or volcanic environment of ore formation, mineralization and alteration are probably the most useful and most direct guides to ore. Areas of disseminated pyrite and minor vein pyrite and possibly anomalous amounts of Hg and As correlate closely with the known areas of Au mineralization. However, the Snowfield Gold Zone has Au associated with a low pyrite content (5% ?) and no apparent contrast in pyrite content between Au-bearing (.03 - .10 oz/t Au) and barren country rock.

All the Au zones are in feldspar stable, potassium silicate alteration zones with K-feldspar or sericite being the dominant silicate mineral. The presence of secondary K-feldspar appears to correlate closely with more significant ( .05 oz/t Au) values. Intense silification may be the feature which correlates most closely with Au. The potassium silicate zones generally change in all directions to chlorite dominant assemblages.

Areas with .2 to 1.0% Cu and up to .03% Mo commonly underlie the Au zones. If the Cu-Mo zones, which also contain some Au, are genetically related to the Au zones they can be used as guides to unexposed Au zones. Structurally prepared ground such as permeable breccias or intensely fractured areas could be important for localizing the mineralizing fluids.

If the mineralization is related to volcanic processes, volcanic features such as permeable breccias and feeder structures may be more important than widespread metal zonation. However, the occurrence of Au in a 2.2 km linear trend in andesite, andesite breccia and flow banded rhyolite indicates a structural or metal zonation control from a large source area rather than control by volcanic stratigraphy.

## Sulphurets Epithermal Disseminated Gold Zones Compared to Gold-Rich Porphyry Copper Deposits.

The following is an extreme generalization of data for Gold-Rich Porphyry Copper Deposits (GRPCD) taken from numerous sources and from Sillitoe (1979). The data is compared to the characteristics of Sulphurets epithermal disseminated gold zones (SEDGZ).

### General

GRPCD have Au normally in centrally located potassium silicate alteration zones dominated by biotite and having an unusually high magnetite content. SEDGZ are feldspar stable, potassium silicate alteration zones in andesites with Au in K-feldspar, quartz, pyrite rock or sericite overprinted rock.

## Grades

GRPCD which are economic or in production have ore zones with .4 - .8% Cu and .5 - .7 g/t Au and some up to .9 g/t Au. The Au and Cu contents are approximately proportional. SEDGZ generally have low Cu values in the Au zones and about 1 g/t Au with the Cu zones. Generally the Au zones overlie the Cu zones. DDH 19 has 57.6 m of .04% Cu and 2.16 g/t Au. Lower in the hole a Cu section has .68% Cu and .93 g/t Au. The thickest Cu section intersected is 51.9 m of .62% Cu and .89 g/t Au in DDH 37.

## Petrographic Suite

GRPCD are commonly in shoshonitic intrusives, calc-alkaline quartz diorites and less commonly are in adamellite and latite porphyries. The ore zones are within or mainly within the stocks. SEDGZ are associated with alkaline albite syenite, syenite, quartz syenite, granite and alaskite. The mineralized zones are in andesites underlain by or a significant distance from syenites. No significant Au values have been located in intrusive rocks.

## Wallrocks

The wall rocks for GRPCD are commonly andesitic volcanics but many other rock types occur. The deposits seem unrelated to wall rock type. The SEDGZ are entirely within andesites. In two of the three extensive mineralized areas a thick andesite breccia makes the best host rock.

## Alteration

GRPCD have Au in feldspar stable potassium silicate alteration zones with biotite and subordinate K-feldspar. In general the significant minerals are biotite, quartz and magnetite, lesser K-feldspar, anhydrite and chlorite and minor or absent epidote, diopside, garnet and scapolite. The SEDGZ are in feldspar stable, potassium silicate alteration zones with K-feldspar, quartz and pyrite. Sericite may be absent or abundant at the expense of K-feldspar.

Abundant transparent quartz of replacement origin in the form of stockworks and intervening silicification accompanies GRPCD, except in the B.C. Intermontaine district. Intense silicification and less commonly fine quartz veining zones characterize the SEDGZ. However, at Sulphurets, large zones of intense quartz veining with feldspar stable alteration also occur which contain no significant Au or Cu.

A sericitic zone may or may not be present in the GRPCD and no significant Au occurs with sericitic alteration if it is present. The SEDGZ vary from slightly sericitic to dominantly sericitic. The sericitic Snowfield Gold Zone probably is the product of phyllic overprinting on an originally K-feldspar dominant alteration assemblage.

Other Associations

GRPCD have Au associated with 3 - 10% magnetite. The SEDGZ have no detected magnetite.

GRPCD are associated with generally low Mo contents, commonly 30 ppm. The SEDGZ are within a environment having elevated Mo contents. The Cu-bearing sections in and below the Au zones have .01 to .03% Mo.

The pyrite content of GRPCD is low (1 - 4%?) and pyrite is locally uncommon. The SEDGZ generally have abundant pyrite (10 - 40%). However, not all the pyritic areas contain anomalous amounts of Au.

The Au in GRPCD is free. Free gold is common in minute grains in the Canyon Zone at Sulphurets and has been observed once in the Sulphurets Breccia Zone.

GRPCD commonly have a high flourine content. The primary high fluroine content lowers the solidus of the magma and increases the solubility of water in the melt which promotes the formation of a late magmatic hydrous potassium silicate melt. A few analyses indicate about 1500 ppm F in the SEDGZ and the Moly Zone has a halo of up to 8000 ppm F. Fluorite veins have been observed in two Mo-bearing areas.

## Sulphurets Epithermal Disseminated Gold Deposits Compared to Epithermal Gold Deposits

The nature of the mineralization and alteration in the Sulphurets disseminated gold zones is quite different from most epithermal gold deposits (EGD). The only strong similarity between the two is their association with volcanic rocks.

### General

EGD are stock work, vein or breccia zones commonly in explosion or collapse breccias over volcanic necks or along the margins of calderas and caldera resurgent domes. SEDGD occur in andesite breccias and massive andesites. No volcanic neck, vent or caldera features are known.

## Alteration and Mineralization

EGD have discrete alteration halos developed around highly permeable zones of stockwork fracturing or brecciation. Gold occurs with silicification and sericite or K-feldspar. The deposits are commonly zoned downwards from Au - Ag to Pb - Zn to Cu - Mo and the overall sulphide content is low. The SEDGD consist of Au associated with a high pyrite content in zones of silicification and K-feldspar or sericite which are controlled by permeability or structures. The deposits are zoned downwards from Au to Cu - Mo with lower Au values.

## Other Features

EGD are commonly associated with anomalous amounts of Te, F, Mo, La, Sb, Mn and Ba. F and Ba are common in the gangue and Mo is minor but ubiquitous. At Sulphurets F is present in anomalous amounts and Hg and or As appear to correlate closely with Au. Mo is only present in anomalous amounts with the associated Cu mineralization.

## The Breccia zone of the Sulphurets Gold Zone

### General

In the Breccia Zone, the best Au values occur in an andesite breccia with silicification, pyrite, K-feldspar and minor sericite and chlorite. The pyrite content varies from about 15 to 40%. Intense silicification probably correlates best with higher Au values. The lower portion of the gently north west dipping breccia unit contains the areas of higher ( .1 oz/t) Au values.

The breccia unit is underlain by a weakly silicified, K-feldspar and chlorite altered, low pyrite zone with Cu, Mo and low Au. This zone is at least 54 m thick.

The breccia unit is overlain by an erratically altered zone at least 60 m thick. Au values are low but local sections contain .1 oz/t Au.

### Work Done

Six holes have been drilled in the Breccia Zone from 3 locations. Granduc drilled 3 holes in the easterly portion of the zone in 1968. The area has been mapped and chip sampled. One timber covered area was soil sampled.

Dimensions

The Breccia Zone is drill indicated for 230 m and up to 650m in an east-west direction and open if it is continuous with DDH 6 (Granduc's hole with .04 oz/t Au over 27.4 m). The Breccia Zone is part of an area of alteration, mineralization and anomalous Au contents which extend for 1.0 to 1.2 km in an east - west direction.

The zone has only been extended into the mountain in a north-south direction on one section by DDH 12, 38 and 39. It continues at least 200 m to the north and the best grades (.077 oz/t Au over 30 m in DDH 39) were obtained 200 m in from the cliffs. A second hole to the north, DDH 37, on section with DDH 19 and 20, failed to intersect the breccia or significant Au values. Apparently the breccia unit had not been deposited, did not form (if it is steam brecciated andesite) or was displaced by faulting. However, where the breccia was expected the hole intersected silicification, weak? K-feldspar, 1-5% pyrite and 51.95 m of 0.62% Cu, 0.02% Mo and 0.026 oz/t Au.

The breccia unit appears to thicken to the west and northwest. It has a maximum vertical drill thickness of 95 m and up to 165.9 m of 0.033 oz/t Au has been drilled, including waste sections and lower grade sections, in the upper parts of the holes.

## Grade and Tonnage

About 20,000,000 tonnes of about 0.05 oz/t Au can be inferred from 5 drill holes assuming dimensions of 650 m long by 200 m wide by 50 m thick at S.G. = 3.2. This does not include Cu-Mo-Au mineralization below the main Au section.

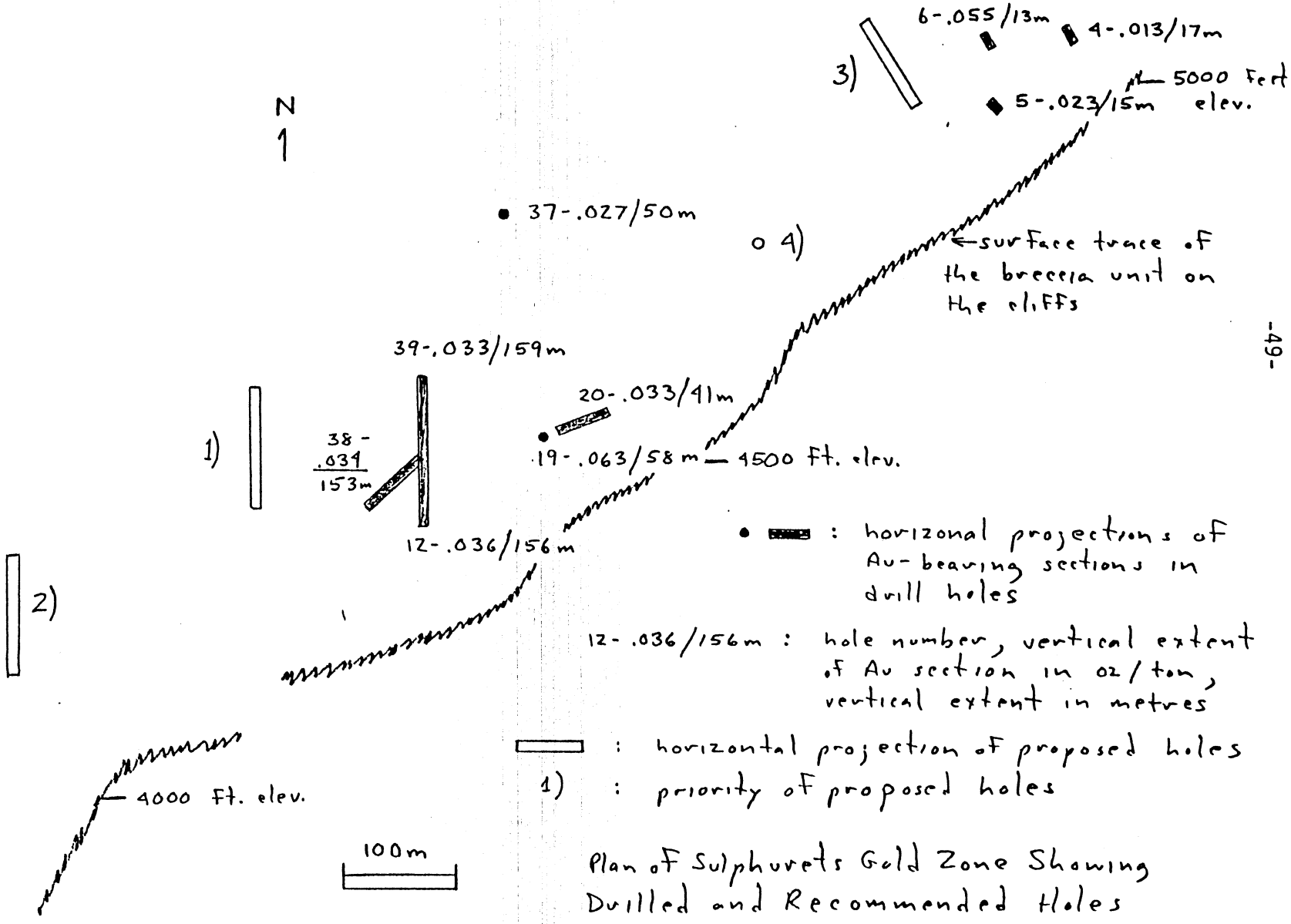
## Recommendations

If drilling continues on the Breccia Zone, the following drilling, shown on Figure 2, is recommended:

1. A 600 foot hole at -90° and a 700 foot hole due north at -70° drilled on a section 150 m west of DDH 12, 38, 39 to follow the breccia unit.

2. Contingent on proposal (1.), a 700 foot hole at -90° and a 700 foot hole due north at -70° drilled 200 m west of (1.) to test an area with anomalously high Au assays.

3. A 500 foot hole at -60° drilled south to southeast to check whether the intersections in Granduc's holes are in the same breccia unit as the Breccia Zone.




• ▬ : horizonal projections of Au-bearing sections in drill holes

12-.036/156m : hole number, vertical extent of Au section in oz/ton, vertical extent in metres

▭ : horizontal projection of proposed holes

1) : priority of proposed holes

Plan of Sulphurets Gold Zone Showing Drilled and Recommended Holes

Figure 2 - 1981 Report

Figure 1

4. A 700 foot hole at -90° to test an area where there is a thin exposure of the breccia unit and sections with excellent disseminated chalcopyrite on the cliffs below the breccia exposure. This hole would help to determine the relation between the Au content of the breccia unit and underlying chalcopyrite plus minor molybdenite mineralization.

## The Canyon Zone of the Sulphurets Gold Zone

### General

The Canyon Zone is the westerly extension of the Breccia Zone. Gold occurs in altered andesite with silicification, quartz veining, pyrite and sericite. Gold values correlate roughly with silicification and to a lesser extent with a higher pyrite content. A high proportion of the Au may be free, occurring as fine flakes mainly adjacent to thin quartz-pyrite veins.

The mineralized zones appear to be controlled by high-angle fracture and fault zones and by low-angle feeder structures which are now massive, multi-veined quartz masses. Some Cu is associated with the areas of Au but generally the higher Cu and Mo values occur below the Au zones.

## Work Done

The mineralized area has been mapped and sampled as well as conditions permit. Six holes have been drilled from three locations.

## Dimensions

The Canyon Zone is about 150 m long in an east-west direction, bounded by a fault on the east side and open on the west. The north-south horizontal direction is probably 200 m. The vertical extent of mineralization is 28 - 112 m and open uphill.

Since only four holes have been drilled in mineralization and most exposures are on steep slopes or cliffs, the geometry of the mineralized zones is poorly known. The zones appear to be elongate tabular zones adjacent to high-angle faults or more irregular sub-horizontal (?) zones above low-angle structures.

## Grades and Tonnage

The best grades over significant intervals are only .03 to .04 oz/t Au. Sections of about .1 occur but are not as abundant as in the Breccia Zone and do not occur in a consistent pattern. Tonnage can not be estimated at this time.

## Recommendations

The following drilling is recommended if Au grades of .03 to .04 and possibly up to .06 are considered feasible exploration targets:

1. A 600 foot hole at -90° drilled in an intensely pyritic and silicified area northeast of DDH 26, 27. A drill site has already been cut on a forested cliff at this proposed location.

2. A 500 foot hole at -60° drilled southeast from above the west bank of Canyon Creek to examine a section with minor pyrite veins and local chalcopyrite-molybdenite-tourmaline zones with an average Au content of about .03. A drill site has been cut for this location.

## The Snowfield Gold Zone

### General

The Snowfield Gold Zone is in an area of andesitic (?) volcanic breccia surrounded by mainly basic tuffs. Au occurs with about 10% pyrite disseminated in rock with variable proportions of sericite and chlorite. A strong penetrative foliation averaging

091°/60° N, and a weak subparallel foliation, obscure any bedding or original structural relationships. Traces of molybdenite occur in the Au-bearing and surrounding areas.

The Snowfield Gold Zone is south of a quartz flooded area drilled by Granduc for Mo in 1968. The quartz flooded area appears to be a Mo-bearing quartz-pyrite relict from deep hypugene oxidization caused by meteoric water flow initiated by late-stage intrusives. On a large scale, the eastern half of the north side of Mitchell-Sulphurets ridge is probably a phyllic overprinting on an originally K-feldspar dominant potassic zone.

Work Done

The Snowfield Gold Zone was discovered by lithogeochemical sampling in 1980. Outcrop areas sampled in 1980 were trenched and chip sampled in 1981 confirming the Au contents. The area has been mapped and partly sampled. Granduc drilled two holes in 1968 north of the zone. The bottom of DDH 8 projects just into the edge of the Au zone at a depth of about 200 - 250 m. The core was not assayed for Au.

Dimensions

The area of significant Au values is poorly defined. In plan it covers an area about 330 m by 250 m. The south side of the

zone is covered by the down-hill edge of the permanent icefield along the crest of Mitchell-Sulphurets Ridge. The Au zone is on a slope averaging 16°. Overburden on the Au zone is probably a maximum of 1 - 2 m thick and the ice cap over the south edge of the zone is probably thin (10 to perhaps 50 m?).

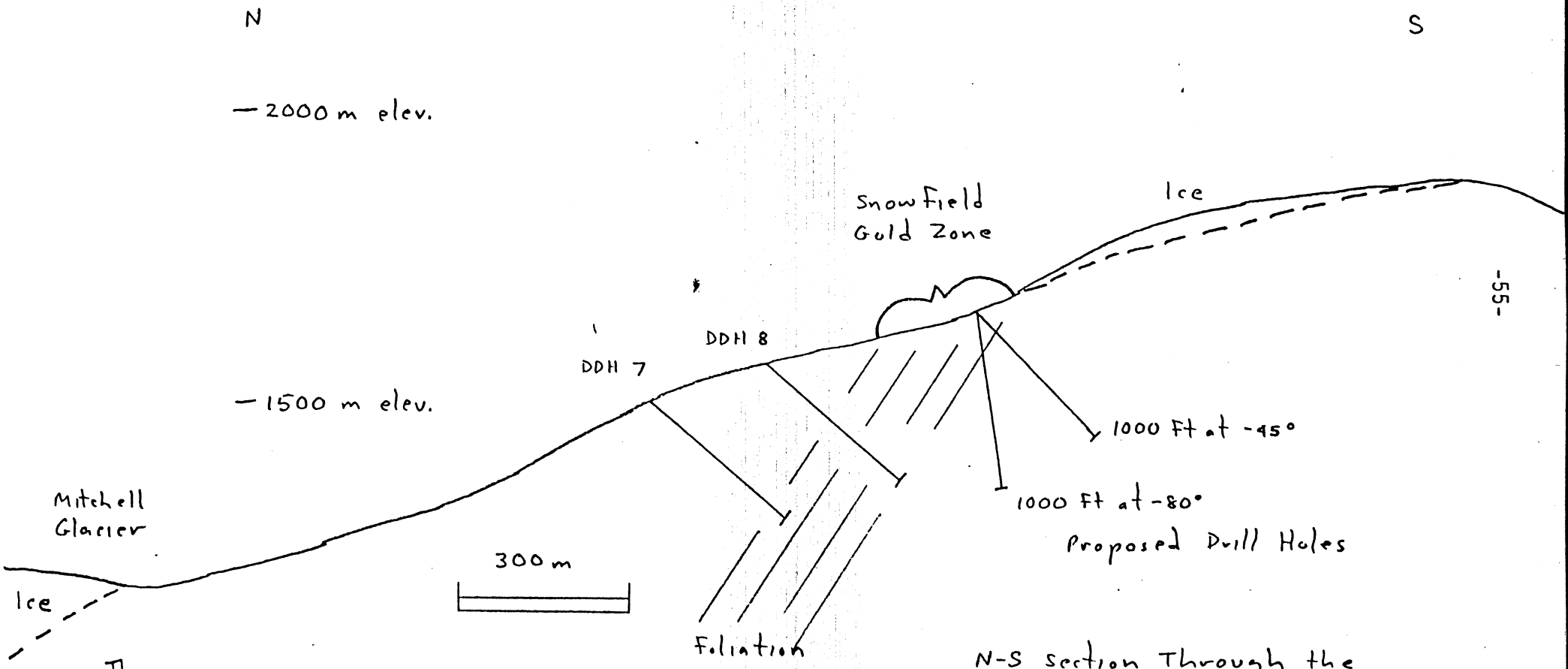
## Grade and Tonnage

Trenching in the area of Au mineralization indicates average grades in the range of .04 to .08 oz/t Au. The area has excellent potential for bulk mineable ore but not enough work has been done to estimate grade and tonnage.

## Recommendations

All the outcrop areas in the Snowfield Gold Zone should be trenched to determine the grade at surface and precisely define the boundaries of the zone. Drilling should be done to test the vertical dimension of the mineralized zone and to extend exploration to the south where the zone is covered by an ice sheet.

Figure 3 shows two recommended holes drilled due south at -45° and -80°. The holes would be drilled close to the ice sheet. The recommended holes are 1000 feet long but may be drilled further or terminated before 1000 feet depending on the interpreted results.




N-S section Through the Snow Field Gold Zone showing the Proposed Drill Holes

Figure 3 - 1981 Report

Figure 2

## SULPHURETS EPITHERMAL VEINS

### Classification

The quartz-precious metal veins on the Sulphurets property can be classified as four types:

1. vuggy infilling of fault breccia and quartz-carbonate veining (367 Area).

2. mineralized patches and veins probably with some continuity within zones of intense silicification and veining (Brucejack Peninsula Area).

3. vein stockworks and minor related isolated veins (South Brucejack Area).

4. extensive, massive quartz-pyrite veins (Iron Cap Area).

The vein characteristics, Au:Ag ratios and asociated mineralogy indicate that the four types may represent vertical zonation of epithermal conditions from type 1 near surface to types 2 and 3 at moderate depths above the zone of boiling in the vein system to type 4 at a greater depth. If this vertical zonation is true then the Iron Cap veins would have the lowest potential for containing economic grades.

## Characteristics of the Sulphurets Epithermal Veins

Type 1:

The type 1 veins occur in zones of tectonic brecciation between parallel faults. They are at an oblique angle to the faults and probably resulted from zones of distension forming between the faults due to movement on the faults. Vuggy crystalline quartz fills the voids between breccia clasts and quartz and quartz-carbonate veins cut the areas of breccia infilling and spread beyond them. Sericitic alteration is very weak and there is no halo around the zone. The sulphide content is very low. Minor arsenopyrite and pyrite occur and sphalerite and galena were observed only in isolated trace amounts.

Type 2:

The type 2 vein zones occur parallel to and in between splay faults associated with the north-south Brucejack Fault. Areas between parallel faults have been intensely silicificed by random stockworks and are surrounded by sericitic wallrocks. It appears that the 15 - 20 m wide silicified core between faults was rebroken and reveined by metal-bearing fluids. Mineralization is characterized by trace pyrite in quartz veins with weakly pyritic wallrocks and minor sphalerite, galena, argentite, tetrahedrite, electrum and other Ag-bearing minerals in quartz veins. Au correlates with Ag and Hg and locally with Zn, Pb and Sb. As

occurs in the wallrocks. Barite veins are common. The highest grades of Au and Ag occur in intensely shattered, massive quartz, flooded with argentite and electrum.

Type 3:

The type 3 veins do not have an obvious relationship with faults. They are mainly about normal to the dominant fault set in their area. The type 3 veins occur as isolated quartz veins or stockworks of mainly sub-vertical orientation. The veins contain tetrahedrite, minor sphalerite and galena and trace pyrite. The vein zones are within broad areas of pervasive silicification and sericitization. The Au-bearing veins correlate with anomalously high Hg, Ag, Pb and Zn. Anomalous As levels occur in the adjacent wallrock.

Type 4:

The type 4 veins are sub-parallel to the trend of the Brucejack Fault and correspond to one of three main fault sets in the area. The veins consist of massive and uniform quartz with 5 - 10% disseminated pyrite. They are within a broad area characterized by silicification and sericitization (Egan, 1981). Immediate vein wallrock is only slightly more sericitic than rock hundreds of metres from the veins. The veins contain minor tetrahedrite and magnetite and trace chalcopyrite, molybdenite, sphalerite and galena. Higher Au values appear to correlate with tetrahedrite and magnetite.

One ubiquitous feature of productive Au-Ag epigenetic veins which is totally lacking at Sulphurets is the cockade structure, crustified banding and vein brecciation which is usually interpreted to be the product of multiple fluid injection into the vein structures. Multiple fluid flow in many epigenetic ore deposits may have been responsible for building up the grades to economic levels.

The Sulphurets veins are commonly within broad halos of sericitic alteration and some have associated barite veins. This may indicate that the precious metal rich sections of the veins are at depth associated with propylitic wallrocks with narrow halos of sericitic alteration.

With the exception of the Iron Cap and a few of the South Brucejack veins, most of the Sulphurets veins are complex irregular stockworks or sheeted stockworks. This makes it difficult at the exploration stage to define a precise structure in which the Au and Ag occur.

## Brucejack Peninsula Area - 28 Area

### General

A silicified zone in arkose occurs between, and parallel to,

faults which are at 45° to the Brucejack Fault. The zone contains low Au-Ag values and strikes along the northeast shore of the peninsula in Brucejack Lake. It consists of pervasive silicification and veining with Au and Ag associated with minor pyrite, galena, sphalerite, tetrahedrite and possibly pyrargyrite. Foliation in the country rock dips about 70° to the northeast and the silicified zone and parallel faults are assumed to have a similar dip.

Three holes were drilled towards the northeast with the dip of the foliation because the showings located at that time were too close to the lake to drill to the southwest. Two and possibly three vein zones were intersected. One vein zone, which was intersected in all three holes, consists of intense silicification and veining similar to the surface showings. However, it appears that the zone is parallel to the surface silicified zone, projects to surface under the lake and along a topographic low which is probably a fault. The three intersections were not distinct vein structures. One had electrum and no visible Pb-Zn, one had very minor Pb-Zn and the other had more Pb-Zn and adjacent electrum. All three intersections are in zones of intense quartz veining and may constitute one or possibly two mineralized vein zones.

The second mineralized zone intersected in drilling is a zone of 6 - 8% pyrite in foliated, sericitic arkose ? with disseminated

sphalerite and galena and minor quartz veins. The Au-Ag section can be detected visibly by the slight increase in pyrite and the sphalerite (0.85%) and galena (0.17%) content (weight percent mineral calculated from Zn and Pb analyses).

Work Done

Two holes at $-45^{o}$ and on at $-70^{o}$ were drilled from two locations 30 m apart. The holes were drilled on mineralized vein zones which were found, mapped and trenched in 1981. Twenty six outcrops were trenched and sampled.

Dimensions

The silicified zone at surface which strikes along the northeast slope of Brucejack Peninsula is exposed for 320 m and trenched along 180 m plus additional scattered trenches. The zone averages 15 - 20 m wide and is between faults about 60 m apart. The zone is lost in swampy ground to the northwest and projects into Brucejack Lake at the southeast end of its exposure. Two trenches, numbers 8 and 11, may represent northwesterly extensions of the vein zones intersected in the three drill holes. However, north-south faults with unknown displacement occur between the trenches and the drill intersections. The trenches are on strike with the drill intersections if the intersected zone strikes

parallel to the surface silicified zone and the adjacent faults. The farthest and highest grade trench is 430 m beyond the drilled area and the total distance between trench 11 and the end of Brucejack Peninsula is 580 m.

Grade and Tonnage

The vein zones are drilled on two sections 30 m apart and the zones are not exposed at surface. Hence any tonnage calculations are premature.

The quartz vein stockwork intersections are (possible true thickness in brackets)

| | | | |
|---|---|---|---|
| DDH 28 | 69.00 - 72.00 = 3.00m (2.1) | 1.49 Au | 1.89 Ag |
| DDH 29 | 160.81 - 177.00 = 16.19m (6.1) | 0.10 Au | 0.74 Ag |
| DDH 30 | 78.00 - 81.00 = 3.00m (2.3) | 0.28 Au | 5.90 Ag |

The trenches which may be surface expressions of these intersections are:

| | | | |
|---|---|---|---|
| Trench 8 | 3.0 m | 0.060 Au | 0.59 Ag |
| Trench 11 | 2.0 m | 0.063 Au | 46.20 Ag |

The pyritic section in DDH 28 which has only been intersected once and is not known at surface has:

| | | | |
|---|---|---|---|
| 120.00 - 126.00 = | 6.00m (4.7) | 0.58 Au | 3.53 Ag |

## Recommendations

Seven holes totalling 2250 feet and 700 feet of contigency drilling in 2 holes is recommended to test the vein zones on two 60 m spaced sections, one 30 m step out to the southeast, which would have to be drilled with the foliation, and short holes under trenches 8 and 11.

1. Two 60 m spaced sections to the northwest of DDH 28, 29 and 30: 2 - 45° holes, each 325 feet and 2 - 70° holes each 325 feet.
2. One 30 m spaced section to the southeast: 1 - 45° hole, 450 feet. (1.) and (2.) will test a total of 210 m of strike length.
3. One 45° hole of 250 feet under each of trenches 8 and 11 and one 70° hole of 350 feet at each site if a vein structure is intersected in the 45° holes.

## Brucejack Peninsula Area-Discovery Area

### General

The Brucejack Peninsula can be divided into three areas by faults. The northern (28 area) and central area are elongate fault blocks trending about 120°. The northern area has an

intensely silicified zone with low Au-Ag values along its axis. The central area consists of arkose with only minor quartz veining. The southern area or Discovery Area consists of arkose, arenite and tuffs with ubiquitous silicification, sericitization and veining. We have been unable to define any orientation that we have confidence in to the mineralized structures.

In 1980 Larry Ferguson located a patch of intensely shattered quartz vein impregnated with argentite and electrum. It assayed 30.0 Au and 664.0 Ag over 1.0 m. In 1982 a silicified mass adjacent to the discovery site was trenched. Values were low except for a 3 m section of 0.25 Au and 23.75 Ag (trench 2).

A quartz-barite vein 45m northwest of trench 2 assayed 0.12 Au, 6.95 Ag over 2.0 m in trench 6 and 0.10 Au, 2.55 Ag over 1.5 m in trench 1.

DDH 30 was drilled from 50 m north of trench 1 and 6 to check a broad area of silification and high Ag background, trench 1 and 6, the discovery area and trench 7 and the area at the south tip of Brucejack Peninsula.

DDH 30 intersected a broad zone of high background Ag and two silicified and mineralized zones that appear to correlate with trenched areas. The section from 4.0 m to 133.0 m averaged 0.40

to 0.42 Ag excluding local sections of higher grade. Beyond 133.0 m the grade dropped to 0.11 to 0.12 Ag.

The section 73.90 m to 74.98 m assayed 0.04 Au and 9.39 Ag. It correlates with trench 1 and 6 and indicates that the vein zone has a strike of about 090/90.

The section from 99.84 to 115.00 m appears to correlate with the discovery outcrop (trench 2 area). Although the section only assayed 0.034 Au over 15.16 m with short sections up to .15 to .27 Au, and seven other sections in DDH 30 have higher Au contents, the Au and Ag content and intense silification appear to correlate with the discovery outcrop. This indicates that the discovery outcrop has an orientation of about 050 - 070/75$^{o}$ N, projects mainly through overburden covered areas, and has a similar orientation to many of the quartz and barite veins located just south of the vein projection.

Work Done

Six outcrops were trenched and sampled and two holes were drilled, DDH 30 and 31, at -45$^{o}$ and -70$^{o}$ from one location.

## Recommendations

A combination of trenching and soil sampling should be tried to identify the orientation of the structure associated with the discovery area. Drilling is recommended contingent upon intersecting encouraging grades in other veins in the Brucejack Lake area. Drilling a series or fan of short (100 to 150 foot) holes could be considered from a location 15 to 20 m north of the discovery outcrop.

## South Brucejack Area

### General

The precious metal areas in the south Brucejack grid area are characterized by discrete quartz veins or vein stockwork zones within broad areas with introduced silica, sericite, pyrite and some K-feldspar. The mineralized structures identified to date have short strike lengths and are narrow or contain narrow sections of significant Au-Ag values. The area is intensely faulted. Mineralized zones do not have any obvious correlations with faults or fault bounded areas.

The following is a description of the four areas of interest in South Brucejack:

1. A quartz vein stockwork zone 100 m long and a maximum of 53 m wide was drilled in DDH 33, 34, 35 and 36. The zone is widest in the drilled area and pinches out to the east. The trend of the stockwork appears to be about 290° with dips very steeply north. The foliation in the area is about 280 - 290°/65°. N.

   The four holes intersected the stockwork zone but only cut scattered Au intersections with the best being 0.48 Au over 2.15 m in DDH 34. Although the Au values appear to correlate with sub-vertical veins it is possible that the higher grade (.2 - .5 Au) sections in all four holes are part of an unknown structure which dips gently to the north.

   Multielement analyses from DDH 33 indicate that Au correlates very well with Hg, well with Zn, moderately well with Ag and Pb and very poorly with As and Sb. A zone with 2.8 to 3.5 X the As background occurs within 10 m of the south side of the stockwork based on one hole. If the As halo correlates with the Au rather than the stockwork it could be useful in determining the orientation of the Au-bearing structure.

2. A well mineralized outcrop occurs in a moraine covered area at 1 + 87 W, 2 + 55 S. It is 50 m from the next closest

outcrop area and 130 m west of DDH 35 and 36. It is possible that it is part of the mineralized system described above. Although the outcrop only assayed .036 Au and 1.9 Ag over 5.1 m it is definitely anomalous in Au and Ag and contains abundant galena. It may be closely associated with veins with higher Au and Ag contents.

3. A poorly exposed quartz-tetrahedrite vein occurs at 0 + 90 W to 1 + 20 W and 3 + 15 to 20 S in an area of extensive moraine cover near the edge of an ice sheet. It contains .5 Au and 8.0 Ag over 1.0 m and .18 Au and 13.9 Ag over 2.0 m in two trenches 17 m apart. The vein was not intersected in the lower part of DDH 35 and 36 about 37 m east of the vein outcrop. The area west of the vein is covered for at least 200 m.

4. A quartz vein with some gray Ag-bearing minerals occurs at 0 + 20 to 60 E and 0 + 85 S. It is exposed for 27 of 40 m along its strike. A grab sample on the east end of the vein assayed 5.9 Au and 543.0 Ag. Possible strike extensions of the vein are covered to the east and in mainly unmineralized rock to the west. The vein is probably about 20 to 100 cm thick.

5. A new high-grade electrum float discovery was made about

400 m south of the southwest corner of Map 55. It contained a 1 cm band of about 20% electrum by volume in a 4 cm quartz vein. The quartz was intensely shattered and identical to the quartz in the discovery outcrop.

Work Done

Four drill holes from two locations and three trenches.

Recommendations

The South Brucejack area is at an early stage of exploration. The potential cannot be assessed at this time but the presence of .1 to .5 Au and local high-grade Au and Ag indicates that additional work must be done. Trenching and detailed mapping is recommended and the following 2500 to 3250 feet of drilling:

area 1) One 600 foot hole at -70° to -75° north of DDH 33, 34 to test the stockwork at depth and also test for possible low-angle veins, plus one 250 feet contigency hole if a low-angle structure is indicated by the first hole.

area 2) A 350 foot hole at -45° and a 500 foot hole at -70° due south.

area 3) A 200 foot hole at -45° and a 350 foot hole at -70° drilled due south.

area 4) A 200 foot hole at -45° and a 300 foot hole at -70°.

An additional 500 feet of drilling in a fan pattern or from a second setup would be contingent upon the first two holes.

## 367 Area

### General

The 367 Area is a zone of tectonically brecciated andesite with a matrix of vuggy quartz, quartz veins and carbonate veins. It occurs in an 050° trending cross fracture zone adjacent to the first north-south fault west of the Brucejack fault. The zone occurs mainly between north-south faults, cross cuts the faults and fades out across the fault. The breccia matrix and veins contain minor arsenopyrite and galena. There is only slight sericitic wallrock alteration.

### Work Done

Geological mapping and a total of 36.15 m of trenching and chip sampling has been completed.

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