

1990 SUMMARY REPORT

*R. V. KIRKHAM*

on the

UNUK RIVER PROJECT

(Unuk, Coul, Icey, Knip, Bou and Irv Claim Groups)

SKEENA MINING DIVISION

NTS 104B/9 & 104B/10

56°35' Lat., 130°20' Long.

802701

Owners:

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Ashworth Explorations Ltd., and Granges Inc.

Operator:

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DECEMBER 20, 1990

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## SUMMARY

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The 1990 Unuk River Project field season involved exploration activities for the second year of a three year program proposed to fulfill the terms of an agreement between the property joint optioners, Springer Resources Ltd. (75%) and Cove Energy Corporation (25%) and the optionee, Granges Inc. A total of \$1,072,997.30 was expended.

Work concentrated on priority target areas established in the 1989 program in the Zone 1 Area (covered by claims Unuk 14 and Unuk 26), the "R" Grid (Coul 1) and the Beedee Zone (claims Unuk 18 and Unuk 19), as well as the development of new targets in the U2 Grid Area (claims Unuk 11 and Unuk 12).

Exploration in the **Zone 1 Area** included remapping and sampling, IP survey over priority targets selected from pre-existing geochemical and geological data, followed by diamond drilling (13 holes @ 2698 m). Only trace gold values were encountered in drilling the sheared felsic-sedimentary contact north of 1200N. Anomalous gold values up to 7.91 g/t across 0.4 m were encountered in diamond drilling of the Cliff Zone between 700N and 1200N. Anomalous gold values up to 3.77 g/t Au across 1.00 m were returned in drilling the AP structure north along strike of the collar of drill hole AP-4 (drilled in 1989). Continued work, including diamond drilling, is recommended for the AP Zone and Cliff Zone structures in 1991.

Remapping of the **"R" grid** verified favourable "Eskay Creek" stratigraphy. Targets were established from geological, geochemical and geophysical data. Diamond drilling (3 holes at 656.6 m) yielded discouraging results. Since favourable rock types are encountered within and north of the Creek Zone, a re-examination of this portion of the stratigraphy of the "R" grid is recommended.

Mapping and resampling in the **Beedee Zone Area** have indicated that gold mineralization is located in narrow contact aureoles peripheral to what are likely altered mafic dikes. The area may have potential if a larger dike with a larger contact aureole or a close-spaced dike swarm can be located.

From five target areas produced in preliminary exploration of the U2 grid area in 1990, three have been selected for continued exploration in 1991. These include:

- 1) **Bruno's Showing** (gold values of up to 15.7 g/t in breccia veins in close proximity to a major airborne magnetic/resistivity anomaly).

- 2) **U2 North Zone** (low gold values associated with arsenopyrite occur in a structural and stratigraphic setting similar to the Zone 1/AP Zone area).
- 3) **Stibnite Showing** (low gold values associated with arsenopyrite and stibnite mineralization in a structure which has been traced along strike for 150 m).

In addition to the recommended exploration in the Zone 1, "R" grid, Beedee Zone and U2 grid areas, a re-examination of the Coul 2 claim geology is recommended in light of substantial Eskay Creek type mineralization being traced by American Fibre Corporation to within 2.0 km of the north boundary of the claim.

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(1:1000 scale)

Map Pocket

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(1:1000 scale)

Map Pocket

*Maps in tube*

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## 1990 SUMMARY OF FIELD ACTIVITIES

### UNUK RIVER PROJECT

#### 1. INTRODUCTION

The area encompassed by the report comprises a 33-claim group known as the Unuk Claim Group, a 4-claim group known as the Coul Claim Group, the 2-claim Knip Group, a 3-claim group known as the Bou Claim Group and the single claim Irv (**Figure 2**). The property comprises 683 recorded units or approximately 17,075 hectares. The claims are recorded as follows:

PROJ NAME	CLAIM #	CLAIM NAME	CLAIM SIZE	DUE DATE
UNUK OPTION	5217	BOU 1	6.00	1993/02/28
UNUK OPTION	5218	BOU 2	15.00	1993/02/28
UNUK OPTION	5219	BOU 3	20.00	1993/02/28
UNUK OPTION	5220	KNIP 1	16.00	1993/02/28
UNUK OPTION	5221	KNIP 2	20.00	1993/02/28
UNUK OPTION	5223	ICEY 1	8.00	1993/02/28
UNUK OPTION	5224	ICEY 2	9.00	1993/02/28
UNUK OPTION	5213	COUL 3	20.00	1994/02/28
UNUK OPTION	5214	COUL 4	20.00	1994/02/28
UNUK OPTION	5225	UNUK 1	20.00	1994/02/28
UNUK OPTION	5226	UNUK 2	20.00	1994/02/28
UNUK OPTION	5227	UNUK 11	20.00	1994/02/28
UNUK OPTION	5228	UNUK 12	20.00	1994/02/28
UNUK OPTION	5229	UNUK 3	20.00	1994/02/28
UNUK OPTION	5230	UNUK 4	20.00	1994/02/28
UNUK OPTION	5231	UNUK 9	20.00	1994/02/28
UNUK OPTION	5232	UNUK 10	20.00	1994/02/28
UNUK OPTION	5233	UNUK 5	20.00	1994/02/28
UNUK OPTION	5234	UNUK 6	8.00	1994/02/28
UNUK OPTION	5235	UNUK 7	20.00	1994/02/28
UNUK OPTION	5236	UNUK 18	20.00	1994/02/28
UNUK OPTION	5237	UNUK 19	20.00	1994/02/28
UNUK OPTION	5238	UNUK 8	20.00	1994/02/28
UNUK OPTION	5239	UNUK 16	20.00	1994/02/28
UNUK OPTION	5240	UNUK 17	20.00	1994/02/28
UNUK OPTION	5241	UNUK 13	16.00	1994/02/28
UNUK OPTION	5242	UNUK 14	16.00	1994/02/28
UNUK OPTION	5243	UNUK 15	20.00	1994/02/28
UNUK OPTION	5245	UNUK 21	20.00	1994/02/28
UNUK OPTION	5246	UNUK 22	20.00	1994/02/28
UNUK OPTION	5247	UNUK 23	20.00	1994/02/28
UNUK OPTION	5248	UNUK 24	12.00	1994/02/28
UNUK OPTION	5249	UNUK 25	12.00	1994/02/28
UNUK OPTION	6397	UNUK 26	16.00	1994/10/01
UNUK OPTION	6398	UNUK 44	4.00	1994/10/01
UNUK OPTION	8088	UNUK 50	8.00	1994/10/07
UNUK OPTION	6479	UNUK 28	4.00	1994/10/30
UNUK OPTION	6480	UNUK 29	5.00	1994/10/30
UNUK OPTION	6481	UNUK 30	8.00	1994/10/30
UNUK OPTION	6482	UNUK 34	3.00	1994/10/30
UNUK OPTION	6483	UNUK 36	8.00	1994/10/30
UNUK OPTION	6484	UNUK 37	4.00	1994/10/30
UNUK OPTION	5222	IRV	5.00	1995/02/28
UNUK OPTION	5211	COUL 1	20.00	1997/02/28
UNUK OPTION	5212	COUL 2	20.00	1997/02/28



Malcolm Bell, Clive Ashworth, Ashworth Explorations Ltd., and Granges Inc. (Unuk 50) are the registered owners of the claims. The claims are held by Granges Inc. under option from Springer Resources Ltd. (75%) and Cove Resources Corporation (25%). The scope of this report is to present past work carried out on the property, outline areas of work in the 1990 field season, present results of 1990 field activities and finally recommend additional work required for the 1991 field season. Models utilized include epigene gold mineralization of the Brucejack or Premier deposits for structural features such as the AP Zone and Beedee Zone, and the epithermal/syngenetic Calpine model for stratigraphy encountered in the "R" grid area.

## 2. LOCATION AND ACCESS

The claims are all located in the Skeena Mining Division, approximately 1000km north of the city of Vancouver and 65km north of Stewart, B.C. on NTS map sheets 104 B/9 and 104 B/10, as shown in **Figures 1 and 2**.

Access to the area is gained by helicopter from Bell II on the Stewart-Cassiar Highway approximately 50km to the east.

The property is characterized by steep vegetation-covered slopes up to 1220m (4000 ft) elevation and alpine conditions with ice fields and glaciers at higher elevations. Elevations, on the property, vary from 244m (800 ft.) at camp to about 2286 m (7500 ft.) at the top of the Beedee Zone area.

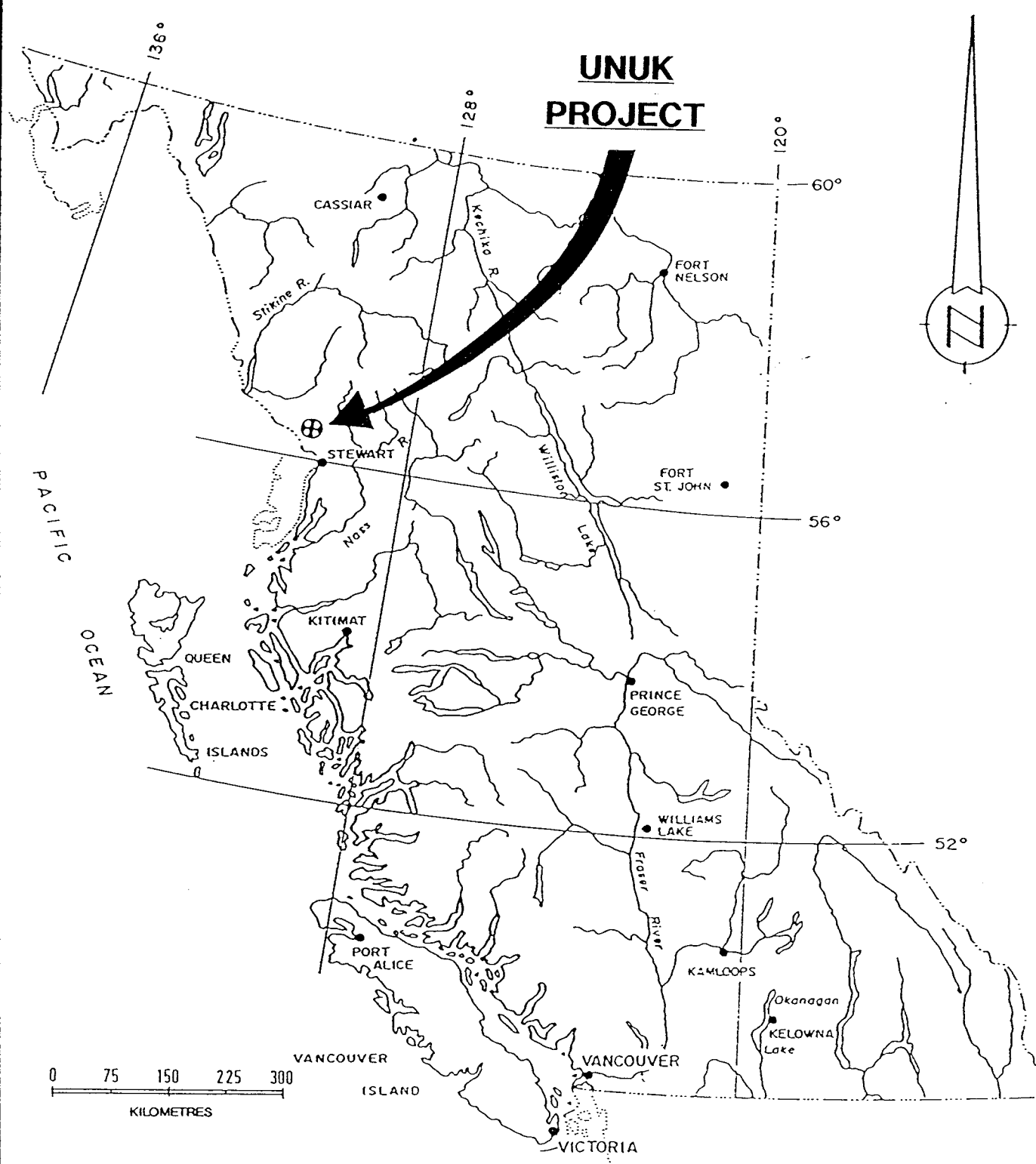
## 3. REGIONAL GEOLOGY AND MINERALIZATION

The project area is located within Stikinia along the western margin of the Intermontane tectonic belt. It is underlain by a thick volcano-sedimentary succession of Upper Triassic to Middle Jurassic age which is overlain by marine basin sediments of Middle to Upper Jurassic age (**Figure 3**).

Northeast of John Peaks a sequence of upper Triassic Stuhini Group and Lower Jurassic Hazelton Group sediments and volcanics is exposed. These units are further subdivided into three sequences which reflect increasing volcanism as time progresses:

- 1) an older shelf sequence represented by thin-bedded siltstones, immature fine-grained wackes, impure limestones and andesitic tuffs;
- 2) a crudely layered sequence of andesitic tuffs and flows with minor limestone lenses;

# UNUK PROJECT

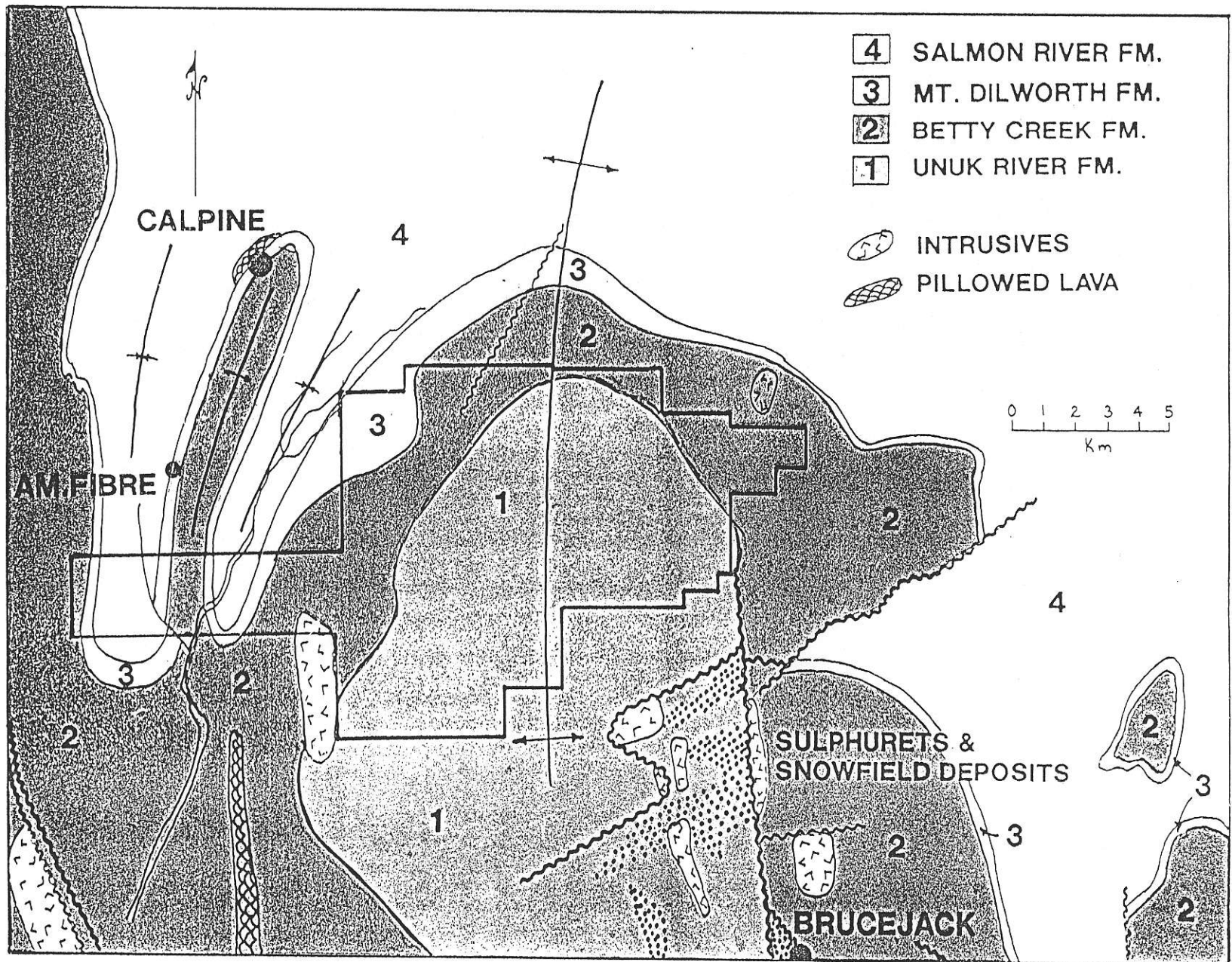


## PROJECT LOCATION MAP

UNUK OPTION  
SKEENA MINING DIVISION, B. C.



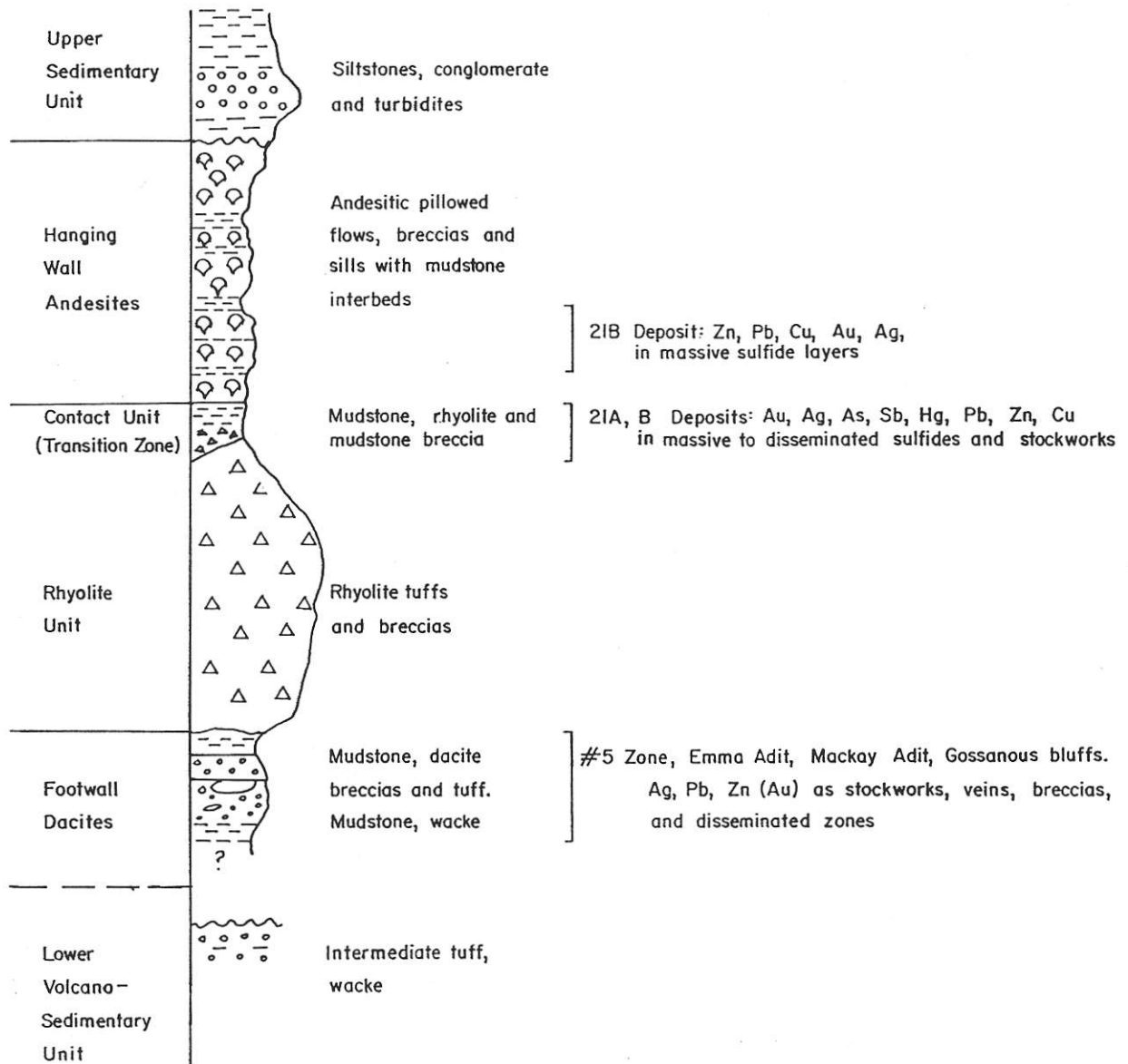
FIGURE: 1



REGIONAL GEOLOGY

FIG. 3a

Colour



Eskay Creek Stratigraphy (modified after Britton et al, 1989)

FIG. 3b

- 3) an overlying sequence of green-grey and purple andesitic to dacitic pyroclastics locally distinguished by coarse (up to 1 cm diameter) hornblende phenocrysts (Betty Creek Formation).

Lower Jurassic volcanism terminated with a thin but regionally extensive blanket of felsic pyroclastics known as the Mt. Dilworth Formation. Characteristic of this formation are variably welded tuffs, flowbanded rhyolites, bedded ash tuffs and dacitic lapilli tuffs.

Middle Jurassic Salmon River Formation rocks outcrop along the Unuk River valley and on the Prout Plateau. These consist of a thick sequence of thinly bedded turbiditic siltstones and fine sandstones correlative with the Spatsizi Group. Basal Salmon River Formation sediments, due to the coexistence of belemnite and Weyla fossils, are determined to be of Toarcian age.

Sedimentary and volcanic rocks of the project area have been cut by a variety of plutons representing at least four intrusive episodes spanning late Triassic to Tertiary time.

Major structural features apparent in the Unuk River area are north-trending folds and a major normal fault known as the Harrymel Creek Fault. A number of lesser normal faults which repeat stratigraphy are recognized at the toe of Bruce Glacier (Anderson, 1989), and there has been speculation that more such features exist in the area. The Mt. Dilworth Formation has been interpreted to be tightly folded through an anticline-syncline pair between Unuk River and Harrymel Creek and then more broadly folded through an anticline over the Unuk Claim Group. Some B.C. Department of Mines (BCDM) personnel have suggested that the tight folding west of the Unuk River may be re-interpreted as repetition of stratigraphy through faulting (Britton, personal communication, 1990).

Metamorphism has been determined to be lower greenschist facies of Cretaceous age characterized by conversion of clay minerals to white mica, saussuritization of plagioclase and chloritization of mafic minerals. Metamorphic grades may rise to lower amphibolite facies in contact aureoles peripheral to intrusives of the Coast Plutonic Complex.

### 3.1 Target Types

Two important target types exist in the project area.

- a. Gold mineralization at the Calpine or Eskay Creek deposit occurs as broadly stratabound mineralization in the 21A and 21B deposits. These are within the Contact Zone (a series of mudstones, rhyolites and tuffaceous mudstone breccias). Cross-cutting mineralization is also recognized as

stockworks underlying the 21A and 21B deposits. This includes disseminated fissure vein gold-silver-lead-zinc mineralization with variable sericite-silica alteration and minor antimony, and arsenic mineralization within the rhyolites and disseminated sulfides in veins and shears in the footwall dacites. Associated metallic sulfides of the 21A deposit include stibnite, native gold, native silver, native arsenic, mercury, wurtzite, cinnabar, arsenopyrite, tetrahedrite, realgar, amalgam, aktashite, orpiment, sphalerite, galena and pyrite. Current reserve estimates (Dec. 1990) at the 21B zone Eskay Creek are 4,360,000 tons grading 0.77 oz/t gold and 29.12 oz/t silver (proven and probable).

- b. The second gold target type is dominantly structurally rather than stratigraphically related. Original interest in the project area focused on the Brucejack deposit (Lyman, 1988; Adamec, 1988). Numerous intrusives plus volcanics and sediments of middle Jurassic age are cut by north to northwest trending faults. Intensely altered zones with sericite, K-feldspar, silica, carbonate and chlorite accompany these faults. Mineralization styles include low grade disseminations, epithermal stockworks and veins. Gold values are associated with pyrite, chalcopyrite, molybdenite, ruby silver, galena, stephanite, cerargyrite, electrum, native gold, tetrahedrite, friebertite, argentite, sphalerite and bornite. Combined reserves for the Peninsula and West Zones are estimated to approach one million tonnes grading about 10 g/t gold and 800 g/t silver. Intrusives similar to the Premier Porphyry (mineralizer at Brucejack) occur in the Beedee Zone area. Also, the AP zone is a structural feature with an alteration assemblage similar to that at the Brucejack Deposit.

Figure 3b is a stratigraphic column illustrating the position of gold, silver and base metal mineralization within felsic to intermediate volcanics and related sediments of lower to middle Jurassic age.

A correlation of general stratigraphy and specific units (like tuffaceous mudstone breccias) recognized in the Creek Zone (Gaboury, 1990) suggests some similarity between the "R" grid area and the Eskay Creek deposit.

#### 4. PREVIOUS WORK AND RESULTS

The claims discussed in this report were staked in 1986 and 1987 on behalf of Malcolm Bell, Clive Ashworth and Ashworth Explorations Ltd.

Initial work in 1986 involved an airborne VLF-Mag survey commissioned by Hi-Tec Resource Management Limited, followed by a four day follow-up examination of the property geology by J.P. Sorbara and Associates. In September and October of 1987 Hi-Tec Resource Management Limited conducted a two phase reconnaissance exploration program (totalling 28 days) to look for precious metal mineralization similar to that found in the Brucejack Lake area. Hi-Tec carried out a similar program in September 1988 (16 days) to follow up the results of the previous year and to outline other areas of interest on which to focus future exploration efforts.

These preliminary reconnaissance-style investigations defined six areas of interest.

#### 5. 1989 WORK PROGRAM

In keeping with the option agreement negotiated between Granges Inc. and Springer Resources/Cove Resources, a field camp was established in late June 1989 and an exploration program of geological mapping, geochemical and geophysical surveying and diamond drilling was conducted under the supervision of B.E. Gaboury, geologist for Granges Inc. This work is described in Gaboury, 1990.

Surface exploration activities in 1989 were initially divided between detailed work in the six areas of interest established from previous work and reconnaissance traverses in other areas (as yet unexplored) geared toward developing new targets.

Reconnaissance contour traverses involved 1:10,000 scale geological mapping, prospecting and collection of "B" horizon soil samples at 100 m intervals plus silt samples from any active streams encountered.

Detailed work on the "R" grid, "J" grid, Zone 1/AP Zone and Zone 2 areas (**Figure 4**) involved establishing surveyed control grids and collection of "B" horizon soil samples at 50 m intervals along wing lines. Ground based VLF-Mag surveys were carried out over the Zone 1 grid and the "R" grid. Follow-up work in the Beedee Zone involved more closely spaced reconnaissance traverses in an attempt to locate the source of highly anomalous soils collected by Hi-Tec Resource Management Ltd.

The last four weeks of the program involved 911 m of preliminary diamond drilling on the south end of the Zone 1 area (AP Zone) and the "Creek Zone" of the "R" grid. A total of \$1,030,606.00 was expended.

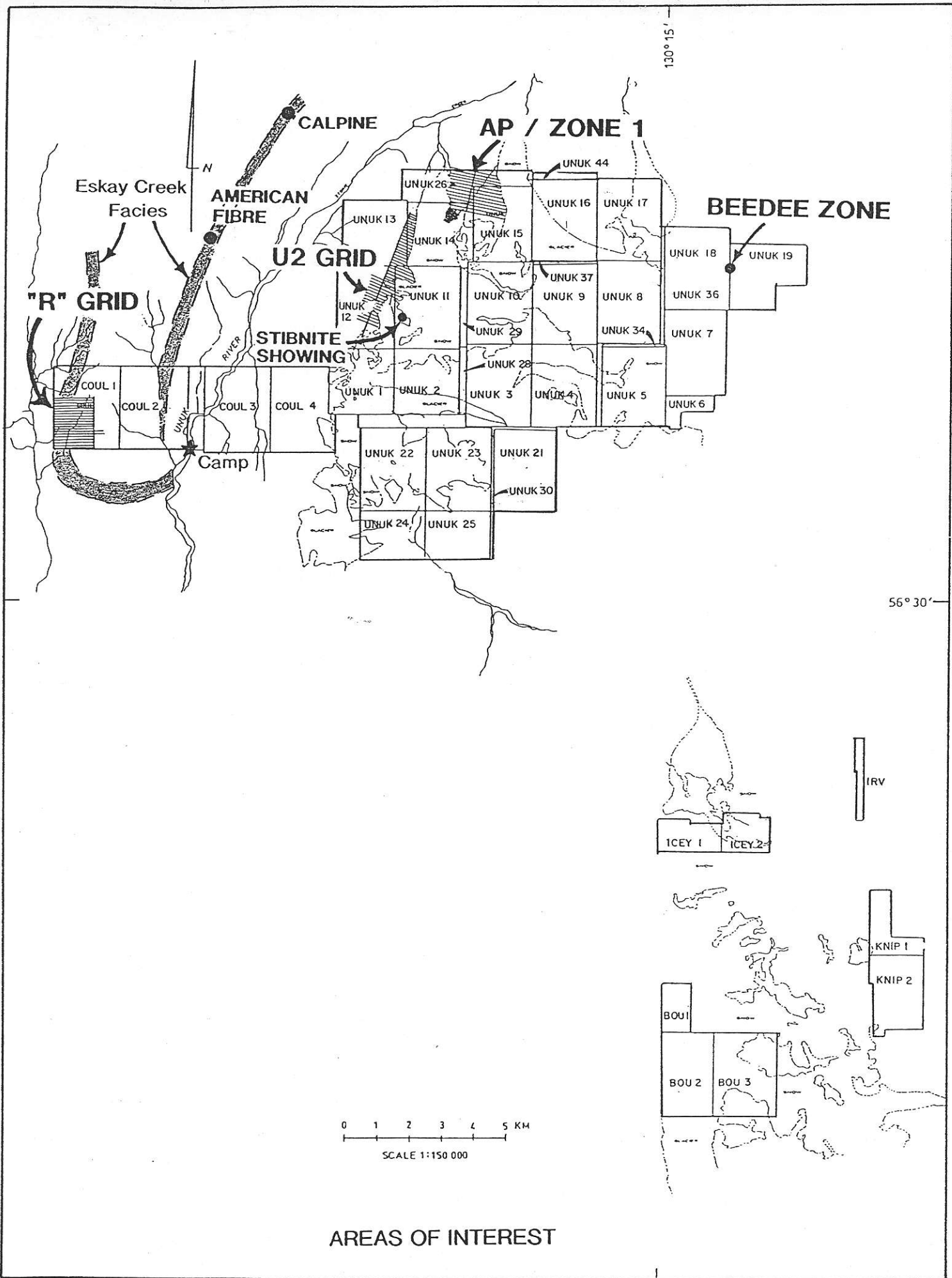


FIG. 4



## 6. RESULTS OF 1989 FIELD SEASON ACTIVITIES

### 6.1 AP Zone/Zone 1 Trench Areas

Two areas of interest, containing gold mineralization were outlined in 1989 activities on the **Zone 1** area (**Figure 4**). The **AP Zone**, found in a follow-up of a 3160 ppb Au hosted by tuffaceous mudstones and brecciated welded tuffs was traced on surface with trenching. The zone is characterized by galena-sphalerite-pyrite-arsenopyrite-(chalcopyrite) mineralization associated with shearing, brecciation, silicification, kaolinization, talc alteration, sericitization, carbonatization and possible albitization, hosted by felsic volcanic rocks of the Betty Creek (and possibly Mt. Dilworth) Formation. Although values of up to 56.5 g/t Au and 32 g/t Ag across 0.5 m were returned from chip sampling in surface trenches, considerably less favourable results were returned from similar mineralization and alteration encountered in subsequent diamond drilling (5 holes totalling 567 m). Best results were 1.5 g/t gold across 0.5 m.

The second area of interest in the Zone 1 area is underlain by mineralized coarse volcanoclastic rocks known as the **Zone 1 Trench Area**. Extensive trenching in this area returned gold values of up to 1.68 g/t but control for mineralization remained enigmatic until 1990.

### 6.2 Cliff Zone

The **Cliff Zone** is a mineralized structure visible at the base of the cliffs between 600N and 1200N on the Zone 1 grid. Sampling in 1989 produced anomalous gold geochemical values ranging up to 1400 ppb. The zone also includes auriferous cross-cutting veins between 100N and 1200N and 100W. Anomalous soil geochemical values returned from the base of cliffs to the north, and a 10.3 g/t gold grab sample collected at 1800N/100E suggested that the zone extended north to the property boundary.

### 6.3 "R" Grid

Calpine-like stratigraphy consisting of a rhyolite-argillite sequence bounded to the west by andesites and to the east by dacites was recognized to exist in the **"R" Grid** area. Mapping/prospecting located mineralization in the **Creek Zone** (between lines 100 N and 200 N from 550 W to 750 W) which returned values of up to 7.33 g/t Au and 20 g/t Ag in grab samples of variably sheared pyrite-arsenopyrite mineralized siltstones and tuffaceous mudstones. Diamond drilling (3 holes totalling 344.43 m) returned best values of 1.77 g/t Au.

#### 6.4 Beedee Zone

The source of gold mineralization in the **Beedee Zone** did not become clear until late in the 1989 field season when siliceous base metal bearing breccia veins were discovered immediately above the soil anomalies outlined by earlier traverses. Values of up to 5.57 g/t Au were returned from grab samples collected. The area was of particular interest, being along strike of the Brucejack Lineament and containing numerous intrusive dikes and sills of material very similar in appearance to the Premier Porphyry, which is ubiquitous in the Brucejack deposit area.

#### 6.5 "J" Grid

Preliminary grid mapping and soil sampling in 1989 in the **"J" Grid** area failed to repeat soil anomalies outlined by earlier workers or develop any favourable geological targets for gold mineralization.

#### 6.6 Zone 2

Activities in the **Zone 2** area returned values, in grab samples, of up to 2.7 g/t Au from pyrite mineralized E-W trending fractures in dacitic volcanic rocks to the ESE of the Tarn Lake. Also, arsenopyrite mineralized fractures near the base of a felsic volcanic sequence 2 km to the north, very similar to the felsic volcanic sequence encountered in the AP Zone/Zone 1 area, returned values of up to 1.57 g/t Au in grab samples. Late in the 1989 field season, prospecting at the toe of a N-S trend icelobe south of the Tarn Lake led to the discovery of an angular "boulder" of massive sulfides carrying 1.4 g/t Au, 80 g/t Ag, 1.8% Pb, 0.17% Cu and > 10% Zn. The source was not located before inclement weather prevented further prospecting.

#### 6.7 Other Areas

In addition to the higher priority targets, discussed above, several less significant target areas were outlined by the reconnaissance mapping activities. These are discussed in the 1989 summary of field activities.

### 7. 1990 EXPLORATION PROGRAM AND RESULTS

#### 7.1 Zone 1/AP Zone Area

##### 7.1.1 Work Completed

On June 22, 1990, under the supervision of B.E. Gaboury, geologist for Granges Inc., the Unuk River Camp was re-activated and two days later work commenced in the Zone 1/AP

area. Activities completed during the 1990 field season in this area included:

- 1) Re-establishment of pre-existing Zone 1 and AP Zone grids, and fill-in B horizon soil or talus slide fine soil sampling where warranted.
- 2) Re-mapping of the Zone 1 grid plus more detailed prospecting and rock sampling in areas of interest outlined in 1989.
- 3) IP survey over areas of interest (determined from 1989 field season).
- 4) 13 hole diamond drill program.

Re-establishment of the Zone 1 grid was accomplished primarily by Granges Inc. personnel with some minor line-cutting by Gordon Clark and Associates (2 man days) in preparation for IP surveying. In conjunction with the Zone 1/AP Zone re-mapping program from June 24 to August 19, 1990, 169 rock samples and 6 soil samples were collected and submitted for analysis. In addition, 50 rock samples were collected and submitted for whole rock geochemical analysis. One hundred and nine diamond drill core samples were taken from previously unsampled portions of 1989 drill holes for geochemical analysis. Diamond drilling was carried out by J.T. Thomas Ltd., of Smithers, B.C.

Soil and rock samples collected were submitted to Acme Analytical Laboratories of Vancouver for 30-element ICP analysis, geochemical fire assay for gold and flameless AA for mercury. Fifty rock samples collected for whole rock analysis were submitted to Chemex Laboratories of North Vancouver. **Appendix 1** is a list of rock samples (with descriptions) collected in conjunction with the mapping/prospecting activities. **Appendix 2** includes Certificates of Analyses for rock and soil samples collected, and **Appendix 3** is a list including rocks collected for whole rock analysis plus descriptions and analyses. Analytical methods are included with the individual certificates of analysis in **Appendix 2**.

IP surveying over areas of interest outlined in the 1989 field program was carried out by Peter Walcott and Associates of Vancouver, B.C. utilizing a Hunttec 7.5 kw transmitter-generator and a BRGM Elrec 6 receiver in a pole-dipole array. A total of 80 man-days (16 survey days) was utilized in producing 9.175 km of IP pseudosections over the AP Zone and Zone 1 areas. Helicopter support for the survey totalled 11.6 hrs. A separate report was completed on this data (Walcott, 1990) and included as **Appendix 5**, but

relevant results will be discussed as they apply.

#### 7.1.2 Zone 1 Trench Area - Geology, Geochemistry and Geophysics

Remapping of the Zone 1 grid (**Figure 5a**) has provided a great deal of insight into the nature of the AP structure and its relationship with other major regional structural features. The Zone 1 area is characterized by a series of rhyolitic to dacitic flow rocks and associated coarse fragmental volcanic rocks, variably welded dacitic ash flow tuffs and a thick overlying crudely to nonbedded heterolithic pyroclastic breccia with occasional intercalations of fine bedded tuff or debris flow (blackish argillaceous matrix as opposed to the more sericitic tuffaceous matrix of the pyroclastic breccia). The nature of these rocks suggests near-vent facies volcanism. The volcanic sequence is cross-cut by a swarm of "felsic" to andesitic dikes which are commonly vesicular and produce peripheral brecciation, hydrothermal alteration and sulfide mineralization (pyrite, sphalerite, galena and arsenopyrite) of the host rock. In addition to these cross-cutting dikes are larger diabase bodies located in the northwest corner and the north central portion of the Zone 1 grid and in the AP Zone area itself (the AP Zone is noted for its multitude of cross-cutting, anastomosing diabase dikes comprising 10-15% of the area - Gaboury, 1990). The large diabase body in the NW Zone 1 area is characteristically black, aphanitic and magnetic but occasionally contains brecciated, pyritic, greenish altered sections usually at the edges of the intrusive or along fractures. The altered sections have been found, through thin section analysis and whole rock analysis to be a silicified, chloritized and carbonatized mafic rock. Similar alteration is observed in the AP diabase as well as the smaller sill-like diabase unit which occurs in the north central portion of the Zone 1 grid. An extreme case of this type of alteration is observed in the "felsic" dike swarm in the Zone 1 trench area. These dikes, as well as undergoing alteration themselves, have brecciated, silicified and introduced sulfide mineralization into the host pyroclastic breccias.

Two North-South tie lines were IP surveyed (lines 800 W and 600 W). Although the sulfide mineralization is detected on 800 W as a moderately strong chargeability high, it cannot be traced through to tie line 600 W. A 1989 soil anomaly of up to 145 ppb Au occurs on a west-facing slope above the Zone 1 trenches (which tested sulfide mineralization related to a swarm of the E-W trending "felsic" dikes). The anomaly is located down slope to the west of the southeast contact of the large diabase body with the coarse pyroclastic breccia, and indicates several anomalous areas of high

chargeability. One anomaly to the east of the 1989 soil anomaly is visible as a strongly gossanous pyritic contact zone at least 5-10 m thick.

### 7.1.3 Cliff Zone - Geology, Geochemistry and Geophysics

Soil anomalies in eastern portions of the **Zone 1 West** area are recognized as being spatially related to the sheared contact of the felsic volcanic sequence to the west (identified as very likely being the Mt. Dilworth Fm.) and a dominantly sedimentary sequence fitting the BCDM's current description of portions of the Betty Creek Formation.

Shearing at the felsic volcanic - sedimentary contact appears to be at very shallow angles (possibly a sheared bedding plane contact) and in many places a dominantly dip slip motion is indicated. The AP structure has been traced with IP from a Z-type flexure around 1350 N on the AP grid to the Cliff Zone at 700 N/275 W on the Zone 1 grid, a distance of approximately 500 metres (**Figure 5b**). The AP diabase (as traced by 1989 ground magnetic survey) appears to have deformed the AP structure (folded to the east as indicated by IP data) and was likely instrumental in producing the gold-poor ankerite-galena-sphalerite veins such as "Don's Vein" (Gaboury, 1990) in addition to the abundant near flat-lying tensional quartz veinlets which occur in trenches 1 and 10 in the AP Zone area.

The only apparent difference between the Cliff Zone and the AP Zone is that the AP Zone is observed to cross-cut stratigraphy while the Cliff Zone appears to crudely follow a lithologic contact. It is possible that the Cliff Zone is the major structure and that the AP Zone is a splay from it. Another such splay structure appears to originate from the main structure at 1200 N/250 W and extends southwestward at Az 225 towards "Red Knob", where gold levels in soil reach 420 ppb. This shows up as a weak chargeability high and a minor inflection in the resistivity on the IP pseudosection for line 900 N; it was intersected early in DDH AP-9.

IP has indicated that a continuous traceable zone of broad chargeability highs (which may have coincident resistivity lows or flanking resistivity highs) corresponds with the soil geochemical anomalies outlined in 1989 (Gaboury, 1990). This in turn approximately correlates with the sheared base of the felsic volcanics outlined by 1990 mapping (**Figure 5a**).

Where exposed, the Cliff Zone (at the base of the cliffs between lines 700 N and 100 N) has been found to carry consistently elevated gold values of up to approximately 1400 ppb (Gaboury, 1990). Between lines 1100 N and 1300 N

the zone appears to be sinistrally drag-folded so as to produce an apparent displacement of about 200 metres to the west. This interpretation is supported by IP data. Smaller scale sinistral drag folds with steep northwesterly plunges are observed in ash flow tuffs around 100 N/250 W. Sinistral drag-folding is also observed to overprint diabase dikes in this area. Slickenside evidence, as well as plunges of small-scale drag folds, in this area, indicate an almost horizontal stress field.

The sequence of structural deformation events leading to what is today observed would then be as follows:

- 1) Development of a shear structure with dominantly dip-slip displacement (Cliff Zone at sheared felsic volcanic-sedimentary contact) plus splay structures (AP structure and "Red Knob" structure).
- 2) Emplacement of diabase dikes and larger diabase intrusive bodies with resultant deformation of pre-existing AP Zone and development of ankeritic veins (eg. Don's Vein).
- 3) Re-activation of shear zones by a horizontal dextral stress field producing sinistral drag folding and northwest trending siliceous auriferous veins such as those observed in the cliff between lines 1100 N and 1200 N.

Judging by the higher gold values observed in the northwest trending siliceous veins, it would appear that the later reactivation of the shear zone could have played an important role in the concentration of gold in the tensional regime created within the sinistrally drag-folded portions of the structure.

The correlation of IP, geochemical and geological evidence suggested that drilling of the Zone 1 structure was warranted. Results of this drilling are described in Section 7.1.6.

#### 7.1.4 AP Zone - IP Survey

A preliminary pilot IP survey over the AP Zone, a structure known to have appreciable metallic sulfide content, was carried out early in the 1990 field season (Figure 5b) as a guide to assess the potential of any IP targets subsequently outlined elsewhere on the property. A continuously traceable zone of high chargeability and low resistivity was followed through a dextral fold to the immediate south of the AP diabase body and behind the collar of diamond drill holes AP-1 and AP-4. Since weak mineralization was detected in the top of AP-4, this IP anomaly represented a priority

exploration target. Diamond drill targets were selected from the strongest portion of the IP anomaly. Results of the drilling are described in Section 7.1.6.

#### 7.1.5 Zone 1 East - Geology

A monotonous but structurally complex series of andesitic fragmental volcanics and argillitic to psammitic sediments were mapped on the Zone 1 East grid (**Figure 6**). No significant gold mineralization was detected in rock samples collected on this position of the Zone 1 grid.

#### 7.1.6 Zone 1/AP Zone 1 - 1990 Diamond Drilling

Thirteen diamond drill holes totalling 2415 m were completed on the AP Zone/Zone 1 area between August 20 and September 21, 1990. Results are summarized in **Table 1**. Collar locations are depicted in **Figure 5a**. Diamond drill logs are included in **Appendix 4** and diamond drill sections in **Figure 14**. All core is stored on the property at the Unuk camp.

##### 7.1.6.1 Discussion of 1990 Diamond Drilling

Targets drilled in holes AP-6, AP-7, AP-8, AP-9, AP-10, AP-11, AP-12 and AP-16 confirmed the presence of a fault structure at the base of the felsic volcanics encountered on surface in the Zone 1 area. Shearing encountered in the argillaceous and sandy sediments underlying tuff breccias, flow banded rhyolites, lapilli tuffs and variably welded ash tuffs of the felsic volcanic sequence is either steeply east or west dipping. Generally, only trace elevated gold values were encountered, associated with pyrite and trace arsenopyrite mineralization. Core recoveries were in excess of 90% but drilling was difficult and some holes (eg. AP-6) had to be abandoned before reaching their target depths. Despite use of drilling additives (Quiktrol, etc.) and considerable care, the broken felsic volcanics proved to be excessively abrasive to thin-wall diamond drilling equipment.

The highest gold values encountered in drilling the Cliff Zone structure was in holes AP-7 and AP-12 targeted to test the cross veins observed on surface between lines 1100N and 1200N. The gold values (up to 7.908 g/t) are found to be associated with arsenopyrite, sphalerite and galena mineralization in carbonate veins in tuffaceous mudstone. This is directly analogous to what is observed on surface.

Drilling of the AP structure (drill holes AP-13, AP-14, AP-15, AP-17, and AP-18) has confirmed the presence of a major cross-cutting steeply dipping fault structure hosted

TABLE 1: SUMMARY OF DIAMOND DRILLING  
COMPLETED IN THE AP ZONE/ZONE 1 AREA IN 1990

DDH No.	Location	Angle/ Direction (wrt true N)	Final Depth (m)	Mineralization Encountered	
				from - to	description
AP-6	1350N/88.5W	-45°/Az 302	300.84	No significant mineralization.	
AP-7	738N/195W	-45°/Az 314	197.21	86.70-87.90	1.097 g/t Au & 2.0 g/t Ag across 1.2 m (true width ≈ 0.75 m).
AP-8	1175N/321W	-55°/Az 080	306.91	217.45-218.03	0.83 g/t Au & 2.2 g/t Ag across 0.58 m (true width ≈ 0.33 m).
AP-9	1117N/258W (Zone 1)	-50°/Az 080	238.05	48.40-48.90  219.05-220.05	3.24 g/t Au across 0.5 m (true width ≈ .32 m).  2.04 g/t Au & 7.4 g/t Ag across 1.0 m in silicified argillite (true width ≈ 0.64 m).
AP-10	1600N/075W (Zone 1)	-45°/Az 282	198.12	No significant mineralization.	
AP-11	1600N/003W (Zone 1)	-45°/Az 282	141.12	40.16-40.82	0.46 g/t Au across 0.66 m in altered diabase contact (true width ≈ 0.47 m).
AP-12	1240N/094W (Zone 1)	-45°/Az 210	138.68	58.70-59.10	7.91 g/t Au, 148.6 g/t Ag, 0.65% Zn & 0.33% Pb across 0.40 m in carbonatized tuffaceous mudstone (true width ≈ 0.28 m).
AP-13	1503N/948E (AP Zone)	-45°/Az 165	35.66	No significant mineralization, hole abandoned.	



TABLE 1 (Cont'd.)

DDH No.	Location	Angle/ Direction (wrt true N)	Final Depth (m)	Mineralization Encountered from - to	description
AP-14	1503N/948E	-50°/Az 165	243.8	166.20-172.20	0.79 g/t Au, 28.2 g/t Ag, 0.07% Cu, 2.62% Zn and 0.90% Pb across 6.0 m in brecciated welded tuff (includes a 1.5 m interval carrying; 2.07 g/t Au, 54.4 g/t Ag, 0.03% Cu, 4.12% Zn, & 1.05% Pb). True width ≈ 3.86 m).
AP-15	1503N/948E (AP Zone)	-58°/Az 165	264.26	No significant mineralization encountered.	
AP-16	905N/456W	-45°/Az 134	190.2	Broken, silicified welded tuff encountered between 68.0-80.0 m appears to correspond to "Red Knob" structure, no significant mineralization encountered.	
AP-17	1502N/1020E (AP Zone)	-47°/Az 134	86.6	62.30-64.30	Hole abandoned in shear. 1.25 g/t Au, 20.7 g/t Ag, 0.035% Cu, 1.087% Zn & 0.9% Pb across 2.0 m in brecciated welded tuff (true width ≈ 1.36 m).
				70.10-71.10	3.77 g/t Au, 6.6 g/t Ag, 0.46% Zn & 0.53% Pb across 1.0 m in brecciated welded tuff true width ≈ 0.68 m).
AP-18	1502N/1020E (AP Zone)	-59°/Az 134	93.0	76.55-77.55	1.19 g/t Au and 2.5 g/t Ag across 1.0 m (true width ≈ 0.52 m).
				88.5-91.40	2.63 g/t Au and 19.09 g/t Ag across 1.85 m (true width ≈ 0.95 m).

by welded tuffs, tuffaceous mudstones and argillaceous sediments. Gold values of up to 3.77 g/t plus associated silver, lead, zinc and copper values have been encountered in this structure accompanied by intense silicification, mild to moderate sericitization and kaolinization, and occasional chlorite alteration. Drilling was extremely difficult and over some intervals core recovery fell to less than 50% within the structure.

In addition to testing the Cliff Zone structure, diamond drillhole AP-9 probed the Red Knob structure which can be observed on surface between 700N and 900N and between 300W and 400W. Hole AP-9 intersected an upper zone (16.9-20.0 m downhole) of shearing, silicification and sulfide mineralization with anomalous gold values (up to 177 ppb). In addition, gold values of up to 3236 ppb were intersected in tuffaceous mudstones between 48.40-49.90 m. Between 219.05-220.05 m downhole, moderately sericitized tuffaceous mudstones carry 2.04 g/t Au across a 1.0 m interval. Diamond drill hole AP-16 was drilled to test the Red Knob structure below the soil anomaly. Fracturing and chlorite alteration similar to that observed on surface and in the upper zone in AP-9 was observed, but no significant gold mineralization was intersected. Core angles observed for fracturing and quartz veining were frequently less than 45° (occasionally  $\leq 10^\circ$ ).

## 7.2 "R" Grid Area

### 7.2.1 Work Completed

Field activities in the "R" grid area in 1990 included:

- 1) Refurbishment and extension of "R" grid.
- 2) Soil sampling over grid extensions and tie-in of former grid to new grid (**Figure 8a**).
- 3) Mapping and prospecting of entire "R" grid.
- 4) IP surveying of priority areas (**Figure 8b**).
- 5) Diamond drilling; 3 holes totalling 655.5 m.

Refurbishment of the "R" grid commenced June 26th and a total of 10.0 km of line extensions plus new lines were added by the end of July. The grid currently extends from the south boundary (Coul 1, line 500 S) to 900 N and from 0 W to the west claim boundary between 1200 W and 1300 W.

The refurbished portion of the grid has been remapped and 1989 soil sample locations tied into the refurbished grid. The 1990 soil geochemical data plus anomalies outlined by 1989 activities are presented in **Figure 8a**. Samples were collected with a grubhoe from B soil horizon where developed, or from talus slide fines. Between August 4 and

August 16, a total of 13 survey days (65 man-days utilizing 9.9 hrs of helicopter support) of IP was carried out, covering 6.8 line km of higher priority target area selected from pre-existing geological and geochemical data. IP results are summarized in **Figure 8b**.

#### 7.2.2 "R" Grid Area - Geology, Geochemistry and Geophysics

A series of generally east-dipping rhyolitic to dacitic volcanic rocks with minor thin argillaceous interbeds has been mapped within the anomalous soil area outlined by 1989 field activities. These are bounded to the west and northwest by propylitically altered andesitic volcanic rocks and to the east by a sequence of dacites, argillites, siltstones and occasional coarse epiclastic rocks (**Figure 7**).

Remapping of the refurbished "R" grid and mapping of the "R" grid extensions led to a better resolution of the rhyolite and argillite units in the felsic volcanic-sedimentary sequence which is believed to be, in part, the same time stratigraphic unit and depositional environment as that hosting the Eskay Creek Deposit. The sequence consists of at least two major argillite units and two major rhyolite units. Strata appear to be striking NNE and inclined steeply to the west in areas north and west of the Creek Zone (site of drilling in 1989), and inclined less than or equal to 55 degrees to the east in areas to the south of the Creek Zone. The sequence is bounded to the west by andesites including massive flows and feldspar phyric tuffs; and to the east by dacites which include dacitic feldspar phyric tuffs, andesitic to dacitic tuffs, andesite breccias, crystal-rich dacitic ash flow tuffs, and minor conglomerates, greywackes and argillites.

An altered andesite (chloritized, silicified and pyrite mineralized) or magnesium-metasomatized rhyolite has been traced as a moderately strong NNE trending chargeability anomaly (**Figure 8b**) in correlation with geological mapping. No significant gold geochemical anomaly exists in soils collected over this area (highest value = 16 ppb Au) but there is a patchy overlying arsenic soil anomaly. This altered unit, in close proximity to the western edge of the felsic-sedimentary sequence, may represent the hanging-wall andesite which occurs to the immediate west of the ore-bearing Transition Zone in the Eskay Creek Deposit.

Further to the south, on lines 100 S, 200 S, 300 S and 400 S, a weak chargeability anomaly can be traced along the eastern edge of the rhyolite-argillite sequence. Similarly, a weak chargeability response is found associated with the western edge of the sequence. Corresponding gold and arsenic geochemical signatures (up to 58 ppb Au and up to

201 ppm As) occur in soils over these IP anomalies (Figures 8a and 8b).

A weak chargeability response was found to occur over the Creek Zone which was drilled in 1989. The anomaly is centred to the east of DDH R-1 and indicated dips in this area are to the east (Figure 8b).

### 7.2.3 "R" Grid - 1990 Diamond Drilling Program

Between September 22 and September 28, 1990 three diamond drill holes totalling 655.6 m were completed on the "R" grid in order to test IP/geochemical/geological targets outlined earlier in the field season. These are summarized in Table 2. Drill hole collars are depicted in Figure 7. Diamond drill logs are included in Appendix 4 and diamond drill sections in Figure 15. All core is stored on the property at the Unuk camp. Diamond drill hole R-4 was targeted to test the IP and a weak geochemical anomaly associated with the altered andesite unit located immediately west of the favourable rhyolite-argillite sequence. Diamond drill holes R-5 and R-6 were targeted to test the two parallel IP/geochemical anomalies to the south of the Creek Zone.

TABLE 2: SUMMARY OF DIAMOND DRILLING COMPLETED ON THE "R" GRID IN 1990

Hole No.	Location	Angle/ Direction	Final Depth (m)	Mineralization Encountered	
				from - to	description
R-4	100S/890W	-50°/Az 266	221.6	No significant mineralization.	
R-5	378S/730W	-53°/Az 266	273.4	No significant mineralization.	
R-6	176.5S/761W	-45°/Az 246	160.63	No significant mineralization.	

#### 7.2.3.1 Discussion of 1990 Diamond Drilling

Diamond drilling on the "R" grid was considerably easier than in the Zone 1 area and core recoveries are usually excellent. Diamond drill hole R-4, collared in altered andesite, was drilled to test a strong IP conductor to the west of the rhyolite-argillite sequence mapped earlier in the 1990 field season. A thick sequence of graphitic argillites was encountered rather than the "altered

rhyolites" which occur in sparse outcrops in this area. No significant gold values were encountered in this hole.

Black argillites, siltstones and minor felsic to intermediate tuffaceous horizons were encountered by drill holes R-5 and R-6. As in drill hole R-4, less felsic volcanic material was intersected than was indicated by surface mapping; further discussion of this observation will be made in section 8.4. Stratigraphy appears to dip from 30 to  $>80^\circ$  to the east as indicated by surface measurements. Again, no significant gold values were encountered in drill holes R-5 and R-6.

None of the 1990 drill holes encountered tuffaceous mudstones. The tuffaceous mudstones in the Creek Zone, drilled in 1989, are host to gold mineralization associated with arsenopyrite. They were mapped on surface between lines 0 and 600N in 1989.

### 7.3 U2 Grid Area

#### 7.3.1 Location

The U2 grid area is centred on Tarn Lake which occurs to the west of the Zone 2 area covered in the 1989 field season (Figure 4). It is located on claims Unuk 11 and Unuk 12 at an elevation of 1070 m to 1860 m, and encompasses the areas sampled in 1989. The grid covers the felsic volcanic sequence (hosting gold mineralization of up to 1.57 g/t) which bears great resemblance to rocks of the Zone 1 area (2 km to the south), and the area including the Tarn Lake and pillowed andesites (where a massive sulfide boulder containing 1.4 g/t Au, 80 g/t Ag, 1.8% Pb, 0.17% Cu and  $> 10\%$  Zn was discovered late in 1989).

#### 7.3.2 Work Completed

Activities completed during the 1990 field season in the U2 grid area included:

- 1) Establishment of a compass/topofill picket grid.
- 2) B horizon soils or talus slide fines grid sampling.
- 3) Preliminary grid mapping and prospecting in priority areas established from soil sampling and 1989 prospecting results.
- 4) Minor IP surveying over 1989 Aerodat airborne resistivity/magnetics anomalies.

A 4 km long picketed baseline was established at a bearing of Az 020 true north through the east edge of the Tarn Lake below and to the west of the Zone 2 area. Compass/topofill section lines were established in conjunction with grid soil

sampling and preliminary prospecting.

Over the period from August 17 to August 21, 2.4 line km of IP were carried out over the two Az 150 bearing airborne anomalies outlined by the 1989 Aerodat Survey.

### 7.3.3 Soil Geochemistry

Soil sampling of the U2 grid was completed August 23rd and mapping and prospecting were initiated immediately thereafter. Along with 1989 airborne geophysical data and 1989 reconnaissance geological/geochemical work, available soil results from the 1990 program were utilized to prioritize prospecting/mapping areas. Rock and soil geochemical data are presented in **Figure 9**. Background soil gold values in the U2 grid area appear to be of the order of <10 ppb. The following anomalous areas with  $\geq 40$  ppb Au in soil were selected for more detailed follow-up mapping and prospecting:

- 1) 2500N/2150E to 2600N/2100E to 2700N/1975E to 2800N/1950E (trend of anomaly ~ Az 150 to Az 160).
- 2) 2900N/2550E (trend of anomaly ~ Az 155).
- 3) 1900N/2275E to 2000N/2275E and 2200N/2250E (anomaly trends along the west edge of a ~N-S trending ice lobe).

### 7.3.4 Geophysics

The focus of activities in the Zone 2 area (Gaboury, 1990) in 1990 was two parallel airborne resistivity lows. One with an accompanying intense magnetic low signature, which trends roughly Az 150, is located for the most part under the N-S trending ice lobe. The second is located almost due north of the Zone 2 area, immediately north of an E-W trending ice lobe which extends toward the Tarn Lake (**Figure 9**).

Three short lines of IP over the southernmost airborne anomaly outlined the following features:

- Line 2800N/1750E to 1875E: broad resistivity low and chargeability high
- Line 2700N/1700E to 1850E: chargeability high  
/1750E to 1800E: resistivity low (W dip ?)  
/2100E to 2350E: broad chargeability high; chargeability contrast at 2350E  
/2250E to 2350E: sharp resistivity contrast; metal factor peak at 2325E to 2375E

Line 2600N/1750E to 2250E: broad chargeability high; peaks  
at 1775E  
/1800E to 1850E: resistivity low  
/2025E : resistivity low

Airborne and IP data suggest that a major NW-SE structural feature exists under the N-S trending icelobe.

One IP line across the northern edge of the north airborne anomaly indicated a broad chargeability high from 1625N to 1925N with a resistivity low from 1875N to 1925N.

### 7.3.5 Geology

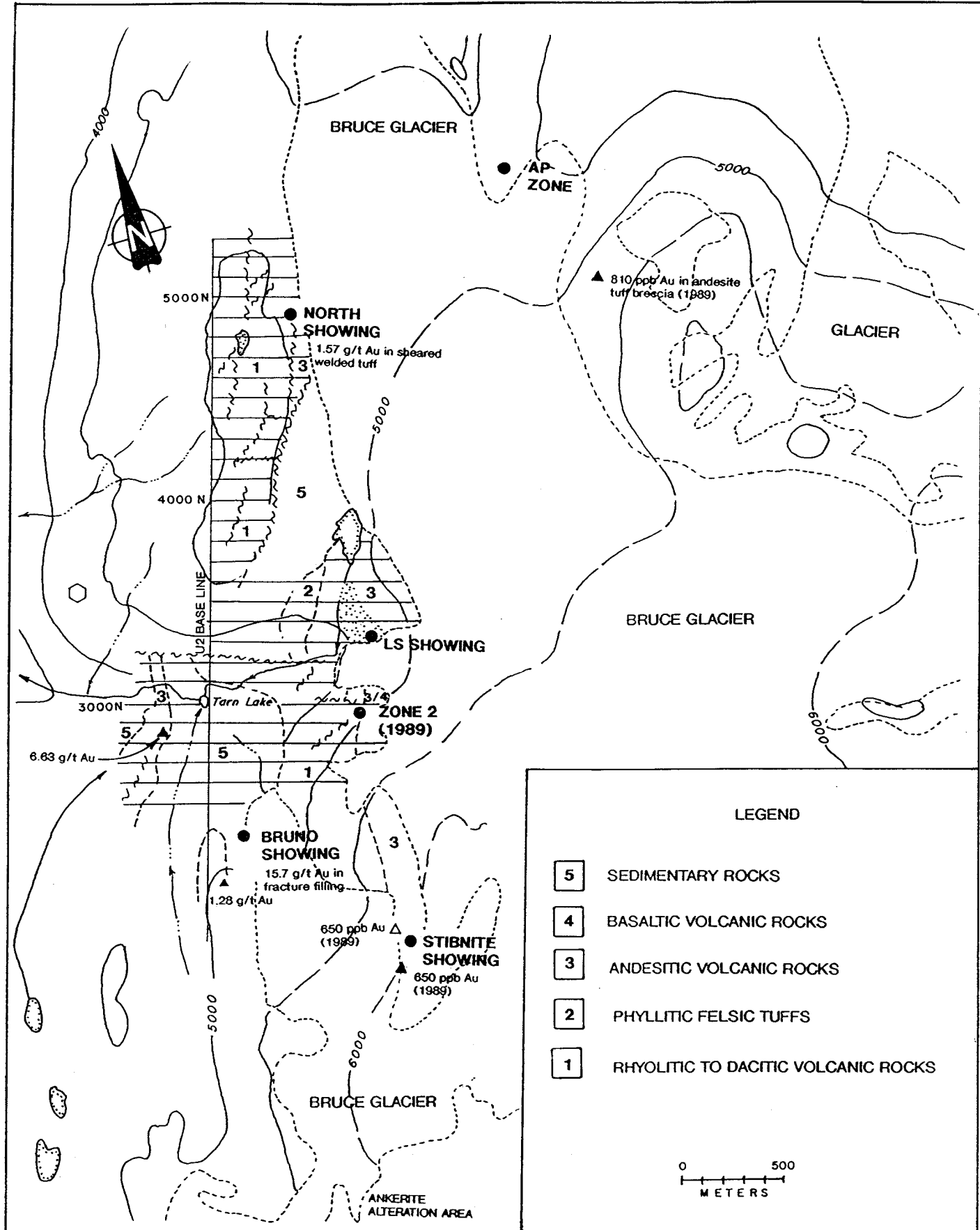
The following is a description of areas of interest outlined in 1990 in the U2 grid area. Their general locations are depicted in **Figure 10**. **Figures 11 a,b,c** are more detailed geological maps of the U2 grid at 1:2000 scale.

The U2 grid is underlain by a sequence of coarse andesitic fragmental volcanics (described in BCDM mapping as Stuhini Group) overlain to the west by a sedimentary sequence including conglomerates, pillow andesites, siltstones, fossiliferous greywackes and minor tuffs which in turn overlain to the west by a felsic volcanic sequence (which includes flowbanded and spherulitic rhyolites, variably welded tuffs and tuff breccias).

#### 7.3.5.1 Bruno's Showing

To the south of the Tarn Lake, east-west trending breccia veins occur within north-south trending tuffaceous dacites and andesites along the western edge of a north-south trending ice lobe which separates the dacitic volcanic rocks of Zone 2 to the east from pillowed hornblende-porphyrific andesites, agglomerates and greywackes to the west. In addition to the breccia veins, the area contains abundant shallow west-dipping tensional quartz veins. Magnetic and resistivity data from Aerodat's 1989 survey suggest a very strong resistivity and magnetic low trending approximately north 45 degrees west across the ice lobe. A massive lead-zinc sulphide boulder was discovered late in 1989 at the base of the ice lobe. It was found to carry 0.4% Cu, >1.5% Pb, >10% Zn, >90 g/t Ag and 1.5-2.0 g/t Au. It is possible that its source is related to this cross-structure.

Mapping in 1990 has outlined a wedge of sedimentary rocks of flysch association including argillites, conglomerates, volcanic mudstones and arenaceous tuffaceous sedimentary rocks (**Figure 11c**). These rocks appear to trend about Az 020 and dip about 45 degrees to the east. Portions of this sequence are sheared and brecciated, containing



U2 GRID – AREAS OF INTEREST

FIG. 10



abundant quartz-carbonate-sulfide mineralization (includes pyrite as well as traces of sphalerite, galena and chalcopyrite). Slickensides on sheared bedding planes indicate dip slip motion with the eastern block upthrown with respect to the western block. The pillowed andesites, agglomerates and finer grained related tuffaceous rocks which occur to the south and west appear to be in fault contact with the sedimentary wedge (this fault contact is observed in one location where pillowed andesites are separated from the sedimentary sequence by a thin shear trending about Az 120). This trend is semi-parallel to the trend of narrow sphalerite rich breccia veins carrying up to 15.7 g/t Au, which can be found to the south along the western edge of the N-S trending ice lobe. One such vein has been found to reach a width of about 30 cm and is traceable for about 50 m to the edge of the ice. In addition to these east-west mineralized veins, several N-S trending zones of shearing and brecciation can be observed at the toe of the ice lobe.

A grab sample, collected in carbonate-altered greywacke (located at 2850N/1775E) along strike of the southern airborne resistivity anomaly (**Figure 11b**) in 1990, has returned 6663 ppb Au and 5.6 ppm Ag. This altered auriferous zone may be related to the auriferous breccia veins of Bruno's showing.

#### 7.3.5.2 U2 North Zone

To the north of the Tarn Lake, in the vicinity of 5100N/2200E, is a resistant, slightly gossanous ridge of felsic volcanic rocks very similar to those of Zone 1. These include flow-banded rhyolites, spherulitic rhyolites, dacitic to rhyolitic ash-flow tuffs (variable degrees of welding), and numerous fine ash to coarse polymictic pyroclastic tuffs. Not only are these rocks lithologically similar to those of Zone 1, they are also similar in their sheared contact to the sedimentary rocks (of the Unuk River Formation?). A further analogy to Zone 1 is the auriferous nature of the sheared felsic volcanic-sedimentary contact (up to 1.57 g/t obtained in grab samples collected in 1989). Similarly north-plunging drag folds are observed in the more felsic volcanic members on the east side of the west-dipping sequence. However, in a preliminary overview of the area, these appear to be dextral and more shallow north plunging.

During the 1990 field season, tuffaceous and argillaceous sedimentary rocks have been mapped and resampled (**Figure 11a**). Up to 388 ppb Au was detected in brecciated welded tuffs containing arsenopyrite mineralization. Results verified anomalous gold, silver and arsenic levels detected

in 1989. Mapping of an extensive zone of fracturing was initiated but additional sampling and mapping are required.

#### 7.3.5.3 Stibnite Showing

Disseminated to massive stibnite + tetrahedrite-tennantite has been traced approximately 150 m along strike to the north, associated with fracturing and carbonate alteration (**Figure 11d**). Antimony values up to 19,454 ppm have been returned but gold values are only slightly anomalous (up to 231 ppb Au). Chip sampling across a felsic dike in the area returned values of 1.847 g/t Au and 5.4 g/t Ag across 0.5 m. The elevated gold in this sample was correlated with high arsenic rather than antimony.

#### 7.3.5.4 LS Showing

Mapping and prospecting in August 1990 has led to a re-investigation of a zone of limonitic and carbonate alteration with generally flat-lying quartz-carbonate-sulfide veins known as the LS showing (**Figure 11c**). The general trend of this zone is about Az 150 to Az 160 degrees and appears to be associated with shearing within a series of felsic, sericitic, tuffaceous sediments. It also appears to correspond with the weaker more northerly airborne resistivity anomaly mentioned earlier in section 7.3.4. Alteration, degree of quartz veining and amount of chalcopyrite mineralization appear to intensify southeastward toward the northern flank of the E-W ice lobe, and subsequently diminish to nothing toward the northwest. A zone of quartz veining up to 1.5 m wide, associated with shearing within the coarse andesitic fragmental, has been discovered within the area of limonitic alteration. It is found to carry appreciable chalcopyrite, galena and sphalerite mineralization and has been traced along strike for ~ 150 m. Only sporadic low gold values were returned from chip sampling of this structure.

#### 7.3.5.5 Tarn Lake Area

East-west trending shearing containing sparse sphalerite-chalcopyrite-galena mineralization has been mapped and sampled in 1990 to the east of Tarn Lake (**Figure 11c**). The structure cross-cuts a roughly north-south trending series of felsic and intermediate volcanic rocks. Preliminary sampling, however, has not indicated any significant associated gold mineralization. The zone, up to 20.0 metres wide, has been traced along strike for about 200 metres.

#### 7.4 Beedee Zone

Preliminary prospecting of the Beedee Zone indicated that the auriferous brecciated argillites sampled late in the 1989 field season are related to E-W trending non-porphyritic "felsic" dikes cutting across a series of argillites, calcareous siltstones and arenites near the base of Beedee Ridge (**Figure 12**). Dikes are similar to those in Zone 1 and are likely of altered mafic composition. This zone of brecciation and sulfide mineralization occurs immediately upslope of gold-anomalous soils collected in 1988 and 1989. Initial rock grab-sampling was carried out to verify the results and make a preliminary assessment of continuity of gold mineralization. Mapping and further prospecting of the area of interest, as well as detailed chip sampling, were carried out in early September. Sporadic values up to 5.1 g/t Au were returned from sampling of sulfide mineralized brecciation which occurs peripheral to these E-W trending "felsic" dikes. The zone of mineralization did not exceed a width of ~ 0.5 m.

#### 7.5 South Claim Groups (Knip, Irv, Bou and Icey Groups)

Due to the difficult nature of access and the lower priority of targets developed in the South Claim groups in 1989, no work was carried out in these areas during the 1990 field season.

### 8. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

#### 8.1 AP Zone

A moderately strong, continuous zone of brecciation, silicification, carbonatization and lead-zinc-(gold)-(silver)-(arsenic) mineralization extends over 300 m along strike from trenches with massive sulfide mineralization at surface, along the eastern edge of the Bruce Glacier, to the intersections in diamond drill holes AP-17 and AP-18 on section 1500N of the AP grid. The zone is clearly indicated by a strong broad IP response of coincident high chargeability and low resistivity. The IP indicates that the zone extends further to the north but appears to diminish in intensity north of section 1650N (AP Grid). It also indicates that the AP structure melds with the Cliff Zone structure which was tested by diamond drill hole AP-7.

Gold values returned from 1990 drilling of the AP Zone structure do not exceed 3.77 g/t, and appear to generally correlate with high arsenic values and often the visual presence of arsenopyrite. The highest gold values obtained on surface along the AP structure are those encountered in the 1989 chip sampling of Trench 12 on section 1193N. A true width interval containing 6.27 g/t Au, 43.4 g/t Ag plus Pb, Zn and Cu values was sampled across 1.5 m. The zone, beyond this point, appears to trend

southwest under the ice. Due to technical difficulties presented by the presence of glacial ice, this portion of the structure was not drill tested.

In order of decreasing priority, two diamond drill holes are recommended to complete the evaluation of gold potential associated with the AP structure:

- 1) Collar location 600N/375W (Zone 1 co-ords),  $-45^{\circ}$ /Az 155; a 150 m drill hole to test the 400 m gap between AP-7 and AP-17, and AP-18. Gold values up to 3.77 g/t have been encountered in these holes and IP data suggests the structure is still quite strong across this untested gap.
- 2) Collar location 225N/730W,  $-45^{\circ}$ /Az 160; a 100 m drill hole to test the AP structure beneath trench 12 (Gaboury, 1990). This hole would pass through the footwall to test the extension of the surface mineralization at depth. (Diamond drill holes R-5 and R-6 were targeted to test the two parallel IP/geochemical anomalies to the south of the Creek Zone).

#### 8.2 Zone 1 Trench Area (Zone 1 Grid)

A diamond drill hole collared at 1300N/705W was originally proposed in 1990 to test a wide zone of sulfide mineralization at the contact of a large altered diabase body with the extensive coarse heterolithic tuff breccia of the west Zone 1 area. There is a coincident IP response and gold-silver-arsenic geochemical expression associated with this contact.

The mineralization encountered at 1800N/100E in 1989 (10.3 g/t Au) is of a similar type of contact zone, but is not as intense as that observed in the vicinity of the Zone 1 trenches. Sulfide mineralization associated with the diabase contact in the Zone 1 trench area has not been drill tested.

It is recommended that the originally proposed hole at 1300N/705W be completed (collar location 1300N/705W,  $-50^{\circ}$ /Az 282 for 150 m).

#### 8.3 Cliff Zone (Zone 1 Grid)

The Cliff zone sampled in 1989 was drill tested in 1990 by DDH AP-7 and returned a core width intercept of 1.097 g/t Au and 2.0 g/t Ag across 1.2 m (true width ~ 0.75 m). The same structure was also tested by holes AP-9 and AP-12 on section 1150N. Hole AP-9 returned a value of 2.04 g/t Au and 7.4 g/t Ag across 1.0 m (true width ~ 0.64 m) while AP-12 intersected 7.91 g/t Au and 148.6 g/t Ag across 0.4 m (true width ~ 0.28 m). The structure was traced geologically, geochemically and geophysically northward, through a flexure around section 1200N, to the north boundary of the property. Drill testing of the

structure north of section 1200 N did not return favourable results and so further work in this area is not warranted. However, an untested gap of approximately 400 m exists between the intercepts of AP-7 and AP-9.

Three holes are recommended as follows:

- 1) One 200 m diamond drill hole, collared at 950N/100W, -45°/Az 305, to test the 400 m gap between AP-7 and AP-9.
- 2) A 150 m somewhat lower priority diamond drill hole collared at 1425N/300W, -45°/Az 102 to test the still untested sheared felsic-sedimentary contact. Thickening of argillites, the wide zone of shearing and the subparallel orientation of the welded tuff/coarse pyroclastic tuff breccia and the northeast diabase body indicates possible continuity of an AP/Cliff Zone structure in this area.
- 3) One 85 m diamond drill hole collared at 900N/330W, -45° Az 282 to scissor drill hole AP-16 (since core angles in AP-16 indicate that the Red Knob structure may dip to the east here).

In addition, a proposed contingency of 165 m of diamond drilling is recommended for Zone 1 targets.

#### 8.4 "R" Grid

In 1990, coincident IP and soil geochemical stratigraphic targets were tested by three diamond drill holes to the south of the Creek Zone drill tested in 1989. In addition to failing to intersect an auriferous horizon these holes did not intersect appreciable felsic volcanic horizons or the tuffaceous mudstones such as those hosting gold mineralization on surface in the Creek Zone. Tuffaceous mudstones, which are the important basal members of the mineralized Transition Zone at Eskay Creek, have been mapped at, and north of, the Creek Zone on the "R" grid.

The "R" grid area remains a priority target. It possesses the same stratigraphy and stratigraphic succession (i.e. indicating that the favourable horizon encountered on the "R" grid is on the same fold limb) as the Eskay Creek Deposit to the north. Subsequent work should focus on the area between the Creek Zone drilled in 1989 and the furthest northerly traced extent of the tuffaceous mudstone on line 600N. More detailed sampling (including trenching) is recommended to evaluate gold-bearing potential in the tuffaceous mudstones and rhyolite breccias in this area. The possibility exists that the tuffaceous mudstones encountered between 0N (the Creek Zone) and 600N represent a former submarine scour channel. If the orientation of this channel was dictated by the same northerly plunges observed at Eskay Creek, the 1989 drill holes may have been targeted under

## 8.6 U2 Grid Area

Only a preliminary investigation of areas of interest developed from geochemical anomalies developed in 1989 and from the 1990 soil sampling prospecting program was completed. Three of the areas of interest discussed earlier in section 7.3.5 of this report warrant further, more detailed, follow-up by mapping and sampling (including surface trenching).

### 8.6.1 A Discussion of Gold Potential in the U2 Grid Area

D. Alldrick (1985), in his discussion of the upper Andesitic sequence of the Unuk River formation, indicates that this sequence of andesitic lavas and volcanoclastic rocks are host to many base and precious metal-rich sulfide deposits. These are generally quartz-carbonate vein systems where the veins enclose fragments of wallrock, chalcedonic quartz and sulfides (breccia veins?). Gold/silver ratios generally lie in the range of 100:1 to 3:1. Deposits falling in this category include Big Missouri, Consolidated Silver Butte Prospect, Silbak, Indian Mine and East Gold Mine. The extensive alteration zone and quartz-carbonate ladder vein systems of the LS and Bruno's showings as well as the Stibnite Showing area may bear some resemblance to this type of deposit. In an earlier paper D. Alldrick describes, in more detail, the mineralization at the Scottie Gold Mine (Alldrick, 1984). Two features shared with the LS and Bruno's showings of the U2 grid are:

- 1) Veins trending Az 110.
- 2) Occurrence of parallel veins with pyrrhotite and pyrrhotite-pyrite with associated base metal sulfide mineralization.

Although the andesitic fragmental volcanics hosting the Stibnite Showing appear to very likely be members of the Unuk River Formation V, (Alldrick 1988), the pillowed andesites, crystal tuffs and heterolithic volcanic conglomerates of Bruno's showing bear more resemblance to the Hanging Wall Andesites of the Eskay Creek Facies.

Observed similarities between stratigraphy on the U2 Grid and Eskay Creek Hanging Wall Andesite Sequence:

- 1) Occurrence of pyrobitumen in some sedimentary members.
- 2) Well developed pillowed andesites.
- 3) Occurrence of tuffaceous mudstone composed of felsic volcanic chips and blocks in a mudstone matrix.

- 4) Occurrence of belemnites and Weyla pelecypods in cobbles in U2 grid conglomerate in the Bruno's showing area indicates we are dealing with the Lower Salmon River Formation.

J.M. Britton *et al* (1989) suggest that the thick sequences of pillowed andesites which occur near Divilbliss Creek, Mt. Madge and Mt. Shirley have been correlated by the GSC with the Bajocian Salmon River Formation. The pillowed andesites of the U2 grid area appear to be along strike of those of Mt. Madge to the south. This correlation with the Eskay Creek Facies coupled with the repeated occurrences of massive sulfide mineralization carrying up to 15.7 g/t Au make this area a high priority for detailed follow-up and eventual diamond drilling.

Due to ore grade gold-silver-zinc values detected in surface sampling in the Bruno's Showing area plus the nearby strong geophysical anomaly, this area is a first priority target for the U2 grid area. The North U2 area is next in priority to Bruno's Showing. Based on identical stratigraphy and similar structure and nature of mineralization, an AP structure-type target is anticipated. Utilizing the concept of repetition of stratigraphy through high angle reverse faults, such as reported by Anderson, 1989 (**Figure 13**), illustrates how the AP structure can be repeated in the north U2 grid area.

#### 8.6.2 Recommendations for Continued Exploration of U2 Grid Targets

Following, in order of decreasing priority, are recommendations for U2 grid areas of interest:

##### 8.6.2.1 Bruno's Showing

- 1) Continued prospecting and mapping.
- 2) Trenching of sphalerite-mineralized breccia veins (10 days @ \$800/day).
- 3) IP over selected areas (3 km @ \$2,000/km).
- 4) Contingency of 500 m of diamond drilling, is proposed for all U2 grid targets.

##### 8.6.2.2 North U2 Grid

- 1) Continued prospecting and mapping.
- 2) Trenching of arsenopyrite mineralized sheared welded tuffs (5 days @ \$800/day).
- 3) IP over sulfide mineralized structures (utilizing AP structure model) (3 km @ \$2,000/km).
- 4) Portion of 500 m diamond drilling contingency recommended for U2 grid targets.

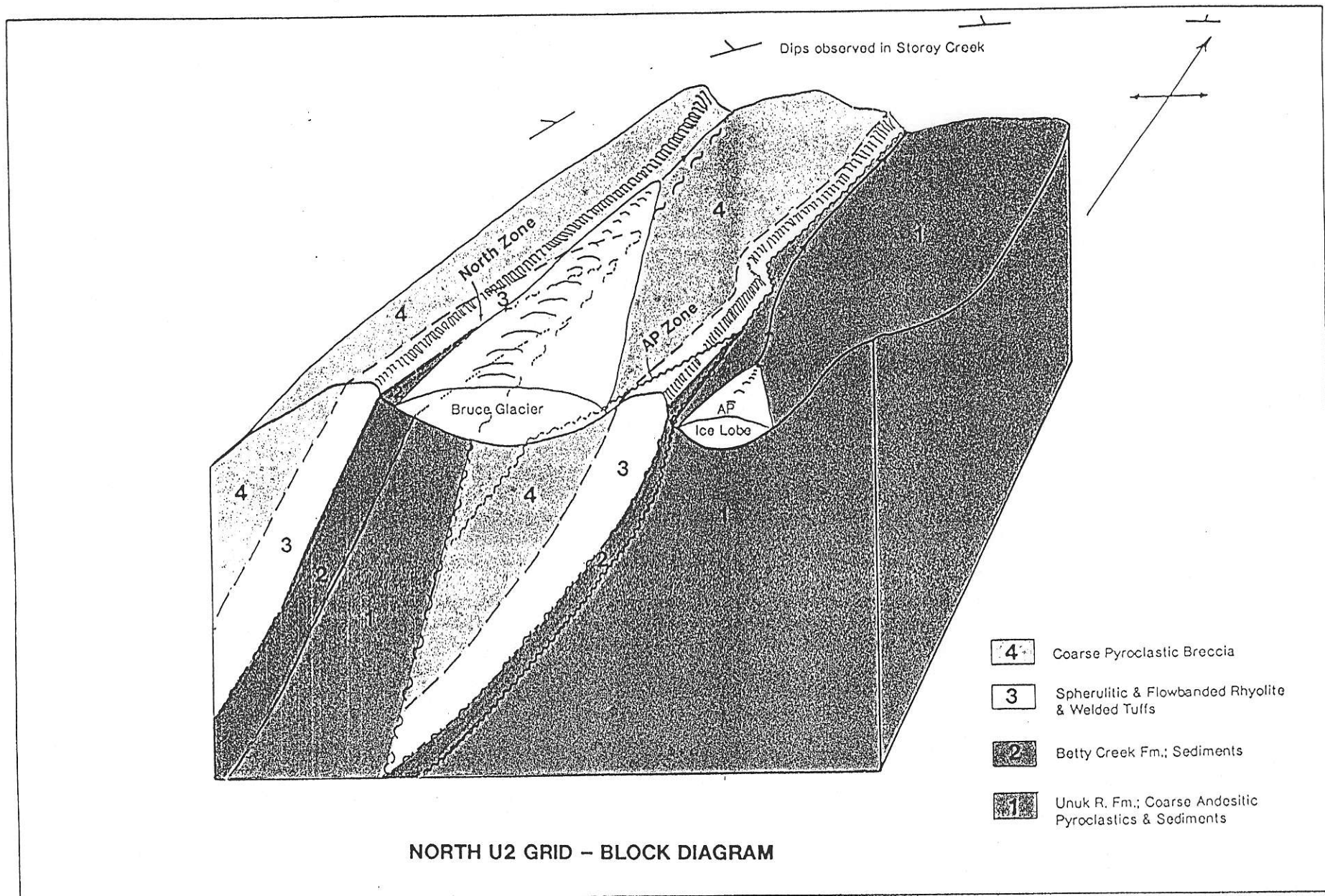


FIG. 13

Colour



#### 8.6.2.3 Stibnite Showing

- 1) More detailed surface evaluation of the stibnite-bearing structure along the entire exposed strike length.
- 2) Trenching of gold-anomalous portions of structure as well as gold-bearing dike sampled in 1990 (5 days @ \$800/day).
- 3) Additional prospecting and mapping of zones of ankeritic alteration observed along strike to the south.

#### 8.6.2.4 LS Showing and Tarn Lake Area

Apart from continued mapping and prospecting of the U2 grid, no additional work is proposed for the LS showing area.

#### 8.7 Beedee Zone

Trenching across the auriferous sulfide-mineralized breccia zones peripheral to the East-West trending "felsic" dikes of the Beedee Zone is recommended. High gold levels in soils collected higher up Beedee ridge indicate that more of these auriferous zones exist. Completion of a 1:2000 scale topographic map of the Beedee zone from air photos, flown late in 1990 will provide required control for additional, more detailed mapping of this area.

#### 8.8 Coul 4

Anomalous stream sediments were collected in 1989 near the foot of John's Peaks on the Coul 4 claim (traverse #10). Graphitic argillites were encountered in some stream beds but outcrop exposure is sparse. The BCDM in their latest investigation of this area propose that the pillowed andesites of the lower Salmon River Formation are along strike of this area. This is the same stratigraphic unit which caps the Eskay Creek deposit. Since pillowed andesites were also encountered along regional strike of this area to the north on the U2 grid, more detailed follow-up prospecting and mapping are suggested.

8.9 Summary of Proposed Expenditures (90 Day Program)

Helicopter support (250 hrs. @ \$700/hr. (fuel included)	\$175,000	
Mob/Demob (excludes helicopter support)	10,000	
Camp costs	85,000	
Field equipment	2,000	
Communication	15,000	
Crew Requirements		
Project Manager - 90 days @ \$170/day	15,300	
3 Seniors - 90 days @ \$240/day	64,800	
3 Juniors - 90 days @ \$180/day	48,600	
1 Cook - 90 days @ \$180/day	16,200	
1 First Aid - 90 days @ \$180/day	16,200	
Line Cutting - 10 km @ \$1,000/km	10,000	
IP Surveying - 9 km @ \$2,000/km	18,000	
Trenching - 30 days @ \$800/day	24,000	
400 Soil Samples @ \$12		
(Fire assay Au and 30 element ICP)	4,800	
2500 rock/core samples @ \$15		
(Fire assay Au and 30 element ICP)	37,500	
Diamond Drilling - 2100 m @ \$80/m all incl.	168,000	
Drafting, report writing	20,000	
Fees, licences and assessment	<u>40,000</u>	
	Sub Total	750,500
	10% Contingency	<u>75,000</u>
	Sub Total	825,500
	10% Management Fee	<u>82,500</u>
	<b>Total</b>	<b><u>\$908,000</u></b>

9. STATEMENT OF 1990 EXPENDITURES

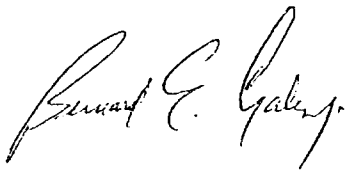
Geologists Wages	\$163,003.58
Unuk River Field Camp Costs	110,690.77
Communication (B.C. Tel, courier, postage)	16,810.45
Transportation (Helicopter, 359 Hrs.)	268,259.48
Mob - Demob (crew and gear to Bell 2)	12,490.15
Line Cutting (10 km @ \$500/day)	
Gordon Clark and Associates Ltd.	22,070.91
Geophysical Survey - IP (18.38 km)	
Peter E. Walcott & Associates Ltd.	40,513.50
Diamond Drilling (3354 metres)	
J.T. Thomas Diamond Drilling Ltd.	227,646.29
Geochemical Analyses & Petrographic Work	56,078.53
Drafting, Report Writing	21,177.09
Fees, Licences and Assessment	<u>36,711.34</u>
	975,452.09
Management Fees	<u>97,545.21</u>
Total (1990)	<u>1,072,997.30</u>
Total 1989 Expenditures	<u>1,030,606.00</u>
Total Expenditures to Date	<u>\$2,103,603.30</u>

**CERTIFICATE OF QUALIFICATIONS**

I, Bernard E. Gaboury of Nanaimo, British Columbia do hereby certify that;

- (1) I am a project geologist for Granges Inc. with offices at 2300, 885 West Georgia Street, Vancouver, B.C., V6C 3E8.
- (2) I am a graduate of University of Manitoba, Winnipeg, Manitoba, with a BSc(Hons) degree in Physical Chemistry and an MSc degree in Geology.
- (3) That I have practised geology for twelve years.
- (4) I have been a member in good standing of the Association of Professional Engineers Province of Manitoba since 1983.
- (5) I personally supervised the field work carried out on the Unuk River Project in 1990.

Dated at Vancouver, B.C. this 14th day of January, 1991.



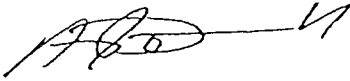
Bernard E. Gaboury  
BSc Hons, MSc, P. Eng.

## CERTIFICATE OF QUALIFICATIONS

I Arthur John O'Donnell, of Delta, British Columbia do hereby certify that:

- 1) I am Exploration Manager for Granges Inc. with office at 2300-885 West Georgia Street, Vancouver, B.C., V6C 3E8.
- 2) I am a graduate of Saint Francis Xavier University, Antigonish, N.S. with a BSc degree in geology. I also took an extra year of geology at Dalhousie University, Halifax, N.S.
- 3) That I have practised my profession for thirty years.
- 4) I have been a member in good standing of the Association of Professional Engineers of the Province of Ontario since 1970 and the Association of Professional Engineers Province of Manitoba since 1980.

Dated at Vancouver, B.C. this 24th day of May 1989.

A handwritten signature in black ink, appearing to read 'A. J. O'Donnell', with a long horizontal line extending to the right.

A. J. O'Donnell, P.Eng.

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**APPENDIX 3**

**Whole Rock Lithochemical Data**

Sample Number	Description	Location	Sample Number	Al2O3	BaO	CaO	Fe2O3	K2O	MgO	MnO	Na2O	P2O5	SiO2	TiO2	LOI
WR 1	pillowed andesite	1 km SSW of tarn lake in Zone 2 area	WR 1	14.50	0.15	6.38	10.71	6.04	5.25	0.16	1.83	0.58	49.94	0.74	2.06
WR 2	flowbanded rhyolite	1390 N/200 W - Zone 1 grid	WR 2	11.19	0.22	0.16	1.34	6.10	0.40	0.03	0.29	0.01	78.66	0.16	1.54
WR 3	felsic dike	1380 N/330 W - Zone 1 grid	WR 3	14.26	0.02	6.53	10.33	2.25	4.60	0.23	2.48	0.33	43.87	1.40	11.90
WR 4	felsic dike	1205 N/340 W - Zone 1 grid	WR 4	14.05	0.09	3.28	11.15	3.85	3.45	0.13	2.04	0.40	52.95	1.44	6.40
WR 5	felsic dike	1420 N/230 W - Zone 1 grid	WR 5	8.77	0.01	0.01	1.39	0.73	0.24	0.04	3.95	0.01	84.63	0.14	0.93
WR 6	welded ash flow tuff	1530 N/280 W - Zone 1 grid	WR 6	13.62	0.14	0.43	4.40	4.87	0.47	0.12	3.86	0.01	68.85	0.33	2.21
WR 7	coarse pyroclastic flow	1419 N/297 W - Zone 1 grid	WR 7	10.72	0.13	8.84	12.08	2.83	4.35	0.35	1.60	0.39	42.31	0.96	14.50
WR 8	coarse pyroclastic flow	1440 N/265 W - Zone 1 grid	WR 8	15.47	0.17	1.49	8.10	4.54	1.46	0.11	1.98	0.37	57.35	1.29	5.23
WR 9	aphanitic rhyolite flow, 12A cv	055 N/635 W - "R" grid	WR 9	11.29	0.25	0.01	0.79	7.91	0.18	0.01	0.39	0.02	79.08	0.24	0.75
WR 10	aphanitic dacite, <5% plag phenocrysts	012 N/592 W - "R" grid	WR 10	15.24	0.04	3.97	7.71	1.94	2.80	0.05	5.40	0.51	54.33	0.98	7.81
WR 11	dacite tuff, 5-10% pumice fragments	965 N/423 W - Zone 1 grid	WR 11	11.78	0.02	3.19	9.72	1.57	1.47	0.15	1.63	0.35	61.77	1.49	4.83
WR 12	intermediate to felsic dike	975 N/135 W - Zone 1 grid	WR 12	15.56	0.17	5.35	11.18	2.70	2.45	0.19	3.43	0.65	54.92	2.00	2.18
WR 13	silicified felsic ash tuff	220 S/850 W - "R" grid	WR 13	13.11	0.04	9.02	9.50	1.77	4.62	0.15	2.98	0.33	41.17	0.89	13.03
WR 14	foliated coarse felsic pyroclastic	1725 N/880 W - Zone 1 grid	WR 14	11.88	0.14	1.22	4.24	3.50	1.04	0.03	1.35	0.04	72.71	0.13	3.02
WR 15	"andesitic" dike in sediments	925 N/370 W - Zone 1 grid	WR 15	14.25	0.23	0.01	5.66	7.77	0.91	0.06	0.87	0.06	67.62	0.55	1.52
WR 16	basaltic andesite flow/flow breccia	620 N/960 E - Zone 1	WR 16	13.56	0.11	8.41	8.82	5.08	6.72	0.01	2.03	0.61	49.20	0.91	2.10
WR 17	diabase dike	DDH AP-1 at 75.5 m.	WR 17	14.44	0.16	5.81	11.22	3.06	3.06	0.21	2.92	0.65	54.69	2.00	2.13
WR 18	diabase dike	1650 N/525 W - Zone 1 grid	WR 18	14.31	0.18	4.43	10.68	2.90	2.15	0.20	3.04	0.63	55.52	1.82	2.42
WR 19	rhyolite	930 N/850 W - Zone 1 grid	WR 19	14.34	0.16	0.01	4.60	5.12	0.55	0.03	2.14	0.07	68.25	0.46	2.68
WR 20	altered diabase	1770 N/600 W - Zone 1 grid	WR 20	14.60	0.18	4.88	9.95	2.78	2.34	0.19	3.11	0.43	55.43	1.42	2.55
WR 21	altered diabase	1500 N/850 W - Zone 1 grid	WR 21	13.65	0.26	0.42	3.81	3.28	0.51	0.06	3.51	0.01	70.66	0.34	2.84
WR 22	altered diabase	1500 N/600 W Zone 1 grid	WR 22	14.73	0.12	2.83	9.12	1.70	2.38	0.12	4.82	0.56	57.60	1.39	3.76
WR 23	altered diabase	1600 N/735 W - Zone 1 grid	WR 23	14.63	0.18	4.07	10.17	2.83	2.56	0.16	3.30	0.48	56.54	1.27	3.48
WR 24	altered diabase	1685N/645W - Zone 1 grid	WR 24	13.52	0.17	4.77	8.04	3.35	2.38	0.17	3.02	0.40	56.58	1.02	5.65
WR 25	diabase	1500N/800W - Zone 1 grid	WR 25	14.20	0.20	5.15	10.72	2.82	2.22	0.20	3.17	0.50	54.84	1.36	4.29
WR 26	altered diabase	1710N/600W - Zone 1 grid	WR 26	16.68	0.15	3.22	7.21	1.99	3.02	0.13	6.02	0.64	53.80	1.58	4.66
WR 27	diabase	1650N/645W - Zone 1 grid	WR 27	15.48	0.23	2.97	10.06	3.05	1.58	0.19	4.24	0.58	57.18	1.50	2.14
WR 28	rhyolite autobreccia	1200N/285W - Zone 1 grid	WR 28	14.44	0.28	2.61	8.16	4.50	1.82	0.14	1.97	0.42	60.25	1.06	3.94
WR 29	intermed (-) felsic dike	1000N/200W - Zone 1 grid	WR 29	11.90	0.12	0.29	1.86	6.82	0.41	0.03	1.34	0.01	75.13	0.16	0.90
WR 30	mafic dike	1300N/500W - Zone 1 grid	WR 30	14.33	0.22	4.94	11.24	2.39	2.65	0.19	3.20	0.61	53.05	1.50	4.98
WR 31	felsic dike	1380N/540W - Zone 1 grid	WR 31	15.42	0.15	2.12	8.90	3.09	1.93	0.09	4.09	0.89	57.01	2.23	3.31
WR 32	Premier "2 feldspar" porphyry	Mitchell Glacier area	WR 32	16.72	0.29	3.54	5.35	3.10	2.59	0.21	4.59	0.45	58.79	0.84	2.27
WR 33	Feldspar porphyry	Beebee ridge (near saddle)	WR 33	16.56	0.77	4.94	7.75	3.14	3.58	0.18	3.32	0.48	51.69	0.82	5.08
WR 34	granodiorite	unit Se. ridge S.E. of A.P. Zone	WR 34	12.11	0.12	10.46	10.34	2.54	10.31	0.18	2.33	0.62	44.76	1.08	2.93
WR 35	diabase dike	1680N/570E - Zone 1 grid	WR 35	13.65	0.13	4.78	13.33	1.21	2.63	0.22	3.95	0.56	55.05	2.66	1.40
WR 36	andesitic dike	1305N/700E - Zone 1 grid	WR 36	13.97	0.13	2.75	13.48	2.51	2.33	0.15	2.77	0.55	49.37	2.43	8.55
WR 37	diabase dike with epidote stringers	1700N/600E - Zone 1 grid	WR 37	12.42	0.08	5.37	12.14	0.26	2.59	0.17	4.60	0.43	54.94	2.46	3.56
WR 38	dacite flowrock	080N/1020W-"R" grid	WR 38										0.00		
WR 39	rhyolite flow	100N/925W-"R" grid	WR 39										0.00		
WR 40	qtz-chl. schist	DDH AP-1 @ 53m	WR 40	10.93	0.24	2.34	2.87	3.66	0.38	0.08	2.48	0.17	72.62	0.23	3.04
WR 41	andesite tuff breccia	DDH AP-1 @ 62m	WR 41	13.98	0.17	3.50	7.81	4.04	1.51	0.18	2.00	0.54	59.48	1.90	4.69
WR 42	dacitic ash tuff	DDH AP-1 @ 24m	WR 42	11.30	0.19	1.68	5.06	4.21	0.73	0.10	1.36	0.15	70.22	0.36	3.77
WR 43	ash flow (lenticular) tuff	DDH AP-4 @ 8.8m	WR 43	13.51	0.24	0.31	3.15	7.80	0.66	0.03	0.22	0.08	70.39	0.44	2.65
WR 44	debris flow (possibly "black tuff")	DDH AP-4 @ 18.3m	WR 44	14.47	0.15	1.53	2.82	4.90	1.25	0.11	0.44	0.12	67.70	0.49	5.41
WR 45	altered dacite	DDH AP-4 @ 26m	WR 45	11.88	0.02	1.31	1.42	3.10	1.26	0.09	0.76	0.05	74.94	0.13	4.16
WR 46	brecciated dacite tuff	DDH R-1 @ 102.3m	WR 46	11.38	0.04	0.19	1.82	3.30	0.52	0.01	0.03	0.02	76.82	0.23	3.23
WR 47	blocky, feldspathic andes. tuff	020N/450W-"R" grid	WR 47	18.59		1.51	7.77	0.91	2.94	0.17	6.29	0.26	57.01	0.72	3.90
WR 48	chloritic, andesitic ash tuff	410N/1050W-"R" grid	WR 48	17.02		8.43	9.12	2.27	2.25	0.21	2.60	0.40	47.94	1.20	8.70
WR 49	quartz phyric dacitic tuff	00N/120W-"R" grid	WR 49	14.54		5.41	3.75	1.50	1.03	0.19	4.73	0.09	61.33	0.39	7.10
WR 50	green dacitic ash-lapilli tuff	360N/050W-"R" grid	WR 50	13.86		7.29	9.27	4.34	5.63	0.22	1.87	0.58	49.03	0.83	7.10
WR 51	feldspathic dacite tuff	400N/070W-"R" grid	WR 51	16.27		0.29	4.10	2.58	1.73	0.12	4.86	0.11	66.96	0.46	2.60
WR 52	cherty rhyolite flow breccia	410N/440W-"R" grid	WR 52	11.32		0.35	2.56	0.29	0.19	0.02	5.95	0.02	77.52	0.19	1.60
WR 53	greenish black rhyolite bx.	358N/050W-"R" grid	WR 53	15.36		9.06	5.27	1.96	2.13	0.10	5.69	0.24	50.01	0.73	9.50
WR 54	calc. amygdal. altered andesite	00N/375W-"R" grid	WR 54	16.63		5.81	9.30	1.33	5.36	0.13	2.57	0.18	47.15	1.21	10.30
WR 55	cherty, flow banded rhyolite	990N/295W - Zone 1 grid	WR 55	12.55		0.65	2.55	4.13	0.27	0.06	3.57	0.06	75.17	0.19	0.90
WR 56	dacitic ash flow tuff	1452N/206W - Zone 1 grid	WR 56	11.42		0.30	1.77	6.13	0.40	0.04	0.22	0.02	77.57	0.15	2.00
WR 57	felsic dike	975N/135E - Zone 1 grid	WR 57	12.64		6.58	10.40	0.76	2.21	0.22	3.07	0.32	54.06	1.75	8.00
WR 58	andesite flow	350N/020W-"R" grid	WR 58	12.88		8.82	10.38	3.64	4.80	0.21	2.35	0.94	49.10	1.03	5.80
WR 59	diabase - green altered	1515N/810W - Zone 1 grid	WR 59										0.00		
WR 60	diabase dike/stock	900N/250W - Zone 1 grid	WR 60										0.00		
WR 61		1170N/875W - Zone 1 grid	WR 61	13.63	0.16	5.92	8.31	3.26	2.10	0.19	2.56	0.54	54.23	1.38	8.27
WR 62		1250N/850W - Zone 1 grid	WR 62	15.04	0.18	5.01	5.68	7.25	2.56	0.34	0.37	0.41	47.94	1.12	11.00
WR 63		1250N/850E - Zone 1 grid	WR 63	8.95	0.12	0.11	14.33	3.66	0.31	0.01	0.12	0.24	64.46	0.61	7.93
WR 64		1250N/875W - Zone 1 grid	WR 64	13.59	0.23	0.14	4.84	9.19	0.15	0.04	0.16	0.24	67.19	1.43	3.00
WR 65		1200N/100W - Zone 1 grid	WR 65	19.36	0.08	0.74	3.68	4.57	1.78	0.05	1.30	0.29	64.35	0.60	4.10
WR 66		1250N/700W - Zone 1 grid	WR 66	13.73	0.17	2.68	10.46	6.99	2.09	0.56	0.44	0.52	51.73	1.56	8.53
WR 67		1690N/625W - Zone 1 grid	WR 67	14.86	0.24	5.68	9.86	2.73	1.39	0.20	3.69	0.76	56.10	1.54	3.92
WR 68		Dike 4 - Zone 1 grid	WR 68	13.33	0.26	0.08	1.39	9.56	0.08	0.01	0.23	0.14	74.25	0.23	1.04
WR 69		255N/580W - "R" grid	WR 69	13.44	0.16	3.18	11.13	4.57	1.50	0.85	2.00	0.49	53.93	1.51	8.00

9. STATEMENT OF 1990 EXPENDITURES

Expenses incurred on Unuk 14, 15 and 26 and subsequently reported in Assessment Report Number 20390: "Geological, Geochemical, Geophysical and Diamond Drilling Report" by B.E. Gaboury, September 20, 1990, are omitted from this Statement of Expenditures.

Geologists Wages (266 man days)	\$ 71,908.02
Unuk River Field Camp Costs	110,690.77
Communication (B.C. Tel, courier, postage)	16,810.45
Transportation (Helicopter, 359 Hrs.)	268,259.48
Mob - Demob (crew and gear to Bell 2)	12,490.15
Line Cutting (10 km)	
Gordon Clark and Associates Ltd.	22,070.91
Geophysical Survey - IP	
(11.70 km on Unuk 11, 12, 14 and Coul 1)	
Peter E. Walcott & Associates Ltd.	25,789.25
Diamond Drilling	
(655.62 m in AP-13 to AP-18 on Unuk 14	
913.52 m in R-4 to R-6 on Coul 1)	
J.T. Thomas Diamond Drilling Ltd.	106,497.53
Geochemical Analyses & Petrographic Work	28,044.60
Drafting and Report Writing	18,977.09
Office Overhead	<u>68,153.82</u>
Total	<u>\$749,692.07</u>