

BONNET PLUME RIVER MINES LTD.
Geological Report - Key Claims Property
Mayo Mining District, Y. T.
August - September, 1969

ALRAE ENGINEERING LTD.



This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of \$ 12,600

D. B. Cairns

Resident Geologist or
Resident Mining Engineer

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

J. [Signature]

Commissioner of Yukon Territory

October 28, 1969

TO PROTECT OUR CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS AND EXTRACTS FROM OUR REPORTS MUST RECEIVE OUR WRITTEN APPROVAL.

Department of
Indian Affairs and
Northern Development



Ministère des
Affaires indiennes et
du Nord canadien

RESTRICTED

Box 1767,
Whitehorse, Y.T., December 31, 1969.

Mining Recorder,
Mayo, Y.T.

our file/notre dossier
your file/votre dossier

M.I. M-252

Geological Report
KEY Claim Group
by Alras Engineering Ltd.
for Bonnet Plume River Mines Ltd. (N.P.L.)

On the recommendation of the Resident Geologist and the Mining Inspector I hereby authorize you to accept this report as representation work under Section 53 (h) of the Yukon Quartz Mining Act to the value of Twelve Thousand Six Hundred (\$12,600.00).

Yours sincerely,

Original signed by
Commissioner J. Smith

James Smith,
Commissioner.

N. G. Woodhams

Attach.

cc: Chief, Oil and Mineral Division
Attention: Geological Evaluation Unit

Central Mining Records - Whitehorse ✓

Resident Geologist

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LIST OF MAPS

Scale

BOUND IN TEXT

Locality Map 1" = 65 mi.

POCKET AT REAR

Map 1	Reconnaissance Geological Map	1" = 850' approx.
Map 2	Mineralized Zone and Drill Sites	1" = 850' approx.
Map 3	Claims Map	1/2" = 1 mile
Map 4	Plan of Drill Locations Site #1	1" = 20'
Map 5	Plan of Drill Locations Site #4	1" = 20'
Figure 1	Site #1 Projected Section of Fault Zone	1" = 20'
Figure 2	Graphic Logs	1" = 10'

APPENDIX

Diamond Drill Logs - DDH #1 to #8

INTRODUCTION

The 56 claim Key group (Claim Sheet 106E-1) is situated on the east bank of the Bonnet Plume River, some one hundred air miles east-northeast of Mayo (grid reference 134°15'W, 65°5'N). The property was taken on option by the company in July 1969 and a program of geological mapping, prospecting and diamond drilling was carried out between August 1, 1969 and September 15, 1969.

The initial work indicated a 700 foot wide zone of significant copper mineralization in acid volcanics and volcanic breccia over a northwesterly trending strike of about 6,000 feet (Map 2). Four sites within this zone, where secondary concentration of copper sulphides has taken place along fault planes and in carbonate vein systems, were selected for further investigation.

In the short time available before freeze-up, reconnaissance diamond drilling was carried out at the two most accessible sites, some 4,000 feet apart. This drilling totalled 1,424 feet and comprised eight short holes, five of which were drilled on a mineralized fault zone designated Site #1, and three in a zone of ramifying vein type mineralization known as Site #4.

Access to the claims was improved by the construction of a short air strip in river gravels on the north bank of the Bonnet Plume river, and access roads to the two drilling sites.

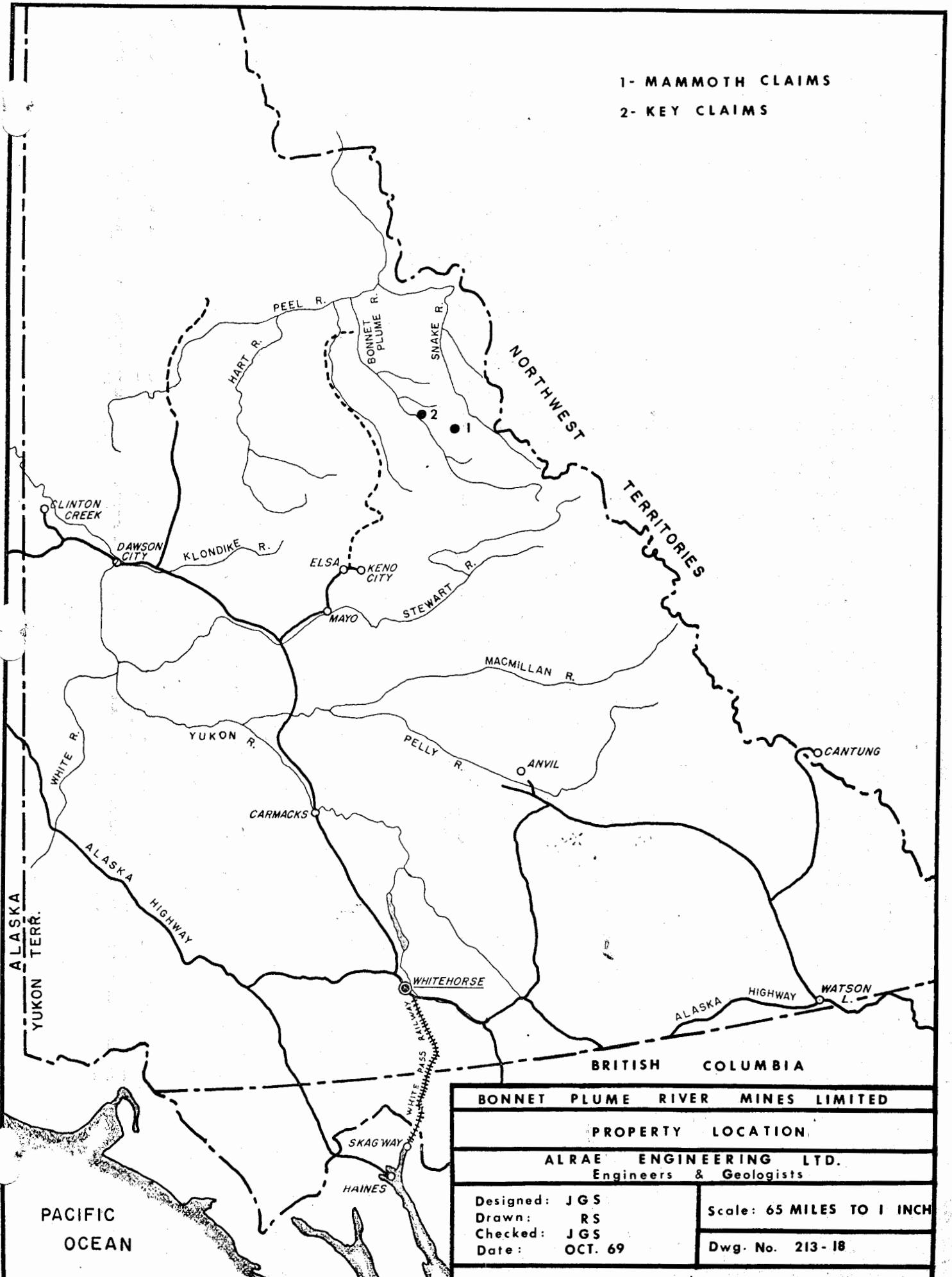
PROPERTY AND OWNERSHIP

The Key claims property comprises 56 mineral claims recorded and held in the names of:

George Vanbibber
Pat Vanbibber
Alan McDiarmid

John Thomas
Fred Caley
Stanley Johnathon
Harry Baum

- 1- MAMMOTH CLAIMS
- 2- KEY CLAIMS



BONNET PLUME RIVER MINES LIMITED	
PROPERTY LOCATION	
ALRAE ENGINEERING LTD. Engineers & Geologists	
Designed: JGS	Scale: 65 MILES TO 1 INCH
Drawn: RS	
Checked: JGS	
Date: OCT. 69	
Dwg. No. 213-18	

The property list of claims is as follows:

<u>Claim Name</u>	<u>Date Recorded</u>	<u>Record Numbers</u>	<u>Expiry Date</u>
Key 1 - 56	June 30, 1969	Y32539 - Y32594 inclusive	June 30, 1970

All work done on these claims as described in this report was carried out by Alrae Engineering Ltd. of 844 W. Hastings Street, Vancouver 1, B.C., on behalf of Bonnet Plume River Mines Ltd. of 625-695 W. Georgia Street, Vancouver 1, B.C., who are the option holders of the above property. Application is herewith made to the Mining Recorder to record this work as representing assessment work on the claims as grouped to a common anniversary expiry date as indicated on the accompanying forms.

LOCATION AND ACCESS

The Key claims are indicated on the official claim map (Claim Sheet 106E-1) as comprising 56 claims in a single block four claims wide by 14 long (grid reference 134°15'W, 65°5'N), extending from the east bank of the Bonnet Plume river in a north-northwest direction toward Rapitan Creek. The claims are 20 miles east of the Wind River Trail and are accessible by caterpillar track and a winter road connecting the Wind River Trail to the Mammoth claims on Dolores Creek, some 20 air miles southeast of the property. Access to the claims was improved by the construction of a short air strip on river gravels on the east bank of the Bonnet Plume River and roads to the drilling sites as indicated on the accompanying map.

TOPOGRAPHY AND WATER SUPPLY

The northeast section of the claim block covers the side hills flanking the Bonnet Plume valley and rise to peaks of 5,500 feet, the river itself being at a little under 2,000 feet. Within this section the terrain is very rugged, with extensive developments of talus on the lower slopes.

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All major creeks contain abundant flowing water throughout the summer months and the valley floor is extremely swampy with a number of small lakes and ice ponds.

Small stands of poorly developed conifers are available in the Bonnet Plume valley, some of which could be used in timbering and general prospecting operations.

NAMES AND ADDRESSES OF PERSONNEL

The following persons took part in the development and exploration programs on the Key claims property of the Bonnet Plume River Mines Ltd. during 1969.

J.G. Simpson, B.Sc., Ph.D.	720 Anderson Cres., West Vancouver, B.C.
J.F. Pagella, M.A., M.Sc. D.I.C.	" "
G. Jilson (student U.B.C.)	410 St. James Circle, Piedmont, Calif.
H. Kabanak	P.O. Box 2349, Whitehorse, Y. T.
D. McLaughlan	P.O. Box 235, Rutland, B. C.
L.I. Proctor	P.O. Box 827, Whitehorse, Y. T.
C.D.N. Taylor, P. Eng.	2420 Queenswood Dr., Victoria, B. C.
E. Smith	P.O. Box 827, Whitehorse, Y. T.
C.E. Ford	P.O. Box 2080, Whitehorse, Y. T.

The diamond drilling was carried out under contract by Coates Enterprises Ltd., of 1668 West First Avenue, Vancouver 9, B.C. and full invoices for this work are attached to the appendix on costs and disbursements.

GEOLOGY

Introduction

No previous detailed work has been carried out on the Key claims and apart from very broad scale indications, no published work is available on the immediate area, as far as is known to the present

authors. In the absence of suitable topographic maps, geological data was plotted on air photograph enlargements (Photograph No. A 12247-76) on a scale of approximately 1" = 850'.

Geological Sequence and Table of Formations

From the base of the hills flanking the main valley, a sequence of banded acid volcanics, massive volcanics, volcanic breccia, shales and interbanded tuffs, thin limestones and a thick sequence of argillites and black slates roughly parallel the valley contours and dip generally to the northeast (Map 1). On high peaks, at the crest of the valley ridge, elements of the volcanic sequence reappear, which have apparently overridden the shale-limestone sequence on flat thrusts derived from the northeast. The strata of economic interest within this sequence are the banded and massive acid volcanics and volcanic breccias which carry intermittent copper and iron mineralization along the visible strike of approximately 6,000 feet; the lower boundary of the volcanic breccia being perhaps more mineralized than other sections of the volcanic sequence. The breccia dies out laterally to the southeast and is replaced by more massive tuffs and flow-banded lavas. In the complete absence of geological data from adjacent areas no specific correlation of the rock units is possible, although, in general terms, it is held that the metasediments are probably related to the Katherine Group of possible Precambrian age and the volcanics to the Rapitan Group which is of somewhat nebulous age from Upper Precambrian to Cambrian.

Lithological units, in decreasing order of age as indicated by the major structures seen on the Key claims property, are as follows:

Table of Formations

<u>Lithological Sequence</u>	<u>Possible Equivalents</u>
Banded acid volcanics and tuffs) Volcanic breccia)	Rapitan Group (Cambrian?)
Shales and interbedded tuffs) Grey limestones and shaley) limestones)	Katherine Group (Upper Pre-Cambrian?)
Black shales and slates)	

STRUCTURE

Although diagnostic way-up features were not readily available, the general structural picture evolved from the field work is that of a huge, recumbent antiform plunging gently north-northeast with a vergence from the east. This is concluded from the apparent tendency to closure toward the north and the plunge of minor folds and bedding-foliation intersections. This infers that the remnant volcanic rocks on the high peaks are a fold repetition of those seen on the lower slopes. The absence of a tuff-shale sequence with a distinctive limestone marker horizon in the repeated beds being due to overriding by the slate-argillite beds. This also implies that the lower slope sequence is reversed, i.e.: the oldest rocks being the argillite-slate group, the youngest being the acid volcanics. Cross-sections of the volcanic sequence and the pattern of banding attitudes in these rocks indicate fold deformation and thrusting paralleling the major structure.

A close pattern of normal faults with north and northeast trends is readily apparent, with a major east-west fracture affecting all structural elements.

MINERALIZATION

Mineralization is restricted to the acid volcanics and volcanic breccia horizons outcropping along the base of the main valley

ridge. All other lithologies are completely barren, except for minor disseminations of syngenetic pyrite in the argillites and slates. No significant mineralization was noted in either outcrop or talus slopes from the isolated exposures of volcanics on the high ridge which is, in fact, outside the claim area.

In the lower slope volcanics the mineralization includes both primary sulphides and secondary sulphides associated with faults and carbonate vein systems. There also appears to be two mineral environments, one in which hematite, in the form of specularite, is predominant and copper either subordinant or absent, and one in which copper is dominant. In general terms, copper mineralization tends to be reduced from north to south along strike and vice-versa for iron.

Primary Sulphides

Throughout the strike length of exposed volcanics, finely disseminated pyrite and chalcopyrite is found in flow-banded volcanics and occasionally in massive tuff and breccia zones. The overall percentage of sulphides in these rocks is very low and long stretches of volcanics are barren. While this type of mineralization would not be of economic significance in itself, it points to the volcanics as being the sulphide host rock for the richer secondary mineralization seen along fault lines and in rocks affected by calcite and quartz vein systems.

Secondary Mineralization

The so-called showings on the property are all restricted to the volcanic sequence and are of two main types, both of which are associated with carbonate veining. The most impressive of these is a fault environment where copper occurs in quartz and calcite filled fractures associated with the fault and in minor cross-fractures and tension veins. The second type is a system of ramifying copper

bearing carbonate veins filling fractures in the axial zones of tight folds or in zones of shearing and general brecciation. In both cases mineralization takes the form of blebs and streaks of chalcopyrite and pyrite and very rarely a little bornite in the calcite and quartz veins. In the brecciated volcanics fine stringers of sulphides occur with only minor amounts of secondary carbonate, although the breccia matrix is invariably quite rich in lime. Malachite staining is widespread in areas of chalcopyrite mineralization, although this is often more readily apparent when the rocks are broken open, and its absence cannot be taken to indicate barren material.

SHOWINGS

No. 1

The most prominent showing is described as the main showing and is located near a minor northeasterly trending fault at the boundary between volcanic breccia and banded acid volcanics and tuff, now largely made over to flaggy micaceous quartzite. At this point carbonate veins near parallel to banding vary from one half inch to two feet in width and together with associated quartz veins are strongly mineralized with chalcopyrite and pyrite in blebs and stringers over a zone some 15 feet wide. Uphill from the showings small cross-fractures are filled with calcite containing blebs of chalcopyrite and the zone, much diminished in width and mineral content, can be traced for about 200 feet. Some 200 feet downslope of the showing a possible outcrop is similarly mineralized.

No. 2

A second area of notable mineralization occurs some 1,000 feet to the south-southeast, again near the contact of breccia and banded volcanics where a small fault trending at 110° azimuth has been mineralized with pyrite and chalcopyrite together with minor carbonate filled cross-fractures. The whole makes up a rusty

malachite stained zone some 10 to 15 feet wide. The scree overburden in this locality prevents tracing of the showing uphill, but little mineralized scree was noted above the showing.

No. 3

Further to the west and forming a bald hillside at the junction of the First Gulley with the main valley floor, ramifying calcite veins in badly fractured volcanic breccia contains chalcopryrite and pyrite resulting in a large surface area of sparsely mineralized material. Northwards, the veining coalesces to a single calcite vein from six feet to 18 inches in width containing scattered blobs of chalcopryrite and roughly paralleling the banding in adjacent rocks. From structural data and observations of the gulley wall, the zone is one of intense folding and thrusting; the copper bearing calcite veins in-filling fractures in the competent breccia horizons.

No. 4

The fourth notable showing occurs some 2,000 feet to the southeast of this again, with chalcopryrite concentrated in blebs in calcite and quartz veins near a gullied fault zone. The result is a broken mineralized zone up to 20 feet wide containing blebs of chalcopryrite up to two feet in diameter. Again, due to scree developments it is impossible to trace this feature uphill from its location.

Elsewhere along the strike of the volcanic horizon, blebs and stringers of chalcopryrite are not uncommon, but in no sense can these be regarded as mineral showings and would, in fact, form part of the normal mineral assemblage of a deformed volcanic sequence, while areas to the south of No. 4 showing tend to show a redistribution of iron in the form of specularite rather than copper.

SAMPLING AND ASSAY RESULTS

In all cases the shows are badly weathered and both pyrite and chalcopyrite have been extensively oxidized. Five chip samples were taken across three of the better showings while a sixth sample was made up of a random selection of volcanics containing disseminated sulphides. These samples were forwarded for assay and the location, width, etc. are given together with assay results in Table 1.

DIAMOND DRILL PROGRAM

Four sites within the general zone of copper mineralization were selected for further investigation where secondary concentration of copper sulphides had taken place along fault planes and in carbonate vein systems in fractured zones. In the short time available reconnaissance diamond drilling was carried out at the two most accessible sites, some 4,000 feet apart. This drilling totalled 1,424 feet and comprised eight short holes, five of which were drilled on a mineralized fault designated Site #1 and three in a zone of ramifying vein type mineralization known as Site #4. These sites are identified on the accompanying geological map and detailed site plans of the two locations.

Drilling was carried out using AQ wireline equipment with a Boyles BBS #1 drill. Minor drill moves of a few tens of feet were necessary at each site between holes, and at Site #1 a move of 200 feet was completed to drill hole #8 on an outcrop opened by bulldozing scree at the foot of the cliff. Statistical data for the completed drilling program is summarized in a separate table and assay results are tabulated on the appropriate site plans. Although drilling results were generally good, it is felt that utilization of BQ equipment would give a better sample in vein and brecciated zones.

Site #1

Four holes totalling 575 feet were drilled in the vicinity of the prominent fault outcrop and a final hole of 168 feet was drilled at the base of the scree. The assay values in the country rock are of little economic interest, DDH #3 averaging 0.04% copper over 68 feet and DDH #2 averaging 0.06% copper over 42 feet. These would appear to be general averages outside the fault zone. Holes No's. 1, 2 and 3 all intersected the prominent fault visible in outcrop, but have insufficient spread to give much information as to strike continuity. Thicknesses and assay values for these intersections are tabulated below:

<u>DDH No.</u>	<u>Corrected Thickness Ft.</u>	<u>Assay Value Cu. %</u>	<u>Remarks</u>
1	7.0	3.30	Fault zone
2	9.25	4.80	Fault zone
2	15.80	3.16	Includes foot wall rocks
2	22.75	2.30	Includes wall rocks
3	7.0	5.00	Fault zone
3	<u>33.0</u>	<u>1.07</u>	Includes wall rocks
Average Values	7.75	4.4	Fault zone only
	10.2	3.6	With some wall rock

All core recovered from the fault intersections so far drilled has been completely altered and assay results may be unreliable due to leaching and weathering processes. No information is available as to the type of mineralization in unaltered material.

The fault zone has a measured dip of 55° to 65° towards the northwest and strikes generally north at outcrop but its attitude away from the drill site is not known. The nature of the mineralization and continuity of the zone cannot be predicted from the

available evidence. However, it is likely to be extremely variable in width and show minor irregularity with regard to dip and strike.

Site #4

Three holes were drilled in a region where large cobbles of chalcopyrite and pyrite occur in an area of minor fractures and general brecciation where the country rock exhibits traces of disseminated chalcopyrite and small malachite showings. No large fault zones were intersected although the average background grade of copper in this section is much higher than at Site #1, as indicated in the following table:

<u>DDH No.</u>	<u>Corrected Thickness Ft.</u>	<u>Assay Value Cu. %</u>	<u>Remarks</u>
5	11.5	0.90	Includes a small fault zone
5	21.5	0.58	
5	213.0	0.23	
6	6.5	2.4	Includes a small fault zone
6	76.0	0.20	

Diamond drill hole #6 intersected a weathered, vuggy fault zone at a depth of 106 feet and remained in this material until the hole terminated at 185 feet. Recovery in this section was very low and unreliable, hence the assay value can only be applied to a short footage. It is interesting to note that values in fault material are similar to those shown at Site #1. However, the thickness figures are unreliable and it appears likely that this section of the drill hole was diverted to run down a minor fault plane which may only be a few inches thick.

Diamond drill hole #5 intersected a small fault zone between 36 feet and 39 feet and this more than likely indicates the true thickness of the enriched zone intersected in diamond drill hole #6.

GENERAL ASSESSMENT OF DIAMOND DRILLING

A marked difference exists in the type of mineralization and country rock at the two drill locations. At Site #1 the drill sections cut a green-grey, cleaved and occasionally schistose to slightly siliceous rock which is provisionally described as of metavolcanic origin, possibly water lain tuff. The rock is metamorphosed and veined by quartz and calcite with the development of chloritic material at vein margins. Copper mineralization is largely secondary and associated with vein systems. At surface, malachite and traces of azurite can be found on partings but on breaking the rocks sulphides can easily be observed. The background value of copper is remarkably consistent over sections drilled outside the fault zone and is between .04 and .06 percent. Surface chip samples at Hole #8 showed 0.14% copper which is probably too high by a factor of 2 when compared with assays of drill core. Sulphide mineralization is undoubtedly concentrated in the vein systems but isolated, small disseminated blebs are common over much of the rock mass and probably represent redistribution syngenetic material. Significant concentrations of copper in this area occur only in the zone of prominent faulting. The surface expressions of which are usually heavily stained with malachite and limonitic rust. In the drill core these zones are represented by corroded, ferruginous, brecciated material giving an average assay of 4.4% copper over widths of 7.75 feet. Hanging and footwall rocks carry a slight concentration of copper above background but this is usually insufficient to increase the significant mineralized zone by more than a few feet.

South of the First Gulley, generally, and more particularly at Site #4, the country rocks appear to be less schistose and consist of homogeneous grey banded volcanics cut by frequent minor faults and veins. Impressive thicknesses of secondary calcite concentration occur within the general vein system and reach six to eight feet in

width in some cases. Malachite staining is more limited in these rocks and chalcopryrite and pyrite on fresh surfaces. The drilling indicates that the rock mass has been completely ramified by a complex network of quartz and calcite veins accompanied by brecciation and the rock could be described as a partially recrystallized volcanic breccia. Over much of the core recovered the original rock textures and structures in the volcanics have been completely destroyed.

Considerable concentrations of copper sulphide are associated with a secondary recrystallization in the vein systems and background values are four or five times higher than those described from Site #1 averaging 0.23% copper over considerable widths. Surface chip samples indicated 0.43% copper which again reflects an error of 50% in surface sampling.

Copper concentrations of chalcopryrite in minor fault zones has occurred but no discrete fault zone as at Site #1 was intersected by the drilling. Occasional sections of core showed thick lenses of sulphide, but mostly the width of mineralized veins was from one to two inches only. In the absence of planer structures and marker horizons no orientation was discernable in the drilled sections.

CONCLUSIONS AND RECOMMENDATIONS

Results to date, although inconclusive, indicate a potential for small tonnages of relatively high-grade material concentrated in fault zones. On the basis of results at Site #4 there is also a possibility that larger tonnages of lower grade material may exist, although material intersected to date is of sub-economic grade. A program of closely controlled diamond drilling at the sites shown on the map utilizing a wireline drill with modifications for sub-horizontal holes is indicated. This will require considerable access construction in difficult terrain, but this is not unfeasible. The

possibility of combining diamond drilling at these sites with an exploration adit drifting along the fault zone at Site #1 may be considered. This should not be too difficult, technically, as there is sufficient room, with some blasting, to open a portal from the site of drill hole #4. Roof support and portal stability may present a problem but the permafrozen ground should stabilize the area once away from the portal. No obvious alternative portal position is available. Alternatively, further exploration by diamond drilling could be considered, although the topography is somewhat steep and difficult of access. An effort would be required to get a stable cat road a few hundred feet vertically above Site #1 and this would also be necessary to provide access to suggested Sites #2 and #3. It should be possible to get the bulldozer to these locations by contouring sufficiently far northward from the camp as the topography is less steep in this sector. Further diamond drilling in the general vicinity of Site #4, both north and south of the Second Gulley is also indicated.

The points mitigating against an adit at this stage are the lack of information on the continuity of the fault plane and the fact that underground work would be less flexible than diamond drilling. It would seem preferable at this point in development to explore the sites indicated more thoroughly by diamond drilling, this to be followed by a program of adit development, if results warrant.

The ground is considered unsuitable for either generally acceptable geophysical methods or geochemical prospecting. The opening up of access roads and drill sites with caterpillar and blasting may well reveal further showings of interest and any drill program should be under the close supervision of a qualified geologist.

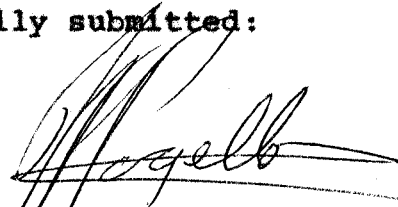
As no accurate maps are available of the property, the early preparation of a contoured topographic map is essential for the

interpretation of drilling results and other data.

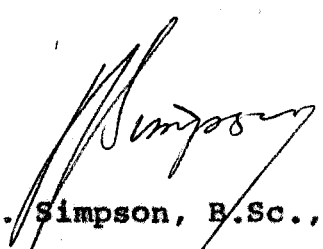
FUTURE PROGRAM AND COST ESTIMATES

Preparation of contoured topographic map	\$ 1,000.00
Diamond drilling up to 4,000 ft. @ \$15/ft.	60,000.00
<u>OR</u>	
Alternative 500 ft. drifting 5' x 7' at total cost of \$80/ft. and 3,000 ft. of diamond drilling at \$15/ft. Estimated costs - \$85,000.00	
Sampling and supervision	5,000.00
Camp expenses and air support for six weeks	15,000.00
Equipment hire	12,000.00
Travel expenses other than above	1,000.00
Consultants fees, preparation of reports	2,000.00
Contingencies	<u>14,000.00</u>
TOTAL	\$ <u>110,000.00</u>

Respectfully submitted:



J.F. Pagella, M.A., M.Sc., D.I.C.



J.G. Simpson, B.Sc., Ph.D.

ASSAY RESULTS

Key Claims

<u>Field No.</u>	<u>Assay No.</u>	<u>Location</u>	<u>Type</u>	<u>Au</u>	<u>Ag</u>	<u>Cu</u>	<u>Pb</u>	<u>Sampler</u>
1	16898	*Site #1	15' chip	0.02	0.1	2.16	0.12	J.G. Simpson
2	16899	500' SE of Site #1	Character diss. sulphides	--	-	0.52	--	J.G. Simpson
3	16900	Site #2	15' chip	--	Tr.	1.50	--	J.G. Simpson
4	10501	Site #4	20' chip	--	-	0.98	--	J.F. Pagella
5	10502	Site #4	20' chip	--	-	0.43	--	J.F. Pagella
6	10808	Site #1	25' chip	--	-	0.14	--	J.F. Pagella

* Actual sample line shown on accompanying drill site plans.

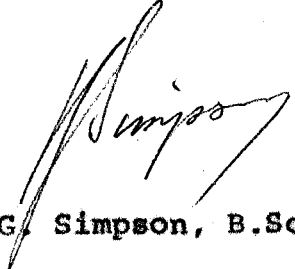
CERTIFICATE

I, John Glenn Simpson, residing at 720 Anderson Crescent, West Vancouver, B.C., do hereby certify that:

1. I am a consulting geologist.
2. I graduated from Kings College, London University, U.K., in 1958 with a B.Sc., honours degree in Geology.
3. I was awarded a Ph.D. in geological studies as an external graduate of London University in 1968.
4. I have recently applied for membership to the Association of Professional Engineers of the Province of British Columbia.
5. I have practised my profession since 1958 in Africa and Canada in the employ of the Geological Survey of Zambia (Northern Rhodesia) and Alrae Engineering Ltd. of Vancouver, B.C.
6. I personally planned and directed the exploration program carried out by Alrae Engineering Ltd. on behalf of Bonnet Plume River Mines Ltd. during the field season of 1969.

I have known Mr. J.P. Pagella for five years and can vouch for his competency and professional standing. Neither myself or Mr. Pagella have any interest, either direct or indirect, in the properties of Bonnet Plume River Mines Ltd. or any associated companies or securities pertaining thereto.

DATED AT VANCOUVER, this 28th day of October, A.D. 1969.


J. G. Simpson, B.Sc., Ph.D.

TIME AND COST DISTRIBUTION

Geology and Diamond Drilling - Costs

Personnel

J.G. Simpson	Geologist	\$ 1,550.00
J. Pagella	Geologist	2,307.00
G.A. Jilson	Geologist	650.00
E. Robbins	Draftswoman	32.50
D. McLaughlin	Cook	1,462.50
H. Kabanak	Cat Operator	2,812.50
Alrae Consultants Fee		<u>1,050.00</u>
		\$ 9,864.50

Camp Costs and Transportation

Aircraft	\$ 13,786.80
Camp Supplies	<u>1,379.46</u>
	\$ 15,166.26

Assays \$ 308.20

Miscellaneous Disbursements

(as per Alrae invoices) \$ 1,631.56

Diamond Drilling

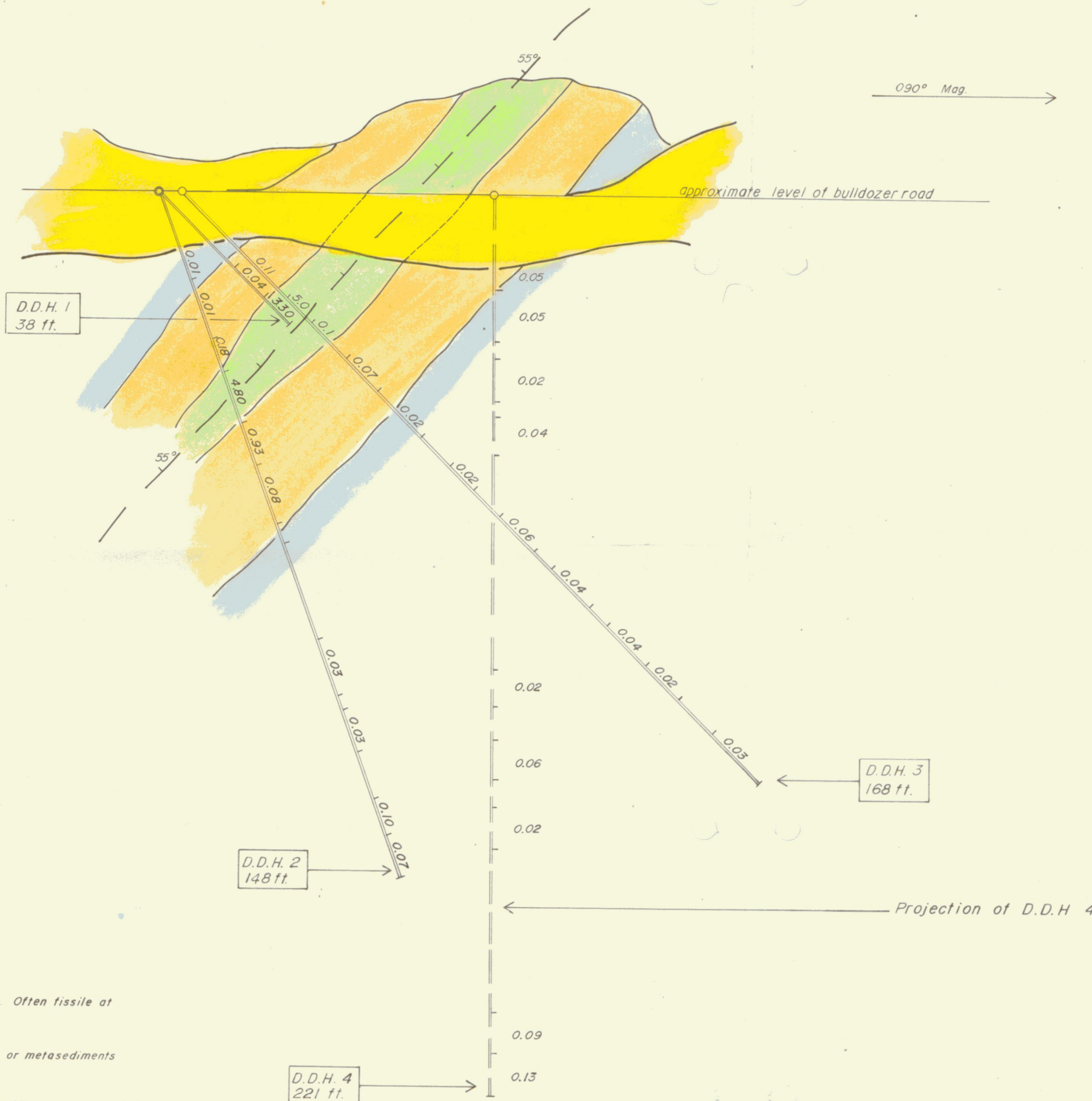
Drilling	\$ 7,646.38
Access and Drill Sites (Cat Rental)	<u>12,000.00</u>
	\$ 19,646.38
Total	\$ 46,616.90
Direct Work Costs	\$ 40,709.00

KEY CLAIMS





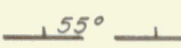
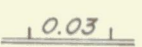
Diamond Drilling (1,424 ft.)	\$ 7,646.38
Drill Access (Cat and Operator)	14,812.50
Camp and Transportation Costs 60%	9,099.73
Assaying	<u>308.60</u>
	\$ 31,867.21

48 Claims - \$22.38/ft. of drilling

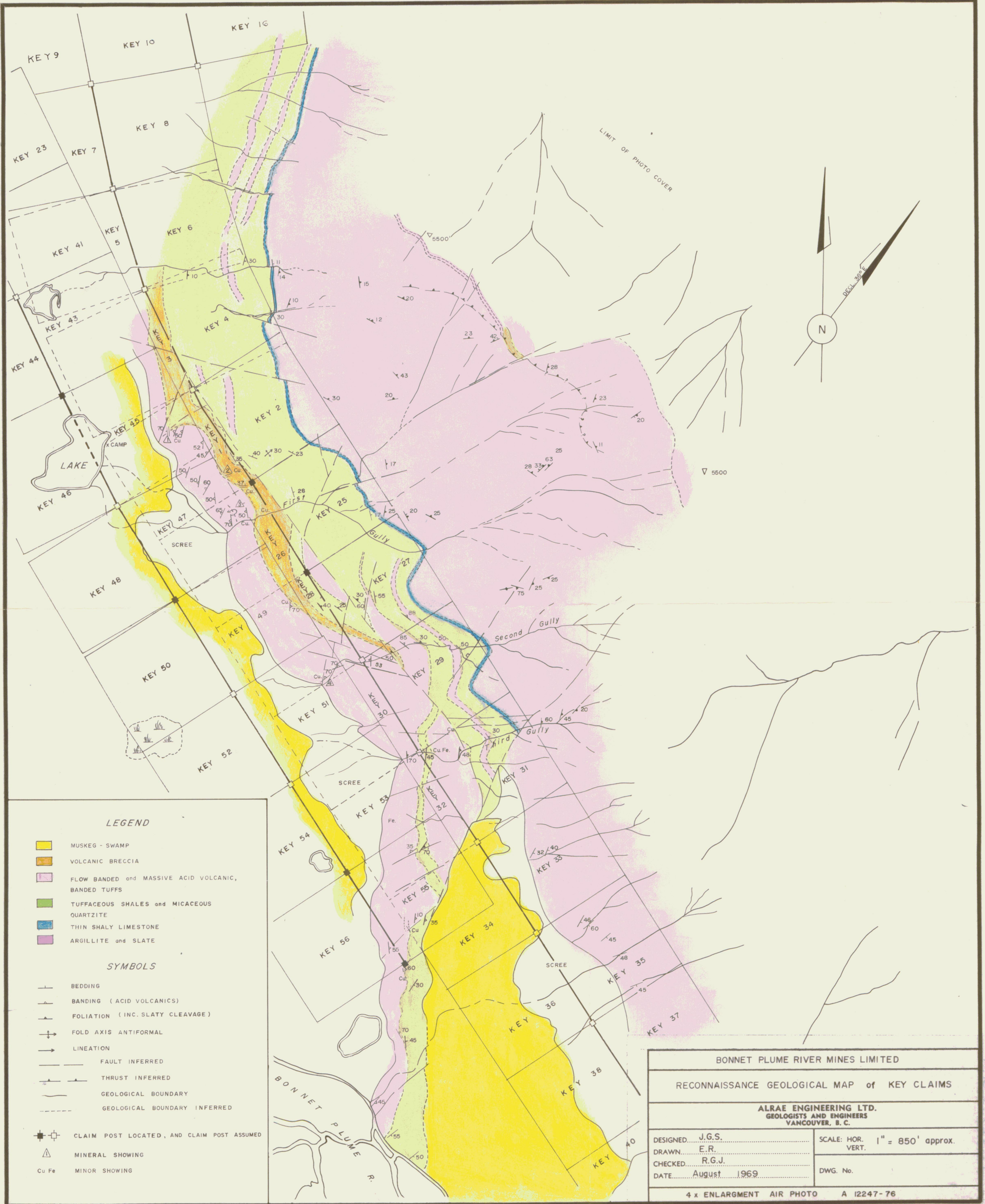
Geology - Wages	\$ 6,775.31
Camp Costs and Transportation 40%	<u>6,066.48</u>
	\$ 12,841.79



LEGEND

-  Pale grey green or dark banded cleaved silicious volcanics. Often fissile at surface. Traces of sulphides.
-  Fairly massive grey or mottled white silicious volcanics or metasediments
-  Friable vuggy very weathered brecciated fault zone. Malachite, azurite, sulphides & Fe oxides.
-  Scree, permafrozen beyond a few feet from the surface.
-  55° Approximate dip of main fault zone.
-  0.03 Drill hole showing assay values.

BONNET PLUME RIVER MINES	
KEY CLAIMS	
SITE #1 PROJECTED SECTION OF FAULT ZONE	
ALRAE ENGINEERING LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED..... J.P.	SCALE: HOR. 1" = 20'
DRAWN..... E.A.R.	VERT.
CHECKED..... J.G.S.	DWG. No. 213-16
DATE..... August, 1969	



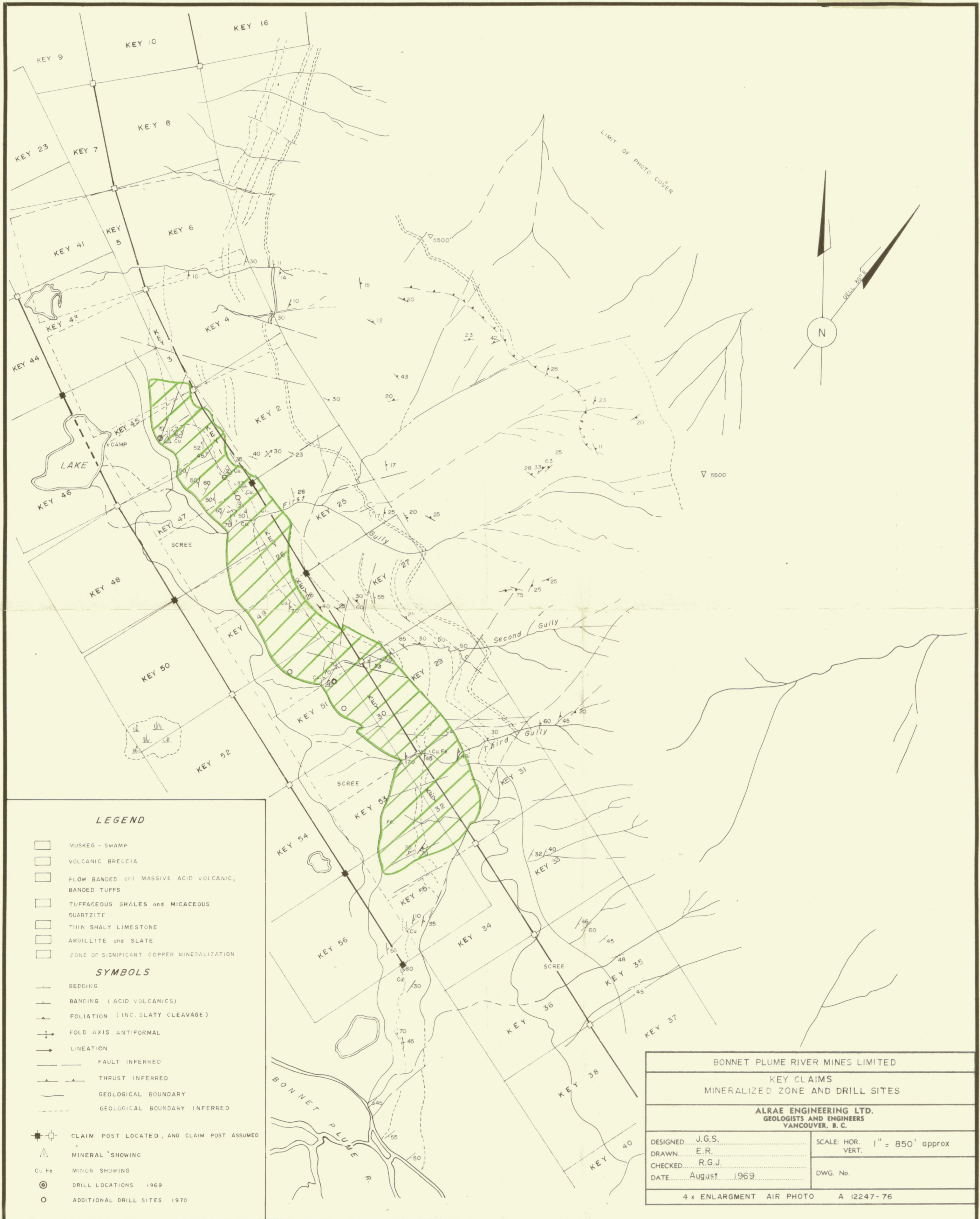
LEGEND

- MUSKEG - SWAMP
- VOLCANIC BRECCIA
- FLOW BANDED and MASSIVE ACID VOLCANIC, BANDED TUFFS
- TUFFACEOUS SHALES and MICACEOUS QUARTZITE
- THIN SHALY LIMESTONE
- ARGILLITE and SLATE

SYMBOLS

- BEDDING
- BANDING (ACID VOLCANICS)
- FOLIATION (INC. SLATY CLEAVAGE)
- FOLD AXIS ANTIFORMAL
- LINEATION
- FAULT INFERRED
- THRUST INFERRED
- GEOLOGICAL BOUNDARY
- GEOLOGICAL BOUNDARY INFERRED
- CLAIM POST LOCATED, AND CLAIM POST ASSUMED
- MINERAL SHOWING
- MINOR SHOWING

BONNET PLUME RIVER MINES LIMITED	
RECONNAISSANCE GEOLOGICAL MAP of KEY CLAIMS	
ALRAE ENGINEERING LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED..... J.G.S.	SCALE: HOR. 1" = 850' approx.
DRAWN..... E.R.	VERT.
CHECKED..... R.G.J.	DWG. No.
DATE..... August 1969	
4 x ENLARGMENT AIR PHOTO A 12247-76	



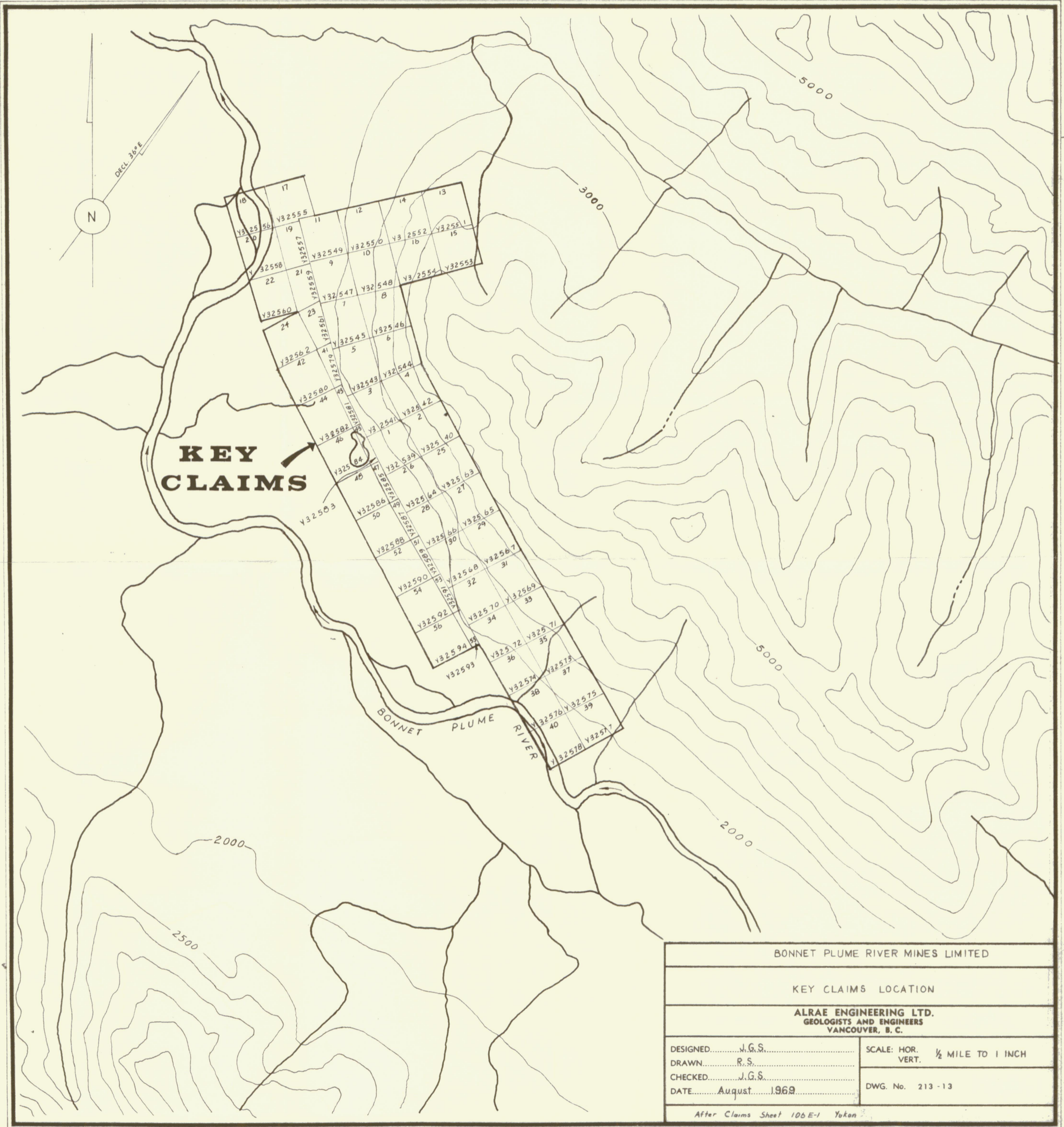
LEGEND

- MUSKEG - SWAMP
- VOLCANIC BRECCIA
- FLOW BANDED and MASSIVE ACID VOLCANIC, BANDED TUFFS
- TUFFACEOUS SHALES and MICACEOUS QUARTZITE
- THIN SHALY LIMESTONE
- ARGILLITE and SLATE
- ZONE OF SIGNIFICANT COPPER MINERALIZATION

SYMBOLS

- BEDDING
- BANDING (ACID VOLCANICS)
- FOLIATION (INC. SLATY CLEAVAGE)
- FOLD AXIS ANTIFORMAL
- LINEATION
- FAULT INFERRED
- THRUST INFERRED
- GEOLOGICAL BOUNDARY
- GEOLOGICAL BOUNDARY INFERRED
- CLAIM POST LOCATED, AND CLAIM POST ASSUMED
- MINERAL SHOWING
- MINOR SHOWING
- DRILL LOCATIONS 1969
- ADDITIONAL DRILL SITES 1970

BONNET PLUME RIVER MINES LIMITED	
KEY CLAIMS MINERALIZED ZONE AND DRILL SITES	
ALRAE ENGINEERING LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED... J.G.S.	SCALE: HOR. 1" = 850' approx.
DRAWN... E.R.	VERT.
CHECKED... R.G.J.	DWG. No.
DATE... August 1969	
4 x ENLARGMENT AIR PHOTO A 12247-76	

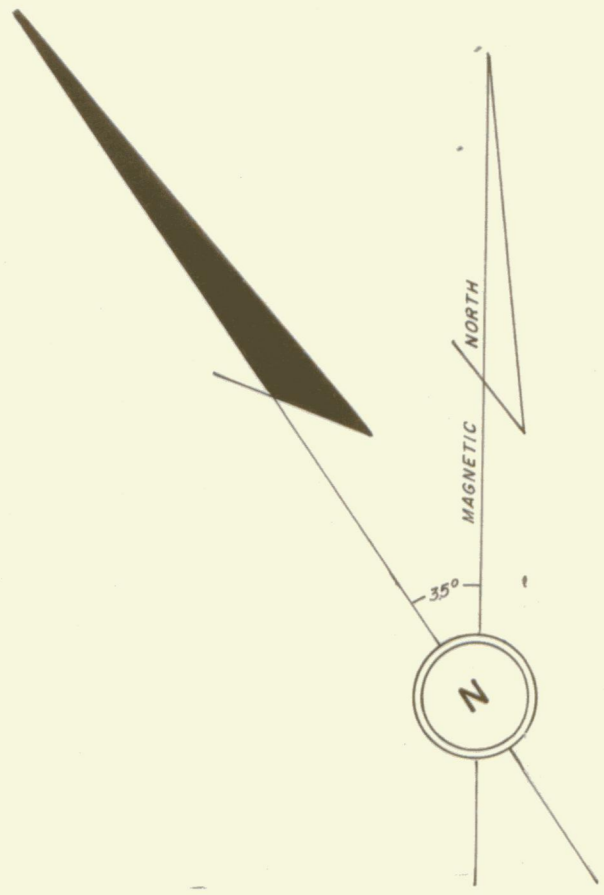


KEY CLAIMS

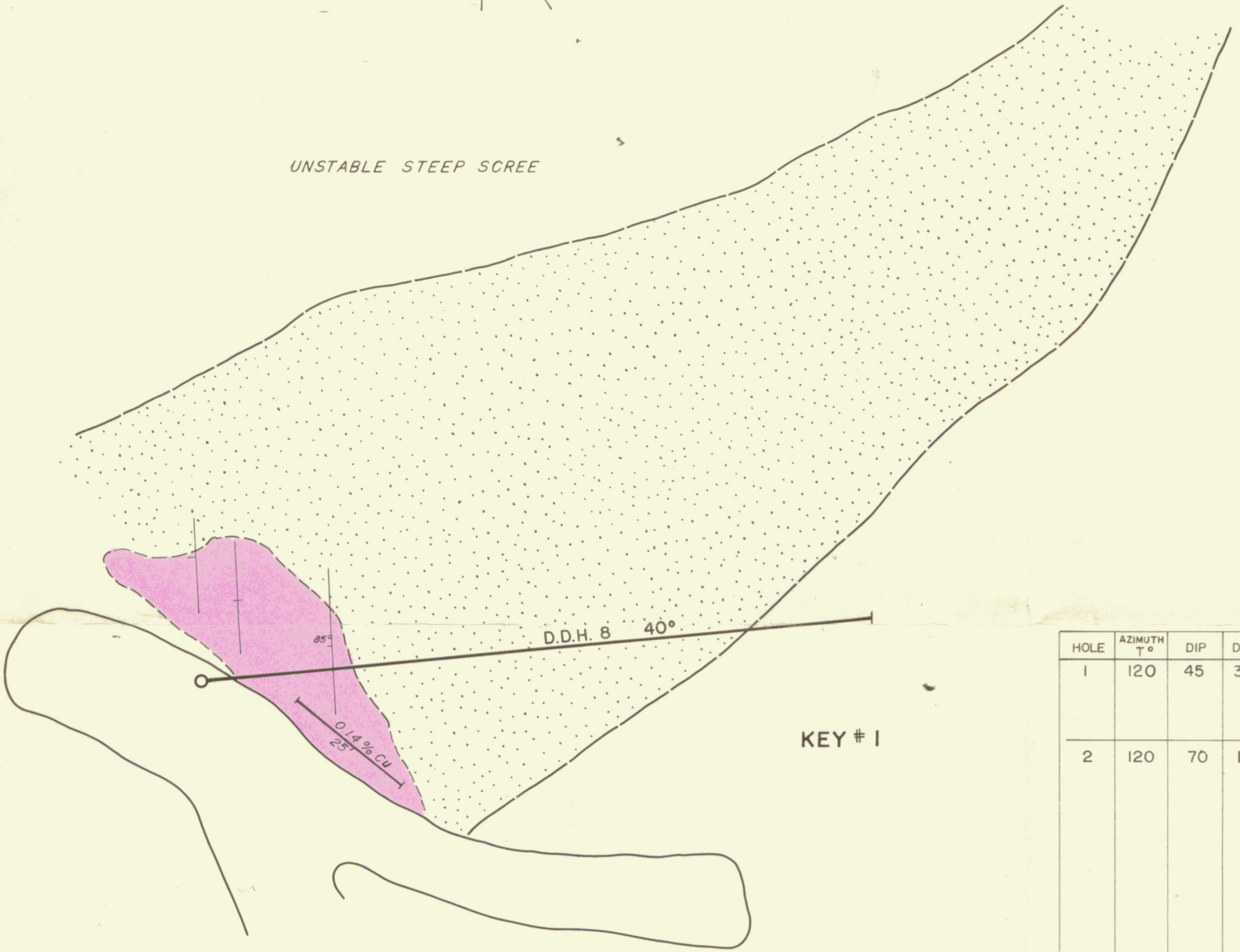
BONNET PLUME RIVER

BONNET PLUME RIVER MINES LIMITED	
KEY CLAIMS LOCATION	
ALRAE ENGINEERING LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED..... J.G.S.	SCALE: HOR. 1/2 MILE TO 1 INCH
DRAWN..... R.S.	VERT.
CHECKED..... J.G.S.	DWG. No. 213-13
DATE..... August, 1969	

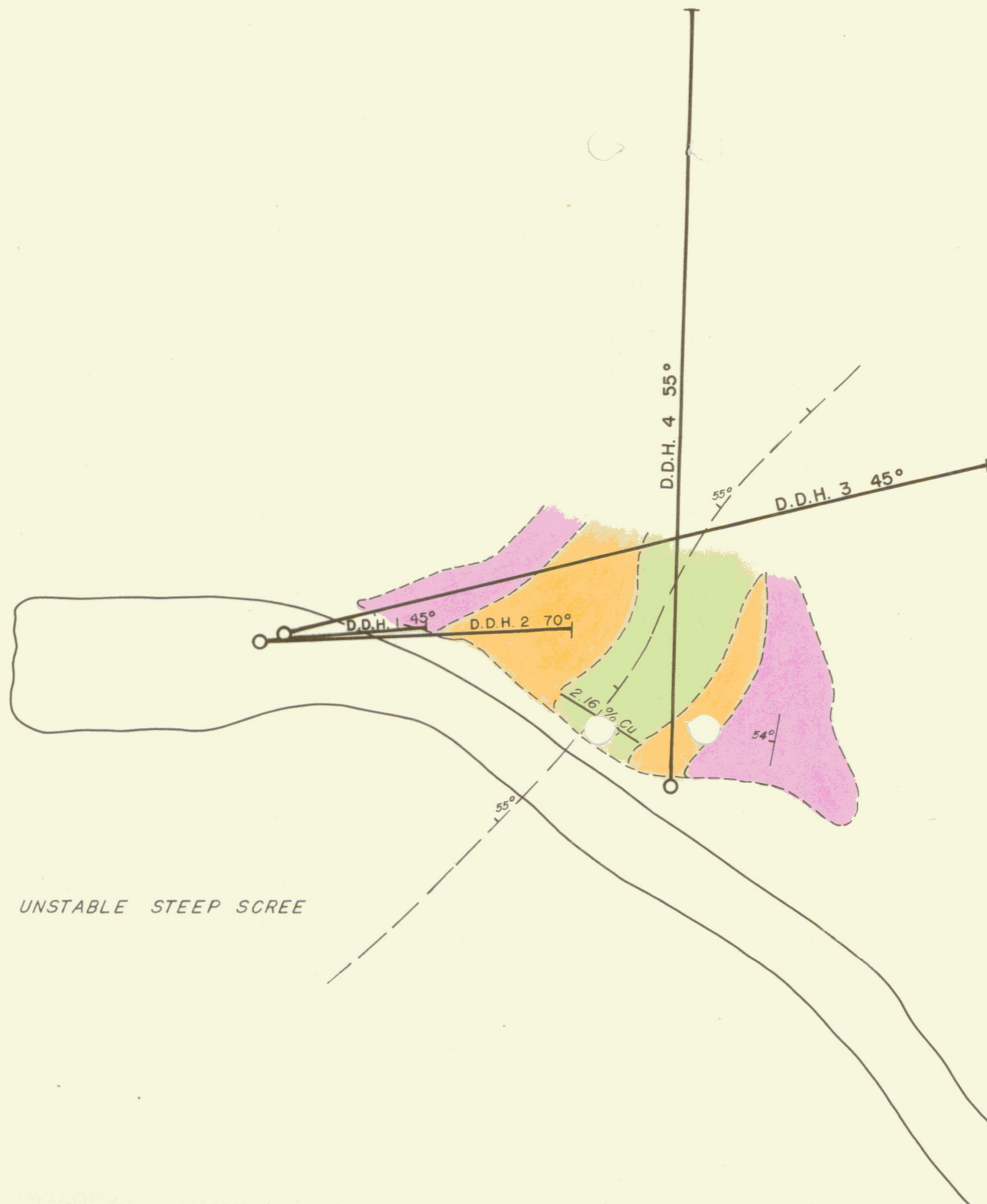
After Claims Sheet 106E-1 Yukon



UNSTABLE STEEP SCREE



KEY # 1



KEY # 1

UNSTABLE STEEP SCREE

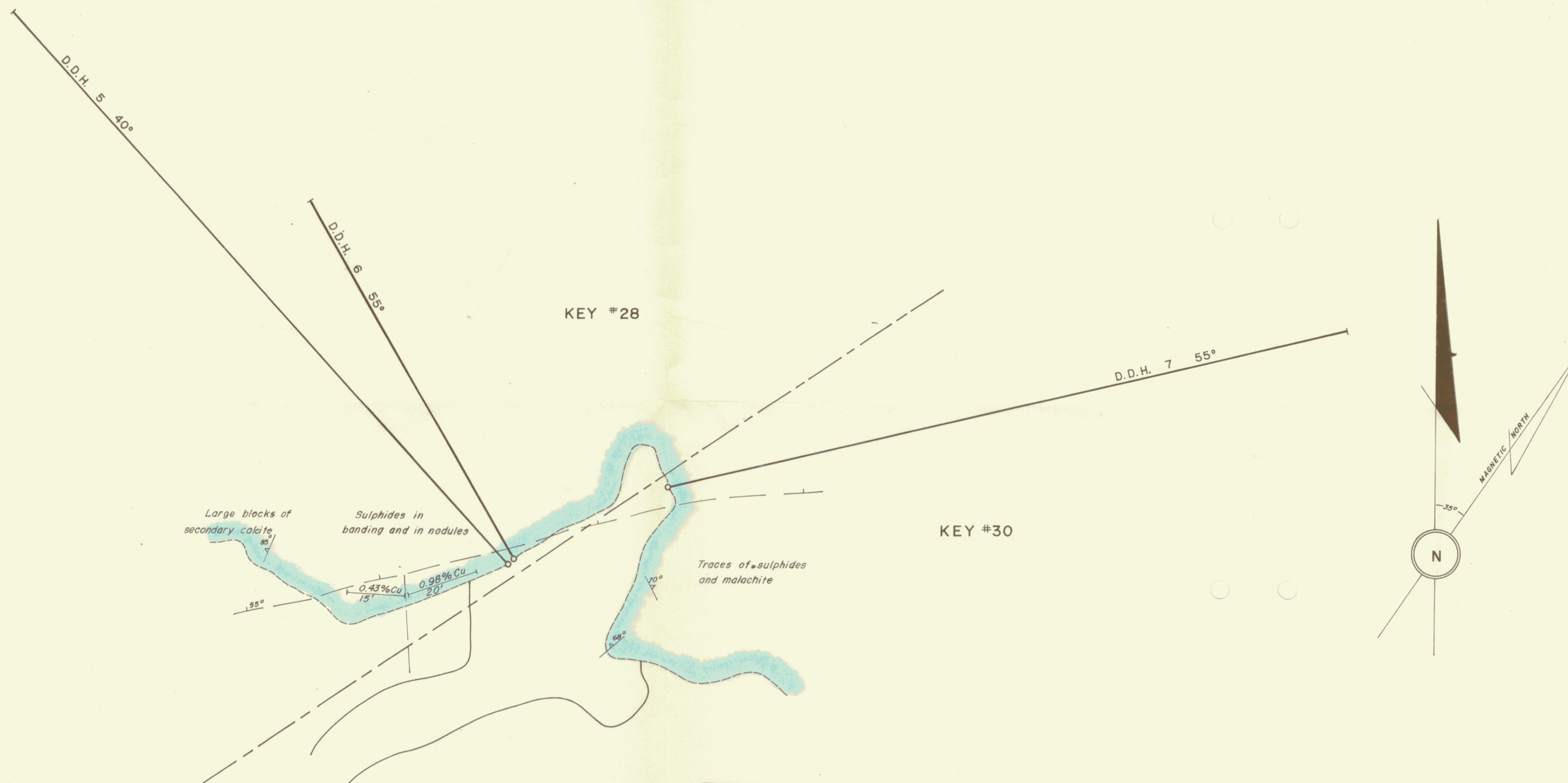
HOLE	AZIMUTH T°	DIP	DEPTH	% RECOVERY	SAMPLE NUMBER	FROM	TO	WIDTH	% Cu	OTHER
1	120	45	38'a	75	1-1	15' 0"	18' 0"	3' 0"	Tr	
					1-2	22' 0"	29' 9"	7' 9"	0-04	
					1-3	31' 0"	38' 0"	7' 0"	3-3	0.04 Au 0.06 Ag
2	120	70	148'	88	2-1	20' 8"	31' 6"	10' 8"	0-01	
					2-2	32' 0"	38' 3"	6' 3"	0-15	
					2-3	39' 9"	50' 0"	10' 3"	4-8	
					2-4	50' 0"	59' 0"	9' 0"	0-93	0.18 Ag
					2-5	59' 0"	71' 6"	12' 6"	0-08	
					2-6	72' 0"	76' 0"	3' 2"	NIL	0.02 Ag
					2-7	97' 0"	107' 1"	10' 1"	0-03	
					2-8	112' 0"	121' 0"	9' 0"	0-03	
					2-9	131' 0"	139' 0"	8' 0"	0-10	
					2-10	139' 6"	148' 0"	8' 6"	0-07	
3	110	45	168'	96	3-1	16' 0"	27' 0"	11' 0"	0-11	0.02 Ag
					3-2	31' 0"	38' 0"	7' 0"	5-0	
					3-3	39' 0"	46' 4"	7' 3"	0-10	
					3-4	48' 0"	56' 6"	8' 6"	0-07	
					3-5	60' 0"	68' 8"	8' 8"	0-02	
					3-6	78' 0"	85' 0"	7' 0"	0-02	
					3-7	92' 6"	103' 0"	10' 6"	0-06	
					3-8	108' 0"	119' 0"	11' 0"	0-04	0.02 Ag
					3-9	124' 0"	185' 6"	11' 6"	0-04	
					3-10	135' 6"	145' 0"	9' 6"	0-02	
					3-11	154' 9"	168' 0"	15' 3"	0-03	
4	035	55	221'	89	4-1	19' 0"	23' 1"	4' 1"	0-05	
					4-2	24' 0"	31' 11"	7' 11"	0-05	
					4-3	40' 6"	49' 7"	9' 1"	0-02	0.08 Ag
					4-4	55' 0"	63' 3"	8' 3"	0-04	
					4-5	117' 0"	124' 0"	7' 0"	0-02	
					4-6	132' 0"	140' 1"	8' 1"	0-06	
					4-7	148' 0"	156' 6"	8' 6"	0-02	
					4-8	202' 0"	212' 0"	10' 0"	0-02	
					4-9	212' 0"	219' 0"	7' 0"	0-13	
8	118	40	162'	82	8-1	29' 6"	34' 6"	5' 0"	0-18	
					8-2	94' 0"	98' 0"	4' 0"	0-25	

a - abandoned

LEGEND

- Fairly massive grey or mottled white silicious volcanics or metamorphosed sediments
- Friable weathered fault brecciated zone. Malachite, azurite, sulphide & ferruginous debris
- Pale grey green well cleaved slightly silicious fissile volcanics. Frequent traces of sulphides
- Scree stabilized by vegetation
- Diamond drill hole (AQ wireline)
- Fault zone with dip
- Bulldozer road
- Geological outcrop
- Geomorphological boundary
- Dip and strike of cleavage bedding or banding
- Chip sample

BONNET PLUME RIVER MINES	
KEY CLAIMS	
PLAN OF DRILL LOCATIONS: SITE I	
ALRAE ENGINEERING LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED: J.P.	SCALE: HOR. 1" = 20'
DRAWN: A.N.	VERT. 1" = 20'
CHECKED: J.G.S.	
DATE: August, 1969	DWG. No. 213-14



HOLE	AZIMUTH T°	DIP	DEPTH	% RECOVERY	SAMPLE NUMBER	FROM	TO	WIDTH	% Cu	OTHER
5	318	40	249'	98	5:1	7'6"	15'2"	7'8"	0.39	
					5:2	16'0"	24'6"	8'6"	0.14	
					5:3	25'3"	36'6"	11'3"	0.12	
					5:4	41'0"	51'6"	10'6"	0.13	
					5:5	51'6"	62'0"	10'6"	0.24	
					5:6	62'0"	73'0"	11'0"	0.13	
					5:7	73'0"	83'0"	10'0"	0.33	
					5:8	83'0"	97'0"	14'0"	0.37	
					5:9	97'0"	103'6"	6'6"	0.19	
					5:10	103'6"	114'0"	10'6"	0.17	
					5:11	114'0"	121'6"	7'6"	0.13	
					5:12	124'6"	135'0"	10'6"	0.27	
					5:13	135'0"	144'0"	9'0"	0.13	
5:14	144'0"	155'0"	11'0"	0.23						
5:15	155'0"	166'0"	10'0"	0.12						
5:16	165'0"	169'0"	4'0"	0.15						
5:17	180'0"	191'0"	11'0"	0.07						
5:18	191'0"	201'0"	10'0"	0.14						
5:19	206'0"	214'6"	8'6"	0.14						
5:20	214'6"	224'9"	10'3"	0.16						
5:21	224'9"	234'9"	10'0"	0.22						
5:22	234'9"	246'3"	11'6"	0.90						
6	330	55	185	56	6:1	11'6"	22'0"	10'6"	0.35	
					6:2	22'0"	31'6"	9'6"	0.23	
					6:3	33'2"	40'0"	6'8"	0.14	
					6:4	40'0"	50'6"	10'6"	0.33	
					6:5	57'0"	63'9"	6'9"	0.10	
					6:6	67'6"	72'6"	5'0"	0.20	
					6:7	77'0"	87'6"	10'6"	0.19	
					6:8	100'6"	106'0"	5'6"	2.40	
					6:9	Fault material from zone 151'		185'	4.80	
					6:10	185'	185'			
7	077	45	253	99	7:1	8'0"	13'6"	5'6"	0.14	
					7:2	38'6"	48'6"	10'0"	0.25	
					7:3	48'6"	58'6"	10'0"	0.27	
					7:4	67'0"	77'6"	10'6"	0.20	
					7:5	87'6"	97'0"	9'6"	0.23	
					7:6	107'0"	118'0"	11'0"	0.13	
					7:7	123'0"	127'0"	4'0"	0.14	
					7:8	142'0"	152'0"	10'0"	0.04	As: Tr Ag: 0.02
					7:9	164'0"	175'0"	11'0"	0.13	
					7:10	243'0"	248'0"	5'0"	1.60	

LEGEND

- Blocky or disturbed banded volcanics, metasomatised by silicious and calcite solutions carrying epigenetic sulphides.
- Diamond drill hole (AQ wireline)
- Fault zone with dip
- Bulldozer road
- Geological outcrop
- Claim boundary
- Flow banding orientation
- Chip sample

BONNET PLUME RIVER MINES	
KEY CLAIMS	
PLAN OF DRILL LOCATIONS: SITE 4	
ALRAE ENGINEERING LTD. GEOLOGISTS AND ENGINEERS VANCOUVER, B. C.	
DESIGNED..... J.P.	SCALE: HOR. 1" = 20'
DRAWN..... E.A.R.	VERT. 1" = 20'
CHECKED..... J.G.S.	
DATE..... August, 1969	DWG. No. 213-15