

840869

N75: 92 L/se

-REPORT ON THE
TEETA CREEK PROPERTY
NEROUTSOS INLET, NANAIMO M. D.
BRITISH COLUMBIA

For: J. R. Billingsley
3157 West 33rd Avenue
Vancouver, B. C.
V6N 2G6

By: G. A. Noel, P.Eng.

January 16, 1979

G. A. NOEL AND ASSOCIATES
CONSULTING GEOLOGISTS
VANCOUVER, B. C.

REPORT ON THE
TEETA CREEK PROPERTY
NEROUTSOS INLET, NANAIMO M. D.
BRITISH COLUMBIA

For: J. R. Billingsley
3157 West 33rd Avenue
Vancouver, B. C.
V6N 2G6

By: G. A. Noel, P.Eng.

January 16, 1979

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	1
INTRODUCTION	5
LOCATION AND ACCESS	5
PROPERTY AND TITLE	6
PREVIOUS WORK	8
GEOLOGY	
General	9
Property	12
Structure	15
Mineralization	16
GEOCHEMICAL RESULTS	17
GEOPHYSICAL RESULTS	
Magnetometer Survey	22
Induced Polarization Survey	22
DRILLING RESULTS	24
CONCLUSIONS	26
RECOMMENDATIONS	28
REFERENCES	30
APPENDIX	

LIST OF ILLUSTRATIONS

FIGURE 1	Location Map	4
FIGURE 2	Claim Map	7
FIGURE 3	Geology Map	11
FIGURE 4	Geochemical - Soils - Cu	19
FIGURE 5	" " - Mo	20
FIGURE 6	Trench & Rock Geochemistry	21
FIGURE 7	Induced Polarization - P.F.E. Contours	23

SUMMARY

The Teeta Creek property is located on the west side of Neroutsos Inlet on the northern end of Vancouver Island at 50°23'15"North, 127°31'West. Access is via air or vehicle to Port Alice and by boat across the inlet to the mouth of Teeta Creek. A rough tractor road leads 3 km. southwest up the creek to the campsite. The property comprises 50 claims owned by Mr. J. R. Billingsley of Vancouver.

The property was first staked in 1967 by the Quatsino Syndicate. In 1968, Newmont Mining Corporation of Canada Ltd., which holds a 10% carried interest, did silt and soil sampling surveys, geological mapping and a magnetometer survey. This was followed by surface trenching and 887 metres of BQ diamond drilling.

In 1974, Cities Service Mineral Corporation optioned the property and in 1975 and 1976 this company completed 2029 metres of BQ drilling as well as geological, geochemical and geophysical surveys on the property. Geologically the property shows many similarities to the Island Copper deposit near Port Hardy. The Teeta Creek area is underlain by Lower Triassic Bonanza Volcanics which include andesite and dacite tuffs, tuff breccias and flows. This volcanic assemblage is intruded by quartz, diorite, granodiorite and numerous dykes. The quartz diorite, which is the largest pluton on the property is intensely altered near its contact with the tuffs and breccias. The pyroclastics and intrusives have been affected by potassic, argillic and carbonate alteration, resulting in pale grey altered rocks (argillic-silicic) and purple biotized units. The pale grey altered rock consists of quartz diorite, granodiorite and

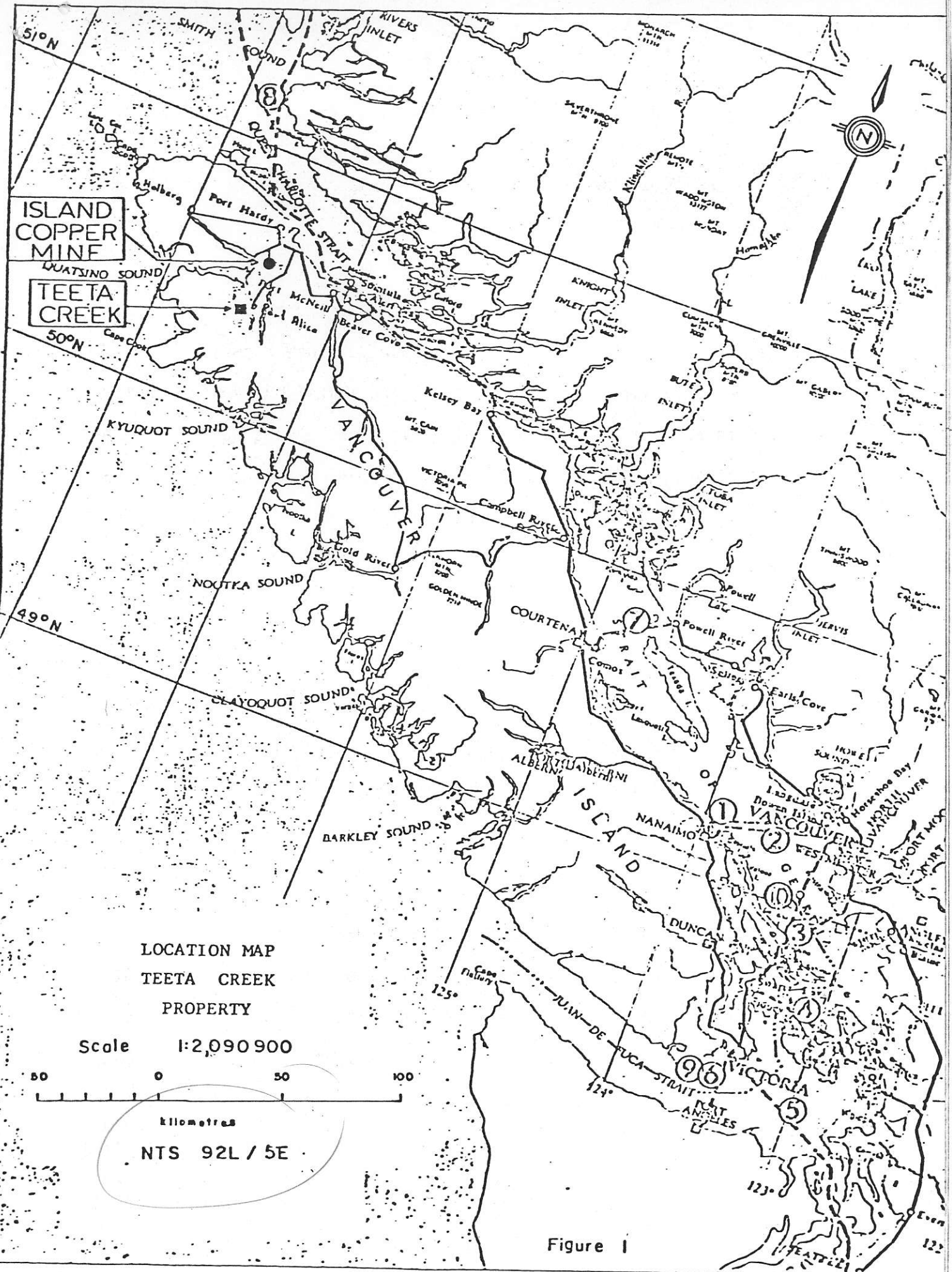
tuff, which have been intensely bleached as a result of silicification with accompanying clay and carbonate alteration. The biotized rocks are generally brown to purple with fragments of biotized quartz diorite, quartz and fine grained tuff in a fine grained biotite matrix.

These intensely altered rocks occupy the central part of the property. The overall structure has not been established, but the distribution of the younger Bonanza members on higher ground suggests a northeast trending anticline with its core exposed along Teeta Creek. The creek itself occupies a major northeast trending fault zone. Pyrrhotite, pyrite and chalcopyrite occur primarily in the intensely fractured and faulted central area in the pale grey altered rocks and to a lesser extent in the purple biotized quartz diorite and tuffs.

The copper soil anomaly on the northwest side of Teeta Creek trends northerly and is 750 metres long by 150-300 metres wide. I.P. and rock geochemical surveys show fairly coincident anomalies. Assays of surface samples in the anomalous area range from 0.02 to 0.65% copper. The molybdenum soil anomaly is closely coincident with the copper anomaly. On the southeast side of Teeta Creek, a fairly significant molybdenum soil anomaly is only partly defined.

A zone of better grade copper mineralization was roughly defined by drilling. It is 360 metres long by 30-60 metres wide and trends N30°E. Most of the copper mineralization tested to date over the whole property ranges from 0.05 to 0.15% Cu over extensive sections.

A program of 900 metres of BQ diamond drilling and some very limited geochemical soil sampling has been recommended at an estimated overall cost of \$150,000.



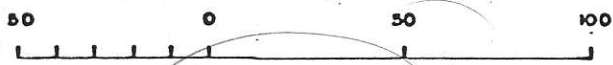
ISLAND
COPPER
MINE

QUATSINO SOUND

TEETA
CREEK

LOCATION MAP
TEETA CREEK
PROPERTY

Scale 1:2,090,900



kilometres

NTS 92L / 5E

Figure 1

INTRODUCTION

This report on the Teeta Creek property in the Nanaimo Mining Division of British Columbia has been prepared at the request of Mr. J. R. Billingsley, 3157 West 33rd Avenue, Vancouver, B. C. The report is based on a detailed examination of the property in 1970, as well as a study of numerous reports and data supplied by Mr. Billingsley and listed under References at the end of this report. The purpose of this study is to assess the results of all previous work and to determine if further exploration is justified. If so, a plan for further exploration is to be presented together with an estimate of the anticipated cost of the recommended program.

LOCATION AND ACCESS

The Teeta Creek property is on the west side of Neroutsos Inlet on the northern end of Vancouver Island, at latitude 50°23'15" North, longitude 127°31' West. The claims straddle Teeta Creek, which flows northeasterly into Neroutsos Inlet, directly across from the town of Port Alice.

Access to the property is by air from Vancouver to Port Hardy, and 50 km. south by road to Port Alice. From Port Alice, it is 2 km. across the inlet to the mouth of Teeta Creek. A rough cat road leads 3 km. southwest to the campsite at the center of the property. Port Alice can also be reached via 370 kms of highway and B. C. Ferries from Vancouver.

The location of the property is shown on Figure 1.

PROPERTY AND TITLE

The property consists of 50 claims which are listed below and also shown on Figure 2.

<u>Mineral Claim</u>	<u>No. of Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
Boy 1	1	24193	March 5, 1985
Boy 2	1	24194	"
Star 1	1	24195	"
Star 3	1	24197	"
Star 5	1	24199	"
Star 7	1	24201	"
Star 8	1	24202	"
Star 9	1	24203	"
Star 10	1	24204	"
Star 11	1	24205	"
Star 12	1	24206	"
Star 13	1	24207	"
Star 14	1	24208	"
Star 15	1	24209	"
Star 17	1	24211	"
Star 21	1	24215	"
Star 22	1	24216	"
Star 23	1	24217	"
Star 24	1	24218	"
Star 25	1	24219	"
Star 26	1	24220	"
Star 27	1	24221	"
Star 28	1	24222	"
Star 29	1	24223	"
Star 30	1	24224	"
Star 31	1	24225	"
Star 32	1	24226	"
Star No.1 Fraction	1	26944	Sept. 4, 1985
Star No.2 Fraction	1	26945	"
Star No.3 Fraction	1	26946	"
Star No.4 Fraction	1	26947	"
Moon 1	1	37894	Nov. 1, 1984
Moon 2	1	37895	"
Moon 3	1	37896	"
Moon 4	1	37897	"
Moon 5	1	37898	"
Moon 6	1	37899	"
Moon 7	1	37900	"
Moon 8	1	37901	"
Moon 9	1	37902	"
Moon 10	1	37903	"
Sun	9	20	July 2, 1985

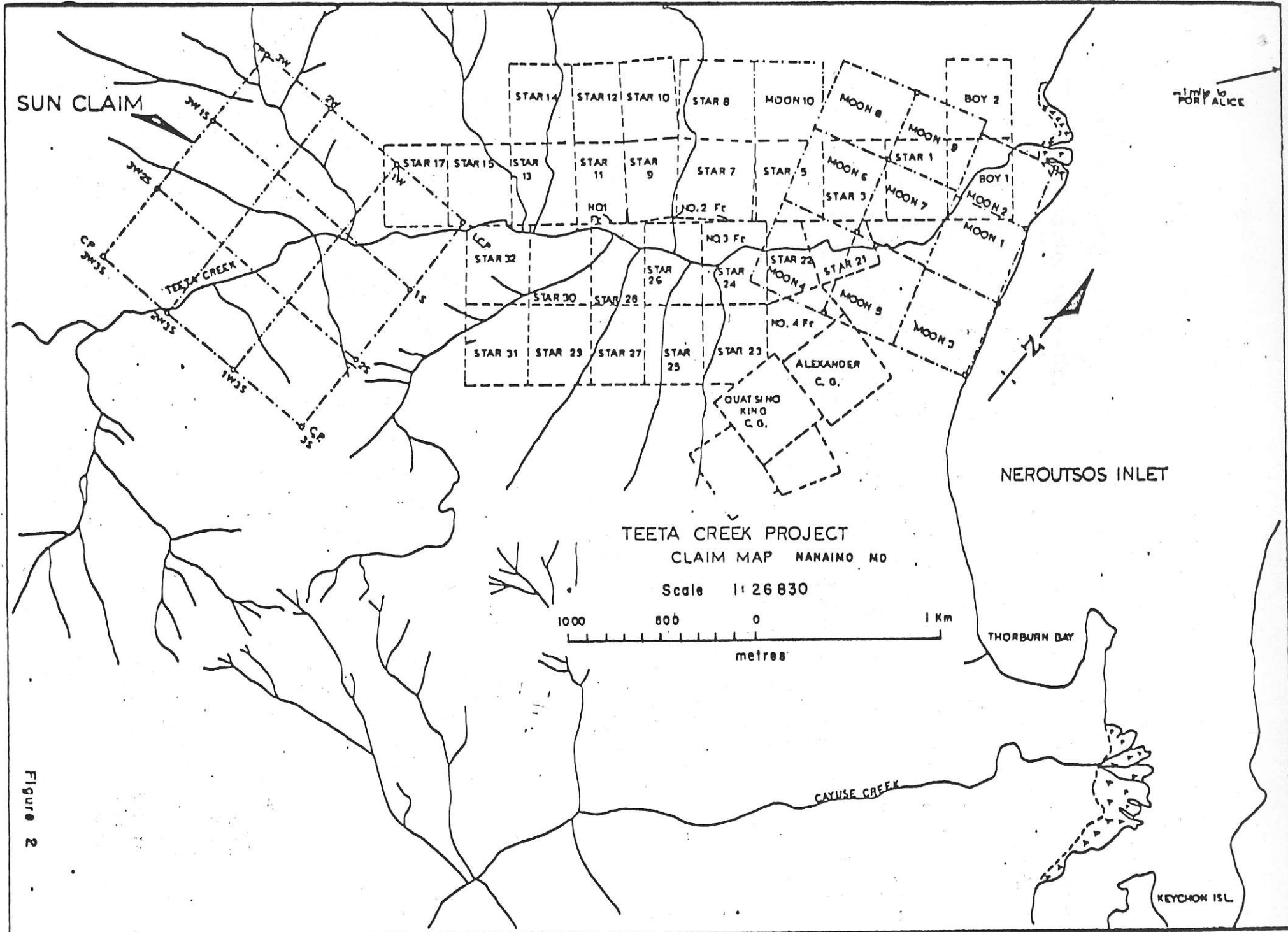


Figure 2

The claims are owned by Mr. J. R. Billingsley, 3157 West 33rd Avenue, Vancouver, B. C. with the following retained non-contributory or carried interests.

Newmont Mining Corp. of Canada Ltd.	10%
Bralorne Resources Limited	5%

According to the terms of an agreement dated June 21, 1972 between Mr. Billingsley and Newmont and Bralorne Resources, the total carried interest may be purchased outright for \$480,000. Otherwise these companies are entitled to a total of 10% of the net proceeds from the sales of minerals from the property until Newmont receives \$320,000 and Bralorne \$160,000.

PREVIOUS WORK

The Teeta Creek copper prospect was discovered in 1967-68 by the Quatsino Syndicate consisting of Newmont Mining Corporation of Canada Ltd., Can-Fer Mines Ltd. and J. R. Billingsley, as a result of a geochemical reconnaissance program. Further stream sediment sampling and geological prospecting were done early in 1968 and 58 claims were staked along Teeta Creek valley. This was followed by detailed geological mapping, soil sampling and a magnetometer survey. Some surface trenching was then done as well as a detailed stream sediment survey of the entire Teeta Creek drainage. In September and October 1968, five BQ diamond drill holes totalling 887 metres were drilled. No further work was done on the property by the Quatsino Syndicate, which had by this time expended in excess of \$120,000 on the Teeta Creek property.

In 1972, the claims were transferred to J. R. Billingsley with Newmont and Can-Fer retaining a 15% total carried interest. In 1974 Cities Service Mineral Corporation optioned the property from J. R. Billingsley and carried out an induced polarization survey over part of the property in November 1974. In 1975, Cities Service conducted geochemical rock, soil and silt sampling surveys and also some geological mapping. Four BQ holes aggregating 1267 metres were drilled on the property. The nine-unit Sun claim was staked to the west of the Star claim block to cover some small copper showings about three miles from the mouth of Teeta Creek. Geological and geochemical surveys were conducted over the Sun claims in 1975.

In 1976, Cities Service conducted detailed geological mapping and geochemical and magnetometer surveys over part of the Teeta Creek property. In addition two BQ holes totalling 762 metres were drilled. Very limited geological mapping and soil sampling were done on the Sun claims. Following this work, Cities Service terminated their option in November 1976 and no further work has been done on the property since that date.

GEOLOGY

General

Northern Vancouver Island is underlain by the Vancouver Group of basic to intermediate volcanic rocks and minor sediments which include the following members: a basal Middle Triassic sediment -

sill unit; the Middle to Upper Triassic Karmutsen Formation of marine volcanics with minor interbedded pyroclastics; the Upper Triassic Quatsino Limestone and Parson Bay Formations of volcani-clastic and pelitic sediments; the Lower Jurassic Harbledown Formation of pelitic sediments and volcanic rocks; and the Lower to Middle Jurassic Bonanza Volcanics.

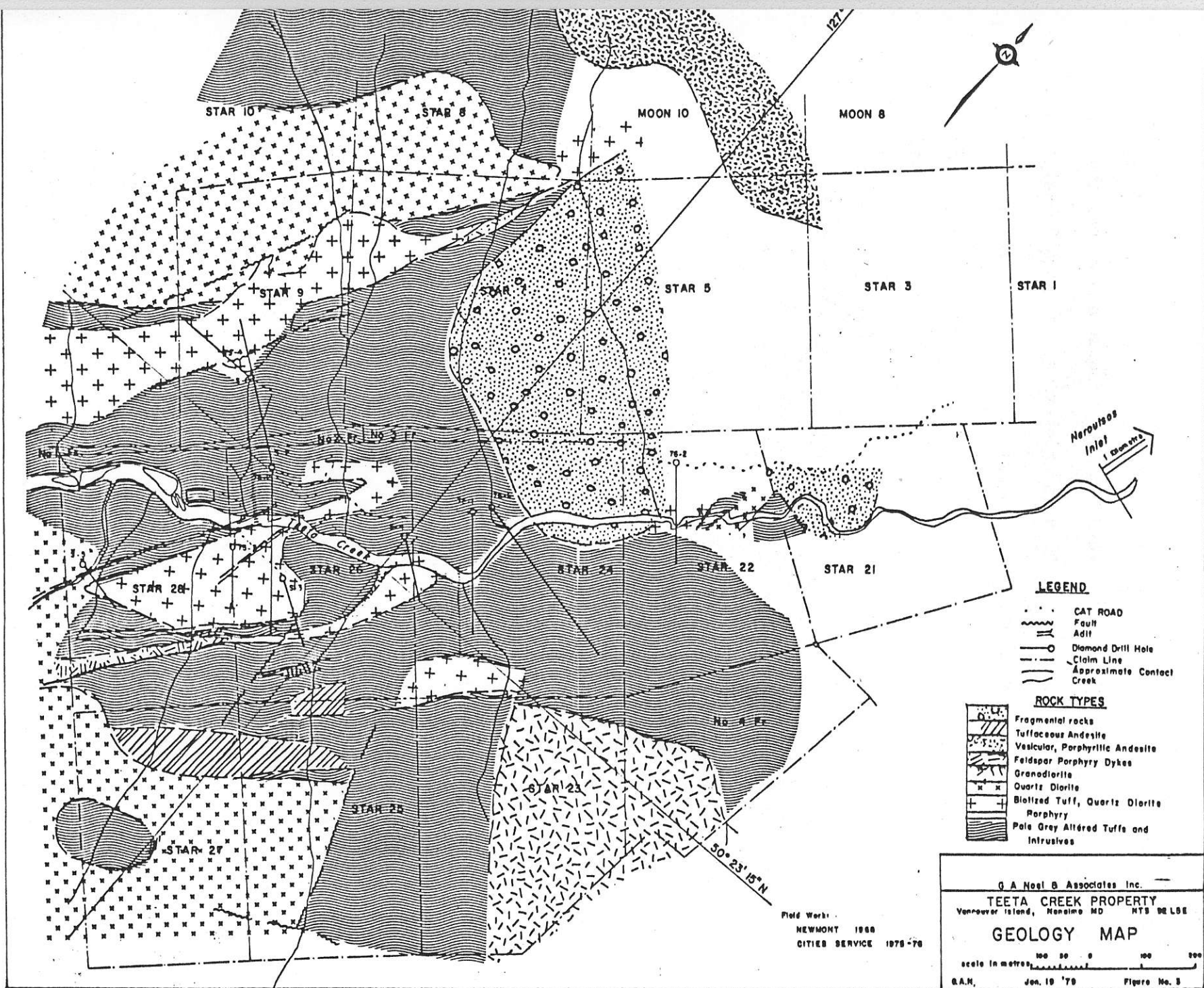
The Vancouver Group are intruded by the Lower to Middle Jurassic Island Intrusions generally of quartz diorite to granodiorite composition. The intrusions are considered at least in part contemporaneous with the Bonanza Volcanics.

Lower Cretaceous clastic sediments unconformably overlie the Vancouver Group.

Structurally, northern Vancouver Island is in the form of a medial north-northwest trending arch flanked by fault blocks with outward dipping strata. The region is crisscrossed by irregular sets of steep to vertical normal or strike-slip faults.

The Teeta Creek area lies in the Brooks Peninsula Fault Zone which separates the Quatsino Fault Block on the northwest from the Karmutson Block to the southeast. This fault zone consists of northeasterly cross-faults which offset several northwesterly faults. The northeasterly faults form the valleys of Cayuse, Teeta and Colonial Creeks, and in places display Late Tertiary volcanics.

A number of copper and molybdenum porphyry deposits on northern Vancouver Island occur in the intruded Bonanza volcanics and pyro-



LEGEND

- CAT ROAD
- ~ Fault
- Adit
- Diamond Drill Hole
- - - Claim Line
- - - Approximate Contact
- ~ Creek

ROCK TYPES

- Fragmental rocks
- Tuffaceous Andesite
- Vesicular, Porphyritic Andesite
- Feldspar Porphyry Dykes
- Granodiorite
- Quartz Diorite
- Biotitized Tuff, Quartz Diorite
- Porphyry
- Pale Grey Altered Tuffs and Intrusives

G. A. Noel & Associates Inc.
 TEETA CREEK PROPERTY
 Vancouver Island, Nanaimo B.C. NTS 92 L5E

GEOLOGY MAP

scale in metres 100 50 0 100 200

G.A.M. Jan. 19 '79 Figure No. 3

Field Work:
 NEWMONT 1988
 CITIES SERVICE 1978-79

clastics as well as in the porphyry intrusions. These occurrences include the Island Copper, Red Dog, Expo, Hep and Road deposits. At Island Copper, a quartz-feldspar porphyry dyke intrudes Lower Bonanza tuffs and volcanics. The dyke is an offshoot of a small granodiorite stock of Upper Jurassic age at the east end of Rupert Inlet.

Property

In the Teeta Creek area, sediments of the Upper Triassic Parson Bay Formation as well as volcanic, pyroclastic and intrusive members of the Lower Jurassic Bonanza Volcanics are intruded by a quartz diorite stock.

The Parson Bay Formation is represented by silicified argillitic tuffs with lenses of grey to black impure limestone. This unit is exposed in a number of outcrops in the southwest corner of Star 27 claim forming several N70°W trending bands up to 180 metres long by 30 metres wide.

The Bonanza Volcanics on the property consist of: andesitic and dacitic tuffs and tuff breccias; porphyritic, vesicular and tuffaceous andesites and a younger fragmental tuff or breccia of blocky texture. The lower section of andesitic and dacitic tuffs and tuff breccias has been intensely altered probably mainly hydrothermally. The intensely altered section has been differentiated into two units which underlie most of the Teeta Creek property: pale grey altered rock and biotized rock. The pale grey altered unit consists of

quartz diorite, granodiorite and tuff. Intense silicification, clay and carbonate alteration have bleached these rocks to megascopic similarity. The biotized rocks are purple with fragments of biotized quartz diorite, quartz and fine grained tuff in a biotite-rich matrix. The fragments vary from 1 cm. to greater than 8 cm. in diameter. These intensely altered rocks occupy the central part of the Teeta Creek property and are generally exposed at lower elevations, in particular along Teeta Creek. Relatively unaltered andesite tuff was intersected in drilling as a medium grained green to black porphyritic rock with broken crystals of plagioclase, hornblende and quartz in a similar fine grained matrix with clots of secondary biotite. The porphyritic vesicular and tuffaceous andesites are found as interbedded units at higher elevations to the north of Teeta Creek on Moon 8 and 10 claims. The porphyritic andesite is a fine grained green volcanic with large feldspar phenocrysts. The vesicular andesite is a dark green to black flow which includes some basalts. The tuffaceous unit is a fine grained green to grey rock considerably higher in the Bonanza sequence than the lower section of tuffs.

The Bonanza Volcanics are intruded on the Teeta Creek property by quartz diorite and granodiorite as well as numerous dykes. The quartz diorite apparently forms a U-shaped body with limbs on both sides of Teeta Creek, open to the east and closing about 1500 metres to the west on the Sun claim. The fresh quartz diorite is a light grey, medium grained rock composed of interlocking grains of plagi-

clase, quartz and aggregates of chlorite and carbonate with interstitial potash feldspar. On the Star claims mainly at lower elevations, the quartz diorite is intensely altered particularly near its contact with the lower Bonanza tuffs. The alteration consists of biotization, silicification and clay and carbonate alteration. Biotized quartz diorite porphyry occurs within the pale grey altered zone as a purple coloured rock consisting of plagioclase phenocrysts in a fine grained groundmass of quartz and secondary biotite. In the pale grey altered zone, the quartz diorite thus exhibits either biotite-quartz-potash feldspar alteration or clay-carbonate-quartz alteration.

The granodiorite occurs as a small plug on the southeast end of the property, outcropping fairly extensively on the east side of Star 23 and the south half of Star No. 4 Fraction. It is a medium grained, sub-porphyrific rock grading from granodiorite to monzonite and in places to quartz diorite. It is probably a facies of the quartz diorite.

Dyke rocks on the property have been divided into two categories: hornblende diorite and basic dykes, and feldspar porphyry dykes. The hornblende diorite dykes are fairly widespread on the southeast side of Teeta Creek. The hornblende diorite is medium to coarse grained with interlocking grains of hornblende and plagioclase. The hornblende in places is up to 2 cm. in diameter. These dykes are pre-mineral and generally show varying amounts of pyrite, chalcopyrite, molybdenite and magnetite. They are believed

to be a late facies of the quartz diorite intrusion. Dark fine grained basic dykes range from andesite to gabbro in composition. They are later than the sulphide mineralization and are generally rather scarce. Feldspar porphyry dykes on the other hand are fairly abundant throughout the property. They vary from 10 cm. to over 15 metres in width and generally trend northeasterly. These dykes have been strongly altered with clay, carbonate and sericite replacing the feldspar phenocrysts. The groundmass consists of fine grained quartz, clay minerals, sericite and carbonate. These dykes are post-mineral as regards copper and molybdenum mineralization, but they generally contain small cubes of pyrite.

Structure

The structural pattern on the Teeta Creek property is complicated by the extent and intensity of alteration as well as by the very limited areas of outcrop. Bonanza Volcanic units on the ridges northwest and southeast of Teeta Creek exhibit northeasterly strikes and shallow dips to the northwest and southeast. On the lower valley slopes and along Teeta Creek, the volcanics and sediments exhibit a general northeasterly strike and moderate southeasterly dip. There is some suggestion from these attitudes and the distribution of younger Bonanza members on the higher ground, of a northeast trending anticlinal structure with the Teeta Creek valley representing the eroded core and the ridges, the limbs of the fold.

The major fault on the property is the northeast trending system along Teeta Creek. It is apparently represented by a series of en echelon faults of small displacements.

Mineralization

Near the quartz diorite contact the volcanics show extensive potassic alteration with development of biotite, minor potash feldspar, quartz, clay, carbonate, sericite, chlorite and epidote. This is believed to represent the first stage alteration on the property. Intense argillic and carbonate alteration in the central part of the property is related to intense fracturing which generally follows a N20°-60°E direction. Quartz veining and general silicification follow this fracturing. Three more stages of fracturing and quartz veining have been recognized and of these four stages, three were accompanied by sulphide mineralization.

The mineralization on the property consists of the followings sulphides in order of decreasing abundance: pyrite, pyrrhotite, chalcopyrite, molybdenite and sphalerite.

Magnetite, gold and silver are also present and the precious metal values are closely associated with the copper mineralization. Magnetite is disseminated through the quartz diorite and in the basic dykes. Pyrrhotite, chalcopyrite and pyrite are found primarily in the intensely fractured and altered central area. The chalcopyrite mineralization is associated with pyrrhotite and they are found interlocked on many silicified fractures. Pyrite is pervasive and does not favor any particular set of fractures. Disseminated pyrrhotite and chalcopyrite are present in the altered zone particularly around breccia and tuff fragments. Molybdenite is apparently restricted to the second stage quartz veins. The contact areas up to 1.5 metres wide along the unmineralized feldspar porphyry dykes

are also favourable sections for copper and other sulphides.

The three fracture sets that carry the better grades of copper, molybdenum, gold and silver mineralization occur almost exclusively in the "pale grey altered" rocks and to a lesser extent in the purple biotized quartz diorite and biotized tuffs. Disseminated pyrrhotite is very abundant in the biotized quartz diorite, where it forms up to 5% by volume.

GEOCHEMICAL RESULTS

Newmont's 1968 geochemical soil survey involved 36 Km. of grid lines with 1070 soil samples taken at 30-metre intervals along lines 60 metres apart. The soils were analyzed for total copper and molybdenum in parts per million. The results of this survey are as follows:

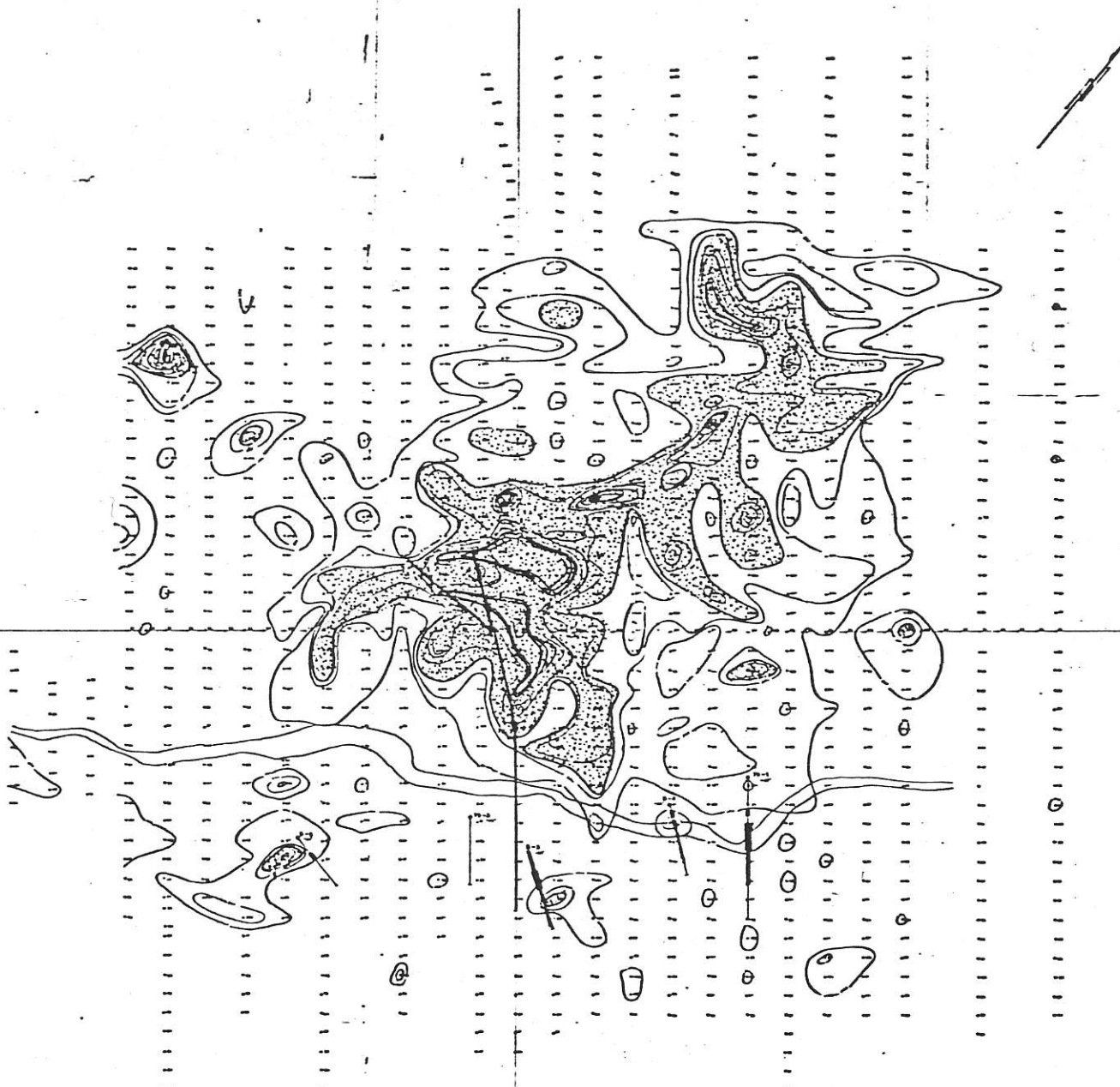
1. The copper background value was 50 ppm. The area enclosed by the 350 ppm copper contour is 750 metres long by 150 to 300 metres wide. It has a very irregular shape, trends northerly and is entirely on the northwest side of Teeta Creek. This anomalous area closely follows the contact between the biotized tuffs and the pale grey altered rock. Copper values in the soils on the southeast side of Teeta Creek are generally less than 150 ppm. Surprisingly, the best copper intersections were drilled in this area. The lower copper values in the soils on the southeast side of the creek are probably the result of heavier overburden including alluvial gravels. On the southeast side of the Teeta Creek, a threshold value of 100 ppm copper outlines

several small anomalies in the vicinity of drill holes S-3 and S-5 but a clear pattern is not readily apparent.

2. The 10 ppm molybdenum contour outlines a N-trending area 850 metres long by 300-600 metres wide. This anomaly encompasses much the same area as the copper soil anomaly but with a wider spread to the east into the pale grey altered rocks and to the west into the quartz diorite. This molybdenum soil anomaly, like the copper soil anomaly, is restricted to the northwest side of Teeta Creek. About 240 metres southwest of drill hole S-5 on Star 30 claim, a significant molybdenum soil anomaly is only partially outlined on the southeast side of Teeta Creek.

3. No correlation could be determined between the sulphide mineralization and mercury, tungsten, tin and arsenic content of the soils.

In 1975 and 1976, Cities Service conducted detailed geochemical rock chip sampling over an area on the northwest side of Teeta Creek where sulphide mineralization had been indicated by an earlier induced polarization survey. This sampling was mainly restricted to drainages to provide the greatest extent of rock exposure, and generally covered Star 7, 8 and 9 claims. Anomalous copper values occurred over an area roughly 600 metres long by 300 metres wide and trending N20°E. Detailed geochemical rock sampling was also done along Teeta Creek for about 2000 metres upstream from its mouth and along several tributary streams on the southeast side of Teeta Creek. Along Teeta Creek the altered tuffs and porphyry show the following ranges in metal values:

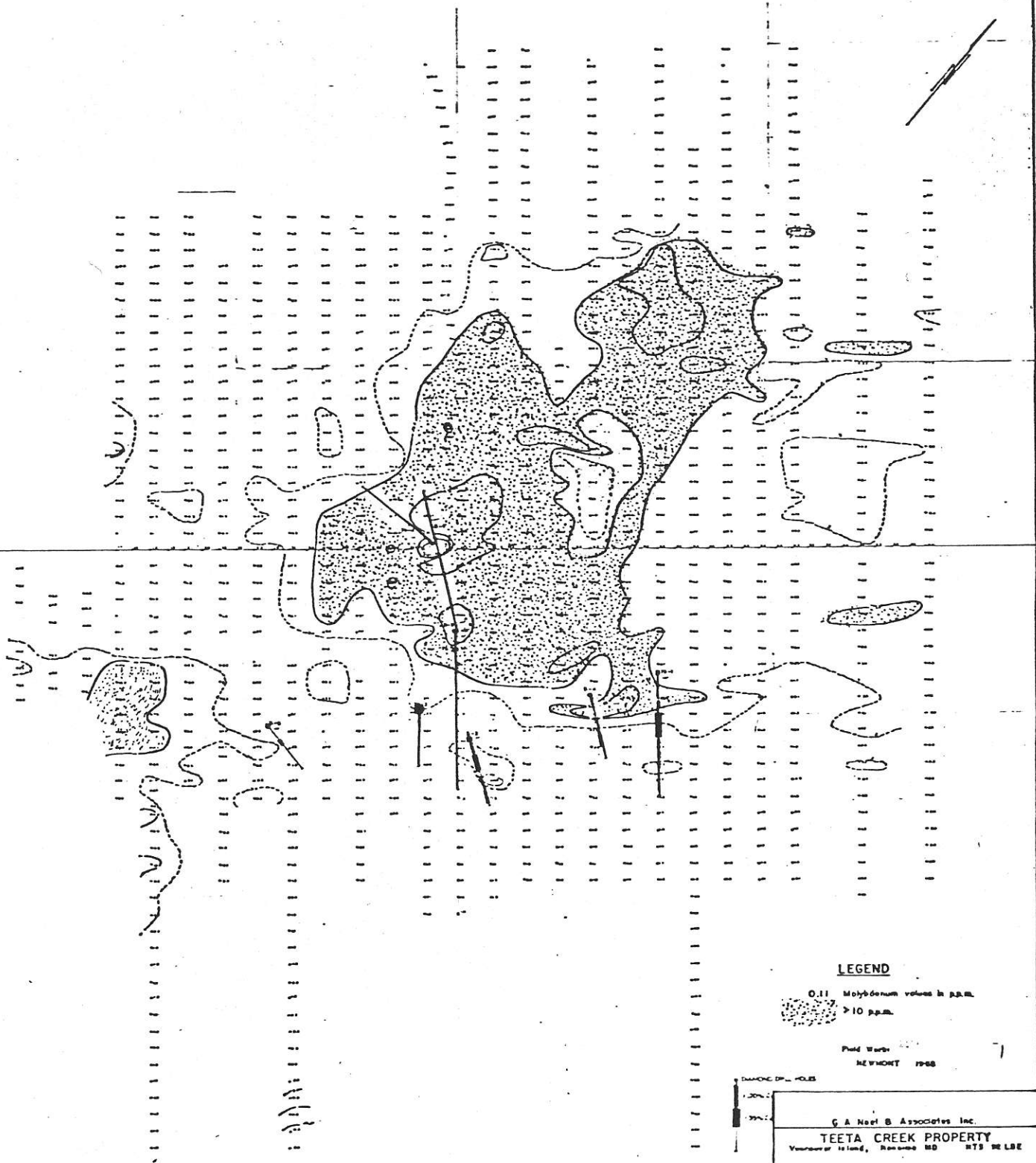


LEGEND

○ 35 Copper values in p.p.m.
● >300 P.P.M.

Field Work
NEWMONT 1968

G. A. Neal & Associates Inc.	
TEETA CREEK PROPERTY	
Vanover Island, Rowan MD. HTS WLSB	
GEOCHEMICAL SOILS - Cu	
Scale in meters: 0 50 100 200	
G.A.N.	Jan. 19 '79
Figure No. 4	



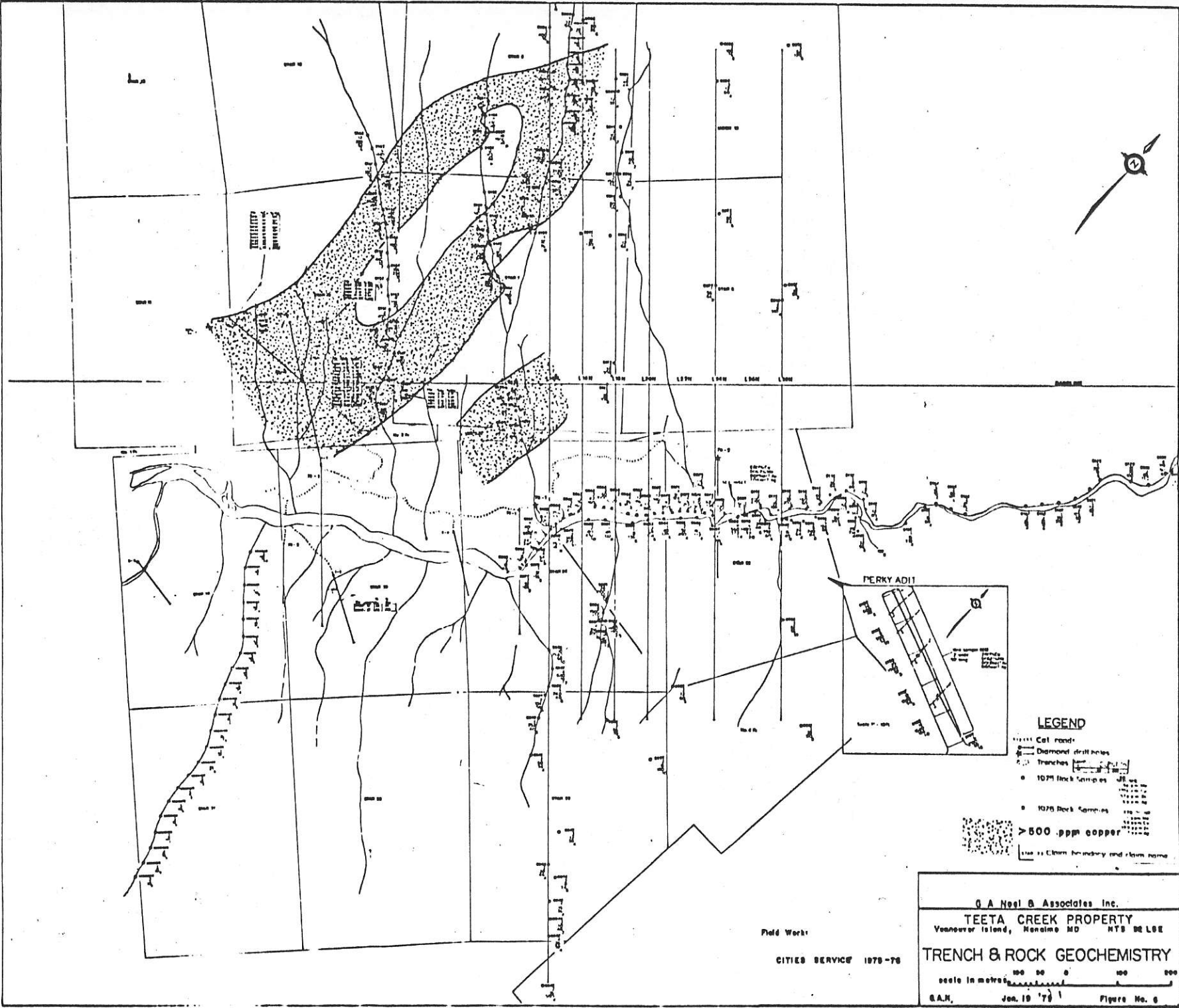
LEGEND

0.11 Molybdenum values in ppm.
Stippled pattern > 10 ppm.

Field Work
NEWMONT 1968

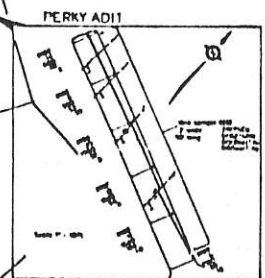
DIMONC DRILL HOLES

G. A. Neel & Associates Inc.	
TEETA CREEK PROPERTY	
Vanover Island, Rossco MD	RTS DE LBE
GEOCHEMICAL SOILS - Mo	
Scale in meters: 0 50 100 200	
G.A.N.	Jan. 19 79 Figure No. 5



LEGEND

- Col road
- o Diamond drill holes
- o Trenches
- o 1075 Rock Samples
- o 1076 Rock Samples
- o > 500 ppm copper
- Claim boundary and claim name



G A Neal & Associates Inc.
TEETA CREEK PROPERTY
 Vancouver Island, Nanaimo MD MTS DEL SE
TRENCH & ROCK GEOCHEMISTRY

Scale in metres: 0 100 200 300 400

S.A.M. Jan. 19 '79 Figure No. 6

Field Work:
CITIES SERVICE 1978-79

Cu 18 - 1960 ppm
Mo 1 - 20 ppm
Zn 40 - 1000 ppm

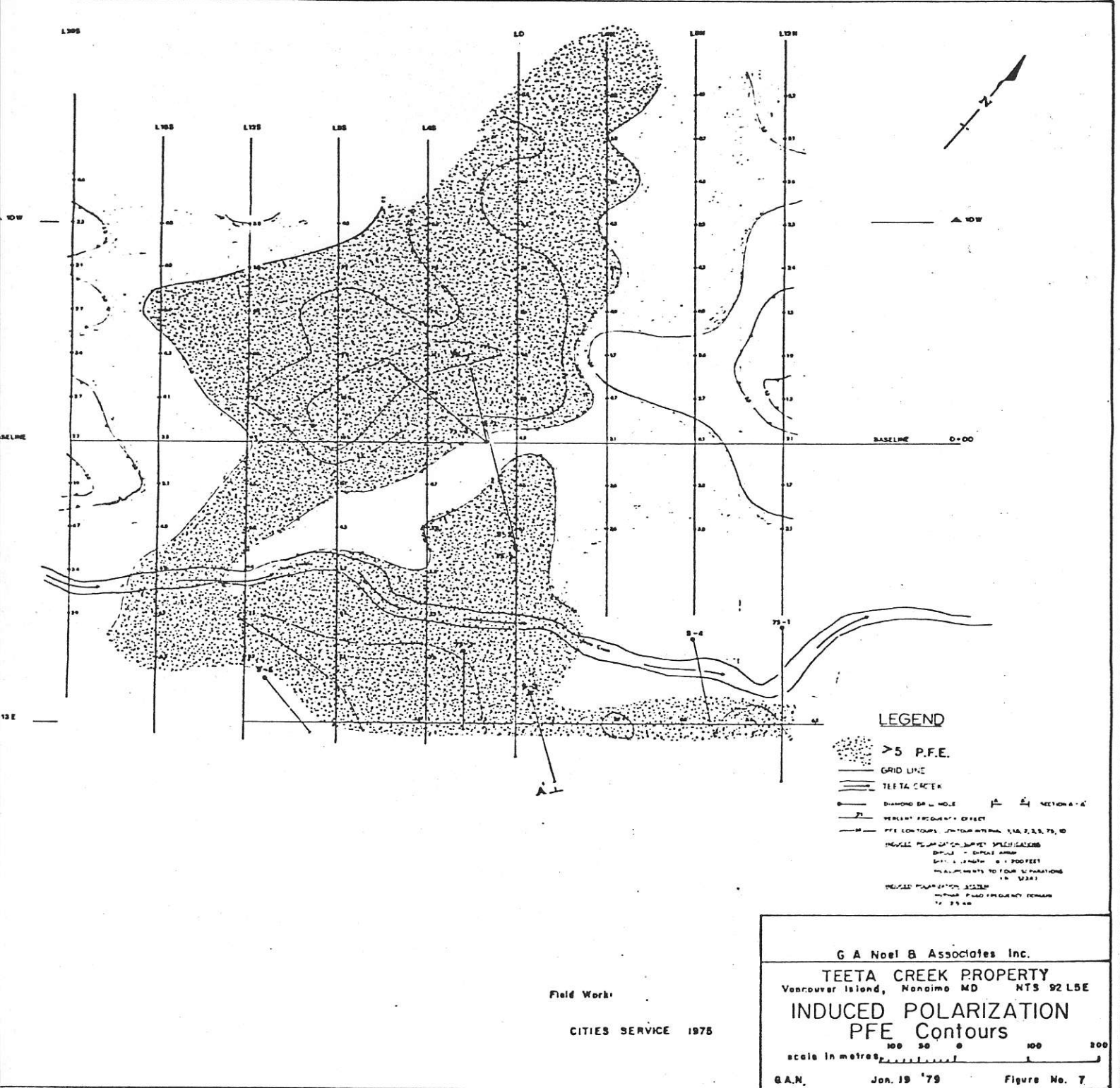
GEOPHYSICAL RESULTS

Magnetometer Survey

The 1968 magnetometer survey by Newmont vaguely outlined some of the gross geologic features. Areas of intrusive rock are roughly defined with a magnetic range of 600-800 gammas. The upper Bonanza volcanics show a considerably higher magnetic susceptibility, and can be readily outlined. The highly altered tuffs and porphyry generally show a magnetic range of 0-800 gammas; however in places the altered diorite porphyry contains magnetite. Unaltered quartz diorite generally produces readings above 800 gammas. In general, low readings (500 gammas) are associated with the sulphide mineralization, but the lower readings are not necessarily indicative of the higher copper grades.

Induced Polarization Survey

The 1974 I.P. survey outlined a large area of low grade sulphide mineralization (1-2%) in a U-shape conforming to the alteration zone along the quartz diorite contact. This area straddles Teeta Creek with the U-shape open to the northeast and one limb on each side of Teeta Creek. Each limb is about 600 metres long by 300 metres wide extending across Star 7, 9, 11, 26 and 28 claims. Within this zone, two smaller areas of higher chargeability indicating 2-3% total sulphides can be defined. From the 1975 drilling results, the areas of highest sulphide content in the form of pyrite do not generally contain the



highest copper values. The better copper grades in most cases are peripheral to the intensely pyritized zones.

DRILLING RESULTS

The 1968 drilling consisted of 886.9 metres in five holes (S-1 to S-5) drilled by Newmont on both sides of Teeta Creek on the Star 9, 26 and 28 claims. A summary of the logs of each of these holes is attached in the Appendix of this report. Hole S-1 was drilled to test both a geochemical soil anomaly and the copper mineralization in a trench to the north of the hole. The amount of copper mineralization encountered in the hole was disappointing. Hole S-2 was drilled to test at depth surface copper mineralization in the vicinity of the hole. This drill hole was mineralized throughout but the copper grade was quite low. Hole S-3 was drilled to test at depth copper mineralization exposed in a local surface trench. This hole intercepted a fairly good section of copper mineralization. Hole S-4 was drilled to extend the mineralized zone located in S-3 and it cut two small higher grade copper sections which are considered the continuation of this zone. Hole S-5 was drilled to test the biotized quartz diorite-volcanic tuff contact area but only minor amounts of significant mineralization were found.

The 1968 drilling showed that the mineralized zones and dykes trend N20°-40°E and dip steeply. It also indicated that zones of higher grade mineralization occur along the contacts of the feldspar porphyry dykes with the mineralized altered zones.

The 1975 drilling consisted of 1266.8 metres in four holes (75-1 to 75-4) drilled by Cities Service Minerals Corporation on both sides of Teeta Creek in the vicinity of the 1968 drilling on Star 9, 24, 26 and 28 claims. Hole 75-1 was drilled to test the north-east end of the mineralized zone located in 1968 in holes S-3 and S-4. The 1975 hole cut a wider mineralized section than the previous holes did. Hole 75-2 was drilled across Teeta Creek to test covered ground between two known mineralized areas. Four short sections of low grade copper mineralization were encountered. Hole 75-3 was drilled to test the southwest end of the mineralized zone located in holes S-3 and S-4. It did not intersect the zone and the I.P. high in this area is evidently due to pyrrhotite in biotized quartz diorite. Hole 75-4 was drilled to intersect a high copper geochemical anomaly with a coincident I.P. high. The best copper values are in the pale grey altered rock in the upper part of the hole, but even this section averages less than 0.2% Cu. The induced polarization anomaly is evidently due to abundant pyrite and perhaps to the artesian water encountered in the hole.

The 1975 drilling confirmed that the I.P. anomalies are due to the intensity of pyritization and only partly to the pyrrhotite distribution. Pyrite and pyrrhotite seem to favour the biotized tuffs and quartz diorite, whereas chalcopyrite favours the intensely fractured and silicified pale grey altered rock. In general, where pyrrhotite is more abundant, chalcopyrite is also more abundant. The steeply dipping copper zone located in the 1968 drilling was extended at least 120 metres to the northeast by its intersection in hole 75-1.

The 1976 drilling consisted of 762.3 metres in two holes drilled by Cities Service to the northeast of the 1975 drilling on Star 24 and Star 22 claims. Hole 76-1 was located to test the northeast end of the mineralized zone defined by holes S-3, S-4 and 75-1. The zone is apparently displaced by faulting since it was not intercepted in the drill hole. Hole 76-2 was located 335 metres northeast of 76-1 and was drilled to test the extent of copper-gold mineralization indicated in an old adit on the northwest side of Teeta Creek on Star 22 claim. Except for two short sections, assays were generally below 0.15% Cu.

CONCLUSIONS

1. The Teeta Creek property represents a similar geological environment to a number of porphyry type copper deposits on northern Vancouver Island including the Island Copper Mine. In all of these occurrences copper and molybdenum mineralization is associated with Jurassic plutons.
2. Potassic alteration is related to the quartz diorite intrusions. Superimposed on this alteration, extensive argillic and carbonate alteration, which follows intense NNE fracturing and faulting, has produced a characteristic pale grey altered unit.
3. The intensely fractured pale grey altered rock, which includes fragmented tuffs and intrusives, is the most receptive host for copper and molybdenum mineralization. The copper and molybdenum sulphides also favour the contact areas between the biotized quartz diorite and tuffs and the pale grey altered section.

4. Chalcopyrite mineralization is closely associated with the occurrences of pyrrhotite in most places peripheral to or within pyritic zones.
5. Most of the copper mineralization ranges from 0.05 to 0.15% Cu over fairly extensive areas.
6. A zone of better grade mineralization ($\pm 0.35\%$ Cu) was roughly defined in drill holes S-3, S-4 and 75-1. It is roughly 360 metres long by 30-60 metres wide trending N30°E.
7. Induced polarization anomalies outline strongly pyritized areas.
8. The copper soil anomaly (300 ppm) on the northwest side of Teeta Creek outlines a north-trending area 750 metres long by 150-300 metres wide. This area encompasses the contact zone between biotized porphyry and tuffs and the pale grey altered unit. The I.P. and rock geochemical surveys produced fairly coincident anomalous areas. Surface assays range from 0.02 to 0.65% Cu with very few sections of consistently higher grade material. The molybdenum soil anomaly on the northwest side of the creek is roughly coincident with the copper anomaly. On the southeast side of the creek a small but significant molybdenum soil anomaly is partly outlined about 240 metres southwest of hole S-5. Apparently, neither drilling nor trenching has been done to date in this area.
9. The Island Copper orebody shows many similarities to Teeta Creek:
 - i) in volcanic tuffs along an intrusive contact;
 - ii) biotitic, argillic and silicic alterations;
 - iii) extensive peripheral

pyritization; iv) widespread low grade copper envelope; vi) low molybdenum values associated with copper mineralization. A notable difference is the pyrrhotite association at Teeta Creek.

10. The younger, fairly well bedded, blocky textured fragmental tuff unit extensively exposed at the northeast end of the property on Star 5, 7 and 24 claims apparently overlies and effectively masks the northeast end of the geochemically favourable zone.

RECOMMENDATIONS

Considerable well planned geological, geophysical, geochemical and physical work have been done in the last ten years on the Teeta Creek property. These programs have indicated a generally low overall copper grade. Considering the similarities to the Island Copper porphyry model, it is entirely possible that a higher grade (0.3% to 0.7% Cu) core is present on the Teeta Creek property. Several fairly obvious drilling targets remain to be tested and the soil survey should be extended to define the molybdenum, and possibly copper, anomalies about 240 metres to the southwest of drill hole S-5. If it has not already been done, the better molybdenum sections of core should be checked for rhenium content since this is a very worthwhile credit at Island Copper Mine.

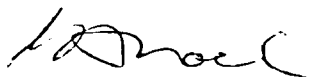
A program of 900 metres of BQ diamond drilling is recommended in three holes specifically described as follows:

1. Length: 300 metres. Bearing: N60°W. Inclination: -45°
Location: collar of drill hole 75-1.
Purpose: To test the geochemical soil and rock anomalies in the pale grey altered unit at the southeast end of Star 7 claim.

2. Length: 300 metres. Bearing: N60°W. Inclination: -45°
Location: about 450 metres NW of hole 75-1.
Purpose: To test the north end of the geochemical soil and rock anomalies at the northwest end of Star 7 claim and southeast end of Star 8 claim.

3. Length: 300 metres. Bearing: N60°W. Inclination: -45°
Location: about 305 metres south of hole (2) above.
Purpose: To test the central part of the geochemical anomalies near the northeast end of Star 9 claim.

Holes 2 and 3 will require considerable site preparation and probably will have to be serviced by helicopter. As a consequence an overall cost of \$160/metre has been used. The estimated total cost of the recommended program is \$150,000 allowing \$6,000 for soil sampling and core and soil analyses.



G. A. NOEL, P.Eng.

Vancouver, B. C.
January 15, 1979.

REFERENCES

- De Paoli, G. M. (1974): Final Report - Geophysics 1974, Teeta Creek Property, Vancouver Island, B. C.; private report for Cities Service Mineral Corporation.
- Lennan, W. B. (1975): A Review of Previous Work and 1975 Diamond Drill Program, Teeta Creek Property; private report for Cities Service Minerals Corporation; March 1976.
- (1976): 1976 Program, Teeta Creek Prospect; private report for Cities Service Minerals Corporation; November 1976.
- Muller, J. E., Northcote, K. E., and Carlisle, D. (1974): Geology and Mineral Deposits of Alert Bay - Cape Scott Map-Area, Vancouver Island, B. C., Geological Survey of Canada, Paper 74-8.
- Takeda, T. (1969): Composite Geological Study of Teeta Creek Property (Quatsino Syndicate); Rumble Beach, B. C.; private report for Newmont Mining Corporation of Canada Limited.
- Tremblay, J. H., Leitch, H. C. B., and Mullin, W. J. (1968): Quatsino Syndicate Project Report 1968; private report for Newmont Mining Corporation of Canada Limited.

A P P E N D I X

DIAMOND DRILL LOG SUMMARIES

1. 1968 - 1969 Drilling (Newmont Mining Corporation of Canada Ltd.)

DDH S-1

Bearing: N52°W Inclination: -45° Length: 153 metres

Recovery: 98% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-2	Casing - no core
2-15	Pale grey altered rock with pyrite, pyrrhotite and chalcopyrite as thin seams and blebs; little molybdenite.
15-107	Purple biotized tuffs with few narrow feldspar porphyry dykes, about 2% total sulphides with pyrite, pyrrhotite and chalcopyrite as thin seams and fine blebs; little molybdenite.
107-153	Andesitic tuff; grey to black with pyrite in thin seams; few narrow feldspar porphyry and basic dykes.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
2-30.5	28.5	0.185
30.5-153	122.5	0.043

DDH S-2

Bearing: N52°W Inclination: -45° Length: 243.2 metres

Recovery: 95.4% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-8.8	Casing - no core
8.8-205.7	Pale grey altered rock with pyrite, pyrrhotite and chalcopyrite in thin seams and blebs.
205.7-243.2	Purple biotized tuffs with pyrite, pyrrhotite and chalcopyrite as fine fracture fillings and blebs; few narrow feldspar porphyry dykes.

S-2 (continued)

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
8.8-23.8	15.0	0.08
23.8-46.6	22.8	0.12
59.4-103.6	44.2	0.14
103.6-125.0	21.4	0.13
177.4-243.2	65.8	0.14

DDH S-3

Bearing: S56°E Inclination: -45° Length: 184.4 metres.

Recovery: 98.5% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-4.3	Casing - no core
4.3-89.6	Purple biotized porphyritic quartz diorite with some biotized tuffs cut by several feldspar porphyry and basic dykes. Pyrite, pyrrhotite and chalcopyrite as very fine fracture fillings and small blebs.
89.6-153.6	Pale grey altered tuffs and porphyritic quartz diorite cut by several feldspar porphyry dykes. Pyrrhotite, pyrite and chalcopyrite as fine fracture fillings and blebs.
153.6-184.4	Purple biotized porphyry mixed with some pale grey alteration; numerous feldspar porphyry dykes; sulphides as fine fracture fillings.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
4.3-96.0	91.7	0.23
(includes 36.5m of 0.36% Cu from 42.7-79.2m)		
113.4-137.2	23.8	0.21
142.7-166.0	23.3	0.19

DDH S-4

Bearing: S52°E Inclination: -45° Length: 167.6 m.

Recovery: 98% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-1.5	Casing - no core
1.5 - 23.0	Purple biotized quartz diorite porphyry with some pale grey silicified sections; pyrite, pyrrhotite and chalcopyrite occur as fine fracture fillings and blebs.
23.0-32.6	Purple biotized tuffs with sulphides as fine fracture fillings and blebs.
32.6-60.8	Pale grey altered rock; silicified; sulphides as fine fracture fillings and blebs in places associated with quartz veins.
60.8-69.0	Feldspar-quartz porphyry dyke.
69.0-96.0	Purple biotized quartz diorite porphyry with sulphides as fine fracture fillings and blebs.
96.0-113.4	Pale grey altered porphyry; sulphides as blebs, stringers and fine fracture fillings.
113.4-143.2	Purple biotized quartz diorite porphyry with sulphides as stringers, fine fracture fillings and blebs associated with quartz veins.
143.2-167.6	Pale grey clay-altered quartz diorite cut by several felsite dykes; sulphides occur as fine fracture fillings and blebs.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
50.9-57.0	6.1	0.36
93.6-105.8	12.2	0.15
105.8-116.4	10.6	0.34
116.4-133.2	16.8	0.17
5-167.6	162.6	0.18

DDH S-5

Bearing: S80°E Inclination: -45° Length: 138.7m

Recovery: 99.1% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-4.6	Casing - no core
4.6-10.2	Diorite, porphyritic; feldspar and mafic phenocrysts; pyrrhotite, pyrite and chalcopyrite as fine fracture fillings and minor blebs.
10.2-28.3	Pale grey altered porphyry; sulphides as fine fracture fillings, blebs and disseminations.
28.3-40.2	Diorite, dark green; sulphides as fine fracture fillings, blebs and stringers.
40.2-55.6	Pale grey siliceous altered rock with patches purple biotized porphyry; includes some diorite and basic dyke; sulphides as fine fracture fillings and small blebs.
55.6-93.4	Diorite; dark green; porphyritic; chlorite and biotite alteration; includes several bands of pale grey altered porphyry; sulphides as fine fracture fillings, blebs and disseminations.
93.4-101.3	Purple biotized porphyry with pyrrhotite, pyrite and chalcopyrite as fine fracture fillings and minor blebs.
101.3-122.5	Diorite; porphyritic; chloritized in places; sulphides as fine fracture fillings and disseminations; purple biotitic alteration 112.2-117.3m.
122.5-130.6	Pale grey altered porphyry; some purple biotization; sulphides as blebs and fracture fillings.
130.6-138.7	Diorite; porphyritic; minor sulphides; pale grey porphyritic alteration.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
44.2-56.4	12.2	0.20
71.3-103.3	32.0	0.14
109.4-118.6	9.2	0.09

2. 1975 Drilling

DDH 75-1

Bearing: S40°E Inclination: -45° Length: 304.8m

Recovery: 100% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-4.6	Casing - no core
4.6-304.8	Predominantly pale grey altered rock; zones of remnant purple biotized prophyritic quartz diorite and tuffs; swarms of feldspar porphyry dykes.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>	<u>oz/ton Ag</u>
103.6-170.7	67.1	0.349	0.145
103.6-249.9	146.3	0.256	

DDH 75-2

Bearing: S40°E Inclination: -50° Length: 457.2m

Recovery: 99.2% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-11.3	Casing - no core
11.3-457.2	Purple biotized quartz diorite, biotized tuffs, pale grey altered rock and andesitic tuffs are cut by numerous dykes.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
11.3-36.6	25.3	0.147
185.9-222.5	36.6	0.17
351.7-384.0	32.3	0.16
402.3-423.7	21.4	0.20

3. 1976 Drilling

DDH 76-1

Bearing: S77°E Inclination: -45° Length: 457.2

Recovery: 92.9% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-5.3	Casing - no core
5.3-313.9	Pale grey altered quartz feldspar porphyry; clay-carbonate alteration; minor sericite, silica biotite and chlorite; weakly disseminated pyrite and chalcopyrite.
313.9-457.2	Pale grey altered porphyry-assimilation zone; weak to moderate clay alteration. Numerous felsite and feldspar porphyry dykes; some andesite dykes.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
57.9-262.1	204.2	0.028
213.4-228.6	15.2	0.140
161.4-277.4	116.0	0.045
344.4-359.6	15.2	0.234
304.8-402.3	97.5	0.097

DDH 76-2

Bearing: S40°E Inclination: -55° Length: 305.1 m

Recovery: 96% Core size: BQ

<u>Interval (m)</u>	<u>Description</u>
0-39.9	Casing - no core
39.9-115.8	Pale grey altered porphyry to purple biotized porphyry; chloritized
115.8-169.0	Purple biotized fragmental tuff
169.0-198.4	Pale grey altered quartz diorite porphyry
198.4-234.1	Pale grey altered fragmental porphyry tuff

DDH 76-2 continued

<u>Interval (m)</u>	<u>Description</u>
234.1-305.1	Pale grey altered porphyry to purple biotized and silicified tuff; in places shows intrusive texture and green colour due to partial assimilation and chlorization; number of felsite, feldspar porphyry and andesite dyke intersections.

Assays:

<u>Interval (m)</u>	<u>Length (m)</u>	<u>% Cu</u>
39.9-51.8	11.9	0.075
51.8-64.0	12.2	0.13
64.0-109.7	45.7	0.06
109.7-115.8	6.1	0.32
115.8-289.6	173.8	0.065
289.6-304.8	15.2	0.214

ROUGH
 COMPILATION
 Teeta Creek Cu
 Feb. 80
 1" = 200'

- Cu > 300 ppm in soil
 or \approx Mo > 10 ppm
- ⌈ Cu in rock geochem
- ▨ P.F.E. > 7.5

