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92F/09

TEXADA PROJECT

1989 REPORT

by

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for

FREEPORT-McMoRan GOLD COMPANY (CANADA) LTD.

SUMMARY

The Texada Property is located 70 miles northwest of Vancouver on the northern end of Texada Island. Base and precious metal rights to the 5200 acre property were optioned from Vananda Gold Company Ltd. a junior mining company listed on the Vancouver Stock Exchange, in June of 1988. Vananda Gold, in turn, have the mineral rights in the form of a mineral lease from the registered claim holders, Ideal Cement Company. Freeport has the right to earn a 70% interest by spending C$2.6 million and making payments of C$500,000 by 1994.

In 1989 C$640,000 was spent on exploration for a total C$1,300,000 in expenditures to date. Two payments totalling C$100,000 have been made to Vananda Gold and C$25,500 has been made to three other groups for additional claims. In 1990, C$99,000 in option payments will be required to hold the mineral options through 1991.

The northern portion of the property hosts four historic gold-copper mines, collectively known as the Vananda Camp. These include the Marble Bay, Little Billy, Copper Queen and Cornell Mines with combined production of 78,000 ounces of gold from 340,000 tons of bornite-rich skarn ore. At the southern end of the property, the Texada Iron Mines produced 10,000,000 long tons of iron concentrate, 59,000,000 pounds of copper and 31,000 ounces of gold from 20,000,000 long tons of skarn ore contained in eleven separate deposits.

Freeport's exploration in 1988 and 1989 included 26 diamond drill holes, totalling 22,730 feet and 73 line miles of cut, mapped, soil sampled and geophysically surveyed grid.

Potential and indicated reserves from Freeport's drilling at the Little Billy are estimated to be 205,000 tons of 0.279 ounces per ton of gold and 2.37% copper. A 1979 drill hole intersection of 12 metres of 0.051 ounces per ton gold and 1.51% copper, 1,100 feet east of the Little Billy, has coincident magnetic and residual gravity anomalies that suggests the Little Billy mineralization may be open toward the 1979 hole. If so, the potential resource can be estimated at 2,000,000 tons of skarn grading from 0.05 ounces to 0.25 ounces of gold and > 1.5% copper.

Seven other geological, geophysical and geochemical targets extending from mineralization in drill holes or at surface have potential for copper, zinc and gold reserves. These include:

- down dip of drill hole T89-26 with 2.2 metres of 0.302 ounces per ton gold in a silicified massive pyrite zone;

- plus 18 metres of pyrite reported in a 1966 limestone quarry drill hole;

- 0.22 ounces per ton gold in a massive pyrite-sphalerite manto-type deposit exposed in a bench of Ideal's limestone quarry on strike with a 350 metre residual gravity anomaly;

- 6.4 metres of 1.9% copper in a Texada Mines' drill hole within a 30 metre thick skarn that is coincident to a 750 metre long residual gravity and VLF anomaly;

- a 0.6 ounce per ton gold soil anomaly along a major structure that is also adjacent to a broad residual gravity high and a smaller magnetic peak, indicative of magnetite skarn;

- a 400 metre long zinc, cadmium and weak gold soil anomaly coincident to a 600 metre long residual gravity anomaly that is indicative of a buried manto deposit; and

- a 600 metre zone of anomalous magnetics and gold soil geochemistry along the footwall of a diorite sill with magnetite-chalcopyrite skarn showings containing sporadic gold values to 0.15 ounces per ton.

Diamond drilling and surface trenching is recommended for all targets with priority being given to the Little Billy extension, down dip of the T89-26 drill hole and the plus 18 metres of sulphide in the limestone quarry drill hole.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

Freeport-McMoRan Gold Company (Canada) Ltd., through an option agreement dated June 1st, 1988, has the right to earn a 51% interest in 120 mineral claims, encompassing approximately 5200 acres, on Texada Island, B.C. The agreement with Vananda Gold Ltd., a publicly traded company listed on the Vancouver Stock Exchange, also grants Freeport the right to earn a further 19% interest for a total of 70% interest in the claims. Once Freeport has earned its elected interest, Vananda must participate or dilute to a 15% carried interest.

During 1988, Freeport spent C$600,000 on initial exploration of the property. A follow-up program in 1989 brings expenditures to date up to C$1.3 million, equal to that required for Freeport's initial 51% interest (C$150,000 in cash payments are required in addition).

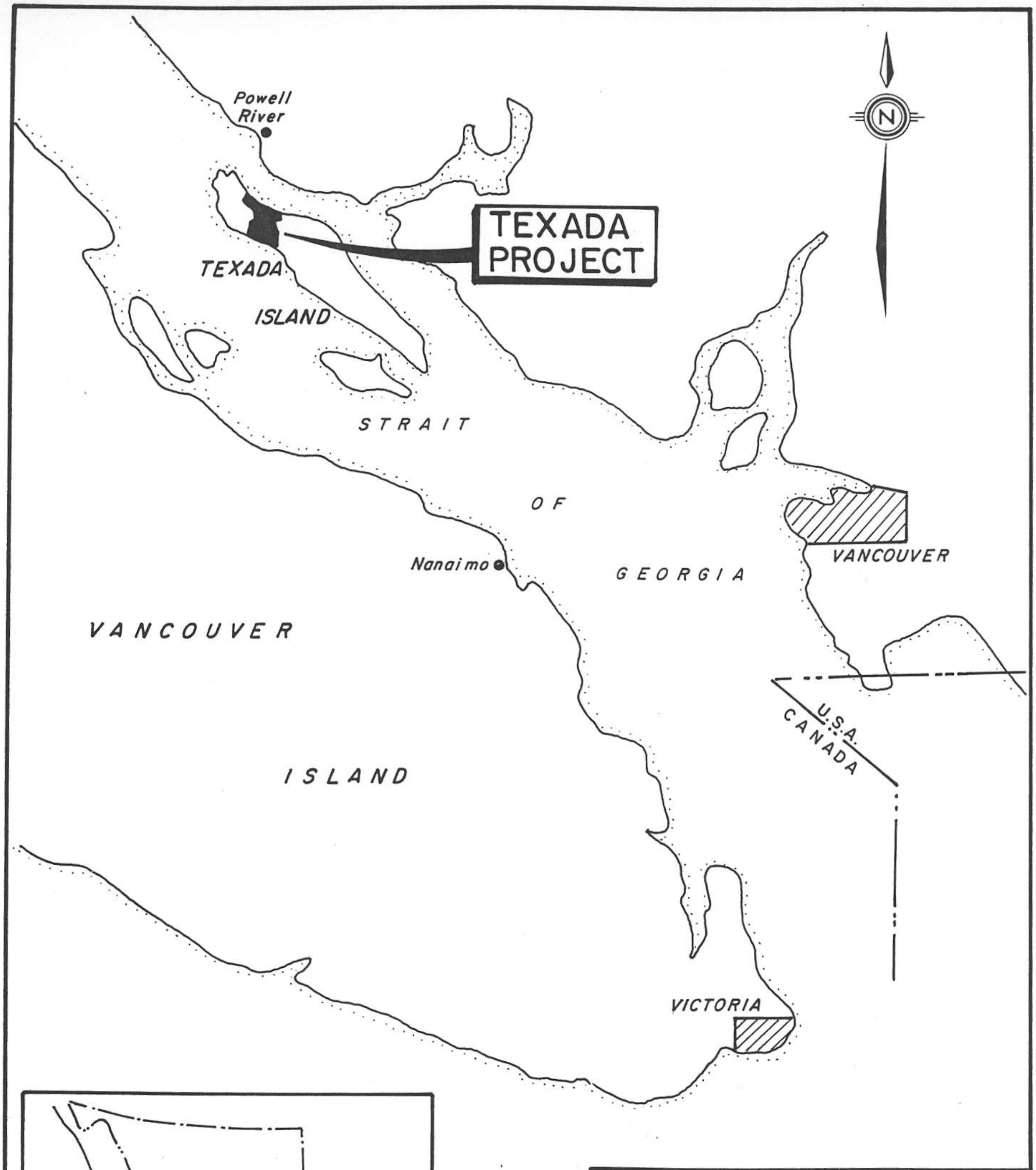
The following report brings together all work performed by Freeport and previous operators of the claims to the best of the authors' knowledge. For an outline of the property's exploration history see the 1988 Texada Project Report, (Forster, 1989).

1.1 Location and Access

The claim block encompasses the small town of Vananda situated near the northern end of Texada Island, 120 kilometres northwest of Vancouver, B.C. (Figure 1). Texada Island, a 50 km by 6 km northwest-southeast island in the Strait of Georgia, lies between the mainland and Vancouver Island. Well serviced by road and ferry from Powell River on the mainland, there are also scheduled daily air services to a 3,300 foot asphalt air strip near the town of Gillies Bay. Three operating limestone quarries provide barge service to the island, shipping approximately three million tons of limestone annually. The now dormant Texada Iron Mines, located at the southern end of the claim block and on the southwestern side of the island, had a deep water port facility that allowed ocean-going ships to transport concentrate directly to Japan.

1.2 Infrastructure

The principal settlements of Texada Island are Vananda and Gillies Bay, each with approximately 700 and 400 residents respectively. Situated at the northern and southern ends of the claim block, the towns are connected by a paved highway and power lines through the central portion of the claims. Powell River, a city of 14,000 people, is the ferry terminus for the island and the main population centre of the region. MacMillan Bloedel operates one of their largest and most modern pulp mills within the city limits.



FREEPORT-McMoRan GOLD COMPANY

TEXADA PROJECT

LOCATION

0 10 20 30 MILES
0 20 40 60 KM.

SCALE 1:1,000,000	DATE: MARCH 1989
N.T.S. 92F - 10E, 15E	FIGURE Nº. 1

CHONG

The southwest portion of the claim block is actively quarried by Ideal Cement Company, producing 2.3 million tons of limestone annually. The northeast corner of the claims encompass a large, dormant limestone quarry, owned by Lafarge Cement, with a small chemical grade limestone quarry operating immediately to the south and adjacent to the eastern boundary of the property. At the most northerly end of the island, near the ferry terminal, the third operating quarry, owned by Ashgrove Cement Company, produces one million tons of limestone per annum.

Logging is an important secondary industry for the Island. Although no active logging is presently being carried out within the claim block, several crown granted claims were recently logged by the surface right owners, including Vananda Gold. At present, most of the active logging on the island is within a large block of privately owned land controlled by Doman Industries.

Tourism and other activities normally adversely affected by mining are virtually nonexistent. The two small logging companies often provide heavy machinery and timber clearing services to the quarries and road and drill site preparation for Freeport.

The island is well serviced with electric power as the main electrical transmission line between Vancouver Island and the mainland crosses Texada Island. The extension of the Transmountain Gas Pipeline to Vancouver Island has recently been announced and will also traverse the island.

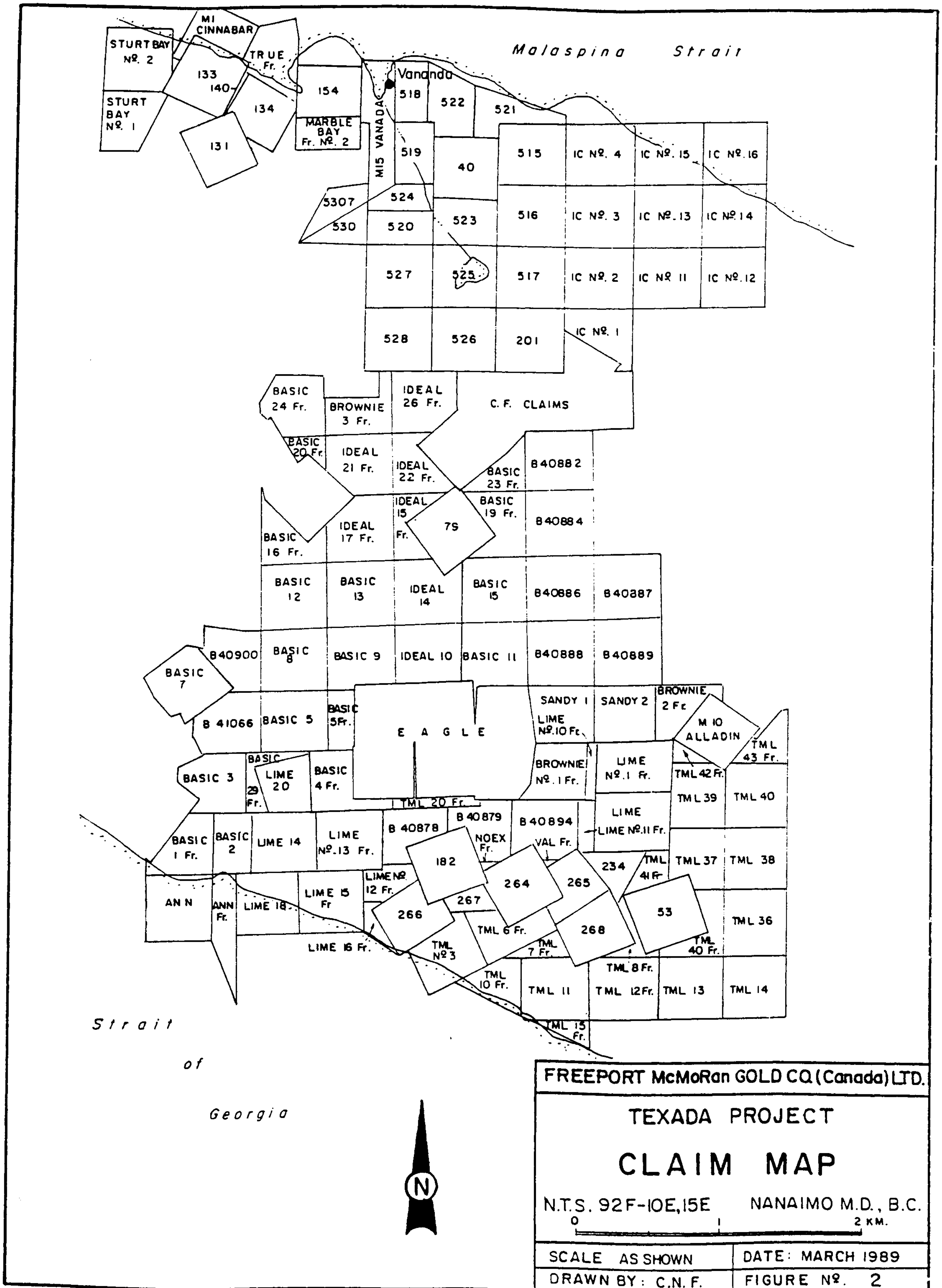
1.3 Topography and Climate

The northern half of the island has moderate topography with up to 500 feet of relief on the claim block. Climate is cool and wet in the winter and warm and dry in summer. Snowfall and protracted cold weather are uncommon, hence year round exploration and development is possible. Yearly rainfall averages 30 inches.

1.4 Claim Holdings

The claim block includes three mining leases, thirty-eight crown granted mineral claims and ninety-two located claims and fractions (listed in Appendix I). Most are owned by Ideal Cement Company and leased to Vananda Gold, making them subject to the Net Profit and Net Smelter Returns described below. The rest of the claims are subject to the three additional option agreements described below.

The irregular shaped claim block (Figure 2) is roughly 7.5 km long (N-S), 4.5 km wide, and totals approximately 5200 acres. Expiration dates on the staked claims vary from 1990 through 1997, however, all will be extended to 1999 when the 1988 assessment work has been filed for credit.


Malaspina Strait
Strait of Georgia
Vananda
STURT BAY Nº. 2
STURT BAY Nº. 1
MI CINNABAR
TRUE Fr.
133
140
134
131
154
MARBLE BAY Fr. Nº. 2
MI5 VANADA
518
522
521
519
40
515
IC Nº. 4
IC Nº. 15
IC Nº. 16
5307
524
530
520
523
516
IC Nº. 3
IC Nº. 13
IC Nº. 14
527
525
517
IC Nº. 2
IC Nº 11
IC Nº. 12
528
526
201
IC Nº. 1
BASIC 24 Fr.
BROWNIE 3 Fr.
IDEAL 26 Fr.
C. F. CLAIMS
BASIC 20 Fr.
IDEAL 21 Fr.
IDEAL 22 Fr.
BASIC 23 Fr.
B 40882
IDEAL 15 Fr.
79
BASIC 19 Fr.
B 40884
BASIC 16 Fr.
IDEAL 17 Fr.
BASIC 12
BASIC 13
IDEAL 14
BASIC 15
B40886
B40887
B40900
BASIC 8
BASIC 9
IDEAL 10
BASIC 11
B40888
B40889
BASIC 7
B 41066
BASIC 5
BASIC 5Fr.
E A G L E
SANDY 1
SANDY 2
BROWNIE 2 Fr.
LIME Nº.10 Fr.
M 10 ALLADIN
TML 43 Fr.
BASIC 3
BASIC 29 Fr.
LIME 20
BASIC 4 Fr.
BROWNIE Nº. 1 Fr.
LIME Nº. 1 Fr.
TML 42 Fr.
TML 20 Fr.
TML 39
TML 40
B 40878
B 40879
B 40894
LIME
LIME Nº.11 Fr.
BASIC 1 Fr.
BASIC 2
LIME 14
LIME Nº.13 Fr.
NOEX Fr.
VAL Fr.
182
234
TML 41 Fr.
TML 37
TML 38
LIME Nº 12 Fr.
264
265
ANN
ANN Fr.
LIME 18
LIME 15 Fr
267
266
53
TML 36
TML 6 Fr.
268
LIME 16 Fr.
TML Nº 3
TML 7 Fr.
TML 40 Fr.
TML 8 Fr.
TML 10 Fr.
TML 11
TML 12 Fr.
TML 13
TML 14
TML 15 Fr.
N
FREEPORT McMoRan GOLD CO. (Canada) LTD.
TEXADA PROJECT
CLAIM MAP
N.T.S. 92F-10E,15E
NANAIMO M.D., B.C.
0
1
2 KM.
SCALE AS SHOWN
DATE: MARCH 1989
DRAWN BY: C.N.F.
FIGURE Nº. 2

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1.5 Underlying Agreements

The property is subject to a lease agreement, dated December 28, 1978, between Ideal Cement and Shima Resources Ltd. and re-assigned and amended July 25, 1983 to Marble Bay Holdings Ltd. and its parent company, Cartier Resources.

Provisions include:

a) $200,000 due Ideal Cement during the twenty month period commencing on the second anniversary of commercial production;

b) a 6% net profit interest, subject to a $10,000 minimum annual payment.

Marble Bay Holdings (Cartier Resources) subsequently entered into an agreement, dated June 30, 1986, with Vananda Gold Ltd. that allowed Vananda the right to earn 100 percent interest in the lease by spending $425,000 before July 31, 1988. This was accomplished and recognized by Marble Bay by letter.

Marble Bay and Cartier retain a 2.5% Net Smelter Royalty, subject to a $2,000,000 buy-out, less all interim payments to Marble Bay, and:

Marble Bay reserves the right to recover a 20% working interest in the lease by paying to Vananda, by bank draft, an amount equal to the aggregate of all the expenditures incurred by Vananda on the property after Vananda has earned its 100% interest. Marble Bay can only exercise this right after it has received a copy of a feasibility study recommending that the Mineral Properties be placed into production and has 180 days to make their declaration. This is a one time option and pertains only to the first feasibility study. If not exercised, the right does not apply to subsequent feasibility studies.

Expenditures referred to above are defined in the June 30, 1986 agreement as:

> "those pertaining to Mining Operation, including every kind of work done on or in respect of, the Mineral Properties or the products therefrom by or under the direction of Vananda and all expenditures in respect of, or incidental to such work."

IT IS ASSUMED THAT ALL EXPENDITURES BY FREEPORT ON THE PROPERTY ARE DEEMED TO BE VANANDA EXPENDITURES FOR THE PURPOSE OF CALCULATING THE PAYMENT.

1.6 Agreement Between Vananda Gold Ltd. and Freeport-McMoRan Gold Company (Canada) Limited

Dated June 1, 1988, Freeport entered into an agreement with Vananda Gold Ltd. to earn a 51% interest in the Mineral Property by making the following expenditures and payments to Vananda Gold Company.

$ 50,000	Paid August 1988
$ 50,000	Paid June 1, 1989
$ 75,000	Due June 1, 1990
$ 75,000	Due June 1, 1991
$1,300,000	Exploration expenditures by June 1,1992

Freeport then has the exclusive option to earn an additional 19% interest by expending $1,300,000 and paying $250,000 to Vananda over a two year period.

When Freeport earns either a 51% or 70% interest, the operating agreement will be signed, allowing Vananda and Freeport to continue exploration, development and production on a joint venture basis. Should either party choose not to participate, a dilution clause allows for a non-recouperable reduction in interest to 15% Net Profits Royalty.

1.7 Sandy Claim Agreement

Freeport-McMoRan Gold Company (Canada) Limited, on September 12, 1988 optioned two claims, Sandy 1 & 2, within the main property from Messrs. Johanson, Perry and Duker of Vananda. Terms of this agreement include:

$ 4,500	Paid September 12, 1988
$ 6,000	Paid September 12, 1989
$ 9,000	Due September 12, 1990
$12,000	Due September 12, 1991
$15,000	Due September 12, 1992

3% Net Smelter Return, subject to a $1,500,000 buy-out of the Net Smelter Return.

1.8 Eagle Claim Agreement

On March 13, 1989, an option agreement between Freeport-McMoRan Gold, Vananda Gold, Kargen Development Corporation and Eileen Forward was signed regarding the Eagle group of claims. Terms of the agreement include:

$10,000	Paid March 13, 1989
$10,000	Due annually on the anniversary of the agreement to commencement of commercial production

3% Net Smelter Return from commencement of commercial production, subject to a $1,500,000 buy-out of the Net Smelter Return

1.9 Marble Bay Fraction No. 1 Agreement

An option agreement between Freeport-McMoRan Gold and Messrs. M. Donald and R. Kimball was signed May 5, 1989 regarding the Marble Bay Fraction No. 1 mineral claim. Terms of the agreement include:

$5000	Paid May 5, 1989
$5000	Due May 5, 1990
$5000	Due May 5, 1991

3% Net Smelter Return from commencement of commercial production, subject to a $500,000 buy-out of the Net Smelter Return

2.0 FREEPORT WORK

2.1 1988 Program

Initially, both aerial photography and airborne geophysics were flown over the property. Ground work then commenced with the rehabilitation of 1984 cut grids (Cornell Grid) at the north end of the property and the cutting of the 23 line kilometre Sandy Grid at the south end of the property. Induced polarization and soil sample surveys were then conducted on the two grids. Geological work included 1:2000 scale mapping in the Little Billy, Copper Queen, Cornell and Florence/Security areas and 1:5000 scale mapping regionally. Chip/channel sampling of the open pits and re-sampling drill core at Texada Mines was also carried out. The program concluded with seven diamond drill holes totalling 2500 metres in the Little Billy/Copper Queen area.

2.2 1989 Program

The 1989 field program commenced with 1:2000 scale structural mapping of the Marble Bay Fault Zone (Glover,1989) and 1:5000 scale geological mapping of the property, Figures 7a & b (Bradford, 1989). This followed with 1:2000 scale geological mapping in the Volunteer, Vananda, Sandy and Eagle map areas, (Figure 5) and detailed prospecting and sampling in selected areas.

To provide control for geological mapping and ground surveys, a total of 60.6 km of line were cut in 1989. This included 11.3 km on the Volunteer Grid, 7.2 km of fill-in lines on the Cornell Grid and 42.2 km on the Eagle Grid.

Both geophysical and geochemical surveys were carried out on cut grids. Geophysics included a follow-up induced polarization survey in the Little Billy area and magnetics-VLF surveying of all grids on the property. Soil sampling involved initial sampling of the Eagle and Volunteer Grids and fill-in sampling on the Cornell Grid.

A total of 4429 metres in 19 holes were diamond drilled in 1989. This included 3 holes south of the Little Billy, 2 holes in the Copper Queen area, 4 holes at the Cornell and 10 holes on the Sandy Grid.

Petrographic work was carried out on selected samples from drilling and geological mapping.

Table 1 - Freeport Work

	1989	To Date
Linecutting		
Volunteer Grid	11.25 km	11.25 km
Cornell Grid	7.2 km	42.25 km
Eagle Grid	42.15 km	42.15 km
Sandy Grid	--	23.15 km
Total:	60.60 km	118.80 km
Flagged Grids		
Belle Grid	--	4.00 km
Soil Samples		
Volunteer Grid	272	272
Cornell Grid	235	489
Eagle Grid	1027	1027
Sandy Grid	--	501
Total:	1534	2289

Drilling	1989	To Date
Little Billy	1097.6 m	2955.2 m
Copper Queen	1180.2 m	1714.2 m
Cornell	785.8 m	785.8 m
Sandy	1365.2 m	1365.2 m
Total:	4428.8 m	6820.4 m

3.0 REGIONAL GEOLOGY

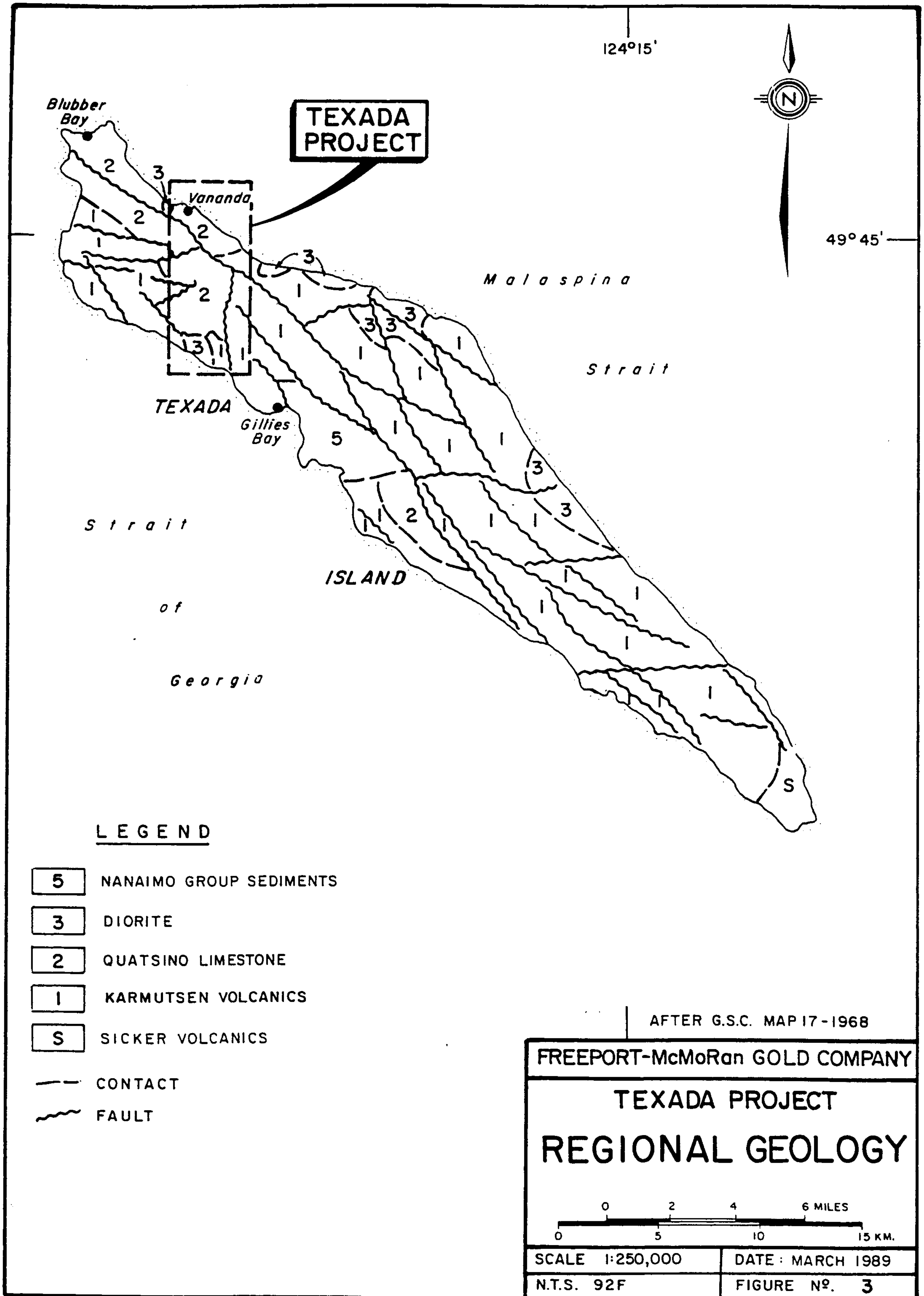
The regional geology of Texada Island was last described in full by McConnell in 1914. Since then only Muller, in his Alberni Map sheet on Vancouver Island (1969), has touched on Texada geology (Figure 3). Recognizing this fact, as well as the recent activity by major exploration companies, Gerry Ray of the B.C. Geological Survey has embarked on a mapping program of the north end of the island.

Texada Island is 80% underlain by an unknown thickness of undifferentiated basalts correlated with the middle to upper Triassic Karmutsen Formation of Vancouver Island (Muller, 1969). Overlying these, exposed principally in the northwestern and central areas of the island, are upper Triassic equivalents of the Quatsino limestones on Vancouver Island (Muller, 1969). Of lesser significance, Cretaceous sandstones and shales of the Cedar District Formation unconformably overlie Karmutsen volcanics north of Gillies Bay while middle to upper Paleozoic Sicker volcanics and sediments are unconformably overlain by Karmutsen volcanics at the southern tip of the island.

Intrusive into both the Karmutsen and Quatsino Formations are middle to upper Jurassic quartz diorite (Little Billy) to quartz monzonite (Gillies Bay) stocks belonging to the Island Intrusive suite. A variety of dykes and small stocks with compositions ranging from basalt to hornblende diorite are possibly lower to middle Jurassic Bonanza Sub-group equivalents while a swarm of north-trending dykes north of Texada Mines are related to the Gillies Bay Stock.

Structurally, the island is dominated by northwest-trending left-lateral strike-slip faults (Glover, 1989). Folding is restricted to a broad syncline between Texada Mines and Vananda and local tight folds associated with the contacts of intrusives.

Metamorphism is restricted to contact metamorphic marble development in limestone and hornfelsing in volcanics peripheral to stocks and dykes.


124°15'
49° 45'
Blubber Bay
TEXADA PROJECT
Vananda
Malaspina
Strait
TEXADA
Gillies Bay
ISLAND
Strait
of
Georgia
LEGEND
5 NANAIMO GROUP SEDIMENTS
3 DIORITE
2 QUATSINO LIMESTONE
1 KARMUTSEN VOLCANICS
S SICKER VOLCANICS
CONTACT
FAULT
AFTER G.S.C. MAP 17-1968
FREEPORT-McMoRan GOLD COMPANY
TEXADA PROJECT
REGIONAL GEOLOGY
0 2 4 6 MILES
0 5 10 15 KM.
SCALE 1:250,000
DATE: MARCH 1989
N.T.S. 92F
FIGURE Nº. 3
CHONG

4.0 PROPERTY GEOLOGY

The Texada property is underlain by Middle(?) - Upper Triassic Karmutsen Formation basalts and Upper Triassic Quatsino Formation limestones which have been gently folded into a broad, north-plunging syncline. This sequence has been cut by three major northwest-trending fault zones (Little Billy, Marble Bay (Glover, 1989), and Holly) and intruded by numerous stocks, dykes and sills (Figure 4).

For an in-depth description of property geology see Bradford, 1989: "Geology of the Freeport - Vananda Gold Property".

4.1 Karmutsen Formation

Volcanics of the Karmutsen Formation are exposed along the eastern and western boundaries of the property as well as in an uplifted block around Priest Lake. They consist of amygdaloidal, massive and pillowed basalts,pillow breccias, hyaloclastites, tuffs and submarine debris flows.

Karmutsen volcanics occur in both normal and faulted contacts with the overlying Quatsino limestones on the property. Contact dips of 30 degrees or less are suggested from surface outcrops and drilling. Where the contact is not visible, the presence of a 1-3 m intermittent lensoidal limestone horizon (located within metres of the upper contact) within the volcanics is indicative of a normal contact.

The Karmutsen frequently contains abundant disseminated pyrite ± chalcopyrite and magnetite giving it both an above average IP signature and a strong magnetic signature. Geochemically, it is high in both copper and gold.

Epidote alteration and hornfelsing are common peripheral to stocks and dykes.

4.2 Quatsino Formation

With thicknesses of up to 2000 feet (Muller,1969), the Quatsino limestones underlie 80% of the property. They are generally non-descript, fine grained and dark grey, but have frequently been bleached and recrystallized. Bleaching ranges from light grey to white, while recrystallization produces crystals up to 1 cm across in the most extreme case. Both bleaching and recrystallization are indicative of intrusive, faulting and/or hydrothermal activity.

Its featureless nature, combined with extensive recrystallization, make it difficult to designate marker units in the Quatsino. Notable features, such as well-developed bedding, are not continuous enough to follow, with the only distinguishable unit found to date being a thinly-laminated siliceous fragmental unit. Identified from drilling (Figure 94), but also noted in outcrop in the Volunteer, Security and Sandy areas, this unit marks the bottom 60 metres of the limestones.

4.3 Intrusives

Two major stocks belonging to the Island Intrusive suite (Carson, 1972) intrude the property. The biotite-quartz diorite Little Billy Stock intrudes limestone at the north end of the island, while the quartz monzonite Gillies Bay Stock intrudes both volcanics and limestone at the south end of the island.

A series of smaller stocks and sills intrude both the volcanics and limestone on the property. These range in composition from hornblende diorite to hornblende-quartz diorite and are probably related to the larger intrusives on the property. The Volunteer intrusive is designated a sill-like body from magnetic modelling of the total field ground magnetometer survey, Figures 15 & 21 through 26, which shows it to be a 200 metre thick tabular body dipping southwest at 30 degrees. While not a sill in the true sense, the carbonates and the underlying basalt dip northeast at approximately 30 degrees, the term distinguishes it from a stock-like body and has certain economic significance described later in the report.

Dykes and sills are generally feldspar (hornblende, biotite) porphyries. North of the Marble Bay Fault dykes are northeast-trending, while nearer to the fault they trend more northwest. At the south end of the property, a distinct north-trending dyke swarm radiates northward from the Gillies Bay Stock.

4.4 Structural Geology

Three major left-lateral strike-slip faults have been outlined on the property, the Little Billy, Marble Bay and Holly Faults (Figures 4 & 7). The northernmost Little Billy Fault, defined by airborne magnetics, offsets the limestone/volcanic contact along the northeast property boundary. Immediately south, the complex Marble Bay Fault Zone offsets the limestone/volcanic contact south of the Imperial quarry and extends through the town of Vananda in a series of splays. Within these splays are horsts, grabens and several fault-bounded (controlled ?) hornblende diorite stocks. In the south central area of the claims lies the Holly Fault. It offsets two limestone/volcanic contacts and, along with the Lake Fault, bounds a graben block in the vicinity of Texada Mines.

Abundant minor faults of varying attitude also occur on the property. Many of these have been resealed by later dykes.

The broad, north-plunging fold between Vananda and Texada Mines is the major fold structure on the property. Local tight folds are associated with the contacts of intrusives.

5.0 ECONOMIC GEOLOGY

5.1 Mineralization

The historic production and grades for the Vananda Camp and Texada Mines are summarized in Tables 2 and 3, with detailed descriptions of the deposits described in previous reports, Forster (1989), Peatfield (1986), Stevenson (1945), Ney (1943), Lakes (1930) and McConnell (1914). For this report a brief summary of the deposit types and the mineral occurrences will suffice.

The four principal deposits of the Vananda Camp, are the Marble Bay, Little Billy, Copper Queen and Cornell (Figures 4 & 6). All are garnet, pyroxene, wollastonite skarns. Occurring as steeply plunging pipes, the bornite-rich deposits are mostly developed in contact with either feldspar porphyry dykes or hornblende diorite and biotite quartz diorite stocks. Pyrite, molybdenite, sphalerite, chalcocite, digenite and traces of a silver telluride, hessite, are also present. Gold occurs as free, fine to coarse grains, along the contacts of the bornite, pyrite and silicate minerals.

The Texada Mines' iron-copper deposits are also skarns, but an order of magnitude larger in size. Developed along the extremely irregular contact of the Gillies Bay quartz monzonite stock, the mine consisted of five open pits and six underground deposits, Figures 7 & 8. The open pit deposits include the Prescott and Yellow Kid which are principally vertical, massive magnetite pipes developed in the marbles adjacent to, but not at, the contacts of the quartz monzonite. The Paxton and Paxton South are magnetite-chalcopyrite skarns developed on the footwall volcanic contact and as vertical, tabular bodies extending up the overhanging quartz monzonite contact. The Lake consisted of massive amphibole, magnetite, pyrrhotite skarn along a reverse faulted contact of the marble and basalt, such that the basalt is in both the foot wall and the hanging wall. The underground skarn zones were formed along the flat volcanic-marble contact underlying the quartz monzonite intrusive. Although primarily magnetite-rich, chalcopyrite was considerably enhanced along the marble skarn interface.

In addition to the skarn deposits there are a number of massive base metal and iron sulphide replacement deposits that occur in mostly unaltered limestone. In the Ideal Quarry, a two metre thick, flat lying body of megacrystic calcite, massive sphalerite and pyrite replaces fine grained, dark grey limestone and is referred to as the Manto deposit. The only alteration of note is a halo of silica that affected the chemical quality of the limestone. Chip sampling along the face of the body by Vananda Gold Ltd, returned 0.22 ounces per ton gold along 17 feet.

Other replacement occurrences include the Sentinel, Sandy and Lucky Jack. One newly re-discovered occurrence, not previously reported, is the Vauxhall showing, just north of the Gillies Bay road in the central portion of the property. Old trenching, now grown over, exposed a flat lying (?) band of massive pyrite and sphalerite in a vertical fracture system in unaltered limestone. Samples of the mineralization are available only from the dumps and returned gold assays to 0.15 ounces per ton. As in all of the zinc occurrences, cadmium is >100 ppm.

TABLE 2 - PRODUCTION HISTORY OF TEXADA ISLAND MINES

Mine	Period	Prod. (tons)	Au (oz)	Ag (oz)	Cu (lbs)	Fe (MMt)
Cu Queen	1903-1917	4,500	1,660	12,500	398,000	
Cornell	1897-1917	44,500	16,600	77,400	3,016,000	
Little Billy	1896-1952	70,000	12,800	42,260	4,446,350	
Marble Bay	1899-1929	220,000	54,460	445,000	15,000,000	
Total Vananda		339,250	85,520	577,160	22,860,350	
Texada Mines	1952-1976	23,000,000	31,300	833,900	58,900,000	11.4

TABLE 3 - PRODUCTION GRADES FOR TEXADA ISLAND MINES

Mine	Period	Prod. (ton)	Au (opt)	Ag (opt)	Cu (%)
Cu Queen	1903-1917	4,500	0.370	2.78	4.4
Cornell	1897-1917	44,750	0.37	1.73	3.4
Little Billy	1896-1952	70,000	0.18	0.60	1.3
Marble Bay	1899-1929	220,000	0.25	2.02	3.4
Ttl. Vananda		339,250	0.252	1.70	3.0
Texada Mines	1952-1976	23,000,000	0.001	0.036	0.14

6.0 GEOCHEMISTRY

A total of 1,534 soil samples and 243 rock chip samples were collected in 1989. These were analyzed for gold by fire assay with an atomic absorption finish and for 32 additional elements by ICP. Samples with >1,000 ppb Au were fire assayed for greater accuracy, while drill core with suspected coarse gold was screened for metallics prior to assay. Analytical work was conducted by Chemex Labs in North Vancouver.

6.1 Soil Geochemistry

Of the 1,534 soil samples collected in 1989, 1,027 were collected on the Eagle Grid, 272 were from the Volunteer Grid and 235 were fill-in samples from the Cornell Grid.

Although areas of 100% outcrop had sparse soil, the sampling has proven very useful on the property, detecting possible leakage from blind mineralization, defining broad base metal haloes and extending known mineralization.

The following is a grid by grid breakdown of soil anomalies on the property. It includes 1988 and 1989 sampling by Freeport as well as 819 samples taken on the Cornell Grid by Vananda Gold in 1987.

6.1.1 Volunteer Grid

Twenty-five by fifty metre centered samples defined a 650 metre long gold anomaly parallel to the long axis of the Volunteer Sill. Gold values within this anomaly are generally less than 100 ppb with spot highs to 6,850 ppb (Figure 17). Also associated with the sill are numerous copper and arsenic anomalies (Figure 19). The copper-gold anomalies are within the intrusive and extend beyond the margins, while the ± more mobile arsenic anomalies fringe the sill. Four small zinc-lead anomalies also occur peripheral to the intrusive (Figure 18).

The principal gold anomaly is not correlative with known gold mineralization or skarn. Hornblende diorite with magnetite and calc-silicate developed on fracture fillings and as stockworks underlies the gold anomaly, although rock geochemistry of these outcrops returned background gold values only.

The gold-copper anomalies along the southern margin of the sill correlate to a small copper-magnetite skarn exposed in a trench with assays to 0.30 ounces per ton gold from selected, mineralized samples (Figure 16). Potential strike extent suggested by the gold-copper values is 175 metres.

6.1.2 Cornell Grid

As described in the 1988 report (Forster, 1989), Vananda Gold's 25 by 50 metre sampling at the north end of the grid outlined a number of copper, gold and lead, arsenic anomalies (Figures 29 & 30). Abundant copper anomalies west of the Florence-Security area are indicative of disseminated chalcopyrite in the volcanics while scattered gold anomalies also occur in this area. The two large copper-gold anomalies immediately north of Emily Lake, with gold values up to 12,300 ppb, were trenched in 1987 by Vananda Gold. Gold geochemistry also outlined the Security showing as well as two strong anomalies with up to 1010 ppb Au centered over an aeromagnetic low (Aerodat, 1988). Northeast of the Florence area, where the limestone is known to be very thick, scattered small lead, arsenic, gold and copper anomalies may represent leakage along the Marble Bay Fault Zone from mineralization at depth.

Freeport's sampling covered the south end of the grid at a sample density of 25 by 50 metres (Figures 49, 50 & 51). In the area of the Cornell Mine, significant contamination by mine tailings eliminates the anomalies within the Marble Bay Fault Zone.

To the northwest of the Cornell the soil survey outlined a > 650 metre coincident lead/zinc anomaly containing smaller gold, copper and arsenic anomalies. Paralleling the 110 metre elevation contour along the hill side, it suggests a flat-lying lead-zinc manto with local concentrations of gold, copper and arsenic. The anomaly is centered around station 6+50 S; 2+00 E where a soil sample returned values of 192 ppm copper, 6,460 ppb gold, 4,000 ppm lead, 5,300 ppm arsenic, 6,000 ppm zinc and 15.0 ppm silver. In the Imperial Quarry, 500 metres southeast, a polymetallic massive sulphide/coarse calcite vein encountered by the quarry operators returned values up to 0.124 ounces per ton gold, 3.51 ounces per ton silver, >100 ppm cadmium, 1,005 ppm antimony and >10,000 ppm lead-zinc. Blocks of massive gossan with the sulphide vein assayed 5% copper and 0.024 ounces per ton gold.

6.1.3 Eagle Grid

The Eagle Grid was sampled in 1989 at 25 metre intervals on 100 metre spaced lines. Anomalous copper, gold, lead, zinc and silver values are more abundant at the south end of the grid peripheral to the Gillies Bay Stock and its apophysis (Figures 66, 67, 68, 72, 73 & 74). Here, anomalous copper dominates the west side of the grid along the volcanic contact, with scattered gold and arsenic anomalies occurring intermittently (Figures 72 & 74). Zinc is also strongly anomalous (Figure 73). Immediately above the Anomaly A workings, a 2,350 ppb gold high in soil is associated with weakly developed garnetite skarn along a diorite dyke. Mineralized rock samples and specimens of the massive magnetite skarn from the portal of the workings had background gold values.

North of the main intrusive, a number of small gold and copper anomalies occur along the Northwest Diorite and its associated rectilinear dyke pattern. Intermittent zones of actinolite-chalcopyrite skarn are directly associated with these anomalies. Along the east edge of the grid, point source copper, gold and arsenic anomalies follow north-south-trending dykes.

A 300 metre corridor south of and parallel to the Holly Fault hosts a concentration of multiple element anomalies, while north of the fault the geochemistry is very subdued. Anomalies south of the fault include arsenic, zinc ± lead and cadmium, with concentrations of copper and gold at the eastern edge of the grid. Included in this concentration of high golds is a sample assaying 0.691 ounces per ton immediately south of the fault (Figure 78). Five check samples within a 20 metre radius returned from 2,500 to 4,500 ppb gold. No source has been recognized for the gold although a hornblende diorite dyke outcrops adjacent to the sample locations. The anomaly also occurs on a slope at the edge of a topographic bench that leads down to a linear swamp occupying the trace of the Holly Fault.

Two hundred metres west of the above gold high is a north-south trending zinc, lead, cadmium soil anomaly, Figure 67 (Nb: cadmium is not plotted). Sitting immediately east of the Eagle base line, between lines 15N and 18N, the linear anomaly is 400 metres long and 75 to 100 metres wide with zinc values to 5,300 ppm, lead values to 240 ppm, cadmium to 20 ppm (background is <0.5 ppm) and two gold responses to 45 ppb (Figure 66). The presence of cadmium suggests a potential manto-type deposit.

At the northwest corner of the grid, a wedge of volcanics bounded to the north by the Holly Fault and to the south by a northeast-trending fault underlies two anomalous gold zones with values to 1,270 ppb (Figure 66). One zone with 500 metres of strike length and ± 75 metres of width, traces the contact of a small hornblende diorite stock and the volcanics (Figure 65). Minor quartz veining is noted in the volcanics along the contact, however no sulphide mineralization has been found.

6.1.4 Sandy Grid

The Sandy Grid was sampled in 1988 at 25 metre intervals on lines spaced 100 metres apart with results plotted on Figures 78, 79, 80, 97, 98 & 99. Unlike the Eagle and Volunteer sampling, none of the samples were run for 32 elements by ICP. Follow-up sampling on 50 metre lines west of Paxton Lake has since provided better definition of anomalies in this area. Sample density was also increased in the area of the Sandy Showing to 10 by 25 metres in order to clearly define its strike potential (Figures 84, 85 & 86).

Northwest of the White Rock Quarry, in an area bounded by the Lake and Holly Faults, are two areas with coincident zinc/lead/arsenic ± silver anomalies (Figures 98 & 99). The most northerly zinc anomaly is cut by the Holly Fault and strikes northwest for 900 metres (Figure 79). Coincident with the zinc anomaly is a large arsenic anomaly and scattered small gold, arsenic and lead anomalies (Figures 78 & 80). As two known zinc ± lead, arsenic showings occur within the anomaly at the extreme north end the anomalous soil geochemistry suggests that the mineralization might be connected and therefore more extensive than is visible on surface (Figure 77). As ICP analysis was not done on the Sandy Grid samples, cadmium values are not available, although the exposed mineralization has cadmium >100 ppm.

West of Paxton Lake anomalous gold values in the soil over the volcanics outlined a 100 by 200 metre gold anomaly with highs to 190 ppb (Figure 97). Extensive copper (up to 2900 ppm) and lesser arsenic are also associated with this anomaly. Disseminated chalcopyrite filling vesicles in the basalts is the most likely explanation for the anomalies. Extensive outcrop further reduces the potential for a buried, economic target.

Along the Aladdin/Sentinel ridge, a broad, northwest-trending area of anomalous zinc ± lead, gold and copper values are coincident to a linear 400 metre long hydrothermal breccia developed in the limestones (Figures 78 & 79). Rock chip samples on 10 metre by 50 metre centres did not locate significant precious or base metal values within the breccia (Figures 89-91).

The potential extent of the Sandy showing is indicated by a 300 metre by 50 metre gold anomaly defined by the detailed soil sampling (Figure 84). Sulphide mineralization had been exposed in three old trenches with one sample, chipped over 0.6 metres, returning 1.123 ounces per ton gold. The anomaly terminates abruptly at the Holly Fault, suggesting that the gold mineralization is cut off in this direction.

6.1.5 Belle Grid

In 1988, an 800 metre by 600 metre area was sampled on chain and compass lines to test a zone of low resistivity outlined by the airborne geophysics (Aerodat, 1988). As sampling was conducted at 50 metre intervals on lines spaced 100 metres apart, the anomalies tend to be spot highs. Those anomalies larger than one sample point include a two point copper/gold anomaly surrounding the Belle shaft (Figure 58) and a broader, four sample zinc anomaly east of the shaft (Figure 59). The copper/gold anomaly includes highs to 500 ppb Au and 160 ppm Cu while the zinc anomaly includes values up to 1800 ppm zinc. Anomalous base metal values along the main roadway are interpreted to be contamination from road fill and general traffic.

6.1.6 Summary

On a property scale, a few trends are evident. Copper-gold ± arsenic anomalies are frequent over the volcanics, while zinc-arsenic ± gold, copper, lead anomalies are frequent over the limestone. All elements analyzed for, dominated by copper, gold, arsenic and zinc, are commonly anomalous near intrusives. Silver is rarely anomalous throughout the property.

6.2 Rock Geochemistry

A total of 243 rock samples were taken during the course of prospecting and mapping in 1989. In addition, because of a lack of soil and abundant outcrop, 142 rock samples were taken at 10 metre intervals over an anomalous zone between the Aladdin and Sentinel showings, as previously discussed. This revealed weakly anomalous copper, gold, zinc and lead near the known mineralization plus a few scattered spot highs (Figures 89, 90 & 91).

7.0 GEOPHYSICS

Geophysical surveys undertaken on the property include airborne total field magnetics, electro-magnetics and VLF electro-magnetics; gradient and pole-dipole IP; total field and gradiometer magnetics; VLF electro-magnetics and gravity.

In 1977, Ager and Beretta conducted a regional gravity survey on 400 metre spaced lines with 60 metre station intervals. Detailed follow-up of three areas was undertaken in 1979 with gravity, IP, magnetics and VLF-EM. The gravity was tightly controlled in elevation (0.03 m) and terrain corrected to a 600 metre radius. The Bouger gravity was reduced to a residual gravity map by computer processing.

The 1988 program was initiated with a multi-sensor airborne geophysical survey flown by Aerodat of Toronto. The 750 kilometre survey, flown in conjunction with surrounding property holders Echo Bay Mines and BP Resources, consisted of total field magnetics, electro-magnetics and VLF electro-magnetics. Of these, the total field magnetics have proven very useful in defining basement geology.

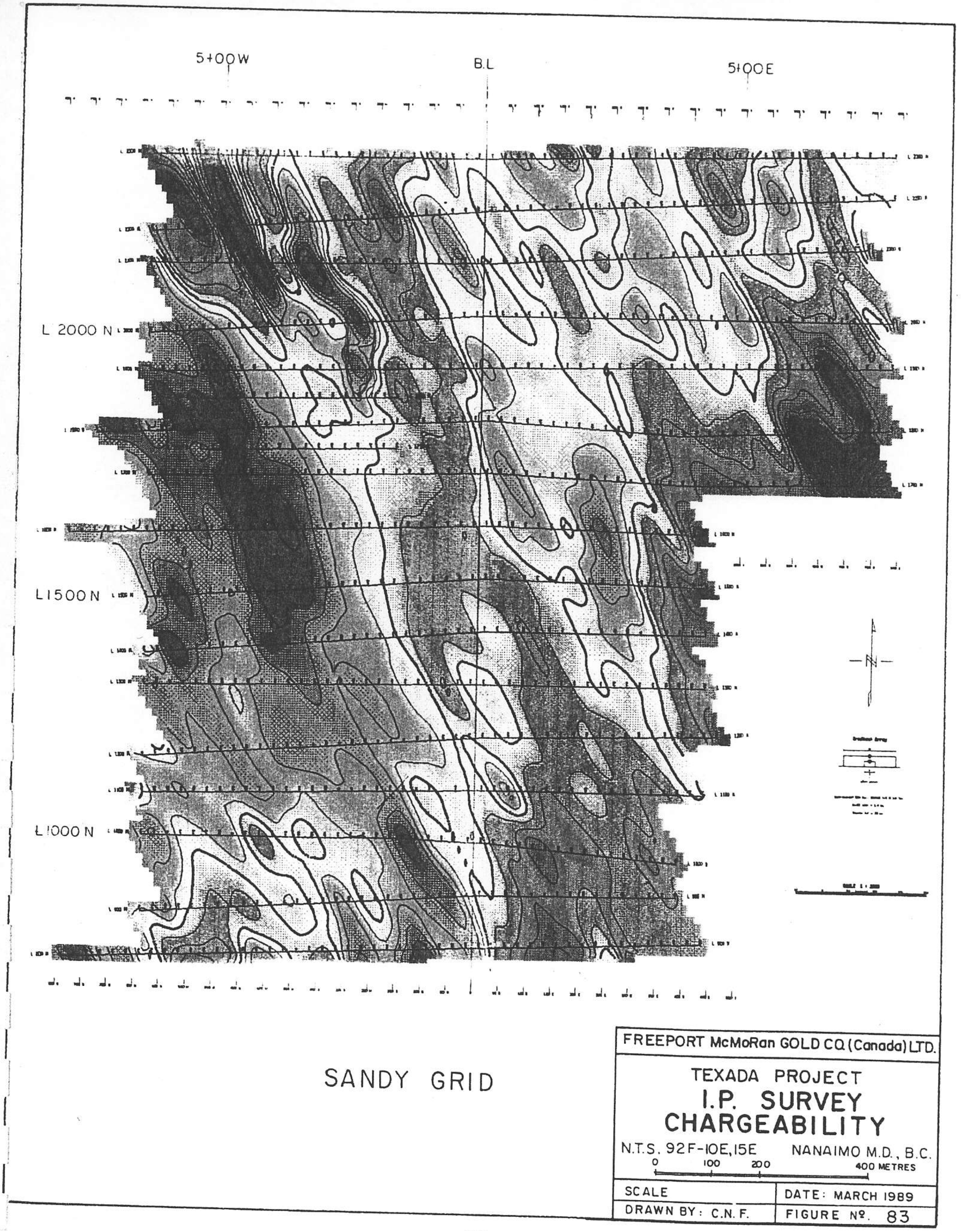
Also in 1988, P. Walcott and Associates, conducted IP surveys over the Cornell and Sandy Grids using a gradient array with a 3.4 kilometre current electrode spacing and a 25 metre "a"-spacing. Selected lines with strong chargeability highs were detailed with the pole-dipole method. These surveys outlined a number of anomalies, three of which have been drilled.

Delta Geosciences conducted the 1989 geophysical program which included 7.7 kms of gradient IP, using a 1.5 kilometre dipole spacing and an "a"-spacing of 25 metres, in the Little Billy area. Additionally, all grids were surveyed with total field and gradiometer magnetics and VLF-EM, for a total of 105 line kilometres. The magnetics and 21.4 and 24.8 kHz VLF, were collected in one pass using an EDA Omni IV Plus system at 12.5 metre intervals. A grid by grid breakdown of the Mag-VLF work includes 42.25 km on the Cornell Grid, 11.25 km on the Volunteer Grid, 31.55 km on the Eagle Grid and 21.2 km on the Sandy Grid.

7.1 Volunteer Grid

The Volunteer Grid was surveyed at 12.5 metre intervals on lines spaced 50 metres apart. Although the VLF was dominated by a power line running down the centre of the grid (Figure 27), the magnetic data has proven very useful (Figure 20).

The magnetics outlined the extent and geometry of the Volunteer intrusive and distinguish possible magnetite bodies fringing and beneath it. Generally, the magnetics are dominated by a broad anomaly tailing off gently to the southwest with local spike highs. Scattered small highs north of the highway are related to dyking and a few small metal dumps near Ideal's haul road. Sections along lines 4+50, 5+00 and 7+00 E were profiled and modelled (Figures 21-26).


5+00W
B.L
5+00E
L 2000 N
L1500N
L1000N
SANDY GRID
FREEPORT McMoRan GOLD CO. (Canada) LTD.
TEXADA PROJECT
I.P. SURVEY
CHARGEABILITY
N.T.S. 92F-10E,15E
NANAIMO M.D., B.C.
0
100
200
400 METRES
SCALE
DATE: MARCH 1989
DRAWN BY: C.N.F.
FIGURE Nº. 83

Modelling profiles without spike highs show the Volunteer hornblende diorite to be sill-like and dipping about 30 degrees southwest (Figures 21 & 24). Lines containing spike highs modify the model and make the sill appear to have a steeper dip (Figures 22, 23, 25, & 26). Modelling also outlines tabular bodies on the north and south sides of the sill (Figure 22). A 40 metre thick body dipping 50 degrees southwest is indicated on the hanging wall of the sill and a 10 to 40 metre thick body dipping between dipping 55 and 75 degrees southwest, is outlined in the footwall of the sill. Surface sampling of massive magnetite-chalcopyrite in the footwall assayed up to 0.112 oz/ton Au, while similar mineralization in the hanging wall assayed up to 0.330 oz/ton Au (Figure 16).

7.2 Cornell Grid

Walcott's induced polarization anomalies in the Cornell and Copper Queen areas were discussed in Forster (1989). Drill hole T89-8, collared southeast of the Copper Queen, did not encounter chargeable material although the hole was drilled to the volcanic basement. The VLF-EM survey picked up a very conductive feature near surface, analogous to a steel water pipe that is coincident to the highest peak of the chargeability high. While a pipe was suspected as a contributing factor for the IP, it is still not clear if a pipe is solely responsible for the extremely broad IP feature.

In the Little Billy East area, Ager's regional gravity survey and the detailed follow-up survey define a residual gravity high to 0.50 milligals coincident to an airborne magnetic high (Figure 35). Subsequent ground magnetics provide better definition to the airborne magnetic feature and show that the main axis of the gravity high is strongly magnetic, as are several shoulders and lobes (Figure 31). A drill hole in 1979 intersected 12 metres of 1.55% Cu and 0.051 opt Au in a magnetite-rich skarn on the main axis of the anomalies (Figure 46. Adjacent holes failed to locate additional mineralization as they were either stopped short in a granitic sill or were placed off to the side of the anomalies.

The gravity feature strikes westerly toward the copper-gold skarns drilled in 1988 and southeasterly under the LaFarge Quarry where it is open at the margin of the survey area. Over the Little Billy Mine, a distinct 0.25 milligal residual high defines a barren garnetite zone in the underground workings that is open to the northwest along the margin of the Little Billy quartz diorite stock.

7.3 Eagle Grid

Lines 3N to 23N were surveyed by ground magnetics and VLF-EM

(Figures 69, 70, 75 & 76). The remaining lines of the grid were not surveyed as they had not been cut prior to the completion of the geophysical survey.

The VLF defined two linear conductors that run virtually the length of the coverage west of the Eagle base line (Figures 70 & 76). The most westerly anomaly is coincident to a dyke with pods of chalcopyrite in actinolite skarn developed along the contact. The short wavelength of the in-phase component indicates a narrow conductor caused by shearing along the dyke margin. The second conductor is developed along the western contact of the Northwest Diorite and is coincident to massive chalcopyrite in drill holes completed by Texada Mines in the mid-1960's. The most northerly drill hole south of line 8N, cut 11 feet of 2.35% Cu and 10 feet of 1.45% Cu within a one hundred foot interval of skarn. The VLF profile on lines 7N and 8N reflect a broad or multiple component conductor continuing to line 9N. From 10N through 21N (1,100 metres) the VLF profiles trace a narrow but conductive source continuing to the north.

A 0.25 milligal to 1.0 milligal residual high transgresses the Northwest Diorite and the associated airborne magnetic high. Striking north-northwest, the 300 metre by 800 metre anomaly continues 400 metres beyond the contact of the diorite and into the limestone basin under the Ideal quarry. On strike of the principal underground workings of Texada Mines, the gravity could be expressing a continuation of the deep, copper-rich North Extension. The 1.0 milligal axis of the feature also appears to be coincident to the chalcopyrite-rich skarn on the contact of the diorite and to the broad portion of the VLF anomaly on lines 7N, 8N and 9N (Figure 76).

The total field ground magnetics refined the broad magnetic airborne anomaly that is roughly coincident, albeit broader, than the outcropping Northwest Diorite (Figures 69 & 75). The pattern of the ground magnetics shows a number of small magnetic pods along and under the contacts of the intrusive. The Texada Mines drill holes demonstrate that the contacts dip steeply towards the centre of the body, thus the magnetic pods would be in the footwall of the intrusive.

At the southern end of the grid, line 3N, the magnetics clearly show that the Anomaly A orebody (Texada Mines) continues only to line 4N (Figure 75). In addition, there are at least four smaller magnetic pods developed along the southern contact of the volcanics and limestone with dioritic dykes.

Immediately east of the Eagle base line between lines 13N and 19N, a northerly trending 0.25 to 0.50 milligal high lies between a small apophysis of the Northwest Diorite outcropping on line 13N and intercepted in drill hole 80-10. Coincident to the gravity high is a similarly shaped zinc, lead, cadmium soil geochemical anomaly with moderately elevated spot highs of gold to 45 ppb (Figures 66 & 67). The presence of anomalous cadmium and the lack of magnetic or VLF anomalism supports the possibility that the gravity high is related to a massive zinc-lead manto deposit.

7.4 Sandy Grid

The IP survey and subsequent chargeability anomalies, Figure 83, were described in the 1988 final report. Drill testing of these targets in 1989 failed to locate economic sulphide mineralization. The broad chargeability features west of the base line were strongly altered, pyritic basalts lying at a shallow depth beneath the limestones. The IP feature between Paxton Lake and the base line had no sulphide explanation but could have been caused by graphitic limestone at the base of carbonate rocks.

The magnetometre and VLF survey defines north and northwest trending structures correlative to known faults and dykes (Figures 81, 82, 100 & 101). Although the Holly Fault provides a strong VLF conductor, the Lake Fault does not. Its presence is marked by an abrupt break in the magnetics with a broad low on the downthrown side and a high over the upthrown volcanics. The Holly Fault marks the east margin of the magnetic low although the magnetic gradient on the upthrow side of the volcanics is more subdued than the west side of the Lake Fault suggesting that the vertical component is much less for the Holly Fault.

At the junction between the Sandy and Eagle grids, on lines 14N, 15N and 16N, a multi-peaked, circular magnetic anomaly lies at the southern edge of the Holly and Lake Faults (Figure 81). A coincident, 0.25 milligal residual gravity high extends 400 metres northeast from the magnetic high and broadens to 300 metres. Flanking the magnetic high on the east and north side, is a broad VLF conductor centered over the Holly Fault and a swamp (Figure 82). Although most of the swamps on the property are conductive, linear filtering (Karous and Hjelt, 1983) by Hendrickson shows a broad, deep source for the VLF conductor.

At the northwest end of Paxton Lake a 0.25 milligal residual gravity high outlines a 400 metre by 150 metre zone coincident to a broad VLF-EM anomaly. The conductor is also coincident to a swamp and for this reason has been considered to have no merit. The presence of the gravity high could indicate a massive sulphide zone, although IP chargeabilities are low.

8.0 DIAMOND DRILLING

A total of 4428.8 metres in 19 holes were diamond drilled in 1989. Burwash Contract Drilling of Cobble Hill, B.C. performed the work with one, and later two, Longyear 38 unitized skid drills drilling NQ diameter core. Total drill contractor costs averaged $19.85 per foot while total cost per foot drilled, including site preparation, geological drill supervision, core management, assays and core rack construction, averaged $23.08.

The following is an area by area summary of 1989 drilling. Table 4 summarizes Freeport drilling on the property to date.

8.1 Little Billy

Holes T89-9, 11 and 13 were drilled on a section 60 metres south of the mineralization encountered in T88-3 and 4 to test its strike extent in this direction (Figures 39 a & b). Hole T89-9 intersected three 5 to 12 metre sections of skarn over 40 metres, one of which included 6.4 metres grading 0.075 oz/ton Au and 0.82% Cu. Hole T89-11, 45 metres up dip, encountered biotite quartz diorite higher up in the hole which appears to cut off the skarn in this direction. Hole T89-13, 45 metres down dip of T89-9, shows that the Little Billy Stock steepens markedly in this direction and the skarn thins out to two one metre zones.

8.2 Copper Queen

Two deep holes, T89-8 and 16, were drilled in the Copper Queen area. T89-8 tested a very strong chargeability high and the possible southeast extension of the Copper Queen Mine along strongly metasomatized dykes (Figure 47). Although the hole did not encounter significant skarn or gold mineralization, it intersected 0.5 metres of high grade lead-zinc at 34 metres and bottomed in volcanic basement at a depth of 619 metres. A biotite quartz diorite sill/dyke at 620 metres, metasomatized dykes and megacrystic marble all suggest a close proximity to the quartz diorite stock.

Hole T89-16 was drilled to test the northwesterly projection of the Copper Queen ore zone (Figure 40). It encountered a metasomatized dyke where the ore extension was projected and barren skarn sandwiched between a feldspar porphyry diorite sill and the biotite quartz diorite stock. It also shows that the biotite quartz diorite contact steepens significantly to the west from that shown in T89-9 to the north.

8.3 Cornell

Four holes were drilled in the area of the Cornell Mine. Hole T89-10 was drilled to test the projection of the Tanzer stope to the southeast (Figure 54). It intersected barren skarn in the area of the projection as well as a large silicified feldspar porphyry dyke at the base of the hole. Drill holes T89-12, 14 and 15 were

TABLE 4

1988/89 DRILL SUMMARY

HOLE #	TARGET	RESULTS From (m)	To (m)	Length (m)	Au (opt)	Ag (opt)	Cu (%)	Pb (%)	Zn (%)
T88-1	Little Billy 650 stope projection	228.2	234.1	5.9	0.212	0.85	1.58		
		241.2	243.7	2.5	0.146	2.65	5.92		
T88-2	Down dip projection of T88-1 mineralization	Narrow skarn, low grade - pinched out or faulted off.							
T88-3	Southern strike projection of T88-1 mineralization	271.1	276.2	5.1	0.82	2.16	2.9		
T88-4	Up dip projection of T88-3 mineralization	273.8	274.8	1.0	0.132	0.63			
		278.8	283.5	4.7	0.499	1.55	2.57		
T88-5	Down dip projection of T88-3 mineralization	Narrow skarn, low grade - abrupt pinch out or fault off-set.							
T88-6	Large IP anomaly	Metasomatized Copper Queen Dyke - no explanation for IP.							
T88-7	Large IP anomaly	301.1	302.4	1.3				2.03	5.74
		No explanation for IP.							
T89-8	Southeast projection of Copper Queen Mine	34.0	34.5	0.5				>10,000 ppm	>10,000 ppm
T89-9	Southern strike projection of T88-3 & 4	292.1	298.5	6.4	0.075		0.82		
T89-10	Southeastern projection of Tanzer ore stope in the Cornell Mine	Barren skarn.							
T89-11	Southern strike projection of T88-3 & 4	No skarn, cut-off by biotite quartz diorite. (Little Billy Stock)							
T89-12	Down dip projection of a 1929 hole intersecting high Cu and abnormally low Au values -> poor assaying suspected - Cornell Mine area	No skarn at limestone/hornblende diorite contact.							
T89-13	Down dip projection of T89-9 mineralization	Narrow skarn, low grade. Little Billy Stock steepened markedly to the west.							
T89-14	Up dip projection of a 1929 hole intersecting high Cu and abnormally low Au values -> poor assaying suspected - Cornell Mine area	Lost in fault.							
T89-15	Down dip projection of a 1929 hole intersecting high Cu and abnormally low Au values -> poor assaying suspected - Cornell Mine area	Narrow skarn, low grade.							
T89-16	Northwesterly projection of Copper Queen ore zone	Metasomatized dyke where ore extension was projected and barren skarn at the biotite quartz diorite contact.							

HOLE #	TARGET	RESULTS From (m)	To (m)	Length (m)	Au (opt)	Ag (opt)	Cu (%)	Pb (%)	Zn (%)
T89-17	IP/gold soil anomaly	Graphitic limestone.							
T89-18	IP/gold soil anomaly	Graphitic limestone.							
T89-19	IP anomaly/possible skarn at limestone/volcanic contact immediately north of Gillies Bay Stock.	Weakly Au anomalous narrow skarn at contact of the Karmutsen Basalt.							
T89-20	IP anomaly/possible skarn at limestone/volcanic contact immediately north of Gillies Bay Stock.	Anomalous Au skarn at contact.							
T89-21	Thickening skarn in T89-20 intersecting north-south structure emanating from Gillies Bay Stock.	Hit dyke-filled structure, contact cut-off.							
T89-22	Strong IP and suspected buried intrusive (mag) -> skarn at limestone volcanic contact.	Weak skarn at very shallow volcanic contact.							
T89-23	Strong IP and suspected buried intrusive (mag) -> skarn at limestone volcanic contact.	Weak skarn at very shallow volcanic contact.							
T89-24	Strong IP and suspected buried intrusive (mag) -> skarn at limestone volcanic contact.	Weak skarn at very shallow volcanic contact.							
T89-25	Source of strongly bleached & recrystallized marble between T89-22 & 23/ southern extension of Sandy mineralization and anomalous Au geochem.	Weak skarn at very shallow volcanic contact.							
T89-26	Down dip extension of Sandy Showing (1.123 opt Au over 0.6m)	102.8 50m of barren skarn at limestone/volcanic contact.	105	2.2	0.302				

drilled in the vicinity of 1929 drill holes that had high copper and low gold values suggesting poor sampling protocol. Hole T89-12, drilled beneath a significant 1929 intersection, intersected a barren limestone/hornblende diorite contact (Figure 55). Hole T89-14 was lost in the Marble Bay Fault before it could reach its target up dip of hole 29-7 containing 4% Cu and low gold. Hole T89-15 tested the down dip projection of 29-7 and intersected a 0.8 metre thick skarn grading 1,000 ppb gold at the hornblende diorite contact (Figure 56).

8.4 Sandy

A total of 10 holes were drilled in the Sandy area in 1989. The holes tested IP and soil geochemistry anomalies as well as the down dip projections of known mineralization.

Holes T89-17 and 18 (Figures 92 & 93), tested a 200 metre long IP anomaly with a coincident gold soil anomaly along the east side of the grid. Both intersected a very graphitic limestone unit which most likely explains the IP.

Holes T89-19, 20 and 21 were drilled 50 metres apart along Line 12+00 N of the Sandy Grid (Figures 96 & 102). The holes straddle the southern end of a northwest-trending IP anomaly and a broad magnetic high. T89-19 encountered a thin skarn with weakly anomalous gold at the limestone/basalt contact, just 68 metres below surface. T89-20, 50 metres west of T89-19, intersected 2.3 metres of skarn geochemically anomalous in gold. T89-21, 50 metres further west, was targeted on skarn projected from T89-20 and the intersection of a north - south structure emanating from the Gillies Bay Stock. The hole hit a dyke-filled structure that cut the contact off. Drilled on a common section, the holes defined the attitude of the volcanic contact and identified a marker unit in the limestone. The marker, a siliceous fragmental unit recognized on surface locally, marks an horizon which only occurs within 50 metres of the limestone/volcanic contact. It has since been used extensively in surface mapping as an indicator of the proximity to the volcanic basement and whether observed contacts are conformable or faulted.

Holes T89-22 to 25 were drilled along Line 16+00 N of the Sandy Grid over top of a large, northwest-trending IP chargeability high (Figures 77 & 94). T89-22 cored through 32 metres of coarse white marble near its collar and then intersected weak skarn at a still shallow volcanic contact. Prior to this hole, it was believed that the volcanics would be much deeper than 80 metres in this area. T89-23 was collared 66 metres east of T89-22 to test the east flank of the IP. It encountered a small section of course white marble near the top of the hole and weak skarn at the volcanic contact. T89-24 stepped off 105 metres west of T89-22 to test the west flank of the IP anomaly. It did not intersect any

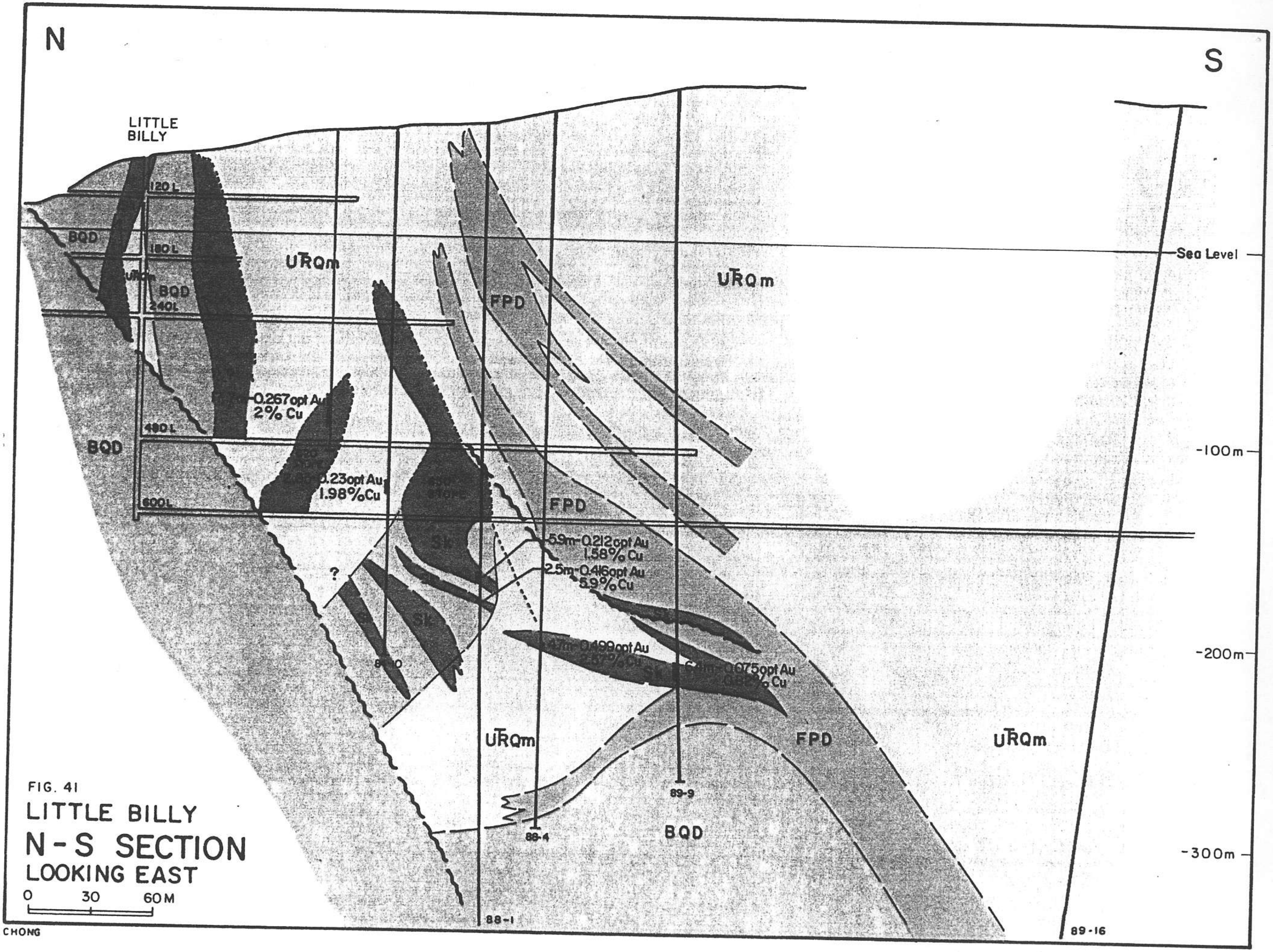


FIG. 41
LITTLE BILLY
N - S SECTION
LOOKING EAST

CHONG

coarse white marble in the Quatsino and intersected weak skarn at the volcanic contact. Holes T89-22, 23 and 24 all intersected the limestone marker unit discovered on the Line 12+00 N section to the south. The holes also encounterd intensely developed quartz, carbonate, pyrite veinlets parallel the core axis in the underlying volcanics.

Drill hole T89-25 was drilled at -50 degrees to test the vertical quartz-carbonate-pyrite veining mentioned above. The gold soil geochemical anomaly, striking south from the Sandy showing, which cuts between holes T89-22 and 23, could have been related to the source of the bleaching and an extension of the Sandy mineralization to the south. This was not the case; T89-25 intersected weak skarn at the limestone/volcanic contact but no significant mineralization in the target area.

Drill hole T89-26 (Figure 95), was drilled beneath the Sandy Showing to test the down dip extension of surface mineralization which assayed 1.123 oz/ton Au over 0.60 metres. The hole intersected 0.302 oz/ton Au over 2.2 metres in silicified, massive pyrite (marcasite?) ninety metres below the showing and 50 metres of skarn at the limestone/volcanic contact. As the volcanics were not encountered until much deeper in the hole than would be expected from drill sections 12+00 N and 16+00 N, the Lake Fault must cut between T89-26 and the holes along Line 16+00 N to the south.

9.0 POTENTIAL

9.1 Little Billy:

The ore bodies mined in the Little Billy Mine were small, scattered pods of <50,000 tons developed along irregularities in the Little Billy Stock. The zones intersected in Freeport's drilling could be in the 100,000 ton range. On the longitudinal plan (Figure 41), the mineralization intersected in the 600 level underground holes and the two mineralized skarn bands in T88-1 are interpreted by the writer (Forster) to represent a steep, west dipping zone plunging northwesterly from the 650 stope.

The area of the skarn shown on the vertical longitudinal section as determined by planimeter, is 6,100 square metres (Figure 41). Assuming a 5 metre horizontal thickness and a specific gravity of 3.2, the tonnes possibly contained in this zone below the 600 level, is estimated to be 97,600. Converting 97,600 tonnes to imperial units at 1.10, the tonnage potential of the zone is 107,000 tons. The grade of this, averaging the intersections in T88-1, can be stated as 0.272 ounces per ton gold and 3.15% copper. However, as the intersections are at the extreme southern side of the zone, this grade should not be considered representative of the entire section and does not reflect mining dilution. The skarn is terminated at the projection of a 45 degree dipping fault zone reported in the upper levels of the Little Billy Mine.

Drill holes T88-3 & 4 intersected a ten to fifteen metre thick skarn zone with 5.1 metres of 0.82 opt gold, 2.9% copper in T88-3 and 4.7 metres of 0.499 opt gold, 2.67% copper in T88-4. The core to bedding angles on the skarn-limestone contacts support a flat lying skarn as shown on the drill section (Figure 38).

Reserves of the 88-3 & 4 block can be estimated by assuming a 10 metre width extent east and west from the ore intercepts giving a total width of 45 metres. Strike extent is given as 1/2 the distance to 88-1, or 15 metres plus 1/2 the distance to 89-9, or 30 metres, for a total of 45 metres. Therefore using an average thickness of 4.9 metres, a specific gravity of 3.2 and a conversion factor of 1.1 (tonnes to tons), the total tons for the zone is 35,000 grading 0.666 ounces per ton gold and 2.74% copper.

The mineralized skarn intersected in T89-9; 6.4 metres of 0.075 opt gold and 0.82% copper, also appears to have a shallow dip to the west and is probably continuous from T88-3 & 4 (Figure 41). The width of the zone is 50 metres, and the strike, at 1/2 the distance to T88-3 & 4 of 30 metres plus an equal extension to the south of 30 metres, totals 60 metres (Figures 39a & 41). Therefore, a true thickness of 6.0 metres, a specific gravity of 3.2 and the 1.1 conversion factor to tons allows a calculation of 63,000 tons grading 0.075 ounces per ton gold and 0.82% copper for the T89-9 block.

Averaging the T88-3 & 4 block with the T89-9 block indicates a reserve of 98,000 tons grading 0.286 ounces per ton of gold and 1.51% copper. This zone is open to the east from T88-4 although is probably restricted by T89-11, and is clearly cut off to the west.

Determination of the same mineralized area in plan section by planimeter and assuming a 5.5 metre average thickness, a S.G. of 3.2 and a 1.1 conversion factor to tons yields a 77,000 ton body of 0.32 ounces per ton gold and 1.6% copper. As previously stated, the skarn appears to be open to the east following a trough in the quartz diorite intrusive.

Combining the potential of the down dip extension of the 650 stope with the calculated tons in the T88-3 & 4, and T89-9 blocks, the total indicated and potential reserves are given as:

Drill Indicated:	98,000 tons;	0.286 opt Au, 1.51% Cu
Potential:	107,000 tons;	0.272 opt Au, 3.15% Cu
TOTALS:	**205,000 TONS;**	**0.279 OPT Au, 2.37% Cu**

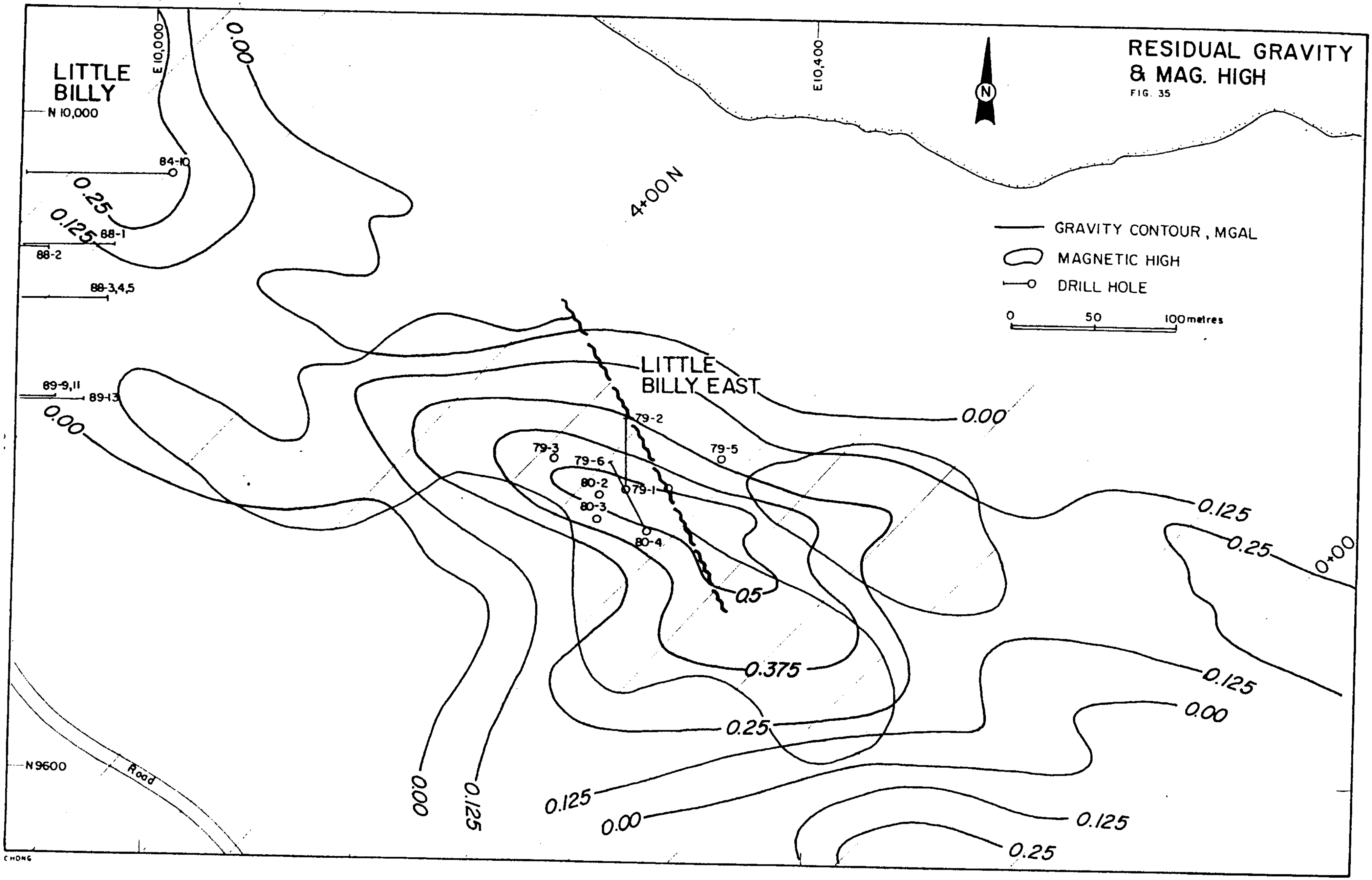
9.2 Little Billy East:

Drilling by Cartier Resources in 1979 and 1980 on a gravity, magnetic and IP anomaly 350 metres east of the T88 and T89 Little Billy holes, intersected 12 metres of 0.051 opt gold and 1.5% copper in a magnetite-rich skarn. Ten holes drilled around this intersection (79-1) failed to locate similar or better mineralization. Re-logging of these holes now indicates that the holes drilled within the gravity/magnetic target were stopped short of their objective in a quartz diorite sill. This sill, interpreted as vertical dykes by the previous workers, is apparent in the drill holes south of the zone and in holes T89-9, 11, 13, & 16. The ground magnetic survey completed by Freeport shows the airborne anomaly is coincident to the gravity high (Figure 35), and places the central axis over the 79-1 intersection (Figure 46).

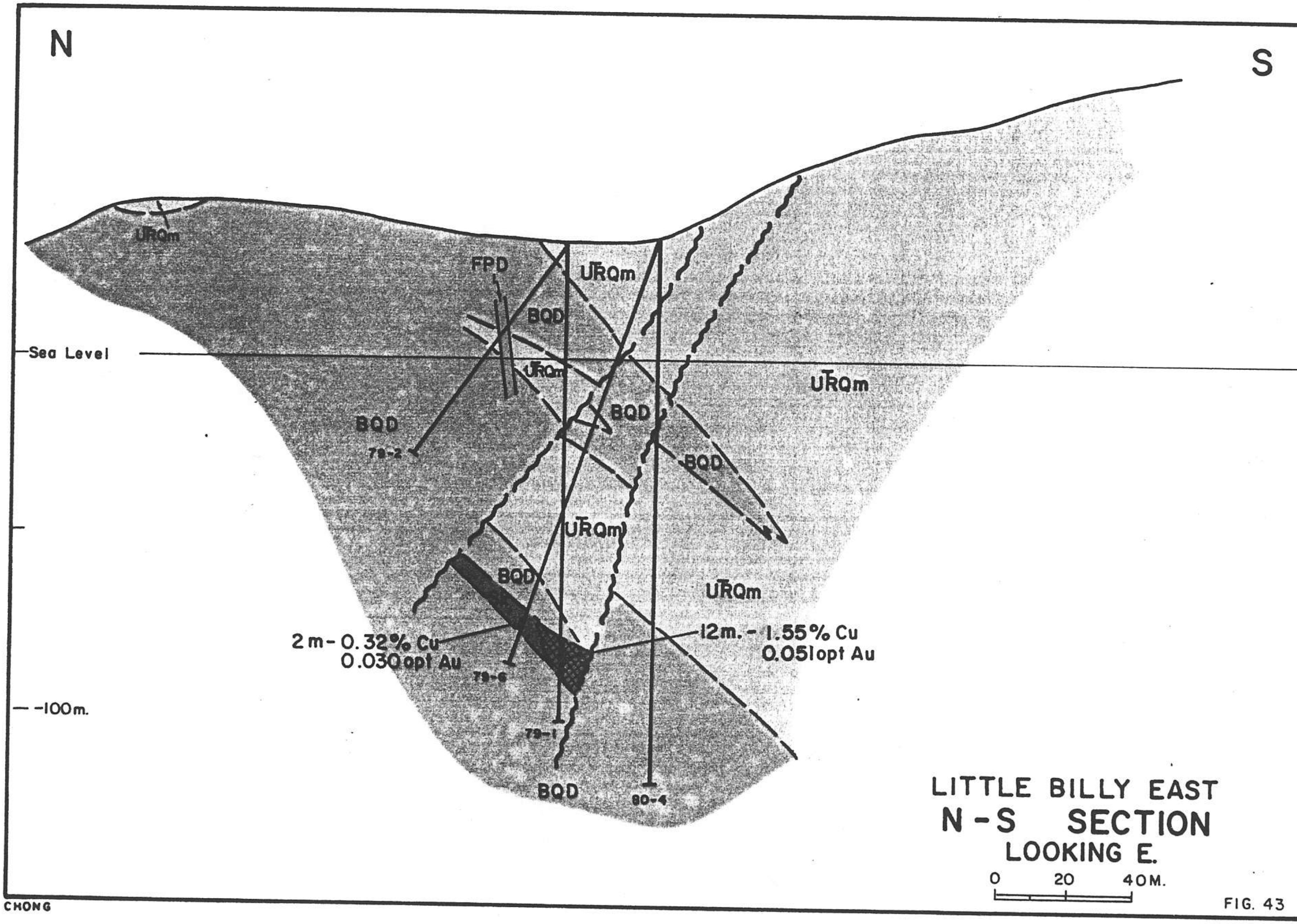
Consequently, the combined magnetics and residual gravity high define a target extending from the 79-1 drill hole, plunging west towards the flat lying, mineralized skarn in T88-3 & 4. Figure 45 illustrates this concept and Figures 42, 43, & 44 provide north-south cross sections of the potential mineralization. The narrow, 79-1 zone, constricted by two faults, reflects the narrowest portion of the residual gravity high and the sharpest "spike" on the ground magnetics (Figure 46). Moving west, the magnetics and gravity broaden and become more subdued as the faults diverge and the zone becomes deeper.

The gravity and magnetic highs continue to the east and to the southeast from 79-1. Although holes 79-5 and 80-5 intersected quartz diorite from top to bottom, apparently cutting the mineralization off to the east, the ground magnetics and residual gravity re-establish the zone east of this quartz diorite lobe. The southeasterly zone must also be broken off from the main anomaly as hole 80-4 tested the entire section below the sill without intersecting skarn. Here again, the ground magnetics show a distinct break in the anomaly before re-establishing the trend south of hole 80-4, coincident to the southerly lobe on the residual gravity.

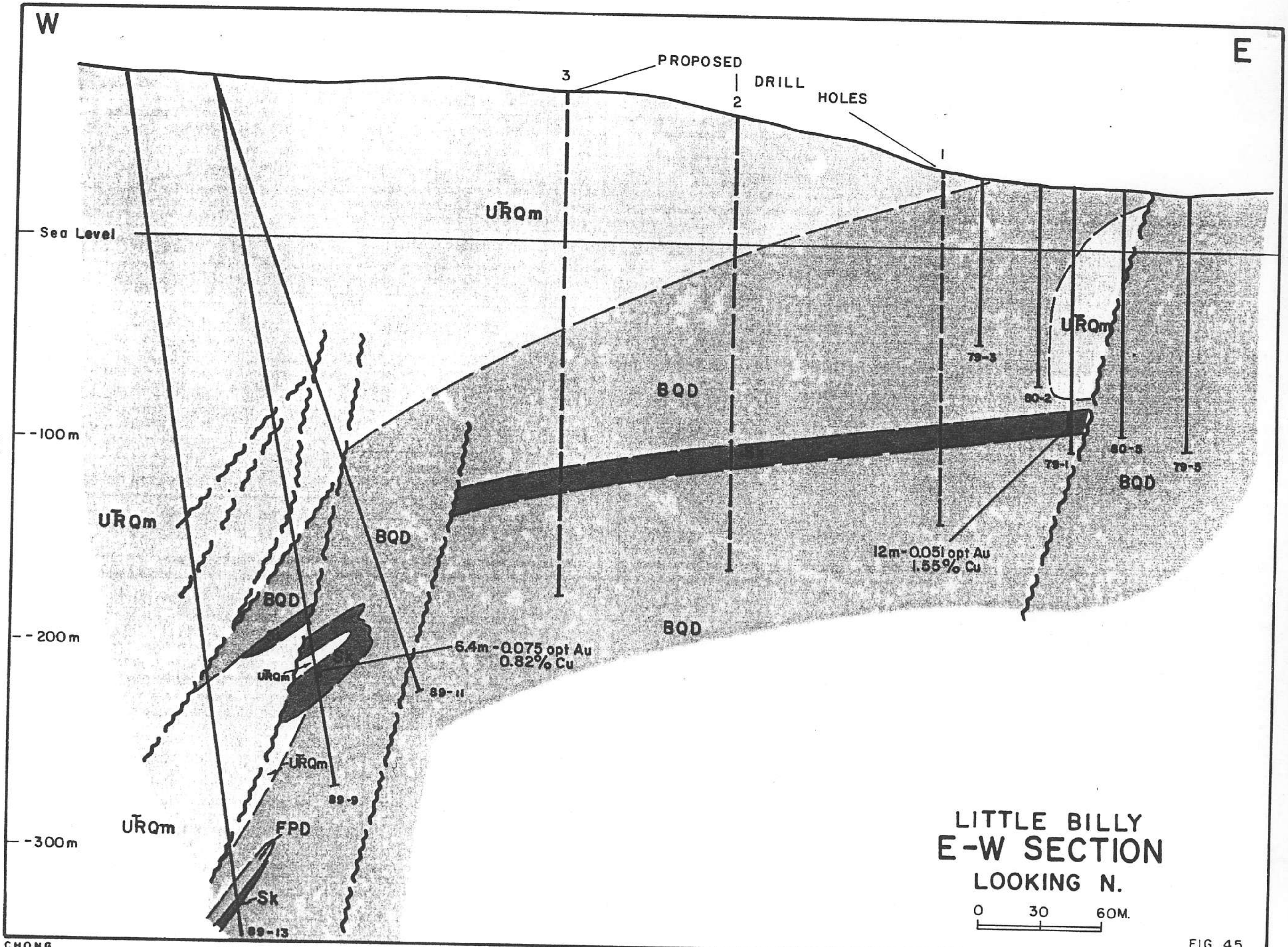
The tonnage potential of this gravity, magnetic anomaly can be estimated by planimetering the area of the coincident anomalies. Assuming a ten metre thickness (79-1 is 12 metres thick) and a specific gravity of 3.2, the overall "room for potential" is approximately 1.75 million tonnes (1.93 million tons). The 0.25 milligal residual gravity contours further suggest that the skarn could continue to both the east and the southeast under the Lafarge quarry. Estimating a grade for this is difficult, however it is probable that it would be somewhere between the 79-1 intersection and the Little Billy zones.



RESIDUAL GRAVITY
& MAG. HIGH
FIG. 35
LITTLE
BILLY
LITTLE
BILLY EAST
N 10,000
N9600
E10,000
E10,400
4+00N
0+00
N
GRAVITY CONTOUR, MGAL
MAGNETIC HIGH
DRILL HOLE
0
50
100 metres
84-10
88-1
88-2
88-3,4,5
89-9,11
89-13
79-2
79-3
79-5
79-6
79-1
80-2
80-3
80-4
0.00
0.125
0.25
0.375
0.5
Road
CHONG


N
S
UTRQm
FPD
UTRQm
BQD
Sea Level
UTRQm
UTRQm
BQD
BQD
79-2
BQD
UTRQm
BQD
UTRQm
2 m - 0.32% Cu
0.030 opt Au
12m. - 1.55% Cu
0.051 opt Au
79-6
-100m.
79-1
BQD
80-4
LITTLE BILLY EAST
N - S SECTION
LOOKING E.
0 20 40 M.
FIG. 43

CHONG


W
E
PROPOSED
DRILL
HOLES
3
2
1
Sea Level
-100m
-200m
-300m
UTRQm
BQD
79-3
80-2
79-1
80-5
79-5
12m-0.051 opt Au
1.55% Cu
6.4m-0.075 opt Au
0.82% Cu
Sk
89-11
89-9
89-13
FPD
LITTLE BILLY
E-W SECTION
LOOKING N.
0 30 60M.

CHONG

FIG. 45

9.3 Marble Bay Mine:

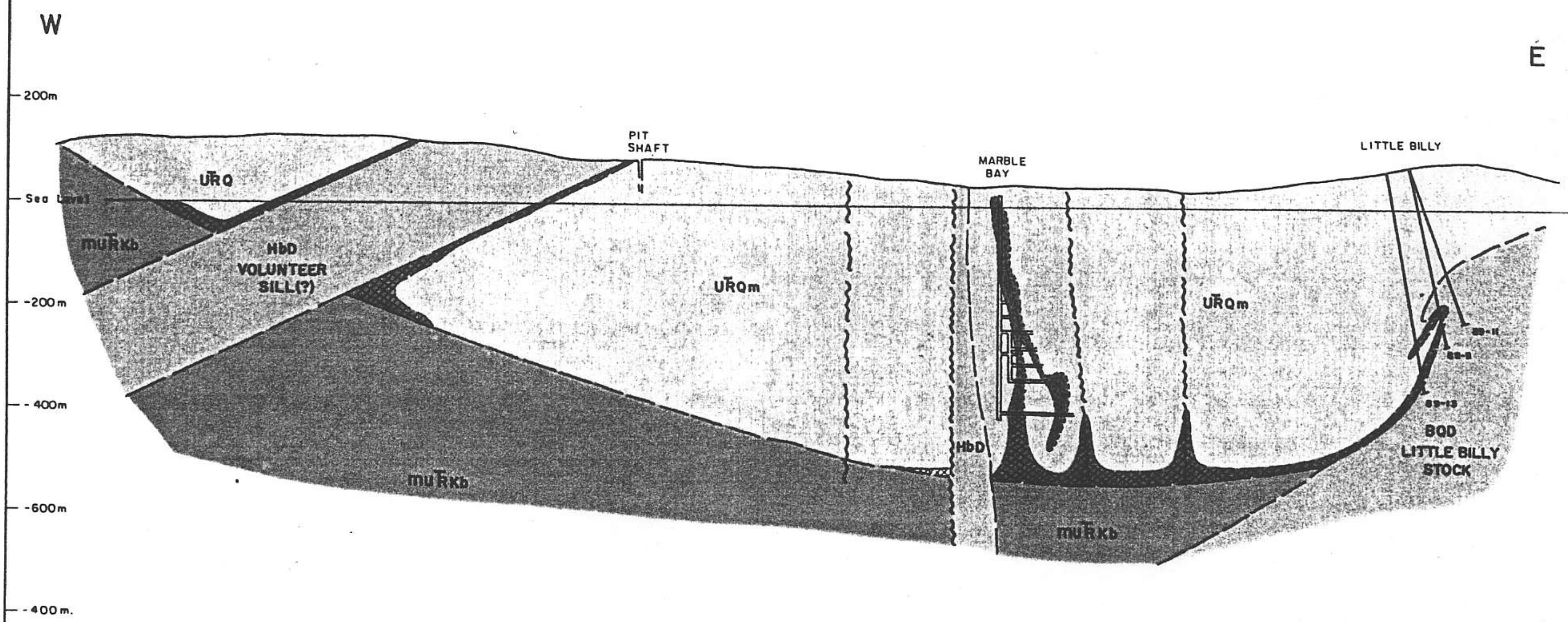
The deep potential of the Marble Bay Mine is illustrated on Figure 14 which shows an east-west cross section from the Volunteer through the Marble Bay Mine and the Little Billy Stock. The original Freeport model of a large skarn zone developed at the base of the carbonates on either a granitic or volcanic basement is still possible. However, the best estimate of the depth to this zone is 600 metres (2,000 feet) below surface. The present workers also have no method for determining the vertical component on the various splays of the Marble Bay fault zone which further complicates an estimation of the target depth. Finally, as the potential is under the town of Vananda, deep electrical exploration tools would be unusable due to cultural interference and at the projected depths, gravity would also be of little use.

9.4 Volunteer:

Modelling of the ground magnetics over the Volunteer hornblende diorite suggests the body is tabular and dipping 30 degrees to the south. Although not a sill, the term is used to distinguish it from a vertical plug. Along the southern contact of the diorite are magnetite-chalcopyrite skarns that have erratic gold values to 0.15 opt gold. The soil geochemistry over the intrusive is also anomalous further indicating precious metal enrichment. Section 7+50E (Figure 15), demonstrates the potential for a skarn zone in the footwall of the "sill" and at the sill's contact with the underlying carbonates and basalt. There is room for 150 metres of down-dip extent plus 50 to 100 metres north from the triple point junction. Strike length is limited by the property boundaries at 600 metres. Assuming 10 metres of thickness, with up to 40 metres indicated by the magnetic modelling, the overall tonnage potential is estimated at about 5 million tonnes (5.5 million tons). The strong magnetic anomalies indicates that magnetite would be the dominant mineral so that copper would likely be more typical of the copper-rich zones of Texada Mines, or up to 1.5% Cu. Hopefully the proximity to the Vananda camp and the Marble Bay Fault Zone would elevate the gold to a 0.10 ounce per ton credit, as indicated by the surface mineralization and geochemistry.

9.5 Sandy Claim:

Drill hole T89-26 revealed two significant facts. One, that the surface mineralization persisted vertically for 90 metres and is associated with intense silicification; and two, that a 50 metre interval of skarn is developed at the faulted contact of the volcanics and carbonates. Figure 11 illustrates the graben developed between the Lake and Holly Faults below T89-26. The Lake North deposit, 1 kilometre south, formed along the same structural

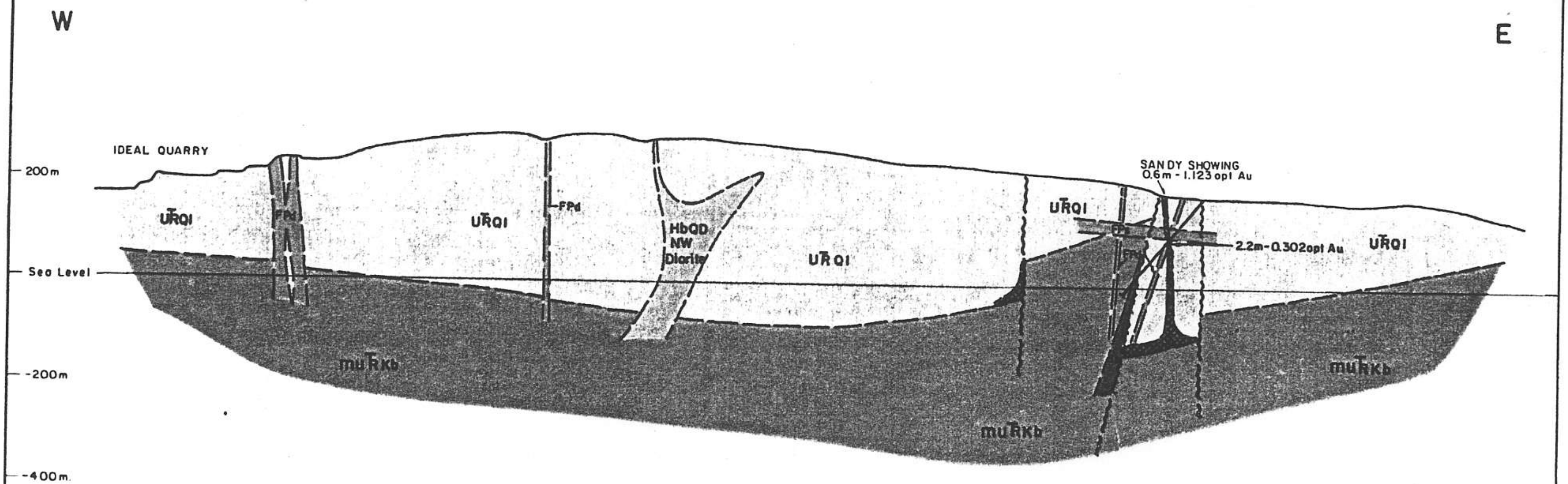


VOLUNTEER - LITTLE BILLY
E-W SECTION
LOOKING N.

0 200 400M.

FIG. 14

CHONG



SANDY SHOWING
E-W SECTION
LOOKING N.

0 200 400M.

CHONG

FIG. 11

feature with barren skarn up the hanging wall contact with the volcanics, Figure 8. The lack of a positive magnetic anomaly over this portion of the graben rules out a magnetite-pyrrhotite body similar to the Lake.

Assuming a silicified, gold-pyrite (copper) skarn is developed at the base of the carbonates between the two faults, the room for potential can be stated as 150 metres of width (expanding to the south) and up to 800 metres of strike potential southeast along the Lake Fault. Assuming ten metres of thickness, the potential could approximate 5 million tonnes (5.5 million tons) of undetermined grade.

9.6 Eagle Grid:

Three base metal, manto targets with potentially significant gold associations are indicated from the geophysics, geochemistry and Ideal Cement's limestone drilling. Additionally, a copper-rich zone proximal to the Northwest Diorite is suggested by the regional gravity mapping of Ager (1977) and a strong gold soil anomaly, with coincident gravity, magnetic and VLF anomalies on the Holly Fault Zone indicates a potentially significant gold target.

At the west side of the Ideal Limestone quarry, the two metre thick, flat-lying Manto showing has no obvious lateral extent. In itself, it is not a significant target except that sampling by Vananda along the exposed face returned 0.22 opt gold over 17 feet. Two test lines of IP over and flanking the showing produced a chargeability anomaly immediately to the south. Drilling by Ideal to define their limestone encountered a zone of increased silica and "other" insoluble material south of the showing and in close proximity to the chargeability high (Figure 13). Ager's gravity survey defines a linear, 0.10 to 0.25 milligal residual anomaly along a southerly trend from the manto for 1.2 kilometres. At the southern end of this gravity feature, near the limestone/volcanic contact, is a strong magnetic anomaly with coincident copper, gold soil geochemistry to 450 ppm Cu and 80 ppb Au.

North of Ideals quarry, in a wedge of limestone bounded on the northwest and northeast by major faults (including the Holly Fault) a pyritic zone (Ideal's terminology) was encountered in hole 432. Reported in the chemical logs, the hole intersected 60 feet of >2.5% Fe_2O_3 with SiO_2 values from 0.6% to 2.1% in the 60 foot interval above the sulphides. Assuming that the Fe_2O_3 relates to hematitic gossan developed with the sulphides, the silicified interval above the iron is analogous to silicification reported by Ideal adjacent to the Manto showing. The hole cut the zone at 120 feet (84 feet below the surface) and stopped in the iron-rich material. Without descriptive logs, the base metal content, attitude &/or geometry of the occurrence cannot be determined.

The soil geochemistry shows no anomalous metals immediately above the pyritic zone, however, moderate zinc, cadmium, arsenic and spot gold highs occur on lines cut 100 metres and 200 metres to the south. Magnetics, VLF-EM and gravity similarly gave no response over the zone. However, the zone cannot be ignored as a geochemical expression in soil above a hidden deposit 100 feet below in limestone would be weak, as would magnetics and VLF over a sphalerite-pyrite manto deposit. Until the zone is intersected in a modern drill hole to determine its nature, a tonnage potential estimate is meaningless. Suffice to say that 60 plus feet of sulphides, if they contain economic base and precious metals, will be significant.

The zinc, lead, cadmium soil geochemical anomaly with the coincident residual gravity feature east of the Eagle base line has an indicated strike extent of 400 metres based on the geochemistry, and 600 metres based on the gravity. Assuming a 500 metre strike length, 10 metres of thickness and a specific gravity of 3.2, the tonnes per vertical metre would be 16,000. Until the zone is exposed and drill tested the depth potential cannot be addressed. It is assumed that if the residual gravity feature is related to mineralization, than there would have to be significant depth extent to provide sufficient mass to register as a gravity high.

Copper potential on the Eagle grid is confined mostly to the Eagle crown grant claims. Along the western contact of the Northwest Diorite, Texada Mines intersected chalcopyrite-rich zones in a 30 metre thick skarn zone at the southern boundary of the Eagle claims. VLF-EM traces the structure hosting the zone 1300 metres to the north. The strongest VLF responses are immediately over the mineralization and persist north for 150 metres. A large residual gravity high, possibly coincident to the VLF and the mineralization, extends from the centre of the diorite, north northwest, well beyond the limits of the diorite and its associated airborne magnetic high. With a central peak of +1.0 milligal the .25 milligal contour defines a potential zone with up to 750 metres of strike length and 200 metres of width. Assuming the gravity feature is coincident to the VLF anomaly, the copper-rich skarn may plunge north-northwest for up to 700 metres with a vertical dip of three hundred metres (Figure 10). As there was a total of 6.4 metres of 1.9% Cu in the two intercepts, a 700 metre strike potential with 300 metres of down-dip extent could host a 4.3 million tonne (4.7 million ton) copper zone. Gold potential, based on one surface sample, appears to be trace with soil geochemistry returning values to 120 ppb gold. As the copper mineralization is enclosed within 30 metres of skarn, the room for potential of the zone with depth towards the underlying volcanics is considerably greater than that stated here.

Gold potential of the Eagle grid, aside from the gold associated with the base metal mantos, appears to be limited to a

0.61 opt gold value in a soil sample on line 15N at 4+75E. Although no source for the gold has been found, the fact that it lies along the Holly Fault zone, approximately 500 metres from T89-26 suggests the target proposed in the fault trough under T89-26 may continue to the northwest. The anomaly also flanks a broad, 400 metre by 200 metre, 0.25 milligal residual gravity high, a magnetic high and a strong VLF conductor. While no interesting geochemical values lie to the northeast of the fault, the portion of the gravity anomaly southwest of the fault, has moderate zinc and cadmium values. The follow-up, detailed gravity of Ager (1979) also defines a residual gravity feature striking towards the gold high. Unfortunately, the limits of Ager's detailed grid did not reach the locality of the anomaly.

9.7 Imperial Quarry:

Outside the eastern boundary of the claim block is the small Imperial Limestone quarry operated for chemical grade limestone. The airborne magnetic survey defined a circular magnetic high under the southern limit of the quarry that appears to be an intrusive stock. Within the quarry, intense vertical bleaching in the black limestones demonstrate considerable CO_2 and methane development under the quarry, possibly from an igneous source and/or skarn deposit. The quarry operations exposed a narrow base metal vein with up to 0.1 opt gold. Associated with the vein were blocks of malachite - azurite gossan with values to 0.028 opt gold and 5% copper. Extending north from the quarry, roughly parallel to the carbonate/volcanic contact, is a residual gravity low to -1.75 milligals. Although very broad, 300 to 600 metre across, the low has a sharp amplitude indicative of a narrower, near surface feature. The axis of the low appears to originate within the quarry where the sulphide vein and gossan were exposed and extends northward for 700 metres to the edge of the gravity coverage. Along this northern trend, the axis of the low deepens to -1.75 milligals and broadens to 200 metres.

Geochemically, the low is east of the limit of the soil geochemical survey and under the Imperial quarry and the top of the Lafarge quarry. However, 200 to 300 metres west of the gravity low, Freeport's soil sampling located a 500 metre long, north trending zinc, lead, arsenic anomaly with spot gold highs developed in faults cross-cutting the base metal anomaly. Although the two features are not coincident, their close proximity suggests some genetic relationship.

The previous workers, including Ager (1977), have considered the low to be indicative of a deep trough of limestone developed under the quarries. However, the airborne magnetics indicates the volcanic contact, exposed 250 metres to the east of the low, has a gradual, uniform dip to the west. Should there be a deep basin suddenly developed under the gravity low, the magnetics would show a similar trough as they do under Vananda, the central portion of the claim block and over the graben block north of the Lake deposit.

Consequently, the writer believes that the gravity low must be explained by a very low specific gravity zone within the carbonates. This would indicate either a well developed karst system with open caverns, possibly filled with alluvial material; or a major gossan zone resulting from the weathering of a massive sulphide deposit. The Ketza deposit in the central Yukon is an example of this type of feature. The fact that copper-rich gossan with interesting gold values exists in the Imperial quarry supports the latter possibility.

10.0 DISCUSSION

The drilling to date has focused on defining the mineralized extensions of the Little Billy Mine, the possible extensions of the Copper Queen and Cornell Mines and testing IP/geochemical targets from the 1988 program. Surface exploration in 1989 was expanded significantly to include the recently acquired Eagle claims and the area north of the Texada Mine workings, through the Eagle claims and across the Holly Fault to the Lucky Jack massive sulphide replacement veins. The claims west of the Marble Bay Mine, the Volunteer group, were also surveyed geophysically and geochemically.

The results of this surface exploration have been described in previous sections of the report and clearly show targets with significant potential for base and precious metal replacement deposits and for copper and copper-gold skarns. Most of these targets were recognized by the end of the last drill campaign, however, it was considered prudent to suspend the drilling pending a thorough review of all data.

The exploration model originally proposed by the writer is still untested in the Vananda area because of the lack of a definitive drill target and the presence of the Vananda Township. This being the model of a major skarn developed at the base of the carbonates on the volcanic contact near or over a dioritic pluton. Only T89-8 bottomed in the basalt, at 2040 feet, without encountering skarn at the contact. The presence of granitic sills and dykes and the coarseness of the marble in the middle sections of the hole indicated the intrusive stock was relatively close. However, because the hole was drilled southeast of the Copper Queen to test IP and alteration in the adjacent 1988 drill holes, it does not constitute a test of the favourable zone between the Marble Bay, Little Billy and Copper Queen mines.

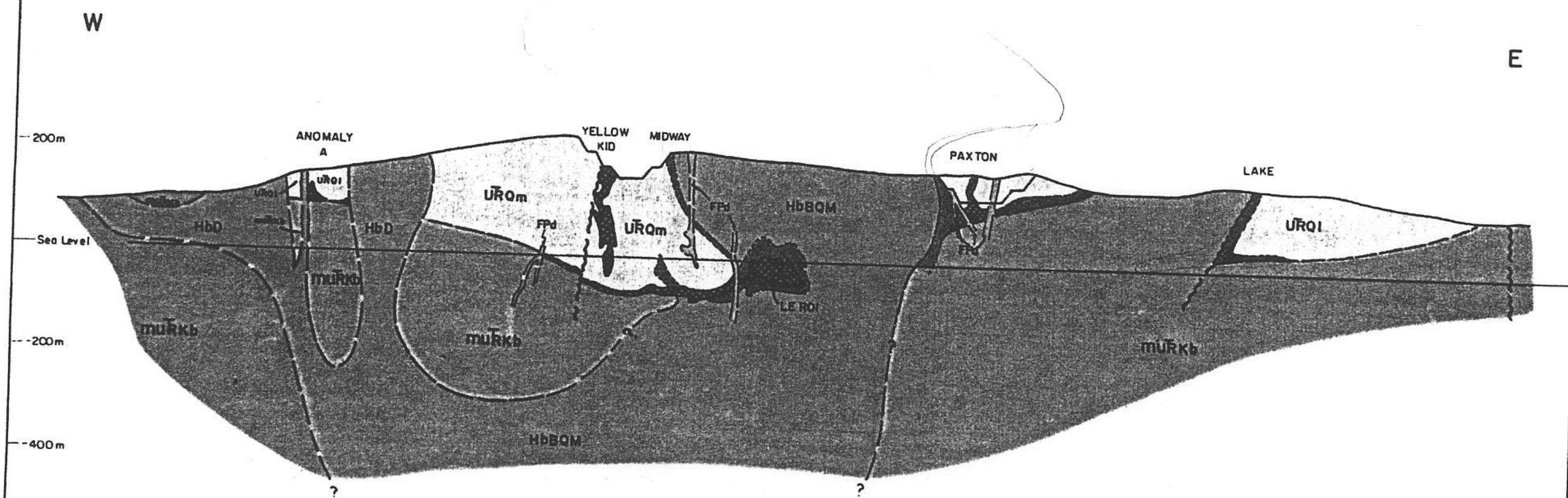
The drill holes on the southern half of the property, within the Sandy grid, were bottomed in basalt. Although only one encountered economic mineralization, each of the holes encountered one to three metres of garnetite skarn at the contact. As the holes were up to one kilometre from the Gillies Bay Stock, the presence of skarn demonstrates that the influence of the stock is widespread and the basic model of skarn development at the contact is operable.

Refining the model with the extensive data base now in hand indicates that while the carbonate/volcanic contact is a favourable horizon for skarn development, a structural and/or intrusive control is also required for the deposition of significant ore bodies. The Lake, Paxton, Yellow Kidd and Prescott deposits are all developed along north-south, to northwest-southeast structures and/or intrusive contacts. The underground deposits were mostly developed along the carbonate/volcanic contact within embayments of the Gillies Bay Stock and/or under overhanging contacts of the stock (Figure 8). At the mine scale, the flat lying deposits also show considerable structural development.

The Vananda skarns follow similar controls, albeit to a lessor extent. The Little Billy deposits are developed either in or along embayments or structural "overhangs" of the Little Billy Stock and have a north-south preference to their long axis and plunge. Likewise, the Marble Bay and Copper Queen skarn pipes follow north-south and, in part, northwest-southeast trends. They also follow feldspar porphyry dykes that have been intensely bleached and metasomatized.

The Cornell deposits show the greatest affinity for structure being developed along a serpentinized cross structure in contact with a megacrystic hornblende diorite. The cross structure is probably a splay off the Marble Bay Fault Zone. Petrography of the mineralized skarn reveals intense shearing and brecciation of the bornite and pyroxene with gold accompanied by chlorite, sericite and carbonate filling the breccia matrix.

The massive sulphide replacement deposits may well have a close genetic link to the skarns and are therefore indicative of deep-seated skarn targets. In Northern Mexico, high temperature, carbonate-hosted Ag-Pb-Zn(Cu) deposits developed in a thick carbonate sequence commonly grade from mantos downward into massive sulphide chimneys that in turn grade downward into skarn chimneys cored by dykes (Megaw, Ruiz and Titley, 1988). These base metal, silver replacement deposits also commonly develop up to one kilometre out from the skarn deposits which are usually proximal to the granitic stocks. "Structural controls include intrusive contacts, faults, fold axes, fractures, fissures, and cavern zones. Of these, the intrusive contacts and the intrusion-related faults are most important in the skarns, whereas regional faults, folds and fracture systems are dominant controls on the mantos and chimneys." (Megaw et al, 1988).



TEXADA MINES
E-W SECTION
LOOKING N.

0 200 400M.

CHONG

FIG. 8

At Texada the relationship of the base and precious metal replacement manto deposits with respect to the skarns has not been directly established. However considerable speculation has been made as to their importance, particularly as the soil geochemistry has outlined extensive areas of anomalous zinc values with associated lead, cadmium, arsenic and lesser copper and gold. Clearly, the proximity of these showings and anomalies to the major fault structures (ie. the Holly and Marble Bay) as well as to the intrusive bodies like the Northwest Diorite must be considered important. The more distal occurrences, such as the Lucky Jack, Vauxhall, Sandy veins and Sentinel are also structurally related to north-south and northwest-southeast fracture and/or breccia systems. Whether these sulphide showings could be the upper expression of a deep-seated skarn system is open to speculation.

For the present, exploration must focus on the major structures, particularly the Holly/Lake structure and the sulphide and skarn occurrences along it; and the overhanging intrusive contacts, particularly, the Northwest Diorite, the Volunteer Sill and the Little Billy Stock. Although the Marble Bay Mine was the largest producer of the Vananda deposits, the probable depth to the target and the town of Vananda make for a difficult and expensive exploration target.

11.0 CONCLUSIONS

11.1 Little Billy:

The potential and drill indicated gold-copper reserves estimated at the Little Billy of 205,000 tons at 0.279 ounces per ton of gold and 2.37% copper would not represent an economic deposit for Freeport. The limits of the two zones are well defined, with one possible opening available for a continuation of the skarn to the Little Billy East zone. Suggested by magnetics and gravity, the potential could expand into a 2,000,000 ton plus deposit of copper-gold ore.

11.2 Copper Queen & Cornell:

The drilling peripheral to both deposits failed to locate significant extensions to the known deposits. Deep drilling to the northwest and southeast of the Copper Queen also failed to locate mineralized skarn at the base of the carbonates on either the granitic or volcanic basement. No deep drilling was done under the Cornell, however the complex structure and the hornblende diorite stock negate the potential of a deep deposit under the mine. Flanking the Cornell, no gold targets, geological or geophysical, are indicated to direct further drilling.

11.3 Marble Bay:

The depth to the carbonate basement and the presence of the townsite above the mine area do not allow for a geophysical or geochemical survey. The only geological target that can be considered is the projection of the northern ore shoot down to a the weak magnetic ridge that appears to mark a ridge of quartz diorite connecting the Sturt Bay Stock to the Little Billy Stock. As this will be 1800 to 2000 feet below surface and under the Vananda high school, drilling will be difficult.

11.4 Volunteer:

The Volunteer intrusive represents an excellent igneous trap for a major skarn system. The strong magnetics and exposed magnetite skarns indicate that iron will be the dominant commodity. However elevated gold geochemistry in the soils and assays to 0.30 ounces per ton in the copper-rich portions of the skarns suggest that there could be significant gold credits. The tonnage potential for the target area is estimated at 5,000,000 tons.

11.5 Sandy Grid:

The intersection of 0.3 opt gold in a silicified zone of massive pyrite in T89-26 and the 50 metre section of quartz-carbonate altered skarn in the faulted, vertical contact with the volcanics could be indicative of a gold-pyrite skarn system at the base of the down-faulted block. The location of the Lake Fault, as principal ore control for the Lake Deposit, juxtaposed to the Holly Fault, provides an ideal setting for the downward projection of a gold-bearing massive sulphide "chimney" into a gold-rich skarn system. Assuming up to 150 metres across the base of the graben is mineralized, there is room for 5,000,000 tonnes of skarn projecting southeast along the structure.

Drilling of the IP targets on the other portions of the grid has failed to locate additional economic mineralization. Only the extensive zinc-lead soil anomalies remain to be explained. As coincident gold geochemistry is lacking, the anomalies are not considered important with respect to a gold exploration play. They may, however, be considered as an important carbonate, lead-zinc target.

11.6 Eagle Grid:

Five targets for gold and or base metals are indicated within or adjacent to the Eagle Grid. The three main gold targets include the Manto showing in Ideal's quarry, the pyritic zone encountered in Ideal's limestone drilling (because of its proximity to the Holly Fault) and the 0.6 opt gold soil anomaly with its adjacent magnetic/gravity high bordering the Holly Fault. Until gold mineralization is intersected in a drill hole, no estimate of tonnage potential will be made. However, the room for potential, assuming normal mining widths, will be in the multi million tonne category for each of the targets.

The residual gravity and VLF surveys have defined a major anomaly coincident to chalcopyrite-rich skarn intersected by Texada Mines in drill holes on the west contact of the Northwest Diorite. As the diorite contact dips to the east, a reverse dipping intrusive contact zone could extend down for 250 metres to the underlying volcanics. Given the 6.4 metres of 1.9% copper in the most northerly drill hole, the strike and dip, as defined by the gravity, VLF and geology, gives a minimum tonnage potential of 3,000,000 tonnes.

At the north end of the Northwest Diorite, extending to the Holly Fault, the residual gravity and geochemical anomalies define a base metal zone with potentially 16,000 tonnes per vertical metre, assuming a ten metre width. No mineralization has yet been discovered. Gold potential can only be assumed as equivalent to the other manto-type targets with marginal gold geochemistry.

12.0 RECOMMENDATIONS:

The primary recommendations are predicated on a gold priority basis only as follows:

1. Three drill holes to test the magnetic, gravity feature over the Little Billy East area with 2 additional holes to explore the strike potential of the easterly and southeasterly gravity trends, assuming the initial drill holes are positive.

2. One drill hole down-dip of the intercept in T89-26. If skarn is located at the base of the carbonates, then holes northwest and southeast along the Lake Fault structure will be necessary.

3. One drill hole into the gravity feature south of the Manto showing and one drill hole into the mineralization encountered in Ideal's limestone hole north of the quarry.

4. Two holes drilled northeast, on section, from the Volunteer Sill to test the underside of the sill for the source of the magnetic and gold soil anomalies.

5. Excavator trenching of the gold, zinc, cadmium soil anomalies and coincident residual gravity highs north of the Eagle claims. Follow-up drilling will be required if mineralization is found in place. The residual gravity features will require drill testing for a proper explanation.

6. As a copper target, drill the extension of the copper mineralization on the west side of the Northwest Diorite, following the gravity and VLF anomalies. Holes to the basement volcanics, on both sides of the diorite, will be necessary.

7. Should the above drilling prove positive, continued surface exploration of the remaining sulphide showings and base metal geochemistry should be done. This would include detailed gravity, IP, VLF and Magnetics. At least a third of the property, underlain by carbonates has yet to be explored.

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APPENDIX I

PROPERTY HOLDINGS

Mining Leases

Cinnabar
Alladin
Vananda

Crown Grants

Copper Queen
Eastgate
Lucky Jack
Volunteer
Europe
Great Copper Chief
Toothpick FR
Marble Bay
Cameron
Cornell
Goodall FR
Leroi
Boulder Nest
Jack North
Yellow Kid
L.M.C.
McLeod #3
McLeod #4
McLeod #5
McLeod #6
McLeod #7
McLeod #8
McLeod #1
McLeod #2 FR
Lap #1 FR
Lap #2 FR
Lap #3 FR
Lap #4 FR
Lap #5
Lap #6
Lap #8
Eagle
Eagle No. 1
Eagle No. 2
Eagle No. 3
Eagle No. 4
Eagle No. 5
Eagle No. 6

Claims

BASIC 29 Fr.
Brownie No. 1 Fr.
Brownie #2 Fr.
Brownie #3 Fr.
B-40878
B-40879
B-40882
B-40884
B-40886
B-40887
B-40888
B-40889
B. 41066
B. 40900
B. 40894
Lime
Lime No. 1 Fr.
T.M.L. No. 3
Lime No. 10 Fr.
Lime No. 11 Fr.
Lime No. 12 Fr.
Lime No. 13 Fr.
Lime 14
Lime 15 Fr
Lime 16 Fr
T.M.L. #6 Fr.
T.M.L. #7 Fr.
T.M.L. #8 Fr.
T.M.L. #9 Fr.
T.M.L. #10 Fr.
T.M.L. #11
T.M.L. #12 Fr.
T.M.L. #13
T.M.L. #14
T.M.L. #15 Fr.
TML 36
TML 37
TML 38
TML 39
TML 40
T.M.L. #41 Fr.
T.M.L. #42 Fr.
T.M.L. #43 Fr.
Lime #18
Lime #20

<u>Claims Cont'd</u>

Ann
Ann Fr.
True Fr.
IC No. 1
IC No. 2
IC No. 3
IC No. 4
I.C. No. 11
I.C. No. 12
I.C. No. 13
I.C. No. 14
I.C. No. 15
I.C. No. 16
MARBLE BAY FRACTION No. 2* (* base metals rights only)
STURT BAY NO. 1
STURT BAY NO. 2
VAL Fr
NOEX Fr
Basic #1 Fr.
Basic #2
Basic #3
Basic #4 Fr.
Basic #5
Basic #6 Fr.
Basic #7
Basic #8
Basic #9
Basic #11
Basic #12
Basic #13
Basic #15
Basic #16 Fr.
Basic #19 Fr.
Basic #20 Fr.
Basic #23 Fr.
Basic #24 Fr.
IDEAL 10
IDEAL 14
IDEAL 17 Fr.
IDEAL 18 Fr.
IDEAL 21 Fr.
IDEAL 22 Fr.
IDEAL 26 Fr.
TML 20 FR.
Marble Bay Fraction No. 1
Sandy 1
Sandy 2

Hole	North	East	Elev	Azi	Dip	Min North	Max North	Min East	Max East	Min Elev	Max Elev
79-1	9775	10289	32	0	-90	9775	9775	10289	10289	-101	32
79-2	9775	10289	32	0	-55	9775	9816	10289	10289	-26	32
79-3	9793	10245	34	0	-90	9793	9793	10245	10245	-47	34
79-4	9746	10229	40	0	-90	9746	9746	10229	10229	-43	40
79-5	9795	10346	28	0	-90	9795	9795	10346	10346	-99	28
79-6	9749	10301	34	335	-70	9749	9788	10283	10301	-85	34
80-1	9591	10266	83	0	-90	9591	9591	10266	10266	-250	83
80-2	9772	10273	32	0	-90	9772	9772	10273	10273	-67	32
80-3	9757	10271	34	0	-90	9757	9757	10271	10271	-116	34
80-4	9749	10301	34	0	-90	9749	9749	10301	10301	-118	34
80-5	9776	10314	31	0	-90	9776	9776	10314	10314	-92	31
80-6	4682	10922	186	0	-90	4682	4682	10922	10922	41	186
80-7	4704	10827	189	236	-55	4656	4704	10757	10827	68	189
80-8	4682	10922	186	270	-55	4682	4682	10860	10922	97	186
80-9	6027	9858	177	0	-90	6027	6027	9858	9858	48	177
80-10	6000	9935	172	207	-70	5961	6000	9915	9935	54	172
84-10	9963	10011	54	270	-76	9963	9963	9951	10011	-209	54
T88-1	9918	9908	57	90	-80	9913	9918	9908	9972	-332	57
T88-2	9918	9862	54	90	-75	9918	9920	9862	9934	-224	54
T88-3	9885	9848	64	90	-74	9885	9885	9848	9945	-323	64
T88-4	9885	9848	64	90	-70	9885	9887	9848	9963	-293	64
T88-5	9885	9848	64	90	-79	9883	9885	9848	9920	-326	64
T88-6	9510	10165	84	225	-60	9440	9510	10102	10165	-88	84
T88-7	9355	10333	84	225	-60	9256	9355	10208	10333	-212	84
T89-8	9352	10177	85	45	-80	9352	9427	10177	10242	-533	85
T89-9	9825	9870	76	90	-78	9817	9825	9870	9936	-269	76
T89-10	8487	10564	72	225	-60	8369	8487	10432	10564	-253	72
T89-11	9825	9870	76	90	-70	9819	9825	9870	9976	-222	76
T89-12	8582	10513	53	254	-65	8559	8582	10434	10513	-122	53
T89-13	9825	9828	73	90	-81	9825	9825	9828	9893	-350	73
T89-14	8710	10404	55	225	-53	8690	8710	10384	10404	18	55
T89-15	8710	10404	55	225	-75	8677	8710	10371	10404	-115	55
T89-16	9577	9831	70	45	-80	9577	9639	9831	9902	-474	70
T89-17	5163	11180	167	0	-90	5163	5163	11180	11180	14	167
T89-18	5062	11146	174	90	-87	5062	5062	11146	11154	8	174
T89-19	4757	10632	207	270	-90	4757	4757	10629	10632	120	207
T89-20	4757	10579	202	0	-90	4757	4757	10579	10579	103	202
T89-21	4757	10530	202	0	-90	4757	4757	10530	10530	142	202
T89-22	5156	10525	192	0	-90	5156	5156	10525	10525	96	192
T89-23	5156	10594	187	0	-90	5156	5156	10594	10594	116	187
T89-24	5156	10420	212	0	-90	5156	5156	10420	10420	62	212
T89-25	5156	10626	186	270	-50	5156	5156	10469	10626	0	186
T89-26	5387	10656	162	270	-50	5387	5390	10501	10656	-24	162

	-- Collars --	-- Project --
Min Northing..	4682	4656
Max Northing..	9963	9963
Min Easting...	9828	9828
Max Easting...	11180	11180
Min Elevation.	28	-533
Max Elevation.	212	142