The Exploration of Potential Mineral Resources in Papua New Guinea

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THIRD PECC MINERAL NETWORK MEETING

MINING ECONOMY: DEVELOPMENT & ENVIRONMENTAL PROTECTION

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INTRODUCTION

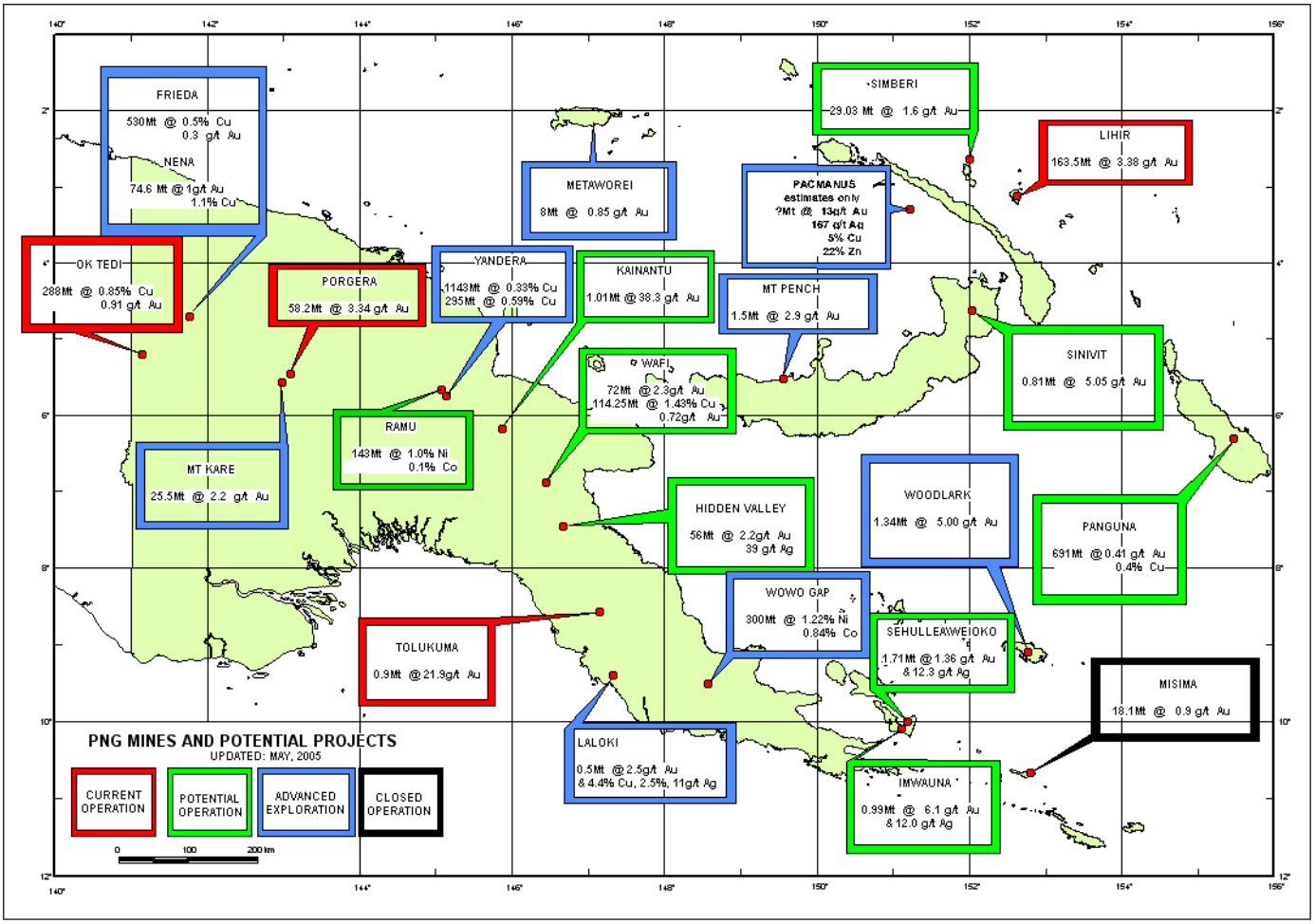
Papua New Guinea (PNG) is geologically one of the most prospective countries in the world for magmatic arc Cu-Au resources because of its tectonic setting on the Pacific "*Rim of Fire"* tectonic plate boundary. With a long mining history, dating back to 1878, the country historically has been one of the world's largest copper and gold producers from its world class ore deposits, such as Bougainville, Lihir, Misima, OK Tedi and Porgera. In addition, recent developments have seen the discovery of medium size ore deposits, including Tolukuma, Kainantu, Hidden Valley, Simberi and Nickel Laterite deposit of Ramu and Wowo Gap (fig. 1).

Since gaining independence in 1975, PNG has, along with other nations, suffered periods of downturn in mineral exploration investment. However, in recent years there has been a strengthening of investment back into PNG. This has occurred as a result of increasing world demand for commodities (with resultant price increases), together with a change to a more favourable fiscal regime for investment.

PNG operates a parliamentary democracy, based on the Westminster model, where all major parties support private enterprise and foreign investment. There are many existing Australian, Canadian and other international companies who successfully operate both exploration and mining projects in the country, a trend which is seen gaining momentum over recent times. However, new players who recently show interest include South African Companies and Chinese companies for precious metals and nickel and cobalt respectively.

Some projects that may pose potential opportunity for interested players wanting to participate in the exciting mineral industry in PNG is summarised below. All mining projects that are at advance stages of development or are already in operation are not included in this paper, but they will be included in the main presentation at the Third PECC Mineral Networking in Taiyuan City, China from 8th -11th September 2005.

Figure 1 Mines and Potential Projects In PNG



FREIDA COPPER AND GOLD PROJECT

NAME: Frieda River
LOCATION: Frieda River area, Sandaun Province
OPERATOR: Highlands Pacific Limited
OWNERSHIP: Highlands Frieda Pty Limited 87.9%
OMRD Frieda Co. Ltd. 12.1%
STATUS: E.L. 58 (149 km^2)
YEAR GRANTED: 1968
EXPIRY DATE: 14-11-2005

BACKGROUND

The Frieda River District hosts the largest undeveloped copper resource in PNG with a long and well documented history. It contains in access of over 600Mt of copper and 18 million ounces of gold a resource that is substantially higher than Ok Tedi's contained metals (313 Mt of Copper and 9.7mmillion ounces of gold). It comprises of at least seven Cu_Au porphyry deposits, a significant high sulphide Cu-Au deposit (Nena), and numerous prospects of porphyry, epithermal and skarn/hornfels/vein types. The major deposits (Nena, Horse/Ivaal, Koki and Trukai) collectively contain an estimate resource of over a billion tonnes of copper @ 0.5% and gold @ 3g/t.

The licence area (EL 58) covering the deposit area is located near the border of the Sandaun and East Sepik Provinces (north-western, Papua New Guinea). Highlands Pacific owns an 88.0% interest

in the project with the remainder held by a consortium of Japanese companies under the management of OMRD Frieda Co. Ltd.

In January 2002 the company reached an agreement with Noranda whereby Noranda acquired an option to take up to a 72% interest in the Frieda property. Under this agreement, Noranda is funding Highlands Pacific's share of project costs for the option period, which expires in January 2007, and spending a minimum USD750, 000 per year. At any time during the five year option period Noranda is able to exercise the option by committing to complete a bankable feasibility study including funding Highlands Pacific's share of all ongoing expenditure. Noranda also has the option to acquire a 72% interest in the Nena property by paying to Highlands Pacific an additional USD10.8 million. Highlands Pacific currently manages the project and conducts field operations on behalf of the joint venture.

CURRENT STATUS

During 2003 six diamond drill holes (for a total of 1,433m) were completed at the Trukai prospect which is a faulted north westerly extension of the main porphyry copper body at Horse/Ivaal. The 2003 program has completed preliminary evaluation at Trukai and a resource estimated from this and earlier drilling has resulted in the addition to the total porphyry resource of around 105Mt averaging 0.8%Cu and 0.41g/t Au (calculated at a 0.5%Cu cut off).

As part of a general review of the project Noranda also engaged Snowden Mining Consultants to undertake a review of the resource estimate for Horse/Ivaal. Final results were generally in agreement with the earlier estimates by Highlands although using different search parameters resulted in a significantly larger global resource of over a billion tonnes at a similar grade (0.2%Copper cut off). Snowdens also calculated the resource at a range of cutoffs including 0.5%Cu which gave a total resource for Horse/Ivaal/Trukai of 468Mt at 0.70%Cu and 0.42g/tAu.

Noranda is currently committed to an expanded evaluation of the Frieda project and drilling has commenced in 2004 and is currently ongoing.

MINERALISATION

The Nena copper/gold deposit occurs in the northern part of the Frieda River Intrusive Complex. Mineralisation and alteration surrounding the deposit forms a northwest trending, sub-horizontal cigar shaped body approximately 1,200 m long and 300 m in diameter. The principal primary copper minerals are chalcocite and covellite (both sulphides of copper), enargite/luzonite (copper arsenic sulphide polymorphs) and minor stibioluzonite (copper arsenic antinomy sulphide). Low-grade (»0.6g/t Au) gold mineralisation is associated with copper mineralisation. Intense weathering and surface leaching conditions have resulted in the formation of an oxide gold cap calculated at 18Mt @ 1.4g/t Au, from which virtually all of the copper has been leached. Below this there is a strong zone of secondary copper sulphide enrichment (chalcocite and minor covellite) which attenuates with depth.

The Horse/Ivaal and Koki porphyry copper deposits are clustered in a 3 km² zone in the south east portion of the FRIC. At least five known porphyry deposits occur in this area but only two are sufficiently drilled for a resource to be calculated. Mineralisation in the porphyries is associated with multiphase (five separate intrusives) intrusives and is related to zoned hydrothermal alteration and intense quartz and sulphide veining distributed around biotite bearing intrusives. Copper minerals are typically chalcopyrite and common bornite with chalcocite in an enriched blanket occurring near surface. Higher grade copper mineralisation is generally associated with a high intensity of alteration and veining occurring in steep NW trending structures.

RESOURCES

The Nena, Horse/Ivaal and Koki deposits are estimated to collectively contain approximately 15.9 billion pounds (7.2 million tonnes) of copper and 14.1 million ounces of gold. The resources at the Frieda River deposit is summarised in the table shown below.

Table 1. Identified resource at Nena Deposit

Nena Deposit - Identified Mineral Resource												
	Measured			**Indicated**			**Inferred**			**Total**		
Resource Style	**Mt**	**Au g/t**	**Cu %**	**Mt**	**Au g/t**	**Cu %**	**Mt**	**Au g/t**	**Cu %**	**Mt**	**Au g/t**	**Cu %**
Gold	13.8	1.4	0.1	3.4	1.4	0.1	0.8	1.5	0.1	18.0	1.4	0.1
Copper	42.2	0.6	2.3	7.6	0.6	1.7	1.2	0.4	1.8	51.0	0.6	2.2

Table 2. Identified resource at Horse/Ivaal Deposit/Trukai Deposit

Horse / Ivaal / Trukai Deposit - Identified Mineral Resource								
Indicated			**Inferred**			**Total**		
Mt	**Cu %**	**Au g/t**	**Mt**	**Cu %**	**Au g/t**	**Mt**	**Cu %**	**Au g/t**
109	0.6	0.3	895	0.5	0.3	1,005	0.5	0.3

Table 3. Identified resource Koki Deposit

Koki Deposit - Identified Mineral Resource (Inferred)		
Mt	**Cu %**	**Au g/t**
274	0.4	0.3

WAFI GOLD COPPER DEPOSIT

LOCATION: Wafi River, Morobe Province
OPERATOR: Harmony Gold
OWNERSHIP: Wafi Mining Limited
STATUS: EL 440 (95km$_2$), 1105, & 1103.
YEAR GRANTED: 1980

BACKGROUND

The Wafi high sulphidation gold orebody and the related Golpu porphyry copper-gold deposit around 1 km to the north-east, are located approximately 60 km south-west of the port city of Lae and 70 km NNW of the Hidden Valley project. The prospect area hosts significant copper-gold resource that is yet to be to fully explored and currently work is progressing to towards finalisation of a prefeasibility study to be completed soon. It resource is estimated to be 100Mt @ 1.27% Cu and 0.64g/t gold for the porphyry and 111.4@ 1.62 g/t (5.8 million ounces) for the Wafi epithermal gold.

The exploration licence Mt Wanion (EL 440) was granted to CRAE in 1980. Since then Elders Limited, Australian Gold Fields NL (AGF) and Aurora Gold Pty Ltd have had some involvement in the project. Abelle Limited fully acquired the property by mid may 2003 from Aurora and soon after that Harmony acquired controlling shares in Abelle Limited . Currently, the project is controlled by the Harmony Gold Mining Company Limited through its subsidiary Abelle Limited which wholly owns Wafi Mining Ltd the operator of the project.

Table 4. Resource at Wafi and Golpu

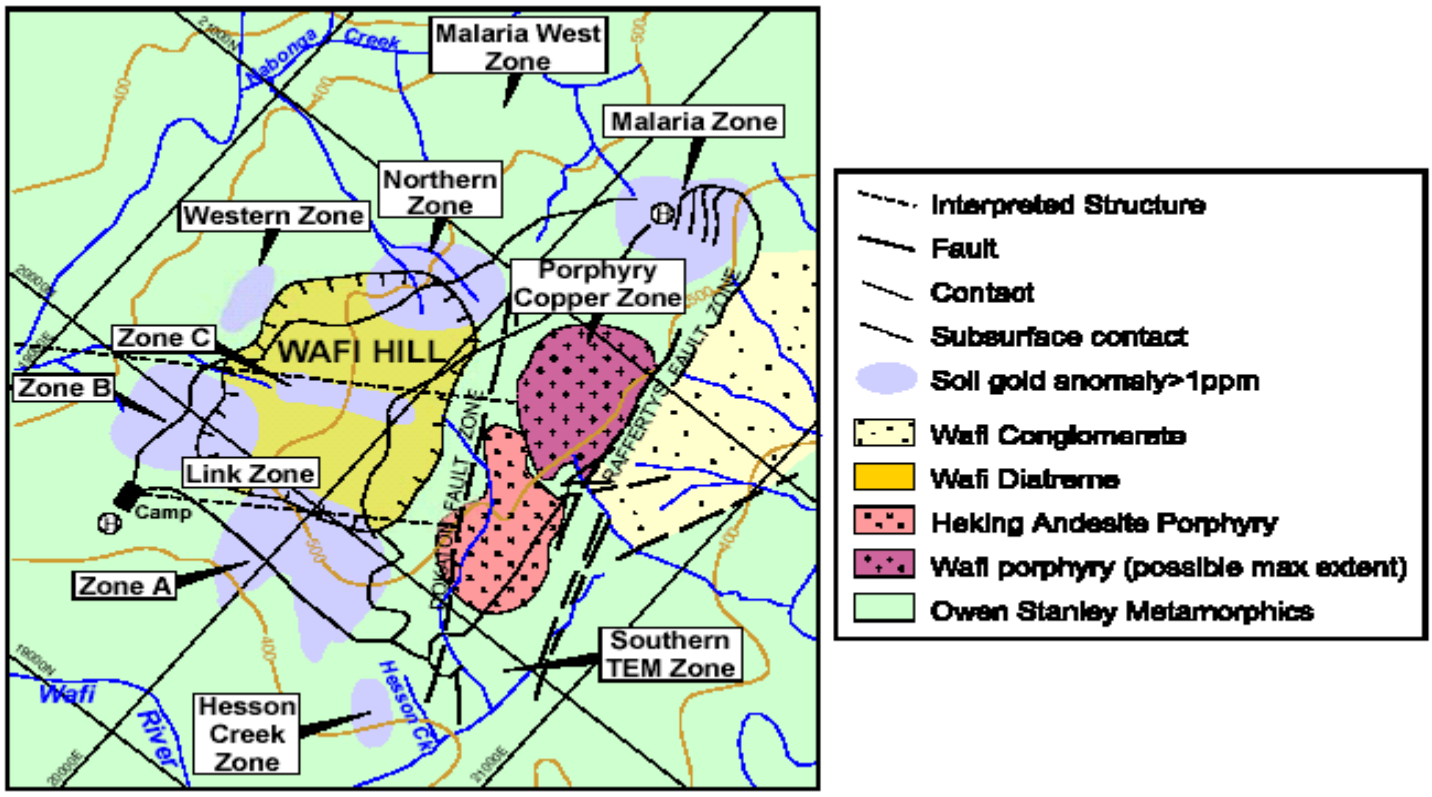
DEPOSIT	WAFI	GOLPU
RECOURCE	72.2	114.25
COPPER		1.43
GOLD	2.72	0.72

CURRENT STATUS
Harmony is currently reviewing all data relating to the Golpu Project with the objective of performing a pre-feasibility into the development of the project.

WAFI RESOURCE
The Wafi gold prospect has been determined to have an Inferred Resource of 72.2 million tonnes at 2.72 g/t Au using a cut-off grade of 1.0 g/t Au. The bulk of the drilling currently taking place is within this overall resource estimate area.

RESOURCE AT GOLPU
The Golpu Project has a current resource of 114.25Mt @ 1.43% Cu and 0.72 g/t Au.

Figure 2 Showing mineralised zones At Wafi



SIMUKU COPPER GOLD

LOCATION: Simuku, West New Britain Province
OPERATOR: Macmin (PNG) Ltd
OWNERSHIP: Macmin 90%
WS Yeaman 10%
STATUS: EL 1077 (44km^2),
YEAR GRANTED: 1994

BACKGROUND

The Simuku porphyry is a very large copper/molybdenum porphyry system with potential to host a resource of over a billion tonnes of copper @ 3% with gold credits is situated along a well known northwest trending belt of mineralisation between Mt Pench Prospect in the northwest to Simi Prospect on the south coast of New Britain. It consist of three prospective areas referred to as North Simuku, Central Simuku and South Simuku Prospects extends about 3km long and 300 to 500m wide within a mineralized area of about 12km^2 (figure.1).

First discovered in the 1960's it was not until 1980's that the property was properly explored by Esso and City Resources, and more recently by Macmin/NGG and Cyprus Amax on JV arrangements that has resulted in a total of 12 drill holes totalling 1982.6m, trenching, soil sampling etc. The highlights of some of these drill intersects include and trenching includes;

- Primary copper grades of 100m @ 0.45% in hole SMD 3
- 40m @ 0.64% in the chalcocite blanket from SMD4
- 276m @ 0.33% Cu from hole 12 (entire hole)
- 47m @0.58% Cu, with over 0.10g/t Au and 80ppm molybdenum from hole 7.
- 210g/t gold and 55g/t Ag from 3 m channel in the Misasuguran tributary,
- 70m @ 0.25% copper and anomalous zinc from a samples up to 7.2 %

This project presents an excellent opportunity to locate and develop porphyry copper/gold systems in a relatively accessible and lower cost region of Papua New Guinea

CURRENT STATUS

Exploration is underway to define high grade components, both copper and molybdenum, of the system which would allow commencement of a copper/ molybdenum mining operation. Substantial bulldozer trenching has been completed and further trenching is scheduled to commence in February, prior to drill testing in the second quarter of 2005. Two long trenches, totalling 3400m in length were completed. Trench 1, of total length 1670m, traversed the central/southern part of the porphyry copper system (see Press Release dated 29th October 2003 for additional detail of Simuku). The mineralogy of the copper and molybdenum mineralisation (substantial jarosite and hematite alteration) over much of the trench suggests significant leaching of copper minerals from the surface environment which could lead to the formation of a subsurface enriched copper zone.

Significant copper and molybdenum occurs over most of the trenched area with results such as 165m of 0.184% copper and 25ppm molybdenum, 30m of 0.223% copper, 72m of 0.073% copper and 241ppm molybdenum, 24m of 0.34% copper and 37ppm molybdenum. The 72m length of 241ppm molybdenum is regarded as particularly significant and re-assaying of part of this zone by the XRF method suggests that the molybdenum results above are understated by between 5 and 25%.

Trench 2 results are considered excellent for surface samples, particularly in view of the current geological interpretation of the prospect that there has been substantial leaching of copper minerals from the surface environment. We would expect substantially higher grades at depth within a secondary enriched chalcocite (copper) "blanket". NGG believes that potential exists to define two styles of mineralisation at Simuku. near surface secondary enriched copper mineralisation consisting primarily of chalcocite with copper grades of 0.5% to 1.0% copper. zones of primary molybdenum/copper mineralisation with grades of 0.03% to 0.05% of MoS2, 0.3% to 0.5% copper, and minor gold (0.05 to 0.1g/t gold).

Trench 2 (for location see web site) tested the southern part of a high value copper in soil anomaly (for details see Press Release dated 29 October 2003). This trench contained significant copper over a 1700m length and is still open to the east. This wide zone averaged 0.08% Cu and contained the following higher grade intersections.

A third trench is will be dug across the southernmost part of the copper soil anomaly and trench 2 will be extended to the south and drilling testing in 2005.

RESOURCE

A total of 12 drill holes were completed, 7 shallow RC holes and 5 diamond holes (1153.05m) at Simuku with more than one billion tones of copper mineralisation at 0.35% Cu (hosted by phyllic altered dacite porphyry); drill holes such as 40m at 0.64% Cu; 277m at 0.33% Cu; trenches such as 33m at 0.63% Cu; 0.19g/t Au, 77ppm Mo.

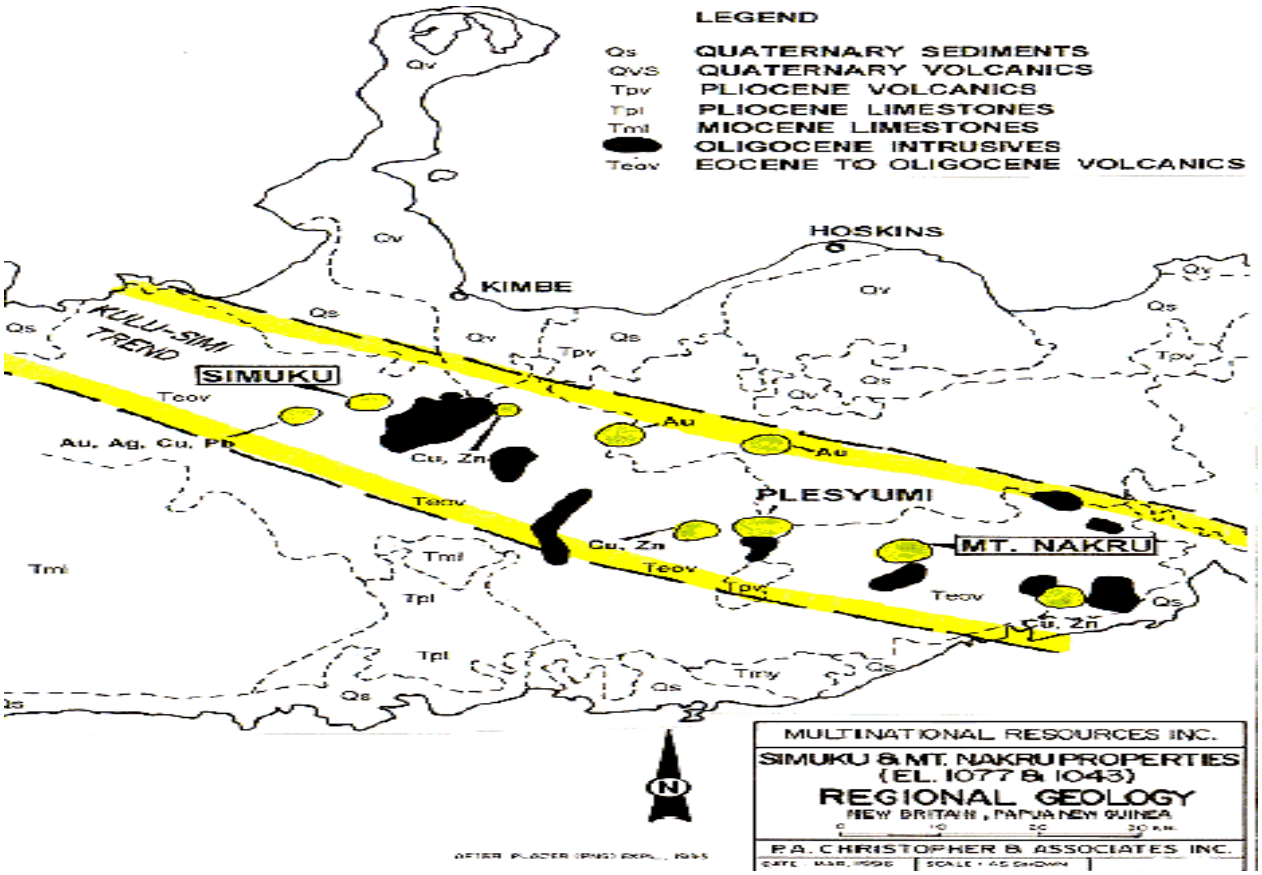


Figure. 3 Showing Trend in Mineralisation

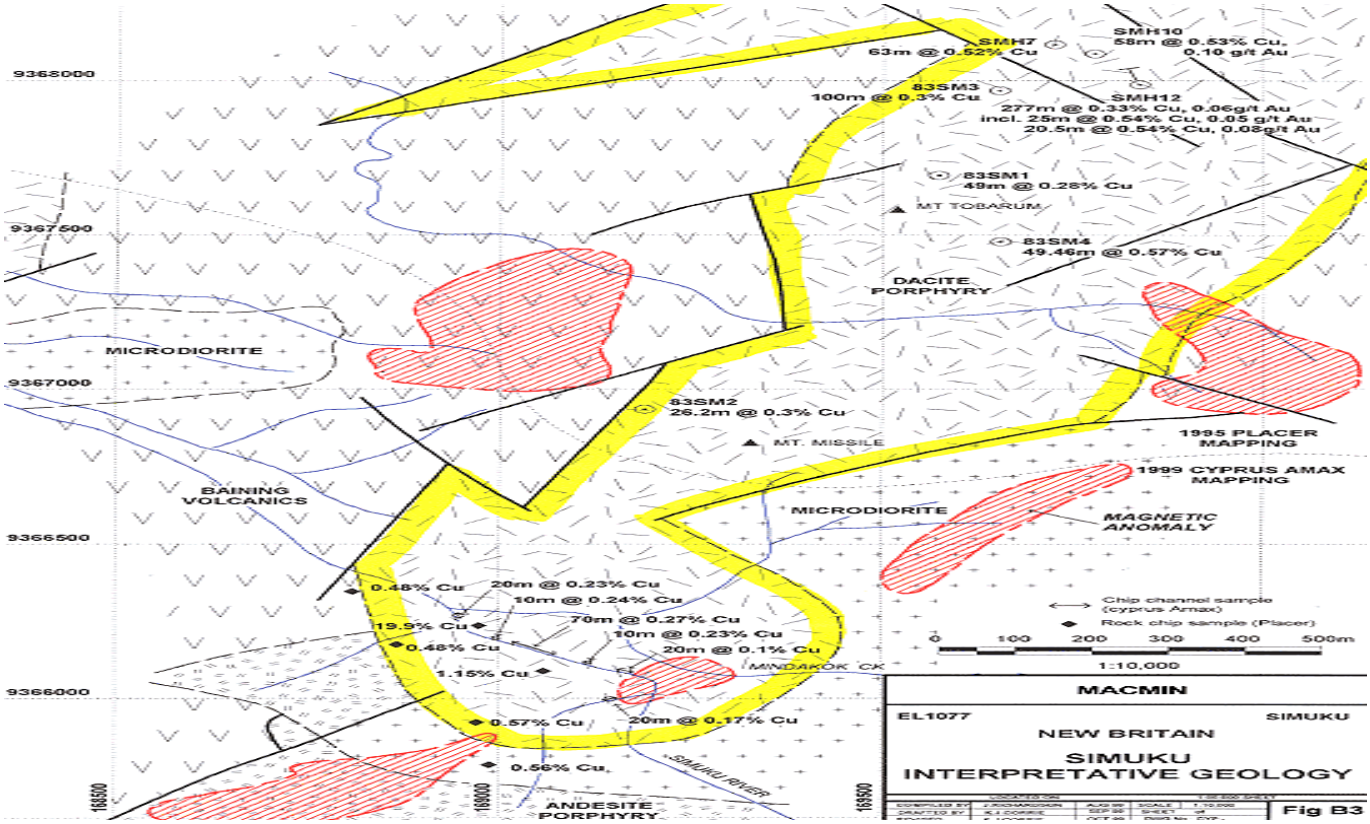


Figure 4. Interpretive Geology Map of Simuku

MOUNT NAKRU GOLD COPPER

LOCATION: Mount Nakru, West New Britain Province
OPERATOR: Macmin (PNG) Ltd.
OWNERSHIP: Macmin (PNG) Ltd 100%
Kanon Resources earning 50%
STATUS: EL 1043 (47km^2),
YEAR GRANTED: 1999

BACKGROUND

The Nakru property is situated to the south-eastern end of the linear north-westerly trending group of porphyry-style altered and mineralised prospects extending from the south coast to the north coast of West New Britain consists of four separate but closely spaced occurrences. There are two porphyry copper/gold systems with previous drill testing are Mt. Nakru and Plesyumi and both have good potential for moderate sized porphyry copper deposits. The Mt. Nakru system has good gold credits with indications of a near surface gold deposit in a leached cap below thin pumice and ash cover. The Mt. Nakru 1 prospect has the best previous results from trenching (45m. @ 2.50 g/t Au) and drilling (74m @ 0.78% Cu; 45m @ 0.75 g/t Au). The property, explored between 1982 and 1992 by Esso and City Resources, was farmed out to BHP in 1988. From 1982 to 1992 expenditures of $3.9 million Australian was reported by Roth (1993) to have encountered extensive mineralization in drill holes and numerous untested targets.

The Mt. Nakru exploration licence (EL1043) covering 322km^2 was granted to Mac Mining NL on 8th December 1992. The company then changed its name to Macmin NL. The licence has gone through several two-year renewals and reductions. The present Mt. Nakru tenement covers about 47km^2 in two separate blocks with the location of the 14 sub-blocks. The property can be maintained at its present size with future reductions optional.

NGG, subject to shareholder and regulatory approval, is presently acquiring a 100% interest in the Mt. Nakru property from Macmin.

CURRENT STATUS

Work conducted over the four geochemical anomaly known as Nakru 1, 2 ,3 and 4 includes;

- Hand and power auger soil sampling
- Panned concentrate, stream sediment and BLEG sampling
- Hand and dozer trenching
- Diamond drilling totalling 1289.60 meters and
- Geophysical surveys including aeromagnetics and .radiometrics

Currently there is ongoing trenching, sampling and drilling planned for the project.

MINERALISATION

The main exploration target on the Nakru property is a gold enhanced porphyry copper deposit with possibility enrichment of gold and copper resulting from leaching and supergene enrichment. Skarn mineralization occurs when dacite porphyry intrudes limy volcanoclastic or sedimentary rocks (e.g. Lae River Skarn), and may be a exploration target in limestone lenses that were previously reported in the northern and western area of the Nakru property.

The Plesyumi porphyry prospect occurs within and is genetically related to high-silica, high-soda, low-potash porphyritic rocks (Titley, 1978). The Plesyumi prospect is similar to Simuku with network veinlets in dacite porphyry (Richardson, 1999).
Secondary copper and gold deposits, resulting from tropical weathering and leaching and supergene enrichment, represent an alternate target on the Mt. Nakru property.

A total of 14 named prospects occur within EL 1043. Major prospects, summarized from Richardson (1999). The Plesyumi and Mt. Nakru 1 porphyry copper prospects are advanced by good drill intersections. Hole 6 in the Mt. Nakru 1 reported to grade 0.40% copper over its full 205m length and hole 3 contained 93.99m grading 0.46 g/t gold and 0.43% copper.

Near surface gold grades at the Mt. Nakru 1 prospect justify evaluation for gold enriched surficial blanket with trenches grading 27m @ 0.97 g/t Au, 3m @ 17.00 g/t Au and 21m 0.97 g/t Au and the upper part of holes 1, 2, and 3 containing 8.60m @ 1.34 g/t Au, 47.34m @ 0.312 g/t Au and 27.75m @ 0.51 g/t Au, respectively. BHP check assays are reported to have supported the results in hole Nak 001 but did not confirm the 7.4 g/t Au assay in hole Nak 003. The gold discrepancy, reported by Bateman Kinhill (1993), has not been explained.

NAKRU RESOURCE

The Mt. Nakru prospect area is at the drilling stage with a total of 21 holes totalling 3,175m completed in Plesyumi prospect area and 8 holes totalling about 1057.55m completed in the Mt. Nakru prospect area. The Mt. Nakru property has a number of excellent exploration targets, but does not have a calculated resources or reserves.

Figure 5. Showing Mineralised Zones

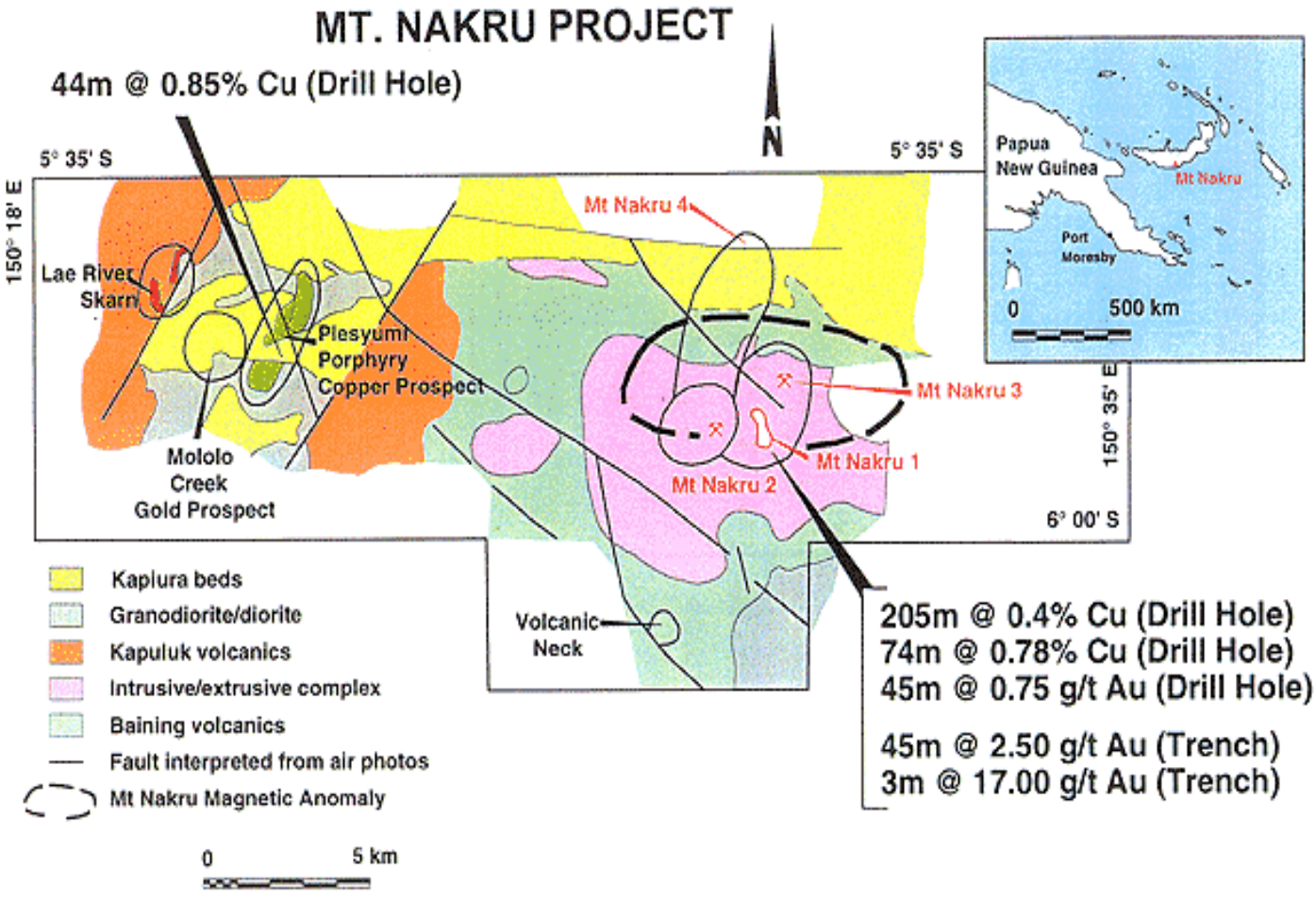
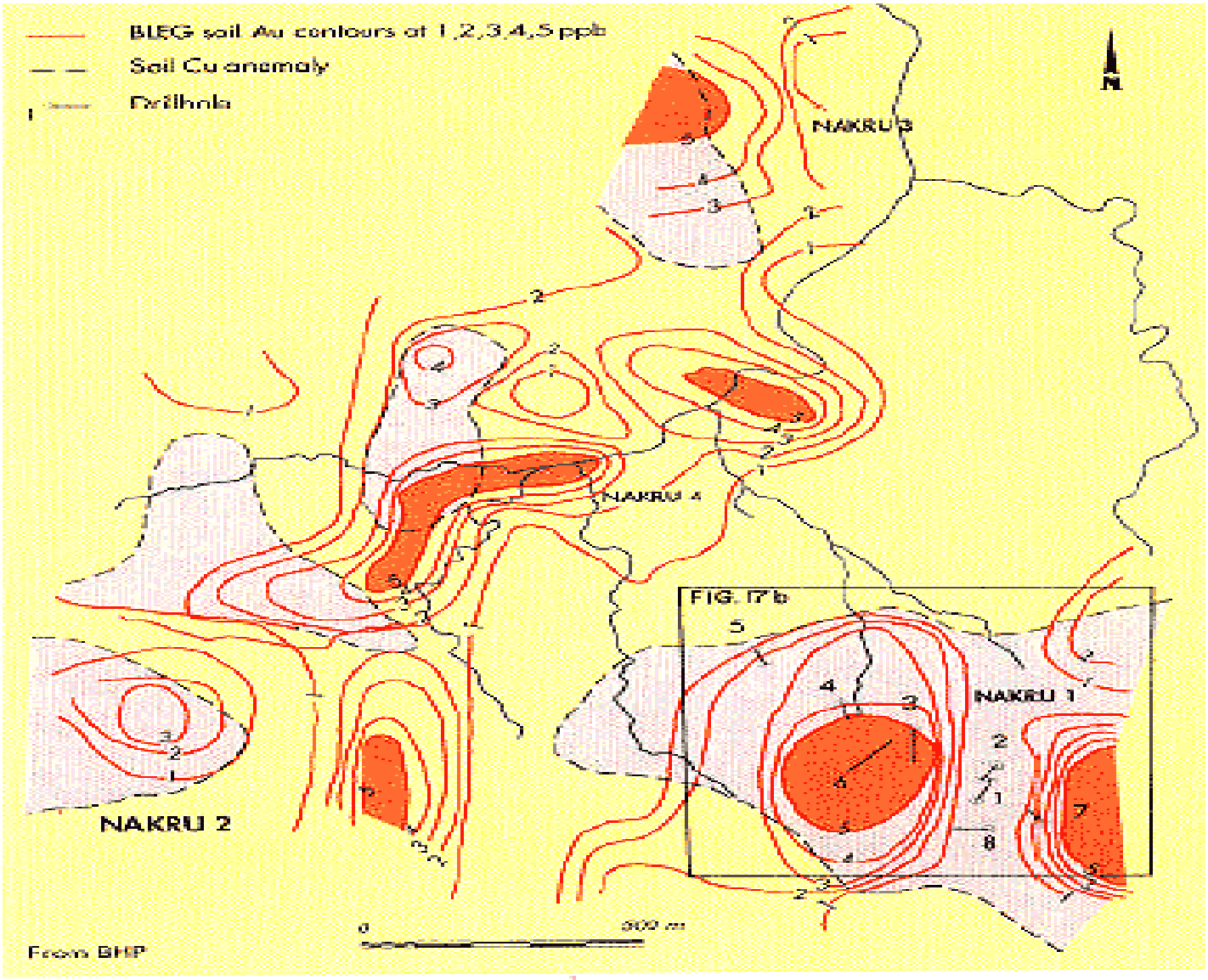


Figure 6.Soil Gold Geochemistry over Mt. Nakru



BLEG – Bulk Leach Extractable Gold

After MacMin N.L., '93

MULTINATIONAL RESOURCES INC.		
MT. NAKRU PROPERTY - EL 1043		
MT. NAKRU PROSPECTS		
SOIL GEOCHEMISTRY		
NEW BRITAIN, PAPAU NEW GUINEA		
P.A. CHRISTOPHER & ASSOCIATES INC.		
DATE : MAR.1996	SCALE : AS SHOWN	

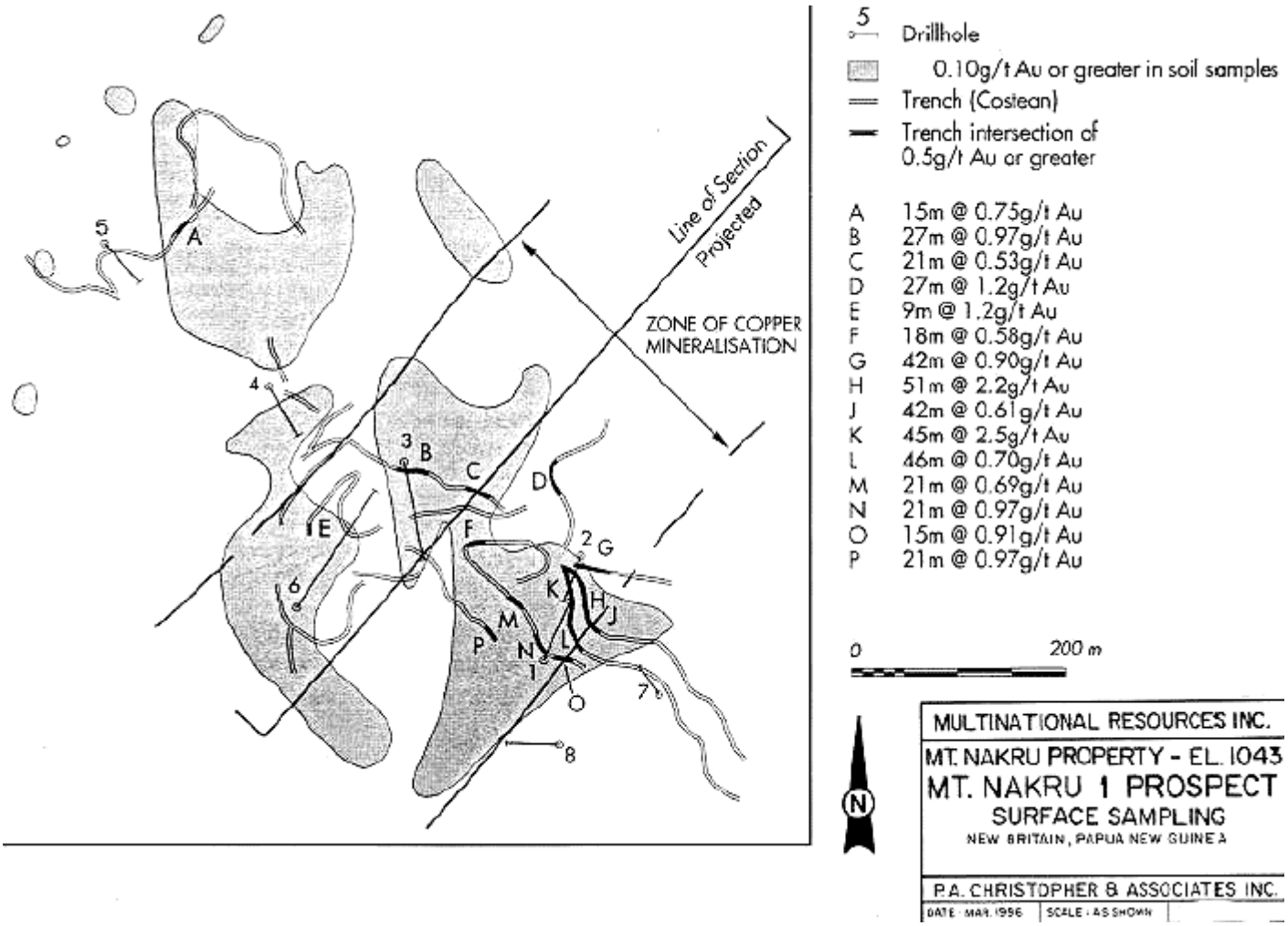
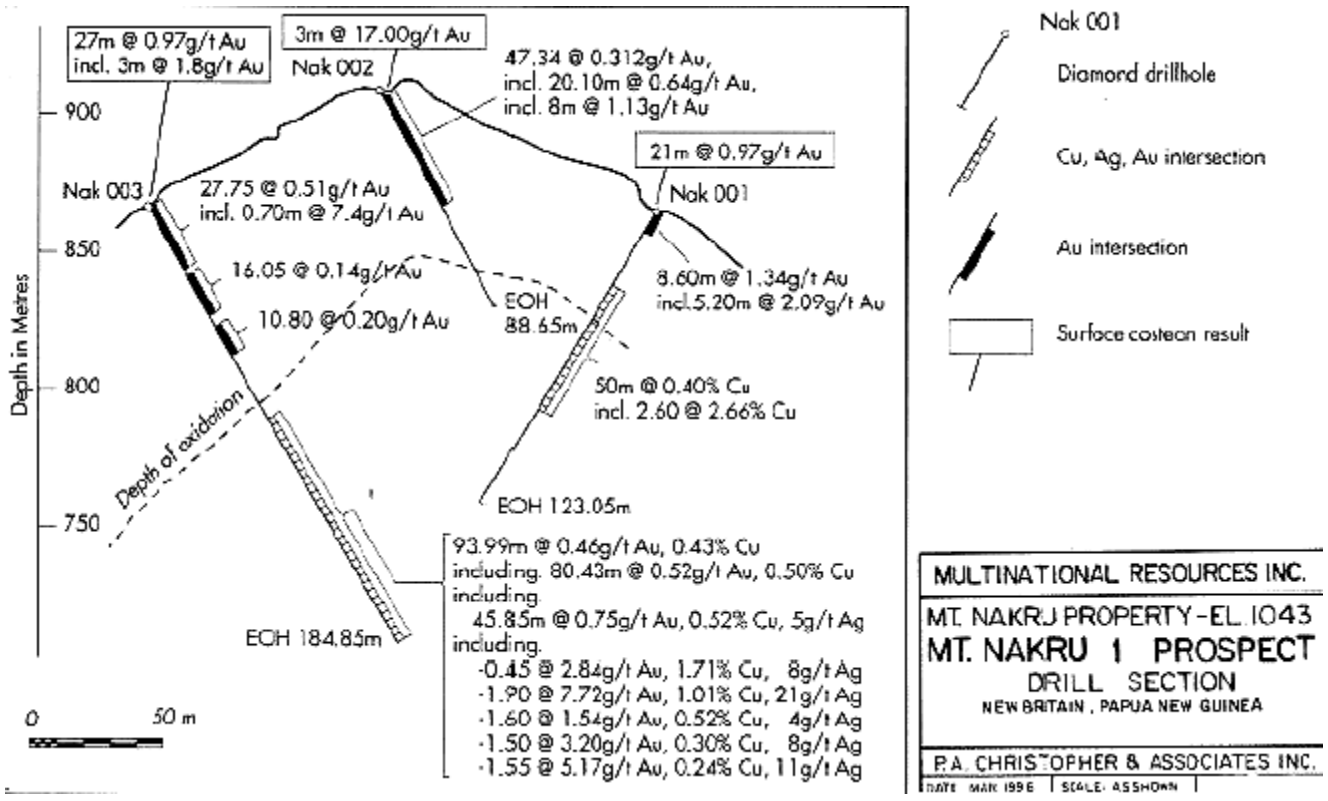


Figure 7 Drill Section Through the Mt. Nakuru Prospect.



YANDERRA (PORPHYRY Cu-Mo)

LOCATION: Bundi, Madang Province
OPERATOR: Belvedere Ltd.
OWNERSHIP: Belvedere Ltd 100%
STATUS: EL 1335 (1163km^2),
YEAR GRANTED: 2003

BACKGROUND

The Yandera Project, which includes the Yandera Porphyry Copper-Gold prospect, is one PNG's largest underdevelop deposit which lies along the lower northern flanks of the Bismarck Range in Madang Province of Papua New Guinea. Exploration in 1970's resulted in a resource estimate of 338Mt -124Mt inferred resource grading at 0.42%Cu, 0.1g/t Au and 0.018% Mo.

Exploration Licence (EL1335) that covers the project area of approximately 1163km^2 was granted on 20 November 2003 to Beldevere Limited. Beldevere Ltd's exploration strategy is to investigate the economic potential of the porphyry copper deposit as well the potential for epithermal gold systems.

CURRENT STATUS

BMR geologists discovered the Yanderra deposit in the late 1950s. Most surface exploration and drilling was completed during 1965–82. 1965–69, Kennecott Exploration carried out regional sampling and mapping, and drilled 13 DDHs intersecting a supergene enrichment zone. Three DDHs in Omora Prospect outlined significant primary Cu mineralisation. 1973–76, under a JV with BHP, another 75 DDHs were drilled and an inferred resource of 338 Mt of 0.42% Cu, 146 ppm Mo and 0.1 g/t Au was defined. 1977–82, another 14 shallow DDHs were completed, and the inferred resource was upgraded to 1143 Mt at 0.33% Cu which included 295 Mt at 0.59% Cu. 1982–89, a regional program for Au was carried out by Aquitaine (Australia & New Zealand) Ltd. The licence lapsed and in 1992 Highlands Gold was granted EL 1023 (Bundi) and carried out a limited regional sampling program. An aeromagnetic survey was flown in 1996. Highlands Pacific–Cyprus Amax JV reviewed the data in 1998–99 and conducted a limited field program within the Gremi and Gamagu zones. Cyprus concluded that high-grade Cu mineralisation was confined to narrow structures and dykes, and the target of >100 Mt at 1.0% Cu was not attainable.

Beldevere Limited has done some preliminary field investigation in 2004 and have signed an agreement with Marengo to earn an initial 50% interest in the project by spending A$500,000 on exploration within 24 months, thereafter Marengo has the right to earn a 90% interest in the property by sole funding to the completion of a feasibility study subject to Belvedere Limited electing not to contribute. Furthermore, Marengo will reimburse the vendors a total of A$100,000 over a 12 month period, for previous exploration expenditure. Upon earning a 50% interest, Marengo will issue 2,000,000 20 cent options (or 8% of options on issue at the time, whichever is greater) to Belvedere Limited.

Marengo's objective, beside the evaluation of the porphyry mineralisation, is to explore for gold-bearing epithermal veins peripheral to the known porphyry mineralisation. Evidence indicates the prospectivity for this style of mineralisation to be very high with field reports noting auriferous quartz-carbonate stringers, auriferous manganese oxide stringers and several alluvial gold workings

RESOURCE

A mineable resource of 338.5 Mt at 0.42% Cu, 146 ppm Mo and 0.1 g/t Au was defined (1976). However, exploration has failed to complete the objective of outlining an indicated resource and so Cyprus concluded that high-grade Cu mineralisation is confined to narrow structures and dykes so the target of >100 Mt at 1.0 % was not attainable. This conclusion is not justified because of

inadequate surface and drill data on all the different prospects within the mineralised complex were not considered in this regard since almost all exploration has been concentrated on the Yanderra Prospect. On top of that the control on the high-grade mineralisation is currently poorly understood. Also the surrounding region and many zones within the Yanderra complex have not been adequately investigated and understood. Previous work by Highlands Pacific Ltd delineated of a significant area 15 x 10 km containing highly anomalous stream sediment Cu values. This is very encouraging for further discoveries with the porphyry system.

WOWO GAP (NICKEL LATERITE)

LOCATION: Wowo, Oro Province
OPERATOR: Niugini Nickels Ltd.
OWNERSHIP: Niugini Nickels Ltd 100%
STATUS: EL 1165 (94.4km^2),
YEAR GRANTED: 1996

BACKGROUND

The Wowo Gap Project is huge laterite deposit with a potential for a global resource of in access of 300 Mt of lateritic and saprolitic ore that has developed over a peridotite breccia. There is lot of potential outside the current project area as well. Within the project area previous exploration of Wowo Gap laterite nickel deposit has outlined a resource of 62 Mt @1.8% Ni equivalent

The project area under exploration licence (EL1165) granted to Niugni Nickels in 1996 was first discovered in 1958. Several exploration companies had explored it since and a prefeasiility was carried out in 1972 found the deposit uneconomic. The metallurgy, stripping characteristics and location of Wowo Gap compares favourably with other lateric nickel deposits. Further drilling and pitting are required to bring the project to the feasibility study stage.

The Wowo Gap Project is located about 200 kilometres east of Port Moresby, and 35 kilometres from the towns of Safia, near the Musa River and Wanigela, situated on Collingwood Bay. The deposit is located at the eastern end of the Didana Range in a topographic saddle some 700 meters above sea level. The area is drained by the Musa River and its various tributaries, the largest of which is Bereruma Creek which flows north from the deposit.

CURRENT STATUS

Since the granting of the Licence Niugini Nickel NL has undertaken review of past data and there were periods of low activity corresponding to low commodity price and the asian economic crisis. The drilling completed in 2003 was only within the laterite developed on the foliated ultramafic. Drilling of the Sivai Breccia was completed in 2004. Soil and young volcanic ash overlies limonite- and saprolite-laterite profiles.

The limonite profile, 1 to 10 metres, thick consists of clay with iron oxides. Commonly this material in the diamond core contains no boulders. At similar depths in the pits there are small weathered boulders, particularly at the bottom of the profile. It is probable that the diamond bit has pushed the small boulders away in the limonite-clay rich material. Only when the boulders are large enough to resist the downward thrust of the drill stem have they been penetrated.

The saprolite profile, 1 to 15 metres thick, consists of serpentine and garnierite with clay. This material also contains significant sections of boulders. The boulders are interspersed with the saprolite material. This lower section of the profile was previously not seen in the pits or wacker drilling, as this material was too hard to have been previously penetrated

Sources of Saprolite include: New Caledonia, Philippines and Indonesia. Saprolite is used as a direct feed for the production of Ferronickel with Ferronickel accounting for approximately 38% of the world's primary nickel production.

Ferronickel smelters are located throughout the world with significant production centres situated in New Caledonia, Indonesia, and Japan. The latter relies 100% on imported material to satisfy demand, with the three smelters in Japan importing approximately 3.0 Mtpa of Saprolite averaging 2.35% Ni. RMC understands that +2.0% Ni grade Saprolite ore sells for +US$35.00/wmt. RMC has initiated discussions with selected Japanese companies involved in the Saprolite trade to determine interest in Wowo Gap's role as a potential Saprolite ore source of the future.

Planning is underway for the commencement of a Wacker drilling programme at Awariobo once the Wowo Gap drilling is complete.

WOWO GAP REOURCES

The reported "inferred resource with a0.8% nickel cutt off from pits, previous diamond drilling and wacker drilling is;

Central Zone	Limonite	30.9Mt @ 1.09% Ni and 0.11%Co
	Saprolite	17.9Mt @ 1.44% Ni and 0.04%Co
Northern Zone	Limonite	18.0Mt @ 1.02% Ni and 0.11%Co
Total		**66.8Mt @ 1.17% Ni and 0.09%Co**

However comparisons of work by Niugini Nickel indicate that limonite profile of limonite were twice as thick and as a result potentially doubles the resource potential of the limonite drilled area.

Limited drilling in the Central Zone indicated that with further drilling there is a potential to conceptually increase the increase significantly from 18Mt, as as no saprolite ore has been factored into this resource. The Ther is significant resource open to the north and south and will be furter teste by continuing the current drilling program across s the Sivai Breccia and immendiately to the north and south.

Comparing the Wowo Gap nickel deposit with the Ramu nickel deposit you can see that the global resource at Ramu is 143 Mt @ 1.01% Nickel and 0.01% cobalt.

Comparision Of Wowo Gap With Ramu

Parameters	**Wowo Gap**			**Ramu**		
Resources:	**Mt**	**%Ni**	**%Co**	**Mt**	**%Ni**	**%Co**
Measured	15.95	1.42	0.081	42	0.93	0.11
Indicated				29.8	1.07	0.11
Inferred	40	1.22	0.08	71.0	1.04	0.10
Global	307	1.6 Ni (equiv)		143	1.103	0.10
Average Moisture Content	25%					
Distance from Coast	30km			50km		
Terrain To Coast	Relatively steep			Relatively flat		

PANGUNA (Porphyry Copper)

LOCATION:	Panguna, Bougainville Province	
OPERATOR:	BougainvilleCopper Limited	
OWNERSHIP:	Rio Tinto	53.6%
	PNG Government	19.1%
	Public Share Holding	27.3%
STATUS:	EL's 1-7 (593km^2), Under Moratorium	
YEAR GRANTED:		
SML	1 (3770ha)	
L.M.P	1 + 7 Mining Easement	

BACKGROUND

The giant Panguna porphyry Cu-Au deposit is located in the Crown Prince Range in central south Bougainville Island. It is owned by Bougainville Copper Ltd, a subsidiary of Rio Tinto (formally CRA Ltd). Panguna began productions in 1972 and was producing at a rate of 166,000 t of copper and 450,000 oz of gold per year at the time of its forced closure in 1989. Over its operating life it produced 3 Mt of copper and 305 t (9.7 Moz) of gold in concentrate. Remaining ore reserves stand at 691 Mt at 0.4 percent Cu and 0.47 g/t gold. Estimated costs of re-opening the mine range from US$400-600 million. Operations could only be restored after a return to political normalcy on the Island. The mine was forced to close in May 1989 after an armed rebellion by secessionists wanting larger benefits to mine landowners and independence from Papua New Guinea. This is as yet unresolved and no time frame for recommencement of the mine can be stated.

CURRENT STATUS

There is currently no production at Panguna and the mine site and facilities and machinery etc are in appalling conditions. There is sufficient resource to support another 15 years of production rate of 180,000 tonne copper and 450,000 ounces au. However one can only guess the true start up capital cost as it has been estimate be as high as well over a US$ I billion (pers comm)s to as low as US$ 400 million (BCL annual Report 1995), a proper assessment/evaluation should be carried out for verification.

The political situation on Bougainville is probably the key to ensuring the reopening of the mine. With the formation of the Autonomous Bougainville Government it is envisage that the need to have an economic base to generate revenue for the government to provide essential services and kick stating the economy of the province will provide the catalyst in ensuring the reopening of the mine. Otherwise it is a sensitive issue and the area is classified as "no go zone".

PANGUNA RESOURCES

The recoverable proved ore reserves remained as from 1989 is estimated at 496million tonnes with an average grade of 0.42% copper and 0.55% grams per tonne gold. No exploration was carried on the island of Bougainville due to a moratorium Geological survey work carried out by the Department of Mining in 1989 identified through stream base and rock chip geochemical survey. These numerous potential have yet to be fully explored.

MOROBE BEACH SANDS' CHROMITE

LOCATION: Morobe, Morobe Province

OPERATOR: Orientals Minerals Holdings Ltd.
OWNERSHIP: Orientals Minerals Holdings Ltd 100%
STATUS: EL 1305 (136.3.4km^2),
YEAR GRANTED: 2001

INTRODUCTION
This project consists of two significant chromite resources beach sand resource with an identified resource of 103Mt @ 2.83% chromite, 1.41%Cr_2O_3., located along 45km of the Morobe coastine and 70km S-E of Lae in the Morobe Province. Discovered and evaluated in the 1970's this deposit may become a viable proposition as a result improved technology and commodity price.

Chromite is concentrated mainly in deltaic sediments from the main streams draining the Bowutu Mountains. The major constituents of the beach sands are olivine, enstatite, antigorite, tremolite, magnetite and chromite. The black sand component of the beach sands consists of chromite together with magnetite. Small amounts of pyrite and goethite also occur in the black sands and also gold flakes have been noted in black sand samples from Sela Delta.

Exploration License (EL) 1305 was granted to OM Holdings Limited on the 9th April 2001 covering an area of 252 square kilometres. Technology, especially technology for mining beach sands may have advanced in the last twenty years. Cheaper and cost effective sand mining technology may be available. This is a major aspect that is being explored. The widespread presence of alluvial gold in the "heavy sands" has been widely documented but not accurately quantified, neither has the value of co-product olivine.

The eastern part of Papua New Guinea's mainland central cordillera has belts of ultramafic bodies that were believed to be ophiolitic remnants. These ultramafic bodies are the focus for current nickel laterite exploration. They are also responsible for the detrital chromite deposits particularly along the coast between Salamaua and Morobe government stations in the Morobe Province, which is the subject of this discussion. Several of the detrital chromite prospects were explored between 1970 and 1980.

CURRENT STATUS
Past exploration has focussed on Hessen Bay and Sachsen Bay. Exploration has since been abandoned, the prime reason being the lack of grade to make a mineable reserve. Attention should then be focused on improving the grade at those prospects which have been explored, or, by focussing exploration on prospects that received less attention such as the Bitoi River Delta, Buso Bay and Paiewa River Delta areas.

During the tenure OM Holdings Limited have undertaken and completed a number of task which include data compilation and verification, field evaluation on site, reserve calculation and independent metallurgical test work and laboratories in PNG, China and Western Australia. The result have proved to be encouraging and the effort now is to secure a consumer arrangement before advancing into a full scale feasibility studies.

CHROMITE RESOURCE
The table below summarises the results of these programs giving average chromium and chromite equivalent for horizons less than 1.5m and greater than 1.5m in the depositional areas respectively (Burt & McGain, 1972; Nutter, 1972). Sela Delta's, Alealer Delta's and Baden Bay's results are for the entire depositional horizons.

Table 5. Average Chromite Grade For Various Deposits

Localities	Average Chromite Grade (%)			
	Cr		Cr_2O_3 Equivalent	
Sela Delta	2		1.2	
Alealer Delta	3		1.8	
Baden Bay	0.22		0.55	
	<1.5m	>1.5m	<1.5m	>1.5m
Sachsen Bay	1.54	0.92	3.85	2.3
Hessen Bay	1.44	0.79	3.6	2.0
Buso Bay	0.69	0.39	1.7	0.98
Paiewa Delta	0.84	0.41	2.1	1.0
Fowio Bay	1.18	1.06	2.9	2.6
Natter Bay	0.33	0.31	0.8	0.8

Between 1977 and 1978, PA384, PA409 and PA437 were held over the area. In total, 111 holes with depths ranging between 10m and 30m were drilled mainly in Hessen and Sachsen bays with one hole drilled at Buso bay. Amax Exploration was also responsible for exploration here. Between 70% and 80% of these areas were drilled. Hessen Bay was drilled on 400m x 200m, and 200m x 100m grids. Sachsen Bay was drilled on a 200m x 200m grid spacing.

In 1977 a different drilling program also by Amax saw seven holes drilled offshore, three in Hessen Bay and four in Sachsen Bay. The holes were drilled in water depths up to five metres. Onshore, 9 holes were dilled at Hessen Bay, 34 at Sachsen Bay and one at Buso Bay. A comparison of average onshore and offshore chromite values for Hessen Bay and Sachsen Bay are shown in the table below. Average offshore chromite grade for both Hessen Bay and Sachsen Bay are consistent, but are lower than the offshore grade. This may be explained by differences in discharge from the two rivers flowing into these estimates of the chromite sands along the coast between Salamaua and Morobe have been placed at about 200 million tonnes and the average grade is about 1.5 % chromite (Lowenstein and Pieters, 1974).

Table 6. Average Chromite Values For Hessan Bay and Sachsen Bay

Average Chromite values of Hessen Bay and Sachsen Bay		
	Average % Chromite Hessen Bay	Average % Chromite Sachsen Bay
Onshore holes	2.55	3.75
Offshore holes	2.49	2.5
Onshore + Offshore	2.55	3.59

1980 “resources and tonnages” for the entire Morobe Coast chromite deposits as supplied by Amax Explorations are shown in the Table below. The “resources” were based on a maximum mining depth of 12 metres and any high grades below that horizon were not included. No attempt was made to reduce these resources to mineable reserves or allow for mining dilution, and the classification does not conform to present day JORC reporting standards.

Table 7. Tonnages of Chromite at Different Cutt Off Grade % Chromite

Cut Off Grade % Chromite	Total Sediment in Ground		Minus 2 mm Sediments	
	Tonnes (x 1000)	% Chromite (avg)	Tonnes (x 1000)	% Chromite (avg)
10	740	9.56	673	10.5
9	1,476	9.11	1,345	10.0
8	1,824	8.4	1,565	9.79
7	2,514	8.0	2,202	9.13
6	3,774	7.29	3,346	8.23
5	5,546	6.56	4,947	7.35
4	9,790	5.21	8,214	6.21
3	14,492	4.33	11,594	5.42

CHROMITE TREATMENT

In the 1980's investigations were conducted into chromite extraction using production units of various sizes to exploit the entire calculated resource of 115 million tonnes of chromite at 2.25% chromite. The use of smaller plants was not viable and the use of larger plants with mining rates up to 2000 TPH was only marginally viable. The focus was then switched to identifying an ore deposit of much higher grade that would be selectively mined using a smaller plant that would provide for a modest return on the capital employed.

Smaller plants of 100 tonnes per hour (TPH), 250 TPH and 500 TPH mining rates were investigated for possible use. Even then the grades required to break even using these smaller plants were higher than that available in the apparent reserves. Therefore, the logical decision was that mining operation would be uneconomical. The Table below summarises the 1980 feasibility study results.

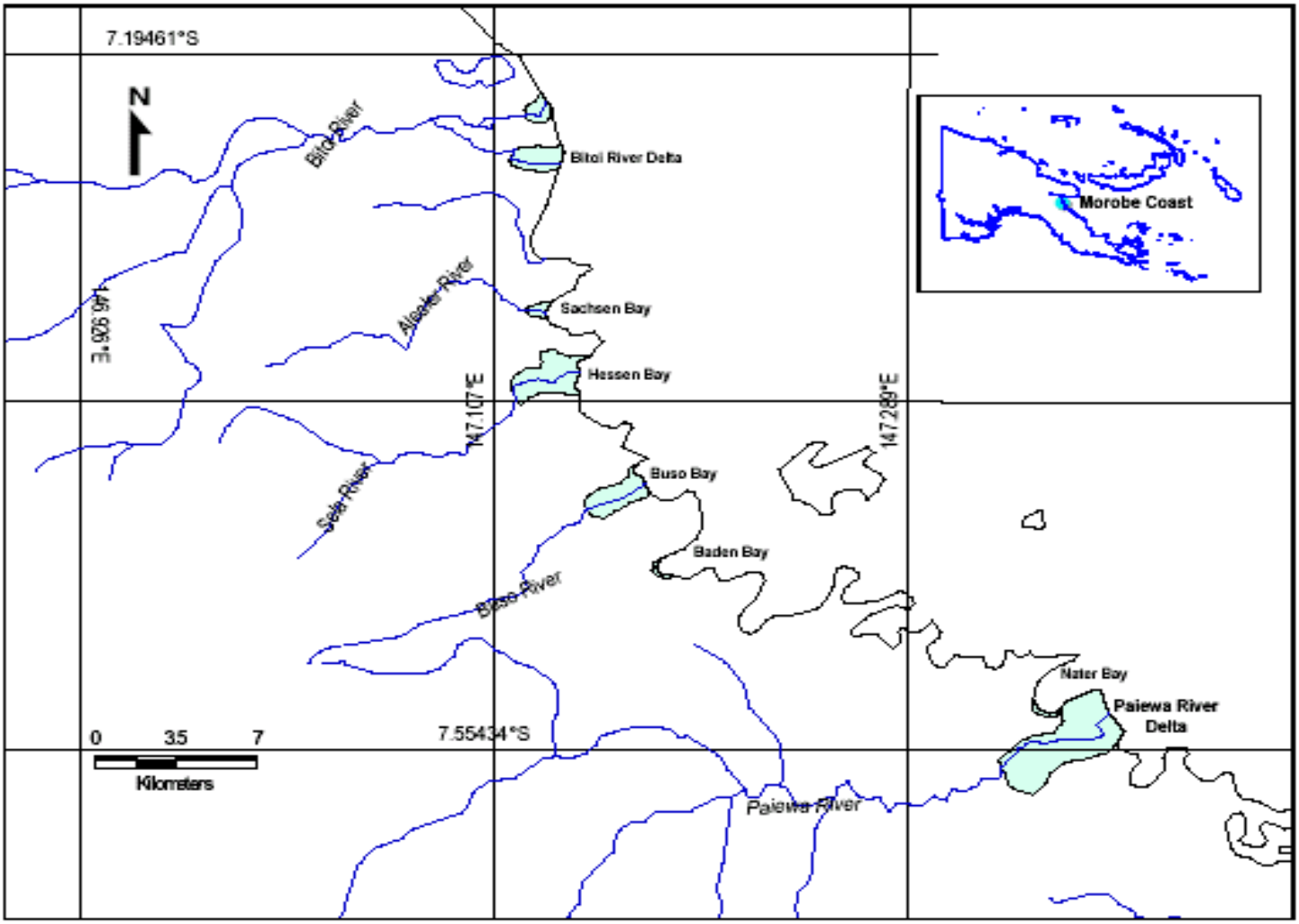
RECOMMENDATION

For the purpose of promoting and assessing the viability of these prospects at this point in time – over twenty years on, certain aspects and economics of exploration have to be assessed. It is felt that detailed exploration has to be extended to the other prospects within the area. Advancement in technology relating to beach mining has also to be assessed. Detailed exploration has so far been focussed on Hessen Bay and Sachsen Bay. No detailed exploration has been mentioned of adjacent prospective areas such as the Paiewa River Delta, Buso Bay and Bitoi River Delta. Further exploration in these areas may yield additional tonnage or grade.

Table 8. Mining Rate for % Required For Break Even Point

Cut Off Grade % Chromite	Grade % Chromite in 2mm Sediments	Ore reserve in 2mm sediments (x1000 tonnes)	Cost/tonne (A$)	Grade % Chromite required for break even
100 TPH MINING RATE				
10	10.5	673	14.14	23.56
7	9.13	2202	6.41	10.68
5	7.35	4947	4.52	7.53
3	5.42	11594	3.65	6.08
250 TPH MINING RATE				
10	10.5	673	20.83	34.72
7	9.13	2202	7.99	13.32
5	7.35	4947	4.84	8.07
3	5.42	11594	3.24	5.4
500 TPH MINING RATE				
10	10.5	673	26.43	44.05
7	9.13	2202	9.27	15.45
5	7.35	4947	5.07	8.45
3	5.42	11594	3.13	5.52

Figure 8. Location Map Showing Of Delta Area



COPPER SMELTING

Copper produced from PNG is being exported as concentrates to Japan, Germany and other overseas countries where the concentrates are smelted/ refined to copper metal and other finished products. There are no facilities in the country at the moment to treat the concentrate. A number of government sponsored studies were carried out in the late 1970's and each 1980's to evaluate the possibility of setting a copper smelter in PNG. The study outcomes indicated that though there were sufficient volume of copper produced in the country to support a copper smelting operation the country did not have necessary supporting infrastructures in place for it to be viable.

Highlands Pacific Ltd in their feasibility study on the Frieda River Copper Project in 1996 proposed to mine and produce LME grade copper cathodes on site. The company had developed a process which they patented called the "Nenatech Process" that could allow them to achieve that with minimal capital cost. This indicates that there is technology available in the market now that can make a copper refinery in PNG a viable proposition. The ideal location for such a plant would be in either the port cities of Lae or Madang on the coast and at the same time proximal to vast undeveloped resources of copper deposits such as Wafi, Yanderra and Frieda. Also the, Simuku, Nakru and the exciting offshore Pacmanus and Susu Knoll polymetallic sulfides deposits (less than 2,000 in the Bismarck Sea) are with few hours shipping distance away. Table 4 and Figure x is a summary of potential copper mines and production estimates do warrant serious consideration of a copper smelter/refinery to be established in PNG.

The development of gas in the highlands of PNG opens up possibility where the gas can be used as catalyst to stimulate other sectors of the economy as well. Domestically to electricity that can provide energy source for the refinery as well other economic activities.

It is anticipated that copper production in PNG will increase as small to medium mines come into production within the next 10 years. With the possibility of Panguna and probably Yanderra can only increase the level of copper production to surpass 1.8 Mt is a possibility. (Figure 1).

Figure 9. Future Copper Production

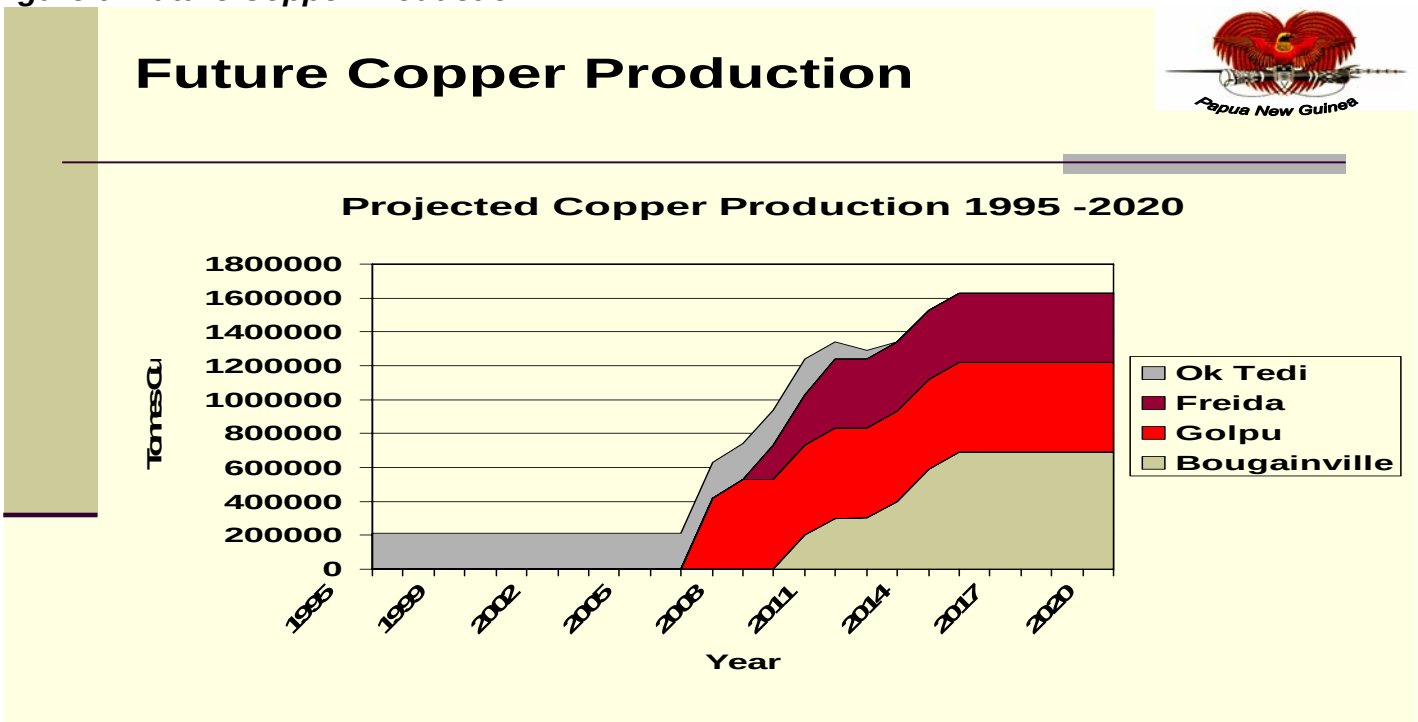


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Table 9. Current and Future Copper Production Estimates

Table 3.0 - Current and Future Copper Production Estimates*

Mine	Rate	Value K mill/yr	Start year	Mine Life Yrs
Current Production				
Ok Tedi	210,000	460	1984	8
Future Developments				
Nena Frieda	160-220,000	350	2007	30
Wafi	100,000	220	2007	15
Laloki	4000	8	2010	4
Simuku	40,000?	80?	2015?	6?
Nakru	40,000?	80?	2015?	6?
Yanderra	190-230,000?	350?	2015?	30
Pacmanus	155,000?	16	2015?	7
Future Restoration				
Panguna	180,000	350	2010?	15
Copper = K2200/tonne				
* These are estimates only and may not reflect company policy.				

LIMESTONE

Papua New Guinea is endowed with vast resources of limestone deposits. These deposits are found on the mainland (New Guinea) and the outer islands. The limestone deposits ranges in characteristics from very soft to very hard re crystalline limestone occurring as lenses in marine sediments, raised coralline reefs or massive formations covering vast areas with thickness up to several hundreds of meters. The age of the limestone deposits range from quaternary to Palaeozoic. The younger, softer and high quality deposits (bioclastic) generally occur in the coastal and outer islands.

In the past, the special uses of limestone as been very limited has been used in making of stabilised bricks, building stone, small scale production of lime for domestic use and agriculture. Currently limestone is mainly used as aggregate for the surfacing of roads and airstrips. In the mining sector the two major mines such as Ok-Tedi, Porgera and Panguna (before closure) produce their own lime for their mineral for mineral recovery plant, however they also import lime at times. Other mines like the giant gold mine at Lihir Island, Tolukuma, and Misima (Before closure) import lime from New Zealand and Australia.

The country has a cement plant that has been in operating since 1996 however, very little in term of local limestone resource is used in the production of cement. All the clinker material is imported and is blended with gypsum and additives, packed and sold as PNG made cement. There are no plans for the cement plan to mine and use local limestone for cement production.

A few sites have been investigated as potential for establishing a cement plant and all the information from those studies are kept in the Geological Survey of PNG. These sites are strategically located next to the shoreline and deep water port, usually in remote site with no infrastructure (see attached Figure 9 and Table 9)

There is opportunity for commercial production either production of lime for cement for domestic market and export. With a booming mining and oil industry, agriculture and industrial the there is ready domestic market to support a moderate lime plant or provide an alternate material source for the existing cement plant.

Figure 10. Map Showing Areas of Limestone Formations and Location of Sites Investigated

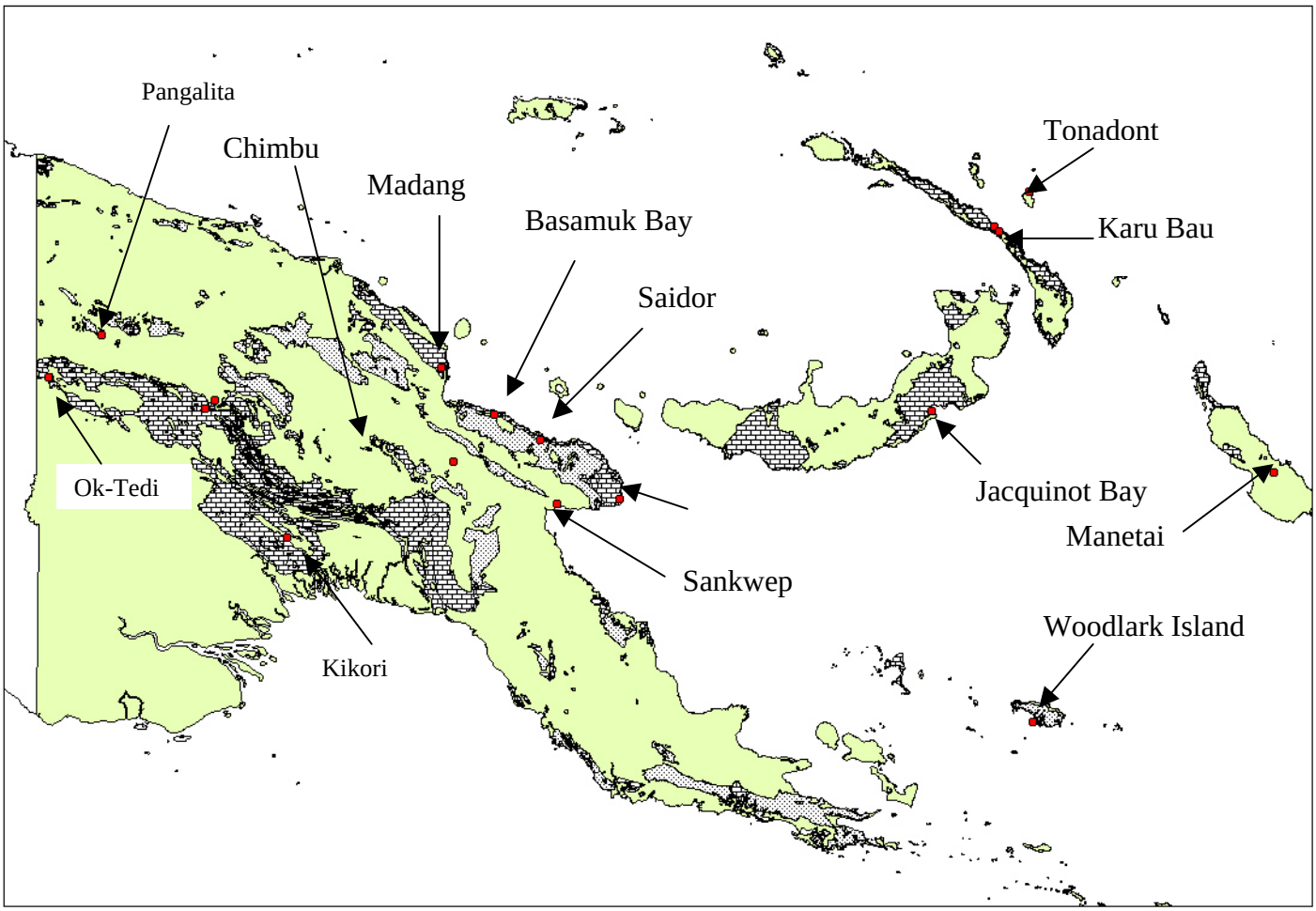

Table 9 List of some sites that has been investigated (incompleted).

No	Deposit Name	Resource Mt	Studies	Rock Type	Age	Reference
1	Tonadont Creek and Londolovit Bluff Area On Lihir island	>3 >1.1	Assays 87-97% CaCO3	Re crystallised Coralline limestone	Quaternary,	89/183,90/009
2	Karu Bay	No est	Assay 77-90% CaCO3	Re crystalline limestone, friable chalky limestone, calcirudite, raised coral reef	Quaternary, & upper tertiary age.	89/183
3	Jacquinot bay	>100	Assay 98% CaCO3 Drilling stability		Mid Miocene	89/183,88/18
4	Woodlark Island			Recrystalline limestone		73/77,73/82
5	Kikori		Assayed 93-98% CaCO3	Crystalline Limestone	Mid Miocene	73/263,74/227
6	Sankwep	>10.7	Assay >92.7% CaCO3 Drilling Feasibility Study			83/140,83/138 1995/45
7	Finschaffen		Assay 93% CaCO3	Chalky		73/75,75/75,75/74
8	Saidor	>186	Assay >90% CaCO3 Feasibility Drilling Clay nearby	Coralline limestone	Pleistocene - Holocene	78/137,79/115
9	Basamuk Bay		Assay 92% CaCO3 Drilling	Coralline limestone, cemented conglomerate		
10	Madang					
11	Chimbu Limestone	>55	Assay 87-97% CaCO3	Fossiliferous calcarenite, cpral algal limestone	Mid Eocene to early oligocene	94/144
12	Pangalita at Porgera		Assay 90% CaCO3 Drilling			95/075
13	Ok-Tedi	>98	Assay <84%CaO Drilling			
14	Manetai		Assay 93-97% CaCO3			1989/155

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