M E M O R A N D U M

To : Kim Stanton-Cook

From : Cisco Montes

Date : 22 May 2009

Re : **Cerro Colorado Copper Porphyry Project, Panama**

1.0 Introduction

The Cerro Colorado copper-molybdenum-gold property is a world class, super-giant deposit and is considered the largest undeveloped mining project in Latin America today. The project has the potential to become an even greater foreign exchange earner for the country than the Panama Canal.

Cerro Colorado is recognized as the 13th largest porphyry deposit on the basis of contained copper, with an estimated resource of 1.75 billion tonnes of contained copper with an average grade of 0.64% Cu (with a cut-off grade of 0.5%). According to a feasibility study completed by private consultants Kvaerner Metals, the mine was to have a life span of about 12 years using SX-EW technology, producing 50 million to 60 million pounds of cathode copper per year at an average cost of US$0.47 per pound. This would be followed by a conventional milling operation with an estimated production rate of 50,000 tonnes per day, yielding 300 million pounds of copper in concentrate annually at an average cash cost of less than US$0.30 per pound.

The project is currently held by CODEMIN (Corporación de Desarrollo Minero), the Panama Government Mining Agency and is reportedly about to be submitted for an international tendering process for its eventual development.

This memorandum contains a brief compilation of data (mostly freely available on the internet), conducted for Golden Cross Resources Ltd as an introduction to this deposit. It highlights the current status of tenure, access, geopolitical risk, infrastructure, and includes a summary of exploration history, tectonic setting and geology.

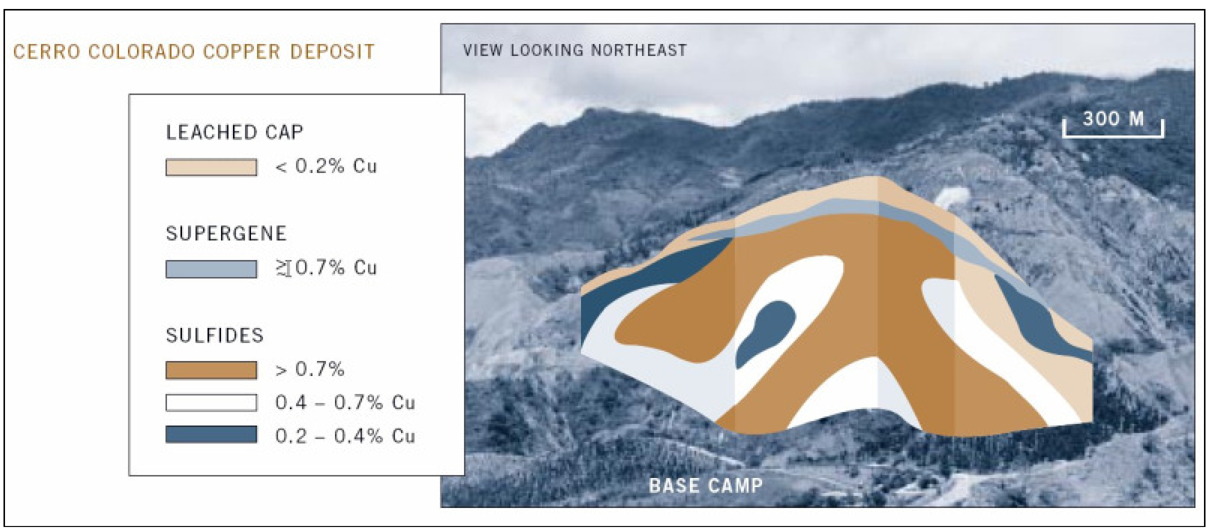


Fig 1.1 3D surface representation of the Cerro Colorado ore body (Tiomin Resources Inc, Annual Report 1997)

It should be noted that there is a sparsity of hard facts with all aspects of the Cerro Colorado project. Most of the technical work has been completed by private exploration companies and remains unpublished. There are few published works on the deposit, but these are not readily available (eg. Linn, K. O., 1981, “Geology of Panama’s Cerro Colorado Porphyry Copper Deposit”, published by the Colorado School of Mines – Colorado classification HED4/1.13/2/24/5-6, and also appearing in Mineral and Energy Resources v.24 No.5 pp1-15 and No.6 pp 1-14).

There are also a number of academic investigations, and Masters thesis which are unpublished (but presumably available with some effort). There are a very few published articles directly or indirectly pertaining to Cerro Colorado and these include:

Kesler, S, E., Sutter, J, F., Issigonis, M, J., Jones, L, M., and Walker, R, L., “Evolution of Porphyry Copper Mineralisation in an Ocean Island Arc: Panama”
Economic Geology vol. 72, 1977, pp 1142-1153 (see attached in zip file)

Clarke, A, H., “Potassium-argon age of the Cerro Colorado porphyry copper deposit, Panama”
Economic Geology vol. 74, No.3, May 1979.

It is assumed (lets be hopeful) that a complete copy of all private company and state owned company work has been carefully archived by CODEMIN and the Ministerio de Comercio e Industrias (MICI) to be made available to companies involved in the tendering process. Failing this, any serious evaluation of the project may require the cooperation of Tiomin Resources and/or Kvaerner Metals. In the light of the Mina Santa Rosa debacle in the late 1990s (which saw a departing Greenstone Resources Corporation take all the exploration and mine documentation with them and/or not made it available to the Panama government agencies for any possible future start-up of the gold mine); this is seen as a real concern.

The single most notable feature of this deposit is that it has remained undeveloped after almost four decades of (intermittent) modern exploration. A number of the world major players have been involved in various JVs, and have departed seemingly without success. This includes Canadian Javelin, Noranda and RTZ. More than anything else this alludes to a degree of risk and inherent social, political and infrastructure difficulties with the project development which will require analysis.

Notwithstanding the above, the Panamanian population has just elected a new government in the recent national elections (3 May 2009), with the new president Ricardo Martinelli, reportedly a keen advocate of mining development in Panama. The climate for investment is also right considering the ongoing development of the giant Petaquilla copper project by Inmet Mining Corporation, and continued exploration in the highly promising Cerro Chorcha copper project by Dominion Minerals Corporation.

Note: Petaquilla has a NI 43-101 mineable reserve of 1,115 million tonnes @ 0.5% Cu, 0.015% Mo and 0.09 g/t Au. Cerro Chorcha has a 2006 NI 43-1-1 compliant inferred mineral resource of 134.9 million tonnes @ 0.48 % Cu and 0.059 g/t Au (using a 0.2% Cu cut-off grade) or 70.5 million tonnes @ 0.68 % Cu and 0.095 g/t Au (using a 0.4% Cu cut-off grade). Bellhaven Resources has reported on 20 April 2009 that it has sold 100% of its interests in Cerro Chorcha to Dominion Minerals Corporation.

The timing for a possible evaluation and involvement in this project by GCR is spot-on. Panama is considered under explored and remains highly prospective, especially considering the relatively low level of mining and exploration activity prevalent in the last four decades. The copper porphyry belt extending from Costa Rica through Cerro Chorcha, Cerro Colorado and Petaquilla has the potential to become a world class mining field. The tectonic setting of this field has many of the elements seen in central Chile, and more discoveries are seen as almost inevitable. The country also boasts political and economic stability and a geographical location proximal to all major trading nations. During the current period of global economic recession (which has been felt sufficiently hard in this service-sector dominated economy to influence a major democratic change in government), it is entirely conceivable that the new administration may actively back the Cerro Colorado project development in the face of long established, ill-informed public opposition. This will require goodwill, cooperation and agreement with the Ngobe-Bugle Comarca, a semi-autonomous indigenous "government", which should be brokered by the national government for a sensible and expeditious result.

2.0 Location & Access

Cerro Colorado, the "red hill" is located entirely within the Ngobe-Bugle Comarca in the District of Remedios, Province of Chiriqui approximately 260km west of Panama City. It is situated on the southern flanks of the Cordillera Central, some 2 km south of the continental divide, approximately mid-way between the major regional centres of Santiago and David.

Access to the project area is via the western Panamerica Highway system from Panama City to the town of Tole (surfaced all weather roads), and gravel roads to Hato Chami and Cerro Colorado, some 33 km.

Figure 2.1 Cerro Colorado – 3D Regional Location Perspective (looking approximately west)
Note relative positions of Cerro Colorado to Petaquilla and Cerro Chorcha.

As part of Tiomin Resources' development project (see Section 4.0 Exploration History), a proposed port site at La Popa, in the Gulf of Chiriqui (Pacific Ocean), together with smelter site, tailings dams, concentrate pipelines and improved roads were envisaged for the development. Work on these was not commenced, but it is fair to surmise that any future development would have a somewhat similar arrangement (see Figure 2.4 overleaf).

The geographical coordinates of the Cerro Colorado project site, together with those of Petaquilla and Cerro Chorcha are as follows:

Cerro Colorado	8° 30' 23.93" N / 81° 47' 58.01" W (412 030 E / 940 886 N)
Petaquilla	8° 50' 02.26" N / 80° 36' 37.10" W
Cerro Chorcha	8° 36' 43.29" N / 82° 05' 24.30" W

Figure 2.2 Cerro Colorado Location Plan – Panama Provinces
Note Project located within Comarca Ngobe-Bugle

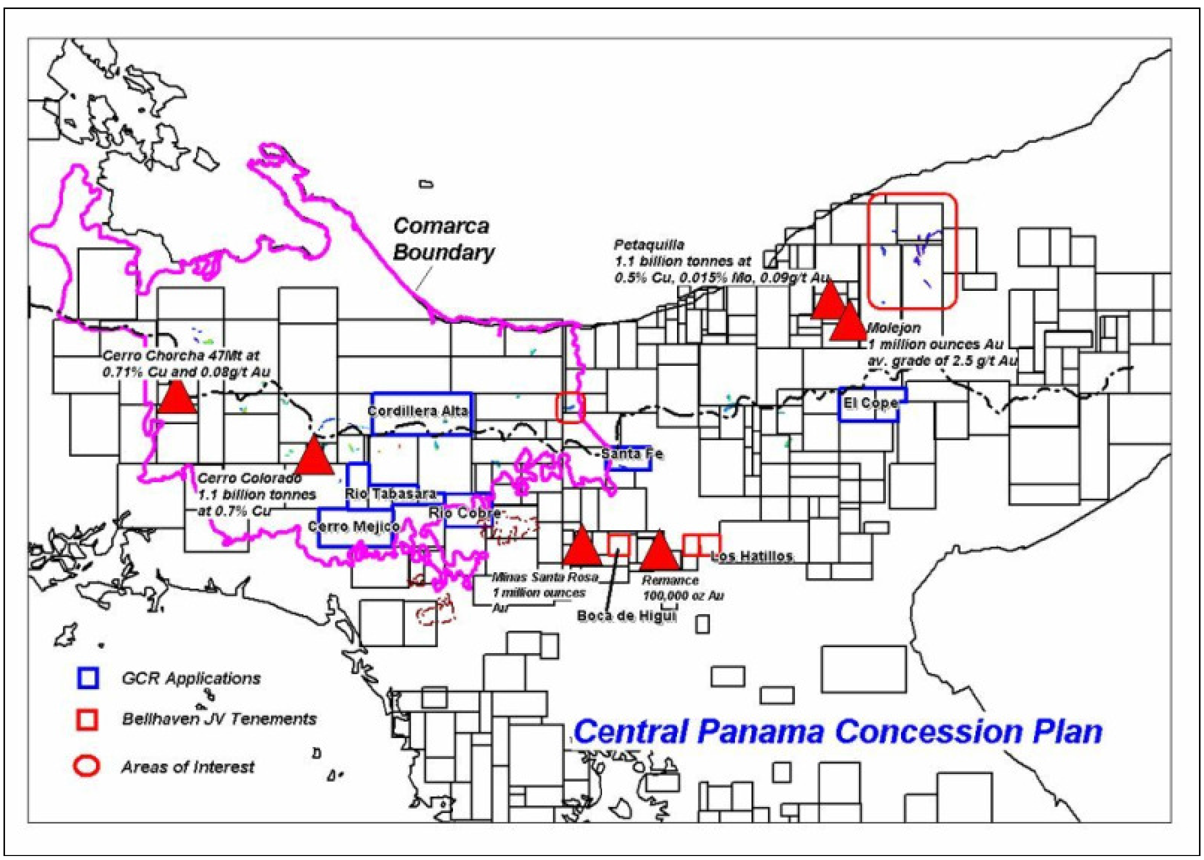


Figure 2.3 Cerro Colorado Location Plan – Concession Plan
The GCR concession applications are shown in blue, and major mineral projects in red.
(From Torrey, C., Panama Exploration Summary of Visit February 2008)

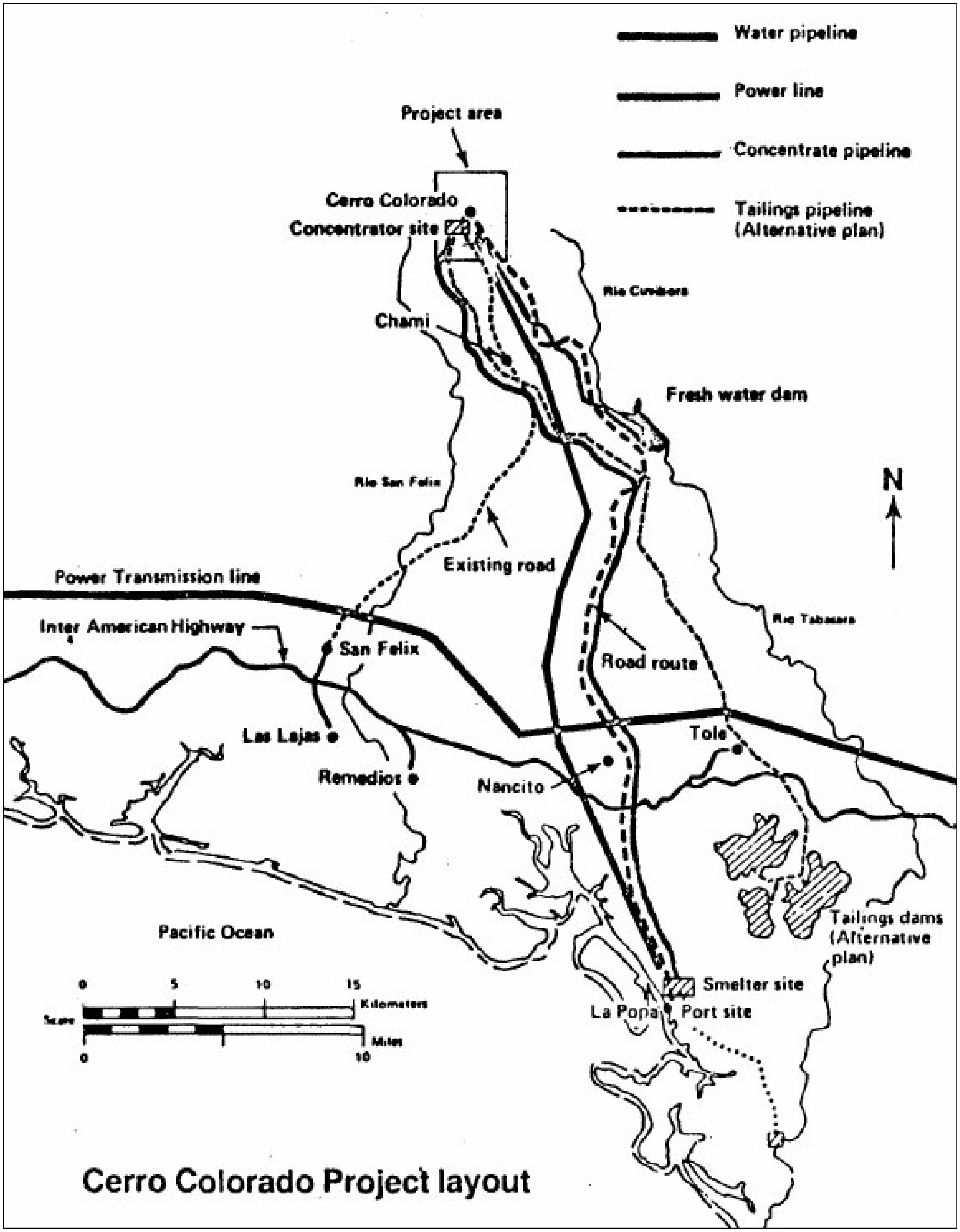


Figure 2.4 Tiomin Resources (1997) Cerro Colorado Proposed Infrastructure Layout (Source JOGMEC – Japan Oil Gas Metals National Corporation, 29 May 2008)

Figure 2.5 Aerial Photo of Cerro Colorado project location (looking NW)
Note steep topography, and sparsely vegetated terrain south of the continental divide.
(Source JOGMEC – Japan Oil Gas Metals National Corporation, 29 May 2008)

The elevation of the project area is approximately 1200 m.a.s.l., and is located on the Cerro Colorado and Rio San Felix 1:50,000 Instituto Geographico Nacional (Tomy Guardia) scale topographic plans.

The topography is relatively steep and rugged, and is sparsely vegetated with grasses, shrubs, and low thickets. It should be noted that the southern side of the cordillera is demonstrably less wooded than the northern Caribbean side, which is a consequence of climatic conditions (rain shadow) and human intervention (thousands of years of indigenous slash and burn agricultural practices, plus the more recent logging and farm clearing operations). Localised plantations of (non-native) pine species are common throughout the region and are usually brought about by cooperative ventures between local campesino landowner groups and the Panama environment agency ANAM.

As mentioned in the introduction (see Section 1), there is a sparsity of hard facts with all aspects of the Cerro Colorado project. From the available data we can only surmise that the existing roads to Hato Chami and the project site are usable to 4WD vehicles at least during the dry months of the year. Future developments will require a total revamp of existing infrastructure.

3.0 Tenure Details

The Cerro Colorado project is defined by the contract specific, Panama legislation of March 15, 1996 *(Ley Cerro Colorado, Contrato No.32 15/03/96)*, which granted an area of 2000 hectares in a single exploration concession (one zone) extending 4.0 x 5.0 kms to CODEMIN-Panacobre S.A.

The surrounding tenements are for the most part concession applications in the name of GeoMinas, a group belonging to Petaquilla Minerals Limited chairman Richard Fifer. It should be stressed that the tenure data is not up to date, and belongs to the MapIntec database (July 2008). These areas are all concession applications, except for area 93-70 (immediately south of Cerro Colorado), which is a Geominas area in “Reserve Status”. (This invariably means that the concession has been handed back to the state, and is in a period of moratorium prior to being made available to other parties). The concessions are mostly from the period 1992-1994, a period of 15 years without having been granted, and consequently not enabling the state to charge and receive cannon fees.

There is also GCR-MapIntec’s “Rio Tabasara” concession (2007-95) some 7.0 km east of Cerro Colorado (also an application), and MinAmerica Corporation’s (94-75-1) immediately to the north of 2007-95.

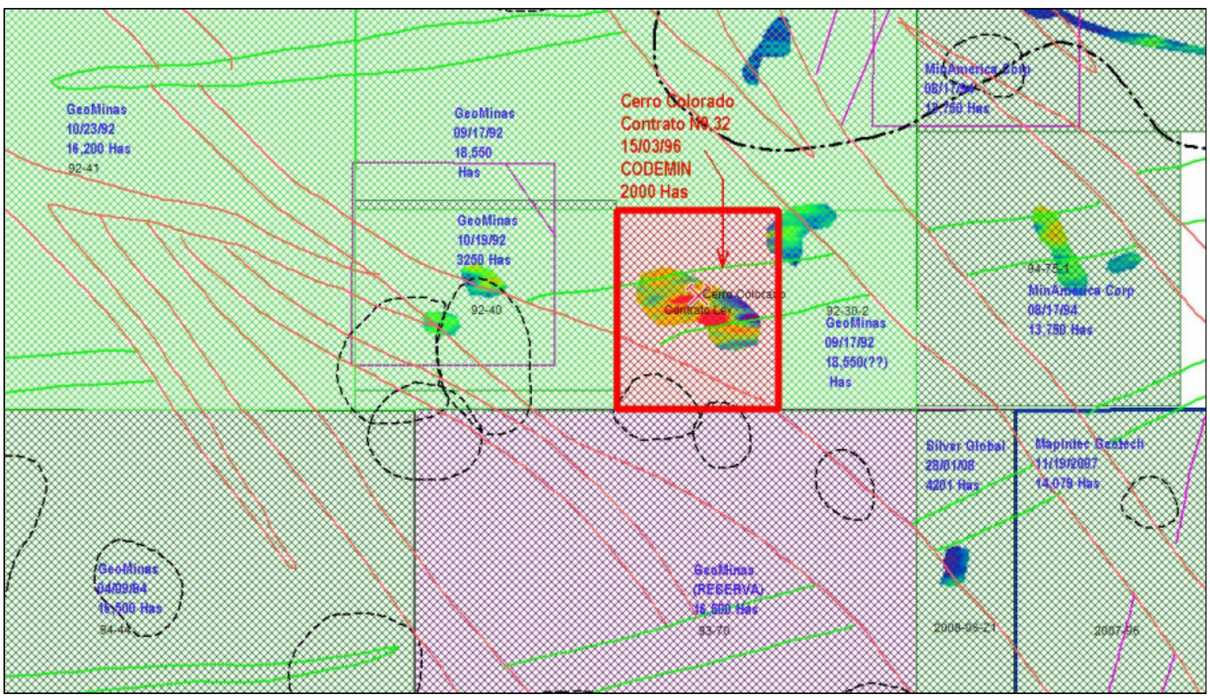


Figure 3.1 Tenement Map in the Cerro Colorado environs.
The Contrato No.32 concession extends over an area limited to 4.0 km x 5.0 km (2000 Has)
The Cerro Colorado project is shown as a discrete geophysical anomaly (high radiometric and low aeromagnetic signature).

4.0 Exploration History

The following exploration history summary is derived from a number of sources, most notable various JOGMEC reports (translated from Japanese), the Multinational Monitor May 1981, the USGS Minerals Information service yearly publications "The Mineral Industries of Central America - Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama", and the country-specific "The Mineral Industry of Panama", plus web pages for various exploration and mining companies. The various sources often have contradictory dates, so the history summary below is an approximation at best:

1932: The precise date for the discovery of the "red hill" low grade porphyry copper ore body is not known, but has been reported as early 1930's by several sources, and as 1932 by Geneva Gold Corporation (25/01/2007). Presumably this outcrop was featured in mining literature and known in mining circles, although no work was reported until 1970.

1970: Following the discovery of the Petaquilla copper mineralisation in the late 1960's by UNDP programmes and the tendering of the project to a Japanese consortium PMRD (Panama Mineral Resources Development Company), by the Panama government authorities, renewed interest was given to Cerro Colorado. Canadian miner and explorer Canadian Javelin, through its subsidiary Javelin Pavonia and POFIRI (?) acquired the Cerro Colorado concession and began the exploration and drilling of the deposit.

1971: POFIRI explores the deposit.

1973: Noranda enters JV with Canadian Javelin and acquired a stake in the project. No further details available.

1974-1975: Canadian Javelin breaks negotiations with Panama government over project concessions. It is reported that the breakdown was caused by Javelin's insistence on "too high a stake" in the project (Multinational Monitor May 1981). We may presume from this that the Panama government wished to maintain a degree of control in the project unacceptable to Canadian Javelin.

1975: Government of Panama (bought Javelin's interest in the project?) and formed a state owned enterprise CODEMIN (Corporación de Desarrollo Minero).

1976: CODEMIN signs new agreement with Texasgulf Inc for the development of Cerro Colorado. The new enterprise is 20% Texasgulf : 80% CODEMIN and a new development company "Empresa de Cobre Cerro Colorado" is formed. Details of this venture are shown on Figure 4.1 (see overleaf). Texasgulf takes over the duties of completing a feasibility study.

1976-1979: Texasgulf continues exploration and development programmes aimed at completing a feasibility study.

1979: Texasgulf completes feasibility study and presents this to Panama government. Texasgulf withdraws from the project (reportedly due to a cyclical slump in the world copper prices. The Multinational Monitor clarifies this position stating that Texasgulf was unwilling to undertake further feasibility studies which the World Bank insisted on as a precondition for lending financial assistance to the project.

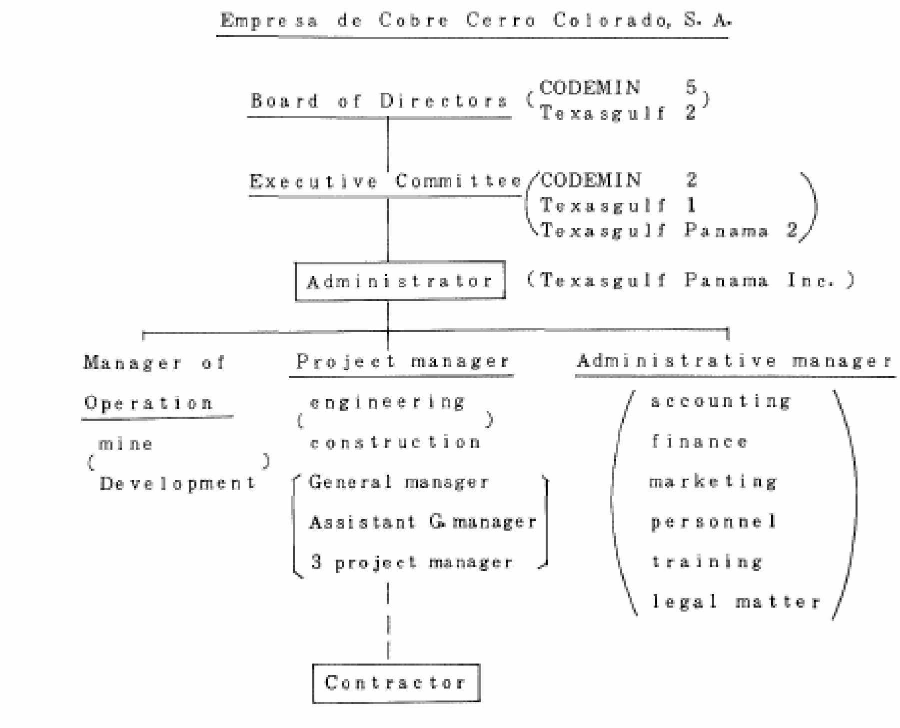


Figure 4.1 Company structure of 1976-1979 Empresa de Cobre Cerro Colorado

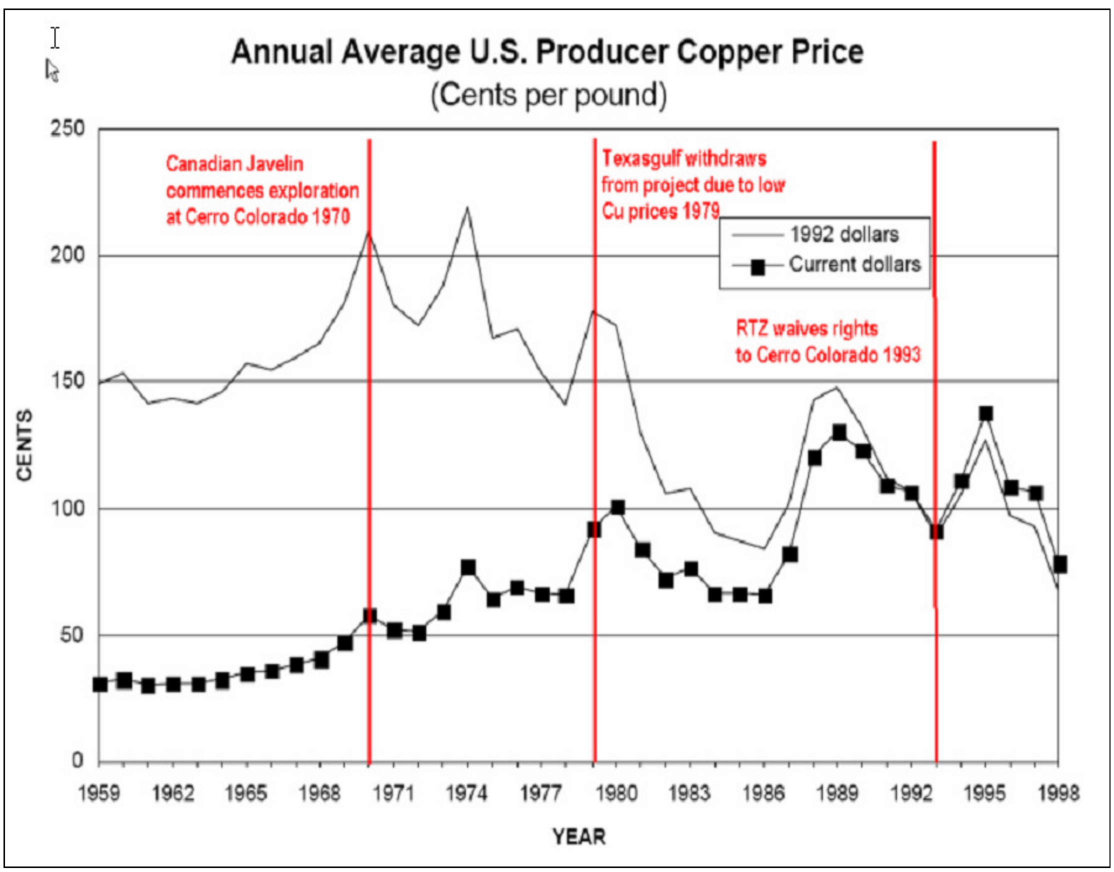


Figure 4.2a Exploration history of Cerro Colorado in context of copper prices and stocks (graph source: EXCO Resources Ltd., 2008)

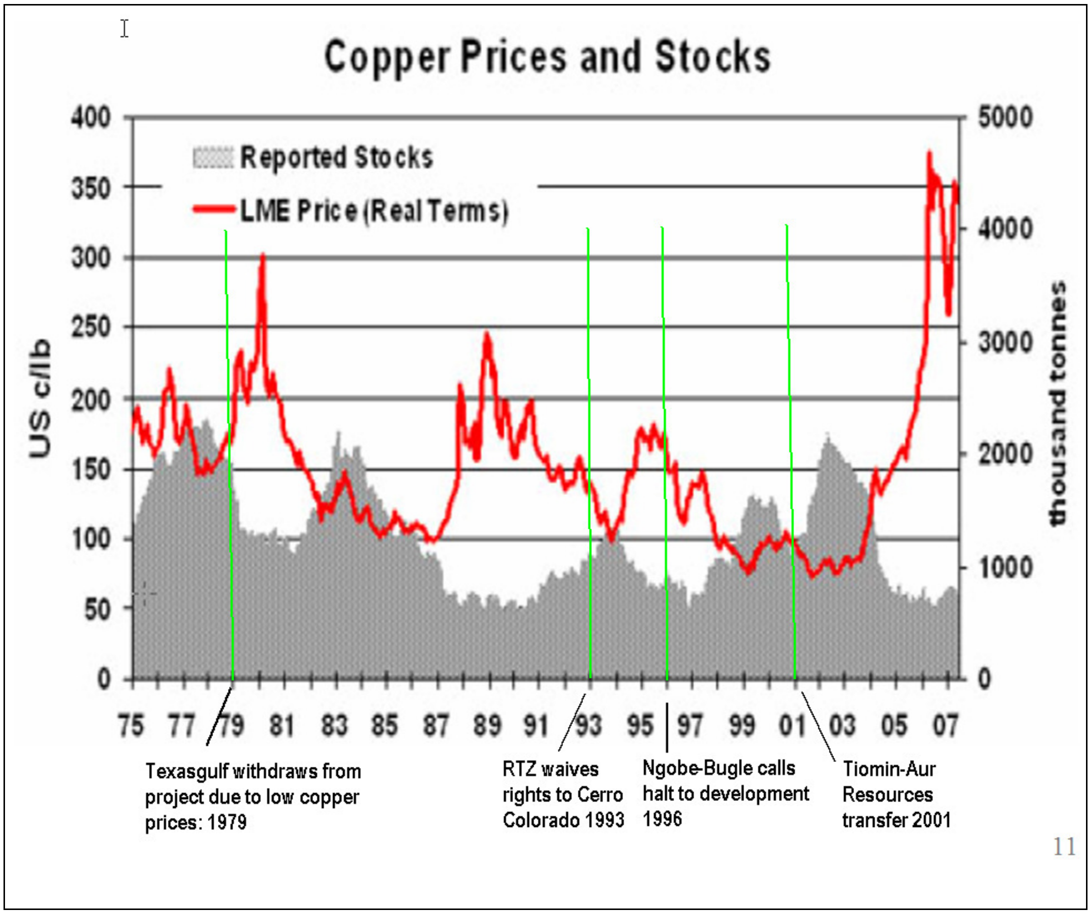


Figure 4.2b Exploration history of Cerro Colorado in context of copper prices and stocks (graph source: EXCO Resources Ltd., 2008)

1980: In May 1980, the Panama government selected the British-based mining conglomerate, Rio Tinto Zinc (RTZ), to replace previous investor Texasgulf Inc. and take up a 49 per cent shareholding in Cerro Colorado. RTZ is a world class, multinational and the largest, diversified private mining company in the world.

1981: RTZ submits feasibility study to Panama government (??)

1981-1993: RTZ management of Cerro Colorado continues (?)
Issues of profitability, infrastructure and environment: Development will not “crystallise” for RTZ (source Jogmec).
NGO Comarca-support organisations reported these issues as follows…

“…For example, RTZ was forced to put on-hold its huge Cerro Colorado copper project in Panama during the mid-1980s). International support for the Guaymi Congress in its struggle to gain land-rights (comarca), combined with opposition from Panamanian Bishops and CEASPA, the country's leading radical think-tank on development, proved too much for the top brass at St. James's Square. "We have had more opposition to this project than anything else we've done," confessed RTZ chair, Sir Anthony Tuke, to a private meeting with members of Survival International: "It is really astonishing". Nonetheless, RTZ continued to hold 49% of the mine's equity, pay the salaries of workers from the state mining company, Codemin, and keep a substantial contingent of its own staff in and around the "copper mountain" …”

1992-1993: CODEMIN (and RTZ?) attempting to sell development rights to Cerro Colorado. Again, due to environmental and indigenous problems these plans are thwarted.

1993: RTZ "waives its rights to the project". It was otherwise reported as "… Rio Tinto was abandoned in the interests of the project." Thus CODEMIN exercised its control over the project and found cause to dismiss its partner.

1993: CODEMIN acquires 100% interest in Cerro Colorado Indigenous people demand a moratorium to development. The "Cerro Colorado Law" set up to safeguard a protection zone around Cerro Colorado.

1996: Panama government gave permission to Tiomin Resources Inc (through its subsidiary Panacobre S.A) for participation in the project. A detailed description of this deal is presented here (source Tiomin Resources 1996 Annual Report):

The Corporation's wholly-owned subsidiary, PanaCobre S.A., has executed an agreement (the PanaCobre Concession Agreement) with the Government of Panama whereby PanaCobre has been granted the right to, among other things, extract, beneficiate, transport, and sell copper from the Cerro Colorado mining concession in Panama. The PanaCobre Concession Agreement will be for an initial term of 25 years from the commencement of construction of the mine facility and will have three extensions at PanaCobre's option for 10 years, 5 years, and 5 years, respectively. The PanaCobre Concession Agreement provides for PanaCobre to, among other things,
(a) make payments at the time of execution of the agreement totalling US$3,000,000;
(b) fund a social programme for indigenous communities in the Cerro Colorado Property area within twenty-four months of the execution of the agreement, at a minimum cost of US$1,800,000;
(c) carry out a pre-feasibility study within twelve months of execution of the agreement at a minimum cost of US$1,500,000;
(d) pay US$3,000,000 upon presentation of a positive pre-feasibility study to CODEMIN;
(e) carry out a feasibility study within twelve months following presentation of a positive pre-feasibility study at a minimum cost of US$1,500,000;
(f) pay US$4,000,000 to CODEMIN upon completion of a positive feasibility study (which would be within twenty-four months of execution of the PanaCobre Concession Agreement), subject to PanaCobre obtaining necessary construction permits;
(g) commence construction of the mine within twelve months after payment of the amount referred to in clause (f)above;
(h) pay US$3,500,000 two years after commencement of construction of the mine;
(i) pay US$3,500,000 four years after commencement of construction of the mine; and
(j) pay US$25,000,000 to CODEMIN 15 years after commencement of construction of the oxide portion of the project or upon reaching commercial production of the sulphide portion of the project by conventional milling methods, whichever occurs first. Upon commencement of commercial production, the PanaCobre Concession Agreement provides for PanaCobre to receive 100% of net profits (as defined in the PanaCobre Concession Agreement) until payback of total capital invested plus interest. After payback, PanaCobre is entitled to 71% of net profits, reducing annually by 1% until PanaCobre's entitlement is reduced to 51%.

1996: Ngobe-Bugle calls a halt to the project. Tiomin continues with feasibility studies as per Panacobre Concession Agreement. In early 1997, the government of Panama granted this group an autonomous homeland that includes the Cerro Colorado project.

1997: Tiomin completed and presented a positive pre-feasibility study on the property. This was reported in a news release (see overleaf for details). The total contained copper resource on the property is estimated to be 32.5 billion pounds. The feasibility study on the SX/EW treatment of the upper supergene zone indicates a mine life of approximately 13 years, producing cathode copper at an average cost of US$0.49 per pound. This is based upon a capital cost of US$200 million, including pre-stripping and mine fleet with a leachable recovery of 650 million pounds of copper. The contract entered into by the Corporation and CODEMIN allows for possible revision to the terms of the contract should the price of copper decline to such an extent as to make the project uneconomic.

Tiomin Resources Inc. Initiates Full Feasibility Study At Cerro Colorado In Panama
TORONTO, March 17, 1997 –
Tiomin Resources Inc. is pleased to announce that it has completed the prefeasibility study on the Cerro Colorado copper project in Panama and is now proceeding with the full feasibility study. The feasibility study for this open-pittable ore body will address both the SX-EW (heapleaching) operation and the conventional milling operation. In accordance with the terms of the contract to develop Cerro Colorado, Tiomin presented the government of Panama with a $3 million US progress payment on March 15, 1997.

Cerro Colorado is widely recognized as the twelfth largest porphyry copper deposit in the world today with a resource base estimated to contain over 40 billion pounds of copper. The prefeasibility study was based on the production, using SX-EW technology, of 50 million to 60 million pounds of cathode copper per year at an average cash cost of $0.47 per pound. This would be followed by a conventional milling operation which currently contemplates production of ore at 50,000 tonnes per day, yielding 300 million pounds of copper in concentrate annually at an average cash cost of less than $0.30 per pound. The comprehensive feasibility study will be completed by March, 1998.

1998: Tiomin submits feasibility study to Panama government (along with associated option payments). The results of this work were summarized by Tiomin as follows:

The feasibility study recently completed on schedule by a leading engineering firm, Kvaerner Metals Corporation, suggests a two phase approach for the development of the Cerro Colorado deposit.
Phase 1 consists of the development of a solvent extraction electrowinning (SX-EW) operation producing 60 million pounds of copper annually directly into cathode form, and which will have a competitive cash-cost profile averaging US$0.49/lb over a 13-year schedule. A pre-feasibility level study of the second phase of development of the large underlying sulfide deposit suggests Cerro Colorado can produce between 400 and 500 million pounds of copper annually in concentrate from a proposed 100,000-tonne-per-day conventional milling complex. Timing of the initiation of construction is predicated on the state of the copper markets and availability of project funding

In early 1998, the Corporation applied for a temporary freeze of contractual terms pending improvement of the copper mark. This resulted in a maximum five year extension of the terms of the agreement (up to 2003). This was detailed in a news release as follows:

May 11, 1998
Contractual Terms for Tiomin's Cerro Colorado Project Are Extended & Feasibility Study Completed
Tiomin Resources Inc. ('Tiomin') announced today that the cabinet of the Republic of Panama has approved a five-year extension for the Cerro Colorado contract. The contract covers the Cerro Colorado copper deposit, the worlds 12th largest, with a mineral resource in excess of 32 billion pounds of copper. The extension provides for a maximum five year suspension of the obligations to make a production decision and related payments required under the existing contract. These obligations will reactivate when the London Metal Exchange copper price remains above US$1.18 per pound for a period of 90 consecutive days.

1999: AUR Resources takes 26 month option to purchase Tiomin’s Panamanian subsidiary, Panacobre. This came about during a period in which Tiomin was commencing the development of its giant Kwale mineral sands deposit in Kenya, and had approximately US$20 million in cash. The project was viewed as uneconomic with the price of copper at $0.80/lb.This was reported in a news release as follows:

February 22, 1999
Tiomin Finalizes Funding Arrangement with AUR Resources
Tiomin Resources Inc. said today it has finalized the previously announced financing arrangement with Aur Resources Inc.. The two-year, US$2.0 million loan will provide Tiomin with the funding to complete a bankable feasibility study on

its Kwale titanium mineral sands project in Kenya. As consideration for providing the loan, Tiomin has granted Aur Resources a 26 month option to purchase its Panamanian subsidiary, PanaCobre S.A which holds the Cerro Colorado porphyry copper deposit in Panama, for an initial consideration of $US 4.0 million payable upon the exercise of the option plus an additional $US 10 million payable upon the start of commercial production. The transaction has received Panamanian government final approval.

2001: AUR Resources completes its option agreement with Tiomin, and acquires Panacobre S.A. This extraordinary event was reported in a news release as follows:

February 23, 2001
Tiomin Resources Transfers Cerro Colorado Copper Project To Aur Resources Inc.
For Value Of US$2.3 Million Tiomin Resources Inc. announced today that under the terms of the loan and option agreement between Tiomin Resources Inc. and Aur Resources Inc. dated December 24,1998, Tiomin has elected to transfer the ownership of its wholly-owned subsidiary, PanaCobre SA, to Aur Resources Inc. in full satisfaction of the US$2.3 million loan made by Aur to Tiomin. PanaCobre SA owns the Cerro Colorado copper project, which has been dormant since 1998. Mr. Jean-Charles Potvin, President and CEO of Tiomin stated "the development of Cerro Colorado has not been a priority for the Company over the past three years and with the price of copper continuing to languish around US$0.80 per pound the project is currently uneconomic. Tiomin is very excited about its Kwale mineral sands project in Kenya and will continue to focus on the development of this titanium project.

2001: AUR Resources releases new estimate of ore reserves:
1,186 million tonnes @ 0.634% Cu, 4.82 g/t Ag, 0.096 g/t Au & 0.014% Mo

2003: The AUR Resources exploration option extension period (granted to Tiomin in 1998) expired on March 2003. The concession rights reverted back to CODEMIN

2003: CODEMIN once again gains 100% ownership of the Cerro Colorado project. CODEMIN plans to implement an international competitive bidding on the project.

2008: DGRM (Direccion General de Recursos Minerales) reiterates that it will implement an international bidding for the Cerro Colorado project.

5.0 Regional Tectonic Setting

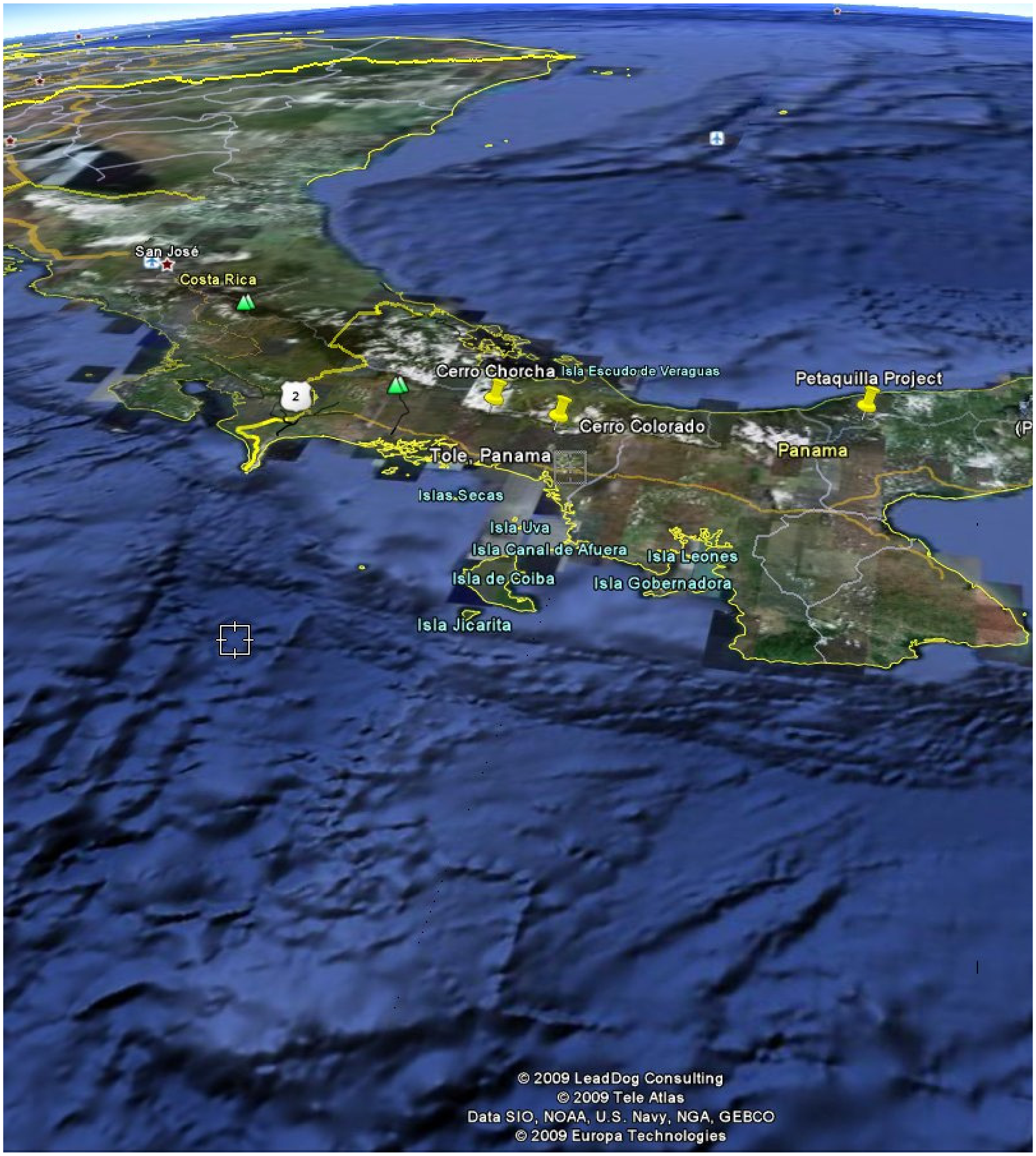


Figure 5.1 Google Image showing tectonic setting of Panama with positions of major copper porphyry deposits indicated with yellow markers.

An amusing introduction to the tectonic setting in Panama is provided by Pratt, T, L., et al in "High resolution seismic imaging of faults beneath Limon Bay, northern Panama Canal, Republic of Panama", Tectonophysics, 2003.

The Isthmus of Panama occupies a complex tectonic setting between the South America, Nazca, Cocos, and Caribbean plates (see Figures 5.1 above, and 5.2 overleaf). *This complexity has made plate boundaries and recent tectonics of the Panama region difficult to discern, but there appears to be a rigid Panama Block caught between the* *four other plates. The Panama Block's location between two continents and two oceans has made it important for scientific and economic reasons. The Isthmus of Panama has been critical to determining ocean circulation, to controlling the distribution of fauna, and to the modern transportation network. Uplift of the isthmus in the Late Miocene and Pliocene allowed the migration of animals between North and South America, and cut off the flow of water between the Atlantic and Pacific oceans. The isthmus has been a major transportation conduit since Spanish conquistador and explorer Vasco Nunez de Balboa first crossed it in 1513 and the 16th and 17th century Spanish hauled gold from Peru across the isthmus. More recently, the Panama railway was an immediate success when it opened in 1855, and the Panama Canal, completed in 1914, remains one of the world's major shipping routes. The seismic hazard in central Panama has been a topic of debate since planning was begun for a trans-isthmian canal, and the tectonic complexity and surprisingly low level of seismic activity continue to produce large uncertainties in seismic hazard evaluation in central Panama. The relative seismic quiescence of Panama, and a fortuitous volcanic eruption in Nicaragua, was a decisive factor for the United States selecting Panama as the site of the trans-isthmian canal. However, strong shaking has been documented frequently in Panama since the European settlement, the most severe being on September 7, 1882, the year the French began their unsuccessful attempt to build the Panama Canal. That event (M~8) struck the north coast of Panama, shut down the railroad for a week for repairs, extensively damaged the town hall, and collapsed one tower of the cathedral in Panama City. The associated tsunami killed about 70 people in the San Blas Islands north of the isthmus. Before the Panama Canal was turned over to the Republic of Panama on December 31, 1999, the authors were requested to help in an assessment of the seismic risk facing Gatun Dam at the north end of the canal. Gatun Dam impounds Gatun Lake, whose waters allow ships to cross the isthmus and allow the canal locks to operate. For this assessment, we carried out geologic mapping, installed a temporary seismic array, and acquired high-resolution seismic reflection profiles in the northern canal area….*

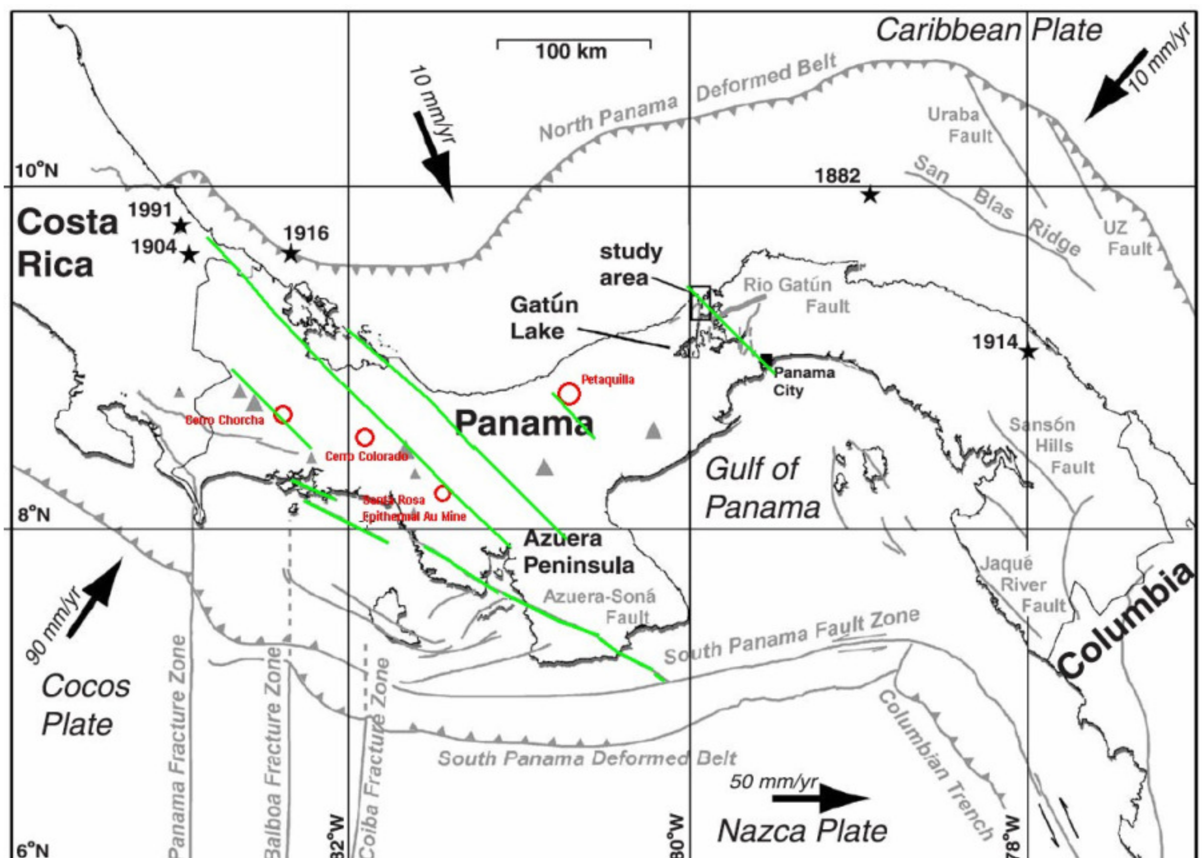


Figure 5.2 Map showing the tectonic setting of Panama with relative plate motions from Trencamp et al. (2002).Stars show locations of earthquakes, triangles on land are volcanoes, gray lines are faults with barbs on hanging wall. Green lines are fault positions transposed from other published metallogenic maps (and are approximate only). Red circles are the major Panama mineral occurrence locations.

Pratt continues in his description of the major tectonic controls affecting Panama:

The Isthmus of Panama is part of a Cretaceous to Holocene age volcanic arc formed in response to the subduction of Pacific oceanic lithosphere beneath the Caribbean plate in Central America. The southern portion of the volcanic arc lies on the Panama Block at the junction between the Cocos, Nazca, South American and Caribbean plates. The Panama Block is composed of Panama and southern Costa Rica, and seismic and geodetic studies indicate the western portion of the Panama Block is a rigid entity that is moving independently of the surrounding plates.

Subduction zones bound the Panama Block on the north and southwest sides, and complex fault zones bound the south and southeast. Along the west side of the microplate, the Cocos plate is being subducted along the southern portion of the Middle America Trench, which terminates at the Panama Fracture Zone). The south side of the Panama Block is formed by a left lateral transform boundary, comprising the South Panama deformed belt and the South Panama Fault Zone,, which accommodates eastward motion of the Nazca plate. Along the north edge of the Panama Block, the Caribbean plate is being subducted along the North Panama deformed belt (NPDB). An extensive accretionary prism along the NPDB has developed in response to the ~200 km of convergence since subduction started in the Miocene. The NPDB has been the source of large earthquakes in 1882, 1904, 1914, 1916, and 1991.

The southeast edge of the Panama Block, along the Panama–Colombia border, is the South America–Panama arc collision zone. This region contains a series of thrust and right-lateral strike-slip faults that are part of a deformation zone extending into South America. This region has accommodated 150–200 km of convergence since the Late Miocene and the collision is thought to have produced the distinctive 'S' shape of the isthmus. In southeast Panama, the collision is expressed as a series of northwest-trending thrust and left-lateral strike-slip faults, including the Sanson Hills and Jacque River Faults.

In contrast to the margins described above, the interior of the Panama Block is characterized by low rates of internal deformation, low rates of seismicity even at very small magnitudes and low topography. These features must be reconciled with evidence that oceanic lithosphere has been subducted recently beneath the isthmus, as implied by the occurrence of recently active volcanoes at several localities along the Cordillera Central speculate that an oceanic spreading ridge has been subducted beneath the Panama Block, creating a "slab window" that lacks a subducted plate and its associated seismicity.

Pollard and Taylor ("Porphyry copper-gold systems from an exploration perspective: Applied aspects and field recognition skills – August 2006") succinctly summarise the broad scale structural and magmatic controls required for the emplacement of giant porphyry systems.

The main concepts thought to govern magmatic arc development in relation to subduction and major fault development are well covered in relation to intrusion centred copper-gold occurrences within the Pacific rim by Corbett and Leach (see Corbett C. J., and Leach T. M., 1997, "Southwest Pacific Rim Gold-Copper Systems: Structure, Alteration and Mineralisation"). *The basic principals are presented in* Figure 5.3 (see overleaf)*, but the important large scale structures controlling magmatic arc emplacement are the inboard, arc parallel to arc-oblique sutures that tend to be steeply dipping reverse faults, although many of them either commence life or develop into major transcurrent systems. The associated arc-normal to oblique transfer structures (cross faults) are suspected to represent zones marking underlying fractures in the slab segments. Intersections of the two temporarily associated systems are viewed as major candidates for batholith and associated cupola ascent.*

The basic concepts have considerable value in exploration and are reasonably easy to apply in reverse. Magmatic arcs, chains and lines of intrusions are marked upon readily available maps at both local, regional and global scales. It is worth noting that not all magmatic arc systems, including those with known major porphyry copper systems are well documented or well understood. Some relatively greenfield arc systems are only superficially explored….

The above synthesis is a well accepted view on the controls of Pacific-Rim porphyry emplacement. These concepts are routinely used for broad scale targeting, and provide valuable tools in formulating exploration strategies. There is a further dimension to the targeting whereby geologists can search within time domains, metallogenic provinces and specific lineaments.

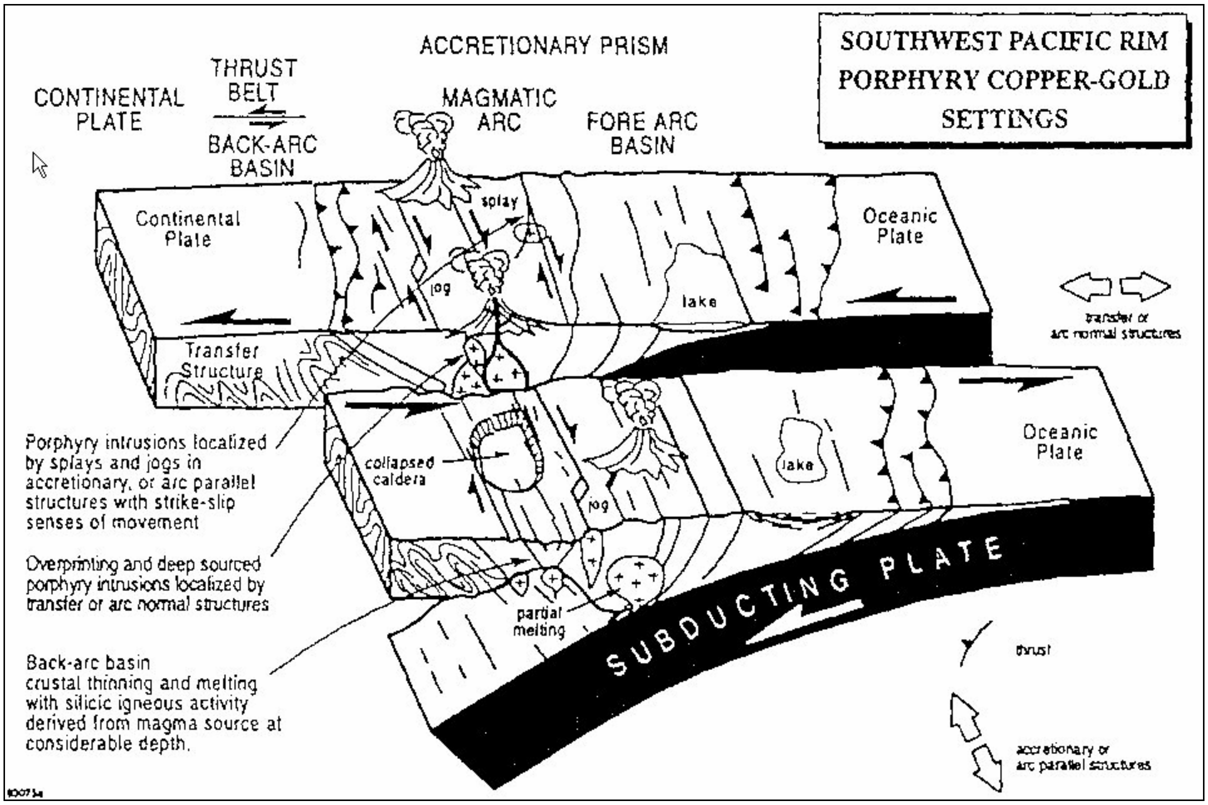


Figure 5.3 Structural settings for the emplacement of porphyry copper-gold (
(from Corbett & Leach, 1997 Southwest Pacific Rim Gold-Copper Systems)

It is not the purpose of this memorandum to arm-wave or draw lines on maps which highlight new areas to explore within Panama. Rather it brings together a series of accepted concepts developed in areas well documented (eg the SW Pacific – Grasberg, Ok Tedi, and the central Andes of Chile) to an area which is poorly documented and certainly under explored.

There is limited availability of age information, which has been reported by Clark et al (Canadian Javelin):

A. H. Clark, E. Farrar, and P. Kents, " Potassium-argon age of the Cerro Colorado porphyry copper deposit, Panama"
Economic Geology; October 1977; v. 72; no. 6; p. 1154-1158

Kesler *et al* conducted a Panama-wide study in which petrographic, chemical, and radiometric age data on the intrusive belts was correlated to the distribution of known copper mineralisation. This report is appended in a zip file, whilst the abstract is copied below:

S. E. Kesler, J. F. Sutter, M. J. Issigonis, L. M. Jones, and R. L. Walker, "Evolution of porphyry copper mineralization in an oceanic island arc; Panama"
Economic Geology; October 1977; v. 72; no. 6; p. 1142-1153

Petrologic, isotopic, and radiometric studies of intrusive rocks in the Panamanian oceanic island arc indicate that magmatism and associated porphyry copper mineralization were episodic and that they exhibit systematic compositional changes. The earliest stage of igneous activity took place about 60 to 70 m.y. ago and involved emplacement of quartz diorites with tholeiitic chemical characteristics, which did not form porphyry copper mineralization. Later magmatism was calc-alkaline in character and commenced with 50 m.y. quartz diorite and K-poor granodiorite. Later events at 35 m.y. and 5 m.y. emplaced granodioritic intrusions that are more potassic than their local predecessors. Porphyry copper mineralization was most intense and most widespread during the last intrusive event.

Comparison of the Panamanian results with information on other island arcs indicates that porphyry copper mineralization is essentially absent from earliest stage, tholeiitic(?) intrusions and, with few but prominent exceptions, becomes more important in successively younger stages of arc evolution. Not all arcs exhibit potassium-enrichment trends like Panama, and late-stage quartz diorite-type porphyry copper deposits can develop. Shoshonitic or alkaline porphyry copper deposits, though absent from the tholeiitic phase of arc evolution, can form at any time during the calc-alkaline stage. Gold values are high in shoshonitic and possibly in quartz diorite-related calc-alkaline porphyry copper deposits, and molybdenum appears to be most abundant in granodiorite-related calc-alkaline deposits

David Shatwell has been a long term exponent of the importance of crustal thickness and subduction geometry to the presence of metallogenic belts. Most of his work emphasises the hypogene deposits of the Andes, as these deposits are linked in space, time and genesis to the Andean subduction system. (See Shatwell, D., "South American Gold Deposits" 1997). There is also a most interesting paper presented at the Ishihara Symposium which merits a look (also attached).

Shatwell, D. "Subducted Ridges, Magmas, Differential Uplift, and Gold Deposits: Examples from South and Central America"
The Ishihara Symposium: Granites and Associated Metallogenesis

Excerpts from this paper appear below:

Magmatic-related Au-Ag deposits of similar age and type in magmatic arcs along convergent margins are not uniformly distributed, but are longitudinally grouped in "gold-rich" regions separated by segments containing few deposits. The nature of the oceanic lithosphere which is being subducted at a convergent margin may influence the rate of uplift and hence the topography of the overlying magmatic arc, through changes to the angle of the subduction zone. Subducted young/warm/light oceanic lithosphere will tend to flatten at about 100 km depth, cause rapid uplift of the overlying crust, modify magma chemistry, and eventually close down magmatic activity. It may result in destruction (by erosion) of existing Au-Ag deposits, and exposure of underlying porphyry systems; conversely, erosion during the cooling cycle of magmatic bodies may promote the formation of large magmatic-related gold deposits at higher levels. This paper examines such processes in Costa Rica and in the Central Andes.

Metallic mineralisation in Costa Rica and other Central American countries is associated with a Miocene magmatic arc emplaced above Cocos Plate oceanic lithosphere which is being subducted eastward below the Caribbean Plate. Mineralisation in Costa Rica is hosted by ca. 6 Ma calcalkaline volcanics and related domes and plutons, overlain in western Costa Rica, by <2 Ma post-mineral volcanic rocks and active volcanoes (Bagby et al., 1987).

The mineralised belt is divided longitudinally into three zones with contrasting metallogenic characteristics.

1. An 80 km low sulfidation gold belt in western Costa Rica. Deposits have been in intermittent production since 1824, mostly from single-vein underground mines. In recent years, large low grade resources have been delineated at the Bellavista and Las Crucitas deposits – in the latter case, 93 Mt, 1.03 g/t Au. Bagby et al. describe the gold veins as "Sado" type, but the association with vein Mn-Mg carbonates and the lack of adularia places them in the (subsequently-defined) carbonate-base metal class, formed by mixing of magmatic fluids with near-surface CO2-rich water (Corbett and Leach, 1998).

2. Adjoining the gold belt to the south east there is a 120 km belt of subeconomic polymetallic vein deposits, in which vein minerals include galena, sphalerite, pyrite, chalcopyrite, pyrrhotite, magnetite, and barite, but no significant gold.

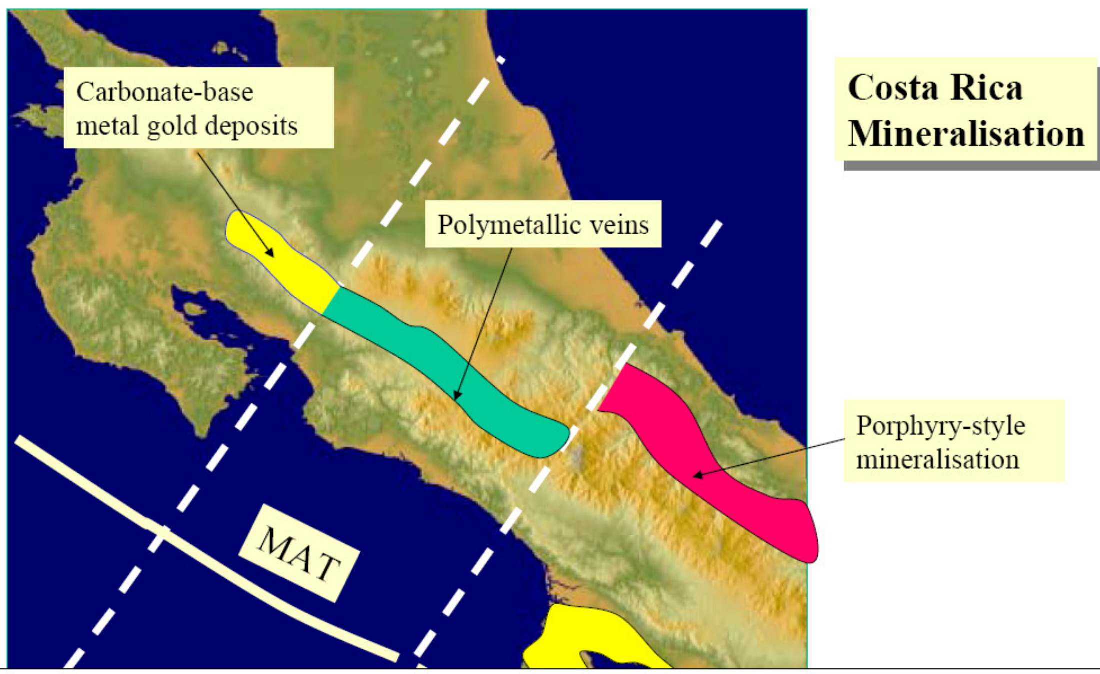
3. South east of the polymetallic zone there is a region of porphyry-style mineralisation at high elevations on the Talamanca Cordillera, extending into Panama. Bagby et al. list 24 porphyry-style occurrences, some of which contain chalcopyrite, molybdenite, secondary biotite, quartz-sericite-pyrite alteration, and sphalerite-galena-barite veins.
*The large **Cerro Colorado** deposit in Panama (1300 Mt, 0.8% Cu) may be part of this zone*

The "porphyry" belt (3) contains the highest part of the Talamanca Cordillera, with elevations above 2000m. There are no Plio-Pleistocene volcanoes, and a Late Miocene batholith is exposed. Offshore, there are no seamounts, but there is *an area of shallower water, where the Cocos Ridge and the Panama Fracture Zone are both being subducted. The Wadati-Benioff zone is absent in this segment (Johnson and Thorkelson, 1998).*

The boundaries between these three divisions are defined by pronounced arc-normal features, including elongated sea-floor ridges in the Cocos Plate, which extend onshore as topographic discontinuities and normal faults in the Caribbean Plate. The boundaries coincide with concentrations of shallow seismicity in both plates.

In segment 1, "smooth" ocean floor was generated at the north-trending East Pacific Rise. In contrast, the inbound seamounts (segment 2) and the Cocos Ridge (segment 3) originate at the site of an active mantle plume crest centred on the Galapagos Islands, situated just south of the east-west trending Nazca-Cocos ridge-transform system.
The seamounts and the relatively warm and buoyant Cocos Ridge first arrived at the Middle America Trench at <2 Ma, flattening the subduction zone and extinguishing volcanic activity. Segment 2 was uplifted and eroded to expose the polymetallic roots of the carbonate-base metal gold systems, while uplift in segment 3 was sufficient to unroof a large batholith and associated porphyry systems. Gold from the eroded Talamanca vein systems was re-deposited to the SW as placers in low-lying coastal regions of the Osa Peninsula.

I infer that ridge and seamount subduction played no obvious part in the origin of the gold deposits, but caused their subsequent destruction by erosion



Slide 9: Metallogenic subdivisions of Costa Rica. A late Miocene (ca 6 Ma) epithermal or carbonate base metal gold belt in NW Costa Rica – production since about 1820. To the SE, subeconomic polymetallic vein deposits, and then porphyry systems in the Talamanca Cordillera, extending SE into Panama. These correspond to differing degrees of uplift and erosion – the low-lying gold belt overlies "smooth" ocean floor, the polymetallic roots of these systems are exposed where seamounts are being subducted, and the porphyry systems are exposed in the Talamanca Cordillera, which is the region of strongest uplift above the subducted Cocos Ridge. The gold eroded from the former epithermal deposits in the Talamanca Cordillera now forms alluvial deposits on the Osa Peninsula

Fig 5.4 Shatwell, D. "Subducted Ridges, Magmas, Differential Uplift, and Gold Deposits: Examples from South and Central America

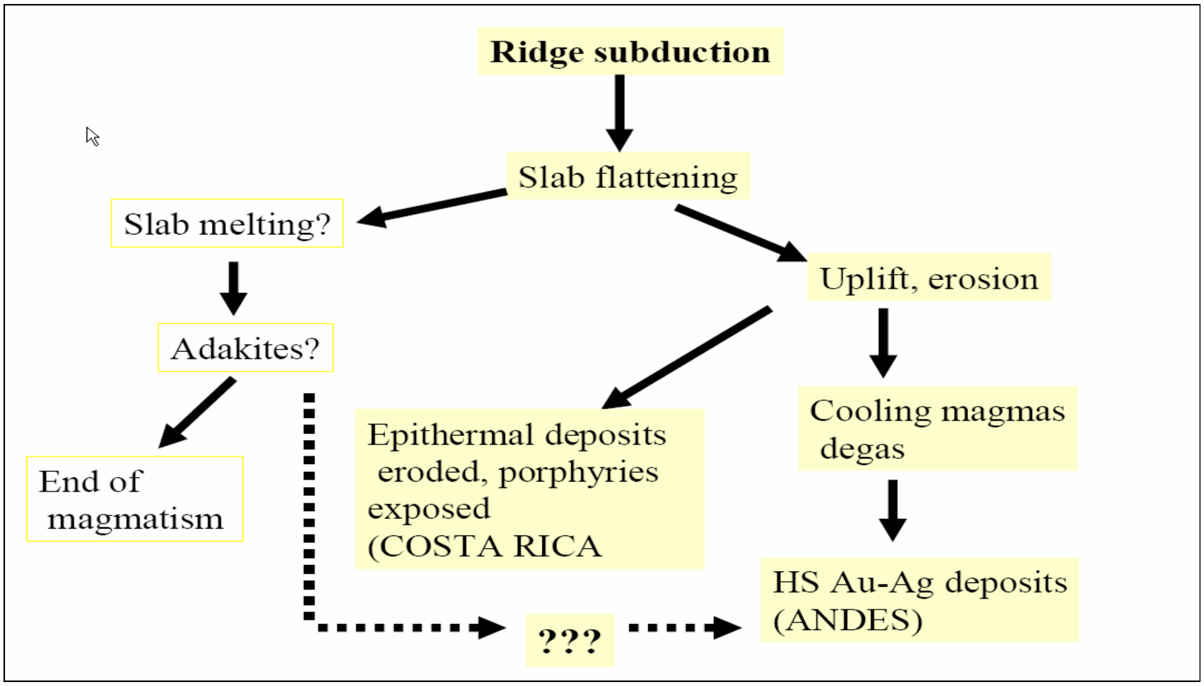


Fig 5.5 *Aseismic ridges propagate from mantle plume crests and are eventually subducted at convergent margins. Being younger and more buoyant than "normal" oceanic lithosphere, they cause the subducted slab to flatten. Oneeffect of this is to modify the magma chemistry by slab melting, (adakites) and ultimately extinguish magmatism. The other effect is to cause topographic uplift of the magmatic arc, (right side of the diagram, yellow boxes). Uplift may erode pre-existing epithermal deposits and expose porphyries (Costa Rica). But it may also be part of the magmatic ore forming process (Andes), especially in relation to high sulfidation gold-silver deposits.*

From: Shatwell, D. "Subducted Ridges, Magmas, Differential Uplift, and Gold Deposits: Examples from South and Central America

Another group of authors that highlight the association of low angle subduction of aseismic ridges, ocean plateaus or seamont chains with mineralisation (albeit with a different interpretation) are Hollings *et al* (see below). Hollings reports that six out of the seven giant copper deposits, and 13 giant gold deposits formed in the last 20 million years can be associated with such areas of low angle subduction aseismic ridges. He also reiterates the concept that giant porphyry deposits cluster within mineral provinces (eg, northern and central Chile host four of the five behemothian copper porphyry deposits, whilst many of the giant gold-rich porphyries are concentrated in the SW Pacific, such as Grasberg and Ok Tedi). Hollings also highlights the discrete temporal-groupings of the major deposits. Twenty-two of the largest copper-molybdenum porphyry deposits occur in three distinct time periods in the last 65 million years, with a high proportion less than 20 million years old.

Excerpts from Holling's paper reinforce the prospective nature of the Miocene magmatic arc in the western-central portion of Panama for the discoveries of other world class copper-molybdenum porphyries:

Peter Hollings[1], David R. Cooke[1], and John L. Walshe[2] "The characteristics, distribution and controls of giant porphyry copper deposits"*

[1] Centre for Ore Deposit Research University of Tasmania Private Bag 79, Hobart, Tasmania 7001Australia
[2] CSIRO Division of Exploration and Mining Kensington, WA 6151, Australia
** Current address – Department of Geology, Lakehead University,Thunder Bay, Ontario, P7B 5E1*

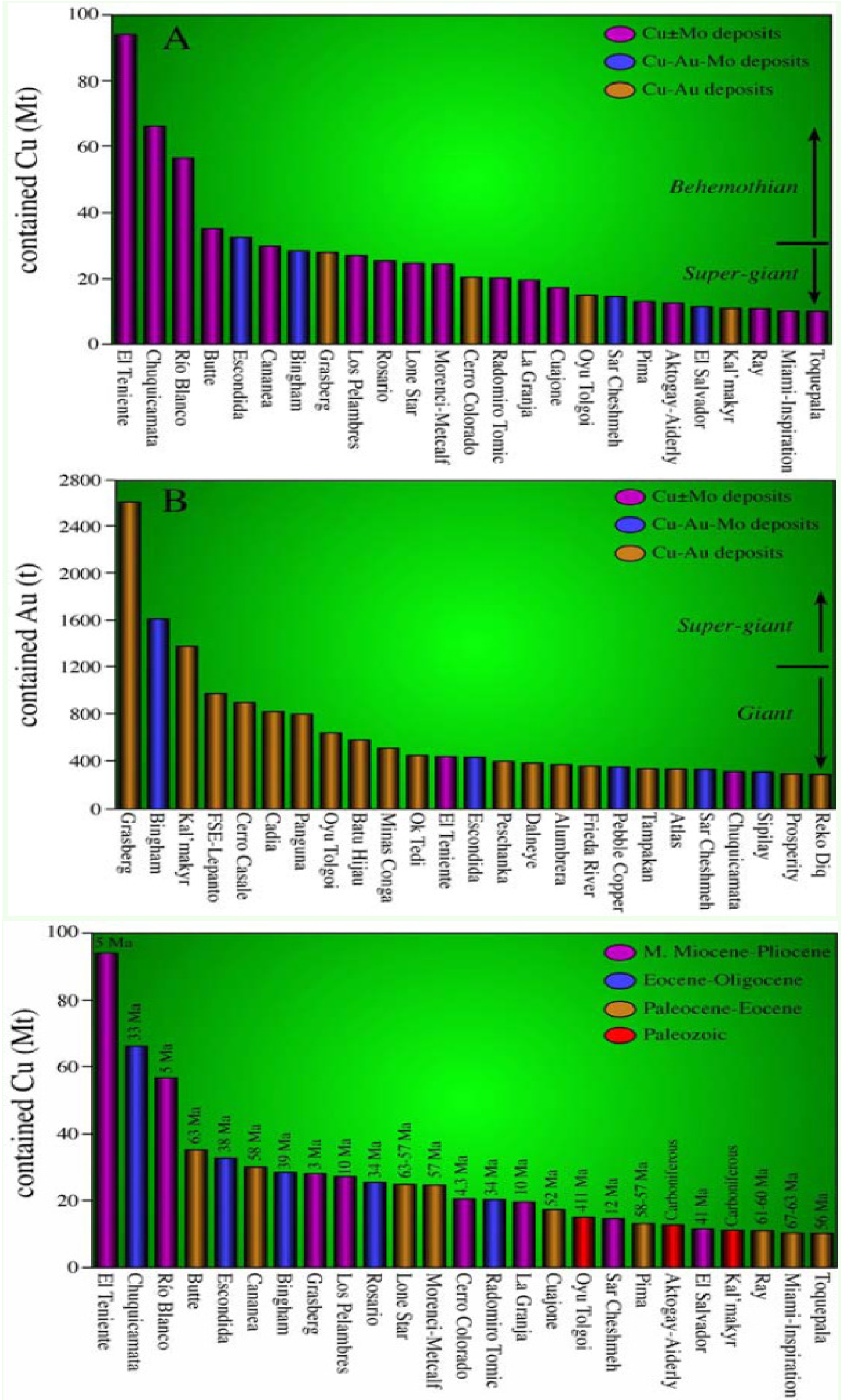


Figure 5.6 A - The 25 largest porphyry copper deposits based on tonnage of contained copper metal
B - The 25 largest gold endowed porphyry copper deposits based on contained gold metal
C - The 25 largest porphyry copper deposits subdivided on the basis of age

*A number of authors have emphasized that tectonic change is of critical importance for porphyry ore formation (e.g., Solomon, 1990; Sillitoe, 1997; Kerrich et al., 2000) with a compressional setting being preferred for copper porphyries (Sillitoe, 1998). The nature of the tectonic triggers for porphyry ore formation may be ephemeral in nature, but by examining the setting of young (<20 Ma) deposits it may be possible to identify potential triggers. In the last 15 million years, the formation of giant porphyry copper-molybdenum and copper-gold deposits around the circum-Pacific has been closely associated with regions where oceanic ridges, seamounts and/or oceanic plateaus have interacted with and/or been subducted beneath oceanic island arcs and continental arcs. In several examples, these tectonic perturbances have promoted flat slab subduction, uplift and erosion, crustal thickening and adakitic or adakite-like magmatism coeval with the formation of well-endowed porphyry and (or) epithermal mineral provinces (Cooke et al., in review). Similar events have been inferred to be associated with the older giant porphyry copper-molybdenum provinces of Northern Chile (Eocene-Oligocene) and SW USA (Cretaceous-Paleocene; Murphy, 2001). One of the better studied examples of a potential tectonic trigger occurs in Central Chile where a compressive peak through the Late Miocene into the Early Pliocene is associated with the subduction of the Juan Fernandez Ridge (***Figure 5.7***) which in turn caused slab flattening, crustal thickening, rapid uplift and exhumation (Kay et al.,1999; Hollings et al., in review). Ridge sub-duction resulted in the cessation of volcanism during the late Miocene-Pliocene coincident with the formation of giant porphyry copper-molybdenum deposits on the southern flexure of the flat slab. Similarly, further to the north, the ~4.3 Ma Cerro-Colorado copper-gold porphyry deposit (Kirkham and Dunne, 2000) is located at the point where the Cocos Ridge is being subducted beneath Panama and Costa Rica (***Figure 5.8***) and shares many tectonic elements with central Chile (Abratis, 1998; Cooke et al., in review).*

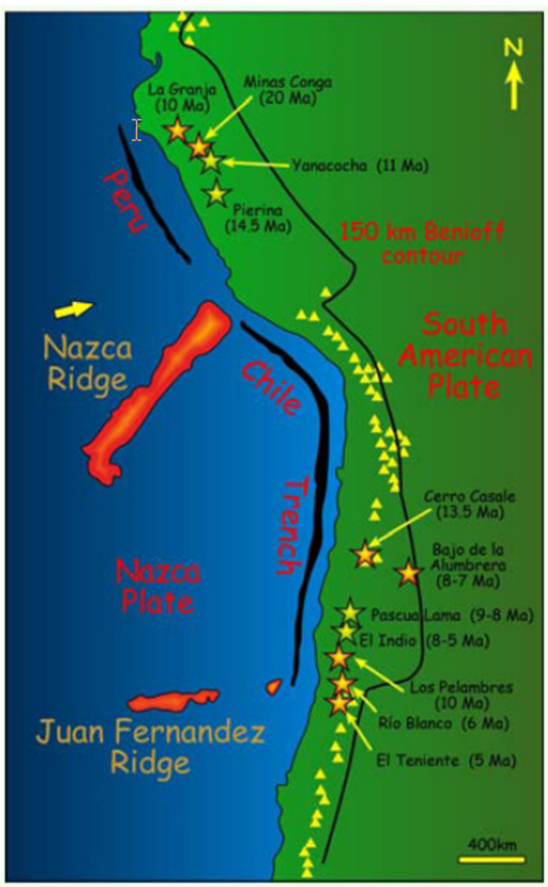


Figure 5.7

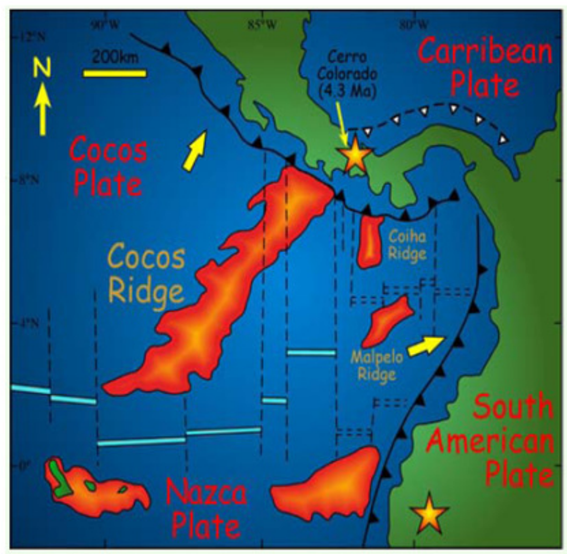


Figure 5.8

Map of the Andean Margin showing the spatial association of the giant ore deposits with regions of ridge subduction – Juan Fernandez Ridge Chile, Nazca Ridge Peru & Cocos Ridge Costa Rica and Panama.

Also shown are the surface projection of the 150km Benioff contour, the location of active volcanoes.

The flat slab segments are highlighted by gaps in active volcanism and coincide with an eastward jog in the 150km Benioff contour

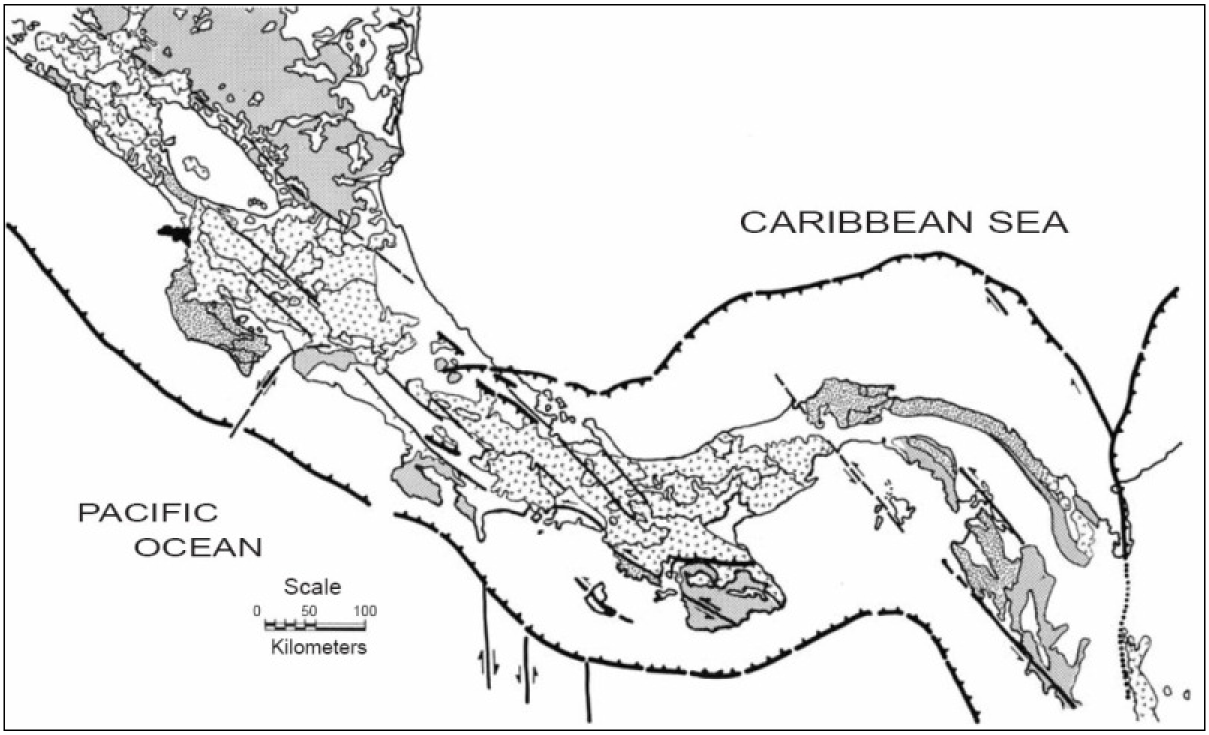


Figure 5.9 Geological Map of Central America (from Nelson, C., & Nietsen, F., 2000 – "Metalogenia de Oro y Cobre en America Central" in Revista Geologica de America Central v23: 25-41) Igneous rocks are divided into ultramafics (solid black), ocean floor (stippled), primitive arc (dotted), and calc-alcaline (v), and alkaline (dashed)

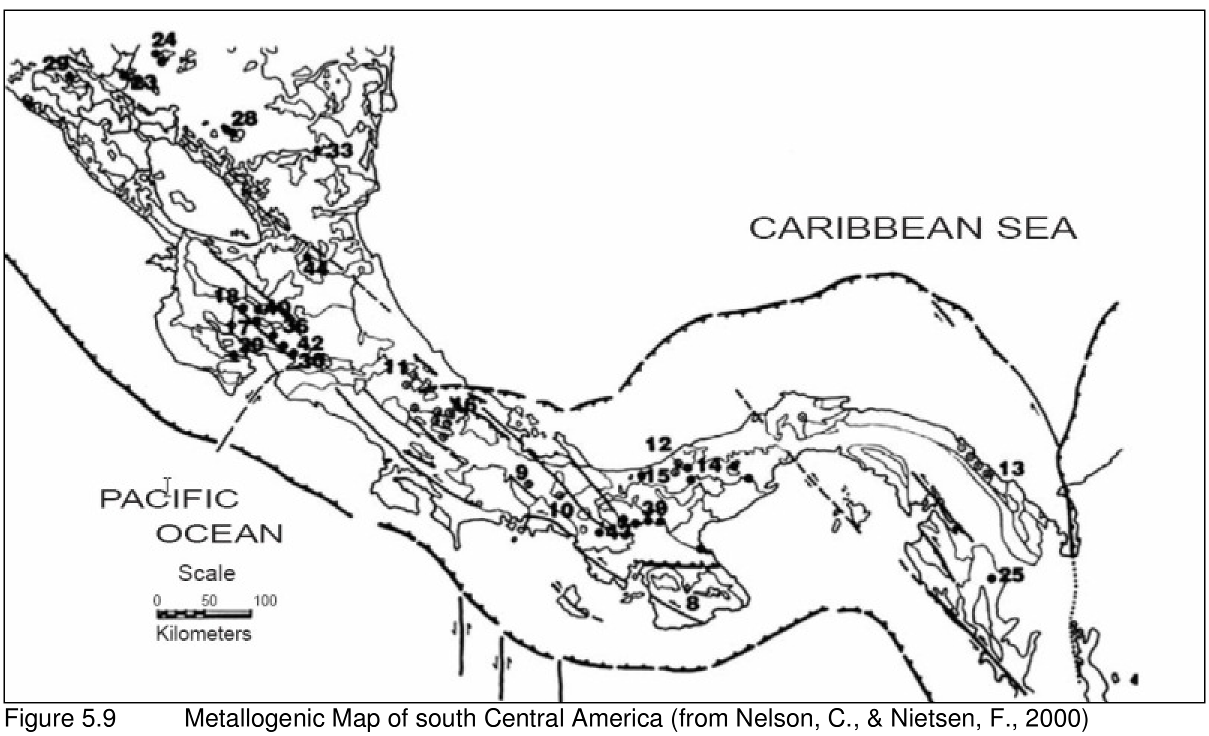


Figure 5.9 Metallogenic Map of south Central America (from Nelson, C., & Nietsen, F., 2000)

09-Cerro Chorcha	10-Cerro Colorado	12- Botija	13- Rio Pito
14- Molejon	15-Palmilla	25-Cana	39- Remance
43-Santa Rosa			

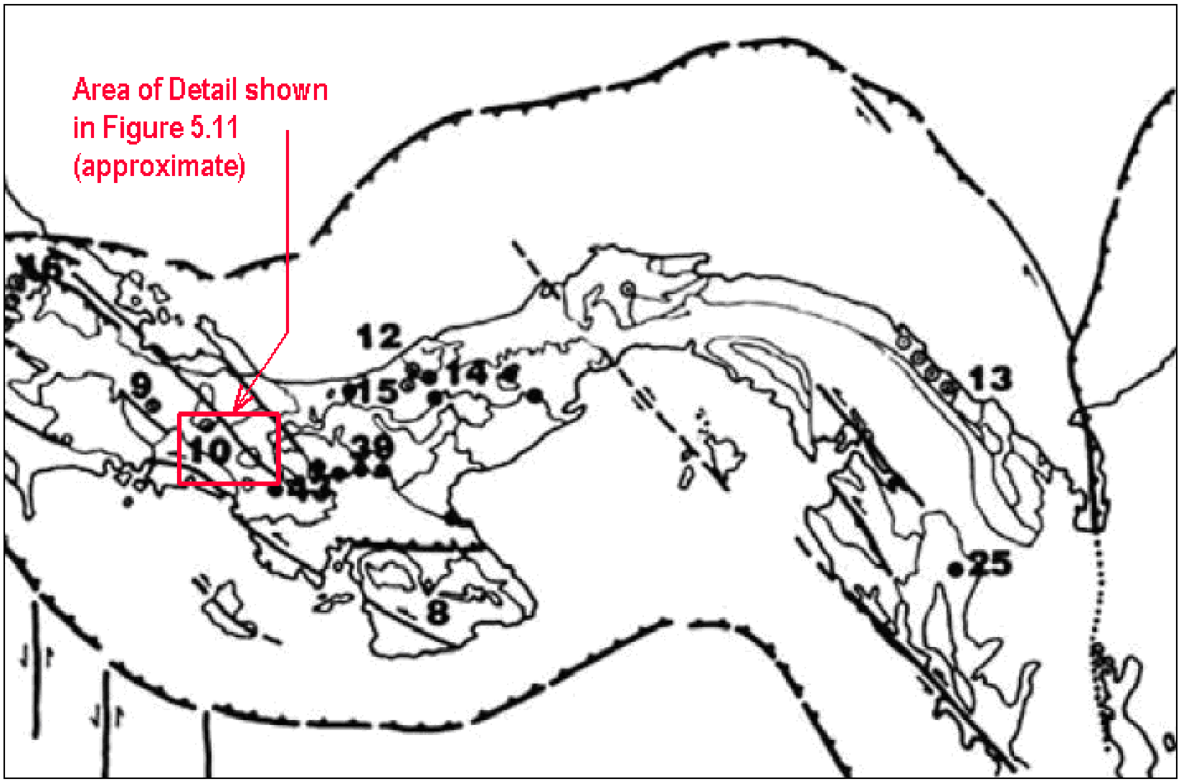


Figure 5.10 Detail from Figure 5.9

09-Cerro Chorcha	10-Cerro Colorado	12- Botija	13- Rio Pito
14- Molejon	15-Palmilla	25-Cana	39- Remance
43-Santa Rosa			

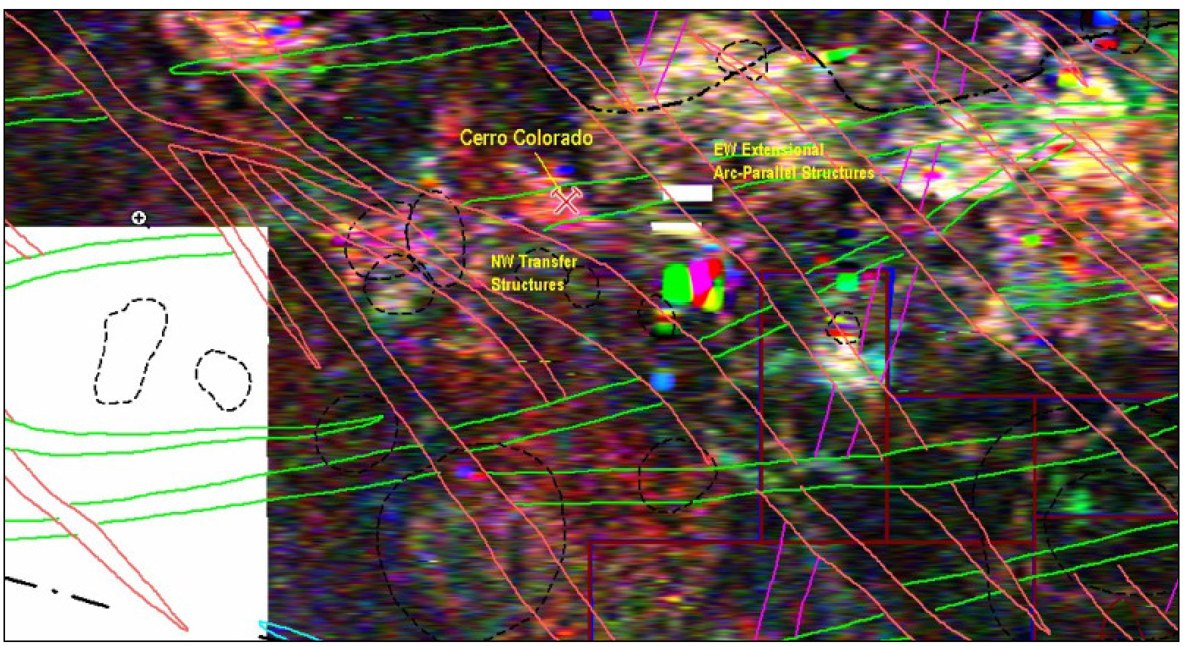


Figure 5.11 Interpreted structural setting at Cerro Colorado; (from Cyprus work based on Landsat imagery) superimposed on total count radiometrics.
Note that many of the structural elements described by Corbett & Leach, Taylor, Shatwell and Hollings are seen at in the vicinity of the Cerro Colorado deposit. Exploration programmes based on these criteria make targeting focused (eg calc-alkaline intrusives cropping out near the intersections of deep-seated NW-transfer structures and EW arc-parallel extensional structures and/or associated splays). There are a number of targets in this image that warrant a closer inspection.

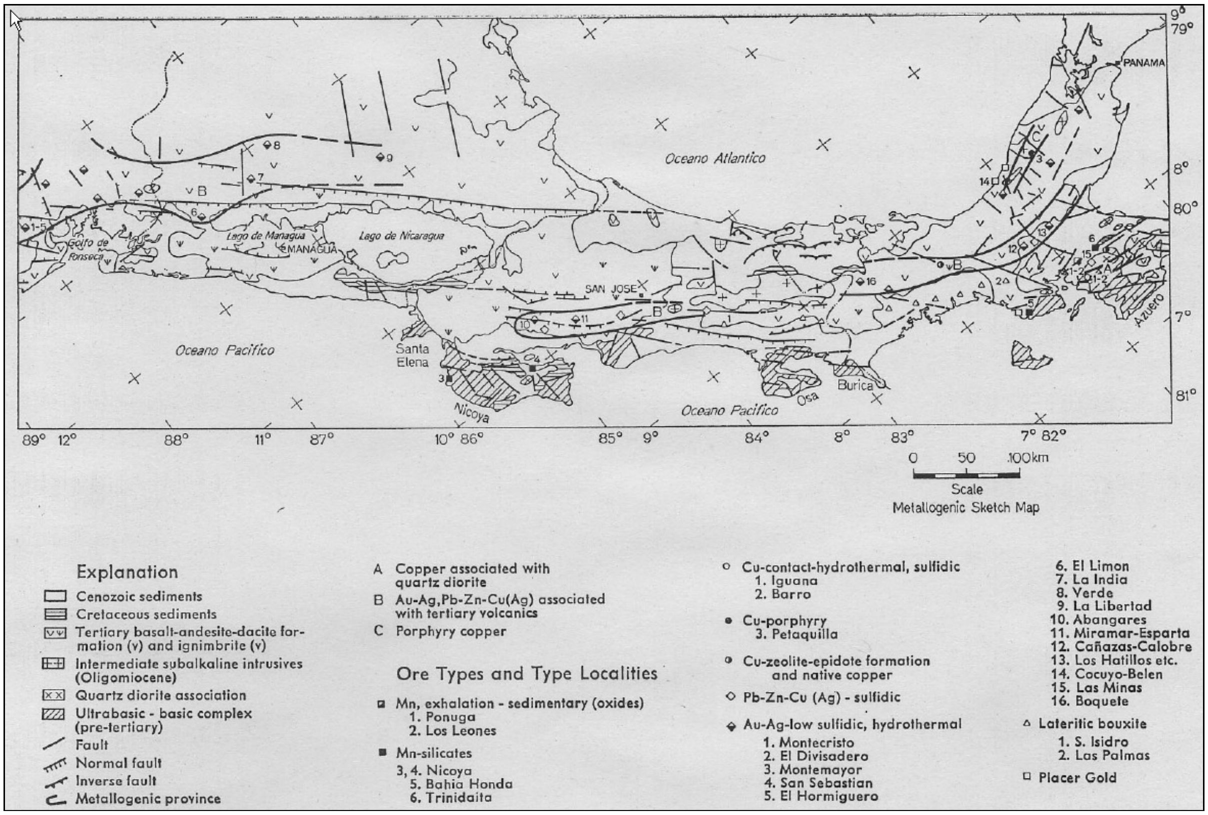


Figure 5.12 Metallogenic Map of Costa Rica – Panama (Ante Ferencic, 1971)
Early work based on UNDP regional mapping programmes – we can see that Ferencic's porphyry-epithermal metallogenic province coincides vaguely with Shatwell's "Segment 3" porphyry style mineralization province (see Figure 5.4)
It is also notable that the Petaquilla porphyries are differentiated from the younger Cerro Colorado metallogenic province.

6.0 Regional Geologic Setting

The following section on regional geological setting is sourced from Teck Cominco's NI 43-101 Petaquilla Project Technical Review:

Panama is a tectonically active area at the junction of four lithospheric plates. Consequently, south vergent subduction and related arc volcanism, high angle strike-slip and block faulting and north vergent thrust faulting are currently shaping the country (Mann, 1995). Western Panama and eastern Costa Rica are underlain by the Chorotega crustal block and share similar characteristics. This block in turn is underlain by a late Cretaceous to recent volcanic arc, constructed on a basement of late Cretaceous to Palaeocene oceanic crust and marine sedimentary and volcanic. Despite a relative paucity of exploration and geologic mapping, numerous areas of significant copper porphyry mineralization have been discovered, including Petaquilla, Cerro Colorado and Cerro Chorcha.

In the Chorotega block, the island arc sequence consists of several distinct pulses of volcanism, including Palaeocene-Eocene, mid-Oligocene, late Oligocene to early Miocene and Pliocene-Pleistocene, probably separated by times of plate reorganization (de Boer et al., 1995).

Intrusive rocks of the older suite lie along a tholeiitic trend on an AFM plot, but not one is known to contain porphyry mineralization (Kesler et al., 1977). Younger rocks are calc-alkaline in affinity and contain porphyry mineralization ranging from Oligocene (Petaquilla) to Pliocene (Cerro Colorado) age.

Middle Oligocene rocks in the Chorotega block, including the 400 km^2 Petaquilla batholith, range from gabbros to hornblende granites. The more northerly location of the Petaquilla batholith relative to the axis of the older arc suggests a flattening of subduction (de Boer et al., 1995). Plutonic rocks of Miocene and younger age are progressively more felsic and calc-alkaline, with an apparent increase in K_2O, evidently corresponding to the evolution of the volcanic arc over time (Kesler et al., 1977). DeBoer et al. (1995) note that Oligocene rocks typically exhibit negative zirconium anomalies, whereas the Miocene and younger rocks show positive zirconium anomalies. Despite these trends, intrusive rocks of all ages exhibit low 87Sr/86Sr initial ratios (Kesler et al., 1977), suggesting derivation from mantle wedge and slab, and emplacement into relatively primitive oceanic basement.

In the Petaquilla area, the oldest rocks are submarine andesite and basalt flows and tuffs, intercalated with clastic sedimentary rocks and reef limestones, of probable Eocene to early Oligocene age. The arc became emergent during mid-Oligocene time, with terrestrial flows and volcaniclastic rocks and lesser intercalated submarine tuffs. Miocene and younger rocks comprise the bulk of volcanic rocks in western Panama, and consist of both terrestrial and marine volcanic and volcanic-derived rocks of progressively more felsic composition.

Kesler et al in "Evolution of Porphyry Copper Mineralisation in an Ocean Island Arc: Panama" summarises the tectonic evolution of intrusive activity and porphyry copper mineralisation in Panama:

According to the petrologic and radiometric data summarized here, the evolution of the Panamanian arc can be divided into two stages, an early, possibly tholeiitic stage and a later, more complex, calc-alkaline stage (Figure 6.1). *The early tholeiitic stage took place about 60 to 70 m.y. ago and involved emplacement of diorite and quartz diorite batholiths in the Azuero and Cerro Azul areas. This intrusive activity did not generate significant porphyry copper mineralization. The close similarity in age and petrology of the Azuero and Cerro Azul areas suggests that they were originally part of a continuous zone. Support for such a correlation is found in the distribution of manganese mines and prospects along the north side of both areas. Case (1974) has shown that there are major discontinuities in regional geophysical parameters between the Azuero and Cerro Azul areas along which faults separating these two regions might* *extend. This Cerro Azul-Azuero zone probably extends north westward to include the geologically similar Sona, Burica, Osa, and Nicoya peninsulas along the west coat of southern Central America (Pichler and Weyl, 1975) and southward to include the Basic Igneous Complex of western Colombia and Ecuador(Goossens and R ose,1973).*

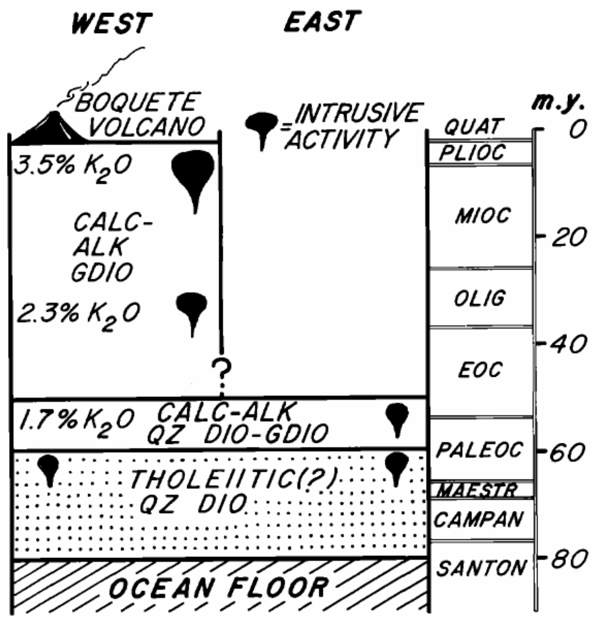


Figure 6.1 Schematic illustration of the evolution of magmetism and porphyry Copper mineralization in the Panamanian island arc (from Kesler et al, 1977)

The later calc-alkaline stage of Panamanian arc evolution began in Eocene time and is still underway. In eastern Panama, the earliest known intrusive activity took place along the Rio Pito-Navagandi trend and probably in the Sierra de Maje (Rio Guayabo). Porphyry copper mineralization which developed in both areas at this time, appears to be of limited economic interest.

Following development of the Eocene Rio Pito intrusive belt, the focus of magmatic activity in Panama shifted gradually to the west. Oligocene magmatism took place in the Petaquilla-Bocas del Toro area and to a lesser extent in the Sierra de Maje. Intrusive activity was apparently limited to the western part of this zone and formed important porphyry copper mineralization at Petaquilla. Subsequent Miocene volcanism was largely restricted to western Panama and, although Miocene intrusions are widespread to the north in Costa Rica (Pichler and Weyl, 1975), few such intrusive rocks and no related porphyry copper deposits have been recognized in Panama. Pliocene and younger volcanism, which was also largely restricted to western Panama, produced the zone of intrusions along the crest of the Serrania de Tabasara and formed extensive porphyry copper mineralization at Chorcha, Cerro Colorado, and elsewhere.

The regional aeromagnetics and radiometrics geophysical surveys conducted by Cyprus in the late 1990s over the Cordillera Central region of Panama are included in the MapIntec database acquired by GCR in 2007.

On a regional scale these are excellent tools for delineating intrusive centres, major structural elements and the relationship of mineral occurrences with geophysical signatures.

Figure 6.2 (see overleaf) shows the potassium radiometrics overlain by mineral occurrences. We can clearly see a range of intrusives extending between the Petaquilla mineral field to Cerro

Colorado and Cerro Chorcha. It is also evident that the mineral deposits fringe the larger batholiths and are hosted in satellite stocks and plutons. The association between major NW-trending deep-seated structures and the deposit locations is also suggested in these images.

Detailed Landsat imagery interpretations commissioned by Cyprus during this period (but completed prior to the release of the aeromagnetics and radiometrics) established a close association of mineralisation with the following:

- NW-trending major structures
- EW-trending extensional structures
- Intrusive centres

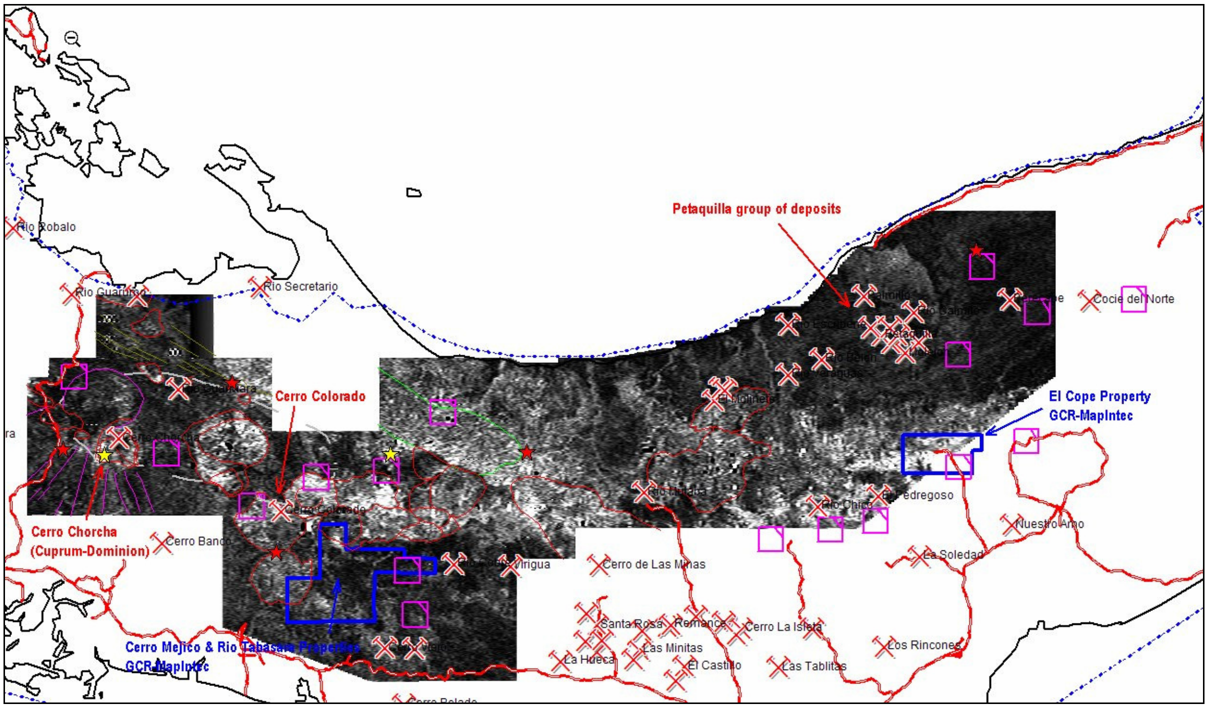


Figure 6.2 Regional Radiometrics (Potassium) in the Cordillera Central Area.
Note location of the three main Panama copper porphyry projects (Petaquilla, Cerro Colorado & Cerro Chorcha.

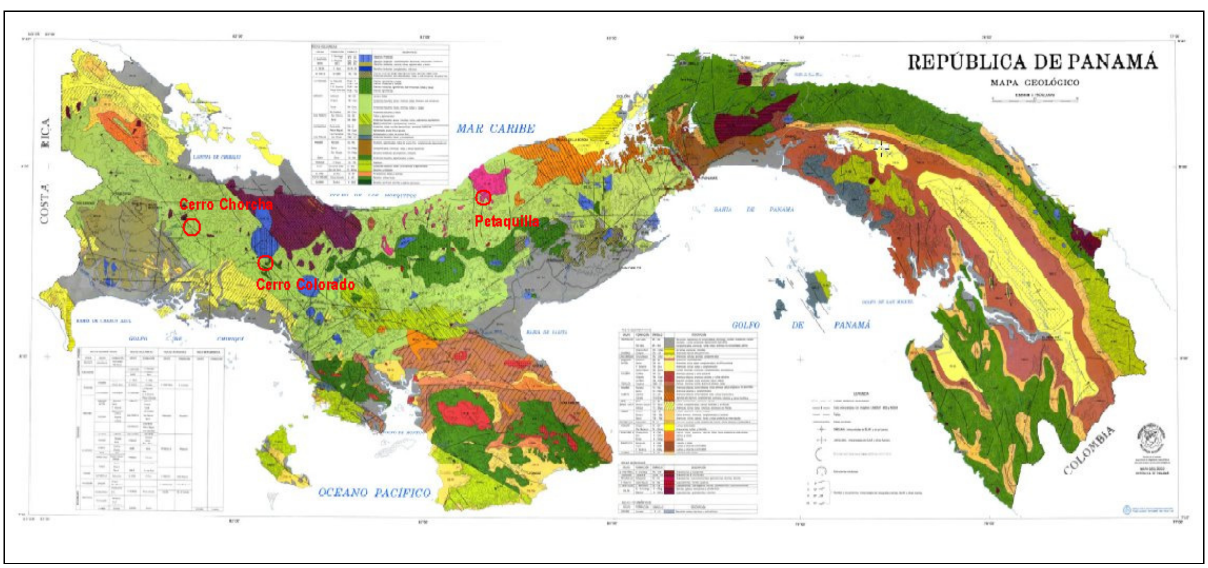


Figure 6.3 Republic of Panama Geology (published by Direccion Regional de Recursos Mineros from UNDP mapping in the period 1965-1972)

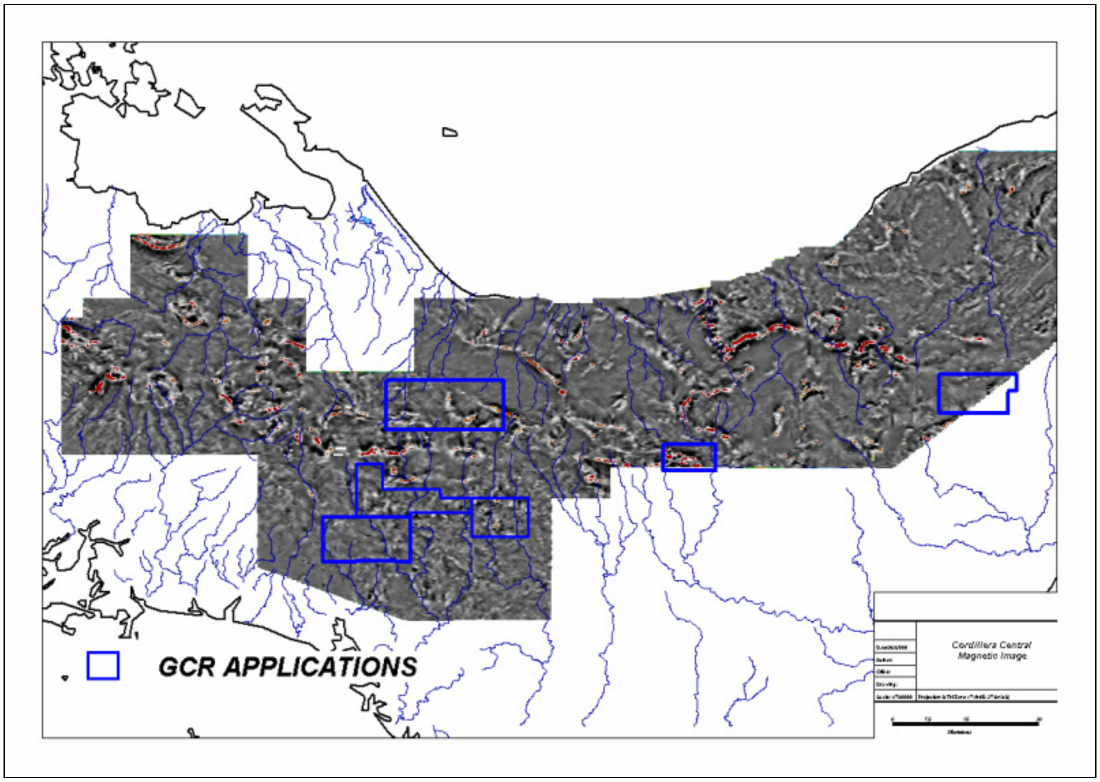


Figure 6.4 Regional Aeromagnetics (RTP greyscale) in the Cordillera Central Area. Cyprus/MapIntec data (from Torrey, C., 2008 Report)
Note numerous discrete intrusive centres, and prominent NW-trending faults.

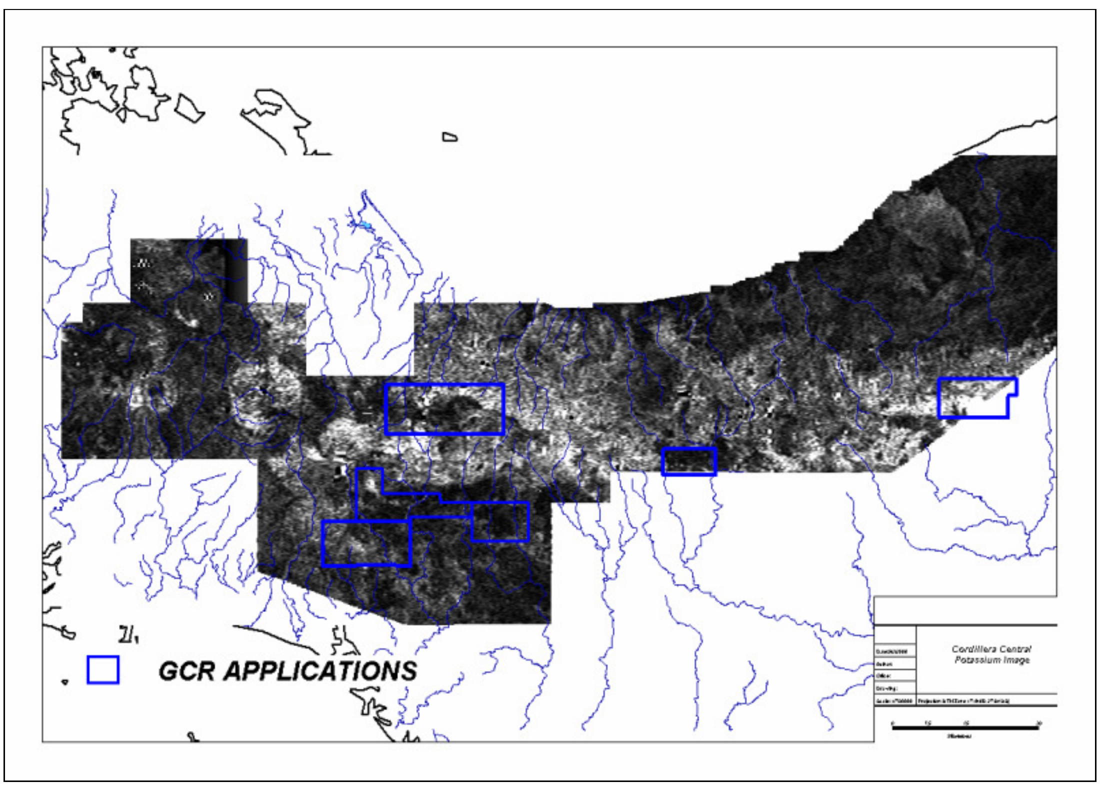


Figure 6.5 Regional Radiometrics (Potassium - greyscale) in the Cordillera Central Area. Cyprus/MapIntec data (from Torrey, C., 2008 Report)

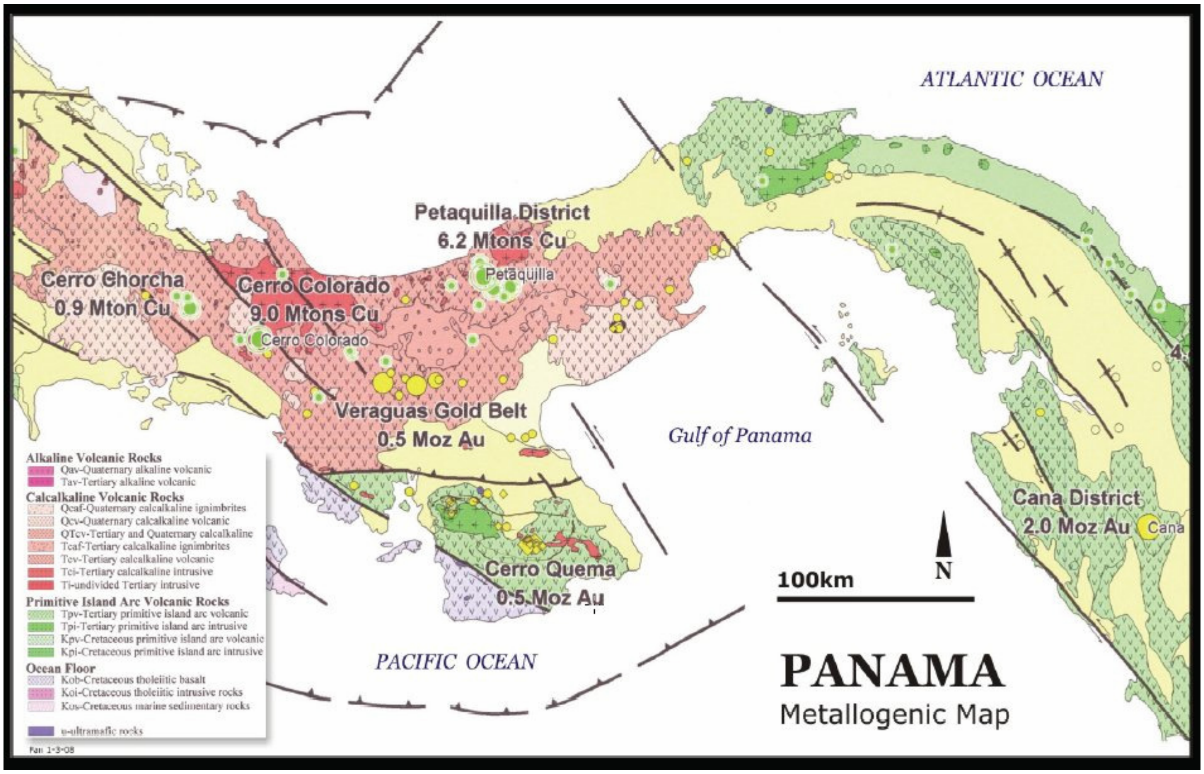


Figure 6.6 Panama Geology & Metallogenic Belt (from GCR image archives)

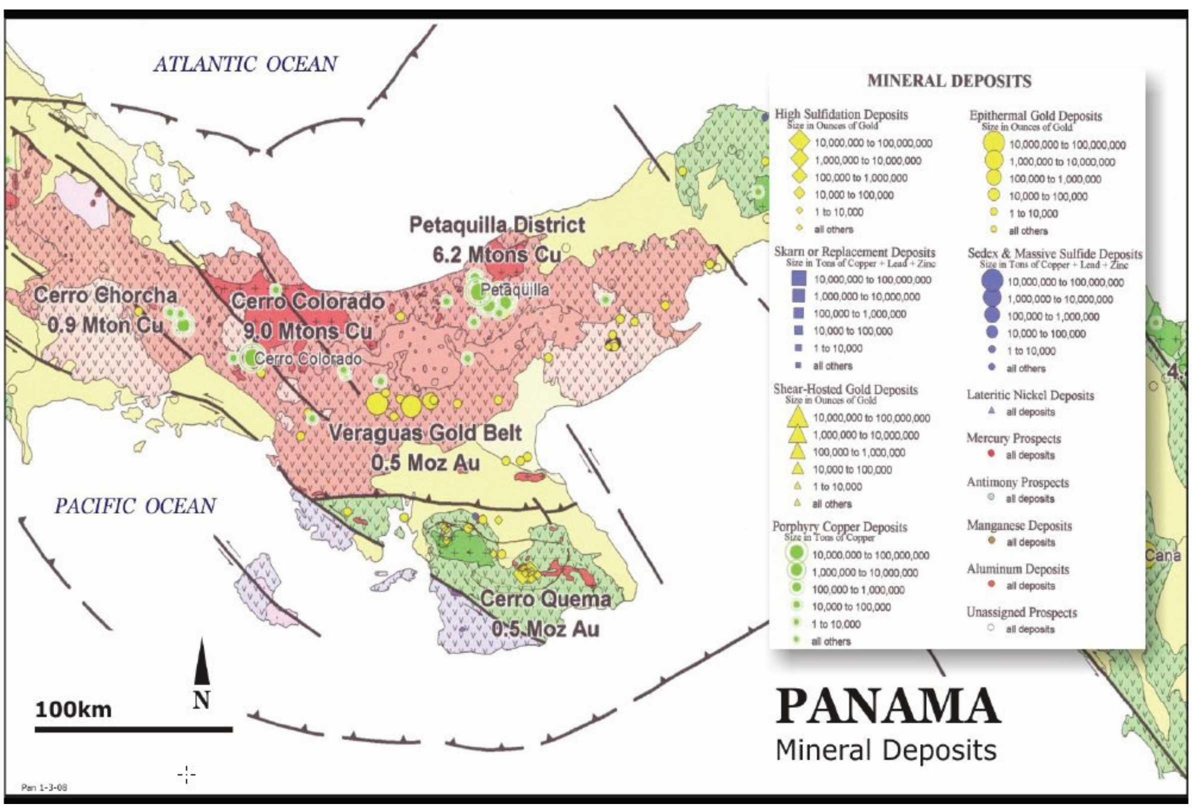


Figure 6.7 Panama Geology & Mineral Deposits (from GCR image archives)

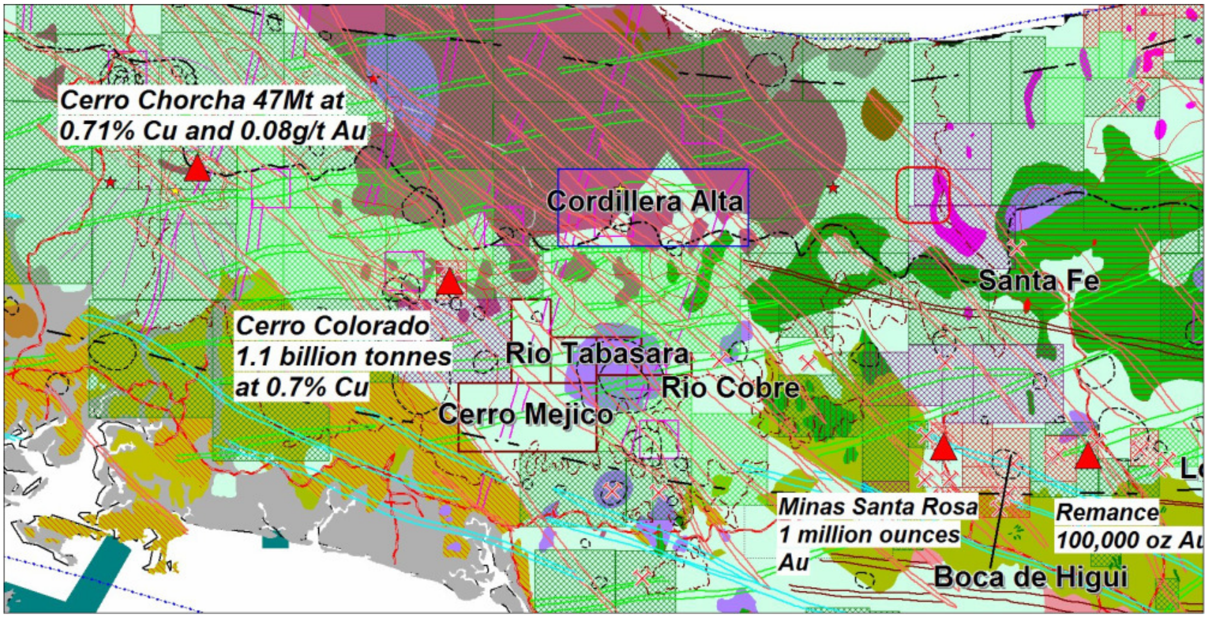


Figure 6.8 Cerro Colorado Regional Geology, Tenements & Mineral Deposit Locations
Digital data from MapIntec database.
GCR concessions labelled, along with major regional deposits,

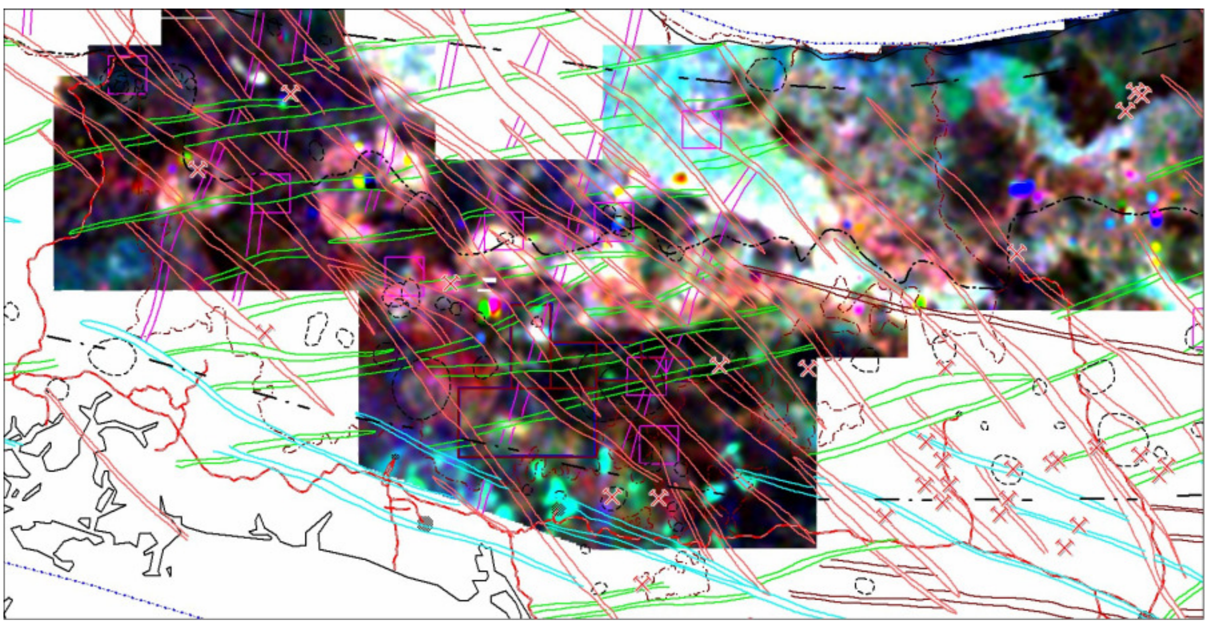


Figure 6.9 Cerro Colorado Regional Radiometrics (Total Count) & Cyprus Structural Interpretation.
Digital data from MapIntec database.
GCR concessions indicated, along with major regional deposits.
Scale: as per Figure 6.8

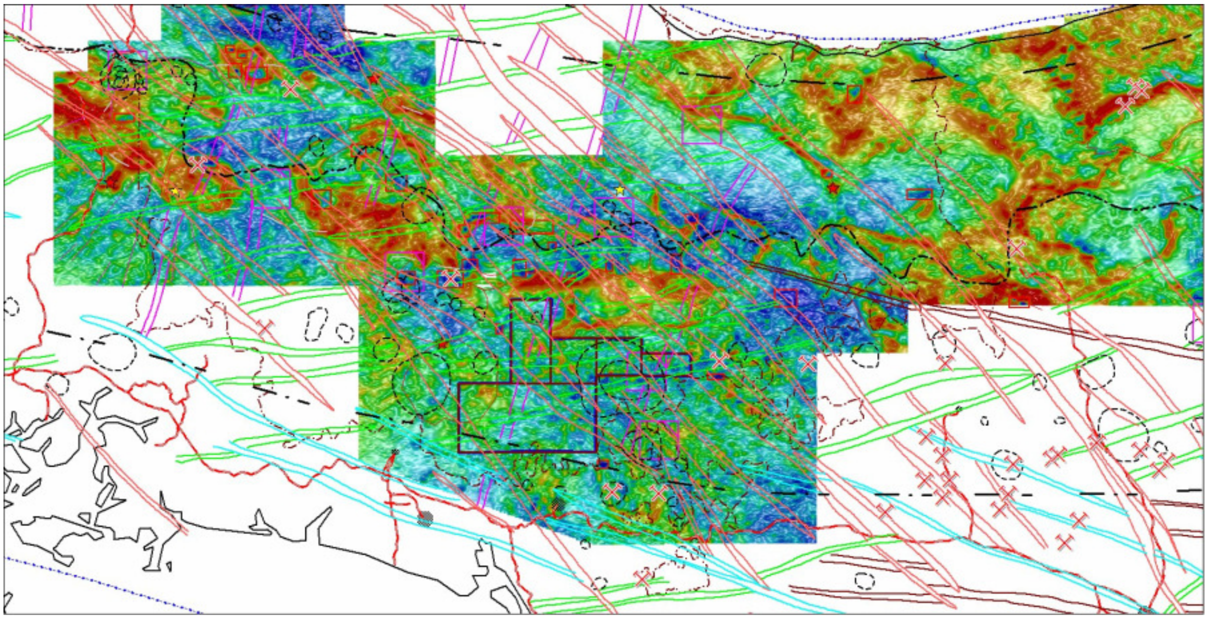


Figure 6.10 Cerro Colorado Regional Aeromagnetics (RTP)
Digital data from MapIntec database.
GCR concessions indicated, along with major regional deposits.
Scale: as per Figure 6.8 & 6.9

7.0 Project Geology

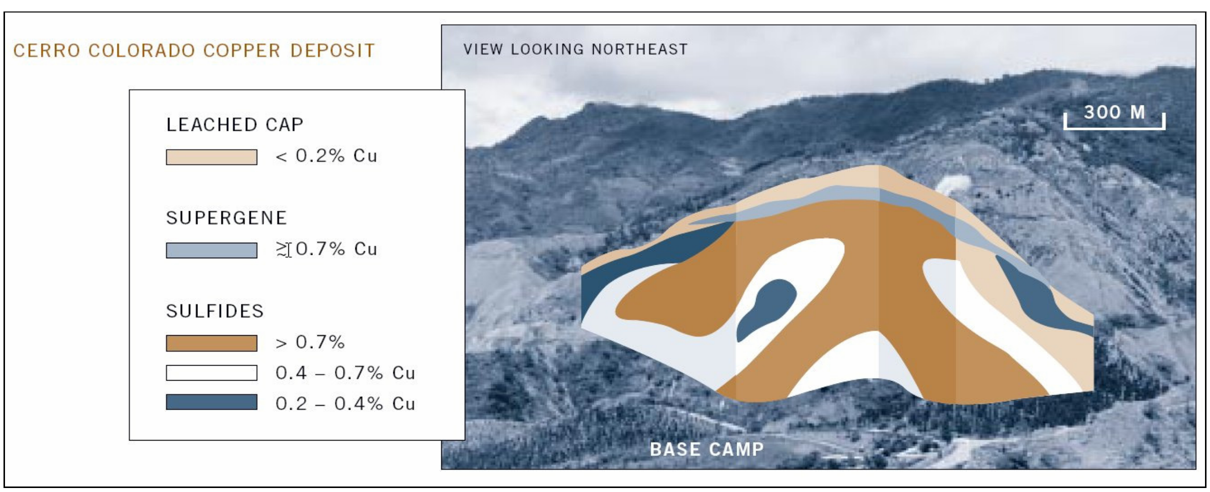


Figure 7.1 Google 3D-view of current Cerro Colorado topography, with Tiomin 3D surface distribution of copper mineralisation. (Tiomin Resources Inc, Annual Report 1997)

There are no detailed accounts of the Cerro Colorado geology (readily) available. As recounted in the Introduction section of this memorandum, most of the technical work has been completed by private exploration companies and remains unpublished. For a serious appraisal of the ore body it is recommended that Linn, K. O., 1981, "Geology of Panama's Cerro Colorado Porphyry Copper Deposit", published by the Colorado School of Mines be obtained.

A geology summary of Cerro Colorado is presented in Kesler et al (Evolution of Porphyry Copper Mineralisation in an Ocean Island Arc:Panama), and is included below:

The granodiorite group defined by the modal analyses plotted in Figure 1 includes rocks from the Petaquilla, Cerro Colorado, Chorcha, and Bocas del Toro areas in western Panama and the Rio Guayabo area in eastern Panama. The largest intrusive bodies in this group are found at Petaquilla and Cerro Colorado (see Figure 7.2 below)*. Numerous small, as yet poorly delineated intrusive bodies are known in the western Petaquilla, Bocas del Toro, and Chorcha areas. As can be seen in Figure 2 and Table 1, rocks from the granodiorite group are dominantly granodiorite in modal composition and range from quartz diorite to quartz monzonite. Although it is relatively abundant in these rocks, K-feldspar does not form phenocrysts. Porphyritic rocks are relatively common in these areas and are well developed at Cerro Colorado, Petaquilla, Chorcha and Rio Guayabo where porphyry copper mineralization is known.*

The largest and best described deposit in the granodiorite group is Cerro Colorado (Figure 7.2) Ore at Cerro Colorado is associated with the equigranular Escopeta granodiorite pluton and complex quartz-feldspar-hornblende porphyry base, known locally as quartz-feldspar porphyry (Issigonis, 1973). Alteration associated with mineralization is widespread and locally intense at Cerro Colorado and the remains of a strongly phyllic-overprinted potassic core are present at depths of 600 m below the present surface. The quartz-feldspar porphyry has been so thoroughly altered that modal or chemical analysis of the existing rock does not reflect its original composition. In the analysed samples of the Escopeta granodiorite (G-5, G-6, Table 1), alteration is limited to low intensity, patchy propylitization that does not appear to have caused significant element migration.

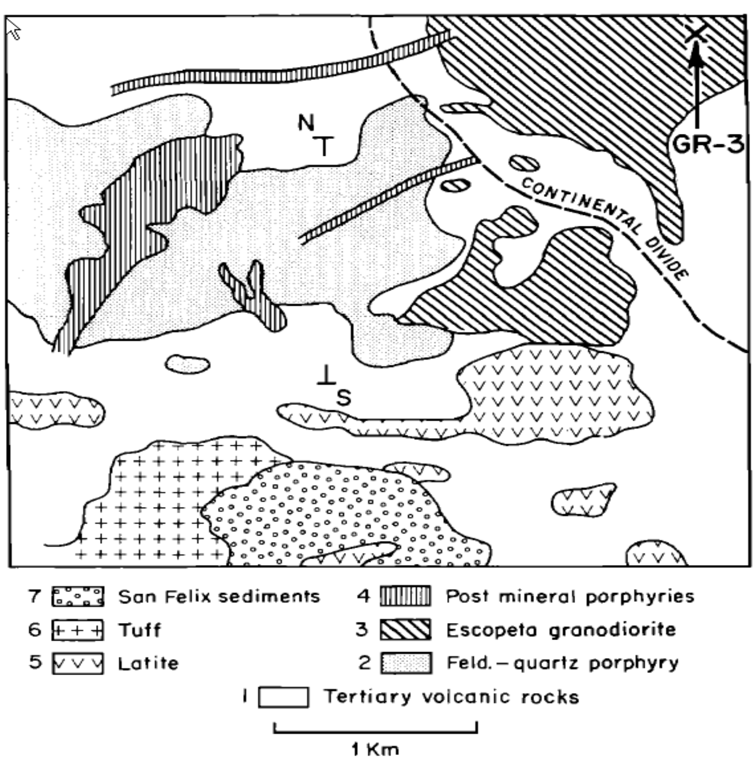


Figure 7.2
Generalised geological map of Cerro Colorado area showing the location of radiometrically dated sample GR-3

(from Kesler et al, 1977)

TABLE 1. Chemical and Modal Analyses of Intrusive Rocks from Panama. Analyses of other rocks located in Figure 1 and mentioned in the text are available from the first author. All analyses have been recalculated to eliminate H_2O, CO_2, and loss on ignition.

	A. Quartz diorite group							B. Granodiorite group	
	Cerro Azul area		Azuero area		Rio Pito area			Petaquilla area	
	P-75-3	P-75-5	H-140-P	H-156-P	PT-21-5m	MD-309	HN-64	M-1001	M-956
SiO_2	46.6	59.7	60.3	54.8	64.7	58.3	68.7	64.8	64.3
Al_2O_3	23.9	17.3	13.4	16.3	17.7	17.3	15.8	16.9	18.3
FeO[1]	5.4	8.1	9.3	10.1	4.0	6.8	3.3	3.6	4.6
MgO	7.6	3.8	6.1	5.3	2.3	3.7	1.9	1.8	1.7
CaO	14.8	8.1	8.5	9.6	4.9	7.0	3.5	4.7	4.0
Na_2O	0.2	2.6	1.7	1.7	3.7	3.4	4.0	4.0	3.0
K_2O	0.1	0.5	0.6	0.5	1.2	1.5	1.0	2.6	2.4
TiO_2	0.16	0.59	0.10	0.27	0.34	0.59	0.37	0.41	0.45
MnO	0.08	0.13	0.10	0.18	0.08	0.12	0.05	0.11	0.12
Total	97.9	100.8	100.1	98.8	98.9	98.7	98.6	98.9	98.9
Qz[2]	tr	20	25	23	20	15	25	20	20
Pl	78	53	31	41	66	56	54	47	60
Kf	—	5	4	1	tr	11	5	24	9
Hb	11	19	39	27	11	18	—	8	10
Bi	—	—	—	—	—	—	15	—	—
Px	—	—	—	—	—	—	—	—	—
Mg	1	3	1	2	2	—	1	1	1
Ol	10	—	—	—	—	—	—	—	—
Rock name	Dio	Qz Dio	Qz Dio	Qz Dio	Qz Por (Dacite)	Gdio	Qz Dio	Qz Mz	Gdio

[1] Total iron expressed as FeO.
[2] Modal mineral abundances (Qz-quartz, Pl-plagioclase, Kf-K-feldspar, Hb-Hornblende, Bi-biotite, Px-pyroxene, Mg-magnetite, Ol-olivine).

TABLE 1—(*Continued*)

B. Granodiorite Group								
Cerro Colorado area		Bocas del Toro area					Rio Guayabo area	
G-5	G-6	TV-79	LJ-128	LJ-147	MD-160	VD-52	LJ-632	LJ-647
65.0	63.9	66.9	62.3	61.9	59.0	67.2	64.4	64.0
17.4	17.9	15.5	16.9	16.2	16.7	16.1	18.2	18.3
4.0	3.7	3.9	5.1	6.0	6.8	3.4	3.5	2.8
2.1	2.0	1.6	2.0	2.5	2.8	1.2	1.3	1.6
3.7	4.3	3.8	4.4	4.9	6.0	3.6	3.9	3.7
4.2	4.6	3.4	3.4	3.0	3.4	4.4	5.7	5.4
2.6	2.2	3.5	4.1	4.0	3.0	2.5	1.7	2.1
0.77	0.74	0.47	0.54	0.62	0.76	0.46	0.38	0.30
0.11	0.08	0.10	0.15	0.14	0.16	0.15	0.05	0.03
99.9	99.4	99.2	98.9	99.3	98.6	99.0	98.1	98.2
19	16	16	16	16	11	27	10	
54	56	51	28	41	56	51	67	
16	13	21	39	27	10	14	10	
8	12	4	8	11	10	8	3	
1	tr	5	8	5	11	1	8	
—	—	—	—	—	—	—	—	
2	2	2	1	tr	1	1	1	
—	—	—	—	—	—	—	—	
Gdio	Gdio	Gdio	Qz Mz	Gdio	Gdio	Gdio	Gdio	

TABLE 2. K-Ar Radiometric Ages for Intrusive Rocks from Panama. All samples were analyzed at Ohio State University.

Location	Sample no.	Mineral	% K	Moles rad. Ar/g × 10^{-11}	% rad. ^{40}Ar	Age × 10^{-6} yr
Azuero	H-140-P	Hornblende	0.1901	2.177	16.2	64.87 ± 1.34
		Feldspar	0.7765	7.184	28.0	52.58 ± 0.63
Cerro Azul	P-75-1	Hornblende	0.3493	3.795	44.7	61.58 ± 0.70
		Feldspar	0.3754	3.374	48.0	51.11 ± 0.58
Cerro Colorado	GR-3	Biotite	6.400	3.724	9.6	3.34 ± 0.05
Petaquilla	M-1001	Hornblende	0.3732	2.380	7.5	36.41 ± 2.06
		Feldspar	2.412	12.22	48.9	28.98 ± 0.35
Rio Pito	P-21-14M	Hornblende	0.4578	3.898	45.5	48.45 ± 0.55
		Feldspar	0.7009	6.066	62.4	49.23 ± 0.57

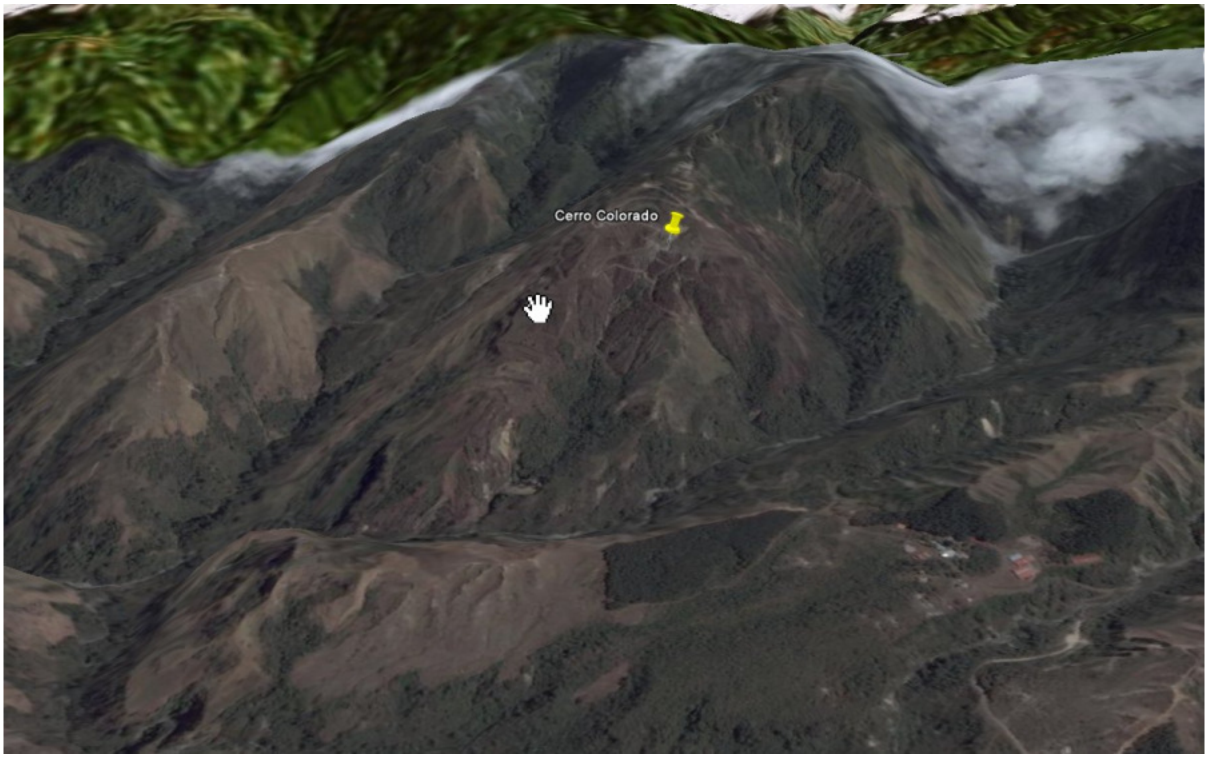
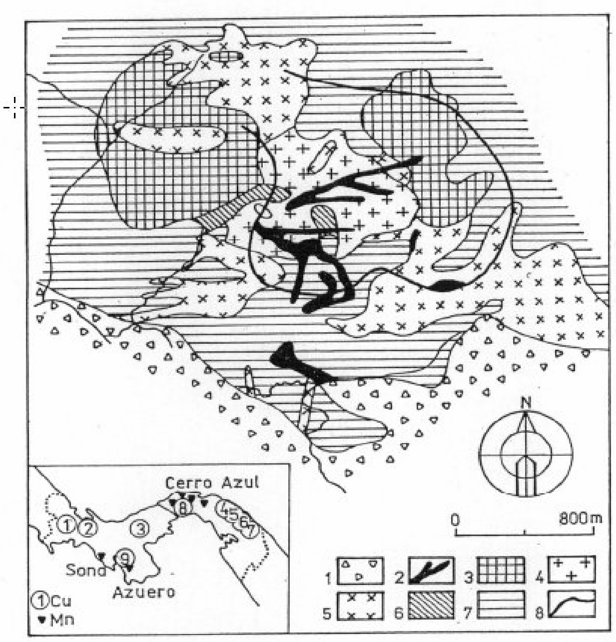


Figure 7.3 Google 3D-view of Cerro Colorado topography (looking NNW)
Note drill pads, access routes and village of Hato Chami in SE corner of image.



1 — tuffs, 2 — rhyodacites, 3 — latites, 4 — quartz porphyry, 5 — quartz monzonites, 6 — ore porphyry, 7 — andesites, 8 — limits of ores at the 1300 m level
Deposits: 1 — Chorcha, 2 — Cerro Colorado, 3 — Rio Guayabo, 4 — Navagandi, 5 — Mulatupo, 6 — Patikan, 7 — Rio Pito, 8 — Cerro Azul, 9 — Azuero Peninsula

図 2-3 Cerro Colorado 鉱床の地質(after Kents 1975 in Clark,1977)

Figure 7.4 Generalised geological map of Cerro Colorado (from JOGMEC 2005 report)

8.0 Observations & Comments

Cerro Colorado is a world class (super giant) copper-molybdenum-gold-silver porphyry deposit located in western Panama. It is the largest undeveloped mineral project in Latin America (and for the sake of comparison, has a larger copper content than Ivanhoe Resource's Oyu Tolgoi porphyry in Mongolia). It is bigger, and has better grades than Inmet Mining's Petaquilla copper project.

The positive Cerro Colorado final feasibility study completed by Kvaerner Metals for Tiomin Resources in 1998 is not available. The best resource estimate we have to work with is the often quoted 1,750 million tonnes @ 0.64% Cu. In 2001, AUR Resources released a new estimate of ore reserves (although no details are available on this work). Thus:

Cerro Colorado:	
Tiomin	1,750 million tonnes @ 0.64% Cu
AUR Resources	1,186 million tonnes @ 0.63% Cu, 0.096 g/t Au, 0.014% Mo and 4.82 g/t Ag
Petaquilla:	
Teck Cominco	1,115 million tonnes @ 0.50% Cu, 0.090 g/t Au, 0.015% Mo and 1.58 g/t Ag

It is located in a poorly explored (and documented) mineralised setting which has the right tectonic ingredients for producing a major mineral province (it has obvious comparisons to the mineralised copper porphyry belts of central and northern Chile).

Cerro Colorado was discovered in 1932, but no work was conducted on the project until 1970 by Canadian Javelin. At that time the UNDP had delineated the Petaquilla and Cerro Chorcha porphyry copper occurrences, and the Panama government was in the business of putting these projects out to international tender.

Since being discovered, the project has been explored by Canadian Javelin, Noranda, Texasgulf, Rio Tinto Zinc (RTZ), Tiomin Resources and AUR Resources. The project is currently 100% owned by the Panama government through its Corporacion de Desarrollo Minero CODEMIN (government mining agency). In all cases the exploration and development of the project has broken down due to a combination of:

- Weak copper prices making the continuation of work non-viable.
- Indigenous related/social protest.
- Panama government/CODEMIN intransigence.

Although the lack of infrastructure at the project site is acute, and the topography and climatic conditions are severe, these have not been cited as being principal reasons for abandonment of the project by any of the past explorers.

A direct comparison of these issues at Cerro Colorado and Petaquilla merits a mention:

- Petaquilla project is located entirely outside indigenous Comarca-controlled territory, thus the question of indigenous issues does not enter the equation.
- The issue of state ownership was initially cause for concern, as we note that the Japanese consortium (PMRD) that worked the Petaquilla discovery from the date of the original tender in 1970 to the completion of feasibility work in 1980 abandoned the project due to "unsuccessful negotiations with the government over terms of production" (source: Teck Cominco NI 43-101 Technical Report). All subsequent work at Petaquilla by Minnova, Inmet Mining, Adrian Resources, GeoRecursos, Petaquilla Minerals and Teck Cominco have been successful in part due to their independence from government interference.
- The weak copper prices have affected Petaquilla and Cerro Colorado in equal measures. It is the unbending stance taken by the Panama government that has led to the multiple

abandonment and stagnation of project development at Cerro Colorado, compared to the market-led decision making and development at Petaquilla.

Currently, GCR is being advised that the Cerro Colorado project will be going to international tender, so a letter of introduction to the relevant Ministerio de Comercio e Industrias (MICI) functionary (in this case apparently a Mrs. Gisela Alvarez de Porras) is being recommended by our Panama associates (MapIntec). This should by all means be put into motion, but the following points should be considered:

- MICI and the DGRM have been telling the world about this tendering process for many years now… perhaps since CODEMIN reacquired the project in 2003. As an example we can see the following excerpt:

"Govt to launch tenders for Cerro Colorado project – Panama"

Published: Friday, March 10, 2006 17:38 (GMT -0400): by Harvey Beltrán / Business News Americas.

"Panama's national mining authority DNRM is preparing to launch bidding in order to hand over the Cerro Colorado copper project to the private sector…"

- The DGRM reiterated a statement regarding the imminent tendering process in 2008, although most political commentators suspected that little would be completed until the period following the national presidential elections on May 03, 2009. This process has been completed, so GCR should be attentive to new developments.
- In a personal meeting with the MICI vice-minister, Jose Manuel Paredes in 2008 regarding the possible acquisition of concessions in moratorium (reserve status), in particular Cyprus' Calovebora concessions, he assured GCR that these could be made available if we could show a commitment to work them. This included what was considered an unworkable demand to complete EIS studies on concessions within the Comarca where no permission to enter was possible. The vice-minister also re-iterated that all such transactions would be easier following the elections (as no standing minister would want to "back" mining companies). In a way this was a tacit admittance that no real progress in mining and exploration matters would be occurring until the post-election period. The DNRM had already declared publicly that no new concession applications would be granted until the next government was installed, so in a way this period of "inactivity" was a clear directive from the Torrijos administration in government. (It is interesting to note that vice-minister Paredes was announced to be working for Dominion Minerals Corporation in the Cerro Chorcha project even before the elections were concluded).

Dominion Announces the Appointment of New CEO

NEW YORK, February 9, 2009 / -- Dominion Minerals Corporation (OTC BB: DMNM) ("Dominion" or the "Company"), is pleased to announce the appointment of ***Manuel José Paredes as its Chief Executive Officer****. Mr. Paredes will also serve as a director on the Company's Board.*

Mr. Paredes succeeds Pini Althaus, who will continue in his capacity as a director of the company, and as Chairman of the Board.

Manuel José Paredes currently resides in Panama City, Panama. Mr. Paredes, 43, has held positions in both the private sector and government and most recently served as Panama's Under Secretary of Commerce from September 2004 until December 2008. He was responsible for overseeing Panama's mining and resource sector. Mr. Paredes was also President of the Panama Chamber of Commerce from 1999 until 2001 and president of the Federation of Chambers of Commerce of Central America in 2001. Mr. Paredes was previously a board member for the Panamanian Tourism Institute from 1994 until 1999. In the private sector Mr. Paredes was Director of Sales and Marketing for Julio Vos S.A., *a Panamanian distribution company, and served on the board of directors of Compañia de Lefevre, a real estate development company with interests in Housing Development and Financing.*

- With the recent presidential elections now complete, and the new Ricardo Martinelli (Democratic Change party) set to take office on 01 July 2009, we have reached that juncture. It is now decision time for GCR (in the short-term period ?) for any successful Cerro Colorado involvement.

Apart from the government issues, the Comarca indigenous issues which have hounded this project require a mention. This is an extremely complex issue which evolves with ever-changing goal posts. There are numerous references to the indigenous disputes with mining projects in the internet. This is a study in itself, but a few pointers are in order:

- The Cerro Colorado project is located within the Ngobe-Bugle Comarca.
- There are various other Comarcas (a form of semi-autonomous indian reservation), which have received their "independence" over a period of time. Mining projects (or any development for that matter) in the various Comarcas will require negotiations with the tribe in question, and not a central governing body. The Ngobe-Bugle tribes make up approximately 65% of the Panama indigenous population, which together number approximately 285,000 or 8.9% of the total Panama population of 3.2 million.

Cuadro 1

DISTRIBUCIÓN DE LA POBLACIÓN INDÍGENA DE PANAMÁ

POBLACIÓN	ABSOLUTA	PORCENTAJE
Total de la Población Indígena	285,231	100%
Ngöbe	169,130	59%
Bugle	17,731	6%
Kuna	61,707	22%
Embera	22,485	8%
Wounaan	6,882	2%
Naso Teribe	3,305	1.2%
Bri-Bri	2,521	.9%
Bokota	993	.3%
No declararon	477	.2

Fuente: X Censo nacional de Población y VI de Vivienda, 14 de mayo de 2000.

Source: Leis, R. 2003, Panama: Condiciones politica para los procesos de autonomia

- The typical sentiment expressed by the indigenous leaders to mining, or any form of mineral exploration within their lands is expressed in the following excerpts from a 1996 Panama News article:

The comarca and Cerro Colorado in Ngobe eyes. Cacique M. Bejarano interviewed by Gonzalo Menéndez. From PMA news, 10 November 1996:

After a two week march through Panama, some 300 Ngobe and Bugle protesters arrived in the capital to press their demands for an autonomous Ngobe-Bugle comarca and the cancellation of Panacobre, SA's concession to mine copper at Cerro Colorado. Meetings with politicians produced no immediate response to these demands, so the protesters set up an indefinite vigil to keep their cause before the public eye. During the vigil The Panama News talked to M. Bejarano, a protester and a regional cacique from eastern Chiriqui.

MB: We were the first to protect these lands. However, many times lands have been declared protected, and in some of these cases it was done to expel the indigenous people and then make deals with big businesses.

GM: The majority of Panamanians don't know the history or cultural characteristics of the Ngobe-Bugle people. What can you say that would enlighten us about these subjects?

MB: We're a group with its own identity, and we have a need to spread our culture. At the moment the government is not paying attention to this. We have to have a demarcation in order to preserve ourselves culturally.

People don't know us because there hasn't been a real cultural diffusion. It's incredible that other people, like the Germans, are more interested in our indigenous culture than the Panamanian people are. Through the Association of Ngobe Women we produce indigenous clothing and export it to Germany. The women show their crafts at European fairs and expositions.

GM: Supposing that you get a comarca, what position would you then take about Cerro Colorado?

MB: First we want a comarca. Then, considering the magnitude of the project, and the contamination...

GM: What contamination? This new project is different from what they wanted to do in the 70s, using heap leaching instead of milling and smelting.

MB: Any activity generates contamination, and we can't compare human activities with industrial ones. They pose the issue the way that you do, but if we analyze their mining experience abroad, it has been devastating.

GM: But they're regulated by the World Bank's environmental standards, and those of the province of Quebec, which are very strict...

MB: In the first place, Panama is a tropical country. How can you apply environmental standards from a country in a totally different situation from ours? Because Panama's in the tropics, it has a rich and sensitive biodiversity.

GM: The Cerro Colorado project involves the investment of more than one billion dollars. It's a big project. Should we conclude that you understand the details for the industrial process and you're saying no to it?

MB: The opposition to the project is because the government is only interested in the economic aspect. The government wants this project to pay the foreign debt, to pay it off with minerals that they find on our land. This investment isn't for us, but for foreign interests.

GM: If the comarca is marked off and good environmental studies are made and followed, might it be possible to simultaneously carry out the project with the proper restrictions and establish the comarca? Wouldn't this bring more benefit than harm to the Ngobe community?

MB: This is an internal problem for us to resolve among ourselves…

- In early 1997, the government of Panama granted the Ngobe-Bugle people their autonomous homeland (comarca) that includes the Cerro Colorado project.
- The Panama government continues to administer the mining and exploration concessions over all of the Panama national territory. The mineral wealth of Cerro Colorado (or any other mineral occurrence) legally belongs to the national government and not the Ngobe-Bugle people. This is an ongoing, present-day dispute between the indigenous population and the central government. Although the government is the owner and administrator of the mineral wealth of the nation, it requires access and all other forms of permits to be negotiated directly with the Comarcas in question. The Comarcas therefore have an effective power of veto to any project. Reaching a settlement with the Ngobe-Bugle Comarca is therefore of paramount importance in any future project at Cerro Colorado. This is monumental task in itself as there are deep political divisions within the Comarca itself, with no unanimously respected leader(s). Allegiances to each of the various leaders or caciques will vary according to geographical location. In many cases the man on the ground will refuse to accept the directives from their elected leaders (whom they do not

favour), but will claim allegiance to an unelected cacique of their liking. Similarly, the elected Comarca will openly question previous agreements. This was made evident to GCR-Panama in discussions with the head cacique of the Ngobe-Bugle, Maximo Saldana in 2008 in reference to Cerro Chorcha. Maximo made clear that in Bellhaven's case they had an agreement for exploration at Cerro Chorcha with the "regional" directive only. There are no assurances whatsoever that a mining permit would ever be granted in this project by the "national" directive, and therefore any future mining permits are far from assured (irrespective of what the national government states).

- Carl Nelson claims that the Indian authorities are not against mining, and seem willing to accept concessions if benefits also accrue to the Indian population. This statement is probably true in essence, but again it is the reaching of such a suitable consensus that is the goal of the Panama mining community in general.

In tendering the Cerro Colorado project to the international mining community CODEMIN and the Panama government cannot ignore the issue of the Comarca sovereignty(?) over the project lands. Any such tender is meaningless without the permits to peacefully go about the business of evaluating and mining these reserves. As was the case in each of the previous agreements with Canadian Javelin, Texasgulf, RTZ, Tiomin and AUR Resources, the government required scheduled progress in the project (eg., a feasibility study to be completed by a fixed date) and scheduled payments from the exploration company, both of which would be unworkable without the access issue being assured.

If the national government is serious about developing the Panama mining industry, and indeed if the new Martinelli administration is keen to proceed with the Cerro Colorado tendering process, these issues must be resolved satisfactorily. We have all heard of rumours that Rio Tinto are still keen on Cerro Colorado and are keeping a close eye on developments. Similarly Codelco are said to be sniffing around, as are BHP-Billiton who are said to be involved in community aid schemes around Cerro Colorado in a bid to get the community on-side.

For any realistic assessment of the viability of the project, GCR must assess the complete project data and the tendering package available from the MICI. Only then will the conditions be made clear. GCR has a prior history of working successfully in Panama which will be an advantage in any future bid. GCR has a network of well connected personnel in Panama, including Zorel Morales (MapIntec), Abraham Bernal and Roy Durling (Arias Fabrega & Fabrega).These should all be consulted to form a successful strategy for Cerro Colorado:

- Zorel Morales (MapIntec) should be consulted once again about the tendering process. It is entirely possible that the new MICI minister should be approached personally in this respect, rather than a letter addressed to Mrs. Gisela Alvarez de Porras (who knows what function she serves in this respect).
- Abraham Bernal could be asked to pursue this matter through his numerous contacts. He was previously Panacobre SAs' accountant and is intimately familiar with the Cerro Colorado issues. Abraham is currently involved with Inmet Mining (Petaquilla) accounting, again very useful connections to foster.
- Arias, Fabrega & Fabrega, either through Roy Durling or his associate and mining expert Francisco Corro will be well connected in such an international tendering move. Such lawyers carry enormous clout with the established political heavyweights (if it in their interests to exercise said clout), and this may be the most direct approach.
- Alternatively GCR could initiate an "official" move from within Australia via the Panama Consulate (rather than through our associates in Panama). As there does not appear to be a fixed deadline for this tender this could be a safe preliminary move that would not affect any subsequent enquiries made from within Panama.