MINDORO RESOURCES LTD.

(MRL GOLD PHILS. INC.)

PAN DE AZUCAR PROJECT
ILOILO PROVINCE, PHILIPPINES

September 28, 2002 – November 20, 2002
SECOND STAGE DRILLING PROGRAM

JANUARY 20, 2003 REPORT

by

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Summary

General

The Pan de Azucar Project (PDA) is located on Pan de Azucar Island, Concepcion municipality, 112 kilometers (km) northeast of Iloilo City in Panay Island, Central Philippines. It is part of a Mineral Production Sharing Agreement (MPSA) held by Minimax Mineral Exploration Corp. (Minimax) in which MRL Gold Philippines, Inc., (MRL Gold), Mindoro Resources Ltd's (Mindoro) fully owned local subsidiary, has the right to earn 75% by completing a phased exploration program.

PDA Project is located within, and alongside, a collapse caldera structure, where the dacitic-andesitic caldera-fill package hosts pervasive and structurally controlled alteration and mineralization, possibly Pliocene in age. Dacitic units are preferred hosts to mineralization, which at surface is represented by ferruginous soil and boulders. Various dioritic intrusive phases have been intersected in drilling. The caldera-wall rock-types consist of unaltered andesite porphyry exogenous domes and andesitic non-welded ignimbrites.

Valderama Deposit

2001 scout diamond drilling on the Valderama Zone, which tested coincident geochemical and strong chargeability anomalies, gave encouraging results, indicating the presence of a near-surface, massive pyritic sulphide deposit containing copper, gold, zinc and silver. Results from eleven shallow drillholes (1,041total meters) gave best drill intercepts in three holes as follows: PDA-03 with 37.1 meters (m) of 0.8% copper, 1.87 g/t gold, PDA-06 with 37.00 m of 0.14 % copper, 1.25 g/t gold , and PDA-08 with 40.25 m of 0.69 % copper, 1.21 g/t gold, 4.34 g/t silver , and 0.63 % zinc. This third intercept includes a 19.25 m section of 1.08 % copper, 1.9 g/t gold, 6.49 g/t silver and 1.19 % zinc.

Gold-copper-silver-zinc mineralization occurs as fracture fillings and replacements in massive pyrite. Chalcopyrite, the main copper mineral, is associated with lesser sphalerite, bornite, covellite and chalcocite. The dominating proximal alteration assemblage is quartz-pyrite-illite (QIP), suggestive of a neutral-pH, low-sulphidation epithermal type.

The Valderama Deposit, although of low-sulphidation epithermal characteristics, is considered to be the equivalent of a high-sulphidation deposit above a porphyry copper-gold system (as the Lepanto high-sulphidation deposit occurs above, and is related to, the Far SE porphyry copper-gold deposit). It is believed that, at PDA, magmatic fluids mixed with abundant meteoric waters, became neutral, and formed a low-sulphidation massive, pyritic sulphide deposit instead.

A Phase 2 program, described here-in, consisted of seven diamond drill holes totaling 476.25 meters. Objective was to expand the dimensions of, and gain more information on, the extent of the Valderama Deposit. The Phase 1, 2001 drill program, had suggested that a copper-gold-silver-zinc deposit of potential economic interest might be present in the Valderama Deposit.

Grades appeared quite uniform and the target was for 1.6 to 2 million ozs gold equivalent – considered a potentially viable target.

The Phase 2 drilling results were of lower tenor than for Phase 1. Best results were; PDA-12 with 32.26 m (46.82- 79.08 m) at 0.59 g/t gold and 36.24 % sulphur; PDA13 with 6.00 m (6.85 - 12.85 m) at 0.59 % copper; and a 9.00-m (12.85 - 21.85 m) section, which gave 0.41 % copper and 0.49 g/t gold; PDA-14 with 7.80 m (70.70 - 78.50 m) at 0.29 g/t gold and 42.08 % sulphur; PDA-15 with 3 m (10.00 – 13.00 m) at 0.16% copper and 0.66 g/t gold, 8 m (16.00 – 24.00 m) at 0.33% copper, and 9 m (24.00 – 33.00 m) at 0.54 g/t gold and 34.66% sulphur.

The Phase 2 results indicate that the later, copper-gold-silver-zinc mineralizing event (superimposed on the massive pyrite deposit) was irregular and erratic. It is impossible to speculate on potential average grade at this time. Although the Valderama Deposit is still under-drilled, and open in several directions, based on these latest results, potential for an economic copper, gold, silver, zinc deposit has been reduced.

There are, however, sufficient data to infer tonnage potential for the Valderama Deposit; which has implications on size and extent of the epithermal mineralizing process, and also the potential sulphur resource. Inferred dimensions of the deposit in the area drilled to date; ie. between PDA-01 and PDA-14 are shown in Figure 4. These suggest a strike length of at least 600 m, width varying from 100 to 200 m (with uncertainties due to degree of faulting), averaging 150 m, and an average thickness of 30.79 m (the latter has been reduced by erosion in PDA-1 and 02, and by fault disruption (?) in PDA-14 and 15). Tonnage potential of the massive pyritic sulphide deposit is therefore estimated to be in the range of 7.5 to 11 million tonnes, with potential for an additional 5 million tonnes between PDA-14 (21,500N) and the property boundary at 21, 750N.

To the south of the Valderama Deposit, residual boulders of iron oxide / alunite at the Saddle Zone and on Ferrris Hill, suggest a total (pre-erosion) strike length in excess of 1.6 km. Residual boulders of heavy iron oxide / alunite boulders at Asparin Hill to the west, suggest the width of the massive sulphide horizon was, at one time, over 900 m (see Mineralization Model, figure 11). Based on these projected dimensions, the Valderama massive, pyritic sulphide deposit was very large indeed, and appears to indicate that extra-ordinarily strong mineralization processes were operative in the PDA caldera. This may well have implications for the size of the inferred porphyry-copper-gold source deposit (figure 11).

Based on drilling to date, the Valderama Deposit averages between 36% and 40% sulphur. Since the deposit is near-surface and a few hundred m from tide water, it may therefore have potential for a low-cost, sulphur source for sulphuric acid production for treatment of the many lateritic nickel deposits expected to go into production in the Philippines, and elsewhere in the region; and for fertilizer production. Main priority, however, will be other copper-gold targets on the PDA Project, and especially a porphyry copper-gold deposit interpreted to be the source of the Valderama Deposit.

<u>Asparin Hill –Porphyry Copper-Gold Target</u>

Whereas the Phase 2 drilling downgraded the potential of the Valderama Deposit, based on results from drill hole PDA-16, it greatly upgraded the porphyry copper-gold target at Asparin Hill. The drill hole was completed on the eastern margin of a circular topographic depression, 350 m in diameter, in an area of strongly anomalous soil geochemistry with boulders of iron-oxide / alunite containing strongly anomalous metal values, and coincident with a broad magnetic high.

The entire 45 m of PDA-16 is characterized by dacitic volcanics and volcaniclastics that have undergone intense hydrothermal alteration, which is very destructive. Three alteration assemblages were recognized: (a) an earlier pervasive illitic / sericitic alteration – corresponding to the QIP (quartz-illite-pyrite assemblage) in the Valderama Deposit, which is overprinted by (b), K-silicate alteration, characterized by hydrothermal biotite and minor chlorite, and itself overprinted by (c) later sericite-chlorite alteration.

Sericite-chlorite alteration is associated with abundant pyrite. Chalcopyrite was detected down to 35 m and occurs in trace amounts up to about 2 volume %. It occurs as fracture fills, disseminations and as streaks and bands. In places it rims cubic pyrite and envelopes sphalerite. Best intercepts were a 10.00 m section (5.00 – 15.00 m), which analyzed 0.24% copper, and a 6.00-m section (20.00 – 26.00 m), which assayed 0.31% zinc. Comsti (2002) notes "*chalcopyrite also occurs in sample no. 29.55 where K-silicate alteration was recognized. The occurrence of chalcopyrite together with K-silicate alteration indicates a possible porphyry copper mineralization at depth. Hence, more chalcopyrite, along with bornite and hydrothermal magnetite may be expected where K-silicate alteration predominates.*"

From crosscutting relationships based on alteration mineralogy, Comsti (2002) recognises a younger episode of magmatism which is represented by the higher temperature assemblages such as sericite-chlorite and K-silicate alterations overprinting illite-sericite (QIP assemblage); Comsti considers that, "*Asparin Hill is a highly prospective site for the search of a high level intrusive or breccia body, which may host porphyry style mineralization. The presence of hydrothermal biotite in two of the drillcore samples from Asparin Hill also strongly supports this claim. Intense silicification in the area has rendered the host rock highly resistant to erosion resulting in topographic prominences, surrounding the circular depression. This intense alteration may be related to the formation of a diatreme or a hydrothermal breccia pipe below. At Asparin Hill, a higher temperature magmatic hydrothermal fluid is responsible for the sericite-chlorite and K-silicate alterations (and possible porphyry type mineralization at depth).*"

Additional evidence for a copper porphyry system on the PDA Project is the propylitised andesite with disseminated chalcopyrite (grading 0.2 % copper), and quartz-magnetite alteration, in the Saddle Zone. A magnetic high anomaly, only partially defined to date, occurs near-by, at Ferraris Hill and may suggests that a buried porphyry copper-gold system lies beneath the Saddle Zone-Ferraris Hill area, related, or separate from (?), the inferred system beneath Asparin Hill. Figure 11is the exploration model of PDA, showing the interpreted relationship between the Valderama Deposit and a porphyry system below, and adjacent to Asparin Hill.

Other Targets
The PDA setting is also considered favourable for the occurrence of bonanza low-sulphidation gold-silver mineralization in feeder fault zones; especially at intersections between the multi-directional caldera-fill normal faults and low-angle gravity faults associated with the caldera ring faults. Favourable structural targets include the West Wall, and Ferraris Hill areas, which have associated geochemical anomalies and alteration.

Reccommendations
Further evaluation of the porphyry copper-gold potential of the PDA Project is strongly recommended. Obvious starting point is the Asparin Hill area, where additional, and deeper, drilling is warranted. Prior to this, a structural interpretation is recommended; in addition, further geological / petrographic studies of the caldera should be undertaken, emphasising and establishing relationships between the Valderama Deposit and the porphyry targets at Asparin Hill and the Saddle Zone. A reinterpretation of all geological, geochemical and geophysical, and especially the magnetic data, is recommended. Consideration should be given to extending the magnetic survey over the entire project area.

Introduction and Terms of Reference

This technical report is prepared by MRL Gold Phils. Inc., (MRL Gold) a wholly-owned subsidiary of Mindoro Resources Ltd.(Mindoro). MRL Gold`s first stage scout drilling on the Valderama Zone of the Pan de Azucar Project (PDA) was carried out in late 2001 and the results are described in a report by H. Ruelo (2002), written under the supervision of J.A. Climie, P. Geol., as the "qualified person". That program intersected significant copper-gold-silver-zinc intercepts in massive pyritic sulphides. This report presents the results of a small, second-phase diamond drilling program carried out between September 28, 2002 and November 20, 2002.

The PDA site covers 322 hectares on the northern portion of Pan de Azucar Island, near Panay Island, in the Central Philippines (Figure 1). It is situated in the northeastern portion of a copper-gold metallogenic belt running 250 kilometers (km) long, and 50 km wide, traversing southwest Negros Island and Eastern Panay Island. Several abandoned and operating copper and gold mines are situated within this mineral-rich region, including Philex Gold's Bulawan Mine, and the Sipalay and Basay copper-gold mines. Large areas in Iloilo and Capiz provinces have been explored by foreign exploration entities like MMJA-JICA, MIM Exploration, Climax Mining, Phelps Dodge Exploration, and Mindoro. Close to Pan de Azucar Island, Azure Mine, near Capiz, is an old copper mine. Several abandoned alluvial gold panning areas are located in the same region.

This report covers the results of the diamond drilling program carried out between September 28 and November 20, 2002. Four new drill holes were completed, two 2001 drill holes were deepened, and one dill hole was lost in bad ground. A total of 476.25 meters (m) were completed. Diamond drilling was contracted through Diamond Drilling Corporation of the Philippines (DDCP), using a NL-26 man-portable rig. Core logging was carried out by

consultant Gerry Comia and Edsel Abrasaldo on site, together with core recovery measurements. Diamond-saw core splitting and sampling was also done at the same site. Split core samples were sent for analyses to McPhar Geoservices (Philippines), Inc. laboratory in Manila for assay.

This report was prepared by J. A. Climie P. Geol., President of Mindoro, and Edsel Abrasaldo, Vice President of MRL Gold. Mr. Abrasaldo has worked full-time on this project since 1997. His experience in mineral exploration in the Philippines dates back to 1977 and he has been involved in the countrywide exploration of various mineral commodities such as chromite, porphyry copper-gold, zircon, rutile, manganese, feldspar, silica sand, PGM, and epithermal gold. From 1977 to 1985, he worked with Philchrome Mining Corporation. From 1986 1996, Mr. Abrasaldo worked with Minimax Mineral Exploration Corporation (Minimax). For Minimax he was involved in the prospecting, acquisition, evaluation and exploration program management of numerous epithermal gold, vein-type gold, PGM, porphyry copper-gold prospects. Since 1997 he has worked for MRL Gold on detailed exploration, diamond drilling and community relations programs.

Petrographic and mineragraphic analyses were performed by Ma. Elveta C. Comsti, Consulting Geologist of Terradata, Inc. Ms. Comsti holds an M.Sc. Degree in Applied Science from the University of New South Wales in Kensington, Australia and has more than 20 years experience in petrography and mineragraphy and related fields. She is currently a faculty member of the Mapua Institute of Technology in Manila and holds the position of Professor 2 teaching Petrography and Mineragraphy.

All information presented in this report was prepared in accordance with the requirements of National Instrument 43-101, Standards of Disclosure for Mineral Projects, and is aimed at further describing the Pan de Azucar property.

The drilling project was carried out under the overall supervision of James Anthony Climie, P. Geol., who was on site for approximately 50% of the drilling program. Mr. Climie is a qualified person as defined by National Instrument 43-101.

All information presented in this report was prepared in accordance with the requirements of National Instrument 43-101, Standards of Disclosure for Mineral Projects.

Property Description and Location

The PDA Project is part of Mineral Production Sharing Agreement (MPSA) 135-99-VI held by Minimax, and totaling 1,235 hectares, located in northeastern Panay Island in Western Central Philippines. That part of the MPSA on Pan de Azucar Island (Figure 2) is bounded by north latitudes 11º 18’ 00” and 11º 17’ 00” and east longitudes 123º 09’ 30” and 123º 10’ 30”. The MPSA is divided into three discontinuous parcels known as Parcel 1, which is located on Pan de Azucar Island and comprising approximately 320 hectares (see Figure 2); Parcel 3 located in the mainland of Concepcion and covering approximately 700 hectares, and Parcel 3A

located in Binanan Island in the municipality of Ajuy and embracing approximately 235 hectares.

The first phase of the detailed exploration program and the scout diamond drilling have been focused on Parcel 1. This area is near the village of Taloto-an, on the northern portion of Pan de Azucar Island. The village belongs to Concepcion municipality, which is situated in the Panay mainland, some twelve kilometers southwest of the project site. Concepcion is part of Iloilo province in the island of Panay, Central Philippines.

Parcels 1, 3 and 3A were originally part of 38 mineral claims (each claim comprising 81 hectares) acquired by Homestake Mineral Exploration Corporation (a private Philippine company) under the old Mining Law known as Presidential Decree 463 (or P.D. 463) on April 9, September 10 and October 2, 1987. On February 20, 1997, Homestake assigned all its rights over the 3,078-hectare mineral properties to Minimax. On July 1997, by virtue of the joint venture agreement entered into by, and between, MRL Gold and Minimax on January 19, 1997, the MPSA was applied for with the Mines and Geosciences Bureau (MGB)-Regional Office No. VI in Iloilo City covering all the mineral claims acquired by Homestake. To facilitate the processing of the MPSA application, the mineral claims covering the whole of Tago Island in Concepcion, which was being programmed for development into an eco-tourism zone, were relinquished. In addition, those areas covered by DENR forestry projects (17 hectares in Parcel 1 and 263 hectares in Parcel 3) were dropped. The MPSA application was approved by Secretary Antonio Cerilles of the Department of Environment and Natural Resources (DENR) on July 1997. The total area approved was 1,235 hectares. The approved MPSA was officially registered with the Mines & Geosciences Bureau (MGB)-Regional Office No. VI on March 15, 2000.

As a gesture of goodwill to local stakeholders, MRL and Minimax agreed to further relinquish approximately 40 hectares from the approved MPSA area in Parcel 1, which is part of a proposed seascape (a proposed coastal preservation zone) on Pan de Azucar Island.

All the mineral claims comprising the MPSA Contract Area have been surveyed by a Government-accredited Geodetic Engineer and approved by the MGB under the provisions of PD 463.

The MPSA contract area is classified by the DENR as alienable and disposable lands. In Parcel 1, which is the focus of the exploration activities, the surface rights belong to various land claimants, who are in the process of titling their properties.

Mindoro Resources Ltd. through its wholly owned subsidiary MRL Gold has the right to earn 75% of the project after completing a three-phased exploration expenditure commitment, and issue shares of Mindoro to Minimax. Mindoro has, to date, earned a 10% interest (Phase 1) in the Project, and has nearly completed requirements to earn a (Phase 2) 40% interest. There are no underlying royalties. Terms of the Agreement were released into the Public Domain on March 10, 1997.

In April, 2001, Mindoro entered into a joint venture agreement with Delta Gold Limited of Australia (Delta Gold), whereby that company could earn up to a 65% interest in the PDA project. The terms were released into the public domain on April 26, 2001. Delta Gold subsequently merged with Goldfields of Australia to form Auriongold, and have since been taken over by Placer Dome of Canada. Auriongold withdrew from the project in June, 2002.

Philippine Mining Law

General
Mineral resources in the Philippines are owned by the State. The exploration, development and utilization of mineral resources may only be undertaken through grants of authority or rights to undertake such activities from the government. Republic Act Number 7942 otherwise known as the Philippine Mining Act of 1995 (together with its revised Implementing Rules and Regulations) is the present governing law on mining rights in the Philippines. It is considered to be a progressive law as it allows 100% foreign ownership of a mining project under a specified form of mineral agreement which is the Financial or Technical Assistance Agreement (FTAA). Previously, foreign equity in mining projects was specifically limited to a maximum of 40%, while at least 60% was required to be owned by Philippine citizens. The constitutionality of the FTAA (100% foreign ownership provision) has been challenged by certain opposition groups and the matter is being considered by the Supreme Court of the Philippines. No judgment has been released at this time.

Mineral Production Sharing Agreement (MPSA)
An MPSA is an agreement under which the government grants the contractor the exclusive right to conduct mining operations within, but not title over, the contract area during a defined period in consideration of a share in the production that takes the form of an excise tax on mineral products.

The approved MPSA has a term of 25 years renewable thereafter for another term not exceeding 25 years. It gives the right to the Contractor to explore the MPSA area for a period of two years renewable for like periods but not to exceed a total term of six years, subject to annual review by the Director of the Mines and Geosciences Bureau (MGB) to evaluate compliance with the terms and conditions of the MPSA. The Contractor is required to strictly comply with the approved Exploration and Environmental Work Programs together with their corresponding budgets. The Contractor is likewise required to submit quarterly and annual accomplishment reports under oath on all activities conducted in the Contract Area. The reports shall include detailed financial expenditures, raw and processed geological, geochemical, geophysical and radiometric data plotted on a map at 1:50,000 scale, copies of originals of assays results, duplicated samples, field data, copies of originals from drilling reports, maps, environmental work program implementation and detailed expenditures showing discrepancies/deviations with approved exploration and environmental plans and budgets as well as all other information of any kind collected during the exploration activities. All the reports submitted to the MGB shall be subject to confidentiality clause of the MPSA.

The Contractor is further required to pay at the same date every year reckoned from the date of

the first payment, to the concerned Municipality an occupation fee over the Contract Area amounting to P50.00 per hectare. If the fee is not paid on the date specified, the Contractor shall pay a surcharge of 25% of the amount due in addition to the occupation fees.

The MPSA may be suspended for failure of the Contractor to comply with any provision of the Philippine Mining Act of 1995 and to pay taxes, fees and/or other charges demandable and due the Government. In addition, the said Agreement may be terminated for the following causes: (a) expiration of its term whether original or renewal; (b) withdrawal from the Agreement by the Contractor; (c) violation by the Contractor of the MPSA's terms and conditions; (d) failure to pay taxes, fees or financial obligations for two consecutive years; (e) false statement or omission of facts by the Contractor; and (f) any other cause or reason provided under the Philippine Mining Act of 1995 and its implementing rules and regulations, or any other relevant laws and regulations.

If the results of exploration reveal the presence of mineral deposits economically and technically feasible for mining operations, the Contractor, during the exploration period, shall submit to the Regional Director, copy furnished the Director, a Declaration of Mining Project Feasibility together with a Mining Project Feasibility Study, a Three Year Development and Construction or Commercial Operation Work Program, a complete geologic report of the area and an Environmental Compliance Certificate . Failure of the Contractor to submit a Declaration of Mining Project Feasibility during the Exploration Period shall be considered a substantial breach of the MPSA.

Once the ECC is secured, the Contractor shall complete the development of the mine including construction of production facilities within 36 months from the submission of the Declaration of Mining Project Feasibility, subject to such extension based on justifiable reasons as the Secretary of the DENR may approve, upon the recommendation of the Regional Director, through the Director of the MGB.

Any portion of the contract area, which shall not be utilized for mining operations shall be relinquished to the Government. The Contractor shall also show proof of its financial and technical competence in mining operations and environmental management.

The Contractor shall submit, within 30 days before the completion of mine development and construction of production facilities, to the Director through the concerned Regional Director a Three-Year Commercial Operation Work Program. The Contractor shall commence commercial utilization immediately upon approval of the Work Programs. Failure of the Contractor to commence commercial production within the period shall be considered a substantial breach of the MPSA.

Exploration Permit Application (EPA)

An EPA is an agreement under which the government grants the contractor the exclusive right to conduct exploration within the contract area during a defined period. The term of an Exploration Permit is two years from the date of the issuance, renewable for like periods but not to exceed a total term of six years. Unlike the MPSA, an EPA is limited to exploration.

Legal and Environmental Matters

The Philippine government grants MPSA`s on the condition that the subject mining activities are managed in a technically, financially, socially, culturally and environmentally responsible manner to enhance the national growth and welfare of the Philippines. DENR requires an Environmental Clearance Certificate (ECC) for any mining activity. The ECC refers to the document issued by the Secretary of the DENR certifying that based on the representations of the proponent and the preparers (the proponent's technical staff of the competent professional group commissioned by the proponent to prepare the EIS and other related documents), as reviewed and validated by the Environmental Impact Assessment Review Committee (EIARC), the proposed project or undertaking will not cause a significant negative environmental impact; that the proponent has complied with all the requirements of the Environmental Impact Assessment System; and that the proponent is committed to implement its approved Environmental Management Plan in the Environmental Impact System or mitigation measures in the Initial Environmental Examination.

The issuance of the ECC by the DENR, which is necessary prior to the conduct of any mine development work and construction of the production facilities in the Contract Area, involves the commissioning of the Environmental Impact Assessment (EIA) and the preparation of the Environmental Impact Statement (EIS). The EIA refers to the process of predicting the likely environmental consequences of implementing projects or undertakings and designing appropriate preventive, mitigating and enhancement measures. On the other hand, the EIS refers to the documents of studies on the environmental impacts of a project including discussions on direct and indirect consequences upon human welfare and ecological and environmental integrity. The Environmental Management Bureau (EMB)/DENR-Regional Office in coordination with the MGB, shall take the primary responsibility for the acceptance, processing, evaluation and monitoring of the EIS and the Initial Environmental Examinations. The EMB/Environmental Management and Protected Areas Services (EMPAS) shall have the authority to recommend to the Secretary of the DENR any appropriate action on applications for an ECC.

The ECC is the basis for the Environmental Protection and Enhancement Program (EPEP) which every party to an MPSA must undertake within the subject area of the MPSA. The EPEP refers to the comprehensive and strategic environmental management plan for the life of a mining project on which the Annual Environmental Protection and Enhancement Programs (AEPEP) are based and implemented to achieve the environmental management objectives, criteria and commitments including protection and rehabilitation of the disturbed environment. The EPEP must be submitted by the company within 30 days from receipt of the ECC. To effectively implement an approved EPEP, the AEPEP is required to be submitted 30 days prior to the beginning of every calendar year. Minesite inspections and quarterly monitoring are conducted by the DENR and a multipartite monitoring team composed of local government units, host communities, non-governmental organizations, the DENR and the company to ensure compliance with the AEPEP.

Companies are required to rehabilitate technically and biologically all areas that are excavated, mined out, covered with tailings or otherwise disturbed and to establish a mine rehabilitation fund, based on their work program. Such a fund must be deposited as a trust fund in a government depository bank and is used for the physical and social rehabilitation of areas and

communities affected by mining activities as well as for research on the social, technical and environmental enhancement aspects of rehabilitation.

Accessibility, Climate, Physiography

PDA Project is located in Pan de Azucar Island, Concepcion municipality, some 112 km northeast of Iloilo City in Panay Island, Central Philippines. The area can be accessed by motorized outrigger boats from the coastal town of Concepcion in about 50 to 70 minutes. Concepcion can be reached in about two hours from Iloilo City via a concreted coastal highway. Some twelve daily commercial flights of Philippine Airlines, Cebu Pacific and Air Philippines fly the Manila-Iloilo route, in addition to several inter-island passenger and cargo ships which run daily to Manila, and other major domestic ports. A domestic seaport is located in Estancia municipality, some ten kilometers northwest of the project area. Iloilo City is the main commercial hub in western central Philippines, and is one of the largest cities outside Manila.

The project area is covered under Type 3 Philippine climate classification characterized by short dry season lasting from one to three months from March to May, and wet season from June to February with no very pronounced maximum rain period. This part of the country is not along the normal path of tropical cyclones.

The island topography is dominated by a chain of rugged hills and mountains, principally Mt. Pan de Azucar (572 m above sea level) and Mt. Macatunao (400 m above sea level) encircling discontinuously a central depression. This topographic depression, composed of flat rice paddy fields accentuated by small hills, marks the location of the PDA Project area.

History

During historical times, gold has been reportedly mined and panned on the mainland Panay Island, near Concepcion township, west of Pan de Azucar. The Japanese during World War II had explored these areas, mainly for copper. In the 1970's, local companies ventured into small-scale mining and conducted trenching. No verifiable record of gold and copper production is obtainable from this activity. In 1986, a private Philippine company Homestake Minerals acquired mineral tenements in eastern Iloilo Province, including Pan de Azucar Island, and carried out aerial reconnaissance surveys and ground exploration. In 1987, the Japan International Cooperation Agency (JICA) and the Metal Mining Agency of Japan (MMAJ), in collaboration with the Philippine MGB, conducted regional and detailed exploration work around Concepcion. This program culminated in shallow diamond drilling of several gold, copper, and molybdenum geochemical anomalies in 1989, excluding Pan de Azucar Island. In the mid-1990's, Chase Resources and TVI Pacific spearheaded exploration work over the same area. Mt. Isa Mines and Climax Mining followed later, and in 1998, Phelps Dodge began acquiring tenements and carried out exploration and scout drilling over areas on the mainland.

At Pan de Azucar, potential for iron was recognized in 1967. Areas with gossanous boulders, including the present Pan de Azucar project site, were investigated with unknown results. Hydrothermal clay deposits south of the island were also recognized. Homestake's early rockchip sampling work of the Pan de Azucar gossan boulders in 1986, resulted in delineating potential areas for gold and copper, centered in the topographic depression. Minimax in the early 1990's launched its own reconnaissance work and confirmed Homestake's sampling results. MRL Gold entered into an agreement on the project with Minimax in 1997.

Detailed ground exploration work was conducted by MRL Gold starting June, 1997. A detailed geological and soil geochemical sampling program was performed from June–December, 1997. This work is summarised in Abrasaldo (1998). No technical work has been carried out between 1997 and 2001, while MRL Gold worked at perfecting the MPSA with the Philippine government. In June 2001, a time domain induced polarization (IP), resistivity and ground magnetometer survey was carried out by McPhar Geoservices (Philippines) Inc. This activity was preliminary to a scout diamond drilling program financed by Australian company Delta Gold, and results are described in Robertshaw (2001, and appended to Ruelo, 2002). A very strong chargeability anomaly was defined over approximately 800 m by 200 m, coincident with the Valderama Zone.

Scout diamond drilling carried out during late 2001under the Delta Gold joint venture, and operated by Mindoro, focused on the Valderama Zone, where a shallow, massive pyritic sulphide deposit with associated copper, gold, silver and zinc mineralization was discovered. Results from ten shallow, wide-spaced, reconnaissance drill holes gave significant values in five holes as follows (holes PDA-03, 06 and 08, through the massive sulphide deposit, are believed to be true thickness). Results are fully reported in Ruelo (2002):

HOLE	FROM (m)	TO (m)	LENGTH (m)	COPPER (%)	GOLD (g/t)	SILVER (g/t)	ZINC (%)
PDA-03	16.3	53.4	37.1	0.8	1.87		
PDA-06	6.0	47.5	41.5	0.12	1.2		
PDA-08	55.75	96	40.25	0.69	1.21	4.34	0.63
Including	55.75	75	19.25	1.08	1.19	6.49	1.19
Additional intercepts proximal to the massive sulphide deposit, possibly in feeder faults:							
PDA-07	29.5	34.2	4.7	0.99	0.5	13.43	1.23
PDA-09	20.35	23	2.65	2.2	1.97	31.1	1.3

Geological Setting

Regional Geology

As described by Ruelo (2002), Pan de Azucar is part of a Tertiary volcanoplutonic arc terrane in the Central Philippines. The island is basically an eroded andesitic-dacitic caldera-dome complex. Regional correlation suggests that the age of the volcanic package is most likely Pliocene-Quaternary. The evolution of the magmatic system may have begun in the southern

part of the arc located in Southern Negros, and continued with a progressive migration to the north located in Eastern Iloilo (Figure 1). As a result, at least three coalescing arcuate, magmatic arcs were formed, temporally arranged as Oligocene (SW Negros Arc), Miocene (SW Negros-East Iloilo Arc}, and Pliocene-Quaternary (Iloilo Arc, or IA). The IA therefore consists of a NNE-trending Miocene-Pliocene -Quaternary system. To the west of the EIA, the Iloilo Basin represents the forearc basin.

The evolution of IA may have resulted from eastward subduction of the leading frontal oceanic slab of the Sulu Plate along the Negros Trench, underneath the Visayan Plate in Oligocene times. Cessation of subduction began in late Miocene when the northern portion of the Sulu Plate was obducted, forming the Antique Ophiolite, west of the forearc basin (the Iloilo Basin). The Negros Trench is presently still active in the southern portion. The detached downgoing slab may have continued its eastward plunge and was responsible for most of the Pliocene-Quaternary volcanoplutonic systems not only at IA, but in Eastern Negros as well.

IA is believed to be a calc-alkali to alkali magmatic arc. Both intrusive and volcanic rock suites are present as batholiths, plugs, domes and eroded volcanic edifices. It covers an area about 150 km long and 40 km wide, extending from Guimaras Island and northward to eastern Capiz Province. Large outcropping diorite complexes are located to the south of Pan de Azucar (e.g. Sara Diorite). Several smaller intrusive and sub-volcanic complexes within the arc exhibit extensive hydrothermal alteration, and large areas have been explored for the past decade by foreign exploration entities like MMJA-JICA, MIM Exploration, Climax Mining, Phelps Dodge Exploration, and MRL Gold. Azure Mine in Capiz is an old copper mine. Several abandoned alluvial gold panning areas are located in Maayon, Capiz.

Local and Property Geology

As established by MRL Gold in 1997, PDA Island is basically an eroded andesitic-dacitic caldera-dome complex. Regional correlation suggests that the age of the volcanic package is most likely Pliocene. The project area embraces the central northern part of Pan de Azucar Island (Figure 3). It is located in a prominent depression, believed to be a collapse caldera structure. The main lithology in the project area consists of volcanic to sub-volcanic, andesitic to dacitic rocktypes. The PDA Project area (Figure 4) is volcanic rock-dominated. Volcanics, volcaniclastics, and sub-volcanic intrusive rocks were identified during the two drilling programs. Compositionally, andesitic rocks dominate over dacitic lithologies. The following summarizes the lithological units within the project area, drawn largely from Ruelo (2002):

Volcanic Rocks

Amygdaloidal Porphyritic Andesite

This rock unit probably constitutes the oldest outcropping lithology at PDA. It forms a narrow inlier at the Saddle Zone, 600 m long and 100 m wide. The rock is moderately altered to epidote-chlorite-quartz-albite-clinozoisite assemblages, with sulphide disseminations consisting of pyrite and chalcopyrite, as well as hydrothermal magnetite. Previous assay work (Abrasaldo 1998) returned 0.21 % copper, with no other metal credits.

Diamond drilling has intercepted narrow to thick sections of similar andesitic rocktypes in most holes. Textures vary from distinct amygdaloidal to equigranular and

pilotaxitic. All have moderate to intense pervasive propylitic alteration (chlorite-epidote-quartz-pyrite ± calcite ± albite ± magnetite ± illite-smectite ± leucoxene).

Dacitic Volcanics and Volcaniclastics
This rocktype was differentiated from the " Intermediate Volcanics and Volcaniclastics" unit of the previous work (Abrasaldo, 1998). It is regarded as a dacitic horizon of the overall dacite-andesite sequence (the corresponding andesite unit is described above). Most of the altered and mineralized host lithology within the project area belongs to this rocktype. Discernible outcrops are in the northern shoreline where they are fresh, locally brecciated to weakly altered, and at Asparin Hill and Bebs Hill where they are moderately to strongly altered. It is believed that the dacite occurs as massive flows / flow breccias (shoreline) and as fragmental rocks (e.g. tuffs, pyroclastic flows). This unit is the most extensive in the tenement area.

Most of the fragmental dacitic rocks exhibit moderate to intense hydrothermal alteration, recognized both in outcrops and residual boulders in and around the PDA depression. The weak-moderate ferruginous boulder fields at Valderama Hill, Ferraris Hill, Asparin Hill, Bebs Hill, and elsewhere within the depression, exhibit relict dacitic lithological characteristics. The intense gossanous boulders on surface at Ferraris and Valderama Hills, and its downward and northward extent (all massive pyritic sulphide horizons in drillcore) are interpreted to be replaced dacitic horizons. Also in drillcore, alteration of the dacitic rocks is dominantly a quartz-illite-pyrite (QIP) assemblage.

Andesitic Pyroclastics (Ignimbrite)
This unit occupies most of the higher steep-sided hills bordering the PDA topographic depression, to the east, south and west. Outcrops are commonly massive but some possess crude thick stratification and layering, some with very low dips (2-10 degrees) to horizontal. It is commonly a coarse fragmental, matrix-supported with "volcanic breccias" and "agglomerate" texture. Clasts are sub-angular, cm- to more than a meter in size, set in a coarse, lapilli- to ash- size glassy matrix. Petrographically it is a granulated / shattered hornblende andesite. Except for the iron-oxide staining, it does not exhibit any signs of hydrothermal alteration. Broken vitric shards and crystals suggest it is a magmatically- fragmented rock, formed as a result of explosive eruptions of gas-charged andesitic magma, deposited as pyroclastic flows, probably in a subaerial environment. The thickness and extent over the island of this unit implies large eruptions akin to caldera-forming events, i.e. non-welded ignimbrite. The eruption vent may not be located in the present topographic depression. Airphoto interpretation reveals that this unit both abuts and drapes over the andesite porphyry flow-dome features. Often, either fault or erosional slide scarps characterize steep hills. Vertical walls, such as in the northeast portion near Mt. Macatunao, do suggest large-scale faulting mechanisms cutting this unit.

Lacustrine deposits were previously identified (Abrasaldo 1998) at PDA, in the east caldera wall (near Bebs Hill), and the west caldera wall. They have been well described as "cream to buff coloured, loosely consolidated, moderately sorted, almost flat dipping sedimentary rocks showing semi-graded bedding and forming distinct bodies in the

lower slopes of the volcanic plugs west and northeast." New findings, however, interpret these outcrops as a contiguous part of the ignimbritic caldera wall, possibly a water-laid proximal airfall tephra layer at the base of the massive proximal ignimbrite breccias, and the andesite porphyry plugs (the "caldera wall"). It does possess structures reminiscent of sedimentary rocks (i.e. layering, graded bedding), but compositionally it is composed of finely-comminuted dominantly dacitic material and volcanic glass shards. Descriptively, it is a water-laid tuff. It may be thick (>10 m?) and widespread. Its paucity as outcrop is hindered by talus derived from the upper sections of the caldera wall. Implications for a water-laid origin may be significant in constraining the relative age, origin and paleo-environment of the tuffaceous hosts to the massive sulphides.

The coarser facies of the ignimbrite contains large (boulder to mega-boulder size) clasts of dark-grey coloured porphyritic andesite porphyry. Previously described as a volcanic breccia, some clasts are intensely oxidized and silicified, set in a matrix of mixed vitric materials, shattered phenocrysts, and minor magnetite grains.

Basaltic Andesite

There is no outcropping rock of this type, and it is recognised in drill core only. A sample from drillcore was petrographically identified as basalt (07/19.00); an amygdaloidal basalt with moderate epidote-chlorite-albite-quartz-pyrite alteration.

Sub-Volcanic Rocks

Diorite

Dioritic rocks do not outcrop and they occur as boulders in the West Wall and identified by petrographic analyses from drillcore samples. Diorite and quartz dioritic rocks are propylitised. Four samples sent for petrographic analyses in 2001 were identified as intrusive rocks in PDA-02, 03, and 07. In PDA-02 (02/82.90 and 02/164.50), dyke-like rocks are deformed with weak to moderate albite-calcite-clay-pyrite-chlorite-quartz-zeolite alteration. Sample 03/92.30 has quartz-chlorite-carbonate-clay-pyrite assemblage and is intensely deformed as well. Sample 07/65.00 is a pervasively propylitised microdiorite with epidote-chlorite-clay-clinozoisite-albite-quartz-pyrite alteration. The rock-type may constitute medium- to coarse-grained sub-volcanic dykes, or even just large xenolithic blocks detached from a “parent diorite at depth”, and included in the propylitised andesite.

Andesite Porphyry (Flow-Dome)

These are conspicuously coarse-grained unaltered rocks seen as outcrops, prominent domal promontories, and talus boulders in many (roughly 20 %) parts of the of the project area. Hornblende and biotite dominate the ferromagnesian minerals and, with coarse-grained plagioclase crystals, make up 30 % of the phenocrysts. Minor primary magnetite is commonly associated. Megascopic observation of fresh andesite porphyry boulders and subcrops showed a prominent flow texture, basically seen as textural alignment of phenocrysts and cooling-flow joints. Aerial photo interpretation revealed that these domal features occupy isolated bodies around the margins of the PDA topographic depression. Prominent peaks like Mt. Looc and Mt. Pan de Azucar

are eroded andesite porphyry domes. Several smaller domal features are located northeast near Macatunao, and southwest of the project tenement. The steep South Caldera wall is believed to be a remnant upthrown block of andesite porphyry. It is interpreted to be an inlier draped by younger andesitic pyroclastics, joining with the Mt. Pan de Azucar dome at depth.

Porphyritic Andesite Dyke
Pre-drilling work has identified hornblende andesite boulders at Asparin and the West Caldera Wall area. Dykes were also observed in drillcore in PDA-04 and 02. It is dark , massive, and moderately magnetic rock. At Asparin Hill, small boulders and outcrops of moderately altered (chlorite-quartz-magnetite-minor pyrite) andesite are located in a topographic depression, while they occur as boulder trains in the West Caldera Wall area. The dyke-like nature is substantiated by its flowage (pilotaxitic) texture and presence of coarse-grained diorite xenoliths.

Other rocktypes

Hydrothermal Breccia
Matrix-supported breccias are found in many of the drill holes and especially in PDA-01,02 and 04. The illite-pyrite (IP) ± chlorite ± quartz breccias are believed to have been formed by hydrothermal processes rather than tectonic activity. Subrounded to angular clasts are composed of lithic and IP-altered fragments, which are more strongly silicified fragments.

Ferruginous boulders
Oxidized, originally pyritic-altered, iron-oxide rocks abound in most hills within the caldera collapse area. Textures and contents of limonitic minerals (along with quartz-illite-chlorite-relict pyrite) are variable, ranging from hematite to goethite. Ferarris Hill, and the eastern flank of Valderama Hill have the most intense gossanous boulders. The Saddle area has strongly supergene-brecciated quartz-hematite float boulders. Moderately ferruginous and vuggy quartz-alunite boulders, anomalous in gold-copper and other metals, are present at Asparin Hill.

Alluvial and Colluvial Deposits
Some 30 % of the project area is covered by recent alluvial and some colluvial materials consisting of gravels, sand, silt and clayey sediments. Most are concentrated in the big semi-circular depression bordered by the caldera wall deposits. The thickness encountered during drilling ranged from 1.0 to 6.80 m.

Deposit Type

Since 1997, MRL Gold has recognised that Pan de Azucar hosts a typical volcanic-related magmatic hydrothermal system which displays genetically and temporally related copper and gold mineralisation styles : low- and, possibly, high- sulphidation epithermal, believed to be

related to an underlying porphyry copper-gold system (Figure 11 this report, and figure 5 in Ruelo, 2002).

The Valderama Deposit is considered to be the epithermal expression of the system.

Valderama Deposit

The Valderama copper-gold-silver-zinc-pyrite deposit is a near-surface stratabound, replacement deposit (Figures 4 and 9). Most of the alteration and mineralization features at the Valderama drilling site suggest it is low-sulphidation epithermal type. Although it occupies the site where a high-sulphidation deposit might be anticipated (eg. Lepanto Deposit), there is no strong evidence that it is high-sulphidation type. Enargite has not been seen on surface or in drillcore. Massive and vuggy silicification are absent, except for a few residual boulders. Quartz-alunite boulders are interpreted to be residual in origin. The presence of minor chalcocite is interpreted to be supergene in origin. Carbonate gangue is also present, which does not occur in high-sulphidation systems.

Some observations, however, suggest high-sulphidation events phase may have overprinted an earlier low-sulphidation event;

1. the abundance of sulphides, i.e. replacement-type fine-grained pyrite
2. arsenic occurs in elevated amounts (up to 840 ppm As).
3. the presence of minor sulphide facies like covellite, chalcocite and bornite occurring later than pyrite.

It is concluded that the Valderama Deposit is a low-sulphidation deposit derived from magmatic fluids, sourced from a porphyry copper-gold system below, which interacted with abundant meteoric fluids in water-saturated dacitic tuffs, possibly in a caldera moat environment. An initial pyrite sheet was formed, up to 40 m thick, which appears to have extended from the Saddle Zone to the northern property boundary about 1.6 km away, which was overprinted by a later, quartz-copper-gold-zinc-silver event

Low-Sulphidation Epithermal Veins / Feeder Zones

Narrower higher-grade intercepts in drill holes PDA-07 and 09 (Table 2, Ruelo (2002)), may represent veins occupying “feeder” faults.

Low-Sulphidation Epithermal Diatreme (?) / Feeder Zone at Asparin Hill and Porphyry Copper-Gold Target

A shallow hole, PDA-16, completed to 45 m on the Asparin Hill target intersected a different alteration and mineral assemblage to that seen in the Valderama Deposit, 700 m to the east (see figure 4).
The alteration assemblage is described in the report by petrographer E. Comsti, appended to this report, and summarised under the section descibing drill hole PDA-16. Her summary of the interpreted mineralization setting at Asparin Hill is as follows (excerpted from her report):

1. *The occurrence of chalcopyrite together with K-silicate alteration indicates a possible porphyry copper mineralization at depth. Hence, more chalcopyrite, along with*

bornite and hydrothermal magnetite may be expected where K-silicate alteration predominates.

2. *Crosscutting relationships based on alteration mineralogy, reveal a younger episode of magmatism which is represented by the higher temperature assemblages such as sericite-chlorite and K-silicate alterations over illite-sericite (QIP);*

3 *Asparin Hill is a highly prospective site for the search of a high level intrusive or breccia body, which may host porphyry style mineralization. It is in this same site where advanced argillic- altered floats were mapped. The presence of hydrothermal biotite in two of the drillcore samples from Asparin also strongly supports this claim. Intense silicification in the area has rendered the host rock highly resistant to erosion resulting in topographic prominences. This intense alteration may be related to the formation of a diatreme or a hydrothermal breccia pipe below.*

4. *At Valderrama Hill, however, the low temperature alteration assemblage related to the delineated massive pyritic deposit is distinct from that at Asparin Hill. In this case, alteration mineralogy suggests the introduction of neutral ph solutions responsible for the deposition of the mineralized massive pyritic body.*

5. *At Asparin Hill, a higher temperature magmatic hydrothermal fluid is responsible for the sericite-chlorite and K-silicate alterations (and possible porphyry type mineralization at depth).*

Comsti concludes that; "*At least two types of hydrothermal fluids have been introduced in the Pan de Azucar area*."

Ore Minerals

This description applies dominantly to the Valderama Deposit. Hypogene mineralization consists of precious- and base metal minerals. Chalcopyrite is the main copper mineral. Bornite, together with covellite and chalcocite, occurs in trace amounts. Gold has not been seen in native form; gold-bearing telluride minerals are suspected. Silver minerals have not been detected. Zinc is present as sphalerite, while minor lead also exists, most probably in the form of galena. Chalcocite +/- covellite (after hypogene bornite) probably represents supergene mineralization episodes.

Ruelo (2002) has described the ore minerals as follows:
Pyrite
Pyrite occurrence has been described under Alteration (below). It is the most ubiquitous sulphide, occurring mainly as allotriomorphic to coarse subhedral-granular aggregates. Grain size range from 1μ to 8 mm. When minor gangue is present, pyrite occurs as spongy and globule-like spongy aggregates or blebs. It also occurs as void and fracture fill exhibiting jigsaw-fit texture.

Chalcopyrite
Chalcopyrite occurs as allotriomorphic granular masses that invade open spaces and cracks in pyrite. It also fringes pyrite crystals, and tends to be more crystalline in form when interlocked with pyrite. In QIP-altered rocks, it also fills voids in the quartz-illite altered gangue, and forms microveinlets together with quartz, sphalerite and pyrite cutting the gangue. Sometimes it occurs as free grains or in occasional contact with pyrite crystals. The above textural relationships suggest that chalcopyrite came after pyrite. Chalcopyrite is often, but not always associated with *sphalerite*. Coexistence among the two is in the form of "chalcopyrite disease" – a texture characterized by blebs of chalcopyrite included in larger sphalerite crystals. Sometimes it occasionally traverses, and in some instances replaces, sphalerite. This relationship implies that chalcopyrite formed later than sphalerite.

Sphalerite
The larger sphalerite crystals have ovoid-shaped inclusions of chalcopyrite, known as chalcopyrite disease. It is also seen as being replaced, engulfed, traversed and invaded by chalcopyrite. Interlocking sphalerite-chalcopyrite grains invade cracks and fractures in pyrite. This relationship suggests earlier pyrite is cut by sphalerite, then later chalcopyrite formed as both replacement and fracture fill. Telluride is suspect as being hosted in sphalerite.

Bornite
This mineral forms minor amounts in the ore mineral assemblage. It occurs as thin linings along chalcopyrite grain boundaries, localized in microfractures and open spaces in the gangue. Fine aggregates are often rimmed by chalcocite ± covellite. It is believed that bornite came after chalcopyrite in the paragenetic sequence.

Covellite
Covellite occurs in trace amounts rimming fine aggregates of bornite. It co-exists with chalcocite around the same mineral. Some oxidized massive pyrite has traces of covellite.

Chalcocite
Chalcocite occurs in minor amounts rimming bornite and pyrite aggregates. It is thought to be mostly supergene.

Telluride?
This mineral is suspected to be present in one of the samples analysed (6/50.3m). It occurs as lath-like high-bireflectance weakly anisotropic crystals hosted by sphalerite.

Alteration Assemblage

<u>Valderama Deposit</u>
The dominant hydrothermal alteration seen in the Valderama Deposit is of low-sulphidation type : a quartz-illite-pyrite (QIP) assemblage suggesting neutral pH fluids. Variations in the relative abundance of pyrite lead to three other gradational alteration types: increase in pyrite makes the rock semi-massive (SPS) and further, a massive pyritic sulphide (MPS). In the absence of quartz, the rock grades into illite-pyrite (IP). Propylitic alteration (chlorite ± quartz ± epidote ± pyrite ± calcite ± magnetite ± albite) affects most of the andesitic units.

Asparin Hill
At Asparin Hill, three distinct alteration assemblages are described by Comsti (2002):

(a) An early illitic/sericitic event (equivalent to the quartz-illite-pyrite event in the Valderama Deposit)
(b) A potassium silicate event characterised by hydrothermal biotite.
(c) A sericite-chlorite event overprinting (a) and (b).
The Asparin Hill alteration, is described in more detail under the description for drill hole PDA-16 (Drilling section).

Mineralization Assemblage

Gold and silver mineralization in the Valderama Deposit is base-metal rich. Chalcopyrite occurs in ore-grade concentrations in places, associated with lesser sphalerite, bornite, covellite and probably galena. Massive pyrite units appear to be the favored host. The probable reason is that mineralization occurs as fracture filling: massive pyrite is invaded by chalcopyrite-sphalerite + Au/Ag minerals. Copper-gold-zinc mineralization in the Valderama Deposit seems to be structurally-controlled as well. Chalcopyrite-sphalerite (+ gold-bearing minerals) was introduced into fractures in the massive pyrite. The same minerals (with bornite+ chalcocite-covellite) occur as veinlets and fracture-fill cutting pervasive low-sulphidation QIP alteration zones. Narrow pyritic, shear-banded fault / breccia zones are mineralized as well. Semi-massive pyrite grading into QIP zones seems to have more subtle precious-base metal mineralization.

Copper and gold values exhibit a positive correlation in massive pyritic units. A few exceptions occur in structurally controlled, but narrow pyritic shears and fault zones. Correspondingly in all other alteration types, the tenor of copper-gold-silver zinc) mineralization increases with attendant increase in pyrite content. The metal content is further enhanced in the presence of fault shears and fault breccias. The presumed absence of enargite is substantiated both by ubiquitous chalcopyrite and non-correlation of arsenic and copper, together with zinc and gold.

Exploration

Reconnaisance Program
MRL Gold conducted ground early-stage exploration work over the property in early 1997 via geologic mapping and rockchip sampling. Anomalous values of copper, gold, zinc, silver, and arsenic in gossanous rock samples were noted. This led to a detailed ground investigation.

Detailed Geological-Soil Geochemistry Program
A very comprehensive report on pre-drilling exploration is contained in Abrasaldo (1998). In summary, the detailed groundwork carried out in 1997, established a 2.3 km-baseline with 100 m spaced gridlines from 0.25 km up to 1.6 km long. The total gridlines cut was 50 line km.

Out of 2,104 soil samples collected, some 1,764 samples were analyzed for gold, copper, silver, zinc lead and arsenic. Ten rockchip float and outcrop samples were assayed for the same element suite, and another twenty-one were sent for mineragraphic and petrographic analyses. A few samples were run for X-ray diffraction (XRD).

Geophysical Program

The IP / magnetic survey was carried out in May-June, 2001, and totaled 9.8 line km of dipole dipole IP, coupled with resistivity measurements on 7 profiles. The ground magnetometer survey covered 11 km on 7 profiles. The survey defined a very strong high chargeabilty anomaly associated with Valderama Hill, and extending northwards to the limit of the survey. Refer to Robertshaw, 2001, appendisized to Ruelo (2002) for complete report details.

Diamond Drilling Program – Phase 1 (2001)

Eleven diamond drill holes totaling 1,041.25 meters were completed. Core logging was done on-site, together with core recovery measurements and subsequent core photography. Diamond-saw core splitting and sampling were also done at the same site. Split core samples were sent for analyses to McPhar Geoservices (Philippines), Inc. laboratory in Manila. Petrographic (thin-section) and mineragraphic (polished-section) analyses were performed on twenty six samples taken from PDA- 01 to PDA- 09. A total of twenty one thin-sections and eight polished sections were completed from these samples, in addition to two thin-sections taken from selected outcrops. Ore and gangue petrographic and mineragraphic analyses were done by Ms. Elvita Comsti, (MSc Applied Geology) a consulting petrographer. Details of the drilling program results are discussed in Ruelo (2002).

Diamond Drilling Program – Phase 2 (2002)

Seven diamond drill holes totaling 476.25 meters were accomplished. Core logging was carried out on-site, together with core recovery measurements and subsequent core photography. Diamond-saw core splitting and sampling were also done at the same time. Split core samples were sent for analyses to McPhar Geoservices (Philippines), Inc. Eleven samples were submitted for petrographic analysis and one sample for mineragraphic analysis. Ore and gangue petrographic and mineragraphic analyses were performed by Ms. Elvita Comsti, (MSc Applied Geology) a consulting petrographer.

Drilling (Phase 2)

Seven diamond drill holes totaling 476.25 meters were completed. Split-core samples varied from 1.50 to 5.00 m in length. A total of 93 samples were assayed and all were analysed for gold, copper, silver and zinc; and 28 samples for sulphur. Four samples were sent to Ostrea Mineral Laboratories, Inc. for routine check assays. The following two tables summarize general information on the drilling parameters and recovery:

DDH No.	Total Meterage	Inclination	Azimuth	Elevation (masl)	Northing	Easting
PDA-2001-05	84.65	-90	000	9.0	21,200	20,210
PDA-2001-09	41.35	-90	000	8.0	21,400	20,095

PDA-2002-12	95.55	-90	000	15.5	21,400	20,189
PDA-2002-13	24.90	-90	000	8.5	21,100	20,270
PDA-2002-14	130.50	-90	000	11.7	21,500	20,141
PDA-2002-15	54.30	-90	000	8.9	21,105	20,270
PDA-2006-16	45.00	-90	000	53.5	20,950	19,600
Total drilled (m)	**476.25**					

DDH No.	Total Depth (m)	Date Started	Date Finished	Average Core Recovery	No. of drilling days
PDA-2002-12	95.55	2-Oct-02	8-Oct-02	93 %	7
PDA-2001-05	157.05	10-Oct-02	15-Oct-02	96 %	5
PDA-2002-13	24.90	17-Oct-02	22-Oct-02	89 %	6
PDA-2001-09	102.00	24-Oct-02	27-Oct-02	99 %	3[1]
PDA-2002-14	130.50	29-Oct-02	3-Nov-02	95 %	6
PDA-2002-15	54.30	6-Nov-02	13-Nov-02	98 %	3[2]
PDA-2002-16	45.00	17-Nov-02	19-Nov-02	93 %	2
Total drilling days					**32**
Average Recovery				**95 %**	

[1]delay due to machine breakdown not included
[2]delay due to inavailability of drilling rods not included

A summary of the significant drill assays is presented below:

PHASE II DRILLING SIGNIFICANT INTERCEPTS

DRILL HOLE NO.	DEPTH INTERVAL, From (m)	DEPTH INTERVAL, To (m)	INTERVAL, m	Cu, %	Au, g/t	S,%
PDA 2001-09	63.65	66.65	3.00	0.22		
PDA 2002-12	36.85	38.75	1.90		1.06	42.53
	42.28	46.82	4.54	0.20		
	46.82	76.00	29.18		0.63	36.66
	46.82	79.08	32.26		0.59	36.24
PDA 2002-13	6.85	12.85	6.00	0.59		
	12.85	21.85	9.00	0.41	0.49	

	21.85	24.90	3.05	0.18		
PDA 2002-14	70.70	78.50	7.80		0.29	42.08
	87.40	90.40	3.00	0.12		40.85
	90.40	93.40	3.00	0.17		
	98.40	101.40	3.00	0.19		
PDA 2002-15	10.00	13.00	3.00	0.16	0.66	
	16.00	24.00	8.00	0.33		
	24.00	33.00	9.00		0.54	34.66
	27.00	30.00	3.00	0.12	0.88	38.37
PDA 2002-16	5.00	15.00	10.00	0.24		

Summary logs and descriptions of the drill holes are as follows;

DDH No.	:	PDA-2001-05
Coordinates	:	21,200N/ 20,210E
Collar Elevation	:	9.0 m RL
Azimuth	:	000^0
Inclination	:	-90°
Total Depth	:	Deepened from 72.4 m to 157.05

PDA 2001-05 was drilled in the 2001 program to a depth of 72.40 m. It is 50 m grid west of PDA-03, a well-mineralized hole. PDA-05 intersected propylitic altered amygdaloidal andesite and then dacitic units with pervasive quartz-pyrite-illite altered hydrofractured breccias. The hole was stopped after a quartz-pyrite breccia / vein zone was intersected starting at 66.00 m. No significant copper or gold values were encountered. The mineralized massive pyrite horizon appears to have been faulted off in this hole, and may occur deeper.

The strong chargeability anomaly extends at least 100 m west of PDA-05 and it was considered that the massive sulphide deposit may have been down-faulted in this area. Hence PDA-05 was deepened. The quartz-pyrite breccia / vein zone intersected at 66.00 m during the previous drilling persisted down to 109.70m hosting two narrow zones of massive pyritic sulphides at 92.27 m and 101.10 m. Pyrite content of the quartz-pyrite breccia unit ranges from 10 to 50 volume %. A tectonic clay-pyrite-quartz breccia unit was intersected at 109.70 m down to the end of the hole at 157.05 m.

A total of 18 samples of 5 m intervals were taken from this hole for assaying. No significant copper, zinc, gold, or silver values were encountered.

DDH No.	**:**	**PDA-2002-09**
Coordinates	:	21,400N/ 20,095E
Collar Elevation	:	8.0 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	Deepened from 60.65 m to 102.00

PDA 2001-09 was drilled 55.00 m west of PDA-08, a well-mineralized hole, also on section 21400N. The top section, completed in 2001, intersected altered propylitised dark grey and amygdaloidal andesite from surface to 18.30 m. A narrow massive pyrite and QIP zone was intersected with a 2-m fault breccia at its top, from 20.35 – 28.75m, before intersecting another propylitised andesite until 31.45 m. Semi-massive pyrite with QIP alteration and a fault zone was intercepted from 31.45 - 56.05 m. The hole was stopped at 60.65m in propylitised andesite. A 2.65 m section from 20.35 to 23.00 m (2001), had analysed 1.97 g/t gold, 2.2 % copper, 31.43 g/t silver and 1.3 % zinc.

The main massive sulphide deposit was not intersected in 2001. Subsequent drilling of PDA 2002-12 on the same section, and correlation with PDA 2001-08 (see Figure 6) suggested that the massive sulphides might occur deeper in PDA-09, which was therefore deepened. The depth extension intersected the brecciated propylitised andesite to 65.40 m, quartz-pyrite breccia from 65.40 – 69.30 m, a fault zone to 71.20 m, and then quartz-pyrite breccia through to 78.75 m. Pyrite content in the breccia ranges from 30–50 volume %. Intensely fractured and altered andesite was encountered from 78.75 – 79.50 m, QIP-altered breccia from 79.50 – 80.50 m, and fractured and altered andesite to 84.80 m. The hole ended at 102 m in quartz-pyrite ± illite breccia, with narrow intercepts of propylitised andesite from 84.80 – 102.00 m.

A total of 11 samples were submitted for assay from this hole extension. Generally, low copper, zinc, gold and silver values were encountered. A 3 m interval (63.65 – 66.65 m) gave 0.22 % copper.

DH No.	**:**	**PDA 2002-12**
Coordinates	:	21,400N / 20,189E
Collar Elevation	:	15.5 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	95.55 m

PDA 2002-12 was drilled 33 m grid east of PDA 2001-08 to provide information on the width of the Valderama Deposit on this section, and to test for a possible feeder zone near the caldera wall. It intersected talus deposits composed chiefly of weathered andesite porphyry fragments from the surface to 2.45 m, ferruginous lateritic soil from 2.45 to 7.35 m, then propylitised andesitic volcanics with quartz-pyrite veinlets, with minor chalcopyrite to 27.05 m., and moderately propylitised andesite porphyry from 27.05 to 36.85 m. A narrow zone of massive pyritic sulphides was intercepted from 36.85 to 38.75 m, then altered andesitic volcaniclastics down to 42.28 m, containing about 5 to 10 volume % pyrite. From 42.28 to 46.82 m, alternating zones of altered dacitic tuff and intense QIP with thin semi-massive pyrite±quartz were encountered. A thicker zone of massive pyritic sulphides occurs from 46.82 to 79.08 m. A narrow section of intensely propylitised andesitic volcanics was intercepted from 79.08 to 80.55 m. Quartz-pyrite breccia with patches of QIP-altered dacitic tuff containing quartz-pyrite

veinlets was intersected from 80.55 m until the bottom of the hole at 95.55 m. The breccia is estimated to contain 10 to 30 volume % pyrite.

A total of 20 samples from this hole were submitted for assaying. The 1.9 m massive pyritic sulphide section from 36.85-38.75 m returned 1.06 g/t gold and 42.53 % sulphur. A 4.54 m (42.28 – 46.82 m) section in the andesitic and dacitic volcaniclastics analyzed 0.2% copper. A 32.26 m section (46.82 –79.08 m) assayed 0.59 g/t gold and 36.24 % sulphur. This includes a 29.18 m (46.82 – 76.00 m) section, which returned 0.63 g/t gold and 36.66% sulphur.

DDH No.	**:**	**PDA 2002-13**
Coordinates	:	21,100N / 20,270E
Collar Elevation	:	8.5 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	24.90 m

PDA 2002-13 was drilled 84 m to the east of PDA-02, on the edge of a rice field close to the northeast flank of Valderama Hill. Objective was to gain information on the eastern extent of the Valderama Deposit, and to help fill a large gap in information on the deposit in this area. A strong chargeability anomaly is present. The hole was lost in heavily brecciated and faulted ground at a depth of 24.90 m. The hole was re-drilled as PDA-15 at a later date. PDA-13 intersected alluvial deposits from surface to 3.70 m, residual soil to 5.90 m, and oxidized weathered tuff to 11.20 m. A 1 m oxidized pyritic unit was encountered to 12.20 m, and weathered tuff until 14.50 m. An intense fault zone was then intersected which gave very difficult drilling conditions. Due to this, the hole was terminated at 24.90 m, and was re-drilled as PDA-15, at a later date.

A total of 8 samples were taken from PDA-13 for assay, including a sample comprising cuttings from the fault zone at 21.00 m. Significant intercepts include a 6.00 m (6.85 – 12.85 m) interval analyzing 0.59 % copper; a 9.00-m (12.85 – 21.85 m) section, which gave 0.41 % copper and 0.49 g/t gold; and a 3.05-m (21.85 – 24.90 m) interval, which gave 0.18 % copper.

DDH No.	**:**	**PDA 2002-14**
Coordinates	:	21,500N / 20,141E
Collar Elevation	:	11.7 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	130.50 m

PDA 2002-14 was drilled 100 m grid north of PDA 2001-08, a well-mineralized hole, to test the northern strike extent of the Valderama Deposit. A particular concern was the possible effect on mineralization of a major cross-cutting fault, the Macatunao Fault that strikes approximately east-west through the immediate area. PDA-14 intersected alluvial deposits from the surface to 6.80 m, an oxide zone from 6.80 – 7.80 m, and altered amygdaloidal basalt

to 17.50 m. Further down hole, from 17.5 to 69.90 m, altered andesitic volcanics were encountered, with intercepts of altered dioritic intrusives with rare chalcopyrite veinlet and narrow zones of massive pyritic sulphides, then intensely altered dacitic tuff to 70.70 m. Massive pyritic sulphide was intersected from 70.70 to 78.50 m containing > 90 volume % pyrite, deformed microdiorite down to 87.40 m, then massive pyritic sulphide from 87.40 – 90.95 m. The hole ended at 130.5 m in quartz-pyrite ± illite breccia, with narrow intercepts of semi-massive and massive pyritic sulphides from 90.95 – 130.50 m.

A total of 14 samples were collected from this hole for assaying. Best results were a 7.80 m section (70.70 – 78.50 m) in massive pyritic sulphides, which assayed 0.29 g/t gold and 42.08 % sulphur; a 3.0 m section (87.40 – 90.40 m) mostly in massive pyritic sulphides, which analyzed 0.12% copper and 40.85% sulphur; a 3.00 m section (90.4 – 93.40 m) in mostly massive and semi-massive pyrite alteration, which assayed 0.17% copper, and a 3.00 m section (98.40 – 101.40 m), which assayed 0.19% copper.

DDH No.	**:**	**PDA 2002-15**
Coordinates	:	21,105N / 20,270E
Collar Elevation	:	8.9 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	54.30 m

PDA 2002-15 was the re-drill of PDA-13. It intersected sandy alluvium to 5.18 m, oxide zone from 5.18 to 8.20 m, and then weathered dacitic (?) tuff to 9.35 m. QIP breccia was intercepted from 9.35 – 14.00 m, altered hornblende andesite porphyry to 16.40 m, and then QIP breccia to 18.20 m. Pyrite content in the breccia ranges from 5 – 80 volume % with minor to significant chalcopyrite content. A fault zone was encountered from 18.20 – 24.40 m, then semi-massive pyritic sulphide to 25.59 m containing 40 – 90 volume % pyrite, and massive pyritic sulphides (> 90 volume % pyrite) to 29.0 m. Alternating zones of dioritic intrusives, massive pyritic sulphides and QIP breccia were encountered from 29.0 to 54.30 m. The hole was terminated in QIP breccia at 54.3m.

A total of eleven samples from this hole were submitted for analysis. The best intercepts were a 3.00-m section (10.00 –13.00 m) in QIP breccia, which gave 0.16% copper and 0.66 g/t gold; an 8.00-m section (16.00 – 24.00 m) mostly in a fault zone, which analyzed 0.33% copper; and a 9.00-m section (24.00 – 33.00 m) mostly in semi-massive to massive pyritic sulphides, which assayed 0.54 g/t gold and 34.66% sulphur including a 3.00-m section (27.00 – 30.00 m) in massive pyritic sulphides, which yielded 0.12% copper, 0.88 g/t gold and 38.37% sulphur.

DDH No.	**:**	**PDA 2002-16**
Coordinates	:	20,950N / 19,600E
Collar Elevation	:	53.50 m RL
Azimuth	:	00^0

Inclination : -90°
Total Depth : 45.00 m

PDA 2002-16 was drilled at Asparin Hill; an area with high soil geochemical results (eg. 690 parts per million (ppm) copper, 659 ppm lead, 116 ppm zinc, 1570 parts per billion (ppb) gold, 2.5 ppm silver, and 800 ppm arsenic); and also the site of a rock sample giving 736 ppm copper, 818 ppm lead, 98 ppm zinc, 355 ppb gold, 15.8 ppm silver, 900 ppm arsenic, 15 ppm molybdenum, 7 ppm antimony and 23.05 ppm mercury. Asparin Hill also falls within a broad high magnetic anomaly; and contains an anomalous, circular topographic depression, approximately 350 m in diameter, interpreted from aerial photos (Ruelo, 2002). PDA-16 was drilled on high ground, on the eastern rim of the circular depression.

PDA-16 intersected oxide zone from the surface to 10.60 m, altered porphyritic dacite containing approximately 1 – 3 volume % pyrite to 20.11 m, then quartz-illite-pyrite-chlorite-altered breccia through 20.59 m. A fault zone was encountered from 20.59 to 22.00 m, then the quartz-illite-pyrite-chlorite-altered hydrothermal breccia to 24.10 m. From 24.10 to 25.50 m, hydrothermally altered dacitic tuff containing 1 – 2 volume % pyrite and 1 – 2 volume % chalcopyrite was intersected. Sericite-chlorite-altered dacite overprinting K-silicate alteration with streaks and bands, disseminated and fracture filling pyrite (3 – 10 volume %) and chalcopyrite (trace) was then intersected through to the end of the hole at 45.00 m.

A total of eleven samples were taken from this hole for assaying. Best intercepts were a 10.00 m section (5.00 – 15.00 m), which analyzed 0.24% copper, and a 6.00-m section (20.00 – 26.00 m), which assayed 0.31% zinc.

Significant alteration was encountered in this hole, which is described in the appended report by E. Comsti. Her findings are summarised as follows (excerpted from her report):

1. *The entire 43.8m of PDA-16 is characterized by volcanics and volcaniclastics that are dacitic in composition as seen from the relict primary quartz grains that remain discernible in most of the samples despite the intense hydrothermal alteration.*

2. *Hydrothermal alteration is very destructive. Three assemblages were recognized by microscopy namely:*

   (a) An earlier illitic/sericitic alteration – corresponding to the QIP (Quartz-illite-pyrite) alteration described in the Internal Report of H.B Ruelo (2002). This is very pervasive and is characteristic of samples from PDA- 14 and 15. All illitic and sericitic alteration reported and described previously in the other drillholes correspond to this alteration.

   (b) Sericite-chlorite alteration – a distinct alteration assemblage recognized in PDA-16. This consists of well-crystallized flakes of sericite and hydrothermal muscovite with or without associated chlorite. The assemblage encroaches the earlier illitic alteration and serves as cementing material to the illite-altered fragments.

(c) K-silicate alteration – this is also a newly recognized alteration occurring inPDAH-16. It is characterized by the predominance of hydrothermal biotite and minor chlorite. It occurs as fracture fills at depths of about 29.55 m and usually as remnants enveloped and overprinted by the more pervasive sericite-chlorite alteration.

3. *In PDA-16, pyrite predominates. Sericite-chlorite alteration is associated with abundant pyrite. Chalcopyrite was detected only in 2 samples, namely at depth of 24.3 m (upper level) where earlier illitic alteration prevails and at 29.55 where K-silicate alteration was recognized. The occurrence of chalcopyrite together with K-silicate alteration indicates a possible porphyry copper mineralization at depth. Hence, more chalcopyrite, along with bornite and hydrothermal magnetite may be expected where K-silicate alteration predominates.*

4. *Crosscutting relationships based on alteration mineralogy, reveal a younger episode of magmatism which is represented by the higher temperature assemblages such as sericite-chlorite and K-silicate alterations over illite-sericite (QIP);*

5. *Asparin Hill is a highly prospective site for the search of a high level intrusive or breccia body, which may host porphyry style mineralization. It is in this same site where advanced argillic- altered floats were mapped. The presence of hydrothermal biotite in two of the drillcore samples from Asparin also strongly supports this claim. Intense silicification in the area has rendered the host rock highly resistant to erosion resulting in topographic prominences. This intense alteration may be related to the formation of a diatreme or a hydrothermal breccia pipe below.*

6. *At Asparin Hill, a higher temperature magmatic hydrothermal fluid is responsible for the Sericite-chlorite and k-silicate alterations (and possible porphyry type mineralization at depth).*

Sampling Method and Approach

Drillcore sampling and subsequent core measurement for core recovery determination were done in the drill site. Core boxes from the rig were then mechanically tightly sealed by heavy-duty polyurethane plastic packing bands, then manually transported to the core house located some 1 to 1.5 km from the drillpad. At the corehouse, these boxes were laid on wooden tables with each box cleaned of dirt before marking and box identification. Utmost care was taken during cleaning and marking. A preliminary reconnaissance log of the core was then conducted, followed by a detailed logging procedure to capture detailed information such as rocktype, alteration, mineralization, structures etc. A detailed graphical log was also drawn on site to assist in visualizing the drillhole information. Additional markings were then applied to each core box, such as rocktype boundaries, structure boundaries etc.

Sample intervals were then decided upon by the authors based on the logging results, after which the core boxes were carefully marked for the beginning and ending of each sample.

The sampling interval was 3 m of for most of the samples. Several intervals were lengthened up to 5 m where mineralization appeared to be of lower-grade potential. Core recovery factors were noted for each sampled interval. Sample boundaries were determined based on a combination of lithology, structures, alteration and mineralization characteristics.

The drill core was then split at the same site using an electric-powered, water-cooled diamond-bladed Dembicon Core Cutter. Before cutting, the cores were wrapped in aluminum foil to avoid breakage and any possible contamination. In some instances, when the core was fragile (e.g. gouge / clay, fault / breccia zones, crumbly fine-grained pyrite), the core was manually split in the box with an improvised wooden knife. Sampling of this material was done by scooping using a plastic spoon. Half of the core was retained in the core box while the other half was sent for assaying.

It is believed that the above procedures, always under the direct supervision of the authors, ensured that sample quality remained high throughout the drilling and sampling program.

All samples collected on site were double-sealed in plastic sample bags before being transported to the (Concepcion municipality) mainland by motorized banca. Some four to five samples were placed in each large plastic sack for further sealing and better handling. These were then loaded on to a hired vehicle to Iloilo City airport some 2 hours away, where these were air-freighted by a reputable courier company, Aboitiz Express, upon the availability of the next commercial flight to Manila.

Sample Preparation and Analyses

Secured sample batches arriving at Manila Domestic Airport were delivered by Aboitiz Express to McPhar Laboratories in Makati City. The sealed bags were opened by McPhar supervisors only. All written instructions for sample preparation and analyses accompanying every dispatch were received in their laboratory. A sample tracking, quality control, and reporting system is maintained between MRL Gold and McPhar.

McPhar Geoservices (Philippines) Inc. offers high quality sample preparation procedures. It is an ISO 9002 certified laboratory and has been providing assay laboratory services to both local and foreign exploration and mining companies for the past 25 years.

Drill core samples, weighing from 1 to 8 kilos each, are first dried, crushed to –1/4 " size, and then split to obtain approximately 1 kilo of sample. The 1 kilo sample is then fine pulverized to –200 mesh. The –200 mesh is sampled for fire assay; copper, zinc and silver analysis; and in some instances for sulfur analysis.

Sample analyses at McPhar Laboratory were performed in the same location as the sample preparation. A total of 93 samples were analysed for gold, copper, zinc, and silver and 28 samples for sulphur. McPhar laboratory assay certificates are presented in Appendix 2.

The following table lists the sample analyses methodology:

Element	Method of Analyses	Detection Limit
gold	Fire Assay on 50 g sample	5 ppb
copper	AAS following hot HCl & HCl/HNO3	5 ppm
zinc	AAS following hot HCl & HCl/HNO3	5 ppm
silver	AAS following hot HCl & HCl/HNO3	0.5 ppm
sulphur	Classical wet method	0.01%

Gold analyses were performed on 50-gram samples by fire assay operation. The 50 gram sample is blended with appropriate flux and a reducing or oxidizing agent added. The blended material is fused at about 1090^0C for approximately 1 hour. After cooling, the lead button is separated from the slag. Depending on the size of the lead button (after placing niter (an oxidizing agent)), the sample is subjected to roasting. A process called cupellation at 860^0-900^0C follows to produce the dore bead, which then undergoes parting and washing in dilute nitric acid. Finally, annealing of the prill at 800^0C is applied to complete the fire assay operation. The gold prill is then weighed in a microbalance with 0.001 mg sensitivity.

Copper, zinc and silver analyses were performed on 25-gram samples aqua regia digestion method. 1 ml of concentrated HNO_3 is added to the sample. The solution is then heated until all the sulfides are evolved. After this, addition of 3 ml concentrated HCl follows. Next the solution is heated in a boiling water bath for 4 hours. The sample is then set to mark to 10 ml using 1N HCl then shaken and settled overnight. Finally, aspiration in AAS is carried out to determine the copper, zinc and silver content.

Sulphur analysis was accomplished using the classical wet method.

Assay Quality Assurance and Quality Control

The McPhar laboratory in Manila ensures a Quality Assurance / Quality Control program incorporated in their sample preparation and analyses procedures. This QA/QC includes a program of duplicate, internal standard and blank assaying practices.

Four check samples from drill holes PDA-12, PDA-15 and PDA-16 were sent to Ostrea Mineral Laboratories, Inc. in Binan, Laguna. Ostrea Lab analysed the gold by employing the Fire Assay method, while the copper and silver were analysed using the Flame AAS method. Ostrea Lab is an ISO-accredited laboratory and has been in the assaying and environmental testing business since 1976.

The four check samples consisted of approximately one kilo each of the fine rejects (minus 200 mesh fraction) obtained from McPhar. 30-gram and 0.25-gram samples were taken from each for the gold determination using the fire assay technique and for the copper and silver analysis using the AAS method respectively. Ostrea employs similar fire assay techniques and AAS method for determining copper and silver to those of McPhar.

The results of the check analyses are presented in the table below.

COMPARISON BETWEEN OSTREA LAB AND MCPHAR LAB ASSAY RESULTS								
			Au, g/t		Cu, ppm		Ag, g/t	
Drill Hole #	Interval	Sample No.	OSTREA	MCPHAR	OSTREA	MCPHAR	OSTREA	MCPHAR
15	10 - 13 m	57100	0.70	0.270	1592.38	1560.000	3.04	2.400
15	16 - 19 m	57102	0.40	0.205	1066.74	1136.000	1.62	1.500
16	23 - 26 m	57117	0.10	0.050	378.77	380.000	1.62	<0.50
12	50 - 53 m	57030	0.48	0.530	525.64	537.000	2.63	1.000
		Anal Method	Fire Assay	Fire Assay	Flame AAS	AAS	Flame AAS	AAS

The table shows very significant discrepancies between the gold assays of McPhar and Ostrea in three samples. In addition, based on megascopic and microscopic analyses of the core samples from PDA-15 and PDA-16 [particularly the ones shown in the table], McPhar's copper analysis do not appear to reflect the mineralization observed in these samples. This prompted McPhar to re-analyze the four samples for gold and copper using coarse rejects. McPhar also did a third gold re-assay on sample 57100.The results of the re-analysis are tabulated below:

COMPARISON BETWEEN OSTREA LAB AND MCPHAR LAB ASSAY RESULTS														
Drill Hole #	Interval	Sample No.	Au, g/t						Cu, ppm					
			OS TREA	MCPHAR					OS TREA	MCPHAR				
				ORI GINAL	RE ASSAY	RESAMPLE				ORI GINAL	RE ASSAY	RESAMPLE		
						SPLIT 1	SPLIT 2	SPLIT 3				SPLIT 1	SPLIT 2	SPLIT 3
15	10 - 13 m	57100	0.70	0.2700	0.7800	0.5800	0.5850	0.6800	1592.38	1560	1663	1570		
15	16 - 19 m	57102	0.40	0.2050	0.2050	0.2100	0.2200	0.2200	1066.74	1136	1175	6595	7070	6550
16	23 - 26 m	57117	0.10	0.0500	0.0550	0.0650			378.77	380	416	404		
12	50 - 53 m	57030	0.48	0.5300	0.4950	0.5150			525.64	537	531	522		
Anal Method			Fire Assay	Fire Assay	Fire Assay	Fire Assay	Fire Assay	Fire Assay	Flame AAS	AAS	AAS	AAS	AAS	AAS

McPhar took the original pulps of the four samples and re-assayed these for gold and re-ran copper by AAS determination. The results are shown in the "REASSAY" columns of the table above. Then another split (SPLIT 1) was obtained from the coarse rejects (minus ¼") of each of the four samples. These were pulverized and re-analyzed for gold and copper. The results are shown in the "SPLIT 1" column of the table above

The whole process, i.e., splitting from the coarse rejects and then fine pulverizing, was repeated twice for samples 57100 and 57102 to get the second and the third splits for the two samples. The two splits of 57100 were re-assayed for gold and the other two splits of 57102 were re-run by AAS for copper. Results are discussed below;

Gold: The results of the McPhar re-assay and re-sample for gold matched well on samples 57102, 57117, and 57030. On the other hand, there is a big discrepancy on sample 57100. McPhar's re-assay result also matched well with that of Ostrea's. McPhar carried out another check by taking a split (Split 2) from the coarse rejects. This was then pulverized and assayed. Another split (Split 3) was obtained from the remaining coarse rejects then pulverized and assayed. The results (shown in "SPLIT 2" and "SPLIT 3" columns for gold) matched well with the result of Split 1. On this discrepancy, McPhar stated, "The originally reported value was really low and could be due to some losses during the fire assaying process which went unnoticed as the replicate assays and spot checks came out within acceptable limits." The discrepancies between the two labs have not been completely explained at this time.

Copper: The results of McPhar's re-analysis and re-sample for copper matched well on samples 57100, 57117, and 57030. Ostrea's results also agreed well with those of McPhar's. However, on sample 57102, there is a large discrepancy between McPhar's Original / Reassay and Split 1 results, which is much higher. McPhar carried out another re-sampling by taking two further splits [2 and 3] from the coarse reject, and re-running them. The copper results for Split 2 and Split 3 matched well with that of Split . They were much higher than the original McPhar result. On this discrepancy, McPhar stated, "Meanwhile, a sampling error must have been committed in getting the first split on sample 57102 which led to the low copper value." Ostrea's result on sample 57102 matched well with the results of McPhar's original and re-assay, but this is because the sample they analysed was from the original, invalid sample pulp.

It is concluded that a sample preparation / processing error occurred in sample 57102, and that subsequent splits, with much higher copper values more accurately reflect copper content and are more consistent with visual and petrographic observations.

Additional checking has been undertaken. The same four samples (coarse rejects) were sent to Intertek Laboratories in Manila for gold and copper determination. In addition, two more samples (coarse rejects) were sent to Ostrea Laboratories for further checking. Results are not yet available as of the time of writing of this report. Any significant discrepancies will be reported at a later time.

Interpretation and Conclusions

Valderama Deposit

The Valderama Deposit, at the northeast portion of the PDA Project, is a near-surface, massive, pyritic sulphide deposit with associated copper, gold, silver and zinc mineralization. Discovered during the first stage scout drilling program, the Valderama Deposit has been only partially outlined by drilling to date and is open in several directions, to the north in particular.

Gold-copper-silver and zinc mineralization occurs as fracture fillings and replacements within the tabular, massive pyritic sulphide replacement body. Chalcopyrite is associated with lesser sphalerite, bornite, covellite and chalcocite. A strong chargebility anomaly reflects the main body of mineralization; this chargeability anomaly is approximately 800 meters long by 150 to 200 meters wide. However, the Phase 2 drilling indicates that some of the dimensions of this

anomaly do not reflect the massive sulphides, and may reflect instead strongly disseminated to semi-massive pyrite content (20-60 %).

The Phase 1, 2001 drill program, suggested that a copper-gold-silver-zinc deposit of potential economic interest might be present in the Valderama Deposit. Grades appeared quite uniform and the target was for about 1.6 to 2 million ozs gold equivalent – considered a potentially viable target. The Phase 2 drilling has been disappointing, and appears to indicate that the later, copper-gold-silver-zinc mineralizing event (superimposed on the massive pyrite deposit) was irregular and erratic. It is impossible to speculate on potential average grade at this time. Based on these latest results, potential for an economic copper, gold, silver, zinc deposit has been reduced.

There are, however, sufficient data to estimate tonnage potential; which has implications on size and extent of the epithermal mineralizing process, overall mineral system, and also the potential sulphur resource. The Valderama Deposit, where intersected by drilling, ranges (un-eroded) from 12.46 m to 41.5 m thick, averaging 30.79 m. Due to lack of drill information, width is very uncertain. The two sections with the most drill information are 21,200N and 21,400N (see figure 4). On both sections it is assumed to be about 100 m wide, and is faulted off in the west (near drill holes PDA-05 and –09), and also in the east on section 21,200N (near PDA-07). However, these two sections occur within a part of the deposit where structural interpretation (figure 4) suggest a triangular-shaped wedge was faulted out. Further south, at Valderama Hill, the geophysical and geochemical data infer a width of 200 m, or more.

Strike length is also uncertain. The deposit has been completely eroded in the south at Ferraris Hill and Saddle Zone, partly eroded at Valderama Hill, and appears to plunge at a shallow angle to the north, where it is open (see long section A-A`, figure 9). The southern, present day boundary of the deposit to the south is believed to be near 20,720N. Outcrops of strongly ferriginous rocks near the property boundary, at 21,750N, and the very extensive alteration extending to the northern property limits, and beyond, as well as geochemical anomalies, suggests the deposit continues to the north, beyond the property boundary.

Inferred dimensions of the deposit in the area drilled to date; ie. between PDA-01 and PDA-14 are shown in Figure 4. These suggest a strike length of at least 600 m, width varying from 100 to 200 m (with uncertainties due to degree of faulting), averaging then, about 150 m wide, and an average thickness of 30.79 m (the latter has been reduced by erosion in PDA-1 and 02, and by fault disruption (?) in PDA-14 and 15). Tonnage potential of the pyritic massive sulphide deposit is therefore estimated to be in the range of 7.5 to 11 million tonnes, with potential for an additional 5 million tonnes between PDA-14 (21,500N) and the property boundary at 21,750N.

To the south, residual boulders of iron oxide / alunite at the Saddle Zone and on Ferraris Hill, suggest a total (pre-erosion) strike length in excess of 1.6 km. Residual boulders of heavy iron oxide / alunite boulders at Asparin Hill to the west, suggest the width of the massive sulphide horizon was, at one time, over 700 m (see Mineralization Model, figure 11). Based on these dimensions, the Valderama massive, pyritic sulphide deposit was very large indeed, and appears to indicate that extra-ordinarily strong mineralization processes were operative in the

PDA caldera. This may well have implications for the size of the interpreted porphyry-copper-gold source deposit (figure 11).

Based on drilling to date, the Valderama Deposit averages from 36% to 40% sulphur. This deposit is near-surface, and only a few hundred m from tide water. It may therefore have potential for a low-cost, sulphur source for sulphuric acid production for processing of the many lateritic nickel deposits expected to go into production in the Philippines, and elsewhere in the region; and for fertilizer production. Main priority, however, will be other copper-gold targets on the PDA Project, and especially a porphyry copper-gold deposit interpreted to be the source of the Valderama Deposit.

Asparin Hill porphyry copper-gold target

While the Phase 2 drilling downgraded the potential of the Valderama Deposit, it greatly upgraded the porphyry copper-gold target at Asparin Hill based on the results from the very shallow drill hole PDA-16. Independent petrographer E. Comsti (2002), concludes:

- *"The occurrence of chalcopyrite together with K-silicate (potassic) alteration indicates a possible porphyry copper mineralization at depth."*

- *"Asparin Hill is a highly prospective site for the search of a high level intrusive or breccia body, which may host porphyry style mineralization".*

- *" The presence of hydrothermal biotite in two of the drillcore samples from Asparin also strongly supports this claim."*

- *" Intense silicification in the area has rendered the host rock highly resistant to erosion resulting in topographic prominences. This intense alteration may be related to the formation of a diatreme or a hydrothermal breccia pipe below".*

It is also noted a broad magnetic high occurs in the Asparin Hill area. Additional evidence for a copper porphyry system is present in propylitised magnetite-bearing andesite with disseminated chalcopyrite (grading 0.2 % copper), and quartz-magnetite alteration, which occurs in the Saddle Zone. A magnetic high anomaly, only partially defined to date, occurs near-by, at Ferraris Hill and may suggest that a buried porphyry copper-gold system lies beneath the Saddle Zone-Ferraris Hill area, related, or separate from (?), the inferred system beneath Asparin Hill. Figure 11is the exploration model for PDA, showing the interpreted relationship between the Valderama Depsit and a porphyry system below, and adjacent to Asparin Hill.

Other Targets

The PDA setting is also considered favourable for the occurrence of bonanza low-sulphidation gold-silver mineralization in feeder fault zones; especially at intersections between the multi-directional caldera-fill normal faults and low-angle gravity faults associated with the caldera

ring faults. Favourable structural targets include the West Wall, and Ferraris Hill areas, which have associated geochemical anomalies and alteration.

Additional evidence for the possible occurrence of low-sulphidation (epithermal gold-rich deposits at PDA include, (after Ruelo, 2002):

1. Low-suphidation epithermal gold deposits rich in base-metal sulphides have been documented to occur around porphyry copper deposits in the Philippines (Masara Davao, Paracale Bicol, Surigao, Lepanto districts)

2. Structural Control : intersection between district-wide normal faults and caldera ring faults, diatreme (hydrothermal breccia) ring fractures, gravity faults dipping shallowly either towards or away from ring faults. Based on preliminary structural interpretation (topographic and aerial-photo analyses), PDA apparently has a NE-oriented structural grain which could suggest a dilational fault jog focused on a right-stepping left-lateral (sinistral) strike slip fault system. Such dilational structures are sites of bonanza zones as in Victoria, Gunung Pongkor (Indonesia), Cerro Vanguardia (Argentina), Misima and Porgera Zone VII in PNG.

3. Lithological Control : poorly lithified, permeable pyroclastic rocks (e.g. dacitic tuff) provide stratal permeability beneath aquitards and other permeability contrast (i.e. massive andesite and unconformity). This could be ideal for large-tonnage but lower grade deposits as at Round Mountain and Ladolam, PNG.

4. Hydrothermal Control : PDA has strong evidences of syn-mineralization faulting that generated structural permeability, triggered hydrothermally as a result of fluid overpressuring. This process led to silicification, boiling, brecciation and attendant gold deposition. The same process has operated in the Victoria deposit in Lepanto district. Hydrothermal breccias were documented at PDA-01, 02, 03, and 04.

5. Quartz gangue : Crystalline to micro-crystalline quartz displaying crustiform and open-space filling textures; also massive, crudely banded and comb quartz. Such features are present at PDA- 01, 02, 04 and 11.

6. Carbonate gangue : present as calcite veins and veinlet arrays, also in matrix of breccias

7. Alteration zone : as QIP grading into SPS and IP zones, restricted but visually subtle

8. Proximal alteration : QIP (Intermediate Argillic)

9. Sulphide abundance : high sulphide (predominantly pyrite and minor base metals), up to 20 volume % in the proximal alteration (intermediate argillic) facies

10. Key sulphide species : sphalerite, galena, chalcopyrite

11. Metals present : Au, Ag (Zn,Pb,Cu)

12. Anomalous metals present locally : Mo, As, Hg (Te ?, Se ?)

Recommendations

Further evaluation of the porphyry copper-gold potential of the PDA Project is strongly recommended. Obvious starting point is the Asparin Hill area, where additional, and deeper, drilling is warranted. Prior to this, a structural interpretation is recommended; in addition, further geological / petrographic studies of the caldera should be undertaken, emphasising and establishing relationships between the Valderama Deposit and the porphyry targets at Asparin Hill and the Saddle Zone. A reinterpretation of all geological, geochemical and geophysical, and especially the magnetic data, is recommended. Consideration should be given to extending the magnetic survey over the entire project area.

References

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Robertshaw, P., 2001. Report on Induced Polarization and Ground Magnetometer Surveys at the Pan de Azucar Property, Central Philippines. *Robertshaw Geophysics*. MRL Gold Philippines, Inc. Internal Report.

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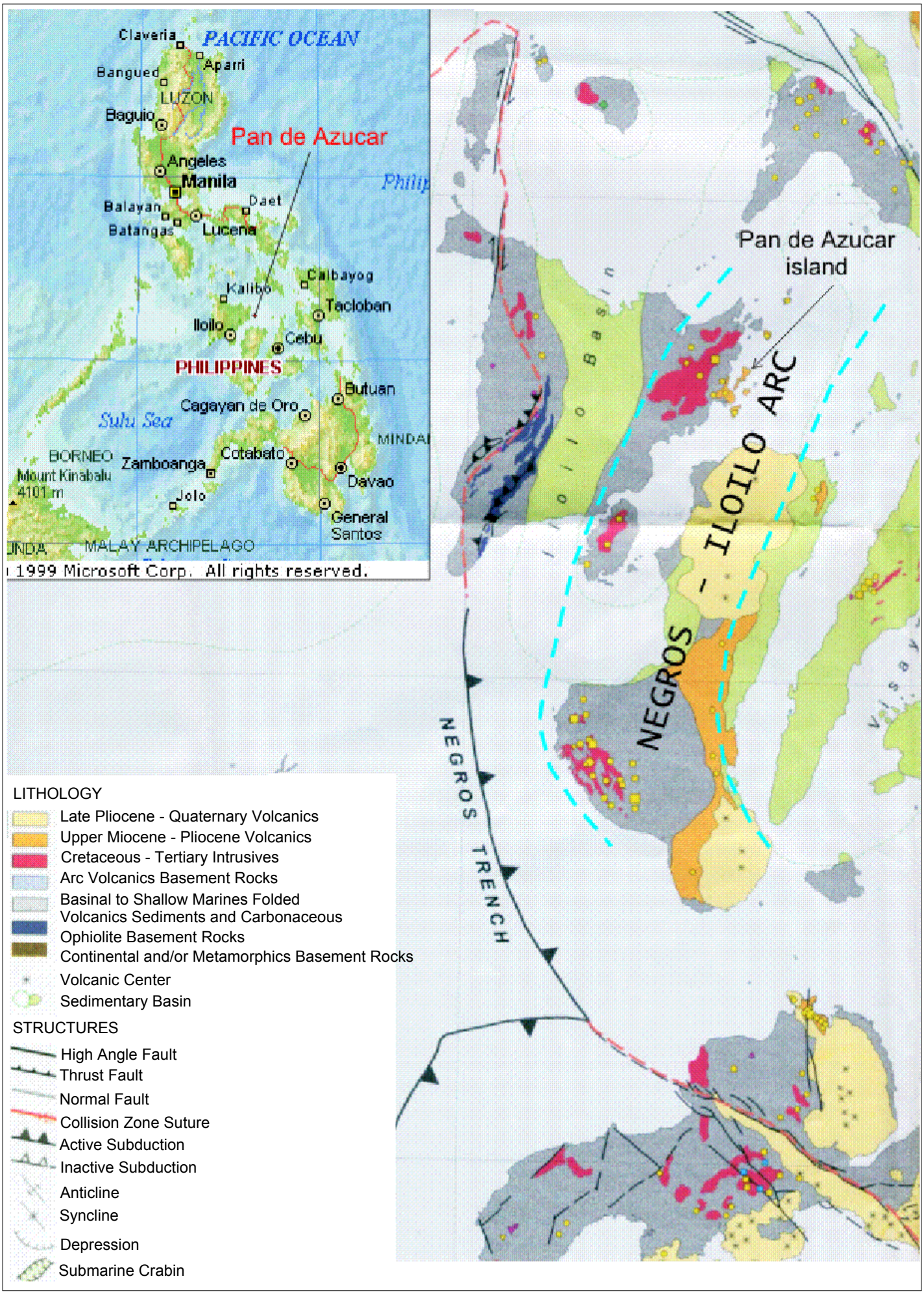

Fig. 1 - Location Map and Regional Setting of Pan de Azucar Project

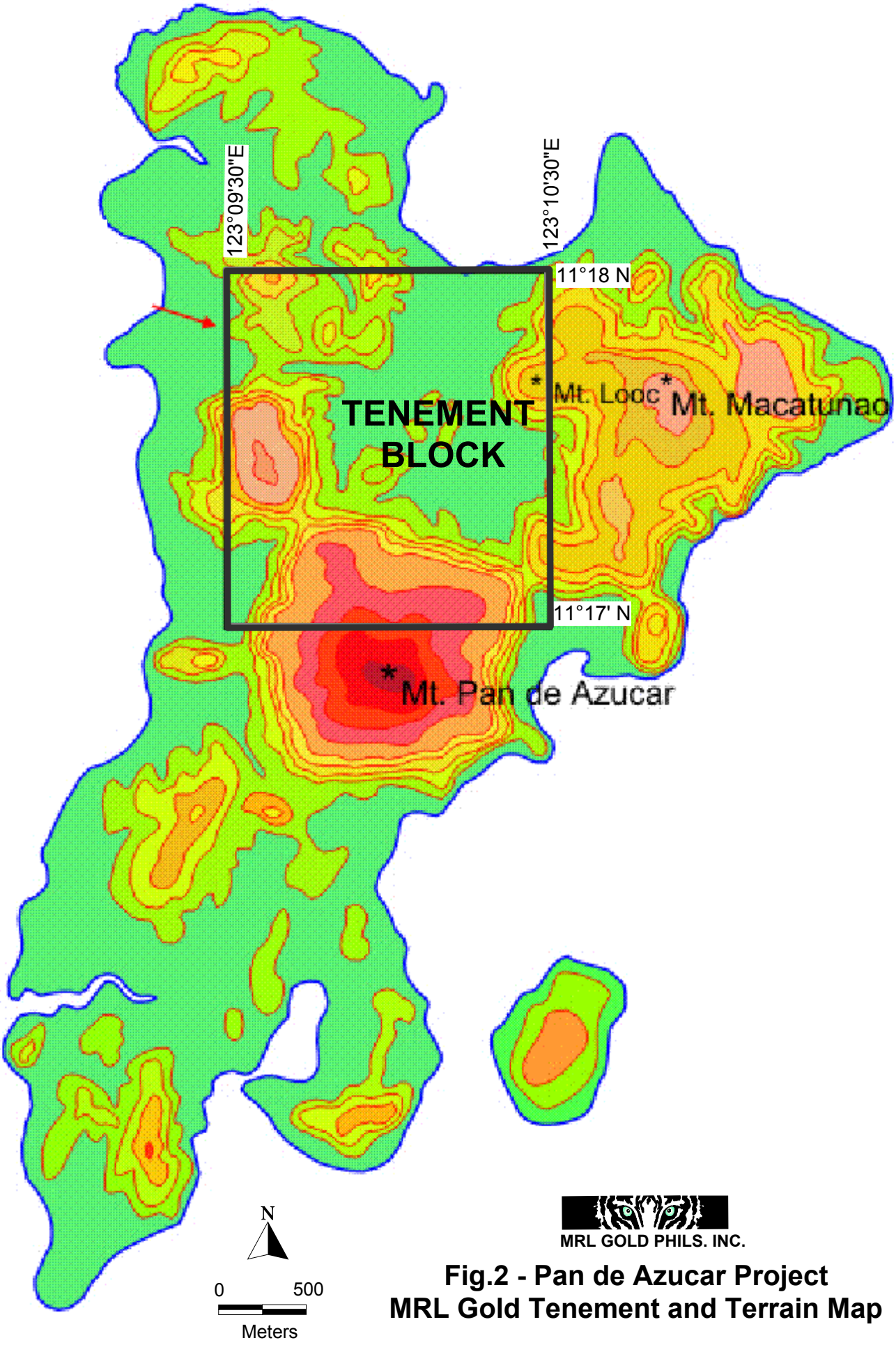

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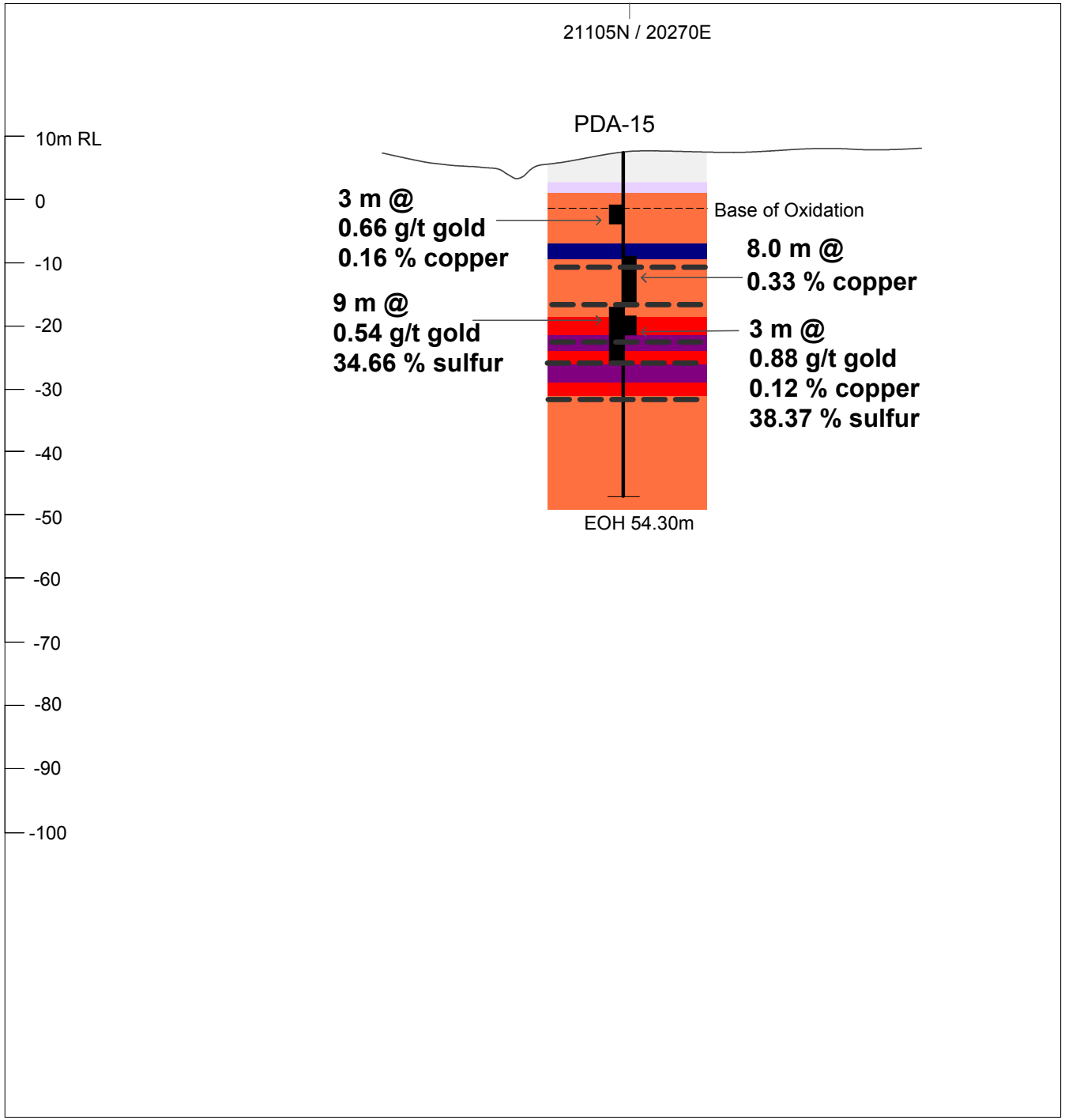
Fig.2 - Pan de Azucar Project
MRL Gold Tenement and Terrain Map



Alluvium

Propylitised dacitic lithic tuff

Propylitised andesite porphyry / porphyritic andesite

Propylitised microdiorite / quatrz diorite

Massive pyritic sulphides

Quartz-illite / sericite ± clay-pyrite-cpy

Fault (assumed horizontal?)

PDA-15

Drillhole

Cu-Au-S down hole interception

10 m

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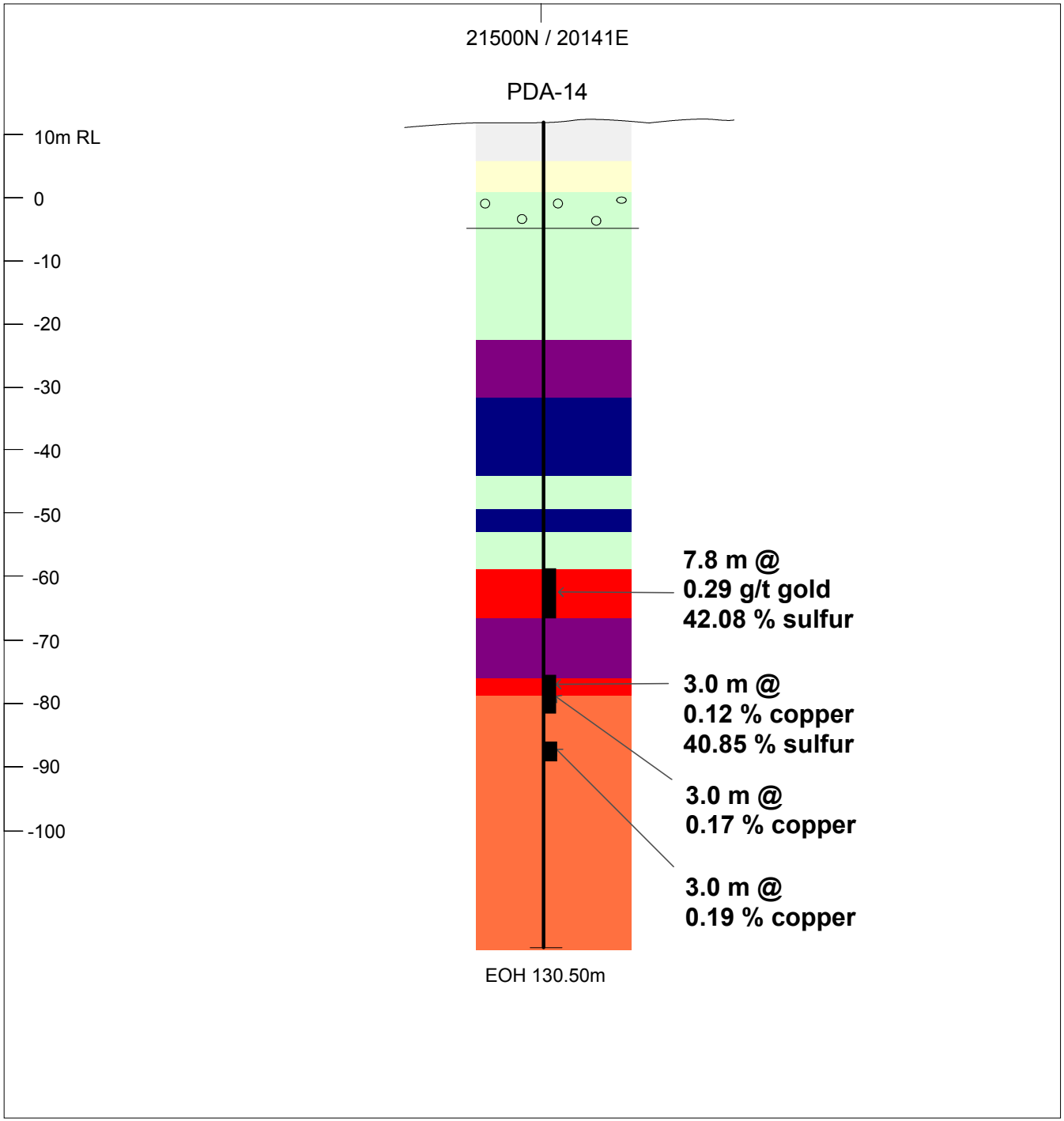
Fig.8 - Pan de Azucar Project
Section 21105N
DDH PDA-15



LEGEND

- Alluvium
- Oxide zone
- Propylitised andesite
- Propylitised amygdaloidal basalt
- Propylitised andesite porphyry / porphyritic andesite
- Propylitised microdiorite / quatrz diorite
- Massive pyritic sulphides
- Quartz-pyrite ± illite

PDA-14

Drillhole

Cu-Au-S down hole interception

10 m

MRL GOLD PHILS. INC.

Fig.7 - Pan de Azucar Project
Section 21500N
DDH PDA-14

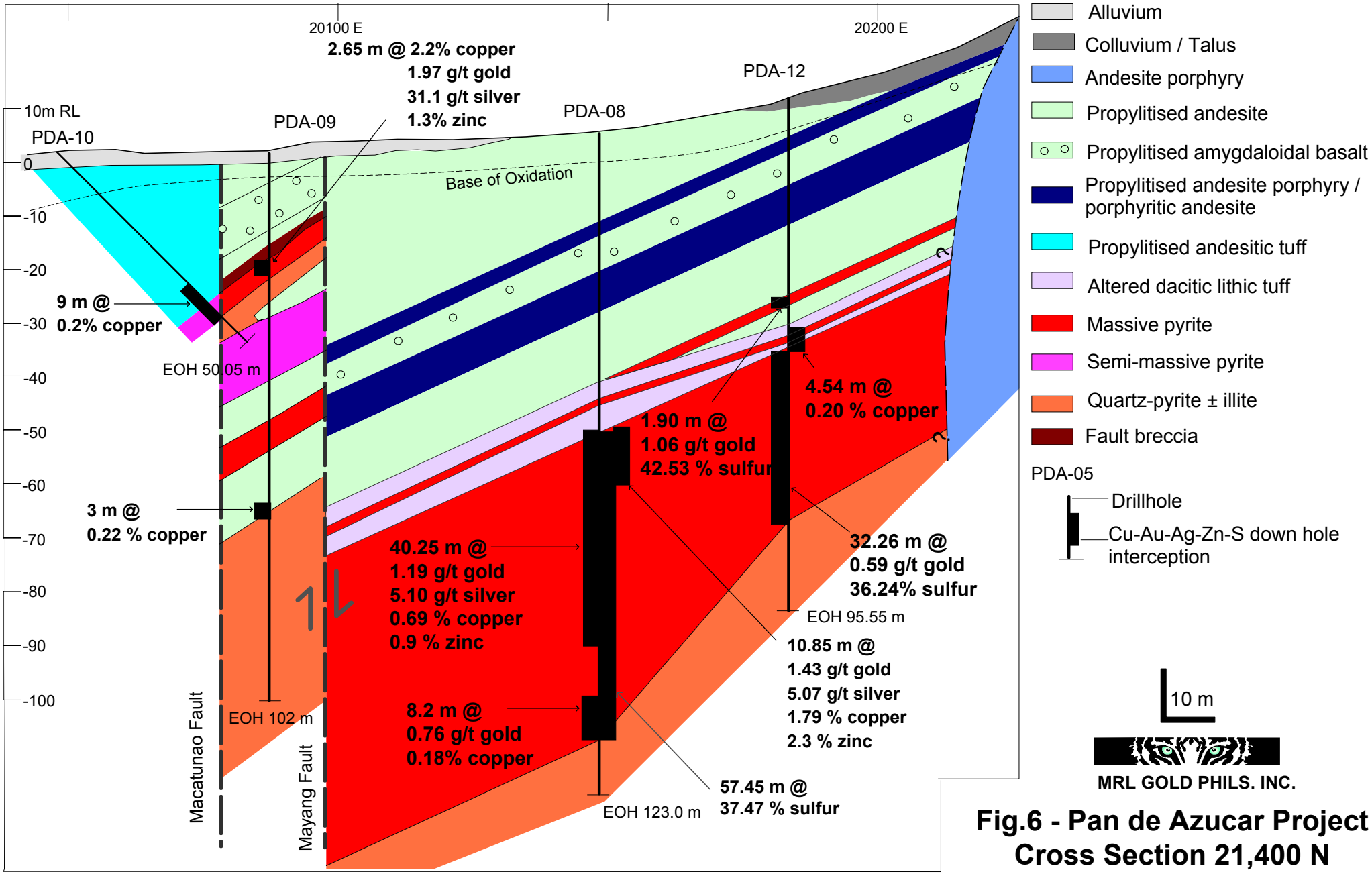
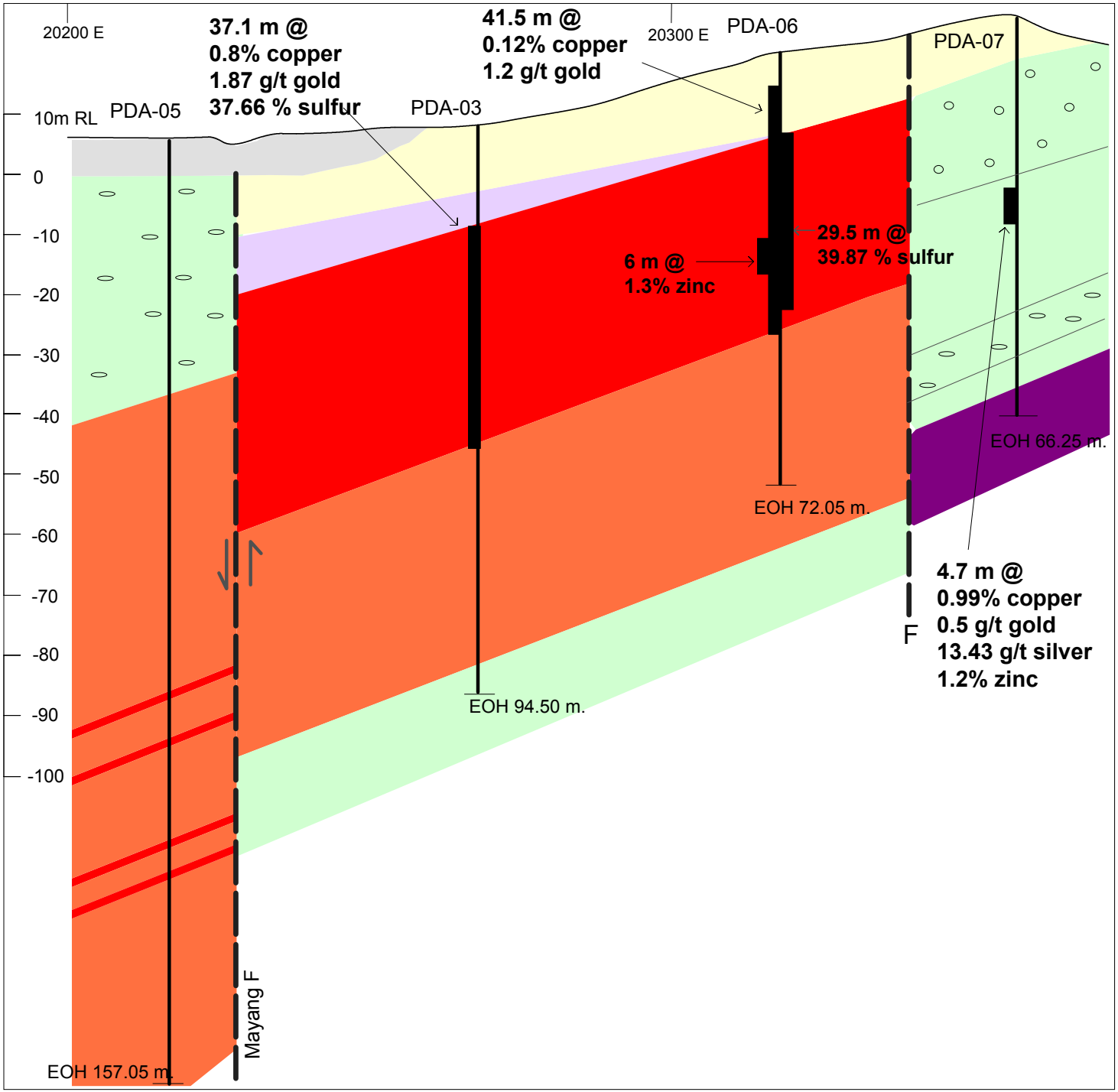


Fig.6 - Pan de Azucar Project Cross Section 21,400 N



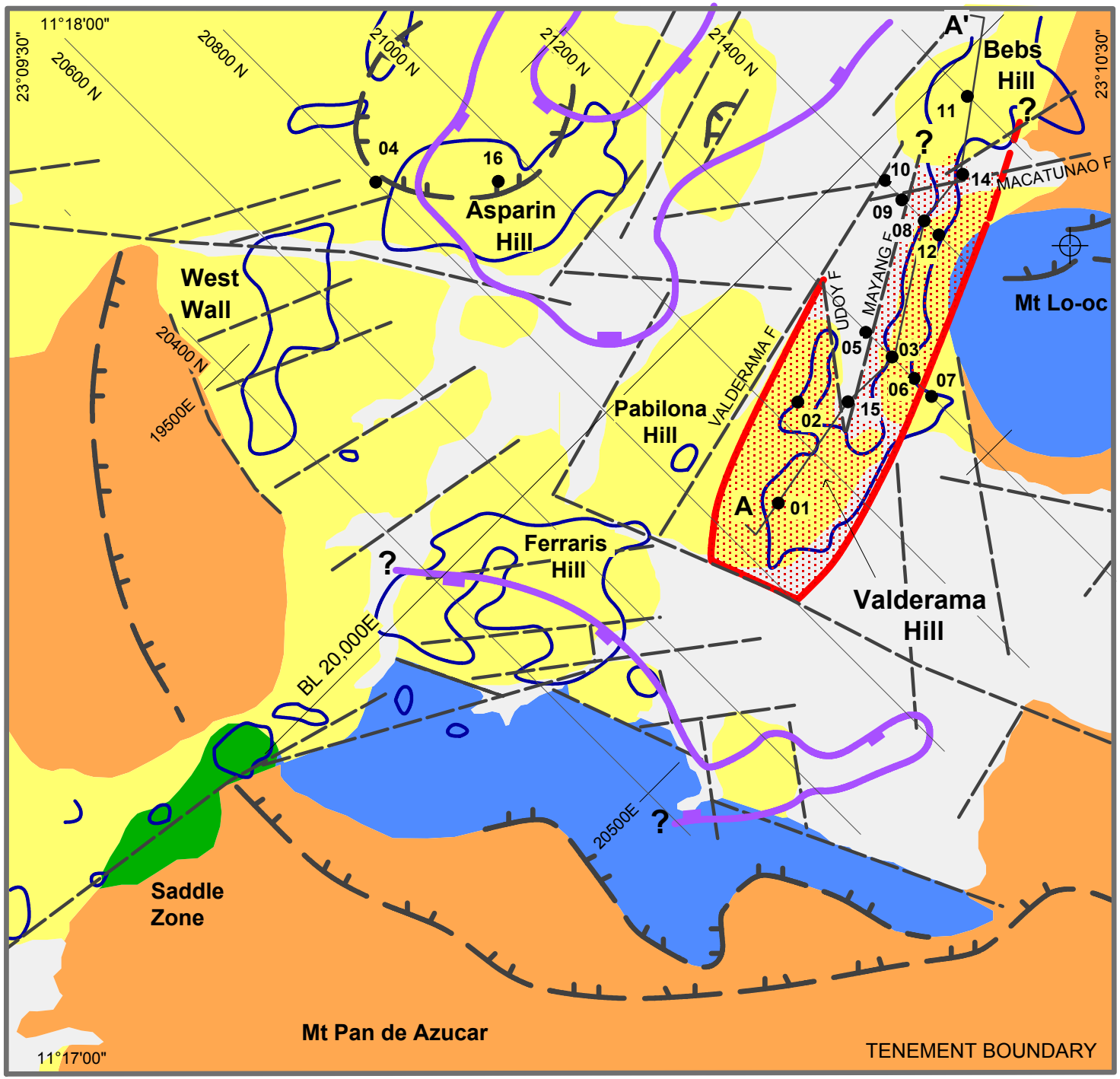
Alluvium
Oxide zone
Propylitised andesite
Propylitised amygdaloidal andesite
Propylitised amygdaloidal basalt
Propylitised microdiorite / quatrz diorite
Altered dacitic lithic tuff
Massive pyritic sulphides
Quartz-pyrite ± illite

PDA-05
Drillhole
Cu-Au-Ag-Zn-S down hole interception

10m

MRL GOLD PHILS. INC.

Fig.5 - Pan de Azucar Project Cross Section 21,200 N



LEGEND

N

Lithology and Structures

- Quaternary alluvium
- Andesite porphyry
- Andesitic volcanics
- } Caldera wall
- Dacitic volcanics & volcaniclastics
- Amygdaloidal andesite
- Fault
- Collapsed features/Ring faults
- Flow dome
- 11 Drill hole location
- A A' Section line

Geochemical and Geophysical Anomalies

- Copper >100 ppm (zinc correlates with copper anomaly)
- Interpreted outline of Valderama Deposit
- Mag hi anomaly

0 200m

Scale 1: 10,000

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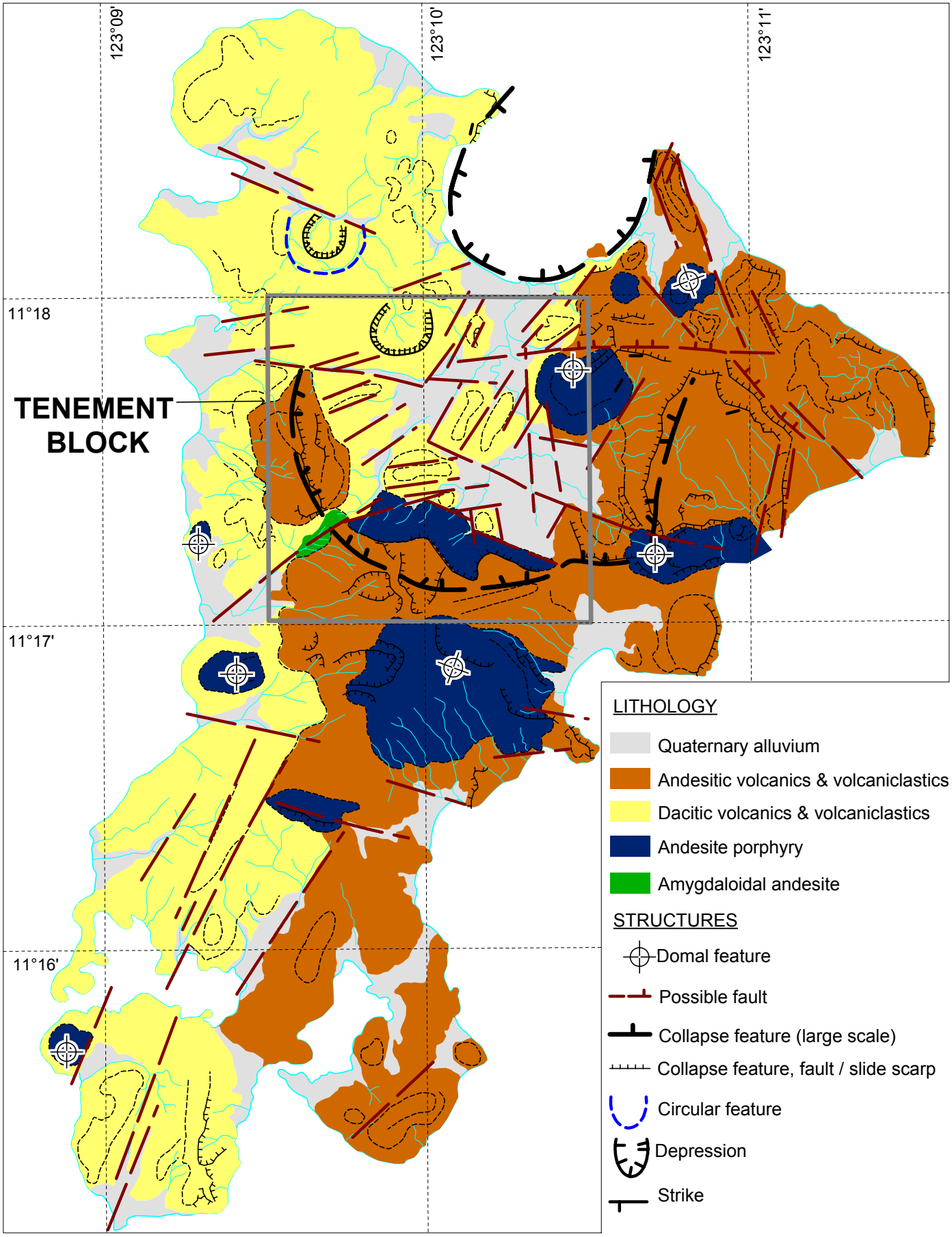
Fig.4 - Pan de Azucar Project Compilation



TOPOGRAPHY

Topographic break

Drainage

N

0 500

Meters

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Fig.3 - Pan de Azucar Project Lithostructural Map

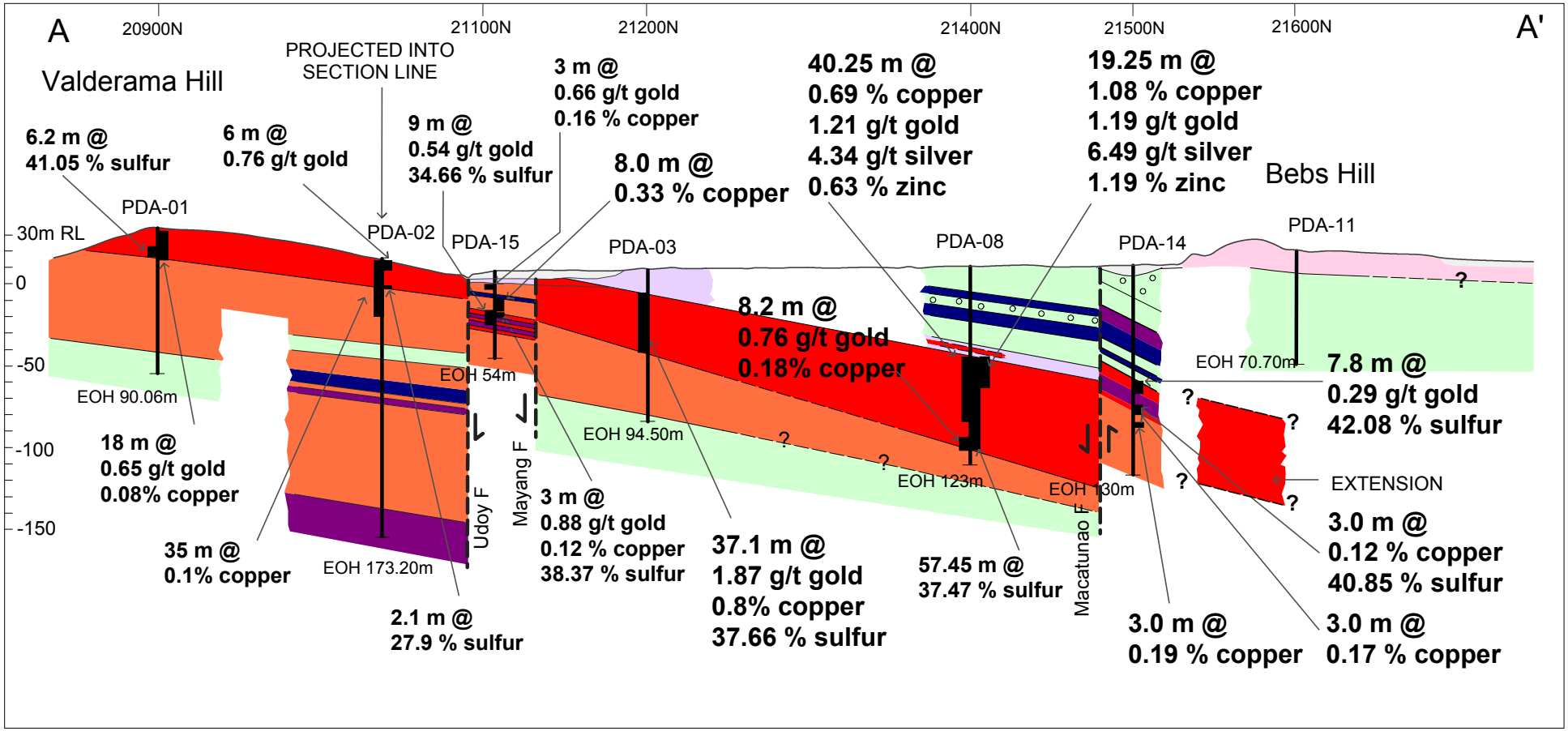

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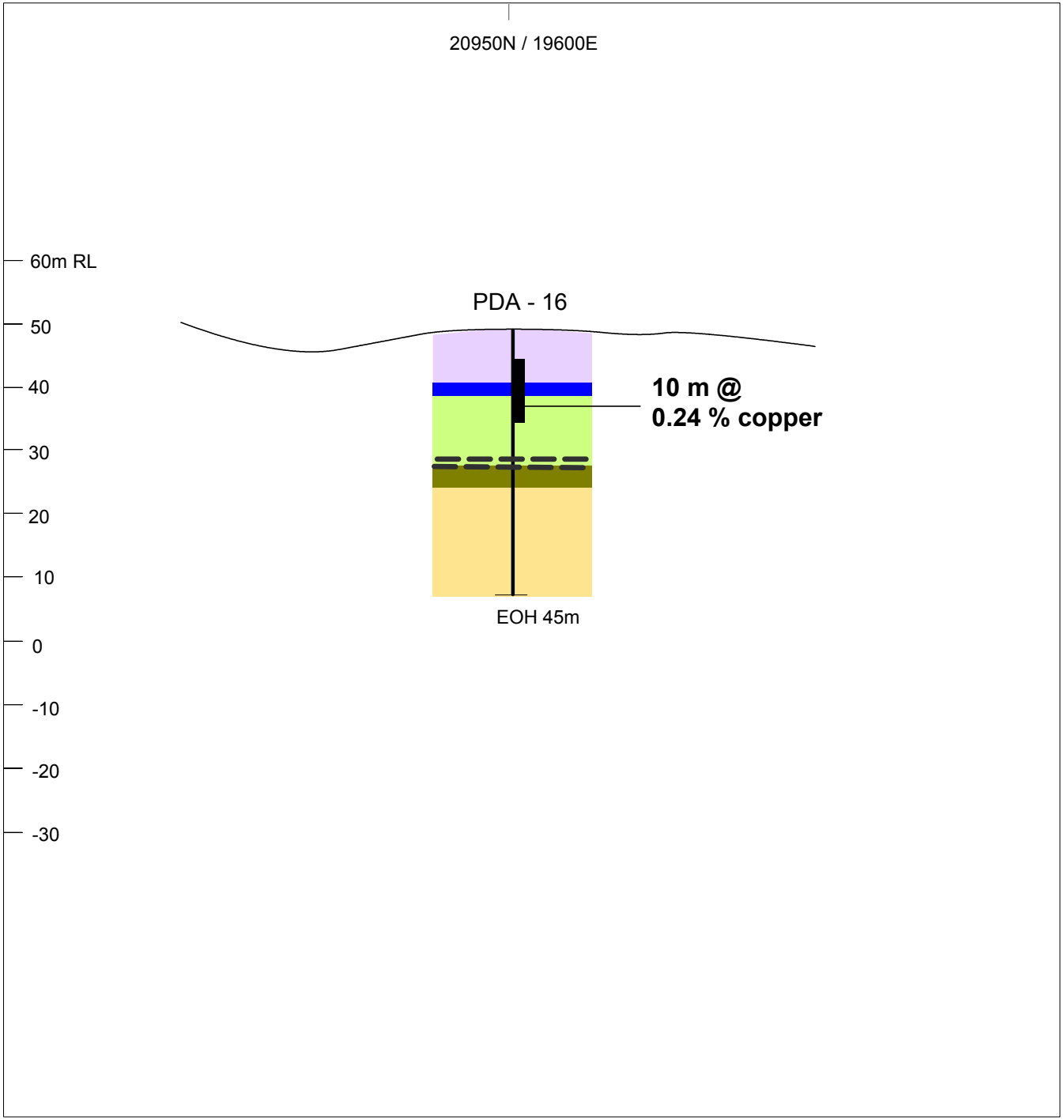
Fig.9 - Pan de Azucar Project Longitudinal Section A-A' (Facing NW)



LEGEND

- Propylitised dacitic lithic tuff
- Propylitised porphyritic andesite
- Sericite-chlorite altered porphyritic dacite
- Quartz-illite-clay-altered dacite tuff with disseminated and fracture filling py (3-10%) and cpy (1-2%)
- Sericite-chlorite-altered dacite overprinting K-silicate alteration (secondary biotite) with streaks and bands, disseminated and fracture filling py (3-10%) and cpy (trace)
- Fault (assumed horizontal?)

PDA-14

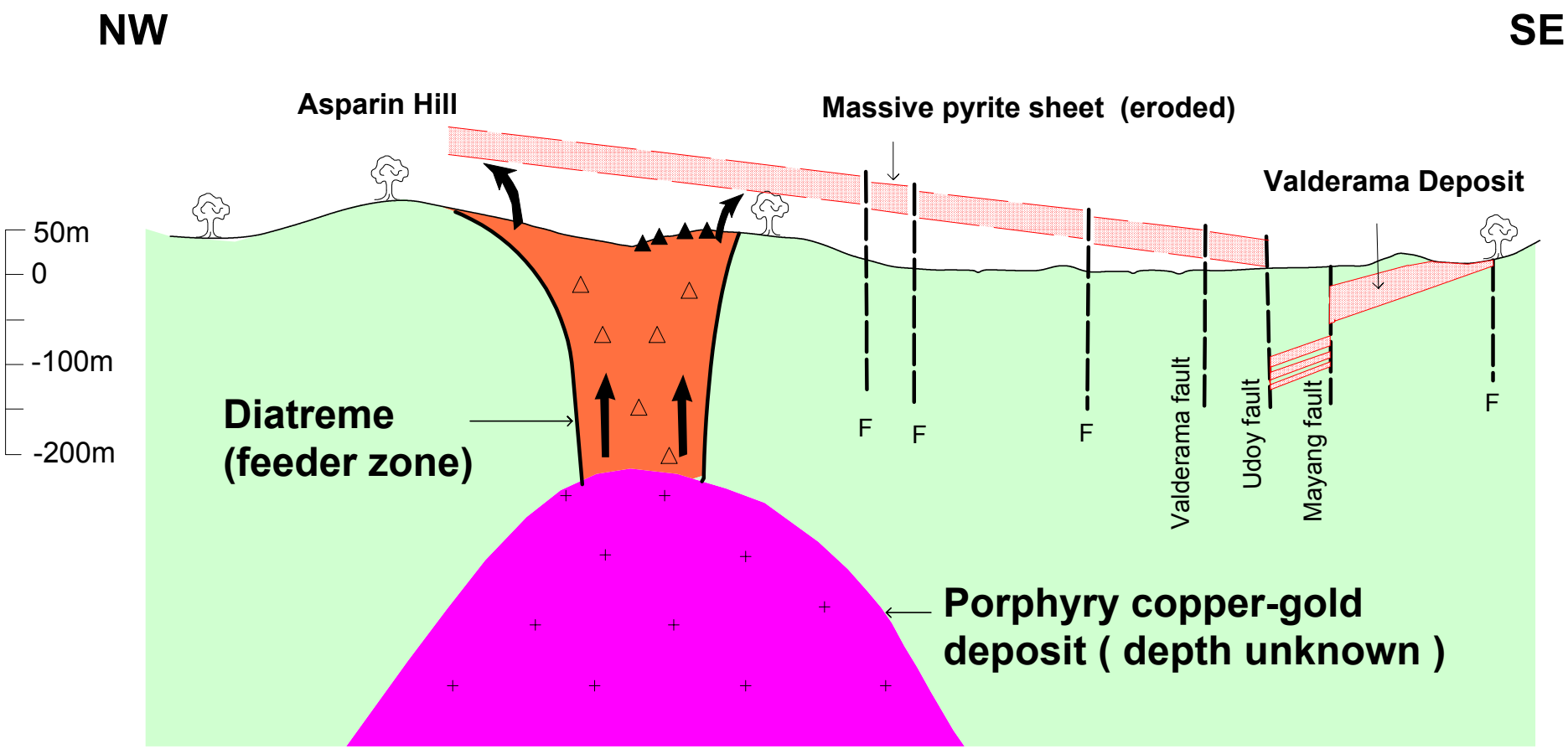
Drillhole

Cu down hole interception

10 m

MRL GOLD PHILS. INC.

Fig.10 - Pan de Azucar Project
Section 20950N
DDH PDA-16



Path of magmatic / mineralizing fluids

Float boulders of iron oxide / alunite plus gold, copper

Diatreme: early quartz-illite alteration overprinted by K-silicate alteration (biotite), overprinted by sericite-(chlorite): plus pyrite, disseminated / veinlet chalcopyrite

Massive pyritic sulphide sheet (mostly eroded but preserved in Valderama Deposit): plus copper-gold-silver-zinc

Dacite, andesite volcaniclastics

Porphyry copper-gold deposit

0 100 200
Meters

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Fig.11 Pan de Azucar Project Mineralization Model

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PAN DE AZUCAR PROJECT

DRILL ASSAY RESULTS TABLE (PHASE II DRILLING)

DDH NO.	SAMPLE NO.	DEPTH INTERVAL, From (m)	DEPTH INTERVAL, To (m)	INTERVAL, m	Cu, %	Zn, %	Au, g/t	Ag, g/t	S,%
PDA - 05	57046	72.40	77.40	5.00	0.00	0.00	0.03	<0.5	
PDA - 05	57047	77.40	82.40	5.00	0.01	0.01	0.06	<0.5	
PDA - 05	57048	82.40	87.40	5.00	0.01	0.01	0.05	<0.5	
PDA - 05	57049	87.40	92.40	5.00	0.00	0.00	0.09	<0.5	
PDA - 05	57050	92.40	97.40	5.00	0.00	0.00	0.05	<0.5	
PDA - 05	57051	97.40	101.10	3.70	0.00	0.00	0.04	<0.5	
PDA - 05	57052	101.10	102.40	1.30	0.00	0.01	0.05	<0.5	
PDA - 05	57053	102.40	107.40	5.00	0.00	0.00	0.03	<0.5	
PDA - 05	57054	107.40	112.40	5.00	0.00	0.00	0.02	<0.5	
PDA - 05	57055	112.40	117.40	5.00	0.00	0.00	0.03	<0.5	
PDA - 05	57056	117.40	122.40	5.00	0.01	0.01	0.08	<0.5	
PDA - 05	57057	122.40	127.40	5.00	0.01	0.01	0.04	<0.5	
PDA - 05	57058	127.40	132.40	5.00	0.01	0.01	0.04	<0.5	
PDA - 05	57059	132.40	137.40	5.00	0.00	0.01	0.04	<0.5	
PDA - 05	57060	137.40	142.40	5.00	0.00	0.01	0.04	<0.5	
PDA - 05	57061	142.40	147.40	5.00	0.00	0.00	0.03	<0.5	
PDA - 05	57062	147.40	152.40	5.00	0.00	0.00	0.03	<0.5	
PDA - 05	57063	152.40	157.05	4.65	0.00	0.00	0.03	<0.5	
PDA - 05	57072	60.65	63.65	3.00	0.01	0.02	0.03	0.6	
PDA - 09	57073	63.65	66.65	3.00	0.22	0.01	0.02	0.7	
PDA - 09	57074	66.65	69.30	2.65	0.03	0.01	0.05	<0.5	
PDA - 09	57075	69.30	71.20	1.90	0.02	0.03	0.05	<0.5	
PDA - 09	57076	71.20	74.20	3.00	0.07	0.01	0.10	0.6	
PDA - 09	57077	74.20	78.45	4.25	0.02	0.01	0.05	<0.5	
PDA - 09	57078	78.45	80.60	2.15	0.01	0.01	0.03	<0.5	
PDA - 09	57079	80.60	83.60	3.00	0.00	0.01	<0.01	<0.5	
PDA - 09	57080	86.60	89.60	3.00	0.01	0.01	0.04	<0.5	
PDA - 09	57081	96.80	99.80	3.00	0.01	0.02	0.06	0.5	
PDA - 09	57082	99.80	102.00	2.20	0.00	0.02	0.04	<0.5	
PDA - 12	57026	36.85	38.75	1.90	0.04	0.04	1.06	2.0	42.53
PDA - 12	57027	38.75	42.28	3.53	0.02	0.02	0.09	<0.5	12.33
PDA - 12	57028	42.28	46.82	4.54	0.20	0.05	0.16	0.5	20.11
PDA - 12	57029	46.82	50.00	3.18	0.04	0.02	0.40	1.0	43.62
PDA - 12	57030	50.00	53.00	3.00	0.05	0.03	0.53	1.0	36.36
PDA - 12	57031	53.00	56.00	3.00	0.03	0.04	0.81	1.4	36.00
PDA - 12	57032	56.00	59.00	3.00	0.07	0.03	0.98	1.3	34.68
PDA - 12	57033	59.00	62.00	3.00	0.28	0.03	0.88	1.2	39.01
PDA - 12	57034	62.00	65.00	3.00	0.04	0.04	0.68	1.1	37.04
PDA - 12	57035	65.00	68.00	3.00	0.03	0.05	0.61	0.8	40.26
PDA - 12	57036	68.00	71.50	3.50	0.02	0.02	0.44	<0.5	31.23
PDA - 12	57037	71.50	73.00	1.50	0.01	0.03	0.37	<0.5	27.95
PDA - 12	57038	73.00	76.00	3.00	0.02	0.04	0.57	0.7	36.62
PDA - 12	57039	76.00	79.08	3.08	0.02	0.02	0.20	<0.5	32.24
PDA - 12	57040	79.08	80.65	1.57	0.01	0.01	0.03	<0.5	3.63

PDA - 12	57041	80.65	83.35	2.70	0.00	0.00	0.04	<0.5	13.41
PDA - 12	57042	83.35	83.75	0.40	0.00	0.01	0.09	<0.5	6.33
PDA - 12	57043	83.75	87.95	4.20	0.00	0.01	0.05	<0.5	7.87
PDA - 12	57044	87.95	92.00	4.05	0.00	0.00	0.05	<0.5	18.32
PDA - 12	57045	92.00	95.55	3.55	0.00	0.00	0.03	<0.5	13.87
PDA - 13	57064	3.85	6.85	3.00	0.05	0.05	0.04	<0.5	
PDA - 13	57065	6.85	9.85	3.00	0.58	0.05	0.01	3.5	
PDA - 13	57066	9.85	12.85	3.00	0.59	0.08	0.05	0.6	
PDA - 13	57067	12.85	15.85	3.00	0.53	0.10	0.62	3.4	
PDA - 13	57068	15.85	18.85	3.00	0.47	0.08	0.38	3.9	
PDA - 13	57069	18.85	21.85	3.00	0.22	0.48	0.47	1.2	
PDA - 13	57070	21.85	24.90	3.05	0.18	0.25	0.11	0.9	
PDA - 13	57071	Cuttings Collected @21m			0.16	0.07	0.09	1.2	
PDA - 14	57083	66.50	70.70	4.20	0.01	0.02	0.05	<0.5	
PDA - 14	57084	70.70	73.70	3.00	0.01	0.04	0.37	1.9	43.18
PDA - 14	57085	73.70	76.70	3.00	0.01	0.02	0.17	0.8	40.92
PDA - 14	57086	76.70	78.50	1.80	0.03	0.03	0.36	1.2	42.18
PDA - 14	57087	78.50	83.50	5.00	0.09	0.07	0.03	0.7	
PDA - 14	57088	83.50	87.40	3.90	0.01	0.02	0.01	0.8	
PDA - 14	57089	87.40	90.40	3.00	0.12	0.01	0.24	0.6	40.85
PDA - 14	57090	90.40	93.40	3.00	0.17	0.01	0.05	<0.5	
PDA - 14	57091	93.40	98.40	5.00	0.07	0.01	0.03	<0.5	
PDA - 14	57092	98.40	101.40	3.00	0.19	0.02	0.14	0.8	
PDA - 14	57093	101.40	104.40	3.00	0.09	0.01	0.13	0.6	
PDA - 14	57094	104.40	107.40	3.00	0.00	0.01	0.05	<0.5	
PDA - 14	57095	107.40	110.40	3.00	0.00	0.00	0.04	<0.5	
PDA - 14	57096	110.40	115.40	5.00	0.00	0.00	0.04	<0.5	
PDA - 15	57100	10.00	13.00	3.00	0.16	0.01	0.27	2.4	
PDA - 15	57101	13.00	16.00	3.00	0.04	0.12	0.06	0.8	
PDA - 15	57102	16.00	19.00	3.00	0.11	0.01	0.21	1.5	
PDA - 15	57103	19.00	24.00	5.00	0.12	0.09	0.09	2.3	
PDA - 15	57104	24.00	27.00	3.00	0.08	0.01	0.46	2.2	34.11
PDA - 15	57105	27.00	30.00	3.00	0.12	0.02	0.88	2.3	38.37
PDA - 15	57106	30.00	33.00	3.00	0.05	0.01	0.29	0.9	31.51
PDA - 15	57107	33.00	37.35	4.35	0.08	0.01	0.12	0.5	21.52
PDA - 15	57108	37.35	42.35	5.00	0.01	0.00	0.04	<0.5	
PDA - 15	57109	42.35	47.35	5.00	0.03	0.00	0.02	<0.5	
PDA - 15	57110	47.35	52.35	5.00	0.03	0.00	0.03	0.9	
PDA - 16	57112	0.00	5.00	5.00	0.07	0.02	0.03	<0.5	
PDA - 16	57113	5.00	10.00	5.00	0.34	0.07	0.02	1.1	
PDA - 16	57114	10.00	15.00	5.00	0.14	0.10	0.01	0.6	
PDA - 16	57115	15.00	20.00	5.00	0.04	0.15	0.02	0.8	
PDA - 16	57116	20.00	23.00	3.00	0.05	0.40	0.04	0.9	
PDA - 16	57117	23.00	26.00	3.00	0.04	0.22	0.05	<0.5	
PDA - 16	57118	26.00	29.00	3.00	0.00	0.02	0.03	<0.5	
PDA - 16	57119	29.00	32.00	3.00	0.01	0.01	0.04	0.9	
PDA - 16	57120	32.00	35.00	3.00	0.02	0.01	0.04	<0.5	
PDA - 16	57121	35.00	40.00	5.00	0.00	0.00	0.03	0.7	
PDA - 16	57122	40.00	45.00	5.00	0.00	0.01	0.03	0.7	

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PHASE II DRILLING SIGNIFICANT INTERCEPTS

DRILL HOLE NO.	DEPTH INTERVAL, From (m)	DEPTH INTERVAL, To (m)	INTERVAL, m	Cu, %	Au, g/t	S,%
PDA 2001-09	63.65	66.65	3.00	0.22		
PDA 2002-12	36.85	38.75	1.90		1.06	42.53
	42.28	46.82	4.54	0.20		
	46.82	76.00	29.18		0.63	36.66
	46.82	79.08	32.26		0.59	36.24
PDA 2002-13	6.85	12.85	6.00	0.59		
	12.85	21.85	9.00	0.41	0.49	
	21.85	24.90	3.05	0.18		
PDA 2002-14	70.70	78.50	7.80		0.29	42.08
	87.40	90.40	3.00	0.12		40.85
	90.40	93.40	3.00	0.17		
	98.40	101.40	3.00	0.19		
PDA 2002-15	10.00	13.00	3.00	0.16	0.27	
	16.00	24.00	8.00	0.12		
	24.00	33.00	9.00		0.54	34.66
	27.00	30.00	3.00	0.12	0.88	38.37
PDA 2002-16	5.00	15.00	10.00	0.24		

DDH No.	**:**	**PDA-2001-05**
Coordinates	:	21,200N/ 20,210E
Collar Elevation	:	9.0 m RL
Azimuth	:	000^0
Inclination	:	-90°
Total Depth	:	Deepened from 72.4 m to 157.05

PDA 2001-05 was drilled in the 2001 program to a depth of 72.40 m. It is 50 m grid west of PDA-03, a well-mineralized hole. PDA-05 intersected propylitic altered amygdaloidal andesite and then dacitic units with pervasive quartz-pyrite-illite altered hydrofractured breccias. The hole was stopped after a quartz-pyrite breccia / vein zone was intersected starting at 66.00 m. No significant copper or gold values were encountered. The mineralized massive pyrite horizon appears to have been faulted off in this hole, and may occur deeper.

The strong chargeability anomaly extends at least 100 m west of PDA-05 and it was considered that the massive sulphide deposit may have been down-faulted in this area. Hence PDA-05 was deepened. The quartz-pyrite breccia / vein zone intersected at 66.00 m during the previous drilling persisted down to 109.70m hosting two narrow zones of massive pyritic sulphides at 92.27 m and 101.10 m. Pyrite content of the quartz-pyrite breccia unit ranges from 10 to 50 volume %. A tectonic clay-pyrite-quartz breccia unit was intersected at 109.70 m down to the end of the hole at 157.05 m.

A total of 18 samples of 5 m intervals were taken from this hole for assaying. No significant copper, zinc, gold, or silver values were encountered.

PDA 2001-05 Summary Lithology Log

72.40 – 109.70 m **HYDROFRACTURED QUARTZ-PYRITE±ILLITE BRECCIA WITH NARROW ZONES OF SEMI-MASSIVE PYRITE, MASSIVE PYRITE AND CLAY-GOUGE-PYRITE**

Gray to light gray color, moderately fractured, moderately vuggy, intense quartz-pyrite-altered. Breccia consists of angular to subrounded clasts of quartz-sericite-pyrite-altered dacitic tuff, silica-pyrite hydrofractured breccia, massive pyrite and quartz-illite±chlorite-pyrite-altered andesitic tuff set in an intense quartz-pyrite-altered matrix. Narrow semi-massive pyrite zones noted at 79.21 – 79.25 m, 73.90 – 74.30 m, 81.20 – 82.05 m, 82.05 – 82.40 m, 84.35 – 85.75 m, 86.65 – 86.85 m, 87.12 – 87.26 m, and 99.90 – 100.25 m. Short stretches of massive pyrite present at 92.27 – 93.15 m, and 101.10 – 102.40 m. Overall pyrite content ranges from 10 – 50 volume %. Pyrite occurs s replacement, infill, fracture fills and disseminations.

109.70 – 157.05 m **TECTONIC BRECCIA**

Brecciated zone with intense clay-pyrite-quartz (20 – 40 volume % pyrite infill and disseminations [5 – 20 volume %]). Clasts consist of quartz-pyrite-altered, massive pyrite-clay, crushed semi-massive pyrite-clay, hydrofractured quartz±illite-pyrite-altered dacitic tuff (relict quartz phenocrysts noted). Pyrite as disseminations (3 – 5 volume %) with supergene chalcocite. Weakly vuggy with drussy quartz in vugs. Sheared texture present. Along sheared zones, pyrite is flattened and with striations. Zones of softer pyrite-clay material locally showing gouge and sheared texture noted at 111.10 –111.25 m, 116.10 – 116.55 m, 117.50 - 118.10 m, and 119.25 – 120 m. Short stretches of massive pyrite noted at 118.5 – 119.0 m, 123.45 – 124.20 m, and 128.5 – 128.60 m.

END OF HOLE PDA 2001-05

DDH No.	**:**	**PDA-2002-09**
Coordinates	:	21,400N/ 20,095E
Collar Elevation	:	8.0 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	Deepened from 60.65 m to 102.00

PDA 2001-09 was drilled 55.00 m west of PDA-08, a well-mineralized hole, also on section 21400N. The top section, completed in 2001, intersected altered propylitised dark grey and amygdaloidal andesite from surface to 18.30 m. A narrow massive pyrite and QIP zone was intersected with a 2-m fault breccia at its top, from 20.35 – 28.75m, before intersecting another propylitised andesite until 31.45 m. Semi-massive pyrite with QIP alteration and a fault zone was intercepted from 31.45 - 56.05 m. The hole was stopped at 60.65m in propylitised andesite. A 2.65 m section from 20.35 to 23.00 m [2001], had analysed 1.97 g/t gold, 2.2 % copper, 31.43 g/t silver and 1.3 % zinc.

The main massive sulphide deposit was not intersected in 2001. Subsequent drilling of PDA 2002-12 on the same section, and correlation with PDA 2001-08 [see Figure 6] suggested that the massive sulphides might occur deeper in PDA-09, which was therefore deepened. The depth extension intersected the brecciated propylitised andesite to 65.40 m, quartz-pyrite breccia from 65.40 – 69.30 m, a fault zone to 71.20 m, and then quartz-pyrite breccia through to 78.75 m. Pyrite content in the breccia ranges from 30–50 volume %. Intensely fractured and altered andesite was encountered from 78.75 – 79.50 m, QIP-altered breccia from 79.50 – 80.50 m, and fractured and altered andesite to 84.80 m. The hole ended at 102 m in quartz-pyrite ± illite breccia, with narrow intercepts of propylitised andesite from 84.80 – 102.00 m.

A total of 11 samples were submitted for assay from this hole extension. Generally, low copper, zinc, gold and silver values were encountered. A 3 m interval (63.65 – 66.65 m) gave 0.22 % copper.

PDA 2001-09 Summary Lithology Log

60.65 – 65.40 m **SHEARED ALTEREDANDESITE**
Fractured zone of gray-green colored, brecciated andesite with moderate pervasive propylitic alteration consisting of chlorite-clay-quartz-epidote-pyrite. Pyrite ranges from 5 – 20 volume %. Crushed zone occurs at 63.55 – 65.40 m.

65.40 – 69.30 m **QUARTZ-PYRITE HYDROFRACTURED BRECCIA**
Moderately fractured light gray color, hydrofractured weakly to moderately vuggy silica-pyrite±clay breccia. Pyrite as infillings and fracture fillings comprises 30 – 50 volume %.

69.30 – 71.20 m **FAULT ZONE**
Gray colored zone of gouge-clay with sub angular to sub rounded fragments of silica-pyrite, pyrite comprising 5 – 10 volume %.

71.20 – 78.75 m **QUARTZ-PYRITE BRECCIA**
Weakly fractured, weakly vuggy, hydrofractured quartz-pyrite± breccia. Pyrite occurs as infills and disseminations comprising 30 – 50 volume%.

78.75 – 79.50 m **INTENSELY FRACTURED ALTERED ANDESITE**
Intensely fractured light to dark green, moderately sheared chlorite-clay±quartz-pyrite-altered fine-grained andesite. Sheared textures as slickensides noted. Pyrite content 3 – 5 volume % as disseminations and fracture fillings.

79.50 – 80.50 m **HYDROFRACTURED QUARTZ-PYRITE ± ILLITE BRECCIA**
Light gray color, brecciated, moderately vuggy, hydrofractured, quartz-pyrite±illite breccia. Pyrite content 30 – 50 volume % as infills and fracture fillings.

80.50 – 84.80 m **FRACTURED ALTERED ANDESITE**
Intensely fractured dark green colored chlorite-clay±quartz-pyrite-altered andesite. Pyrite content 5 – 10 volume % as fracture fills and disseminations. In fault contact with quartz-pyrite breccia.

84.80 – 102.00 m **QUARTZ-PYRITE±ILLITE BRECCIA WITH SHORT NARROW ZONES OF PROPYLITIZED ANDESITE**
Light green to gray, hydrofractured breccia. Intensely silicified and pyritized (10 – 30 volume %) with narrow zones of chlorite-epidote-quartz-pyrite (5 volume %)-altered andesite at 92.5 – 92.85 m, 96.80 – 97.85 m, 99.90 – 100.50 m and 101.50 – 102.00 m. Altered andesite zones are dark green to light gray in color, moderately sheared, generally fine-grained, and with moderate chlorite-clay±quartz-epidote±magnetite±calcite-pyrite alteration. Pyrite content is 1 – 5 volume % as fills in fractures and as disseminations.

END OF HOLE PDA 2001-09

DH No.	**:**	**PDA 2002-12**
Coordinates	:	21,400N / 20,189E
Collar Elevation	:	15.5 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	95.55 m

PDA 2002-12 was drilled 33 m grid east of PDA 2001-08 to provide information on the width of the Valderama Deposit on this section, and to test for a possible feeder zone near the caldera wall. It intersected talus deposits composed chiefly of weathered andesite porphyry fragments from the surface to 2.45 m, ferruginous lateritic soil from 2.45 to 7.35 m, then propylitised andesitic volcanics with quartz-pyrite veinlets, with minor chalcopyrite to 27.05 m., and moderately propylitised andesite porphyry from 27.05 to 36.85 m. A narrow zone of massive pyritic sulphides was intercepted from 36.85 to 38.75 m, then altered andesitic volcaniclastics down to 42.28 m, containing about 5 to 10 volume % pyrite. From 42.28 to 46.82 m, alternating zones of altered dacitic tuff and intense QIP with thin semi-massive pyrite±quartz were encountered. A thicker zone of massive pyritic sulphides occurs from 46.82 to 79.08 m. A narrow section of intensely propylitised andesitic volcanics was intercepted from 79.08 to 80.55 m. Quartz-pyrite breccia with patches of QIP-altered dacitic tuff containing quartz-pyrite veinlets was intersected from 80.55 m until the bottom of the hole at 95.55 m. The breccia is estimated to contain 10 to 30 volume % pyrite.

A total of 20 samples from this hole were submitted for assaying. The 1.9 m massive pyritic sulphide section from 36.85-38.75 m returned 1.06 g/t gold and 42.53 % sulphur. A 4.54 m (42.28 – 46.82 m) section in the andesitic and dacitic volcaniclastics analyzed 0.2% copper. A 32.26 m section (46.82 –79.08 m) assayed 0.59 g/t gold and 36.24 % sulphur. This includes a 29.18 m (46.82 – 76.00 m) section, which returned 0.63 g/t gold and 36.66% sulphur.

PDA 2002-12 Summary Lithology Log

0.00 - 2.45 m	**TALUS** Light brown soil with weathered andesite porphyry fragments.
2.45 - 7.35 m	**OXIDE ZONE** Reddish-brown ferruginous lateritic soil containing fragments of weathered andesite porphyry.
7.35 – 27.05 m	**ALTERED ANDESITIC VOLCANICS** Dark gray-green porphyritic andesite. Moderately altered to quartz-chlorite±albite±magnetite-clay-pyrite±chalcopyrite with distinct sheared textures. Quartz-pyrite veinlets widths ranging from 1mm - 5mm. Abundant limonite stains along fractures present at top of

interval, decreasing down the hole. Pyrite accounts from 1 - 5 volume % mainly as fracture fillings and disseminations. Base of oxidation is 17.45 m. Short stretches of light-gray, fine-grained quartz-chlorite-pyrite-altered andesitic tuff noted at 12.85m, 14.95 - 15.30 m, and 23.35 - 25.5m.

27.05 – 36.85 m **ALTERED ANDESITE PORPHYRY**

Weakly to moderately fractured dark gray-green feldspar-phyric andesite porphyry. Generally medium to coarse-grained, crowded texture, moderately chlorite-quartz-clay-pyrite-altered xenoliths of quartz-chlorite-clay-pyrite-altered andesitic volcanics present at 27.65-27.9m, 33.45 –33.65 m, and 33.85 – 34.0 m. Fine-grained quartz-chlorite-clay-pyrite-altered andesitic tuff at 35.20 – 36.85m.

36.85 – 38.75 m **MASSIVE PYRITE**

Fine-grained, brecciated, weakly vuggy, massive pale to brass yellow pyrite. Pyrite content at least >90 volume %.

38.75 – 42.28 m **ALTERED ANDESITIC TUFF**

Moderately fracture/sheared quarz-chlorite-pyrite±illite-altered andesitic tuff. Brecciated. Pyrite occurs as disseminations and fracture fillings accounting for 5 –10 volume %.

42.28 – 46.82 m **ALTERED DACITIC TUFF WITH NARROW MASSIVE PYRITE±QUARTZ ZONES**

Light gray color, moderately fractured, weakly to moderately vuggy fragmental dacitic tuff. Alternate zones of intense quartz-pyrite-illite alteration and semi-massive pyrite±quartz with widths ranging from 5mm – 5cm. Locally minor breccia.

46.82 – 79.08 m **MASSIVE PYRITE**

Generally intensely to moderately fractured very fine grained pale brass yellow massive pyrite (>90 volume%) locally possessing minor breccia and crudely banded, pseudo-sheared texture. Patches of vuggy silica-pyrite-hematite hydrofractured breccia noted at 54.29 – 54.62 m, 54.95 – 55.25 m, and 77.05 – 77.40 m. Vuggy quartz veinlets present at 54.0 – 54.33 m. Chalcopyrite blebs and disseminations are evident.

98% core lost from 71.5 – 73.0 m.

79.08 – 80.55 m **ALTERED ANDESITIC VOLCANICS**

Weakly to moderately fractured, with intense quartz-chlorite-epidote±magnetite-pyrite-anhydrite?-altered fine-grained andesitic volcanics.

80.55 – 95.55 m **QUARTZ-PYRITE BRECCIA**

-Weakly to moderately fractured light gray silica-pyrite-cemented breccia, weakly vuggy with patches of quartz-illite-pyrite-altered dacitic tuff (85.0 – 87.95 m) with quartz-pyrite veinlets. Pyrite as breccia fillings and fracture fillings (10 – 30 volume %). Fault gouge present at 83.35 – 83.75 m.

END OF HOLE PDA 2002-12

DDH No.	**:**	**PDA 2002-13**
Coordinates	:	21,100N / 20,270E
Collar Elevation	:	8.5 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	24.90 m

PDA 2002-13 was drilled 84 m to the east of PDA-02, on the edge of a rice field close to the northeast flank of Valderama Hill. Objective was to gain information on the eastern extent of the Valderama Deposit, and to help fill a large gap in information on the deposit in this area. A strong chargeability anomaly is present. The hole was lost in heavily brecciated and faulted ground at a depth of 24.90 m. The hole was re-drilled as PDA-15 at a later date. PDA-13 intersected alluvial deposits from surface to 3.70 m, residual soil to 5.90 m, and oxidized weathered tuff to 11.20 m. A 1 m oxidized pyritic unit was encountered to 12.20 m, and weathered tuff until 14.50 m. An intense fault zone was then intersected which gave very difficult drilling conditions. Due to this, the hole was terminated at 24.90 m, and was re-drilled as PDA-15, at a later date.

A total of 8 samples were taken from PDA-13 for assay, including a sample comprising cuttings from the fault zone at 21.00 m. Significant intercepts include a 6.00 m (6.85 – 12.85 m) interval analyzing 0.59 % copper; a 9.00-m (12.85 – 21.85 m) section, which gave 0.41 % copper and 0.49 g/t gold; and a 3.05-m (21.85 – 24.90 m) interval, which gave 0.18 % copper.

PDA 2002-13 Summary Lithology Log

0.00 – 3.70 m	**ALLUVIUM** Dark brown fine sand
3.70 – 5.90 m	**FERRUGINOUS SOIL** Reddish-brown ferruginous soil with occasional fragments of oxidized andesitic tuff.
5.90 – 11.20 m	**OXIDIZED MODERATELY WEATHERED ANDESITIC TUFF** Generally orange-brown in color when oxidized and gray-green when unoxidized. Moderately fractured with limonite (after pyrite). Smectite recognized with remnant pyrite disseminations approximately 1 volume %. The unit is generally clayey.
11.20 – 12.20 m	**OXIDIZED MASSIVE PYRITE** Black, sooty, moderately fractured, weakly vuggy magnetite-hematite-limonite-manganese±quartz. Fractures filled with limonite. Trace of remnant pyrite present.

12.20 – 14.50 m **WEAKLY OXIDIZED, WEATHERED ANDESITIC TUFF**

Dark gray to green in color, moderately sheared intensely altered to green-clay (smectite?) with trace remnant pyrite (1 – 3 volume %) and with trace galena.

14.50 – 24.90 m **PYRITIC FAULT GOUGE**

Dark gray in color consisting of grit to pebble size sub angular to sub rounded clasts of: (1) moderately vuggy silica-pyrite breccia with chalcopyrite disseminations; (2) massive pyrite set in a clay-pyrite (rock flour) matrix. Unit is gougy. Chalcocite after pyrite present. Shear textures noted in the clasts characterized by slickensides, flattened pyrite with striations. Pyrite content is 5 – 10 volume %.

Washed rock fragments from 21.0 m revealed a host rock consisting of microcrystalline quartz and shreds of illite/sericite. Pyrite occurs as crystalline grains sometimes enclosed by chalcopyrite. The latter mineral also occurs as fracture filling. Pyrite is estimated at 6 volume % while chalcopyrite at 6 volume %. Late crystalline quartz veins are associated with coarse-grained sulphides.

END OF HOLE PDA 2002-13

DDH No.	**:**	**PDA 2002-14**
Coordinates	:	21,500N / 20,141E
Collar Elevation	:	11.7 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	130.50 m

PDA 2002-14 was drilled 100 m grid north of PDA 2001-08, a well-mineralized hole, to test the northern strike extent of the Valderama Deposit. A particular concern was the possible effect on mineralization of a major cross-cutting fault, the Macatunao Fault that strikes approximately east-west through the immediate area. PDA-14 intersected alluvial deposits from the surface to 6.80 m, an oxide zone from 6.80 – 7.80 m, and altered amygdaloidal basalt to 17.50 m. Further down hole, from 17.5 to 69.90 m, altered andesitic volcanics were encountered, with intercepts of altered dioritic intrusives with rare chalcopyrite veinlet and narrow zones of massive pyritic sulphides, then intensely altered dacitic tuff to 70.70 m. Massive pyritic sulphide was intersected from 70.70 to 78.50 m containing > 90 volume % pyrite, deformed microdiorite down to 87.40 m, then massive pyritic sulphide from 87.40 – 90.95 m. The hole ended at 130.5 m in quartz-pyrite ± illite breccia, with narrow intercepts of semi-massive and massive pyritic sulphides from 90.95 – 130.50 m.

A total of 14 samples were collected from this hole for assaying. Best results were a 7.80 m section (70.70 – 78.50 m) in massive pyritic sulphides, which assayed 0.29 g/t gold and 42.08 % sulphur; a 3.0 m section (87.40 – 90.40 m) mostly in massive pyritic sulphides, which analyzed 0.12% copper and 40.85% sulphur; a 3.00 m section (90.4 – 93.40 m) in mostly massive and semi-massive pyrite alteration, which assayed 0.17% copper, and a 3.00 m section (98.40 – 101.40 m), which assayed 0.19% copper.

PDA 2002-14 Summary Lithology Log

0.00 – 6.80 m **ALLUVIUM**
Light brown to dark brown alluvial clay with boulders of unaltered hornblende-biotite andesite porphyry.

6.80 – 10.70 m **OXIDE ZONE**
Generally hematitic red in color moderately vuggy, ferruginous zone from 6.80 – 7.80 m. Rusty brown intensely weathered limonitic amygdaloidal basalt from 7.80 – 10.70 m.

10.70 – 17.50 m **ALTERED AMYGDALOIDAL BASALT**
Light greenish-gray chlorite-pyrite±quartz-altered amygdaloidal basalt. Texture is fine-grained massive with pyrite occurring as pseudomorphs of amygdules. Pyrite also occurs as blebs, fracture infills and veinlets comprising 1 – 3 volume %. Quartz occurs as hairline veinlets. A narrow zone of fault-bounded intensely

chlorite-illite-pyrite-altered andesitic volcanics occurs at 13.70 – 14.40 m.

17.50 – 34.00 m **ALTERED ANDESITIC VOLCANICS WITH NARROW ZONES OF DEFORMED QUARTZ-DIORITE AND FELDSPAR-PHYRIC ANDESITE**

Light greenish to dark greenish-gray chlorite-pyrite±clay±quartz-altered andesitic volcanics with localized matrix-supported hydrothermal breccia. This unit is weakly to moderately fractured. Pyrite occurs as fine-grained disseminations composing 1 – 3 volume %. Quartz, where present, occurs as veinlets, which with pyrite occurs as fracture infill. Shearing within the unit is evident. Crushed zone occurs at 30.5 – 30.9 m.

Narrow zones of peppery greenish-gray chlorite-quartz-pyrite-altered deformed quartz-diorite occur at 25.50 – 26.00 m, 27.10 – 27.70 m, 29.30 – 29.50 m, and 31.10 – 31.40 m. Texture is medium-grained massive and brecciated in part. Pyrite occurs as disseminations and fracture-infill, and at times, with quartz veinlets. Pyrite content of this unit is approximately 2 volume %.

A narrow zone of greenish-gray feldspar-phyric andesite with ubiquitous yellow-orange oxidized feldspar phenocrysts occurs at 26.60 – 27.20 m.

34.00 – 34.70 m **ALTERED PORPHYRITIC ANDESITE DIKE**

Dark greenish-gray chlorite-pyrite-clay-altered fine-grained andesite, possibly a dike. Pyrite occurs as fine disseminations and fracture infill comprising 1 – 3 volume %.

34.70 – 43.70 m **DEFORMED QUARTZ-DIORITE**

Light-greenish gray chlorite-quartz±pyrite-altered hard, massive deformed quartz-diorite. Pyrite content <1 volume %. Crushed zone occurs at 39.70 – 40.20 m. This unit is cut by a 10-cm epidotized amygdaloidal andesite where epidote occurs as criss-crossing veinlets associated with quartz.

43.70 – 45.90 m **ALTERED ANDESITIC VOLCANICS CUT BY ALTERED ANDESITE DIKE**

Greenish-gray to grayish brown chlorite-quartz-pyrite±clay-altered andesitic volcanics containing as much as 20 volume % pyrite occurring as coarse aggregates and veinlets. Texture is fine-grained. This unit is cut by grayish-brown epidote-chlorite-zeolite-altered strongly magnetic amygdaloidal andesite dike at 43.7 – 43.95 m and by a gray intensely chlorite-quartz-pyrite-altered porphyritic andesite dike. Pyrite content of the dike reaches up to 30 volume % with rare chalcopyrite in veinlets.

45.90 – 55.50 m

HYDROTHERMALLY ALTERED ANDESITE DIKE WITH ZONES OF FELDSPAR-PHYRIC ANDESITE

Gray to dark gray pyrite±clay±chlorite±quartz-altered fine-grained andesite dike strongly magnetic in places. Pyrite occurs as disseminations and stringers with quartz. Narrow zones of light gray chlorite-clay±pyrite-altered feldspar andesite porphyry occur at 47.07 – 49.5 m; 54.2 – 54.85 m; and 55.1 – 55.5 m.

55.50 – 64.50 m

MIXED ZONES OF PROPYLITISED ANDESITIC VOLCANICS AND DIORITIC INTRUSIVES WITH NARROW ZONE OF MASSIVE SULFIDES

Generally greenish to dark greenish gray intensely quartz-chlorite-pyrite±clay±epidote±epidote±zeolite±calcite-altered andesitic volcanics hydrothermally brecciated in part. Pyrite (3 –5 volume %) occurs as fine disseminations and as stringers as wide as 5 mm.

Narrow zone of greenish-gray quartz-chlorite-pyrite±clay-altered deformed quartz-diorite with 1 volume % pyrite disseminations occurs at 57.0 – 58.01 m.

Narrow zones of generally greenish-gray feldspar-andesite porphyry with crowded texture and altered to chlorite-pyrite-quartz±clay at 58.4 – 59.6 m; 60.6 – 60.9 m; 62.0 – 62.8 m; and 63.3 – 63.65m.

The feldspar-andesite porphyry is cut by gray to brownish-gray andesite dike showing chlorite-quartz-pyrite±clay alteration with pyrite occurring as fine disseminations up to 10 volume %.

Narrow zone of brown to greenish-gray fine to medium-grained chlorite-quartz-pyrite-altered microdiorite with rare chalcopyrite veinlet occurring at 59.8 – 60.6 m. Pyrite content of this unit is about 1 volume %.

A narrow zone of massive pyrite occurs at 64.26 – 64.50 m.

64.50 – 69.90 m

PROPYLITISED ANDESITIC VOLCANICS CUT BY ANDESITE DIKE AND NARROW ZONES OF MASSIVE PYRITE

Grayish pistachio green intensely epidote-zeolite-chlorite-clay-calcite-altered ?andesitic volcanics. Epidote dominates the alteration mineral occurring in clusters. Zeolite occurs as intermittent veinlets. Pyrite content of this unit is approximately 1 volume %. Narrow zones of massive pyrite containing >90 volume % pyrite occur at 67.50 – 67.70 m; and 68.4 – 68.50 m.

69.90 – 70.70 m **INTENSELY ALTERED DACITIC TUFF**

Yellow greenish-gray intensely quartz-illite-pyrite-epidote-altered dacitic tuff locally vuggy and brecciated. Pyrite content is variable but increases in the basal portion. A narrow zone of massive pyrite with ?native sulfur occurs at 67.50 – 67.70 m. Dark greenish-gray altered andesite dikes cut this unit at 67.30 – 67.50 m; 68.20 – 68.30 m; and 69.10 – 69.20 m.

70.70 – 78.50 m **MASSIVE PYRITE WITH NARROW ZONE OF MATRIX-SUPPORTED HYDROTHERMAL BRECCIA**

Pale brass yellow, massive, medium- to coarse-grained massive pyrite containing >90 volume % pyrite. Unit is weakly brecciated. Trace of ?native sulfur present with pyrite. Matrix-supported breccia hydrothermal breccia occurs at 73.20 – 74.10 m. This is light green to light gray in color and characterized by sub angular to surrounded clasts of massive pyrite, quartz, hydrofractured quartz-pyrite breccia, chlorite-clay±quartz-pyrite-altered andesite volcanics set in a matrix consisting of clay-pyrite-?rock flour. Pyrite content of the breccia ranges from 15 – 30 volume % mainly as disseminations and fracture infill.

78.50 – 87.40 m **DEFORMED ?MICRODIORITE**

Peppery green moderately fractured moderately chlorite-clay epidote-quartz-pyrite-altered fine-grained ?microdiorite. Quartz veinlets present. Pyrite occurs mainly as disseminations and fracture fillings ranging from 5 – 10 volume %. Weak ?malachite staining observed at 79.60 m. Occasional chalcopyrite in veinlets present. Zeolite veinlets observed.

87.40 – 90.95 m **MASSIVE PYRITE WITH NARROW ZONE OF HYDROFRACTURED QUARTZ-PYRITE BRECCIA**

Pale brass yellow fine to medium-grained massive pyrite containing >90 volume % pyrite with narrow zone of weakly vuggy hydrofractured breccia with trace chalcopyrite veinlets at 87.95 – 88.4 m. Secondary quartz occurs as vug fillings. Quartz veinlets are present with zeolite. Portions of quartz-zeolite veinlets are stained with rusty brown goethite along fractures observed at 88.30 m. Pyrite (10 – 30 volume %) in the breccia occurs as fine to medium grained fillings in fractures and disseminations in the matrix.

90.95 – 130.50 m **HYDROFRACTURED QUARTZ-PRYRITE±BRECCIA WITH NARROW ZONES OF SEMI-MASSIVE TO MASSIVE PYRITE**

Gray to light gray in color, intensely quartz-illite-pyrite-altered, weakly fractured to massive, weakly vuggy hydrofractured breccia.

Gray to light gray weakly fractured semi-massive pyrite zone with massive texture occurs at 93.15 – 94.25 m. Pyrite occurs as disseminations with or without quartz and clay comprising up to 40 volume %. Pale brass yellow, weakly fractured to massive, weakly brecciated, weakly vuggy massive pyrite zone occurs at 111.35 – 111.6 m. Pyrite content of this massive pyrite zone is >90 volume % with minor clay±quartz filling the interstices of grains.

END OF HOLE PDA 2002-14.

DDH No.	**:**	**PDA 2002-15**
Coordinates	:	21,105N / 20,270E
Collar Elevation	:	8.9 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	54.30 m

PDA 2002-15 was the re-drill of PDA-13. It intersected sandy alluvium to 5.18 m, oxide zone from 5.18 to 8.20 m, and then weathered dacitic [?] tuff to 9.35 m. QIP breccia was intercepted from 9.35 – 14.00 m, altered hornblende andesite porphyry to 16.40 m, and then QIP breccia to 18.20 m. Pyrite content in the breccia ranges from 5 – 80 volume % with minor to significant chalcopyrite content. A fault zone was encountered from 18.20 – 24.40 m, then semi-massive pyritic sulphide to 25.59 m containing 40 – 90 volume % pyrite, and massive pyritic sulphides (> 90 volume % pyrite) to 29.0 m. Alternating zones of dioritic intrusives, massive pyritic sulphides and QIP breccia were encountered from 29.0 to 54.30 m. The hole was terminated in QIP breccia at 54.3m.

A total of eleven samples from this hole were submitted for analysis. The best intercepts were a 3.00-m section (10.00 –13.00 m) in QIP breccia, which gave 0.16% copper and 0.66 g/t gold; an 8.00-m section (16.00 – 24.00 m) mostly in a fault zone, which analyzed 0.33% copper; and a 9.00-m section (24.00 – 33.00 m) mostly in semi-massive to massive pyritic sulphides, which assayed 0.54 g/t gold and 34.66% sulphur including a 3.00-m section (27.00 – 30.00 m) in massive pyritic sulphides, which yielded 0.12% copper, 0.88 g/t gold and 38.37% sulphur.

PDA 2002-15 Summary Lithology Log

0.00 – 5.18 m	**SANDY ALLUVIUM** Generally brown loose dominantly sandy deposit mixed with brown to reddish brown alluvial clay.
5.18 - 8.20 m	**OXIDE ZONE** Brown to reddish brown residual clay from 5.18 to 7.60 m grading into brown reddish decomposed altered volcanic rock with observable clay-quartz-altered fragments. Base of oxidation is at 8.25 m.
8.20 – 9.35 m	**WEATHERED ?DACITIC TUFF** Yellow-greenish gray weathered altered ?dacitic tuff from 8.25 – 9.15 m grading into a narrow gray clay-pyrite zone from 9.15 – 9.35 m containing 40 volume % pyrite.

9.35 – 14.00 m **QUARTZ-PYRITE-ILLITE-ALTERED HYDROFRACTURED BRECCIA**

Light gray to gray quartz-pyrite-illite-altered hydrofractured breccia with semi-massive pyrite intercept (up to 80 volume %) at 11.82 – 12.00 m. Crushed zones occur at 10.0 – 10.3 m; 11.3 – 11.48 m; 12.6 – 12.7 m; 13.0 – 13.3 m; and 13.75 – 14.00 m. Chalcopyrite occurs as blebs and fractures infill and in places account for 1 – 3 volume %. In a more fractured section of the unit, particularly at 12.0 – 12.25 m, oxidation is present. At 13.6 m and adjacent section, chalcocite and ?chrysocolla were observed. Quartz veining noted at 12.70 – 13.0 m.

14.00 – 16.40 m **ALTERED HORNBLENDE-ANDESITE PORPHYRY**

Grayish-green chlorite- clay- epidote- pyrite± zeolite-altered hornblende-andesite porphyry characterized by crowded texture, where hornblende laths are readily observable. Epidote occurs as rounded fragments and as veinlets. Pyrite (1 – 2 volume %) occurs as fine disseminations and blebs in fractures.

16.40 – 18.20 m **QUARTZ-PYRITE-ILLITE-ALTERED HYDROFRACTURED BRECCIA**

Light gray to gray, locally weakly vuggy sericite-quartz-pyrite-altered hydrofractured breccia. A chalcopyrite enriched zone at 16.40 – 16.80 is characterized by chalcopyrite blebs and fractures fills. Chalcopyrite also occurs with pyrite and secondary quartz as crosscutting veinlets Sooty chalcocite noted in hairline fractures. Chalcopyrite content of this section is approximately 10 – 15 volume % while pyrite is estimated at 5 volume %.

18.20 – 24.40 m **FAULT ZONE**

Quartz-clay-pyrite gougy brecciated zone with striations noted in places. Emerald-green ?chrysocolla occurs in fractures. Minor malachite staining noted; occasional chalcopyrite noted.

24.40 – 25.59 m **SEMI-MASSIVE PYRITE**

Dark gray quartz-pyrite±illite-altered semi-massive pyrite containing 40 – 90 volume % pyrite. Chalcopyrite, as replacement of pyrite noted.

25.59 – 29.00 m **MASSIVE PYRITE**

Pale brass yellow, fine-grained massive pyrite containing >90 volume % pyrite with narrow zone of semi-massive pyrite at 26.50 – 26.60 m. Faint malachite staining noted. Sooty chalcocite and chalcopyrite present in fractures. Crushed zone occurs from 27.10 to the basal portion of the unit.

29.00 – 31.90 m **ALTERED MICRODIORITE**

Green weakly to moderately chlorite-epidote-pyrite-quartz-altered microdiorite similar the rock unit encountered in DH 2001-07 at 65.0 m. Unit is weakly magnetic. Fault zone occurs at 29.65 – 31.90 m.

31.90 – 33.65 m **FAULT-BOUNDED MASSIVE PYRITE WITH NARROW ZONE OF HYDROFRACTURED BRECCIA**

Pale brass yellow, fine-grained massive pyrite containing >90 volume % pyrite bounded at the top and basal portions by faults. A narrow zone of light gray to gray quartz-illite-pyrite-altered hydrofractured breccia occurs at 32.15 – 32.90 m with faint malachite staining.

33.65 – 36.13 m **ALTERED MICRODIORITE IN A FAULT ZONE**

Serpentine-green chlorite-clay-pyrite-altered ?microdiorite in fault zone.

36.13 – 38.05 m **MASSIVE PYRITE IN A FAULT ZONE WITH NARROW ZONES OF HYDROFRACTURED BRECCIA**

Pale brass yellow fine-grained pyrite containing >90 volume % pyrite bounded at the basal portion by a fault. Narrow zones of light gray to gray quartz-illite-pyrite-altered hydrofractured breccia occur at 36.25 – 36.40 m; 37.07 –37.24 m; and 37.35 – 37.65 m.

38.05 – 54.30 m **QUARTZ- PYRITE- ILLITE- ALTERED HYDROFRACTURED BRECCIA**

Light gray to dark gray intensely quartz-pyrite-illite-altered hydrofractured breccia with fine-grained pyrite comprising 10 – 20 volume %. Occasional chalcopyrite, as blebs and fractures infill was noted. Crushed zones occur at 41.00 – 41.25 m; 42.95 – 43.60 m; 44.45 – 45.00 m; 47.57 – 47.90 m; 48.37 – 49.10 m; and 50.80 – 51.20 m.

END OF HOLE PDA 2002-15.

DDH No.	**:**	**PDA 2002-16**
Coordinates	:	20,950N / 19,600E
Collar Elevation	:	53.50 m RL
Azimuth	:	00^0
Inclination	:	-90°
Total Depth	:	45.00 m

PDA 2002-16 was drilled at Asparin Hill; an area with high soil geochemical results (eg. 690 parts per million [ppm] copper, 659 ppm lead, 116 ppm zinc, 1570 parts per billion [ppb] gold, 2.5 ppm silver, and 800 ppm arsenic); and also the site of a rock sample giving 736 ppm copper, 818 ppm lead, 98 ppm zinc, 355 ppb gold, 15.8 ppm silver, 900 ppm arsenic, 15 ppm molybdenum, 7 ppm antimony and 23.05 ppm mercury. Asparin Hill also falls within a broad high magnetic anomaly; and contains an anomalous, circular topographic depression, approximately 300 m in diameter, interpreted from aerial photos [Ruelo, 2002]. PDA-16 was drilled on high ground, on the eastern rim of the circular depression.

PDA-16 intersected oxide zone from the surface to 10.60 m, altered porphyritic dacite containing approximately 1 – 3 volume % pyrite to 20.11 m, then quartz-illite-pyrite-chlorite-altered breccia through 20.59 m. A fault zone was encountered from 20.59 to 22.00 m, then the quartz-illite-pyrite-chlorite-altered hydrothermal breccia to 24.10 m. From 24.10 to 25.50 m, hydrothermally altered dacitic tuff containing 1 – 2 volume % pyrite and 1 – 2 volume % chalcopyrite was intersected. Sericite-chlorite-altered dacite overprinting K-silicate alteration with streaks and bands, disseminated and fracture filling pyrite (3 – 10 volume %) and chalcopyrite (trace) was then intersected through to the end of the hole at 45.00 m.

A total of eleven samples were taken from this hole for assaying. Best intercepts were a 10.00 m section (5.00 – 15.00 m), which analyzed 0.24% copper, and a 6.00-m section (20.00 – 26.00 m), which assayed 0.31% zinc.

PDA 2002-16 Summary Lithology Log

0.00 – 10.60 m **OXIDE ZONE**
Mixed reddish brown ferruginous clay and boulder debris of quartz-alunite-altered dacitic and andesitic volcanics. Oxidation at the basal portion consists of goethite along fractures. Base of oxidation at 10.60 m.

10.60 – 20.11 m **ALTERED PORPHYRITIC DACITE**
Light green to grayish-green, weakly to moderately magnetic, generally massive chlorite-illite-quartz±pyrite-altered porphyritic dacite with pyrite increasing in volume with depth. Pyrite content approximately 1 – 3 volume %. Crushed zones occur at 12.95 – 13.15 m; and 14.20 – 15.60 m.

20.11 – 20.59 m	**MATRIX-SUPPORTED HYDROTHERMAL BRECCIA** Gray matrix-supported breccia characterized by quartz-illite-pyrite-chlorite alteration.
20.59 – 22.00 m	**FAULT ZONE** Narrow gougy zone with fragments of porphyritic dacite.
22.00 –24.10 m	**MATRIX-SUPPORTED HYDROTHERMAL BRECCIA** Gray matrix-supported breccia exhibiting quartz-illite-pyrite-chlorite alteration. Crushed zones noted at 22.52 – 22.72 m; and 23.00 – 24.00 m.
24.10 – 25.50 m	**HYDROTHERMALLY ALTERED ?DACITIC TUFF** Greenish-gray quartz-illite-clay-pyrite-altered moderately fractured dacitic tuff characterized by ubiquitous illite/sericite-clay-altered phehocrysts. Sulphides consist of pyrite and chalcopyrite disseminations, the latter also occurring as fracture fills. Chalcopyrite comprises 1 – 2 volume %. Pyrite content is about 10 volume %. Crushed zone occurs at the basal portion of the unit.
25.50 – 41.72 m	**MATRIX-SUPPORTED BRECCIA** Buff-gray to dark greenish-gray matrix-supported poorly sorted breccia. Alteration consists of sericite/illite-quartz-pyrite with encroaching sericite-chlorite alteration. A significant feature is the occurrence of secondary biotite in fractures and opens spaces especially in the section 29.55 m. Also in this section, coarse-grained euhedral to subhedral pyrite and minor chalcopyrite occur as fracture fills, disseminations and as streaks and bands associated with quartz-sericite-chlorite alteration. Pyrite content varies from 5 – 20 volume %. Narrow semi-massive pyrite zone containing 80 – 90 volume % pyrite occurs at 41.10 – 41.20 m. Crushed zones noted at 25.95 – 26.30 m; 27.0 – 27.10 m; 32.10 – 32.40 m; 33.4 – 34.3 m; 36.20 – 36.75 m; 37.80 – 39.45 m; and 40.10 – 40.50 m.
41.72 – 45.00 m	**SERICITE-CHLORITE-ALTERED BRECCIA** Light green sericite-chlorite-altered breccia with trace secondary biotite alteration. Chlorite is ubiquitous occurring as dark green replacement of phenocrysts. Remnant quartz-eye feature indicates a porphyritic dacitic host rock. Pyrite occurs as disseminations with volume reaching as high as 20%. Basal portion appears faulted having a gougy feature.

END OF HOLE PDA 2002-16.

NEW PETROGRAPHIC/MINERAGRAPHIC FINDINGS ON THE PAN DE AZUCAR PROSPECT

For

MRL GOLD PHILIPPINES, INC

Petrographic / mineragraphic analysis was conducted on thin / polished sections of thirteen (13) samples taken from Drillholes 14, 15 and 16 of the Pan De Azucar Prospect. Mr. Edsel Abrasaldo provided the samples with accompanying field data and drillhole location/ geology/alteration maps.

The main purpose of the microscopic analysis is to initially assess DH-16 in terms of alteration, ore mineralogy, lithology and to correlate the findings with the drillhole data gathered from the Valderrama Zone. Incidentally, drilling at DH-16 was terminated at depths of only about 46.8 m. Hence the data presented in this report are limited only to such an extent.

FINDINGS

1. The entire 43.8m of DH-16 is characterized by volcanics and volcaniclastics that are dacitic in composition as seen from the relict primary quartz grains that remain discernible in most of the samples despite the intense hydrothermal alteration.
2. Hydrothermal alteration is very destructive. Four assemblages were recognized by microscopy namely:
    a. An earlier illitic/sericitic alteration – corresponding to the QIP (Quartz-illite-pyrite) alteration described in the Internal Report of H.B Ruelo (2002). This is very pervasive and is characteristic of samples from DH-14 and 15. All illitic and sericitic alteration reported and described previously in the other drillholes correspond to this alteration.
    b. Sericite-chlorite alteration – a distinct alteration assemblage recognized in DH-16. This consists of well-crystallized flakes of sericite and hydrothermal muscovite with or without associated chlorite. The assemblage encroaches the earlier illitic alteration and serves as cementing material to the illite-altered fragments.

c. K-silicate alteration – this is also a newly recognized alteration occurring in DH-16. It is characterized by the predominance of hydrothermal biotite and minor chlorite. It occurs as fracture fills at depths of about 29.55 m and usually as remnants enveloped and overprinted by the more pervasive sericite-chlorite alteration.

3. Massive pyritic mineralization with chalcopyrite ± sphalerite, (Valederrama ore) is dominant in samples DH-14 and 15. This deposit may be a massive sulphide replacement. However, a volcanogenic origin is not totally discounted.
4. In DH-16, pyrite predominates. Sericite-chlorite alteration is associated with abundant pyrite. Chalcopyrite was detected only in 2 samples, namely at depth of 24.3 m (upper level) where earlier illitic alteration prevails and at 29.55 where K-silicate alteration was recognized. The occurrence of chalcopyrite together with k-silicate alteration indicates a possible porphyry copper mineralization at depth. Hence, more chalcopyrite, along with bornite and hydrothermal magnetite may be expected where K-silicate alteration predominates.
5. Crosscutting relationships based on alteration mineralogy, reveal a younger episode of magmatism which is represented by the higher temperature assemblages such as sericite-chlorite and K-silicate alterations over illite-sericite (QIP);
6. Asparin Hill is a highly prospective site for the search of a high level intrusive or breccia body, which may host porphyry style mineralization. It is in this same site where advanced argillic- altered floats were mapped. The presence of hydrothermal biotite in two of the drillcore samples from Asparin also strongly supports this claim. Intense silicification in the area has rendered the host rock highly resistant to erosion resulting in topographic prominences. This intense alteration may be related to the formation of a diatreme or a hydrothermal breccia pipe below.

7. At Valderrama Hill, however, the low temperature alteration assemblage related to the delineated massive pyritic deposit is distinct from that at Asparin Hill.. In this case, alteration mineralogy suggests the introduction of neutral ph solutions responsible for the deposition of the mineralized massive pyritic body.

8. At Asparin Hill, a higher temperature magmatic hydrothermal fluid is responsible for the Sericite-chlorite and k-silicate alterations (and possible porphyry type mineralization at depth).

9. At least two types of hydrothermal fluids have been introduced in the Pan de Azucar area. In this regards, the following mineralization models are recommended to be tested for purposes of further exploration work:

   a) **one-system model** (Figs. 1a & 1b) - which infers that the two different fluids at Valderrama Hill and Asparin Hill are part of one hydrothermal system. The mineralizing fluid at Asparin Hill could have reached the surface as highly acid waters capable of producing massive replacement bodies such as the Enargite deposit of Lepanto Mine in Mankayan, Philippines; However. modification i.e.

dilution of the hot, hypogene fluid along the flanks of the conduit, may have resulted in the production of neutral ph waters that precipitated ores typical of those at Valderrama Hill;

(b) **two-system model** (Fig. 2) - which infers that the massive pyritic mineralization at Valderrama Zone is an older VMS deposit overprinted by later arc magmatic activity resulting in the superposition of the high temperature hydrothermal alteration assemblage as represented in Asparin Hill.

RECOMMENDATIONS FOR FUTURE WORK:

1. Sampling and petrographic analyses of rock sections between Asparin Hill and Valderrama Zone**;**

2. Detailed paragenetic studies of cross-cutting relationships of different types of alteration assemblages and ore mineralization**;**

3. Fluid Inclusion studies of representative vein/gangue materials**;**

4. Geodynamic and Structural geological reconstruction of the Pan de Azucar area in relation with regional tectonic events and timing of mineralization**;**

5. Formulation of appropriate ore and exploration models for the Pan de Azucar and vicinities

PETROGRAPHIC ANALYSIS

SAMPLE MARK **DH –10 46.5M**

MEGASCOPIC DESCRIPTION

Massive pyrite-chalcopyrite layer in contact with bleached, altered country rock.

MICROSCOPIC ANALYSIS

Description

Intense alteration has greatly modified the original textural and mineralogical features of the rock. The section now consists mainly of secondary quartz and illite with clay dusts, scattered opaque grains and very minor chlorite.

Microcrystalline, secondary quartz aggregates are blanketed by irregular clouds of clay, resulting in a turbid appearance. Fine illite shreds are interspersed in the fine-grained quartz base. Abundant vugs are lined and/or partly filled with clear, coarser quartz crystals. Granular to irregularly shaped opaques are confined mostly in these vugs. Other finer opaque specks are clustered to form fine, parallel to intersecting trails that run through the rock. Fibrous green chlorite are randomly dispersed.

Composition

% Primary	% Secondary	
	Quartz	50
	Illite	25
	Clay	13
	Opaques (sulfides)	10
	Chlorite	2

ROCK NAME **Hydrothermally-altered, mineralized rock.**

PETROGRAPHIC ANALYSIS

SAMPLE MARK DH – 13 21.00M Crushed sample

MEGASCOPIC DESCRIPTION

Pyrite-chalcopyrite disseminations in altered country rock.

MICROSCOPIC ANALYSIS

Description

The hostrock consists of interlocking aggregates of microcrystalline quartz and shreds of illite/sericite that swirl around the quartz graines. Cubic granules of pyrite stipples the quartz-illite background. Occasional rounded patches of chalcedonic quartz are randomly scattered throughout the quartz-illite-pyrite host. Late crystalline quartz veins are associated with coarse-grained sulfides.

Composition

	% Secondary
Quartz	40
Ilite/sericite	45
Chalcedonic quartz	5
Opaques	10

ROCK NAME Hydrothermally altered mineralized rock

MINERAGRAPHIC ANALYSIS

SAMPLE MARK DH – 13 21.00M Crushed sample

MEGASCOPIC DESCRIPTION

Pyrite-chalcopyrite disseminations in altered country rock.

MICROSCOPIC ANALYSIS

Description

Idiomorphic granular crystals of pyrite are disseminated throughout the gangue. Fractures in the host rock are filled with chalcopyrite. Pyrite is euhedral against chalcopyrite and perfectly bounded pyrite crystals are sometimes enclosed by chalcopyrite. Sphalerite grains with resorbed boundaries are also enclosed by chalcopyrite. Most sphalerite grains are characterized by chalcopyrite disease.

The suggested sequence of deposition based on microscopy is as follows:

Composition

	Volume %	Paragenesis
Pyrite	15	--------
Chalcopyrite	6	----------
Sphalerite	1	--------
Gangue		----------
Quartz		--------
Illite		-------
Late quartz vein		----------

ORE TYPE Copper-zinc

PETROGRAPHIC ANALYSIS

SAMPLE MARK **DH –14 66.06M**

MEGASCOPIC DESCRIPTION

Chloritized, silicified volcanic rock. One piece consisits of gougy and crumbly volcanic rock.

MICROSCOPIC ANALYSIS

Description

Original features of the rock are difficult to discern due to intense alteration to epidote, zeolite, chlorite and clay.

Few recognizable laths of plagioclase with faint twinning are noted. They are almost always altered to zeolite. Intense flooding of clustered epidote granules in the specimen is conspicuous. These epidote crystals are possibly pseudomorphs after the mafic components. Admixed chlorite + clay mask the section.

Intermittent veinlets of zeolite traverse the rock. Calcite patches and veinlets are randomly dispersed. Opaque specks are widely dissmeninated.

Composition

% Primary		% Secondary	
Plagioclase	trace	Epidote	35
		Zeolite	30
		Clay	15
		Chlorite	10
		Calcite	9
		Opaques	1

ROCK NAME **Propylitized Volcanic rock**

PETROGRAPHIC ANALYSIS

SAMPLE MARK **DH –14 88.3M**

MEGASCOPIC DESCRIPTION

Pyritized black volcanic rock with veinlets of reddish mineral (?)

MICROSCOPIC ANALYSIS

Description

Primary mineralogical and textural features of the specimen are largely obliterated by hydrothermal alteration.

Abundant secondary quartz occur as microcrystalline aggregates that totally replace the groundmass (?) of the original rock. This microcrystalline quartz matrix is interspersed by turbid clay, illite, opaques and chlorite. Secondary quartz occurring as vug fillings assume forms such as medium-grained interlocking allotriomorphic granular aggregates or as dog-tooth crystals. Quartz grains in veinlets are clear with undulose extinction. Others are turbid due to clay superposition. Together with vein quartz are tapered crystals of zeolite with conspicuous bent cleavage traces. Portions of these quartz-zeolite veinlets are stained with reddish brown goethite. Granular opaques are disseminated. Some clustered opaque grains are bordered by fibrous green chlorite.

Composition

% Primary	% Secondary
Quartz	28
Zeolite	15
Clay	20
Illite	10
Opaques	20
Goethite	2
Chlorite	5

ROCK NAME **Hydrothermally altered, mineralized volcanic rock**

PETROGRAPHIC ANALYSIS

SAMPLE MARK **DH –14 100.75 m**

MEGASCOPIC DESCRIPTION

Massive pyrite-chalcopyrite layer and stockworks in silicified rock.

MICROSCOPIC ANALYSIS

Description

Intense quartz-illite-pyrite alteration has completely modified the original rock. The original texture however may be inferred as porphyritic based on the occasional occurrence of subhedral lath-like forms which are most likely those of pre-existing feldspar insets. These relict grains are now wholly replaced by illite +/- chlorite.

Sulfide ores, comprising about 25% of the rock volume, occur as disseminations and veinlets. They usually occur in clusters and exhibit angular to irregular boundaries. Pore spaces between and within opaque granules are occupied by quartz. Sulfides in veinlets are usually associated with quartz + clay + clinozoisite needles. Hair-like trails of quartz + chorite are observed.

The altered plagioclae and opaques are embedded in a relict groundmass composed of aggregates of illite+ clay+ quartz.

Composition

% Primary	% Secondary	
	Quartz	20
	Illite	45
	Opaques	25
	Clay	10
	Clinozoisite	trace
	Chlorite	trace

ROCK NAME **Hydrothermally altered, mineralized volcanic rock**

PETROGRAPHIC/MINERAGRAPHIC ANALYSIS

SAMPLE MARK **DH-15 16.8m**

MEGASCOPIC DESCRIPTION

MICROSCOPIC ANALYSIS

Description

Late coarsely crystalline secondary quartz with associated opaques crosscut the rock in diverse directions. The bulk of the rock is sericite-altered with brown islands of fine-grained chalcedonic quartz + clay Chalcopyrite and pyrite, together with coarse grained secondary quartz occur as diversely oriented intersecting veinlets and fracture fills. Chalcopyrite rims pyrite.

Composition

% Primary	% Secondary	
	Sericite	40
	Chalcedonic quartz + clay	15
	Quartz	
	Late quartz veins	15
	Opaques	20
	Chalcopyrite	(15)
	Pyrite	(5)

ROCK NAME **Hydrothermally altered, mineralized rock.**

ALTERATION **Sericitic**

PETROGRAPHIC/ MINERAGRAPHIC ANALYSIS

SAMPLE MARK **DH-16 24.3**

MEGASCOPIC DESCRIPTION

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MICROSCOPIC ANALYSIS

Description

Quartz-illite-clay-pyrite alteration has totally replaced the components of the original rock. Fragmental texture may however be inferred from coarse-grained fragments measuring as much as 3 mm lengthwise. Some totally altered fragments are tabular and may represent relict phenocrystal grains. A few embayed primary quartz point to an originally dacitic composition of the rock. The bulk of the thin slice is now composed of a mosaic of allotriomorphic, fine-grained secondary quartz masked heavily by shreds of illite/sericite + brown clay (smectite?) and stippled by sulphides.

The sulphides consist of pyrite ad chalcopyrite disseminations. Idiomorphic, mostly cubic pyrite is rimmed by allotriomorphic chalcopyrite which also occurs as fracture fills. Chalcopyrite envelopes sphalerite which exhibits straight contact with the former.

Composition

% Primary		% Secondary		Paragenesis
Relict fragments (wholly replaced)		Quartz	40	
Embayed quartz insets	trace	Illite/sericite	35	
		Clay	15	
		Sulphides	12	
		Pyrite	(10)	-----
		Sphalerite	(trace)	-----
		Chalcopyrite	(2)	-----

ROCK NAME **Hydrothermally altered mineralized fragmental rock (dacitic tuff ?)**

PETROGRAPHIC ANALYSIS

SAMPLE MARK **DH-16 25.5m**

MEGASCOPIC DESCRIPTION

MICROSCOPIC ANALYSIS

Description

The brecciated/fragmented texture of the specimen is emphasized and highlighted by the encroachment of late microgranular quartz. The fragments, which exhibit jigsaw-fit texture are intensely altered to either illite/sericite or fine isotropic brown clay. In places, illitic alteration envelopes clay-altered fragments. An interesting feature is the encroachment of late sericite-chlorite which also cements the illite-sericite-altered fragments. This stage precedes the latest episode of microgranular quartz invasion. The alteration paragenesis as suggested by thin section examination is as follows:

Composition	***Volume %***	***Paragenesis (oldest ------→ youngest)***
Illite	30	-------
Clay	10	-------
Pyrite	10	----------
Sericite	8	----------
Chlorite	5	----------
Quartz	37	----------

ROCK NAME **Hydrothermally altered brecciated rock (hydrothermal breccia ?)**

PETROGRAPHIC/MINERAGRAPHIC ANALYSIS

SAMPLE MARK **DH-16 29.55**

MEGASCOPIC DESCRIPTION

MICROSCOPIC ANALYSIS

Description

Hydrothermal alteration representing hotter hydrothermal fluid and consisting of sericite-chlorite has become more intense compared to 25.5m. The section still contains the pervasive illitic alteration typical of other samples. This alteration type appears like islands with jigsaw-fit texture and cemented by later coarse-grained, well-crystallized sericite with associated chlorite. A significant feature of this section is the occurrence of hydrothermal biotite in fractures and open spaces. This is enveloped by sericitic alteration. Coarse-grained euhedral to subhedral pyrite and minor chalcopyrite occur as fracture fills, disseminations and as streaks and bands associated with quartz-sericite,-chlorite alteration. Another feature not observed in previous samples is the occurrence of well-crystallized laths of muscovite, which are almost always enclosed by pyrite granules..

Composition

% Primary	% Secondary	
	Illite/Clay	10
	Sericite	25
	Chlorite	15
	Biotite	3
	Quartz	27
	Opaques	10
	Pyrite	(10)
	Chalcopyrite	(trace)

ROCK NAME K-silicate overprinted by sericite-chlorite.(with older illitic alteration?)

PETROGRAPHIC ANALYSIS

SAMPLE MARK **DH-16 31.9m**

MEGASCOPIC DESCRIPTION

MICROSCOPIC ANALYSIS

Description

Destructive sericitic alteration has totally masked the rock although relict medium-grained, embayed grains of primary quartz are present indicating original dacitic composition. Opaque grains are coarser and at times spatially associated with laths of coarse-grained hydrothermal muscovite. Rounded silica-clay-altered fragment are also present.

Composition

% Primary		% Secondary	
Quartz	trace	Sericite/ muscovite	40
		Quartz	35
		Clay	15
		Opaques	15

ROCK NAME **Hydrothermally altered rock**

ALTERATION **Sericitic**

PETROGRAPHIC/MINERAGRAPHIC ANALYSIS

SAMPLE MARK **DH-16 40.9**

MEGASCOPIC DESCRIPTION

MICROSCOPIC ANALYSIS

Description

Sample is similar to DH-16 31.9m. It is characterized by the predominance of fine-grained illite and illitic clay which is the alteration assemblage that is spatially and genetically associated with the massive pyritic deposit. Brecciated appearance of the rock in thin section is attributed to the encroachment of fine stringers of opaque grains and introduction of later coarse-grained crystalline quartz. Some rounded fragments are also silica –altered. One part of the thin section is cut by coarse-grained, clear, unmineralized quartz. Coarse hydrothermal muscovite laths enclosed by pyrite grains which are previously noted in sericite-chlorite –altered rocks, are also present.

Composition

% Primary	% Secondary	
	Illite/sericite	50
	Muscovite	trace
	Quartz	20
	Clay	10
	Pyrite	20

ROCK NAME **Hydrothermally altered mineralized rock**

PETROGRAPHIC /MINERAGRAPHI ANALYSIS

SAMPLE MARK **DH-16 43.8**

MEGASCOPIC DESCRIPTION

MICROSCOPIC ANALYSIS

Description

The section is composed dominantly of sericite-chlorite alteration assemblage with remnants of hydrothermal biotite. The occurrence of coarse hydrothermal muscovite laths enveloped by pyrite granules is a characteristic feature. Pyrite grains are also disseminated.

Composition

% Primary		% Secondary	
Quartz	trace	Sericite	45
		Chlorite	15
		Biotite	trace
		Clay	10
		Quartz	
		Pyrite	15

ROCK NAME **Hydrothermally altered mineralized rock**

ALTERATION **Sericite-chlorite overprinting K-silicate**

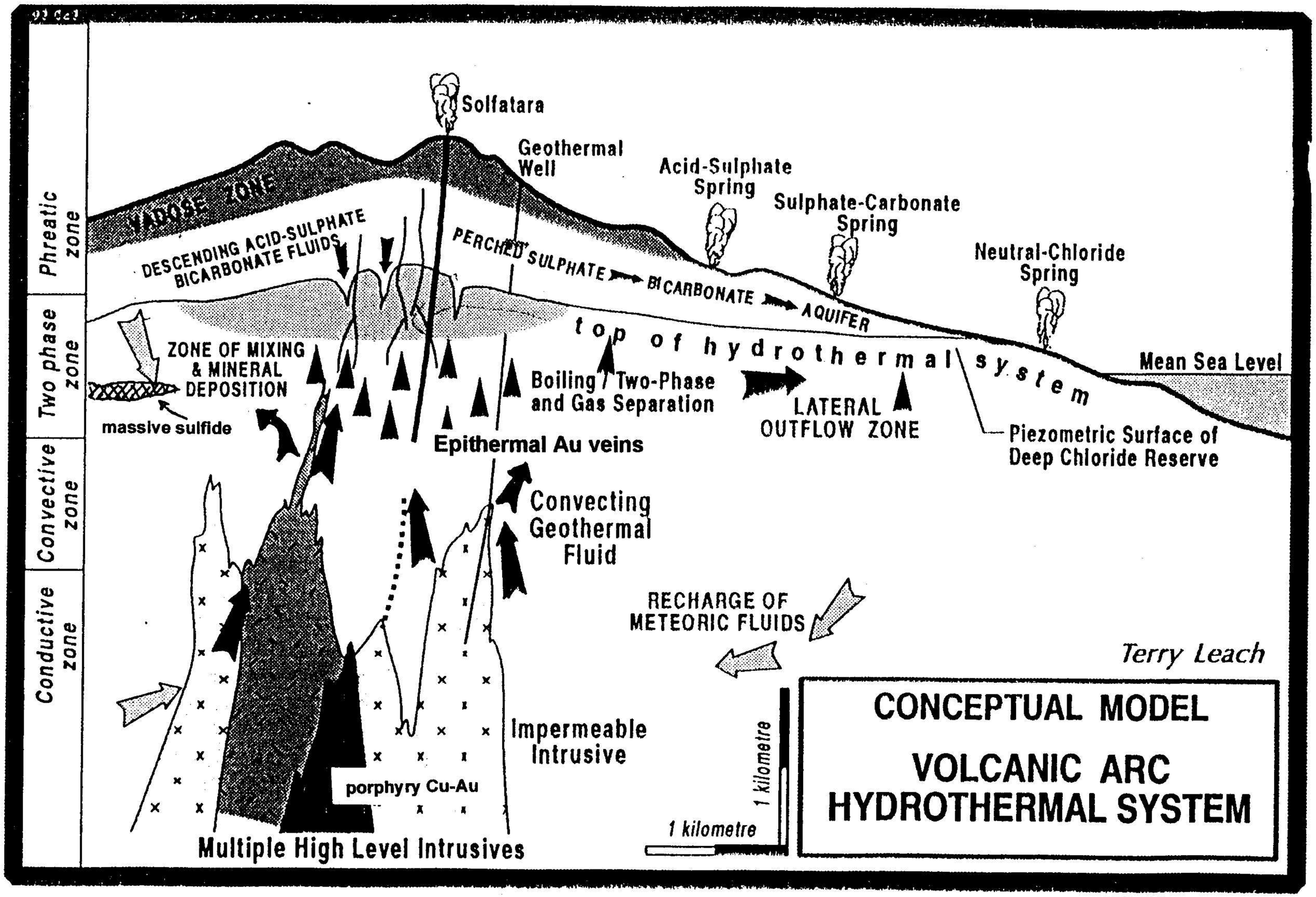

Figure 1a Schematic model of a volcanic arc hydrothermal system showing magmatic fluid flow, mixing with meteoric waters and convection of geothermal / hydrothermal fluids. Note zone of mixing with associated mineral deposition (such as massive sulfides) along the outer flanks of high level intrusives (with associated porphyry copper-gold deposits). (modified from Corbett G.J. and Leach T.M., 1995)

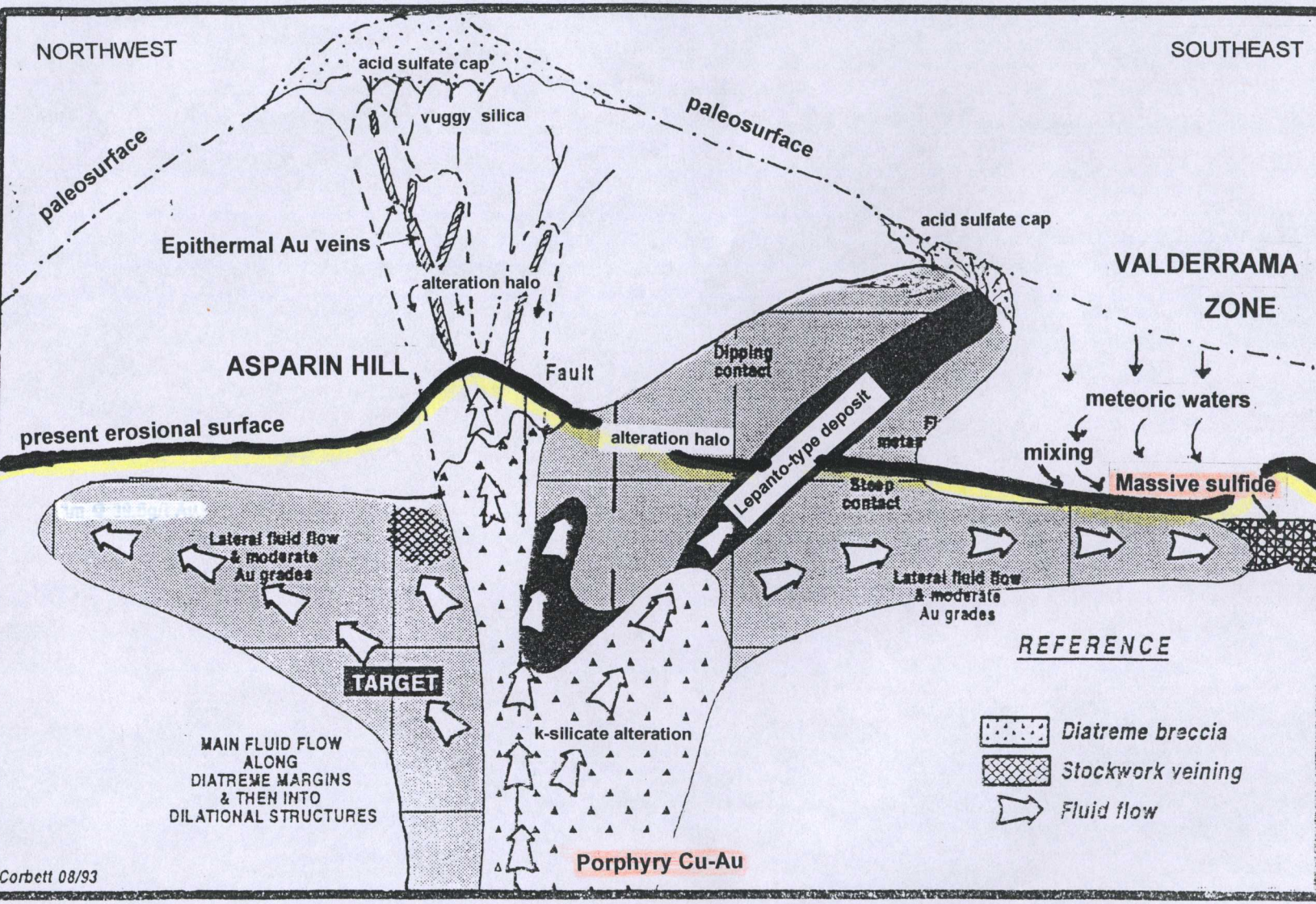

Figure 1b Schematic ore deposit relationship of Asparin Hill high sulfidation system and the low sulfidation Valderrama Zone, both as mineral deposit components of a major hydrothermal / geothermal vent evolution. (modified from Corbett G.J. and Leach T.M., 1995)

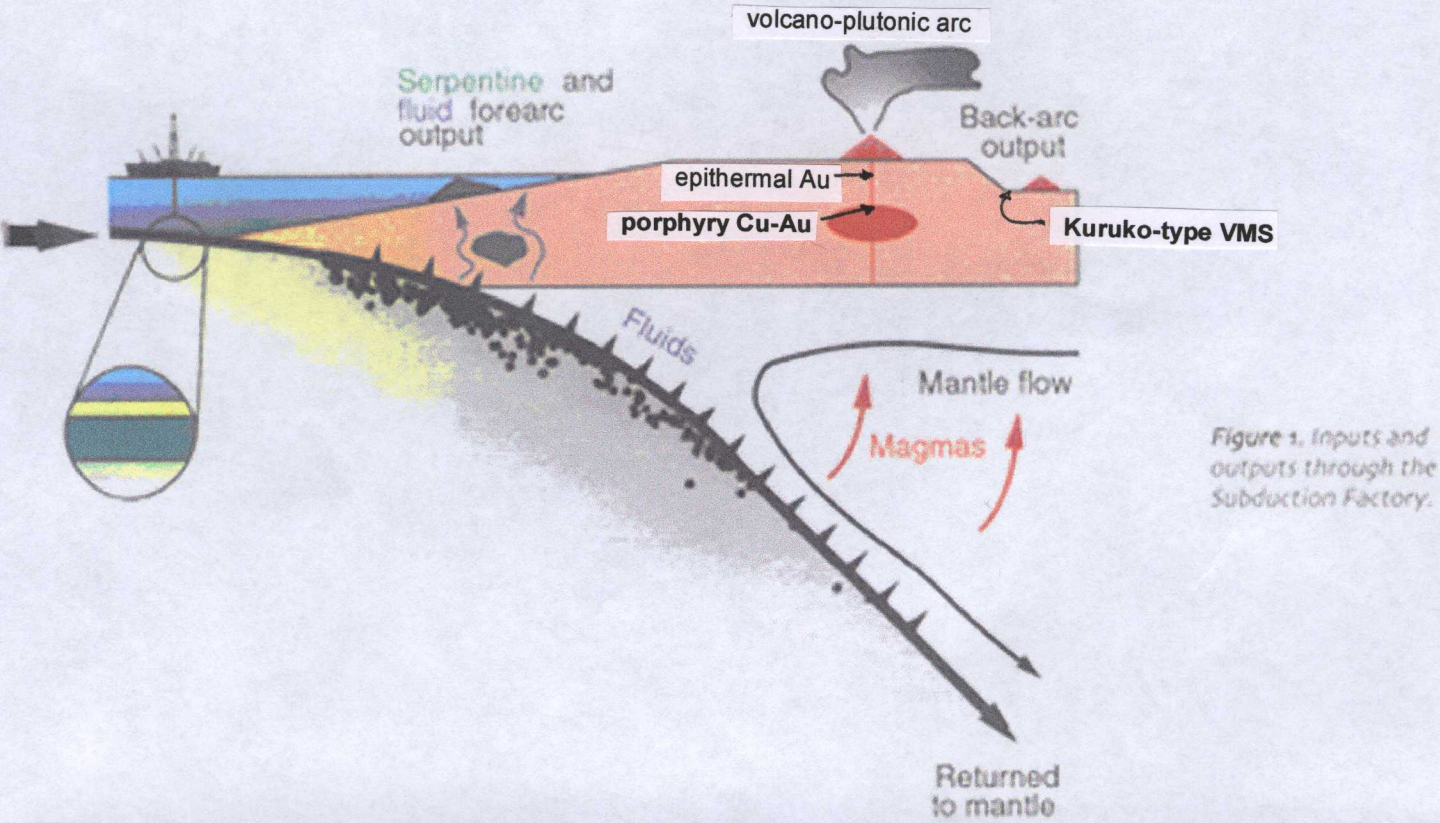

Figure 2 General island arc tectonic model showing separate source regions for deposition of volcanogenic massive sulfides (Kuruko – type VMS) and volcanic / plutonic arc-associated porphyry Cu-Au and epithermal gold-base metal deposits. (modified from Plank, T., 2002, JOIDES Journal; Vol. 28, No. 1) Timing of deposition between VMS and porphyry Cu-Au deposits may be coeval or otherwise.