

**VAALDIAM RESOURCES LTD.**

**TECHNICAL REPORT**

**DUAS BARRAS DIAMOND PROJECT, BRAZIL**

**PRESENTING DETAILS OF DIAMOND RESOURCES COMPLIANT**

**WITH**

**CANADIAN NATIONAL INSTRUMENT 43-101**

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### 3. SUMMARY

The following report, prepared by Vaaldiam Resources Ltd. ("Vaaldiam"), on the Duas Barras Diamond Project in Brazil presents a Mineral Resource estimate that is compliant with Canadian National Instrument 43-101. This report updates the previous one of 1 May 2006.

#### Property Location and Mineral Title

The Duas Barras Property ("the Property") is located in Minas Gerais State, Brazil, approximately 250 km north of Belo Horizonte, the State capital. It is easily accessible by asphalt highways from the major air-service cities. A well maintained dirt road connects the highway to the Property on the left bank of the Jequitinhonha River which flows north through rolling hills. The River has hosted alluvial mining operations on all scales since the 18<sup>th</sup> Century for the recovery of gold and diamonds. The latter were released from an intermediate source to the south, the Sopa Conglomerate, a unit of the Espinhaço Supergroup.

In February 2007 Vaaldiam, operating through a Brazilian subsidiary, was granted the two main permits necessary to operate an open-pit mine on the Property: the *Decreto de Lavra* (Mining Permit) granted by the DNPM, the Federal National Department of Mineral Production; and the Temporary Operating Licence granted by FEAM, the State environmental agency. The final *Licença de Operação* (Operating Licence) is expected to be granted in April 2007. Vaaldiam has complied with all rules and regulations established by the Federal and State mining and environmental agencies.

#### Exploration by Vaaldiam within the Property

During 2005 and 2006, Vaaldiam completed two systematic drilling programs, using both percussion and rotary drills, to confirm the presence of diamondiferous gravels and to determine their areal extent and variable thickness. Concurrently, bulk sampling was undertaken to provide an estimate of the diamond and gold grades of the gravels.

#### Drilling

In May 2005 Vaaldiam initiated its self-managed percussion program using a company-owned Banka drill. By March 2006, a total of 63 drill holes, involving 1,092 m of penetration, had been completed on a largely 100 x 100m regular, grid spacing with some infilling at 50 m spacing. Each drill hole provided the bedrock elevation and, from the evidence of the cuttings, the thickness of gravels categorized by colour.

In February 2006, the rotary drilling program was added to the exploration program and was carried out by Geoativan, a Belo Horizonte based drilling company, using a faster, Maquesonda, mechanical rotary drill. This second program served to accelerate the exploration by quickly, and almost completely, infilling the existing grid. By June 2006, an additional 107 drill holes, producing 2,269 m of core, had been completed at 50 x 50m to delineate a gravel deposit with an areal extent of approximately 1,400 m by 250 m and an average thickness of 7 m.

The results at 50 m spacing demonstrated physical continuity of the gravels and yielded an estimated gravel volume for the northern arm of the Property. In the southern arm 14 drill holes, on a 100 x 100m grid, revealed the presence of additional gravels over an area approximately 250 m by 250 m. To date, 198 holes have been drilled, with the

computerized logs available for all 3,837 m penetrated. Of these some Banka holes had been drilled for the purpose of the estimating the gold grade and its variability.

### **Bulk Sampling**

Between March 2005 and July 2006, Vaaldiam collected two bulk samples from Pit 1 and Pit 2. Excavation was by means of shovel and truck or gravel pump, as necessary. Each sample was collected and processed in the form of several sub-samples. The objective was to quantify the diamond grade and its variation within four identified stratigraphic gravel units (upper, intermediate, transitional, and basal) of differing thickness and degree of representation within the total gravel horizon.

All the samples were fed to a dedicated treatment plant incorporating jigs, grease tables and a sluice box to recover both diamonds and gold. The composite bulk sample recovered from Pit 1 yielded 98.02 carats, represented by 436 diamonds, from a total of 1,886 m<sup>3</sup>. That from Pit 2 produced 61.22 carats, in the form of 179 diamonds, from 721 m<sup>3</sup>.

### **Diamond Grade and Valuation**

The overall grade was estimated from the results achieved for the transitional and basal units in Pit 1. The intermediate and upper gravels were excluded because their apparent low grades, possibly a result of dilution by slumped overlying sediments, implied that they are not potentially payable. The average ratio of the basal unit's thickness to that of the transitional unit in Pit 1 was 6:4. This ratio was applied to the constituent sample grades by assigning 6 parts at 0.22 cts/m<sup>3</sup> and 4 parts at 0.07 cts/m<sup>3</sup> to give a weighted average of 0.16 cts/m<sup>3</sup>.

A diamond parcel of 169.15 carats, all derived from the bulk sampling, with a lower cut-off size of 2 mm, was evaluated by CIDAMA, a local, independent, diamond evaluation and marketing company. The average size and value were 0.23 ct/stone and US\$ 197/ct. The largest stone, a 4.66 ct white dodecahedron, was alone valued at US\$ 1395/ct. The parcel contained, in addition, 24 diamonds, totaling 33.23 cts within a 1.0 to 4.0 ct/stone range, were allocated an average value of US\$ 354/ct.

### **Gold Valuation**

The fine fraction from each of seven sub-samples from Pit 1 was processed through a closed circuit Pleitz jig and gold sluice to recover the contained free gold. Nomos Laboratório in Rio de Janeiro processed a resulting enriched concentrate to recover 297.90 g of gold. By the same methodology as applied to the diamond grade estimation the gold grade was shown to be 0.180 mg fine gold/m<sup>3</sup>.

### **Mineral Resource Estimation**

Vaaldiam successfully conducted the exploration drilling and bulk sampling programs with the objective of estimating a Mineral Resource for the Property. Each drill hole that intersected gravels was allocated an area of influence to which a corresponding gravel thickness was assigned, to produce a gravel volume, and the results were formatted as a data bank. Individual such volumes were categorized as either Indicated or Inferred and the summation of each classification provided a 43-101 compliant Indicated Mineral Resource and a compliant Inferred Mineral Resource. No measured Resource was



estimated because grade continuity had not been proven. The resource figures are detailed in the following table.

Mineral Resource	Volume (m <sup>3</sup> )	Diamond Grade (cts/m <sup>3</sup> )	Diamond Content (carats)	Fine Gold Grade (mg/m <sup>3</sup> )	Fine Gold Content (kg)
Indicated	1,843,000	0.16	295,000	182	335
Inferred	856,000	0.16	137,000	182	156
Total	2,699,000	0.16	432,000	182	491

In July 2006, Vaaldiam decided to advance the project to full production by the end of the first quarter of 2007. Two months later construction was begun of an 80 m<sup>3</sup>/hr jig plant capable of treating 240,000 m<sup>3</sup>/year for both diamond and gold recovery from the Resources identified on the Property.

## **4. INTRODUCTION**

### **4.1. Terms of Reference of the Report**

Vaaldiam Resources Ltd. ("Vaaldiam") commissioned Paul Daigle ("the author") to prepare a Technical Report on the Duas Barras alluvial diamond property, Brazil ("Property") that is compliant with Canadian National Instrument 43-101 (NI 43-101).

The author has been responsible for the exploration program completed on the Property and for any on-going exploration work. He has been on the Property several times since November 2005. In his capacity as Senior Project Geologist, the author works under the direction of Sr. José Fernando Tonoli, Project Manager and Senior Geologist of Vaaldiam. Sr. Tonoli has gained 28 years of experience in the mining industry in Brazil, and of which 24 years were in property acquisition, and mining development and operations with DeBeers Brasil Ltda.

Vaaldiam has accepted the qualifications; expertise, experience, competence and the professional reputation of the author and that they are appropriate and relevant for the preparation of this Technical Report.

### **4.2. Layout of the Report**

A 43-101 compliant report is required to report on the following subjects. These may be found in the following text at the pages stated below.

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Additional Requirements for Technical Reports on Development Properties and  
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### **4.3. Reliance on Other Experts**

In his review of the Property, the author has relied on:

- (a) exploration data provided and generated by Vaaldiam, and
- (b) historical exploration data provided by the original mineral rights owner, Mineração Marly Ltda. ("Marly").

In the production of this report the author has been assisted by Dr. R. H. T. Garnett, President of Valrik Enterprises Inc., a Toronto-based placer consultancy company.

### **4.4. Previous 43-101 Reports on the Property**

A technical report, dated 1 May 2006, on the Duas Barras Project, was prepared by Wardrop Engineering Inc. and submitted to Vaaldiam (Maunula and Daigle, 2006).

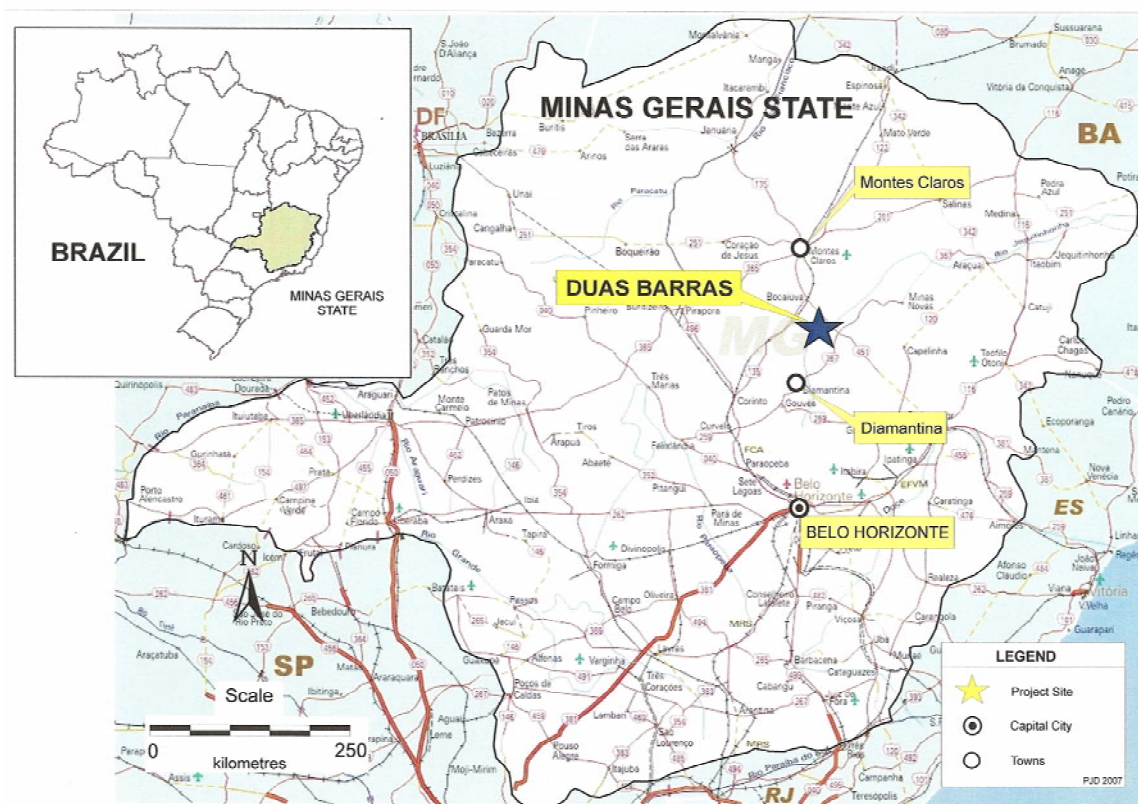
No other 43-101 compliant reports have been issued.

## 5. PROPERTY DESCRIPTION AND LOCATION

The Property is defined by the mineral rights originally held by Marly, under a *Decreto de Lavra* (Mining Permit) No. 806.569/77, granted on 25 August 2006 by the *Departamento Nacional de Produção Mineral* (“DNPM”), the Brazilian National Department of Mineral Production. Notice of the full transfer of these same mineral rights to Vaaldiam’s Brazilian operating subsidiary has been recorded as a “Public Deed of Donation” of Mineral Rights in the country’s Official Gazette.

### 5.1. Location

The property covers an area of 170.89 ha with its boundary defined by latitude and longitude coordinates provided in Appendix (1). It and is situated, as shown in Figure (1).

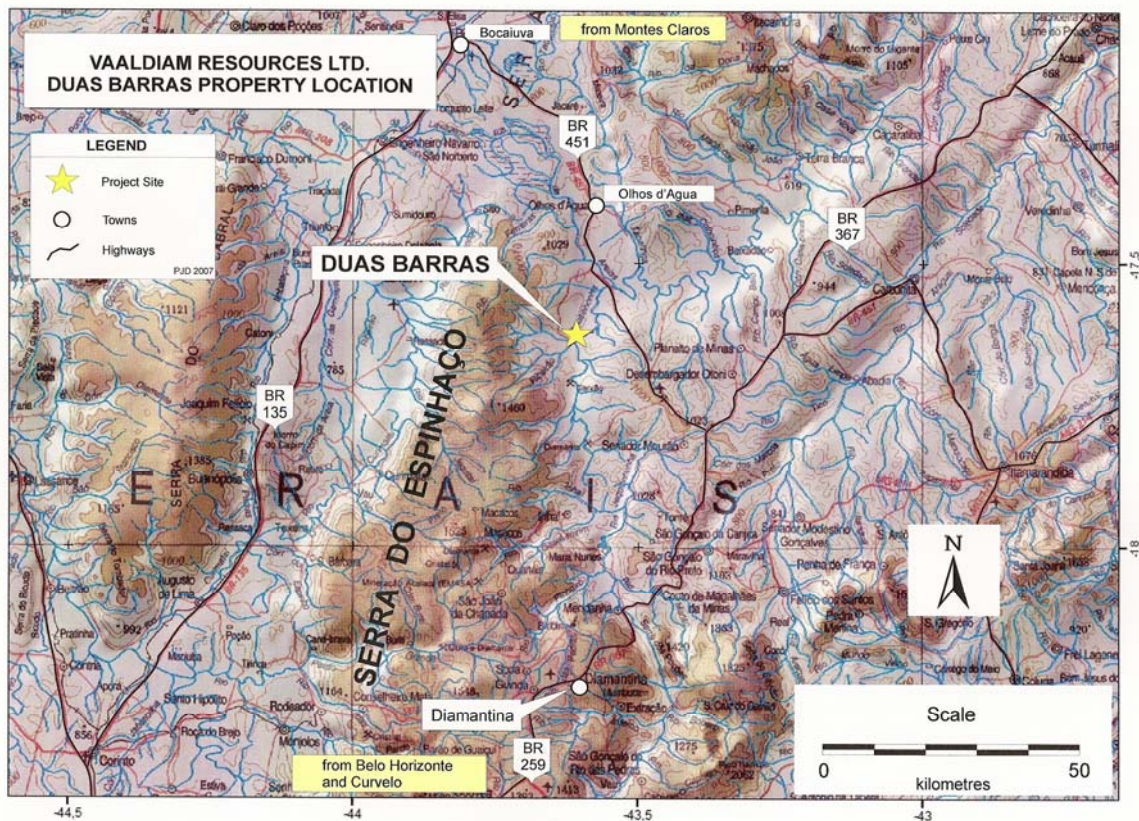


**Figure (1): Location of the Duas Barras Property in Minas Gerais State**

The Property is located:

- approximately at latitude 17° 38' S. and longitude 43° 37' W. in central Minas Gerais State of Brazil;
- approximately 700 km to the northeast of the city of Sao Paulo and roughly 250 km to the north of Belo Horizonte, the state capital;
- 85 km to the north of the town of Diamantina, and on the eastern flank of the Serra do Espinhaço. See Figure (2);

- (d) in the *Prefeitura Municipal* (Municipality) of Olhos d'Agua, which town lies 27 km to the north, and
- (e) along the left bank of the upper Jequitinhonha River within the *Fazenda Duas Barras* (Duas Barras Ranch), a working cattle farm owned by Sr. Geraldo Coelho Moura.



**Figure (2): Topographical map showing the location of the Duas Barras Property relative to the Serra do Espinhaço**

## 5.2. Accessibility, Climate, Local Resources, Infrastructure, and Physiography

### 5.2.1. Accessibility

From Belo Horizonte the Property can be accessed by the following paved highways:

- (a) BR-040 for approximately 98 km towards the northwest to join:
- (b) BR-135 towards the city of Montes Claros, and at Curvelo joining:
- (c) BR-259 which extends 122 km to the town of Diamantina where it turns north into:

- (d) BR-367 which, after 74 km, junctions with:
- (e) BR-451 which, after approximately 50 km to the northwest and 12 km north of a bridge over the Jequitinhonha River, meets a 15 km gravel road leading to the Property.

The Property is most easily reached from the city of Montes Claros which is serviced daily by air from Sao Paulo. From Montes Claros by highways:

- (a) BR-135 heading south for 70 km to the town of Bocaiuva where:
- (b) BR-451 turns south-southeast for 42 km to the town of Olhos d'Agua, and continues beyond Olhos d'Agua for an additional 5 km to meet the 15 km gravel road, described above, leading to the Property.

An 800 metre long laterite airstrip located on the Property could be rendered serviceable with minimal work.

### **5.2.2. Climate**

The climate is semi-arid, with an average of 1500 mm of rainfall during the wet season (November to March). Mean temperatures range from 17 to 20 degrees Celsius. Exploration can be undertaken throughout the year in the more elevated parts of the Property but the lower parts of the flood plain close to the river become flooded during the wet season. Previous experience has shown that heavy rainfall and/or increased groundwater flow may cause slumping of open-pit walls.

### **5.2.3. Local Resources**

Montes Claros, with a population of approximately 200,000, is the closest major centre. The city has all of the necessary services and suppliers that are required to operate an exploration program, including skilled and semi-skilled labour: an adequate supply of fuel, food supplies, construction materials, and manufacturing shops. Diamantina is also a source of skilled labour and hosts equipment manufacturers with experience specific to the diamond mining and processing industries.

### **5.2.4. Infrastructure**

The area is utilized primarily for cattle ranching and the raising of other livestock. Yuka trees are harvesting from dedicated plantations for the production of charcoal to be used in the metallurgical industry.

The nearest existing electrical power (high tension national grid and sub-station) is located 34 km from the Property. Most of the local farms are connected at lower voltage to the grid. Vaaldiam will generate power for its planned mining operations by means of its own dedicated diesel generator, presently being installed. Investigations are being conducted into the feasibility of locally generating hydro-electric power.

The required clean water for a future mining operation will be supplied from three sources: four fifths as recycled water from the tailings, and the balance both from the Jequitinhonha River and from groundwater via dewatering pits.



### 5.2.5. Physiography

Rolling hills and valleys are dominated locally by the flood plain of the northerly flowing Jequitinhonha River. The Property covers a 5 km, curved length of the plain on the left (generally western) side of the River. Variations in elevation within the Property range from 632.0 m above sea level ("asl") at the level of the River, to 679.6 m asl at the highest point within the Property. The hills immediately north of the Property attain an elevation of approximately 800 m ASL. Vegetation is composed of *cerrado*, a natural scrub bush that is typical of the drier parts in the State.

### 5.3. Permits

Two documents allow Vaaldiam<sup>1</sup> to prepare for mining and to install equipment:

(a) The *Decreto de Lavra* (Mining Permit) No. 806.569/77, granted on 23 August 2006 by the *Departamento Nacional de Produção Mineral* ("DNPM"), and

(b) The *Licença de Instalação* (Licence of Installation) LI-nº00063/2002/004/2006, granted on 4 April 2005 by the *Fundação Estadual de Meio Ambiente* ("FEAM"), the Minas Gerais State Environmental Authority.

Mining operations may be commenced under a "Temporary Operating Licence" which recently has been granted by FEAM (Ref: Vaaldiam press release, 19 February, 2007). Vaaldiam expects to receive the final *Licença de Operação* (Operating Licence) from FEAM in April 2007.

Vaaldiam has applied to the *Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis* ("IBAMA"), the Federal Environmental Agency, for an *Anuência*, a special authorization, to operate within a 15 km of a national park. Although Vaaldiam may begin operations under the State-controlled *Licença de Operação*, this Federal, environmental authorization is still necessary.

A 50 m wide margin must be maintained in all places between Vaaldiam's future mining operations and the bank of the Jequitinhonha River. However, a special dispensation can be granted for a reduction of the margin.

Vaaldiam has complied with all the rules and regulations established by the DNPM and the environmental departments COPAM, FEAM, *Instituto Estadual de Floresta*<sup>2</sup> ("IEF")<sup>3</sup>, and IBAMA. The author is not aware of any environmental liabilities or transgressions to which the Property is subject.

All of the necessary filings and registrations have been made with the DNPM and other applicable agencies with respect to the Property. The Property is in good standing, and is clear of all liens, charges and encumbrances. Sr. Geraldo Coelho Moura, the Duas Barras farm owner, continues to control the surface rights to the Property.

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<sup>1</sup> Vaaldiam operates through two Brazilian subsidiaries. For simplicity Vaaldiam and its subsidiaries are referred to collectively, except where stated, as "Vaaldiam".

<sup>2</sup> Environmental agency for forestry.

<sup>3</sup> COPAM, FEAM and IEF are presently being combined into a single State agency.

## 5.4. History

In January 2005 Vaaldiam, through its 99.99%<sup>4</sup> owned subsidiary, Mineração Paraguaçu Industria e Comercio Ltda. (“MPIC”)<sup>5</sup> entered into an option agreement to acquire from Marly a 70% interest in the Property, to be held in a joint venture to be formed for the purpose. The terms of the option required that in the event of it being exercised by MPIC, the company would:

- (a) pay US.\$ 150,000 to Marly;
- (b) provide to the joint venture equipment, for its use, and advances of working capital with an aggregate value of US.\$ 1,500,000;
- (c) receive from Marly a further option to acquire Marly's remaining 30% interest in the joint venture at any time in return for the payment of US.\$ 1,000,000;
- (d) pay a 6 % gross royalty to the Property's surface owner on all revenue from mineral sales.

During 2005, in order to determine whether or not to exercise its option, Vaaldiam completed two programs on the Property:

- (a) A percussion drilling program to confirm the presence of gravels of sufficient thickness and lateral extent, and
- (b) A bulk sampling program, involving the open-pit extraction and processing of approximately 1,885 cubic metres of gravel, at a site which encompassed previous Marly diggings to:
  - assess the diamond grade of the gravels, and
  - substantiate, if possible, a grade estimate provided previously by Marly.

Following successful completion of the two programs, Vaaldiam, in December 2005, renegotiated the terms of the original agreement, obtaining the right to earn an additional 5% interest in the Property in return for a payment of US.\$ 50,000 to Marly. On December 22, 2005 Vaaldiam exercised its recently increased option to acquire the 75% interest in the Property, leaving Marly with 25%. Vaaldiam's operating company for the Duas Barras project is Mineração Montes Claros Ltda. (“MMC”), 99.99% owned by MPIC<sup>67</sup>.

On November 29, 2006 exercised its option to acquire from Marly all the remaining 25% interest in the Property, with payment to Marly according to the following schedule:

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<sup>4</sup> The gradually decreasing balance is held, as required by Brazilian law, by a Brazilian entity, MSP Participações S.A.

<sup>5</sup> Recently renamed Vaaldiam do Brasil Mineração Ltda. (“VBM”)

<sup>6</sup> The gradually decreasing balance is held by Vaaldiam's employee, Sr. José Fernando Tonoli.

<sup>7</sup> Hereafter in this report, except where specifically stated, MPIC, VBM, and MMC are referred to, for simplicity, as “Vaaldiam”



- US.\$ 200,000 on Marly's submission of an application to the DNPM for the cession of the Property's mining rights to MMC;
- US.\$ 400,000 on the DNPM's approval and registration of the Property's mineral rights in the name of MMC, and
- US.\$ 350,000 to be paid to Marly upon the sale of the first diamond production from the Duas Barras deposit, which is expected to occur during the first quarter of 2007.

MMC, effectively Vaaldiam, has the exclusive right of exploration, development and exploitation with respect to the Property.

## **6. REGIONAL GEOLOGY**

### **6.1. Brazilian Context**

Brazil hosts the majority of the South American Platform, the basement of which is composed of metamorphic and igneous rocks, almost entirely of Precambrian age. Crystalline shields cover more than one third of the country, and the rest comprises primarily sedimentary basins.

Two major cratonic areas, the larger Amazonic and the smaller São Francisco craton, are surrounded and separated by fold belts which originated during the Brazilian-Pan African orogenic cycle (0.9-0.57 Ga). The Platform was subjected during the Phanerozoic to the distortional effects of plate tectonics. Extensional forces which created wide intercratonic basins. Commencing in the Silurian, thick sedimentary sequences that accumulated in the basins. In Jurassic and Cretaceous times the development of the Atlantic Ocean resulted in the formation of smaller, narrow, rift type basins.

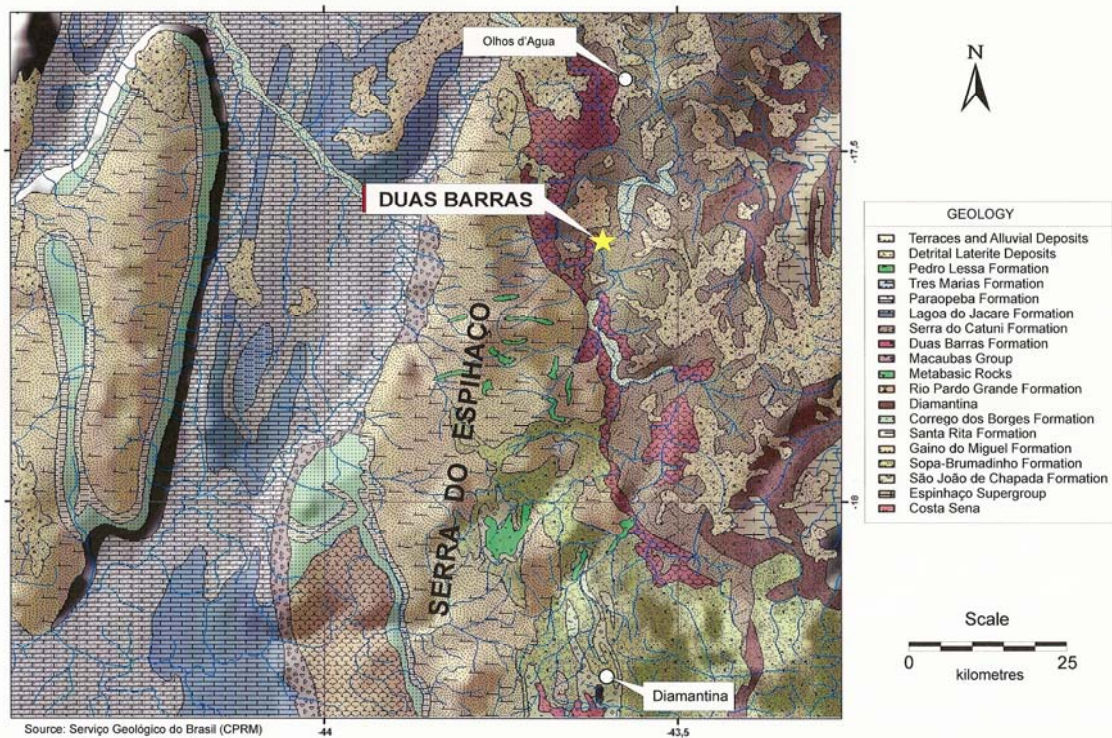
Rifting in the southern part of the São Francisco craton resulted in the development of a rift-sag basin (Uhlein et al., 1998). According to Chaves et al (2000) a trending trough, more than 1,000 km long and 50-100 km wide, cut the craton in a north-south direction northwards from around Belo Horizonte. About 3,000 m of sediments, forming the Espinhaço Supergroup, were deposited in the trough, which is now marked by the Serra do Espinhaço Range. See Figure (3).

### **6.2. Espinhaço Supergroup**

The Espinhaço Supergroup is truncated by many bodies of metabasites, in the form of deeply weathered dykes and sills. The Supergroup hosts three geological units; the central Espinhaço Group, and the Macaúbas and Bambuí Groups, respectively to the east and west. The central unit is part of the Serra do Espinhaço, referred to as the Serra Mineira. It exhibits escarpments and rock massifs alternating with flat lands. The northerly to northeasterly flowing Jequitinhonha River is located in both the Espinhaço Supergroup, in its upper reaches, and the Macaúbas units.

The Supergroup is folded in a broad anticlinorium (the Serra Mineira Anticlinorium), oriented north-south, with a closure in the north. Internally, the structure exhibits a succession of relatively open anticlines and synclines. The layers exhibit a steep dip along the eastern flank of the anticlinorium, along the contact with the Macaúbas Group. Parts of this contact are tectonized, with the development of mylonitic rocks. The Macaúbas Group lies directly upon the Galho do Miguel and Sopa-Brumadinho Formations of the Espinhaço Supergroup, indicating a deep erosional unconformity.

The diamondiferous Sopa Conglomerate occurs in the lower part of the basal Diamantina Group. Also known as the Sopa Brumadinho (Lenney et al., 1996), it is a clast supported rock with a variable argillaceous to coarse-grained sandy matrix, and contains detrital diamonds. According to Chaves et al (2000), the Sopa Conglomerate was deposited mainly in alluvial fan, braided river and fan delta systems. As illustrated in Figure (4), the Sopa-Brumadinho Formation has a significant expression in area around Diamantina.



**Figure (3): Regional geological map showing the location of the Duas Barras Property relative to the Serra do Espinhaço, with enlarged legend**



The Macaúbas Group is divisible into three formations. The Domingas Formation is the lowest unit, having restricted occurrence, and is composed of metasilts containing lenticular bodies of stromatolitic dolomites. This pelitic and carbonaceous sequence is overlain by the Duas Barras Formation which generally comprises poorly sorted and impure quartzites. A feature of these rocks is the constant presence of centimetre-thick microconglomeratic horizons and fine, micaceous quartzites, with channelized cross-bedding and phyllite layers. The uppermost unit of the

Macaúbas Group is the Serra do Catuni Formation of metadiamicrites, quartzites and phyllites. Both the The Duas Barras quartzites and lithological members Serra do Catuni Formation underlie the Property.

The Bambuí Group is represented by a deeply weathered package of phyllites and metasilts. These rocks are attributed to the Serra de Santa Helena Formation.

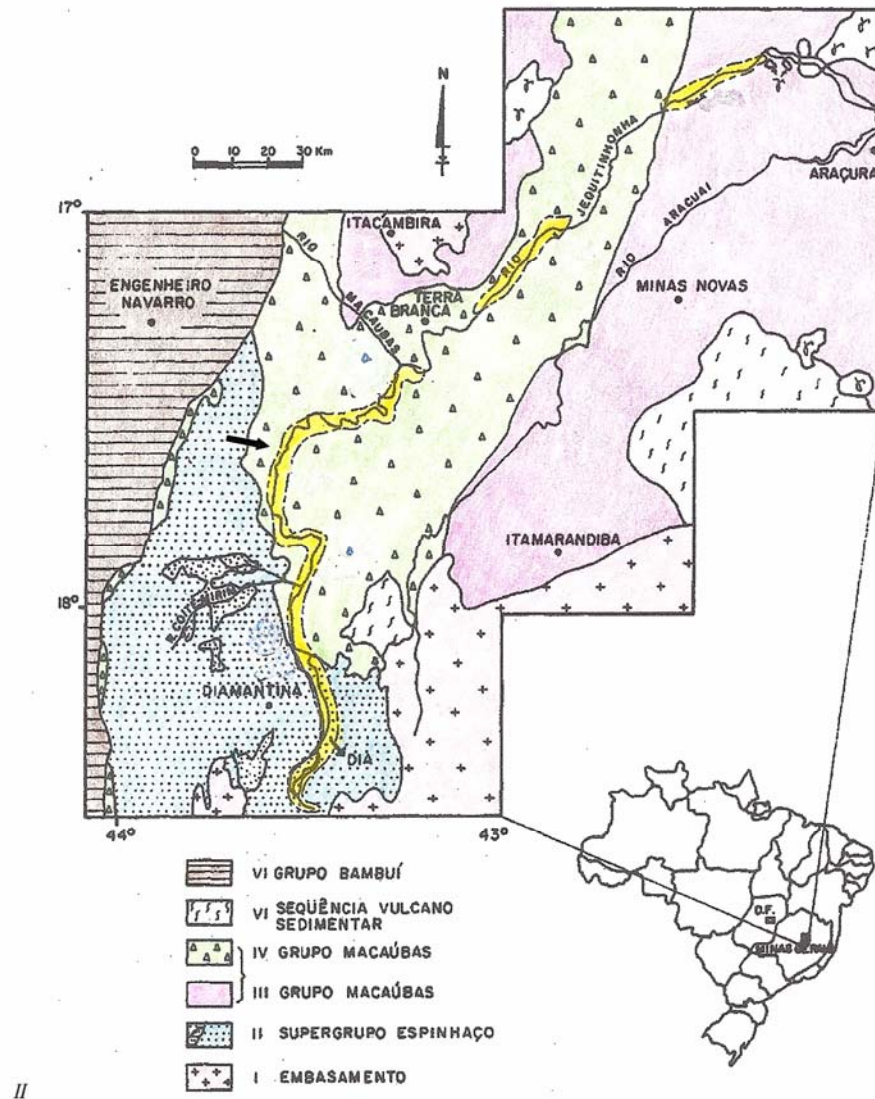


Figure (4): Simplified geological map of the region showing (a) the central Espinhaço, the Bambuí, and Macaúbas Groups, and (b) the location (black arrow) of the Duas Barras Property on the flood plain (yellow) of the Jequitinhonha River. After Campos and Gonzaga (1999).

## **7. REGIONAL MINERALIZATION**

### **7.1. Introduction**

Minas Gerais State possesses over 300 years of mining history and continues to host many large and small mines. The central part of the State contains major reserves of iron and, to a lesser extent gold, especially in the “Iron Quadrilateral” near Belo Horizonte. Otherwise, the State is known for its large variety of gemstones, including diamonds, many of which are derived from the western Triângulo Mineiro.

### **7.2. Diamond Mineralization**

All of the economic diamond deposits in Brazil presently are in the form of secondary concentrations, or placers, as opposed to primary kimberlitic sources. Placers range from lithified paleo deposits of Proterozoic age to more recent gravel-rich, alluvial deposits formed in association with existing fluvial systems. Diamonds have been produced from the State of Minas Gerais since 1729 when they were first discovered in alluvial gravels near Diamantina within the Espinhaço Range.

#### **7.2.1. Provenance and Intermediate Sources**

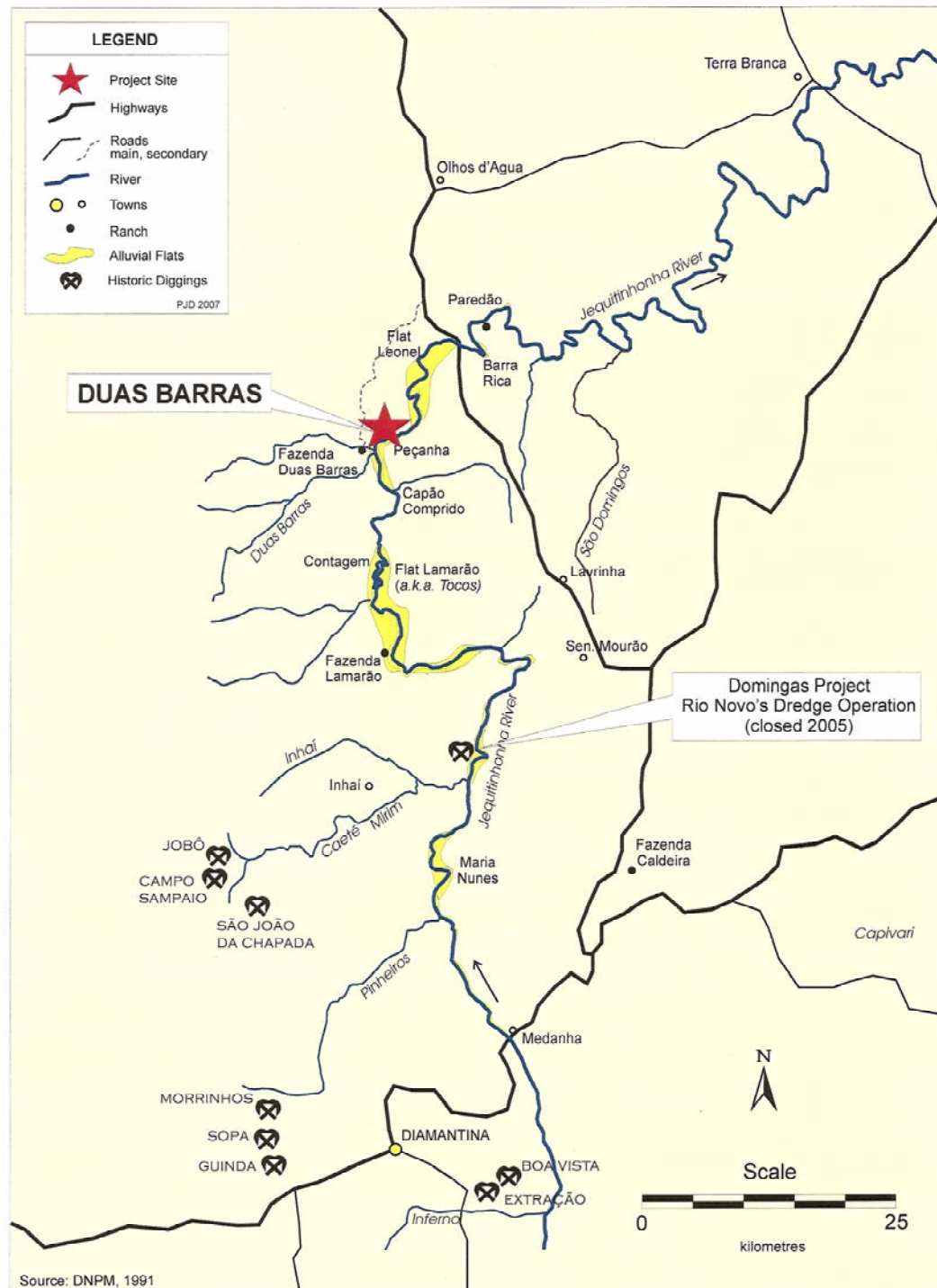
According Chaves et al. (2001) diamond-bearing deposits from the Espinhaço Range are associated with three distinct periods in the geological record. Precambrian, diamond-bearing rocks were introduced into the crust at locations which remain unknown. Some have considered the source of the diamonds to be itacolumite, others that it is a quartzite, or meta-volcanics.

Diamonds were later eroded from these primary rocks and were deposited in the Precambrian conglomerates of Espinhaço basin where they were re-worked several times. During the Phanerozoic structural uplifting of the Espinhaço Range resulted in the erosion, repeated re-working, and finally the deposition, of diamonds in fluvial systems such as the Jequitinhonha River. Figure (5) shows the locations of diamond mining sites.

#### **7.2.2. Formation of Alluvial Diamond Deposits**

A placer deposit (which term includes alluvial, colluvial, and eluvial deposits) is a detrital one within a geomorphological feature by which it may be classified (Garnett and Bassett, 2005). Alluvial deposits are formed in a fluvial environment. The high, or relatively high, density possessed by some minerals serves as the principal cause of their deposition and concentration in sediments. Placer formation “is initiated by a combination of tectonic activity and variations in climate and sea level. Physical and chemical weathering facilitates all forms of erosion and release of minerals into sediments that are transported, sorted, deposited and, and commonly reworked.” Diamonds are more commonly concentrated in fluvial environments as a very minor constituent (parts per billion) of alluvial deposits. They are accompanied by other accessory, heavy minerals.





**Figure (5): Location of historic diamond mining areas in the Sopa Conglomerate around Diamantina and on the Jequitinhonha River (after DNPM, Brazil, 1991).**

“Changes in energy levels and the relative physical characteristics (size, density and shape) of the sediments and minerals determine the style of placer formed.” Lag placers (Appendix 2), in which the grade falls with increasing depth results from an increase in energy that winnows out the hydraulically lighter particles near surface. Accumulation

placers, in which the grade rises with increasing depth (in places to attain a maximum immediately above bedrock) are formed by selective settling of hydraulically heavier particles due to a reduction in energy.

Both styles are found in diamondiferous alluvials which most commonly form within the flood plain of a river, and beneath the river itself. Repetitive supply of sediments and minerals and reversals of energy levels may create one or more phases of both lag and accumulation styles in a single vertical profile through a deposit. Re-working of the sediments in places augments the concentration of diamonds, expressed as the grade (Garnett and Bassett, 2005).

### **7.2.3. Characteristics of Alluvial Diamond Deposits**

Marshall and Baxter-Brown (1995) provided a summary of the characteristics of alluvial diamond deposits. The most important economic attributes are size (thickness and lateral extent), grade, and the quality of the diamonds. Typical grades for economic alluvial deposits range from  $<0.03$  cts/m<sup>3</sup> to several cts/m<sup>3</sup>, although the average grade mined has declined over the years. Some of the lowest grades have been mined successfully in Brazil.

The sediment particle sizes, elevational changes and morphology of the bedrock, and diamond “size” (carats/stone) combine to influence the ease or difficulty of mining and diamond recovery. Diamonds most commonly are found in uni- or bi-modally distributed sediments with a wide range of particle sizes from silt to boulders.

Various resistant accessory minerals possessing a similar density or hydraulic equivalence (combination of size, density and shape) to diamonds (3.5 g/cm<sup>3</sup>) commonly occur with diamonds in a placer deposit. Examples include tourmaline (3.0 – 3.2 g/cm<sup>3</sup>), garnet (3.15 – 4.30 g/cm<sup>3</sup>), kyanite (3.56 – 3.67 g/cm<sup>3</sup>), corundum (3.95 – 4.10 g/cm<sup>3</sup>), rutile (4.18 – 4.25 g/cm<sup>3</sup>), ilmenite (4.5 – 5.0 g/cm<sup>3</sup>), and magnetite (5.17 – 5.18 g/cm<sup>3</sup>). Very finely sized, especially flattened, gold (19.3 g/cm<sup>3</sup>) may also exist as an accessory, its size and shape compensating for its considerably higher density. In places accessory gold may assume sufficiently high concentrations that its extraction as a by-product is economically viable. The most common accompanying mineral is quartz (2.65 g/cm<sup>3</sup>).

The presence of certain accessory minerals (“heavy minerals”) in a placer deposit may signify, though in places unreliably, the presence of diamonds. A useful, sympathetic relationship may even exist between the diamond grade, expressed as carats/m<sup>3</sup>, and the concentration, expressed as mg, g, or kg/m<sup>3</sup>, of one or more of the accessory “indicator minerals”.

Diamonds, as a mineral commodity, are unique in the mining industry, in that there is no fixed price for the “rough goods”. The price of each diamond, expressed as US\$/ct (1.0 ct = 0.2 g), is variable and governed by its “size” and quality. The four categories of quality, in order of decreasing value, are gem, near-gem, industrial and boart. Mainly gem quality diamonds exist in alluvial deposits several kilometres or more from the primary source because lower quality stones tend to be destroyed during sedimentary transport. The average value<sup>8</sup> of the rough diamonds in a deposit is determined from a sufficiently large “parcel”, of the order of hundred, of stones.

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<sup>8</sup> At one extreme is the figure of US.\$ 9/ct, for example, at Mbuji Mayi in the Democratic Republic of Congo. At the other is a value of over US.\$ 500/ct at the Baken Mine in South Africa.

In alluvial deposits individual diamonds are neither evenly distributed throughout the sediment, although they are commonly confined to the full range of gravels, nor are they randomly distributed. They tend to occur in clusters within trap sites which may be the product of bedrock morphology or of sedimentological features such as gravel bars. The volume or footprint of a collected drill hole sample must be viewed in the context of the size of the trap site which may have been intersected by the drill hole. The resulting “nugget effect”, combined with the overall low concentration of diamonds, renders invalid any grade estimation attempted from a conventional drilling machine such as is used for other placer minerals. Indeed, during the exploration of a typical deposit, the chance of recovering a diamond, even a small one, from a sample acquired by a percussive or rotary drill of only a few inches in diameter is close to nil. Even larger diameter drill holes produce samples which are deficient because:

- (a) a negative drill hole, having failed to yield a single diamond despite being situated in a well mineralized area, may cause the intersected ground to be regarded falsely as sterile, and
- (b) larger, higher value, diamonds which contribute significantly to the value of the deposit, are disproportionately small in number compared to all the remaining stones, and may not be recovered.

However, a sufficiently large volume bulk sample, appropriately sited, may provide a reasonably reliable grade estimate that can be attributed to the whole deposit provided that horizontal continuity of host alluvium of sufficiently uniform character has been demonstrated by the drilling to exist throughout the deposit.

The objectives of a bulk sampling program therefore are to ensure that:

- (a) a grade estimation based on the resulting sample is meaningful, requiring that one or more bulk samples are sited in an area, or areas, thought to be representative;
- (b) all “sizes” and qualities of diamonds are represented in it, and
- (c) sufficient diamonds are recovered to form a representative parcel for an independent valuation.

The volume of the bulk sample is influenced by the conditions, the expected grade, and the other characteristics of the deposit, but is usually no less than 1,000 m<sup>3</sup>. The cost usually prohibits the collection of more than a few bulk samples. Therefore two programs are usually undertaken on a diamondiferous placer:

- (a) widespread, regular drilling with the objective of determining the extent, continuity, and volume of the host sediments, usually gravels, and
- (b) some widely separated bulk samples with the objective of determining the grade, sedimentological details, and average diamond value of the deposit.

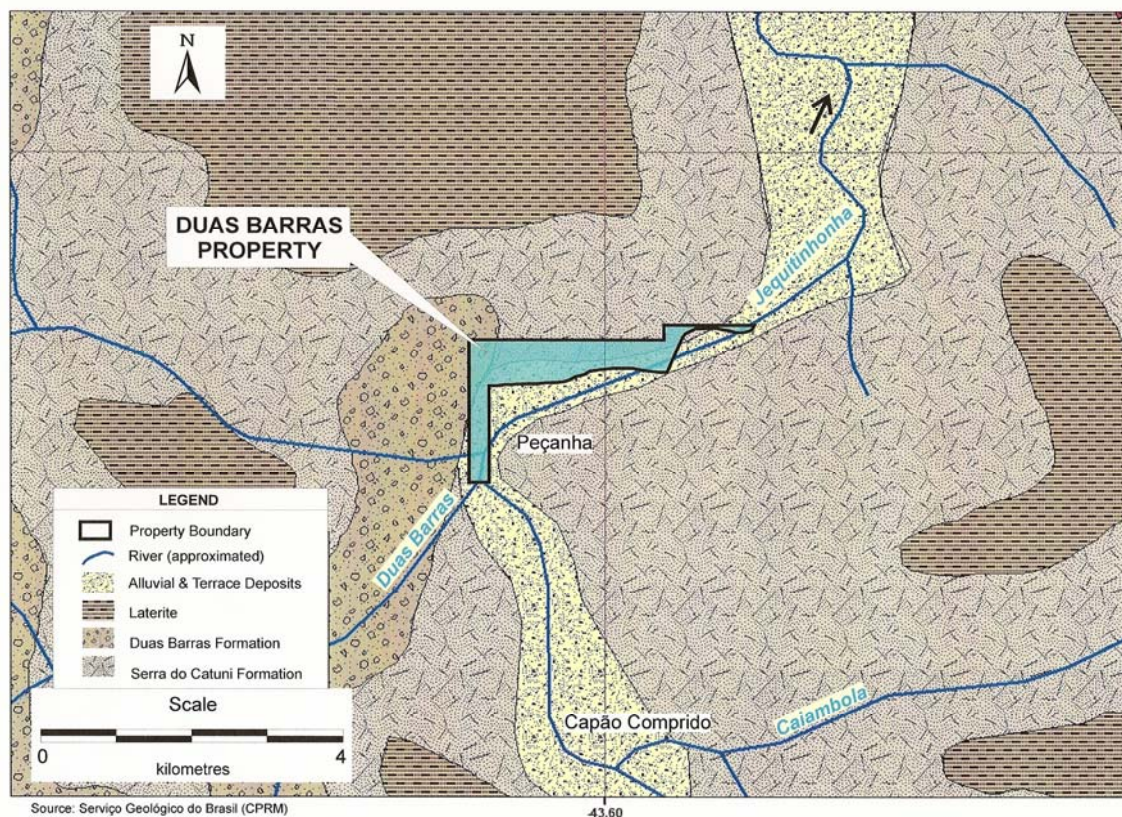
Neither program demonstrates the continuity of grade of the deposit which is only revealed by extending the bulk sampling program into trial mining and, perhaps without pausing, into full scale production.



## 8. LOCAL GEOLOGY

### 8.1. Geological Setting

Figure 6 shows the local geological setting of the Property on a major bend in the Jequitinhonha River. The recent alluvial and terrace deposits of the Jequitinhonha River overlie members, mostly quartzites, of the Duas Barras and Serra do Catuni Formations. The surrounding hills are capped by laterite.



**Figure (6): Local geology in the vicinity of the Duas Barras Property**

The general north-south course of the river appears to be strongly influenced by the trend of the Serra Mineira anticlinorium, whereas local faulting<sup>9</sup> has caused directional changes of 90 degrees. The effect of minor, northwest by southeast faulting on the localised depth of the river's bedrock is evident from detailed investigations.

Figure (7) shows an outcrop of quartzites of the Duas Barras Formation exhibiting the characteristic coarse and medium granulometry and cross-bedding structures.

### 8.2. Topography

The Jequitinhonha River flows between rounded, flat-topped hills, pictured in Figure (8). The elevational range within the area is from 632 m (river level) to about 800 m. The river's gradient is least when on the Macaúbas Group (Chaves and Chambel, 2004).

<sup>9</sup> Visible on Google Earth in the form of narrow valleys.





**Figure (7): Quartzites exposed within the Property**



**Figure (8): Jequitinhonha River – a view, looking northeast, of the right-angled bend in the river, with the Property situated on the left hand side of the river. Old diggings are visible on both sides of the river. In the foreground lateritic gravels originate from a terrace deposit.**

## 9. LOCAL DIAMOND MINERALIZATION

### 9.1. Deposit Types

The Jequitinhonha River is host to diamondiferous placer deposits: in the present day bed load of the river, as paleochannels within its flood plain, and on various terraces (locally known as *grupiara*) of limited width and extent. The deposits are alluvial in nature, although in places some large clasts of angular, fragmented quartzite and laterite may suggest the collapse and incorporation of bank and terrace deposits.

### 9.2. Availability of Technical Information

Although the river banks have been subjected to widespread digging by garimpos, the resulting open-pits invariably are infilled with tailings and water, inhibiting any observation of the stratigraphic sequence and bedrock. Few records of production, other than those of public companies, are available. An exception is a report by Fleisher (1991).

#### 9.2.1. Fleisher's Report

Fleischer (1991) described in qualitative detail a typical alluvial gravel sequence, complete with diamond and gold results, found in the alluvial flat deposits of the Domingas Mine on the Jequitinhonha River. His tabulation is reproduced as Figure (9). Fleischer's work was extensive and his descriptions are considered to be representative of the many alluvial deposits, including that of the Property, in the flood plain of the Jequitinhonha River.

The gold and diamond grades were determined at approximately 1 m intervals from surface to bedrock, using the results of exploration and dredges' production. Fleischer's tabulation illustrates several features:

- (a) There is an overall increase in diamond grade<sup>10 11</sup> with greater depth, but the increase is not uniform.
- (b) The highest grades do not occur at the base of the gravels. Instead, the maximum grade is attained several meters above the contact with the bedrock.
- (c) Below 582 m asl the gravels are white, whereas above 582 m asl they vary in colour from yellow to red.
- (d) The average diamond grade is 0.0369 cts/m<sup>3</sup>.
- (e) The average<sup>12</sup> diamond "size" is 0.25 cts/stone.
- (f) The average gold grade is 112 mg/m<sup>3</sup>.

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<sup>10</sup> Note that the diamond grade is quoted in points/m<sup>3</sup>. 100 points = 1 carat.

<sup>11</sup> The recalculated diamond grade in the last column probably reflects the recovery during production.

<sup>12</sup> The diamonds are significantly larger in the red gravels, and are significantly smaller immediately above the same red gravels.

ALTITUDE	OVERBURDEN 8.4 m	VOLUME m³	LITHOLOGY	HEAVY MINERALS Kg/m³	GOLD		DIAMONDS						RECALCULATED VALUES	
					GROSS WEIGHT (g)	GRADE (g/m³)	NP STONES		TOTAL WEIGHT (ct)	GRADE (pts/m³)	RECOVERED IN THE MILL			
							<1ct	>1ct						
591 -														
590.6														
590 -	AM 1	160,5	GRAVEL MATRIX: WHITE SAND PEBBLES 10 cm Ø LENSES OF FRIABLE SAND	0,88	14,83	0,092	12	-	2,02	1,258	11 STONES 0,78 ct		2,25	1,4
589.6														
589 -	AM 2	150,75		0,69	11,67	0,077	4	-	0,37	0,245			0,41	0,27
588.6														
588 -	AM 3	166,60		0,52	11,65	0,070	8	-	1,99	1,194			2,22	1,33
587.4														
587 -	AM 4	99,15		0,58	6,84	0,069	7	-	2,35	2,370		2,62	2,64	
586.8														
586 -	AM 5	213,00	YELLOW GRAVEL SANDY MATRIX PEBBLES TO 12 cm Ø ARGILLACEOUS LENSES	1,22	12,34	0,058	7	-	1,64	0,77	34 STONES 2,91 ct (INCLUDING SAMPLE 7 A)		2,07	0,97
585.4														
585 -	AM 6	129,00		2,07	16,54	0,128	8	-	1,07	0,829			1,35	1,04
584.5														
584 -	AM 7	150,27	RED GRAVEL W. SANDY ARGILLACEOUS PEBBLES 15 cm Ø	1,50	19,42	0,129	8	1	4,32	2,870		5,45	3,62	
583.3														
583 -	AM 8	216,3	FINE YELLOW GRAVEL W. FRIABLE SANDY MATRIX PEBBLES 5 cm Ø	1,65	28,98	0,133	18	1	4,86	2,250	60 STONES 5,19 ct		6,58	3,04
582 -														
581.9	AM 9	137,75		2,80	20,63	0,149	15	-	2,68	1,970			3,63	2,64
581 -			FRIABLE GRAVEL W. WHITE SANDY MATRIX PEBBLES 10 cm Ø								119 STONES 11,69 ct			
580.3	AM 10	110,10		6,39	26,39	0,239	33	-	7,13	6,476			9,65	8,76
580 -	AM 11	143,25		6,58	24,24	0,169	34	-	7,85	5,480			10,51	7,33
579.5														
579 -	AM 12	198,75	FINE TO MEDIUM GRAVEL RED; SANDY TO ARGILLACEOUS MATRIX WITH X STRAT PEBBLES 5 cm Ø	4,24	44,65	0,224	47	-	13,31	6,700		17,82	8,96	
578.5														
578 -	AM 13	340,74	20CM BED OF FINE GRAVEL WITH 2CM Ø RED LATERITIC PEBBLES	3,66	28,81	0,084	53	1	13,36	3,980		17,88	5,24	
577.85														
577 -	AM 14	470,00	MEDIUM SIZED GRAVEL W/PREDOMINATELY SAND MATRIX. MILKY QUARTZ PEBBLES 40cm	2,64	41,27	0,088	44	1	11,51	2,440	55 STONES 5,08 ct		16,59	3,53
576.21														
576 -	AM 15	152,00		5,59	8,82	0,058	14	-	4,50	2,960			5,62	3,69
575 -														
574.6														
574 -			WEATHERED YELLOW QUARTZITE											
TOTAL		2838,00		2,71	317,08	0,112	312	4	78,96	2,780	26,77	104,65	3,69	

**Figure (9): Alluvial diamond deposit on the Jequitinhonha River: Vertical Grade Profile (Fleisher, 1991)**

The measured content of heavy minerals allows an interpretation (Garnett, 2007) to be made of the alluvial sequence described in Fleisher's tabulation, based on an understanding of the sedimentational history (Appendix 2). The result is illustrated in Figure (10), showing that the entire sequence comprises:

- (a) 4 phases of gravel accumulation, separated by:

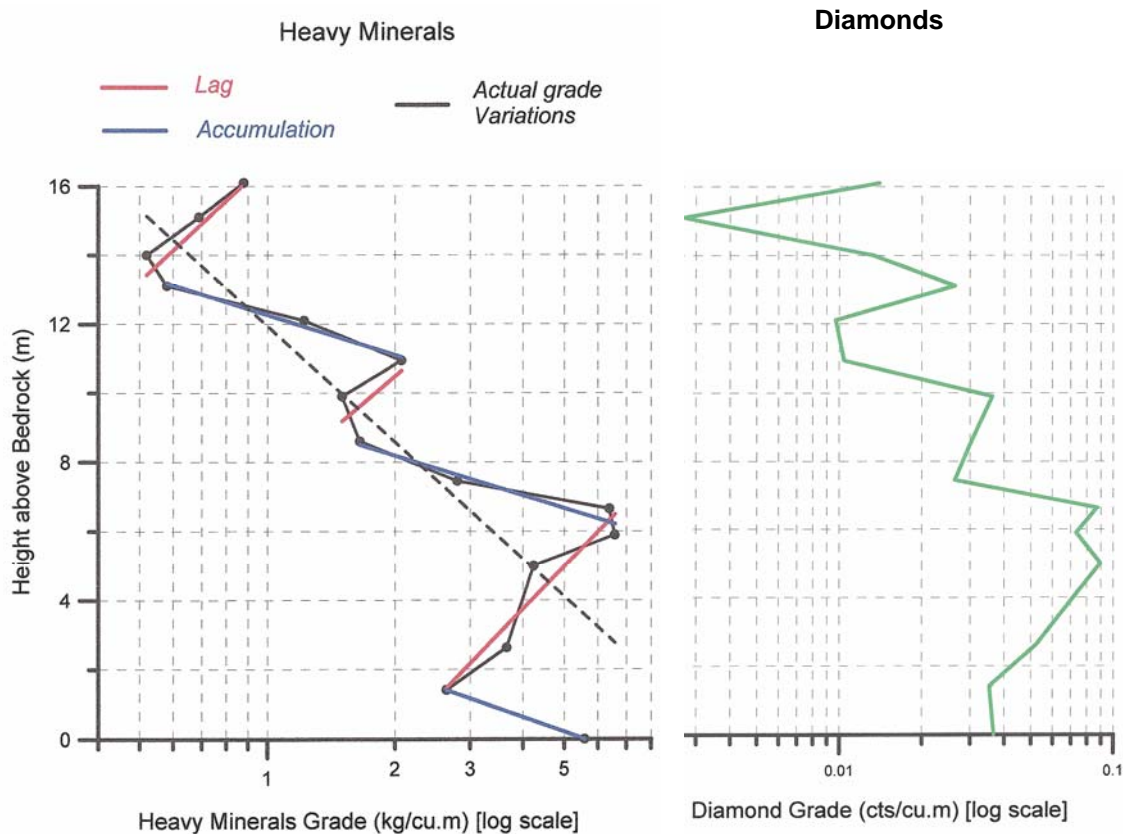
(b) 3 phases of lag concentration (Garnett and Bassett, 2005).

Figure (9) reveals that:

(a) the major changes in gravel coloration occur at:

- 8 m above bedrock – from white to yellow,
- 9 m above bedrock – from yellow to red.

(b) there is a marked change in granulometry, accompanied by some colour change, at 8 m above bedrock.



**Figure (10): Interpretation (Garnett, 2007) of the vertical grade profile (Fleisher, 1991) shown in Figure (9): Left – heavy minerals grade, and Right – recovered diamond grade.**

It is obvious that economically important transitions, resulting in grade reversals, between accumulation and lag gravels are marked by discernible changes in colour and granulometry of the sediments. The implication is that such colour changes must be recorded in any exploration program along the Jequitinhonha River.

The heavy mineral grade reversals illustrated by Figure (10) are mirrored, to a lesser extent, as shown, by the diamond grade. The different size, shape and density of the minerals account for the differences.

### **9.2.2. Other Sources**

Chaves and Chambel (2004) published the results of a study involving the examination and sizing of 186,052 diamonds (17,689 carats) from 14 production locations along the Jequitinhonha River. They found that the average “size” was 0.095 cts/stone with an average 82.2 % gem quality. The average “size” for one month’s production from a single location ranged from 0.057 to 0.374 cts/stone.

In a recent report by Namakwa Diamond Mining Company (Namakwa, 2005) a JORC-compliant estimate for a property on the Jequitinhonha River is said to have revealed more than 8.6 Mm<sup>3</sup> at a grade of 0.134 cts/m<sup>3</sup>. The average depth reportedly exceeds 20 m and the diamonds are valued at US.\$ 300-400/ct.

## 10. LOCAL DIAMOND PRODUCTION

A considerable amount of alluvial mining has been carried out along the Jequitinhonha River during the past 200 years. Current diamond production is from a combination of dredging and smaller scale, *garimpeiro*, open-pitting. Mining by both methods has been conducted both upstream and downstream of the Property. In fact much of the Jequitinhonha River valley is held under mineral licences. The largest holders in the region are Te jucana of Diamantina ("Te jucana"), Minerações Reunidos do Jequitinhonha Ltda. ("MRJ") and Mineração Rio Novo ("Rio Novo"), a subsidiary of the Brazilian construction company Grupo Andrade Gutierrez S.A. Most of the remaining operators are *garimpeiros* (individual diggers) or private companies.

Te jucana was incorporated in 1955 as a local subsidiary of the Belgian mining company, Union Minière, and since 1966 has held a 100 km long claim along the Jequitinhonha River. Te jucana used bucket ladder dredges to recover diamonds from the bed of the River and worked extensively in the alluvial flat areas of Maria Nunes, Flat Lamarão and Flat Leonel, shown in Figure (11). Those at Duas Barras extend over the River (thereby contiguous to the Property) and over the alluvial flats on the right bank of the Jequitinhonha River. The company ceased its operations on the river in 1991 and the company was sold to a small group of *garimpeiros* from Diamantina. The new owners continued dredging for less than 2 years. The remaining low grades could not compensate for the relatively high operating costs<sup>13</sup> and the operations were terminated.

In 2005, Te jucana granted access to their historical mining information to Roan Selection Trust ("RST"), a private company and previously a large public mining company active in Africa, including Angola. (Dietrich, 2000) In August 2005, RST collected samples of alluvium from various points along the Jequitinhonha River, including from the areas Peçanha and Capão Comprido opposite Duas Barras. The samples were presumably processed, elsewhere. No other details of other RST's activities in Brazil are available to the author writing.

MRJ's mineral licence is located approximately 30 km northeast of the Property and covers a length of 72 km along the Jequitinhonha River. Previously held by a SADA Transportes Ltda, the group of 16 mineral licences were united into one mineral licence on 28 June, 2006 (Valente, 2006). Little is known of present day activities on these claims, however, a regional drill program and pit sampling programs were carried out between 1985 and 1991.

In 1988 Rio Novo commenced dredging on some of the alluvial flats contiguous to Te jucana's claims on the Flat Lamarão, and upriver of Vaaldiam's Property. One cutter-suction dredge stripped overburden and the other, a 12 ft<sup>3</sup> (340 litre) bucket-ladder dredge, excavated the alluvial gravel, as illustrated by Figure (12). A concentrate was transported by truck from the dredges to a central plant for processing (DNPM, 1991). The Domingas Mine ceased operations in December 2006, and no production records are available. One other public mining company, the Australian based Resource & Investment NL<sup>14</sup> ("RNI") plans to explore the Jequitinhonha River valley. In December 2005, RNI exercised an option with several individuals and a mining company, Real Extração de Minérios Ltda., thereby obtaining a 75 % interest in two properties. One

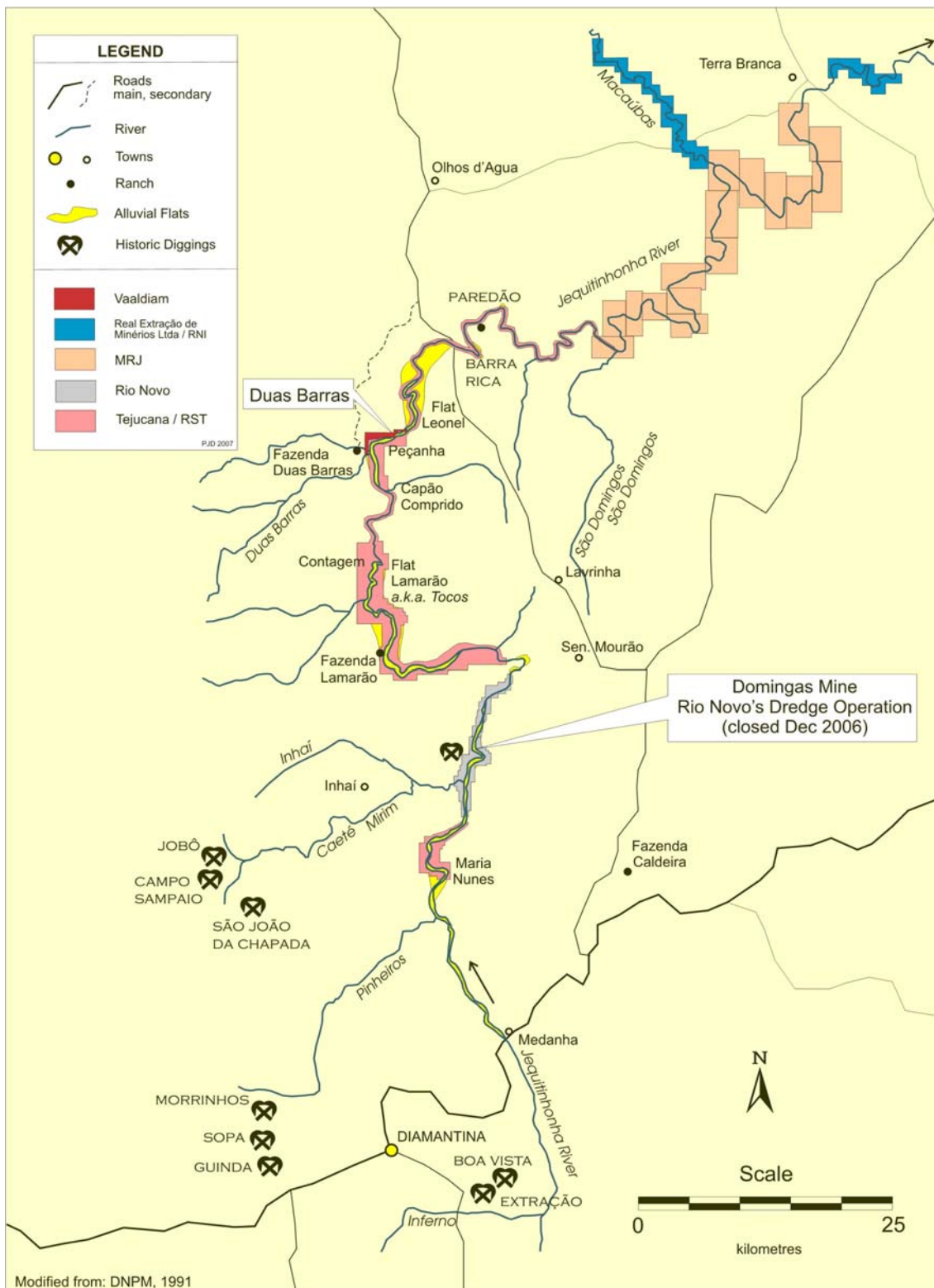
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<sup>13</sup> The loss of a heavily subsidised power supply agreement and the lack of contiguous, higher grade reserves caused a prohibitive rise in operating costs.

<sup>14</sup> Formerly Namakwa Diamond Company NL.



covers 20 km of the Macaúbas River and a second 12 km of the Jequitinhonha River. Both are located near the town of Terra Branca approximately 70 km northeast of the Property.



**Figure (11): Location of adjacent diamond exploration and mining properties on the Jequitinhonha River**





**Figure (12): Two dredges of Mineração Rio Novo working on the Jequitinhonha River. Photo by Mineração Rio Novo (Chaves and Chambel, 2004).**

**Table (1): Diamond production by Mineração Tejuçana S.A. (DNPM, 1991)**

Year	Volume Mined & Treated (Mm <sup>3</sup> )	Diamond Production (carats)	Diamond Grade (cts/m <sup>3</sup> )	Gold Production (kg)	Gold Grade (mg/m <sup>3</sup> )
1969	-	48,032	-	-	
1970	-	61,855	-	-	
1971	-	58,425	-	-	
1972	-	62,462	-	-	
1973	-	65,951	-	-	
1974	-	72,660	-	-	
1975	-	65,439	-	-	
1976	-	71,038	-	-	
1977	5.438	59,087	0.0108	60.622	11
1978	6.866	62,541	0.0091	159.459	23
1979	9.134	64,872	0.0071	135.604	15
1980	9.130	75,113	0.0082	248.912	27
1981	8.301	72,042	0.0086	158.929	19
1982	8.850	71,730	0.0081	164.766	19

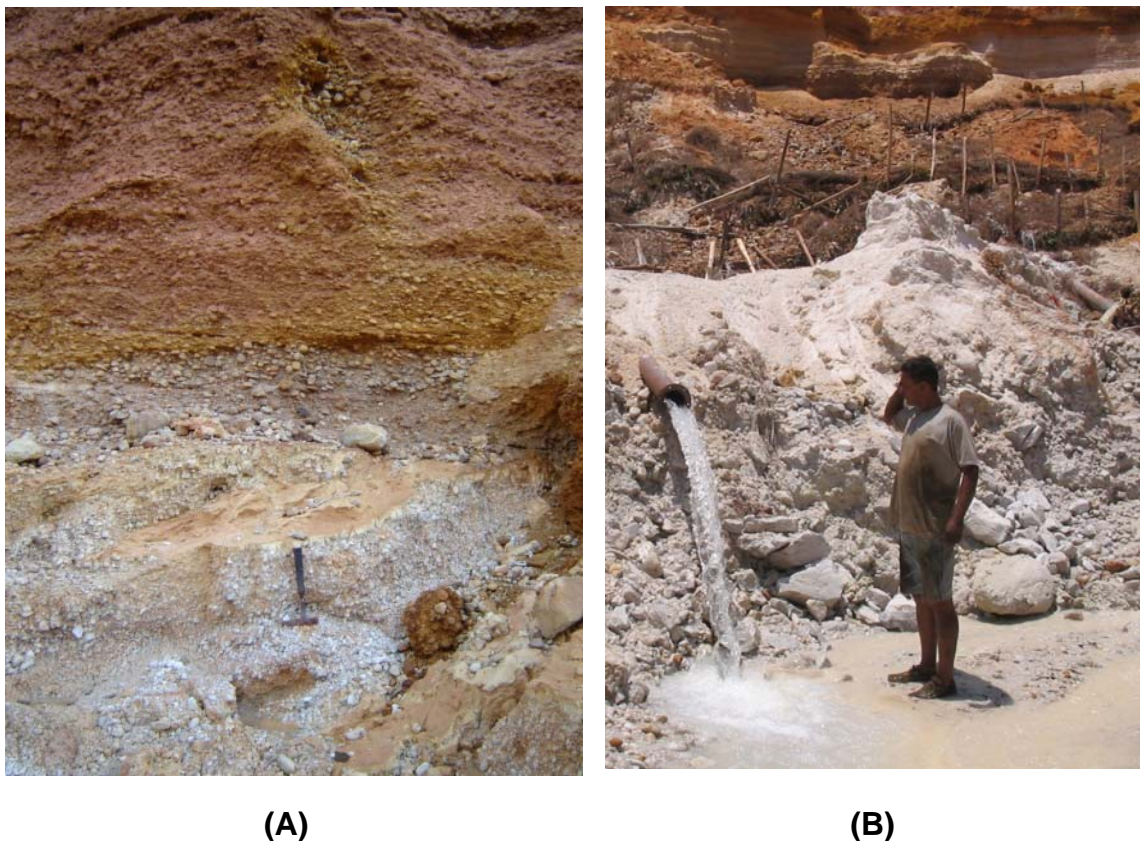
## **10.2. Production Records**

The Domingas Mine produced, by dredging, an average of 70,000 to 100,000 cts/year for more than 10 years. The grades averaged 0.04 cts/m<sup>3</sup>, with a value of about US\$ 200/ct.

The most complete, validated production records are those of Tejucana. By 1983 the dredges were processing in total an estimated 1Mm<sup>3</sup>/month, with grades fluctuating between 0.01 and 0.04 carats/m<sup>3</sup>, to yield a monthly production of about 5,000 carats. It has been estimated that Tejucana was recovering, as a by-product, up to 12 kg of gold per month. Details are provided in Table (1).

## 11. PROPERTY GEOLOGY AND DIAMOND MINERALIZATION

The Property lies on the outside bend of the Jequitinhonha River which is interpreted as having migrated at intervals within the flood plain which is defined by the surrounding hills. As a result, alluvial gravels have been deposited and reworked on both sides of the river. The alluvial deposits within the Property are up to 300 m wide and extend along the river for approximately 1 km. The gravels, white and yellow in colour, overly a quartzitic bedrock and in some places exceed an overall thickness of 20 m. They are typically covered by about 8 – 10 m of overburden comprising red soils on top of a yellow and/or red, clay-rich, horizon known locally as “*massa*”.



**Figure (13): (A) – Yellow gravels overlying white gravels, (B) Typical white gravels on bedrock.**

The gravel package, as revealed by drilling, comprises a lower, white gravel unit and an upper one of yellow gravel. Examples are illustrated in Figure (13). The lower unit, in contact with the bedrock is bi-modal, with a high sand content and cobbles and boulders (up to 700 mm diameter) of quartz and quartzite. Accessory minerals, mainly kyanite and tourmaline, are abundant. The yellow coloration of the upper unit may be a post-depositional effect, but the unit's composition is also slightly different. It typically comprises rounded and sub-rounded cobbles quartz and quartzite up to 100 mm in diameter and sub-rounded boulders ranging up to 300 mm. Both units contain sand lenses with some clay. The saprolitic bedrock surface is another source of clay.

A complete succession is illustrated by Figure (14) in which the measured thicknesses are:



- Soil (solo): 10 m, and massa: 5 m
- yellow gravels (cascalho amarelo): 3m, and
- white gravels (cascalho branco): 9 m



**Figure (14): Stratigraphic succession on the Property<sup>15</sup>. From the surface: soil (solo), massa, yellow gravels (cascalho amarelo), white gravels (cascalho branco), and quartzitic bedrock.**

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<sup>15</sup> Photograph of the northern, benched wall of bulk sample Pit 1, described in section 14 of this report.

The bedrock in places is very irregular. For example, in Figure (14) the three gravel pumps are sited on bedrock. Below their intakes, however, there apparently exists an additional 6 m of gravels, as revealed by probing.

Physical similarities exist between the gravels intersected in drill holes on the Property and Fleisher's (1991) description: specifically, the varying colour of the gravels from white to yellow and a tendency towards red in the upper horizons.

In places in the gravels accessory minerals are abundant, visibly evident as strong, concentrations, mainly kyanite and tourmaline, as shown in Figure (15)



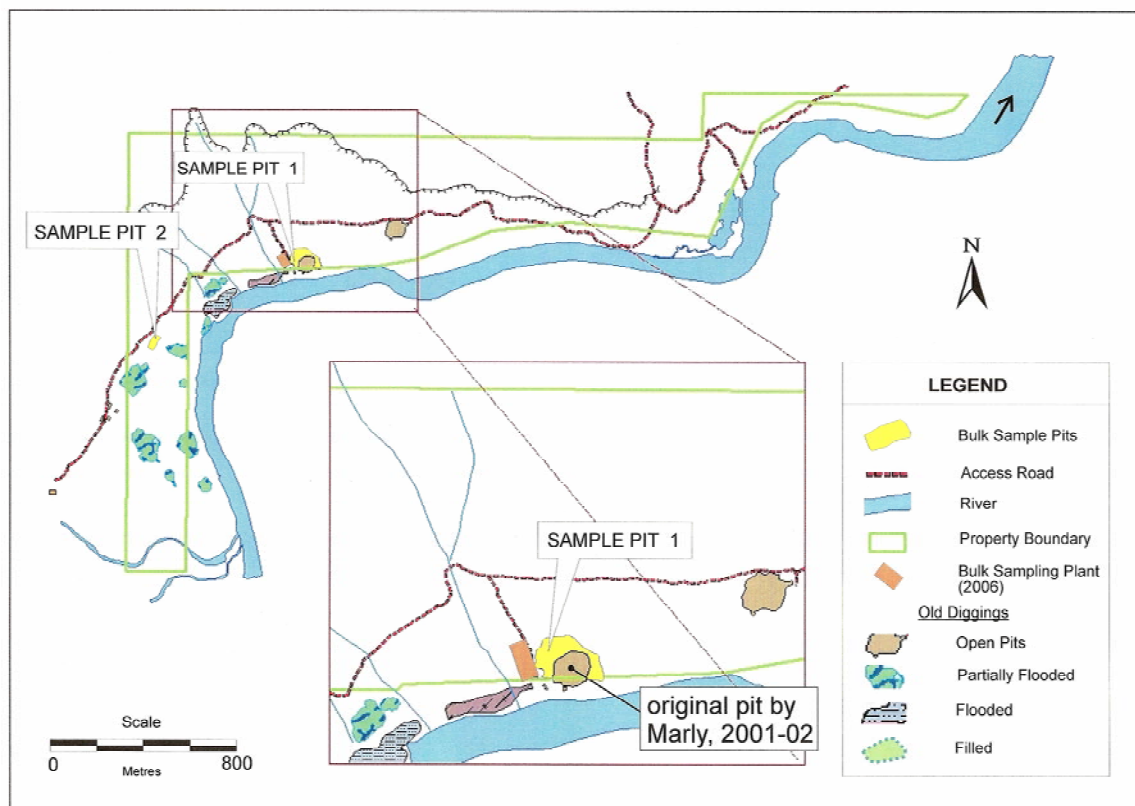
**Figure (15): Concentrations of kyanite and tourmaline in white gravels**

## 12. PREVIOUS WORK ON THE PROPERTY

The Property remains relatively untouched by the extensive mining operations along the river. It has been subjected to only small-scale, garimpeiro open-pitting during the past two decades. Most of the historic diamond and gold production from these isolated diggings has not been recorded. Nevertheless, several garimpeiros who are known to have worked on the Property before 2001 have provided informal production estimates for several of the *garimpos* (diggings). However, such figures have not been confirmed either by the author or by Vaaldiam's staff.

### 12.1. Exploration

Marly undertook some drilling on the Property in 2000, using a 4-inch (100 mm) Banka percussion drill. Two of the resulting nine holes reportedly were located about 150 m north of Vaaldiam's larger bulk sampling pit (Pit 1, excavated subsequently) and intersected 11 m and >15 m (unbottomed on bedrock) of gravels beneath 10 to 14 m of overburden.



**Figure (16): Location of Marly's open-pit and the subsequent Vaaldam pits: Pit 1 and 2**

The Property possesses in plan, as shown in Figures (6) and (16), a rotated "L" shape. The two "arms" are referred to as the "northern arm", extending east-west, and the "southern arm" extending north-south.



## 12.2. Mining

Marly's production was derived from an open-pit which finally measured approximately 30 m by 20 m at surface and reached a depth of approximately 23 m. It was situated, as shown in Figure (16), near the centre of the northern arm of the Property, some 50 m from the riverbank<sup>16</sup>. Excavation was achieved by gravel pumping and Marly exposed an approximate 11 m of gravel under about 14 m of overburden that consisted of sand and lateritized sand, with horizons of hard duricrust. Unsurmountable problems were encountered in handling the sub-surface water with pumps of very limited capacity.

## 12.3. Production records

The only production reports of Marly that are available involve the period from November 2001 to December 2002. During that time Marly mined and processed gravels mainly from the area intersected by the two previously mentioned Banka drill holes and which subsequently was the site of a Vaaldiam bulk sampling pit. Reportedly the mining and treatment of 3,000 m<sup>3</sup> of gravel yielded 840 cts of diamonds, indicating a recovered grade of 0.28 cts/m<sup>3</sup> (Caldeira, 2003). A review of Marly's sales receipts for the diamonds produced reveals that the average sales price was US\$ 222/ct. Individual diamonds of up to 7.41 cts reportedly were recovered. A reported sale of 762 g of by-product gold during the production period indicates a recovered grade of 0.254 mg/m<sup>3</sup>.

Marly's operation was terminated by the COPAM, the environmental agency of Minas Gerais State, for failure to operate with a valid environmental permit and an approved mining and reclamation plan. This suspension has since been resolved.

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<sup>16</sup> Marly's pit was subsequently expanded by Vaaldiam to form the bulk sampling Pit 1.

## **13. EXPLORATION BY VAALDIAM**

During 2005 and 2006 Vaaldiam conducted two specially designed and systematic drilling programs, using percussion and rotary machines, respectively, and preceded by a topographical survey. During the first exploration program, bulk sampling was commenced.

### **13.1. Objectives**

The objectives of the exploration program were to:

- (i) confirm the presence of diamond-bearing gravels that were reported by Marly to have been worked in their open-pit situated roughly in the centre of the Property,
- (ii) substantiate the diamond grade of the alluvial gravels that was reported by Marly from their mining campaign carried out during 2000 and 2001,
- (iii) outline, and estimate the entire volume of, the alluvial deposit within the Property, and

### **13.2. Topographical Survey**

In preparation of the exploration program, a topographic survey was completed in order to:

- (a) establish the boundary of the Property on the ground, and
- (b) locate the position of roads, buildings, and individual drill hole sites.

The topographic survey was undertaken by Sr. Gustavo Botelho, a registered land surveyor in Brazil (Registration number No. CREA-MG Nr. 24.161/TD). He used two Trimble™ Geo Explorer GPS receivers and a digital theodolite Topcon TL-20 survey transit. All of the digital topographic data were processed using the Pathfinder survey software which produced topographic plans and sections. Information collected for each survey point consisted of UTM coordinates and elevation measurements expressed in metres above sea level ("m asl").

Some 300 survey points were established during the survey, and the Property boundary was marked on the ground by 24 monuments. Variations in elevation within the Property were found to range from 630.96 m asl, at the level of the Jequitinhonha River, to 679.62 m asl. The flat-topped ground rises to around 800 m asl immediately to the north of the Property.

### **13.3. Percussion Drilling**

#### **13.3.1. Equipment and Organisation**

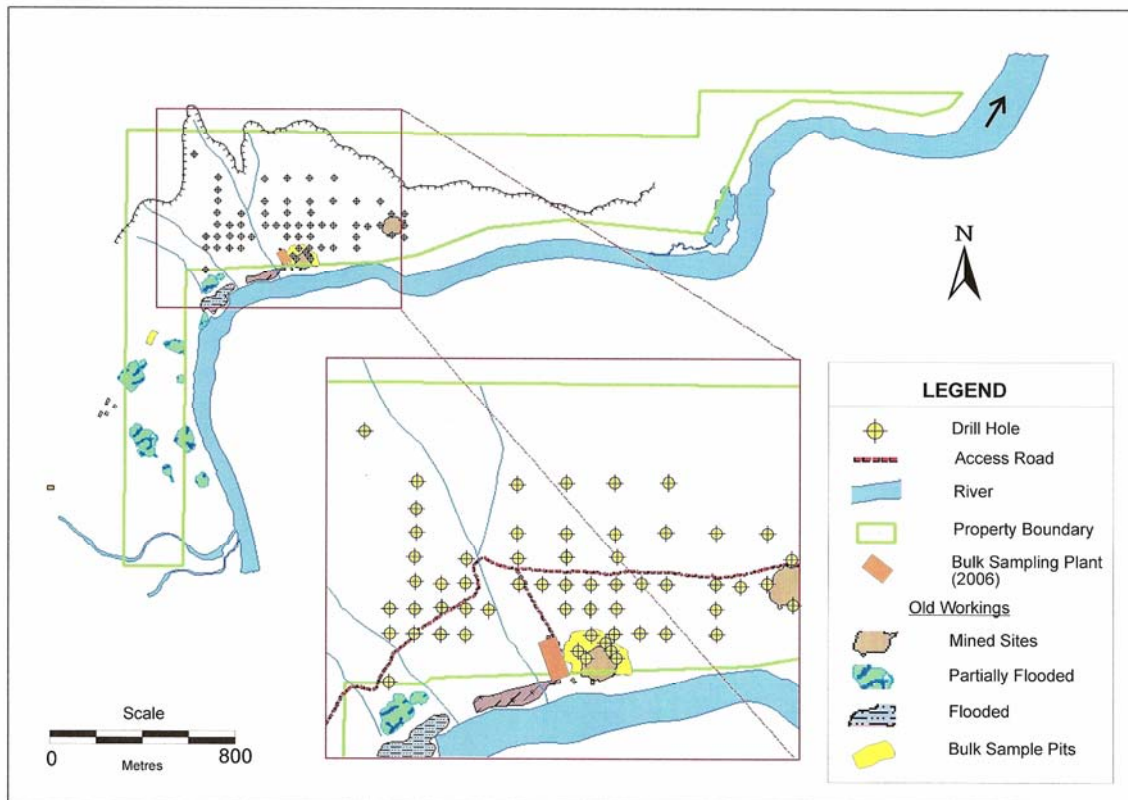
In May 2005, Vaaldiam commenced a percussion drilling program continued into the following year. The program was managed directly by Vaaldiam, and for three reasons a 150 mm (4 inch) diameter Bangka ("Banka") percussion drill (Harrison, 1954) was used:



- (a) Such a machine, with experienced operators, already was available on site.
- (b) Its use allowed a direct comparison to be made with the earlier Banka results reported by Marley, and
- (c) Banka machines are widely used internationally on alluvial deposits.

### 13.3.2. Procedures

By December 2005, 47 drill holes were completed totalling 810 metres penetration, mostly on a grid spacing of 100 x 100 m, and had begun to outline the alluvial deposit. See Figure (17). Three months later, In March 2006, when the Banka drill program was ended, 63 drill holes had been completed for a total of 1,092.50 metres of penetration. The drilling was largely completed on a 100 x 100 m grid, and all of the drill hole collar locations were surveyed to establish their accurate location.



**Figure (17): Location of Banka percussion drill holes completed during Vaaldiam's 2005 program**

Each hole was continued until bedrock had been penetrated, and care was taken to ensure that saprolitic, bedrock quartzite, as opposed to a clay horizon or a saprolitic boulder, had been encountered. The Banka drill produces "cuttings", broken fragments of any clasts which exceed the drill pipe's diameter, or are encountered by the pipe's circumference, together with the matrix (silt, clay, sand, small pebbles).

All the recovered drill cuttings derived from each drill hole were logged on site by an appropriately qualified technician, with the following information being recorded at a depth accuracy of 0.1 m:

- (a) Location and depth of hole
- (b) Any and all visual changes in the cuttings: e.g., colour (white, yellow, etc.), sorting, compaction, presence of limonite and laterite, etc.
- (c) Sedimentological description, especially noting the granulometry
- (d) The heavy mineral content (usually tourmaline and kyanite)
- (e) From the above: the elevation of (i) the bedrock surface, and (ii) the upper limit of the gravels. Small, interbedded lenses of sand and clay were included in the gravel package.

No other tests were performed on the cuttings. The final information yielded, for each surveyed drill hole:

- (a) the bedrock elevation, and
- (b) the thickness of white, yellow, and some red (shallow, possibly older, terrace) gravels immediately above the bedrock.

Although granulometric changes were recorded the size and disturbed nature of the cuttings inhibited any identification of breaks in the intersected sedimentation. The original drill logs (in Portuguese) were retained with computerised versions of the same. The minimum thickness of gravel recorded as 0.5 m. No restraints, such as overburden to gravel ratio, were applied. The term “gravel” was not strictly applied, but in general referred to sediments in which the sand (<2 mm diameter) did not exceed 50 % by volume and in which pebbles (> 4 mm) were common.

The Banka drilling successfully outlined the alluvial deposit and revealed its variable thickness. However, the drill’s slow rate of penetration led to the decision to contract a rotary drill company to achieve the required infill of the existing grid.

## **13.4. Rotary Drilling**

### **13.4.1. Equipment and Organisation**

In February 2006, Vaaldiam contracted Geoaktivan Ltda. (“Geoaktivan”), a drilling company based in Belo Horizonte, to conduct a 2,000 m drill program, later expanded to 2,300 m, using two rotary drills. The machines used were Maquesonda 850 mechanical rotary drills which produced a sample consisting of a 100 mm “core”<sup>17</sup>, albeit in places exhibiting some broken clasts, of sediment.

The objectives of the rotary drill program were to:

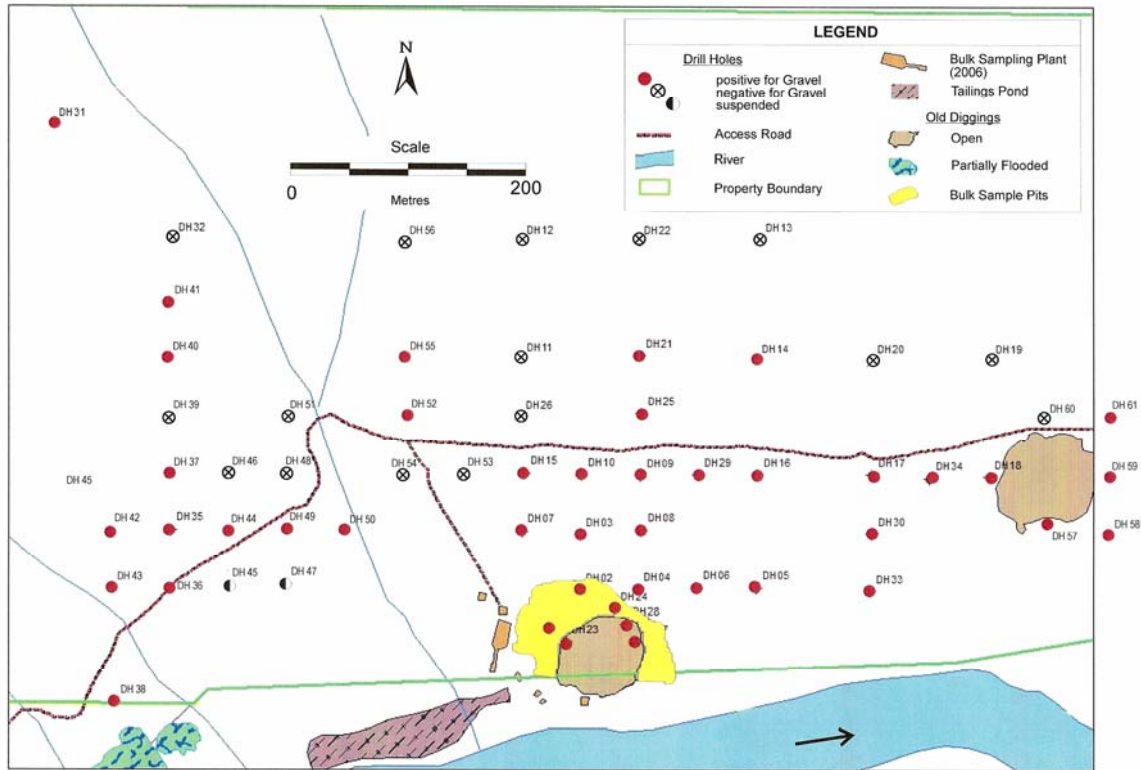
- (a) infill the existing grid of drill holes and to delineate the alluvial deposit on 50 m x 50 m grid spacing to allow the estimation of a resource volume, and

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<sup>17</sup> Where compacted or partly cemented, otherwise disaggregated sediment.

(b) to perform at a faster rate than the Banka drilling.

The machines were operated and the work was supervised, by the employees of Geoaktivan. The core was logged by a Vaaldiam employee. The rotary drill program was completed in June 2006 with a total of 107 drill holes and a combined 2,306.8 m of penetration. The combined results of the two drilling programs are presented in Table (2)



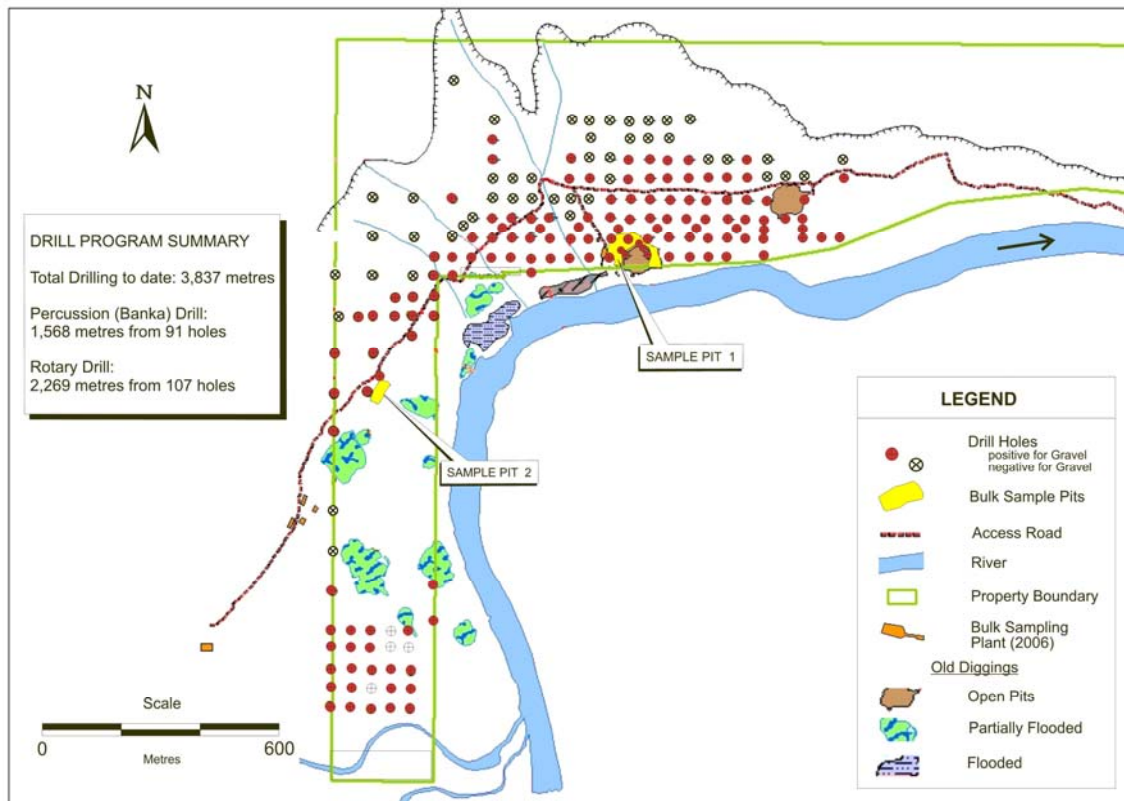
**Figure (18): Location, relative to Pit 1, and results of percussion drill holes completed during the 2005 program**

**Table (2): Drilling achieved during the two Vaaldiam drilling programs**

Program	Number of Drill Holes	Total Penetration (m)	Drill hole Spacing (m)
Percussion (Banka)	91	1,568	
Rotary (Maquesonda)	107	2,269	
Total	198	3,837	50 x 50 <sup>18</sup>

17 twinned drill holes and 6 in the area now occupied by Pit 1, a total of 25, are not shown among the 175 locations indicated in Figure 19.

<sup>18</sup> With a few exceptions in the southern part of the Property.



**Figure (19): Drill hole locations and results of the 2005 and 2006 programs**



**Figure (20): Rotary drill hole cuttings showing white gravels (left), yellow gravels (centre) and red gravels (right).**

### 13.4.2. Procedures

All cores were logged in the same manner as adopted for the earlier, percussive drilling program. The original drill logs were retained, subsequently were computerised, and are available for study.

### 13.5. Data Bank

From the first percussive program, a selection of cuttings, being representative examples of different sediments, was retained for future reference. All the cores resulting from the second, rotary program were stored under cover in wooden core boxes and are available, as necessary for re-logging. An example of typical core is provided by Figure (20). The results were entered into spreadsheets using Excel.

### 13.6. Results

The objectives of the two programs were achieved. The presence of gravels was confirmed in both the northern and the southern arms of the Property, and a deposit was delineated in the northern arm, with the results presented in Table (3).

Ten rotary drill holes were suspected of having been terminated prematurely on a false bedrock<sup>19</sup>. However, by means of drilling repeat holes with the Banka drill, 5 of the 10 since have been confirmed as having bottomed on bedrock, resulting in a correct estimate of the gravel thickness.

**Table (3): Drilling statistics and the results of interpretation**

	Northern Arm	Southern Arm
Drill Hole Spacing (m)	50 x 50	100 max.
Number of Gravel Intersections	90	24
Gravels Located	Yes	Yes
Deposit Delineated	Yes	Yes
Length Identified (m)	1400	250
Width Identified (m)	250	250
Average Thickness (m)	7	3
Range of Thickness (m)	0.5 - 28.7	0.7 – 19.4
Average Overburden Thickness (m)	14	8
Average Depth to Bedrock (m)	20	11
Range of Bedrock Elevation (m)	594 to 646	613 to 628

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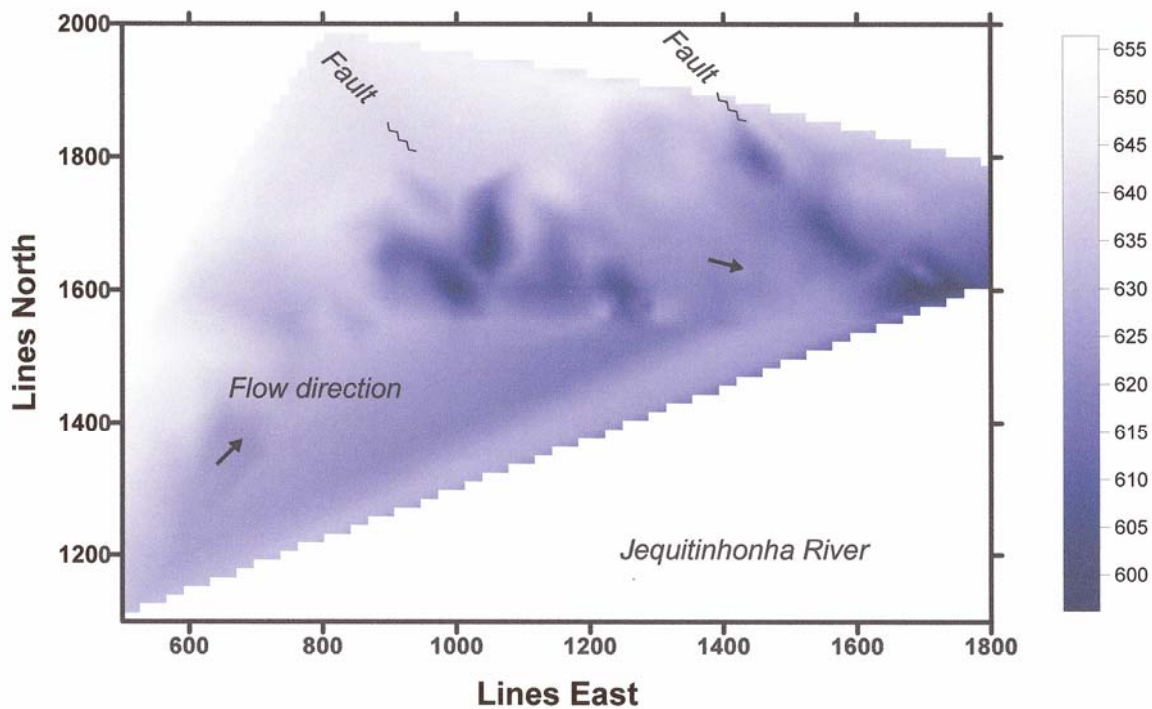
<sup>19</sup> 5 rotary drill holes remain to be checked by Banka drilling.



### 13.7. Interpretation of Results

The results of the drilling are depicted in Figure (21), illustrating certain important features:

- (a) A large paleo channel of the Jequitinhonha River runs through the northern arm of the Property, to the north of, and mirroring the present day course of the River,
- (b) Large indentations, interpreted as bedrock scours<sup>20</sup>, in the paleo channel are oriented generally northwest-southeast. They exist, as shown, where the projected extensions of two faults may be assumed to intersect the paleo channel. Under wet climatic conditions they would have borne tributary waters, locally increasing the fluvial energy levels and selectively eroding the already fault-fractured bedrock.



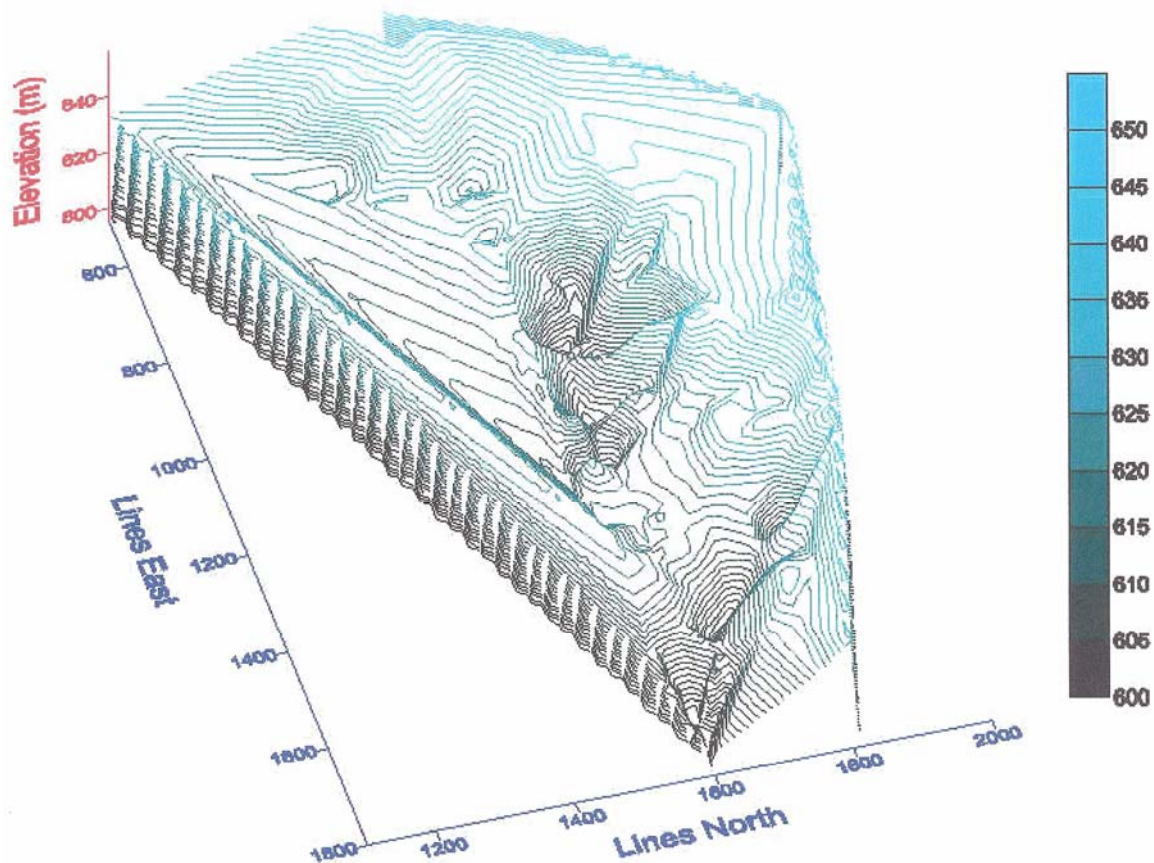
**Figure (21): Bedrock of the paleo channel, showing the Incidence of scours – view looking north**

The irregularities in the bedrock are illustrated further in Figure (22)

The drilling results are also presented graphically in the form of contoured maps of the bedrock elevation and of the thickness of the overlying gravel. See Figures (23) and (24) which show clearly that:

<sup>20</sup> Referred to locally as pot holes.

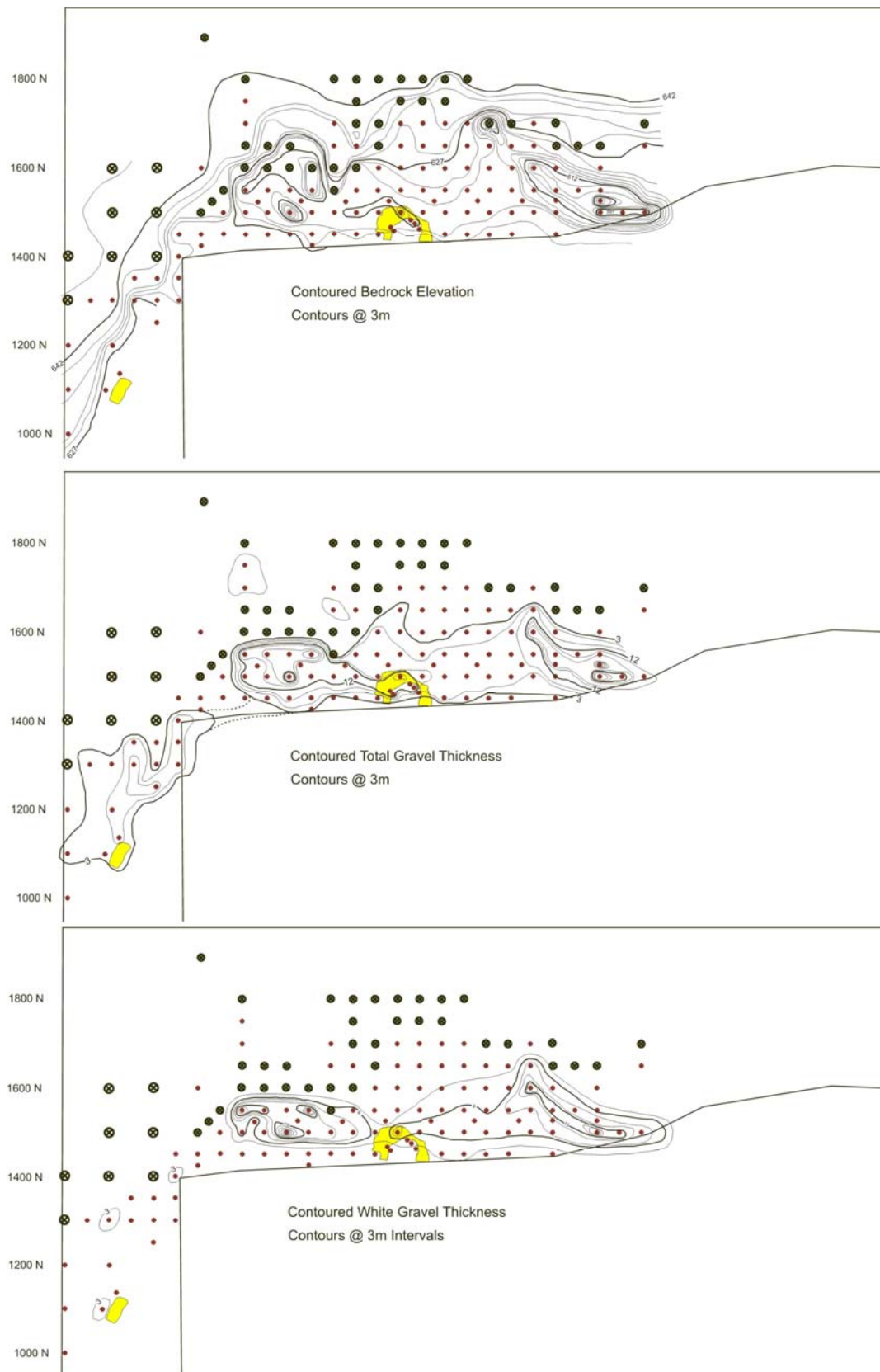
- (a) The total gravels and the white gravels attain their maximum thickness where the bedrock is scoured.
- (b) The lowest bedrock elevation in the Property is 597 m asl.
- (c) The white gravels are in places absent from the gravel sequence, resulting in the yellow gravels being in direct contact with bedrock.
- (d) The gravels (total and white) extend outside the boundaries of the Property, especially in the southern arm.
- (e) There appears to a paleo terrace between 620 and 627 m asl in the southern arm of the Property.
- (f) The overburden consists of a red clay-rich soil and to a lesser extent a 2 m horizon of “massa” a type of gravel<sup>21</sup> comprising large diameter (>200 mm) blocks of quartzite in a clay-rich sand matrix.



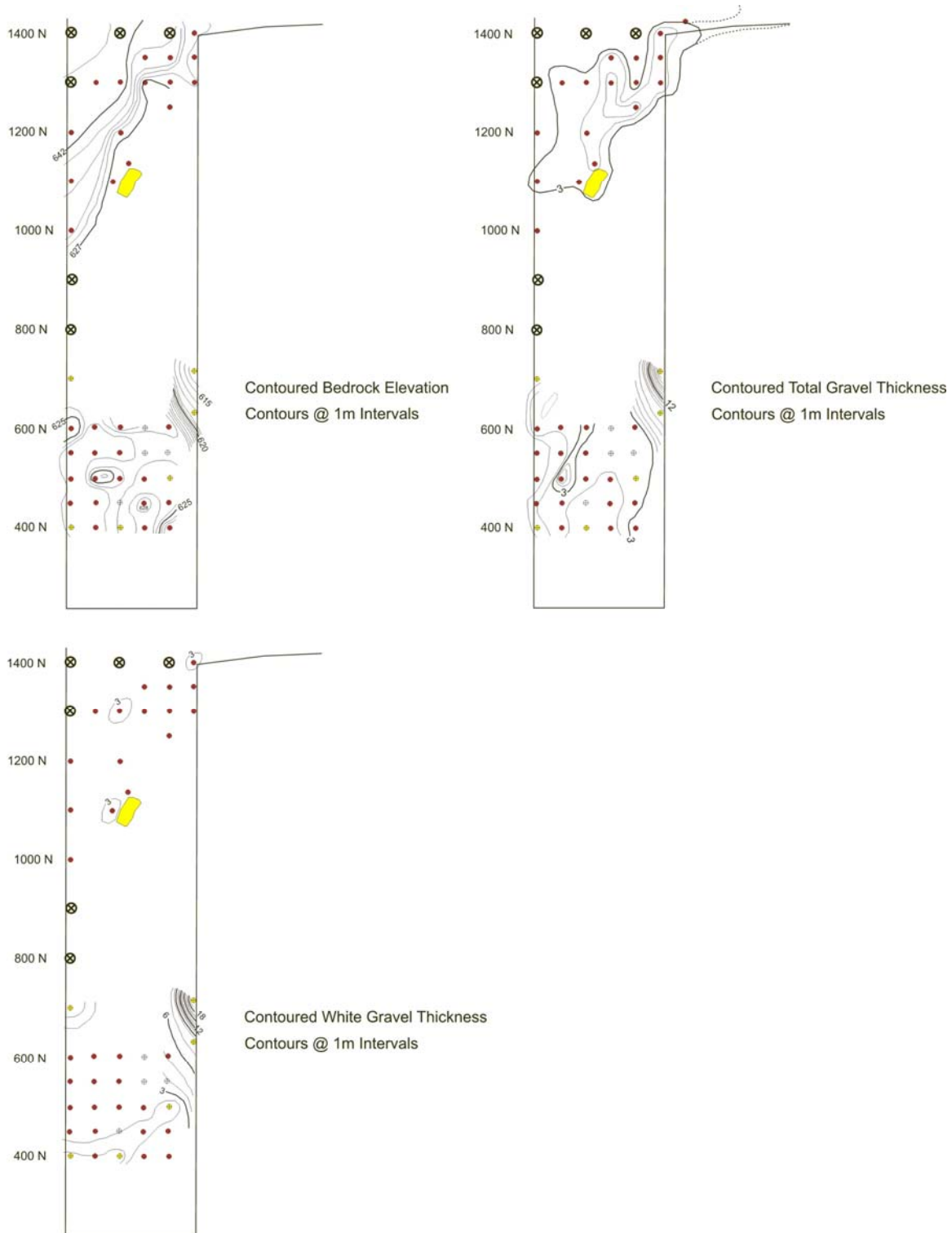
**Figure (22): Irregular bedrock of the paleo channel, viewed from the east.**

<sup>21</sup> Possibly colluvial in origin.





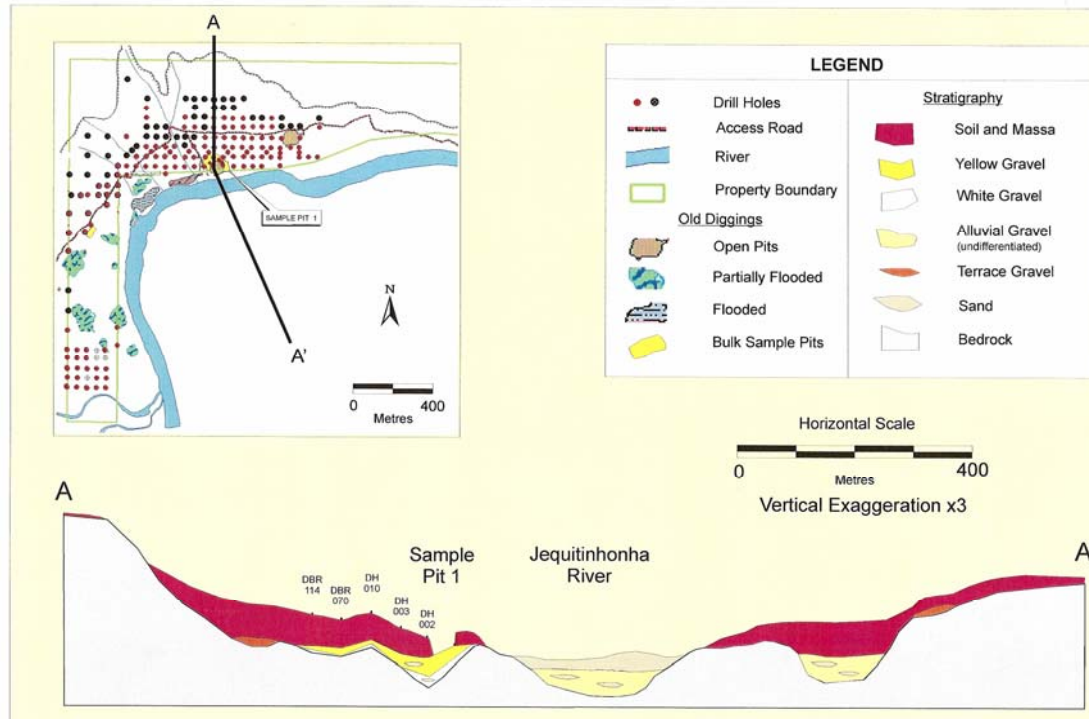
**Figure (23): Northern arm of the Property: Upper– contoured bedrock elevation, Centre – contoured total gravel thickness, Lower – contoured white gravel thickness.**



**Figure (24): Southern arm of the Property: Upper left – contoured bedrock elevation, Upper right – contoured total gravel thickness, Lower – contoured white gravel thickness.** Note: The yellow coloured area indicates the location of the bulk sampling pit, Pit 2, sunk by Vaaldiam following the drilling programs.

The results allow the Property to be viewed in the context of the Jequitinhonha flood plain in Figure (25), with:

- (a) the white gravels in the deepest part of the bedrock, overlain by the yellow gravels and, finally, the red soil and *massa*.
- (b) the terrace gravels, and
- (c) the location of Pit 1.

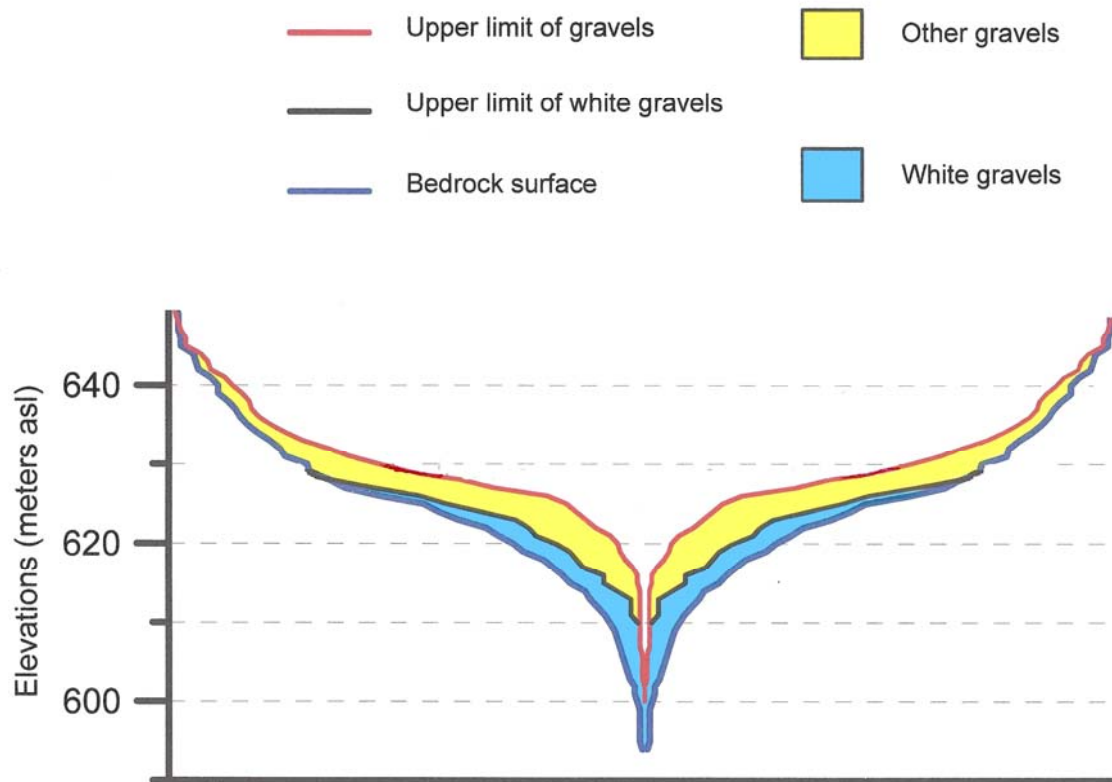


**Figure (25): Transverse section through the Property (to the left) and the flood plain of the Jequitinhonha River – viewed from the west.**

Histograms of the bedrock elevation, thickness of white gravels, and thickness of total gravels may be rearranged as cumulative curves and fitted to their mirror images to form the composite profile<sup>22</sup> shown in Figure (26). The profile emphasises:

- (a) the extreme bedrock indentation by suggested fault-induced scours,
- (b) the greater depth of the upper surface of both the white gravels and the yellow gravels over the bedrock scours,
- (c) the confinement of white gravels to below the 630 m asl elevation, and
- (d) the continuance of yellow gravels to higher elevations, in places as terrace gravels.

<sup>22</sup> Not to be confused with a transverse section



**Figure (26): Composite profile (not to scale) of the Property, showing the relative abundance of white and other gravels at different bedrock elevations. (Garnett, 2007)**

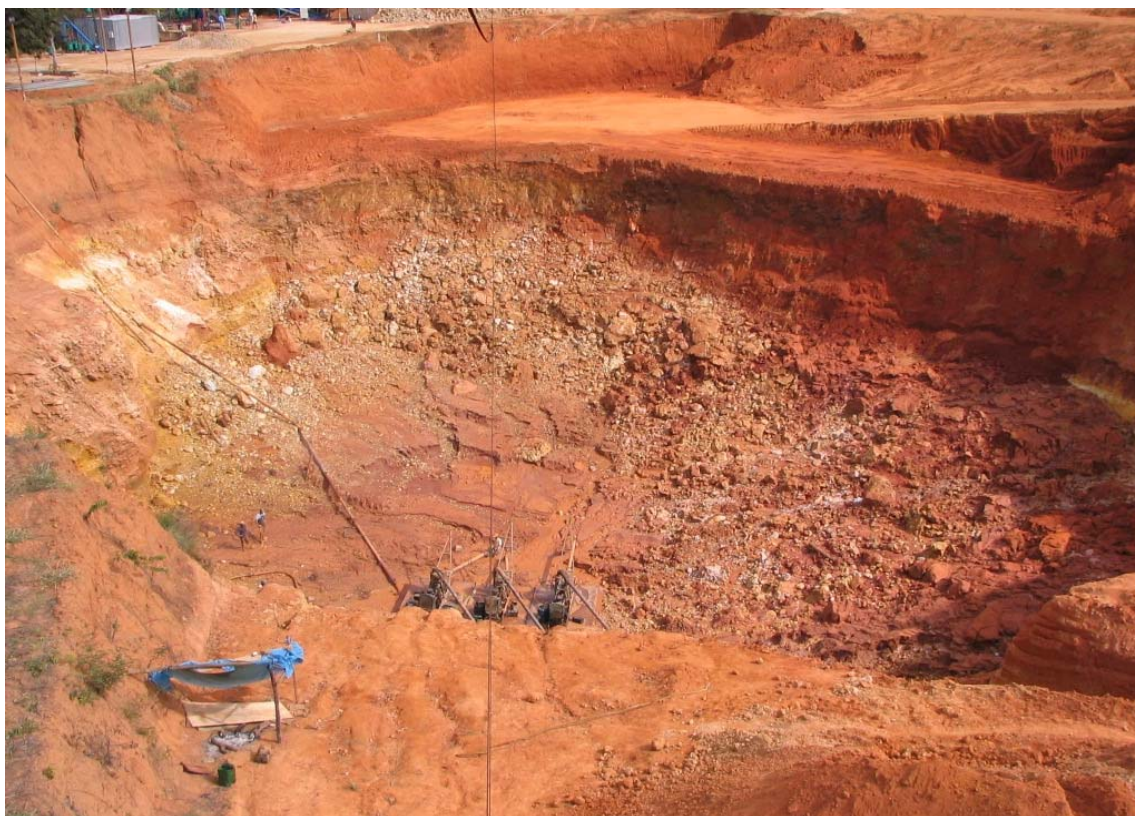
The good continuity of gravels within the paleo channel is visible from Figures (23) and (24). It is confirmed by means of a variogram, included as Appendix (3), showing that the drill spacing used was sufficiently close to demonstrate that continuity.



## 14. BULK SAMPLING BY VAALDIAM

Vaaldiam planned and managed the collection of two bulk samples from within the Property. The sites are referred to as Pit 1 and Pit 2 and are shown in Figure (16) and in subsequent Figures. Each bulk sample consisted of a different number of constituent sub-samples. These were collected and processed with the objective of quantifying the diamond distribution within each of four sedimentary units of gravels in the exposed vertical profile: upper, intermediate, transitional, and basal. This division had not been possible when viewing the cuttings and cores from the drilling programs. All four units were not continuously exposed and in places two adjoining units became one<sup>23</sup>.

During the period from March through to December 2005, 1,886 bank m<sup>3</sup> of gravels were excavated from Pit 1. The Pit, shown in Figures (27) and (28), was created as an expansion of one of Marly's old pits. The smaller Pit 2 involved the removal and treatment of 792 bank m<sup>3</sup>.



**Figure (27): Yellow and white gravels exposed among slumping red overburden in Pit 1**

The material was excavated both mechanically into dump trucks and alternatively<sup>24</sup> by gravel pumps. It was delivered to a stockpile ahead of the dedicated treatment plant.

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<sup>23</sup> For this reason some samples were combined for treatment purposes.

<sup>24</sup> As a slurry.

The Michigan front end loader used to feed the processing plant from the stockpile possessed a measured, average bucket volume of 1.19 m<sup>3</sup> and place the sample on a 80 mm grizzly, from which the undersize was fed to the plant by conveyor.

#### 14.1. Performance

Water inflow into Pit 1 through the gravels from the hills to the north of the Property created two problems during the excavation:

- (a) The more elevated sediments exposed in the Pit walls, despite benching and the insertion of timber, slumped into the Pit, obscuring and heavily diluting the underlying gravels. See Figure (28).
- (b) The small gravel pumps in operation proved insufficient for the de-watering task.

As a result, the upper and intermediate gravels were seriously diluted, and the lowermost gravels were not fully excavated down to bedrock throughout the Pit.



**Figure (28): Slumping, in places, of the Pit walls despite the insertion of lines of timber stakes. Three gravel pumps are visible, situated on bedrock.**

#### 14.2. Sampling Procedure

In Pit 1, shown in Figure (28), the upper horizons of soil, massa, and some upper, yellow gravels were benched in order to prevent slippage. The exposed gravels were selectively excavated by back-hoe. With increasing depth slumping occurred, destroying the haulway. The gravels became increasingly waterlogged and eventually flowing groundwater caused them to slide towards the pit bottom. From there they were pumped to surface by means of three pipelines and were collected on a settling pad. The result



was that with increasing depth the amount of dilution from overlying sediments increased.



Three sources of error exist:

- (a) Serious dilution of the upper and intermediate gravels by overlying, and lower grade sediments (including massa) caused under-estimation of the grade.
- (b) Collection of the pumped samples at surface resulted in the overflow of some fines which may have caused the loss of some diamonds and gold, causing a possible under-estimation of grade.
- (c) Boulders and large cobbles exceeding ca. 6 inches (150 mm) in diameter were not raised by the pumps. The reduced sample volume to which recovered diamonds and gold were later attributed will have caused some over-estimation of grade.

**Figure (29): Vertical sampling divisions in Pit 2**

The sampling of Pit 2 was easier. Figure (29) shows the gravel units that were sampled above a bedrock that, like the ground surface, was sloping upwards, away from the back-hoe.

### **14.3. Bulk Sample Treatment**

Vaaldiam constructed and installed a small diamond<sup>25</sup> recovery plant with a capacity of approximately 5 m<sup>3</sup>/hr. of run-of-mine feed dedicated to the treatment of the bulk samples from Pits 1 and 2.

#### **14.3.1. Plant Flowsheet**

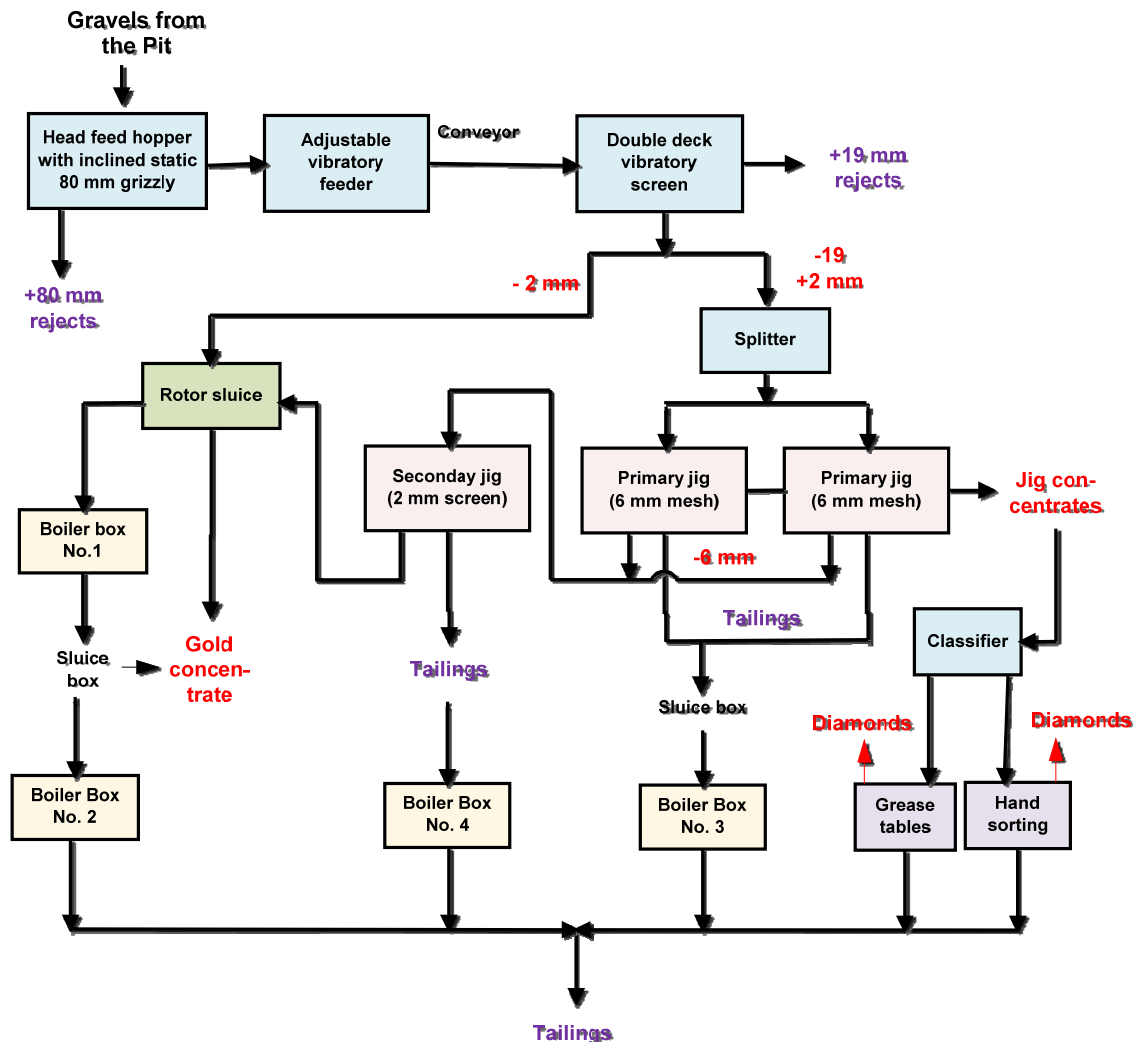
The plant flowsheet, illustrated in Figure (30), comprised an initial grizzly and vibrating screen. All +19 mm material was rejected as tailings. The -19+2 mm fraction was fed to two primary jigs and one secondary, followed by a screen, grease tables, and Pleitz jig for diamond recovery. The -2 mm material, together with the -2 mm secondary jig concentrate, was passed over riffled sluice boxes for gold recovery. The concentrate produced was stored in 30 litre plastic drums which were security sealed for later processing and analysis.

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<sup>25</sup> Also capable of producing a gold concentrate.



The operation of the plant and the maintenance of all security was the responsibility of an experienced Vaaldiam employee.



**Figure (30): Flowsheet of the bulk sampling plant for the recovery of diamonds and gold.**

#### 14.3.2. Security

Vaaldiam recognised that any theft of diamonds is most serious during the exploration sampling phase. Unrecognized loss, especially of large stones may not only cause the grade to be under-estimated but, more importantly, seriously reduce the estimated diamond value. Vaaldiam therefore instituted and maintained throughout the program a system of security, involving several checks and balances. All concentrating and concentrate storage equipment, such as jigs, concentrate bins, and grease tables, were kept locked and sealed. Two persons were required to open such equipment, record the action, and replace the seals. Where diamond-bearing material was handled there were never fewer than three persons, including the plant manager, present. Diamonds

recovered from the grease tables were weighed twice, recorded and signed off by the three individuals present. The grease from the tables was re-cycled.

### 14.3.3. Performance

The plant performed as planned and there is no reason to suspect that any significant loss of diamonds occurred into the tailings. Tracers were introduced into the flowsheet daily and an accurate record of their recovery was maintained. Sufficient security was in place to provide confidence that none was lost to theft during the sample collection and the sample treatment. Therefore the diamonds recovered represent all those that were capable of being recovered by the plant in the efficient manner in which it was operated with the flowsheet described.

There may have been some losses of very fine, flat gold from the sluice boxes with the result that gold grade estimates may be under-stated.

## 14.4. Results

Full exposure of the total gravel and overburden thickness in Pit 1 allowed 4 stratigraphic units to be defined, based on visual observation of the granulometry. As described previously, they are, in decreasing order of elevation: basal (immediately above the bedrock), transitional, Intermediary, and upper. Their relationship to the white and yellow gravels recorded during the drilling program is illustrated in Figure (31).

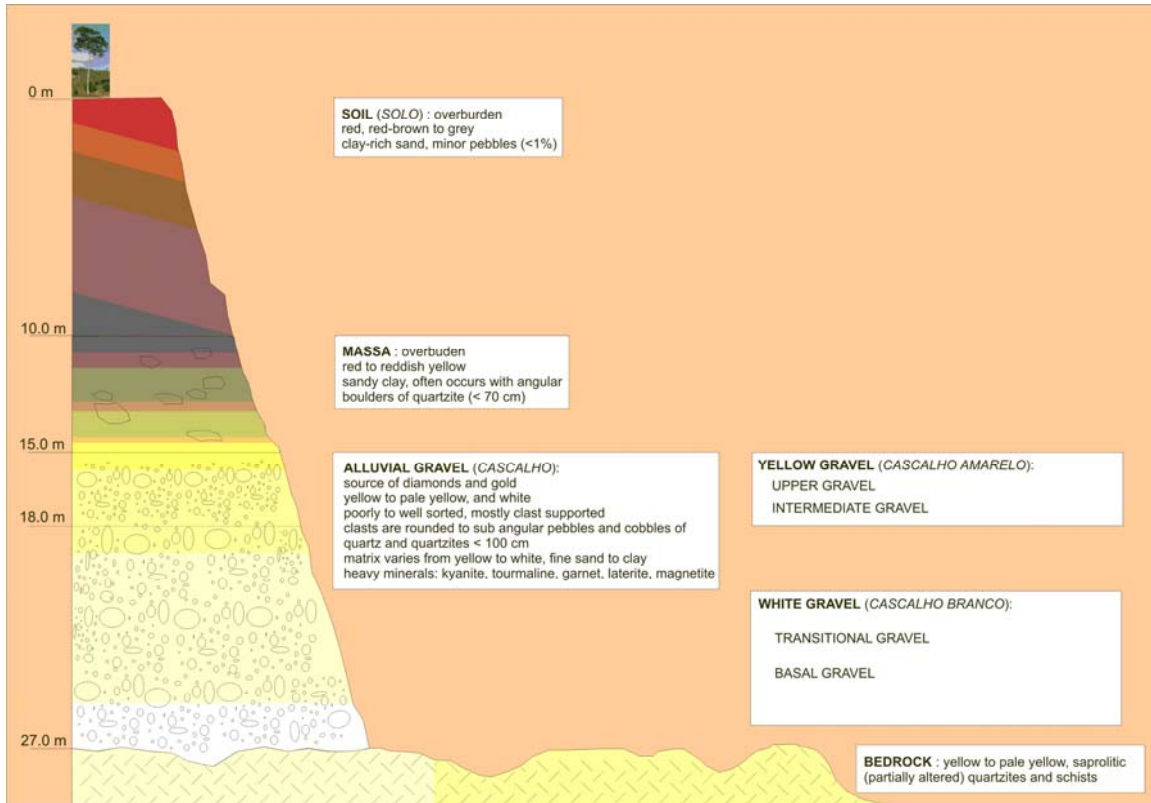


Figure (31): Recorded stratigraphic units in Pit 1

Sub-samples, which together constitute the bulk sample from Pit 1, were collected from each of these units and were treated in the plant, with the results shown in Table (4).

There is an obvious similarity, especially in terms of sediment colour, to the profile described by Fleisher (1991) and illustrated in Figure (9). There is also an obvious increase in grade with greater depth. The apparent, slight, inverse relationship between diamond grade and diamond stone "size" (average of 0.22 cts/stone) may be merely a reflection of the small number of diamonds recovered from the lower grade gravels. However, whereas the grade variations described by Fleisher were at vertical intervals of the order of 1 m or less, no such detail was possible in the open-pit sampling by Vaaldiam. No interpretation of mineralization style, accumulation or lag, is possible from the numeric data alone.

From December 2005 to June 2006, a second bulk sample pit, Pit 2, was established approximately 650 metres to the southwest of Pit 1. It was designed to test an area that was partially lateritized, forming a duricrust composed predominantly of gravel.

A total of 791.51 cubic metres of gravel was excavated in a series of four sub samples where two of the sub samples were of the basal gravel and two sub samples were of the upper gravel. The gravel was removed mainly by gravel pumps. The volume extracted was based on a survey of Pit 2 immediately after extraction. Results of the bulk sampling of Pit 2 are listed in Table (5).

**Table (4): Results of the bulk sampling of Pit 1, showing the recovered diamond grade.**

Strati-graphic Gravel Unit <sup>26</sup>	Unit Vertical Thick-Ness (m)	In Situ <sup>27</sup> Volume Treated (bank m <sup>3</sup> )	Diamonds Recovered		Average Diamond "Size" (cts/stone)	Recover- ed Grade (cts/ bank m <sup>3</sup> )
			Number	Carats		
Upper	)	254	4	1.06	0.27	0.00
Intermediate	) 3.0	493	11	2,63	0.24	0.01
Transitional	)	1,034	319	71.02	0.22	0.07
Basal	) 9.0	105	102	23.31	0.23	0.22
Total	12.0 <sup>28</sup>	1,886	436	98.02	0.22	0.05

<sup>26</sup> The 7 stratigraphic unit samples of upper, intermediate, transitional, and basal gravels were recorded as Samples MMC DB 01, MMC DB 03-04, MMC DB 05-07, and MMC DB 06, respectively.

<sup>27</sup> Determined by survey and back-calculation.

<sup>28</sup> Inclusion of 10 m of soil and 5 m of massa raises the total to 27.0 m from surface to bedrock.

**Table (5): Results of the bulk sampling of Pit 2, showing the recovered diamond grade**

Strati-graphic Gravel Unit <sup>29</sup>	Unit Vertical Thick-Ness (m)	In Situ <sup>30</sup> Volume Treated (bank m <sup>3</sup> )	Diamonds Recovered		Average Diamond "Size" (cts/stone)	Recov-ered Grade (cts/bank m <sup>3</sup> )
			Number	Carats		
Upper	2.8	500	86	19.32	0.22	0.04
Intermediate	1.2 <sup>31</sup>					
Basal	1.0	221	93	41.90	0.45	0.19
Total	5.0	1,886	179	61.22	0.34	0.09

The larger diamond stone "size" in the basal gravel is noteworthy, with an apparently sympathetic relationship between "size" and grade.

#### 14.4.1. Diamond Grade

The estimated diamond grade of gravels targeted for eventual mining on a production scale was based on the bulk sampling results for the transitional and basal units in Pit 1. The intermediate and upper gravels were excluded because their low grades resulted from heavy dilution. The average, measured ratio of the basal unit thickness to the transitional unit thicknesses, within the 9.0 m combined thickness, was 6:4. This ratio was applied to the bulk sample grades by assigning 6 parts at 0.22 cts/m<sup>3</sup> and 4 parts at 0.07 cts/m<sup>3</sup> to give a weighted average of 0.16 cts/m<sup>3</sup>. Although the basal gravels in Pit 2 yielded a higher grade of 0.19 cts/m<sup>3</sup> that figure was disregarded (as a conservative measure) as being less representative of the whole deposit.

#### 14.4.2. Diamond valuation

The diamonds produced from alluvial gravels along the Jequitinhonha River are predominantly gem-quality cuttable goods, with reported average sales values for run-of-mine parcels ranging between US\$150 and \$225 per carat.

A graphical analysis of the "size" variation of all the diamonds, including those from earlier tailings, recovered in Vaaldiam's bulk sampling plant is attached as Appendix (4).

<sup>29</sup> The 4 stratigraphic unit samples of upper and basal gravels were recorded Samples MMC DB 09-10 and MMC DB 08, 18, respectively.

<sup>30</sup> Determined by survey and back-calculation.

<sup>31</sup> Inconsistently represented.

It reveals the existence of two populations, but this may be the result of an over-representation of smaller stones recovered from tailings.

In September 2006, a parcel of diamonds derived from the bulk sampling was evaluated by Comerico e Exportação Ltda. ("CIDAMA"), an independent diamond valuation and marketing company in Diamantina. CIDAMA was selected for the task because the company was responsible for the valuation of diamond production from Rio Novo's Domingas Mine for the last 15 years. Vaaldiam confirmed that the parcel:

- (a) originated from the bulk sampling program on the Property and represented the sampled gravel units in both Pit 1 and Pit 2,
- (b) constituted all the diamonds recovered by means of the bulk sampling; no more and no less.
- (c) during its recovery, had been subject to Vaaldiam's security measures to maintain the Chain of Custody.

In valuing Vaaldiam's parcel CIDAMA utilized their proprietary, September 2006, price book for the valuation, the same price book currently used for all their other valuation and marketing work.

The parcel contained 169.15 carats of diamonds with a lower cut-off "size" of 2 mm. CIDAMA valued the goods at an average of US.\$ 197/ct. The largest stone in the parcel was a 4.66 carat white dodecahedron that alone was valued at US.\$ 1,395/ct. In addition, 24 stones in the parcel, totalling 33.23 carats, within a 1.0 to 4.0 ct range, returned an average value of US.\$ 354/ct. CIDAMA's certificate is attached to this report as Appendix (5). The parcel has been retained in its entirety by Vaaldiam.

The valuation of the parcel further revealed that:

- (a) the percentage gem quality was 97%, the balance being classified as industrial,
- (b) 59 % of the diamonds were classified as white.

#### **14.4.3. Gold Grade**

Between May and June 2006, the fine fraction of each of seven sub-samples, constituting stored mineral concentrates, was processed further on site through a closed circuit of Pleitz jig and gold sluice to extract and recover the free gold component of material from Pit 1. The enriched concentrate was then treated and examined by Nomos Laboratório ("Nomos"), based in Rio de Janeiro (Yamamoto, 2006). It yielded 297.9 g of gold from the seven samples that represented 1,727 m<sup>3</sup> of ground from Pit 1, equivalent to a recovered gold grade of 172 mg/m<sup>3</sup>, with a fineness of ca. 940.

The same method as used for the estimated diamond grade, averaging the transitional and basal gravels<sup>32</sup> on a ratio of 6:4, was applied to the figures in Table (6). This resulted in an in situ, recovered, gold grade of 203 mg/m<sup>3</sup>. Application of 900 as a conservative fineness figure reduced the grade to 182 fine mg/m<sup>3</sup>, equivalent to 0.0059 troy oz/ m<sup>3</sup>.<sup>33</sup>

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<sup>32</sup> The gravel units preferentially mineralized with diamonds.

<sup>33</sup> A recoverable by-product that, at, say, US.\$ 650/oz gold, is worth US.\$ 3.80/m<sup>3</sup>.

Following recognition by Vaaldiam of the amount of gold in the alluvium, a limited program of 10 Banka drill holes, completed in December 2006, was initiated at a spacing of 100 m in order to provide information concerning the gold content of the gravels. The author provided a Banka drilling manual describing the required procedures. The drill cuttings were weighed and sieved at 12# (Tyler) to remove the +1400 micron fraction. The undersize fractions are currently awaiting laboratory processing and analysis.

**Table (6): Results of the sampling of Pit 1, showing the recovered gold grade**

Stratigraphic Gravel Unit <sup>34</sup>	In Situ <sup>35</sup> Volume (bank m <sup>3</sup> )	Gold Recov- ered (g)	Recov- ered Gold Grade (mg/bank m <sup>3</sup> )
Upper	471	2.266	5
Intermediate	145	49.98	35
Transitional	827	192.91	228
Basal	283	52.74	186
Total	1,727	297.90	172

#### 14.4.4. Gold Studies

Gold recovered during the bulk sampling program was examined and screened by both Vaaldiam and Nomos independently in order to derive a size frequency distribution. The closely similar results are attached as Appendix (6). They show that at least 50% of the gold recovered is finer than 150 microns. The implications are that if appropriate equipment for the recovery of finely sized gold is incorporated in a production flowsheet then the recovered grade could be higher than that achieved by the bulk sampling.

#### 14.5. Granulometry Tests (purpose, size frequency results)

Granulometry tests were conducted on the alluvial gravel taken from Pit 1 (two samples, A and B) and Pit 2 (two samples, C and D) in order to develop a reasonably representative size frequency distribution for the gravels for assistance in future plant design. Measured volumes of gravel collected from the exposed basal unit in each Pit

<sup>34</sup> The 7 stratigraphic unit samples of upper, intermediate, transitional, and basal gravels were recorded as Samples MMC DB 01-01B-02, MMC DB 04, MMC DB 05-07, and MMC DB 06, respectively.

<sup>35</sup> Determined by back-calculation.

were wet screened and the results recorded (Daigle, 2005). They are summarized in Table (7).

The results, which are also illustrated graphically in Appendix (7), show that of the sampled ground:

- (a) almost 40 % lies in the -2 mm fraction, as silt and fine to coarse sand.
- (c) almost one third (32.5 %) lies in the +2 -19 mm fraction, as granules and pebbles
- (d) more than one third (36.2 %) lies in the +2 -26 mm fraction, as granules and pebbles
- (e) one quarter (24.5 %) exceeds 26 mm in size and includes cobbles and boulders.

The lower percentage of ore material fraction is due to the presence a greater amount of silt and clay in the matrix of the gravel and the presence of very large boulders (up to 75 cm) and large blocks of “*canga*” material, a discontinuous layer of duricrust (iron-cemented gravel). This result may change as tests are carried out by crushing and milling of the *canga* to prove or disprove the presence of diamonds in the cemented gravel.

**Table (7): Results of granulometry tests conducted on samples from Pits 1 and 2.**

Size Fraction (mm)	Pit 1		Pit 2		Average
	Sample A (% of 1,158 litres volume)	Sample B (% of 1,133 litres volume)	Sample C (% of 1,079 litres volume)	Sample D (% of 1,043 litres volume)	Weighted Average of Samples A,B,C, & D
-2	38	38	36	45	39.2
+ 2 - 4	8	7	6	6	6.8
+ 4 - 6	12	10	6	5	8.4
+ 6 -12	16	16	6	6	11.2
+12 -19	10	4	6	4	6.1
+19 -26	0	5	6	4	3.7
+26	16	20	34	29	24.5
Total	100	100	100	100	100.0



## **15. DATA VERIFICATION**

The author has relied on both data provided by Vaaldiam and Montes Claros and his own observations of all work undertaken by Vaaldiam prior to December 2006. Analytical reports concerning the bulk sampling program and the drill program have been received from Vaaldiam. The author was:

- (a) personally involved in the described granulometry tests, and
- (b) partially involved in the Banka percussion drill and the rotary drill programs.

Internal quality assurance and quality control were instituted and followed throughout. They mainly comprised:

- (a) twinning of drill holes, especially along the centre of the deposit,
- (b) checking the logging of drill holes
- (c) taking and compositing sub-samples during the bulk sampling program.

### **15.1. Exploration**

Data verification for the 2005 and 2006 exploration programs of Vaaldiam and MMC was undertaken by means of site visits by the author, confirmation of adherence to the drilling and sampling protocols, and reviewing all report concerning the work.

The author concludes that all exploration activities and related reporting were conducted with strict adherence to quality control and quality assurance procedures, not only in the presence of the author, but also in his absence.

The author supervised the drilling operation and reviewed all the drillhole logs during his site visits in 2005 and 2006. In addition, several of the 2006 rotary drillholes duplicated 2005 Banka percussion drill holes completed in the previous year in order to confirm the geological descriptions. Although slight differences in nomenclature were found, nevertheless measurements of the gravel thicknesses were found to be consistent.

### **15.2. Drilling Data Bank**

The drillhole database has been reviewed by the author, confirming that the stated results are consistent with the drill logs.

### **15.3. Bulk Sampling and Data Bank**

A measure of the validity of the recovered diamond grades achieved by the bulk sample is provided by examination of the sub-samples which were treated and recorded separately. For example, the 105 m<sup>3</sup> of basal gravel which yielded a recovered grade of 0.22 cts/m<sup>3</sup> comprised four sub-samples, the individual grades of which fell within the range of 0.22 +/- 50 %: a satisfactory result in the context of the sub-sample volumes. The results are presented in Table (8).

**Table (8): Comparative results of sub-sampling the basal gravels in Pit 1**

In Situ Volume Treated (bank m <sup>3</sup> )	Diamonds Recovered (Number)	Diamonds Recovered (carats)	Average Diamond "Size" (cts/stone)	Recovered Grade (cts/bank m <sup>3</sup> )
17.8	13	4.32	0.33	0.24
11.1	14	3.04	0.28	0.27
33.4	52	11.15	0.27	0.33
42.3	23	4.80	0.21	0.11
104.6 <sup>36</sup>	102	23.31	0.23	0.22

All the bulk sampling data were recorded in a dedicated data base that has been checked and re-checked by the author and others.

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<sup>36</sup> Rounded to 105 m<sup>3</sup> in Table (4).

## **16. MINERAL RESOURCE AND RESERVE ESTIMATION**

### **16.1. Definitions**

The definitions of Mineral Resources and Reserves published by the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") are presented in Appendix (8). Three important aspects of the definitions are relevant to this report:

- (a) Demonstration of physical continuity of the mineralized deposit: continuity has been demonstrated with the mostly 50 m spaced drill holes, as evidenced by the variogram attached as Appendix (3).
- (b) Demonstration of continuity of the grade: continuity has not been demonstrated.
- (c) Economic studies: no formal economic studies have been issued yet.

The above factors have limited the categorisation of the resources delineated on the Property to, at best, an Indicated Mineral Resource. Because no Mineral Reserves are estimated, no restraints such as cut-off grade, stripping ratio, dilution, and mining losses have been considered.

### **16.2. Methodology**

The procedure used in the estimation of the diamond resources delineated to date was as follows:

- (a) Drill holes recorded as having intersected less than 0.5 m of gravel were discarded.
- (b) Individual drill holes that intersected 0.5 m or more of gravel were each awarded an area of influence ("polygons") by assuming that the influence of each hole extended midway to the adjacent hole. Because all the holes were drilled on a north-south by east-west grid each polygon took the form of a square or rectangle, albeit in places truncated or slightly distorted. The majority of the polygons measured 2500 m<sup>2</sup> and a few were as large as 3750 m<sup>2</sup>. The largest was nearly 7500 m<sup>2</sup>. Parts of the Property that were not drilled were also referred to as polygons, albeit with complex boundaries
- (c) The gravel thicknesses recorded in individual drill holes were weighted by the corresponding area of the polygon surrounding the drill hole to provide an estimated gravel volume within the polygon.

The author recognises that whereas:

- (a) areas of influence measuring 50 x 50 m in reality possess a higher degree of confidence,
- (b) nevertheless, mathematically greater emphasis is placed on the larger areas of influence

Individual areas of influence were truncated as necessary due to:

- (a) being sited off the grid for geographical reasons,

- (b) the proximity of the Property boundary, and
- (c) the environmental prohibition placed on mining within 50 m of the riverbank.
- (d) the presence of Pits 1 and 2, and of old Marly diggings.

### 16.3. Designation

Individual polygons were designated as representing either an Indicated or an Inferred Resource in the following manner:

- (a) Indicated Resource: all polygons, except those classified as Inferred.
- (a) Inferred Resource:
  - polygons surrounding a drill hole and which were isolated from the main outline of the deposit, and
  - polygons not surrounding a drill hole but into which gravels were demonstrated to extend by the evidence of old diggings and contiguity with polygons in the Indicated category.
  - Each Indicated Resource polygon, as previously described, was allocated an area of influence. Each Inferred Resource polygon was similarly possessed a measure area and was allocated an appropriate gravel thickness based on the nearest Indicated Resource polygon(s).

Three groupings ("blocks") of Indicated Resource polygons exist. They are referred to as the North, Northwest, and South Blocks, as shown in Figure (32). In the opinion of the author:

- (a) grade continuity has been demonstrated within these blocks which are therefore compliant with the 43-101 definition of Indicated Mineral Resource, and
- (b) The remaining areas categorised as Inferred are compliant with the 43-101 definition of Inferred Mineral Resource.

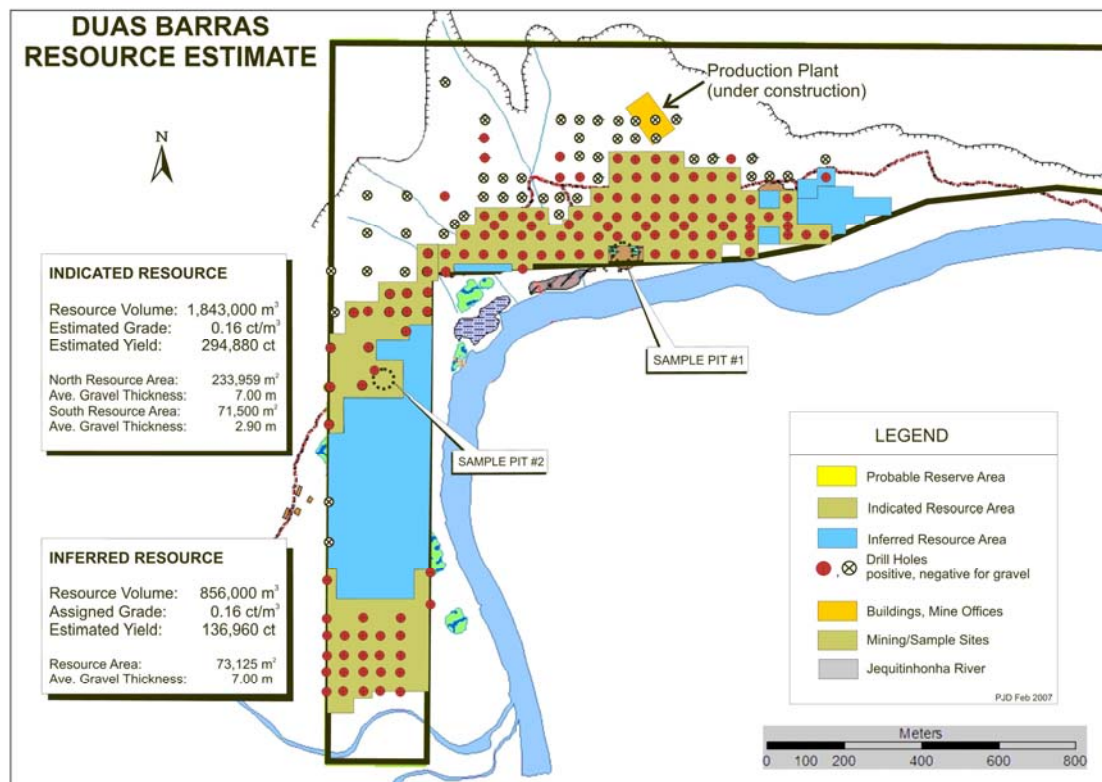
### 16.4. Resource Statement

The total volumes of gravel, by resource category, within the Property were estimated to be as follows:

- (a) Indicated Mineral Resource: 1,843,000 m<sup>3</sup>,
- (b) Inferred Mineral Resource: 856,000 m<sup>3</sup>, and
- (c) Total Mineral Resource: 2,699,000 m<sup>3</sup>.

The volume of Indicated Resource differs from an earlier reported figure of 1,683,000 m<sup>3</sup> (Press Release vaapr2006-26) owing to the inclusion of data resulting from:

- (a) 10 Banka drill holes completed in December 2006 for the purpose of investigating variations in the gold content of the deposit, and
- (b) the inclusion of data from 5 confirmation drill holes.



**Figure (32): Location of the estimated, indicated and inferred resources**

Bulk sampling yielded the following grade estimates which were applied equally to the Indicated Resource blocks:

- (a) Diamond grade: 0.16 ct/m<sup>3</sup> (from section 14.4.1.), and
- (b) Gold grade: 182 fine g/m<sup>3</sup> (from section 14.4.3.)

In the opinion of the author the Inferred Resource areas contain gravels which show every indication of being of similar composition and granulometry<sup>37</sup> to those intersected by drilling in the Indicated Resource blocks. Therefore the same estimated diamond and gold grades were assigned to the Inferred Resources areas.

The results are summarised in the following table.

**Table (9): 43-101 compliant mineral resource summary**

<sup>37</sup> The estimated gravel thickness of 7 m applicable to the Inferred Resources is justified because of the likely presence of thick and deep gravels in a continuation of the paleo channel, which is expected to be located by further drilling, in the southern arm

Mineral Resource	Volume (m <sup>3</sup> )	Diamond Grade <sup>38</sup> (cts/m <sup>3</sup> )	Diamond Content (carats)	Fine Gold Grade <sup>39</sup> (mg/m <sup>3</sup> )	Fine Gold Content <sup>39</sup> (kg)
Indicated	1,843,000	0.16	295,000	182	335 <sup>40</sup>
Inferred	856,000	0.16	137,000	182	156 <sup>41</sup>
Total	2,699,000	0.16	432,000	182	491 <sup>42</sup>

## 16.5. Previous Estimate

In their technical reports available to Vaaldiam, Marly reported an estimated gravel resource of 2,330,860 m<sup>3</sup> within the Property at:

- (a) an average diamond grade of 0.26 cts/m<sup>3</sup> (versus. 0.16 cts/m<sup>3</sup> by Vaaldiam) representing a contained 600,000 carats, and
- (b) an average gold grade of 290 mg/m<sup>3</sup>, (versus. 182 fine mg/m<sup>3</sup> by Vaaldiam) representing a contained 676 kg of gold.

These estimates by Marly were not compliant with Canadian National Instrument 43-101.

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<sup>38</sup> Recoverable by a similar gravity flowsheet as that used for the bulk sampling.

<sup>39</sup> Potentially recoverable.

<sup>40</sup> Equivalent to 10,780 troy ounces.

<sup>41</sup> Equivalent to 5,010 troy ounces.

<sup>42</sup> Equivalent to 15,790 troy ounces.



## **17. FURTHER POTENTIAL**

The deposit is open in various areas, providing some potential for a slight increase in the resource volume. For example:

- (a) In the southern arm of the Property, between lines 600 N and 1100 N.
- (b) As continuations of gravel outside the Property boundary
  - on the southern arm to the west, south and east, and
  - to the southeast of the junction between the northern and southern arms.
- (c) To a lesser extent, at the eastern end of the northern arm.

## 18. RECOMMENDATIONS

The author recommends that:

- (a) some consideration be given to the collection of a bulk sample at or near 600 N in the southern arm<sup>43</sup>.
- (b) exploration<sup>44</sup> continue inside and, if possible, outside the present boundaries of the Property with the objectives, as specified in section 17, of:
- (c) the precise locations of all old diggings inside and immediately outside the Property<sup>45</sup> be determined.

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<sup>43</sup> If allowed by the planned production schedule.

<sup>44</sup> Using the Vaaldiam-owned banka drill on the existing 50 x 50 m grid.

<sup>45</sup> Two known garimpo diggings lie approximately 100 and 300 m outside the eastern boundary of the southern arm of the Property.

## 19. CONCLUSIONS

Vaaldiam successfully conducted exploration (drilling) and bulk-sampling programs with the objective of estimating a mineral resource for the Property. The 43-101 compliant resources are detailed in Table (9).

As a result Vaaldiam took the decision in July 2006 to advance the project to full production by the end of the first quarter of 2007. Multigeo-Mineração, Geologia e Meio Ambiente Ltda, an engineering firm based in Sao Paulo, was engaged to conduct a desktop study and to propose a mining plan for the alluvial diamond deposit (Marly, 2006a, 2006b). In September 2006, Vaaldiam had begun construction of an 80 m<sup>3</sup>/hr jig plant capable of treating 240,000 m<sup>3</sup>/year.

**Table (10): 43-101 compliant mineral resource**

Mineral Resource	Volume (m <sup>3</sup> )	Diamond Grade <sup>46</sup> (cts/m <sup>3</sup> )	Diamond Content (carats)	Fine Gold Grade <sup>47</sup> (mg/m <sup>3</sup> )	Fine Gold Content <sup>39</sup> (kg)
Indicated	1,843,000	0.16	295,000	182	335 <sup>48</sup>
Inferred	856,000	0.16	137,000	182	156 <sup>49</sup>
Total	2,699,000	0.16	432,000	182	491 <sup>50</sup>

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<sup>46</sup> Recoverable by a similar gravity flowsheet as that used for the bulk sampling.

<sup>47</sup> Potentially recoverable.

<sup>48</sup> Equivalent to 10,780 troy ounces.

<sup>49</sup> Equivalent to 5,010 troy ounces.

<sup>50</sup> Equivalent to 15,790 troy ounces.

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vaapr2005-31. Vaaldiam to Exercise Option to Acquire 70% Interest in Duas Barras Diamond Deposit. December 22, 2005

vaapr2006-18. Duas Barras Diamond Project Moves Toward Production. May 29, 2006

vaapr2006-22. 4.65 Carat Diamond Recovered from Duas Barras Bulk Sample. July 20, 2006

vaapr2006-24. Bulk Sampling Completed at Duas Barras. August 15, 2006

vaapr2006-26. Drilling Outlines 430,000 Carat Resource at Duas Barras. August 21, 2006

vaapr2006-27. Mining Permit Granted for Vaaldiam's Duas Barras Property. August 28, 2006

vaapr2006-30. Duas Barras Diamonds Valued at US\$ 197 Per Carat. September 19, 2006

vaapr2006-32. Vaaldiam Acquires 100% of Duas Barras Mine. November 29, 2006



## 22. APPENDICES

**Appendix (1): Decreto de Lavra (Mining Permit) No. 806.569/77, granted on 23 August 2006 by the Departamento Nacional de Produção Mineral ("DNPM")**



MINISTÉRIO DE MINAS E ENERGIA

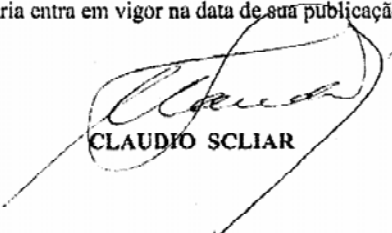
D.O.U.: 25/08/06  
Seção: 1  
Página: 70

PORTARIA Nº 265, DE 23 DE Agosto DE 2006

**O SECRETÁRIO DE GEOLOGIA, MINERAÇÃO E TRANSFORMAÇÃO MINERAL DO MINISTÉRIO DE MINAS E ENERGIA**, no uso da competência que lhe foi delegada pela Portaria Ministerial nº 425, de 8 de setembro de 2005, expedida com fundamento no disposto nos arts. 7º e 43 do Decreto-lei nº 227, de 28 de fevereiro de 1967, com a redação dada pela Lei nº 9.314, de 14 de novembro de 1996, e tendo em vista o que consta do Processo DNPM nº 806569/1977, resolve:

Art. 1º Outorgar à EMPRESA DE MINERAÇÃO MARLY LTDA. concessão para lavrar MINÉRIO DE OURO e DIAMANTE INDUSTRIAL, no Município de Bocaiúva, Estado de Minas Gerais, numa área de 170,89ha, delimitada por um polígono que tem um vértice à 351m, no rumo verdadeiro de 70°02'SW do ponto de Coordenadas Geográficas: Lat. 17°38'18,1"S e Long. 43°36'38,4"W, e os lados a partir deste vértice com os seguintes comprimentos e rumos verdadeiros: 259,32m-SW 90°00'00", 1.880m-NW 00°00'00", 2.459,89m-SE 90°00'00", 200m-NW 00°00'00", 1.139,13m-SE 90°00'00", 87,37m-SW 42°07'25", 121,67m-SW 73°43'24", 318,38m-NW 80°51'19", 241,26m-NW 87°51'44", 177,69m-SW 59°11'40", 538m-SW 24°23'06", 602,20m-NW 84°39'17", 338,52m-SW 83°23'04", 10,58m-SW 72°57'11", 308,66m-SW 67°56'42", 15,06m-SW 74°12'03", 181,21m-SW 79°51'39", 636,77m-SW 87°22'18", 17m-SW 46°04'19", 160,34m-SW 90°00'00", 154,40m-SW 00°00'00", 5,71m-SW 45°34'02", 191,03m-SE 01°03'10", 931,40m-SE 00°00'02".

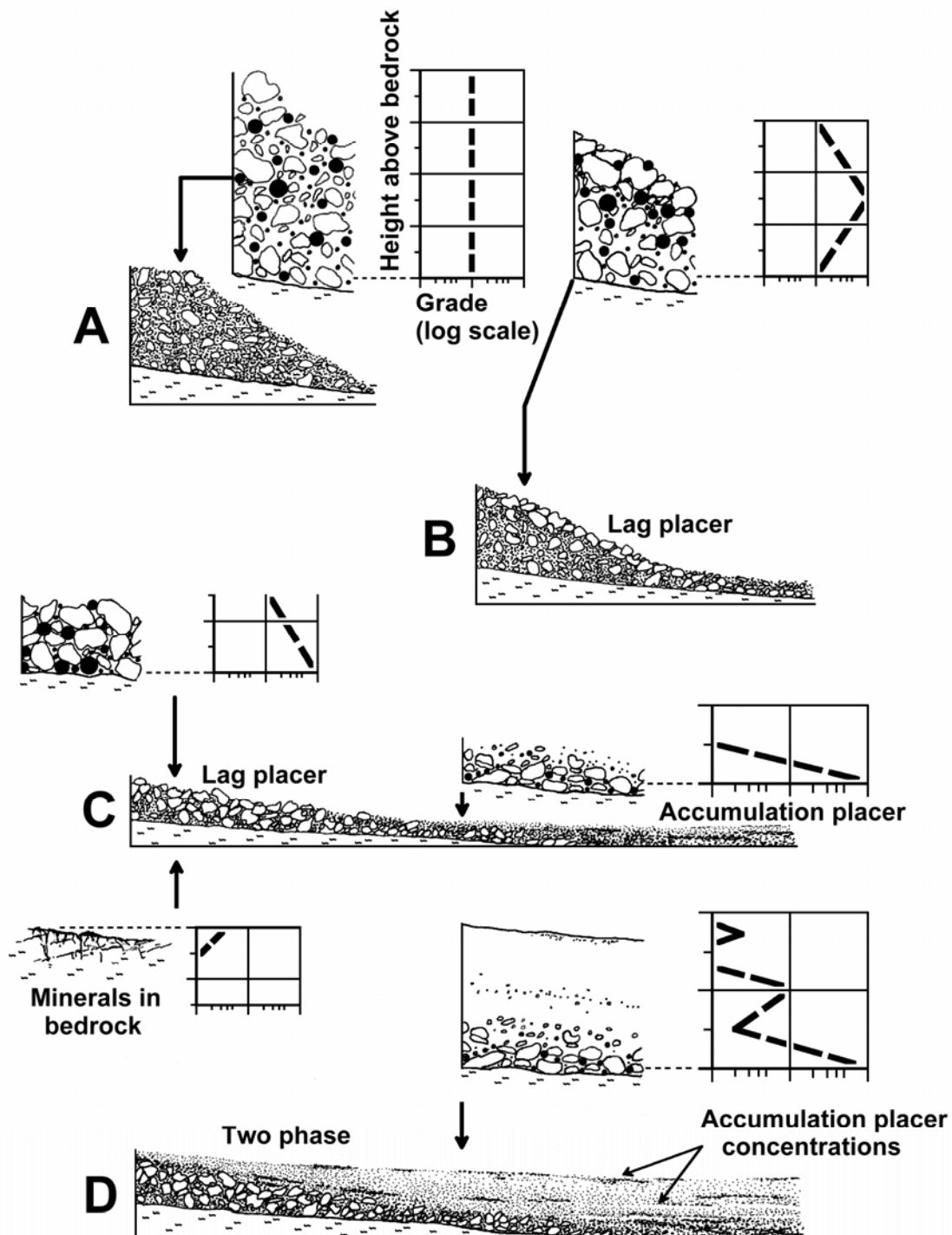
Art. 2º Esta Portaria entra em vigor na data de sua publicação. (Cód. 4.00)

  
CLAUDIO SCLiar

(Empenho 2005NE900055)

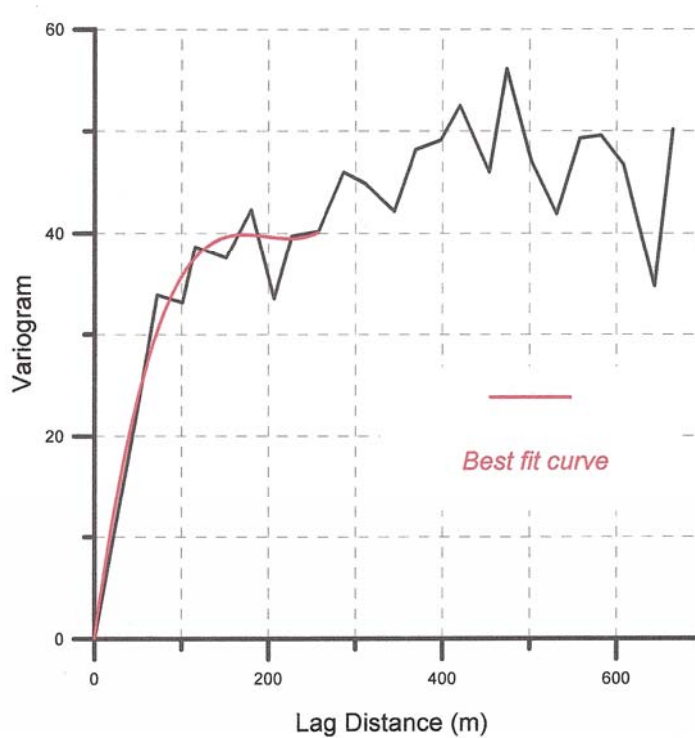
Transcrito no Livro C. 54, fls. 98  
Em 05/09/06 - S/DICAM

**Appendix (2): Formation of Lag and Accumulation Alluvial Deposits** Source: Garnett and Bassett (2005)

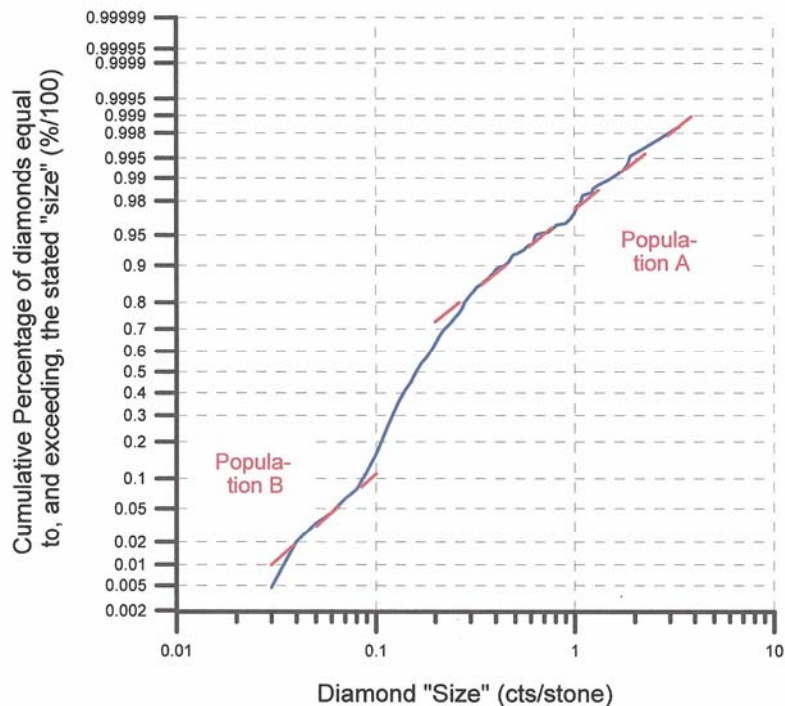


Note the graphical depiction of the vertical grade profile, in the lower right hand corner, showing the effect of both lag and accumulation styles of mineralization.

### Appendix (3): Variogram of Total Gravel Thickness, as Determined by Drilling. Source: Garnett (2007)



### Appendix (4): Cumulative Distribution Curve of Diamond "Size". Source: Garnett (2007)

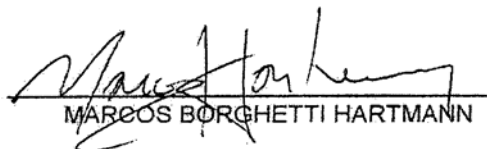


## Appendix (5): Diamond Valuation Certificate Issued by CIDAMA

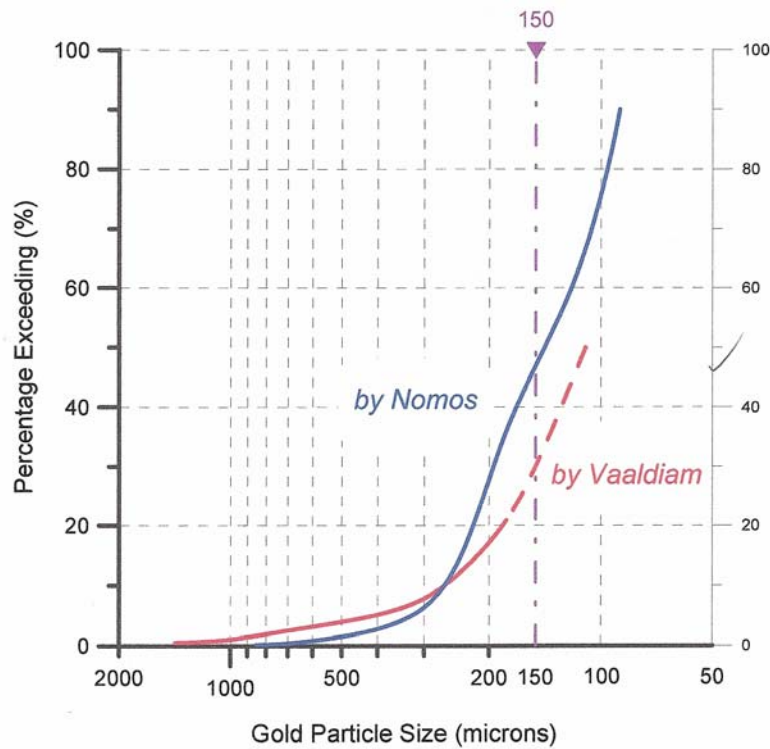
CLIENTE: MINERAÇÃO MONTES CLAROS LTDA  
FAZENDA DUAS BARRAS - ZONA RURAL  
MUNICÍPIO OLHOS D'ÁGUA

CLASSIFICAÇÃO E AVALIAÇÃO DE DIAMANTES EM BRUTO PELA EMPRESA:  
CIDAMA COMÉRCIO E EXPORTAÇÃO LTDA  
TEL: 038 3531 2588 - FAX: 038 3531 1676  
E-MAIL: citel@citel1.com.br  
RUA DO CARMO, 77 - CENTRO - DIAMANTINA - MG  
CNPJ: 86.647.872/0001-61  
I.E.: 216.902134-0065

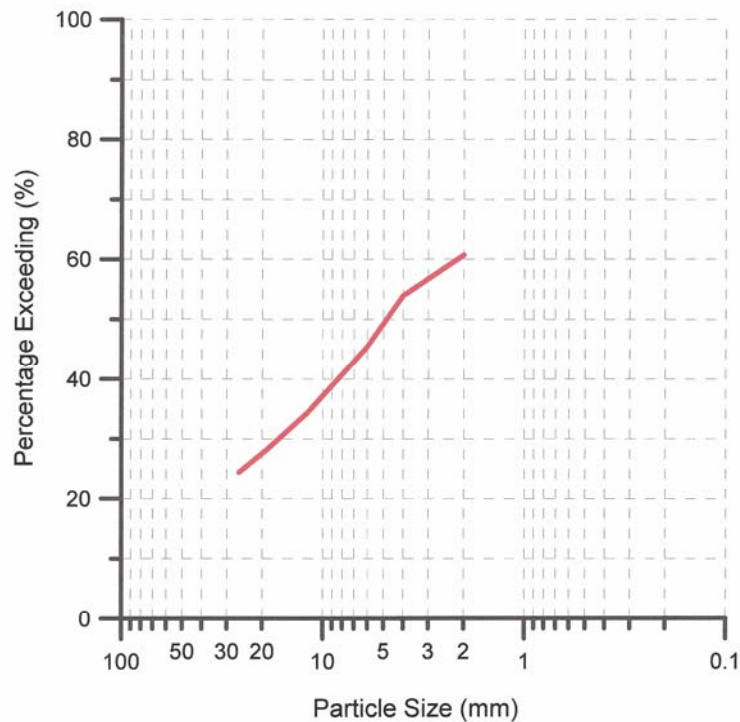
	CT	U\$
4 X 1 1A	46,95	5.868,75
SP	8,36	760,76
CO	8,59	704,38
CH	23,05	1.359,95
2 X 1 1A	21,14	3.699,50
SP	4,50	517,50
CO	2,76	314,64
CH	8,72	619,12
3 X 4 1A	4,64	974,40
CO	0,74	96,94
AM	0,65	61,75
CH	1,16	96,28
4 X 4 1A	11,62	3.311,70
SP	3,93	778,14
CO	1,01	104,03
CH	1,00	106,00
6 X 4 1A	4,38	1.730,98
SP	1,76	440,00
8 X 4 1A	1,85	740,00
CO	1,92	576,00
10 X 4 1A	2,40	1.440,00
12 X 4 1A/SP	3,36	2.520,00
16 X 4 1A	4,66	6.500,00
	169,15	\$33.320,82

  
MARCOS BORGHETTI HARTMANN

**Appendix (6): Results of Gold Particle Size Analyses.** Source: Nomos (2006) and Garnett (2007)



**Appendix (7): Results of Granulometry Tests on Gravels.** Source: Garnett (2007)



## Appendix (8): Definition Standards on Mineral Resources and Reserves

### From the CIM Definition Standards on Mineral Resources and Mineral Reserves (Nov. 2004):

“An **‘Inferred Mineral Resource’** is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, and drill holes.”

“An **‘Indicated Mineral Resource’** is that part of a Mineral Resource for which quantity, grade or quality densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.”

“A **‘Measured Mineral Resource’** is that part of a Mineral Resource for which quantity, grade or quality densities, shape and physical characteristics, are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.”

“A **‘Mineral Reserve’** is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by, at least, a Preliminary Feasibility Study. “

“A **‘Probable Mineral Reserve’** is the economically mineable part of an Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.”

“A **‘Proven Mineral Reserve’** is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.”



## **23. DATE AND SIGNATURE PAGE**

### **Certificate of Paul Joseph Daigle**

I, Paul Joseph Daigle, P.Geo. of Toronto, Ontario, do hereby certify that:

- I am Senior Project Geologist for Vaaldiam Resources Limited with the business address of: 55 University Ave. – Suite 1105, Toronto, Ontario, M5B 1W7, Canada.
- I graduated with a degree in Geology, Specialization (B.Sc. Geology, Spec.) from the University of Concordia in 1989.
- I am a member in good standing of the Association of Professional Engineers and Geoscientists of Saskatchewan.
- I have worked as a geologist for a total of 16 years since my graduation from university.
- I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that, by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purpose of NI 43-101.
- I am responsible for the preparation of all sections of the Technical Report titled “Technical Report of the Duas Barras Project, Brazil (revised)” relating to the exploration carried on the Duas Barras Property. I have visited Duas Barras Property on 24<sup>th</sup> November, 2005 for 24 days; and on March 4<sup>th</sup> 2006 for 36 days.
- I have had prior involvement with the Property that is the subject of the Technical Report.
- I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Report misleading.
- As of the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to make this Technical Report not misleading.
- I am not independent of the issuer applying all of the tests in section 1.5 of the NI 43-101. I am not considered independent since I am an employee of the issuer.
- I have read the NI 43-101 and confirm that the Technical Report has been prepared in compliance with the NI 43-101 and Form 43-101F1.
- I consent to the filing of this Technical Report with any stock exchange or other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of this Technical Report.

Signed and dated, this 30<sup>th</sup> day of March, 2007.

(signed by)

---

Paul J. Daigle, P.Geo.  
Senior Project Geologist  
Vaaldiam Resources Ltd.