

# MOZAMBIQUE

MINISTRY OF MINERAL RESOURCES AND ENERGY



## **Mineral Resources Development And Investment Opportunities**

**Maputo, October 2003**

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## PREFACE

**M**ozambique has a huge and diverse untapped mineral resource base which includes coal, natural gas, rare earth minerals, gold, titanium and non-metallic minerals, with a potential for oil and diamonds.

Despite this mineral wealth, commercial mining until recently has played a relatively minor role in the development of the country's economy due, among other reasons, to incomplete geological data, an undeveloped legal and overall business environment, and, perhaps most importantly, a lack of internal and external financial resources necessary to boost the sector.

However, exploration work carried out by the Geological Survey and private entities during the last 20 years has led to the discovery of important deposits of heavy mineral beach sands, coal, gold, tantalum-niobium and other rare metals, graphite, black granite and other dimension stones, gemstones, phosphates as well as many other metallic and non-metallic minerals. Several of these deposits are now being mined or are in development.

Artisanal miners and prospectors have also played a role particularly in identifying deposits of gold and gemstones. The Niassa Gold Rush in north-western Moçambique was discovered and worked first by local prospectors. The majority of gemstones in the Alto Ligonha pegmatite field are mined by local peasant farmers.

As a consequence of this increased geological knowledge, investment in Moçambique's mineral potential by leading international and regional mining companies has increased particularly for gold, diamonds and other gemstones and titanium minerals.

The Government of Mozambique believes that mining can play a very important role in the development of the country and has given its full support and facilities to the sector. In order to promote and encourage the development of mining, in 2002, a new mining code was enacted to substitute the aged 1986 code and to provide a conducive legal framework for investors.

To further facilitate the development of the mining sector, recent amendments and additions have been made to include a new tax and fiscal incentive regime specially adapted for the mining sector. This code, approved in November of 1994, applies to both national and foreign investors. Legislation liberalising the sale and trade in precious metals and gemstones is slated for enactment in 1995.

The development of mining in Moçambique had been severely affected by the past security situation in the country. With the advent of peace and political stabilisation of the country, the installation in 1994 of a multi-party parliament and democratic government as well as the reinforcement of the economic reforms and private sector liberalisation that begun in 1986, a

favourable business environment exists which guarantees that Moçambique will join other mineral developed economies of the region.

There are good mining venture opportunities in Moçambique to be undertaken individually or in partnership with the government or local private investors. We welcome and encourage you to invest in our rich and beautiful country and assure you that we will mutually benefit.

John W. Kachamila  
Minister of Mineral Resources and Energy

## INTRODUCTION

Moçambique possesses a varied mineral resource base in a unique geologic environment. However, unlike her neighbours - Zimbabwe, Zambia and South Africa, the country had not, until quite recently, developed a mining tradition. As a result, both the exploration and the exploitation of Moçambique's mineral resources are still very much at the embryonic stage, thus offering a very significant resource potential for development which can serve, in turn, as a stimulus for the development of local industry, as well as for the generation of substantial foreign exchange earnings from export of the mineral products.

Both metallic and non-metallic minerals occur in large variety in Moçambique the more important of these are: coal, rare metals (niobium-tantalum), gold, fluorite tin, heavy minerals, graphite, base metals, phosphorites, and mineralization related to carbonatites and pegmatites, including most notably beryl and other precious and semi-precious stones. Apart from these, kimberlites, in northern Moçambique and alluvial and alluvial diamond potential in the southern part of the country have been identified.

Covering large areas of the provinces of Cabo Delgado and Niassa, recent

studies have outlined possible resources of rare earths, uranium, tin-tungsten, columbite, pyrochlore, copper and nickel sulphides. Throughout the country, the different varieties of clays, sands, refractory minerals and feldspar are well known and many of these deposits are being exploited for local and regional industrial mineral needs.

Since 1975 numerous exploration evaluation programmes have been undertaken by the Geological Survey with the aid of private, bilateral and multilateral missions. This has resulted in a better identification and definition of the country's overall mineral resources potential.

The development of these resources, in a manner that is mutually attractive and beneficial for foreign investors as well as for Moçambique, has been defined as a national economic priority.

In addition to both private and government sponsored projects already in progress, this brochure outlines a number of greenfield investment opportunities that could be profitably developed, and also provides information regarding the legal and financial framework for carrying out operations in Moçambique.

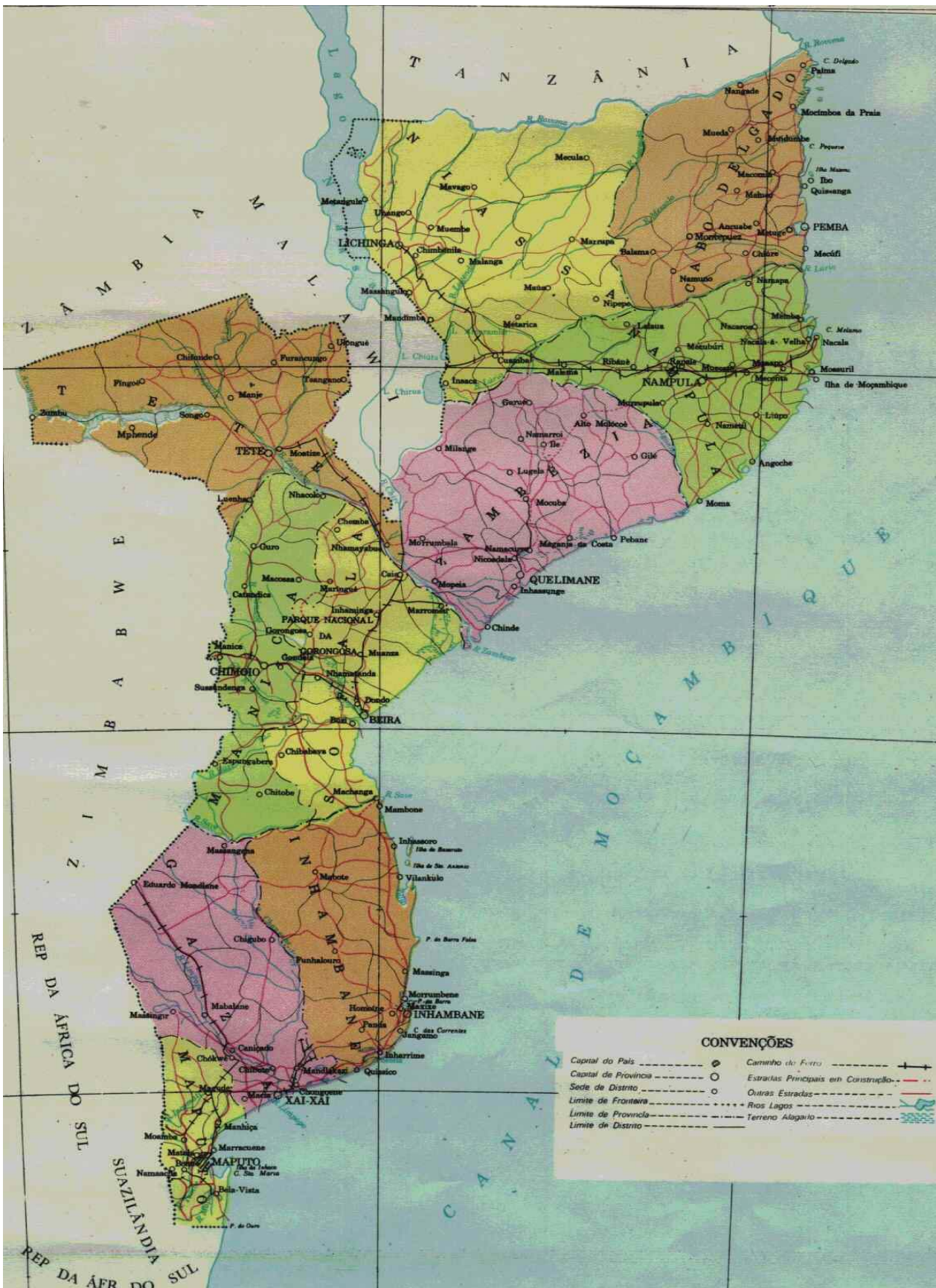


Figure 1 Administrative

## COUNTRY PROFILE

<b>Land Area:</b>	<b>799.390 km<sup>2</sup></b>
<b>Population:</b>	<b>18.961.503 (2004)</b>
<b>Population Growth Rate:</b>	<b>2.54% Per Annum (1999)</b>
<b>Currency:</b>	<b>Metical (MT) US\$1=23,747Mt (May. 2004)</b>
<b>Inflation Rate:</b>	<b>1.3% (1998)</b>
<b>Official Language:</b>	<b>Portuguese</b>
<b>Value of Exports (fob):</b>	<b>US\$ 295m (1998)</b>
<b>Value of Imports (CIF):</b>	<b>US\$ 965 m (1998)</b>
<b>Trade Balance:</b>	<b>- US\$ 670 m (1998)</b>
<b>GDP:</b>	<b>US\$ 16.8 billion (1998)</b>
<b>GDP per capita</b>	<b>US\$ 900 (1998)</b>
<b>Main Export:</b>	<b>Prawns, cashew nuts, cotton, timber</b>
<b>Total Labour Force:</b>	<b>7 million</b>
<b>Literacy Rate:</b>	<b>40% (1998)</b>

**Table 1 Country Profile Resume**

### 2.1 Political Structure

Mozambique carried out with success the peace process, elected a multiparty Parliament and constituted a democratic Government, which is

fulfilling its five year programme, comprising a set of reforms leading to modernisation of the State.

The President of the republic is elected by direct and universal suffrage for a period of 5 years he is government lead.

The government, ministers and consul of Ministers are appoints by the President of the Republic. The primary minister is assisting and advice the president by government leading as well as presenting the government programmes to the parliament.

Mozambique is divided into provinces, districts e and localities the Governor of province is a president representative and government leader. Maputo, the capital is the country largest urban area.

**Population** –is estimated around 15,740 million, The countries population's around 14 million inhabitants Zambézia, the City Maputo and Nampula Provinces the most densely populated. Generally population is concentrated in the coastal areas whit Niassa in the Northwest being the least populated. Portuguese is the official language.

### 2.2 Geographic and Economic Overview

Mozambique covers an area of approximately 800,000 km<sup>2</sup> and has a coast line stretching 2 700km. The population of Mozambique is about 16 million people, over 50% of whom live within 50km of the coast where most of the cash crops such as cotton, copra, cashew nuts and sugar cane are grown. With its long coast line Mozambique is a gateway for a number of hinterland countries of Southern Africa region who use the three cross-country rail lines and five major seaports for their exports and imports.

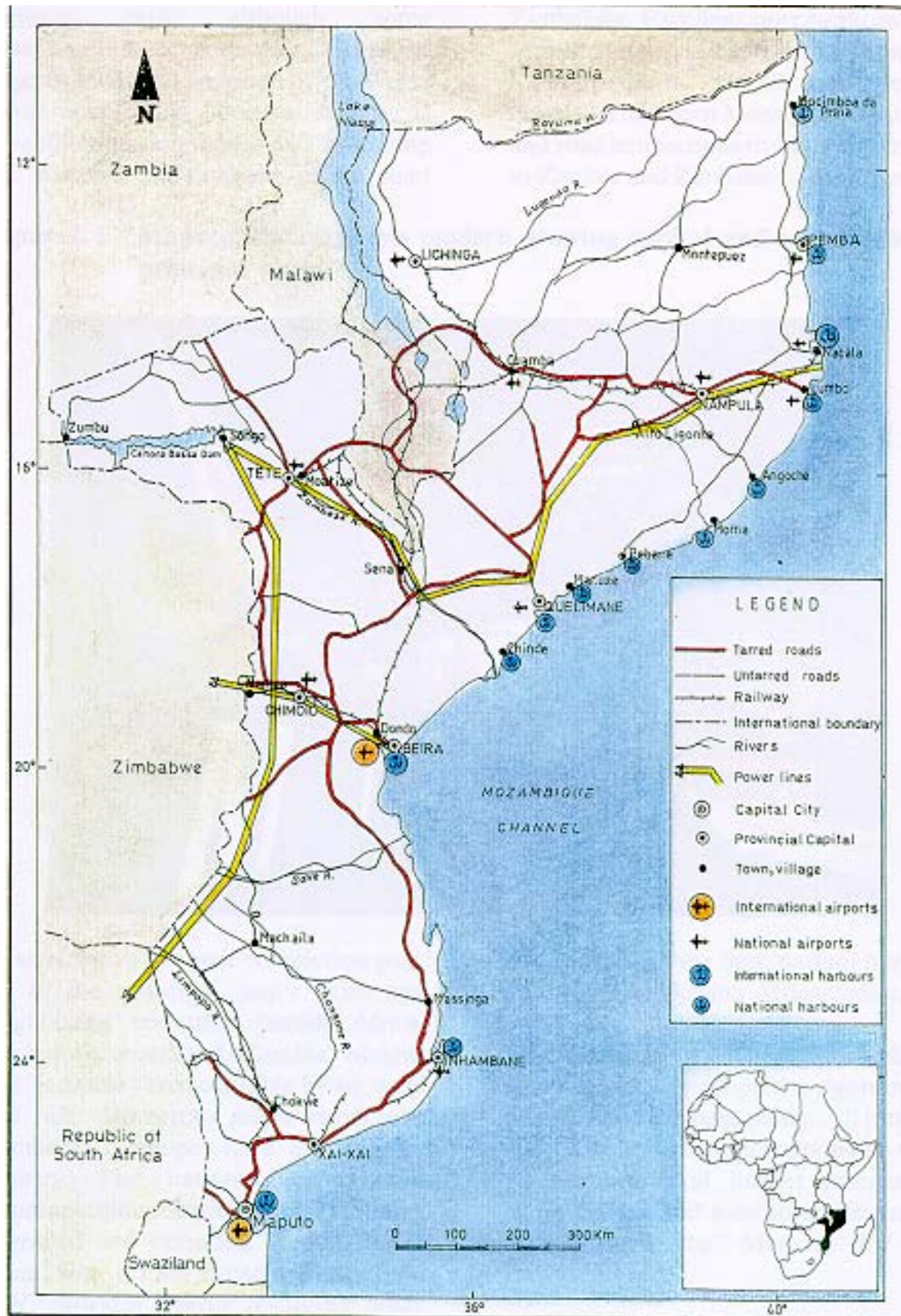


Figure 2 Map of Infrastructures



Economically Mozambique is a country of great potential in relation to natural resources, which are vast. In addition to mining and mineral resources, a few indicators:

**Agriculture** - with over 35 million hectares of excellent arable land where cash crops including copra, sugar, tea, cotton and cashew nuts are produced at world level volumes;

**Fishing** - Mozambican prawns and lobsters are famous;

**Tourism** - Beaches, sport fishing, game reserves and eco-tourism are plentiful;

**Energy** - vast. Hydroelectric resources led by the Cahora Bassa dam, the biggest on the African continent and one of the world's ten largest dams. Natural gas and coal add to this positive energy potential;

**Water resources** - are enormous, over 50 major rivers cross the country and 13,000 km<sup>2</sup> of inner lakes gives the country enough water for agriculture and other purposes;

**Transport** - an extensive railway and road system connect Mozambique's five major seaports with neighbouring countries.

**Infrastructure** - Mozambique's existing infrastructures are fair. Good telecommunications and transport facilities exist, although some rehabilitation is necessary. There is ongoing program supported by the World Bank and other donors, which is rehabilitating, upgrading and extending the national railway and paved road network with a five year completion goal. All of the countries' major cities and neighbouring countries (South

Africa, Zimbabwe, Swaziland, Zambia, Malawi and Tanzania) are accessible by air, road and rail, Numerous major rivers, e.g. Zambeze, Limpopo, Save traverse the country. The national energy and communications distribution grid is being upgraded and extended. Cahora Bassa alone, with a total capacity being 2400 MW, provides energy resources many times in excess of

Mozambique's own demands while also providing electricity to South Africa and in the near future to Zimbabwe. Excellent port facilities exist with connecting rail and road transport in Maputo, Beira, Nacala and Pemba. Nacala, in northern Mozambique with rail and road connections to Malawi, through to Zambia and Zimbabwe, is the deepest, and considered the best, natural harbour on the Indian Ocean's African coast.

### 2.3 Economic Overview

Performance of the Mozambican economy is so far very encouraging. In fact the 1997 balance indicates that GDP (Gross Domestic Product) grew in 8%, the inflation average growth was of 6,5% against more than 60% in 1995, the average depreciation of the national currency, Metical, was of 2.2%, this to provide you with some figures.

Acknowledging the good performance of the country in the implementation of the economic and social reforms and due to the seriousness of the external debt, the World Bank and the International Monetary Fund together with other creditors decided to elect Mozambique as a beneficiary of a financial package for debt reduction for highly indebted poor Country the HIPC initiative, starting from June 1999.

	1996		1997	
	10 <sup>6</sup> USD	%	10 <sup>6</sup> USD	%
Prawns	70,5	31,2	90,2	38,5
Cashew Almond	17,0	7,5	14,1	6,0
Cashew Nut	29,3	13,0	15,1	6,4
Cotton	26,8	11,9	22,2	9,5
Sugar	12,8	5,7	12,8	5,5
Copra	3,7	1,6	4,6	2,0
Citrus	1,0	0,4	0,8	0,3
Wood	9,8	4,3	13,8	5,9
Mineral products	3,3	1,5	4,6	2,0
Fishes products	9,0	4,0	7,2	3,1
Manufactured products	8,3	3,7	19,9	8,5
tyres	2,4	1,1	3,3	1,4
Sub-Total	193,9	85,8	208,6	89,0
Others	32,2	14,2	25,8	11,0
Total	226,1	100,0	234,4	100,0

**Table 2 Main Production**

The table show a small increase in the investment as well as in the mineral production.



**Figure 3 Maputo, the country's modern growing capital one of the five principal ports**

### 3. Legal Framework

#### 3.1 Mineral Licensing

Mining and Geological Policy was approved by Resolution 4/98 of 24th February 1998 which, together with the existing legislation, encourages private participation in the mining ventures while reducing state participation in them. Exploration and mining activities are governed by the Mining Law (No.14/2002, of June 26, and by the Mining Law Regulations approved by Decree No.28/2003, of June 17. Tax and other fiscal matters for the mining sector are subject to the Fiscal Regime (approved by Decree 53/94 of November 9. Small scale and prospecting permits are governed by the Mining legislation. The extraction of construction materials and quarries are subject to licensing under the Mining Law and its Regulations.

Applications for mining rights are addressed to the Minister of Mineral Resources & Energy and submitted to and processed by the National Directorate for Mines. There are five types of mining titles differentiated according to the type of mining activity: Reconnaissance Licence, Prospecting and Exploration Licence, Mining Concession and Mining Pass.

For medium to large scale mineral activities the relevant titles are the Reconnaissance Licence, Prospecting and Exploration Licence and Mining Concession. When applying for these licences, details of the applicant's identity, financial and technical resources, as well as work programmes and budget must be provided. Periodic progress reports are demanded to monitor prospecting and mining operations.

A Reconnaissance Licence is available for reconnaissance operations and is valid for two year. It covers large areas and entitles the holder the right to an exploration licence for a specific mineral in non exclusive area.

A Prospecting and Exploration Licence is issued for an initial period of up to 5 years consistent with the work programmes and budget. The licence may be renewed once for further period of 5 years and for such other period as the Ministry may determine.

The holder of a Prospecting and Exploration Licence has the right to apply for and to be granted a Mining Concession for the particular mineral and area under licence upon submission of mine development and production plan. The maximum period of the licence is 25 years or the life of the mine, whichever is shorter. The Mining Concession may be renewed for further periods not exceeding 25 years each.

Generally large scale and foreign investment projects are also subject to individual licensing agreements because of the complexity and duration of the operations as well as the need to provide for and regulate foreign investment guarantees and incentives. These licensing agreements generally follow the form of a model prepared by the National Directorate of Mines.

Mining certificates are available only to individuals and co-operative associations for small scale artisanal operations and for general prospecting within a defined area. The holder is also entitled to prospect, peg and register a claim. On this basis, the holder can obtain an exclusive certificate or a licence to explore and mine a claim. The mining certificate

has duration of 2 years and is renewable.

The Mining Law provides licence holders with security of tenure allowing linkage between exploration to mining rights. Termination for breach of the law and its regulations or any of the other terms or conditions on which a licence has been granted, is subject to statutorily defined procedures.

There is a general provision in the Mining Regulations requiring licences to conform to the requirements for environmental protection of natural resources. A prerequisite to the grant of a mining concession is the presentation of an environmental impact assessment and environmental plan.

For foreign investment projects, licensing agreements establish detailed provisions, in accordance with industry practice, with regard to force majeure, arbitration, termination and applicable law

### 3.2 Foreign Investment Law

The Investment Law 3/93 of June 24, governs, with the exclusion of the mineral and petroleum resource sectors, all areas of national and foreign investments.

The Government welcomes and encourages direct foreign investment that results in benefits to the national economy while providing investors with fair returns. The economy is open equally to foreign and national investment in all sectors. The same investment incentives are available to both foreign and local investors.

Foreign investors are allowed to operate both local and foreign currency accounts. Foreign currency accounts

held by investors are "denominated" meaning that the availability and free transactability of the foreign currency funds are guaranteed. Foreign retention accounts

where foreign currency receipts from Mozambique derived production and sales are received and held in foreign bank accounts may be allowed on a case by case basis for mining enterprises.

The Banco de Mozambique (BM) is the Central Bank in accordance with exchange law 3/96 of January 4. It is the foreign exchange control authority both for registration of investment and for the remittance or repatriation of foreign investment profits and capital. There is a growing number of private banking and financial institutions: Banco de Fomento e Exterior, Banco Standard Totta de Mozambique, Banco International de MMoçambique, Banco Comercial e de Investimentos, Equator Bank (involved in trade credit) and others. The Commonwealth Development Corporation and the Caisse Française de Development are among the public financial institutions which have operations in Mozambique. A number of other new financial intermediary institutions have been established which offer foreign exchange and investment services.

Under the investment law foreign investors obtaining domestic currency loans follow the same requirements applicable to nationals. Loans may be given for the short, medium or long term, depending on the nature of the undertaking. The foreign investor can arrange any loans required in foreign currency from abroad, with terms, interest rates, grace periods and timing of repayments being subject to formal approval by the Banco de Mozambique. The right to repatriate

capital, dividends and other distributions of profit is guaranteed by law 3/96 of January 4, Exchange Law.

### 3.3 Trade Law

Mining as is the case of other business activities can be undertaken in a personal capacity or through a commercial company. For a foreign person to carry out mining and other business operations including the opening of bank account, obtaining an import or export licence, import duty exemption certificate and other operations and benefits, it is necessary to either incorporate a local company or register a local business agent (commercial representation). The registration of commercial representation or agent is done at the Ministry of Commerce.

The steps to register a local representation include:

- Obtain certificate from the Commercial Registrar that confirms that no other company name already exists similar to the name being proposed.
- Open bank account in the company name and deposit the minimum share capital specified (these funds may not be transacted until after the companies formation).
- The statutes or articles of association are recorded or filed through the “escritura” which is a formalised written recorded of the company statutes.
- The statutes are published in the Boletim da Republica( official Gazette).

- The company is registered with the commercial Registrar and with the local tax office.

Normal registration time will be around two to three months with average costs ranging from US\$ 500 to US\$ 1,000.

There is no requirement for Government or local participation or ownership.

Basic accounting requirement is established in the general Plan accounts. All businesses are required to keep accounts in a manner appropriate to their type of operations, and to maintain proper records in the form of asset register, daybooks and ledgers, retaining copies for ten years. This supervised by the Ministry of Planing and Finance.

The financial year in Mozambique runs 1st January to 31st December. A Company may, with the permission of the Minister of Finance, opt for a different financial year. The company must, for fiscal purposes, close its books and prepare financial statements for the 1st January to 31st December financial year of the foreign investors country of origin, at the request of the investor.

### 3.4 Employment

Employment of workers is governed by the Labour Law No.8/98 of July 20 and recruitment of expatriates is governed by Decree No. 57/2003, Dezember 24. Special procedures apply to expatriates recruited for authorised foreign investment projects.

Unless special terms and procedures are set in an employment contract, the Labour Law regulates the employment relationship.

The right to organise unions and negotiate collective agreements is Guaranteed in the Constitution and regulated by Decree No.33/90.

Normal working day is eight and half-hours and working week varies between 42 and 45 hours. Shorter hours may be adopted for health and safety factors. Shift workers receive a shift bonus of 15% of basic monthly pay. Employees are entitled to paid vacation starting from the first year with 15 days, 20 days in the second and 30 days in subsequent years.

There is a social security scheme for all workers. The labour legislation is under revision.

### 3.5 Privatization Law

- The privatisation process is governed by Decree N° 21/89 , of 23<sup>rd</sup> May, which regulated the alienation of States Companies by means of public bidding and states the administrative system for its execution;
- Law N° 13/91, of 3<sup>rd</sup> August, which authorises the transformation of “Empresas Intervencionadas” (companies that through the relinquishment of their owners or negligence of their managers were taken over by State) into public or private companies;
- Law N° 15/91, of 3<sup>rd</sup> August, complemented by the Law N° 17/92, of 14<sup>th</sup> October, which set regulations norms and for the restructuring of the Public Sector, regulated by the Decree N° 28/91, of 21<sup>st</sup> November, which states the Legal and Administrative

proceedings for the restructuring process.

### 3.6 Resolution of Disputes

Disputes may be settled by negotiation or by arbitration. For authorised foreign investments in the mineral and petroleum sectors, final recourse may be international arbitration under the Rules of the International Chamber of Commerce or under the auspices of the International Centre for the Settlement of Disputes.

### 3.7 The Mining Tax and Investment Code

The increasing mining activity taking place in the Country is a result of the economic, political and social environment conducive to foreign investment that was established by the Government of Mozambique. We do recognize that there is still a lot to be done, to make our country more attractive to new mining investment projects. From time to time, we do compare our mining fiscal regime and incentives with the ones in force in the region to enable us to continue competitive.

The income tax rate for mining ventures is 40%.

The mining sector tax regime was enacted in 1994. Before, mining was regulated by the general tax regime which is more appropriate to a small scale manufacturing industry or services. This mining sector tax was prepared based on, our previous experience of licensing agreements and current licenses and tax regimes applicable to the mining sector in neighbouring countries and other countries with similar conditions.

Our mining tax regime takes into consideration the fact that, Mozambique does not have an industrial and manufacturing base to serve the mineral sector, almost all plant and machinery has to be imported, almost all mining production is for export, and the lack of infrastructure in particular in remote areas where mineral projects are located.

It is recognized that these circumstances add to costs as well as increase the project risk.

To ensure that Mozambique is an attractive investment opportunity as its competitors in the region, the goal is to balance or neutralize these shortcomings or negative factors. In this regard, fiscal incentives are part of this fiscal regime.

The most important of these fiscal incentives include:

- Accumulation and carry forward of expenditure during the exploration and development stages until the first year of production when they are entered in the accounts;
- Accelerated depreciation terms for exploration and development expenditure, alternatively standard or life of mine straight-line rates may be used;
- Royalty levied on mineral production at a rate of 3% for most minerals; 5% for precious metals; 6% for gemstones and 10% for diamonds. Royalty is deductible for determination of taxable income;
- The income tax rate set at 40% with a fifty per cent reduction to 20% for a period of ten years after start of production;
- Foreign non-resident sub-

contractors of mining operations are exempt from the sales tax on services and pay a reduced income tax of 15%.

- Exemption of import duties, taxes and charges on exploration and mining equipment and other materials imported during and for the purposes of exploration and mining operations, this exemption extends to subcontractors;
- Exemption of duties and taxes on exports of mineral products;
- Exemption of withholding tax on interest paid on foreign sourced loans (the rate is normally 18%);

There is a strategy to encourage exploration. In general, exploration, development and operating expenses are allowed as a deduction in respect of the productive unit which they serve. Similarly, a exploration expenditure incurred in respect of a licence area which is not developed may be allowed as a deduction in respect of another deposit/mine brought into production by the same title holder;

### 3.8 Industrial Free Zones

The legislation, which comes under the general investment scheme (see footnote 1 above), is not applicable to the extractive part of mining projects, but would be applicable to downstream processing and beneficiation operations. There is a minimum investment requirement of US\$5 million and factors such as the number of jobs created for Mozambicans, the use of and added value to Mozambican resources and products, and the generation of foreign exchange through export of the product determine whether a project qualifies for the status of an

industrial free zone. As an industrial free zone, an enterprise qualifies for the following fiscal exemptions and benefits:

- Exemption from all customs duties on the import of equipment, plant and other materials for the set-up and operation of the factory as well as for materials used in product manufacture.
- Exemption from all taxes on income, paying instead a royalty on gross revenue which is set at 2% for the first five years of activity and 5% thereafter.
- Dividends and other distributions of profits are exempted from the 18% withholding tax during the first five years of activity.
- Exemption from customs duties on export.
- A special labour regime applies to employees including the discretionary hiring and firing and the only restriction on the wage rate is that it may not be less than the statutory minimum wage. This is being revised under revision of the labour law.

Industrial free zone applications are subject to a maximum forty-five day processing limit and are handled through the Investment Promotion Centre.

### 3.9 Environmental Protection

While promoting mining investment Mozambique seeks to attract investors who care about environmental protection.

In this regard the Environmental Law n<sup>o</sup>. 20/87, of October 01 was enacted, which imposes to the operator an environmental impact assessment

before the operations take off. This was followed by the enactment of the competent Regulations being specific for the mining activity approved by Decree 26/2004 of June 30. The mining activity has also to comply with the provisions of the Water Law no. 16/91 of August 03 regarding the use and discharges into the water.

### 3.10 Mining and Related Operations

In Mozambique, minerals and other natural resources including land, *The Land Law (Law 19/97 of October 01) is wich provide greater security and stability to land use titles. The respective Regulations (Decree. 66/98 of December 8. Land is property of the State, which controls their use and licensing. The principle, which is set down in the Constitution, is reiterated in the legislation governing the mineral sector, namely the Mining Law (Law 14/2002 of June 26) and its Regulations (approved by Decree 28/2003 of June 17).*

Within the government, the Ministry of Mineral Resources and Energy has administrative and regulatory responsibility for the mineral resource sector. Administration of mineral licensing procedures is carried out within the National Directorate of Mines.

Under the Mining Law, mining activity may be carried out under five different types of licenses:

- Reconnaissance Licence,
- Mining Certificate,
- Prospecting and Exploration Licence,
- Mining Concession and



-Mining Pass.

In addition, there is a and minerals products commercial license, which permits the license holder to buy and sell minerals products, Decree 31/95 of July 25 [Regulations Regarding Commerce in Minerals products.

For medium to large scale ventures and for foreign investment the relevant titles are the exclusive and non-exclusive Prospecting and Exploration Licence and Mining Concession.

Where a person wishes to conduct **reconnaissance** operations, such as satellite and air photo imagery and/or field techniques, to determine, for example, the location of a particular mineral occurrence or whether a certain geological environment contains any economic minerals of interest, a **non-exclusive Prospecting and Exploration licence** is issued. This instrument has the duration of one year (non-renewable), may cover relatively large areas and gives the holder a presumptive right to an Prospecting and Exploration Licence for a specific mineral and for a discrete portion of the overall reconnaissance area where the occurrence or deposit has been located. This licence is non-exclusive to the extent that a particular mineral occurrence is not yet specified and the holder has a priority or preference, rather than an exclusivity, in claim or a right of preference before other claims or licence applications for the area and mineral resource(s) covered by this licence

## GEOLOGICAL AND MINING OVERVIEW

### 4.1 Geology

Mozambique's geological terrain comprises approximately 534 000 km<sup>2</sup> Of Precambrian terrains and 266 000 km<sup>2</sup> Of Phanerozoic terrains .

The Precambrian terrains include igneous and metamorphic rocks of Archaean to Upper Proterozoic age.

The Phanerozoic terrains comprise sedimentary basins and related volcanic rocks of the Karoo, Jurassic, Cretaceous, Tertiary and Quaternary age.

#### 4.1.1 Precambrian

The Precambrian areas are divided into three large structural units (Figure 3), as follows:

##### I. Archaean and Lower Proterozoic terrains

They outcrop near the border with Zimbabwe, and constitute the extension of the Greenstone Belt and the granitegneisses of the Zimbabwe Craton.

##### II. Precambrian terrains

They are organised between the end of the Middle Proterozoic and the beginning of the Upper Proterozoic

These terrains are divided into two main belts:

a) The southern extension of the **Irumide Belt**, located at the

eastern margin of the Zimbabwe Craton and at the Northwest of Mozambique as a prolongation of the Irumide Belt of Zambia. The age of formation of these rocks could be Middle roterozoic, and the age of metamorphism is about 1 300 M.Y., according to geochronologic data of Zambia and Zaire; the same rocks were remobilised during the Mozambiquian (Kibarian) orogeny (1 100-900 M.Y.);

b) The **Mozambique Belt** which covers extensive areas of the country. Three main events can be distinguished, each one forming characteristic geologic units:

- Suprasialic terrains (dated 1100-900 M.y.) formed by gneisses with leptinites and a volcano-sedimentary association probably related to an old oceanic discontinuity;
- Igneous complexes, represented by granulites (1070-900 M.y.) and related to a period of convergence;
- Nappes formed during a period of crustal overthrust (c. 1000 M.Y.).

During the last two periods (i.e. convergence and crustal overthrust) intensive granitization of the different units took place.

##### Pan-African Cycle

Represented by deposits of Katanguian orogeny (800-600 M. y.), and an intensive thermo-tectonic event (500 M.y. ± 100 M.y.) with the emplacement of granites and pegmatites, and radiometric rejuvenation of minerals.

## Phanerozoic

During the Carboniferous period, in the area of Gondwanaland, rifting started, associated with sedimentation and widespread igneous activity. In Mozambique three main sedimentary basins were formed:

- a) Intracratonic basins of Alto Zambeze, Rio Lunho and Rio Lugenda, filled with continental deposits and volcanics (Alto Zambeze only) of the Karoo and Post-Karoo;
- b) Coastal basins of Rovuma and Mozambique; and
- c) Coastal basins of Save/Limpopo and Baixo Zambeze.

The last two basins are filled with MesoCenozoic deposits (continental and marine, from west to the east). The Karoo is only represented by volcanics and a thick Plio-Quaternary cover frequently overlays the older terrains.

## 4.2 Economic Geology

Large quantities of metallic and non-metallic minerals occur in Mozambique, most of them with estimated or calculated reserves.

They are distributed as follows:

- In Precambrian terrains - rare metals (niobium-tantalum), rare earth minerals, gold, fluorite, graphite, tin, feldspar, kaolin, copper, asbestos, iron, garnets and other mineralisations related to carbonatites and pegmatites (including apatite and a number of precious and semiprecious stones), as well as

ornamental rocks such as marble, black granite and red granite.

- In Phanerozoic terrains, clays, sands, refractory minerals, limestones, diatomite, bentonite, heavy minerals, coal, natural gas and phosphorites.

Furthermore, Mozambique is rich in thermo-mineral springs related to the Phanerozoic tectonics that affected all the country.

## 4.3 Geological Database

### 4.3.1 Geological Mapping

Mapping activities are conducted by the National Directorate of Geology (DNG).

The following topographic and geologic coverage of the country's 800 000 km<sup>2</sup> is available:

- Over 500,000 km<sup>2</sup> surveyed by airborne magnetic and radiometric methods including 511,360 km<sup>2</sup> at a 1:250,000 scale; 476,650 km<sup>2</sup> at a 1:100,000 scale and 12.675 km<sup>2</sup> at 1:50,000;
- Geologic mapping including 747,504 km<sup>2</sup> at 1:250,000; 472,540 km<sup>2</sup> at 1:100,000; and 173,200 km<sup>2</sup> at 1:50,000;
- Geochemical mapping including 373,000 km<sup>2</sup> at 1:250,000; 66,000 km<sup>2</sup> at 1:1 000,000; and 13,705 km<sup>2</sup> at 1:50,000;
- Satellite imagery and aerial photographic coverage of the entire country;

- Seismic surveys covering 2700 Km of off-shore areas and 20 004 Km of onshore areas.

Topographic maps at 1:250,000, 1:100,000 and 1:50,000 scales for the entire country except for

- Niassa Province and part of Cabo Delgado Province.
- Geologic, geomorphologic, tectonic, metallogenic and mineral resource maps of Mozambique are available at scales of 1:1 000 000 and 1:2 000 000.

A limited computer database of geological data on mineral resources including coal and petroleum is available and being expanded.

DNG has also carried out photointerpretation of aerial photos and satellite imagery. Photo-geological maps are available at scales from 1:40 000 to 1:250 000.

In 1987, DNG published a new geological map of Mozambique at a 1:1 000 000 scale, which substitutes the 1:2 000 000 scale 1968 edition (reprinted 1976).

Geological maps are currently available at a 1:250 000 scale for 94% of the country and at a scale of 1:50 000 for 22% of the national territory (see Figure 1).

	PRE 1975	1975 - 1994	TOTAL	% OF THE COUNTRY
Geological Mapping				
A	364 638	478 590*	644 722	81.57
B	123 540	349 000	472 540	59.11
C		173 200	173 200	21.67
Airborne Geophysical Surveys				
A	511 360		511 360	63.97
B		476 650	476 650	59.63
C		12 675	12 675	1.59
Geochemical Surveys				
A	137 700	238 300	373 000	46.66
B		66 000	66 000	8.26
C	6 630	7075	13 705	1.71
Scales: A – 1:250 000 B – 1:100 000 C – 1:50 000				
* Includes 198 506 km <sup>2</sup> mapped for the second time.				
Total area of the country 799 388				

**Table 3 - indicates some of the geological, geophysical and geochemical mapping activities at different scales which have been realised by DNG.**

Other cartographic documents available are:

- Mineral Deposits and Occurrences Map at 1:2 000 000, 1974 (published);
- Mineral Deposits and Occurrences Map at 1:1 000 000, 1995 (in preparation for printing).
- Industrial Minerals Deposits and Occurrences Map at 1:1 000 000, 1993 (Published);
- Cosmogeological Map at 1:1 000 000. 1980 (unpublished);
- Geomorphological Map at 1:1 000 000 and 1:2 000 000, 1984 (published);
- Lithogeological Map at 1:1 000 000, 1985 (unpublished);

- Metallogenic Map at 1:1 000 000, 1993 (Published);
- Tectonic Map at 1:2 000 000, 1977 (published);
- Tectonic Map at 1:2 000 000, 1995 (in preparation for printing);
- 435 Photogeological Maps of the Sedimentary Basins at 1:50 000 scale;
- 32 Geophysical Maps at 1:250 000 scale; and
- 128 Geophysical Maps at 1:100 000 scale.

Geologic maps are available from the National Directorate of Geology, while topographic maps can be obtained from the National Directorate of Geography and Cadastre (DINAGECA) as well as from the National Remote Sensing and Cartography Centre (CENACARTA).

DNG publishes an annual Geological Bulletin, which has now reached the 42<sup>nd</sup> edition.

## Covered Areas

### Geological maps at 1 : 50 000 scale

	Area	Maps	covered area in Km <sup>2</sup>	Company which take over the work
<b>Geological maps at 1:50 000 scale</b>				
1	Alto Ligonha	25	18 750	Aquater S.p.a
2	Alto Ligonha	43	29 250	Aquater S.p.a
3	Lúrio river mouth	7	5 900	Aquater S.p.a
4	Maputo	1	750	Aquater S.p.a
5	Monapo	4	5 200	Aquater S.p.a
6	Angónia		8 500	Aquater S.p.a
<b>Geological maps at 1:50 000 scale</b>				
1	Inhaca island	1	88	
<b>Geophysical maps at 1:250 000 scale</b>				
1	Tete, Sofala, Manica and Zambezia	24	212 000	Hunting
2	Cabo Delga and Niassa	12	159 770	BRGM
<b>Geochemical maps at 1:250 000 scale</b>				
1	Cabo Delgado and Niassa	17	159 770	BRGM
2	Nampula	12	120 000	BRGM
3	Alto Ligonha,	4	18 750	Aquater S.p.a
4	Manica, Sofala and Tete		212 000	Hunting

**Table 4- Available Maps**

## 4.2 Mineral Resources & Energy Base

Known major mineral occurrences of Mozambique are listed below together with their respective resource-reserve estimate:

<b>Apatite</b>	<b>274 million tons</b>
<b>Asbestos</b>	<b>500 000 tons</b>
<b>Bauxite</b>	<b>6.13 million tons</b>
<b>Bentonite</b>	<b>8.45 million tons</b>
<b>Black Granite</b>	<b>2 million tons</b>
<b>Clay</b>	<b>18.3 million tons</b>
<b>Coal</b>	<b>15 835 million tons</b>
<b>Construction Material</b>	<b>5 billion tons</b>
<b>Copper</b>	<b>382 000 tons</b>
<b>Diatomite</b>	<b>3 million tons</b>
<b>Feldspar</b>	<b>12 000 tons</b>
<b>Fluorite</b>	<b>1.45 million tons</b>
<b>Gold</b>	<b>47 000 tons</b>
<b>Graphite</b>	<b>40 million tons</b>
<b>Guano</b>	<b>900 000 tons</b>
<b>Gypsum</b>	<b>40.2 million tons</b>
<b>Iron Ore</b>	<b>254 million tons</b>
<b>Kaolin</b>	<b>4.4 million tons</b>
<b>Narble</b>	<b>30 million m<sup>3</sup></b>
<b>Mica</b>	<b>72 000 tons</b>
<b>Natural Gas</b>	<b>2.5 trillion cu. ft.</b>
<b>Nepheline Syenite</b>	<b>4.3 billion tons</b>
<b>Limestone</b>	<b>39.76 million tons</b>

<b>Perlite</b>	<b>945 000 tons</b>
<b>Silica</b>	<b>11.4 million tons</b>
<b>Tantalum Ore</b>	<b>7.5 million tons</b>
<b>Titanium Ore</b>	<b>348 million tons</b>

In addition, there exist unquantified but well known extensive occurrences of precious and semiprecious stones (including emeralds, aquamarine, tourmaline, garnet, amethyst, morganite, etc.), kimberlite, manganese, and phosphates.

Since 1976, through various bilateral and multilateral projects, a great deal of new exploration data have been acquired at an expense in excess of US \$150 million.

While current mining is limited to lode and placer gold, marble, gemstones, bentonite, coal, graphite and bauxite, major development projects are underway for heavy minerals, black granite and rare metals/rare earths. Exploration activities are being undertaken by foreign and local companies, as well as under bilateral and multilateral aid programmes.

## 4.3 Current Activities

### 4.3.1 Geology

The National Directorate of Geology is currently involved in the following activities:

- Geological and hydrogeological mapping at different scales (1:2 000 000, 1:1 000 000, 1:250 000, 1:100 000, 1:50 000, etc.);

- Collaboration with other collegial entities in regional and international geological mapping projects;
- Thematic mapping on geology (tectonic, geomorphologic and mineral resource maps);
- Geological mapping of off-shore areas;
- Regional and detailed mineral exploration surveys;
- Participation in studies related to mining and hydrogeological activities, engineering works and environmental studies;
- Laboratory analysis;
- Inventory and quality evaluation of groundwater including pollution;
- Computer processing of geological, geophysical and geochemical data;
- Collection, collation, management and dissemination of geologic information;
- National archive of geologic specimens;
- Geologic Museum.

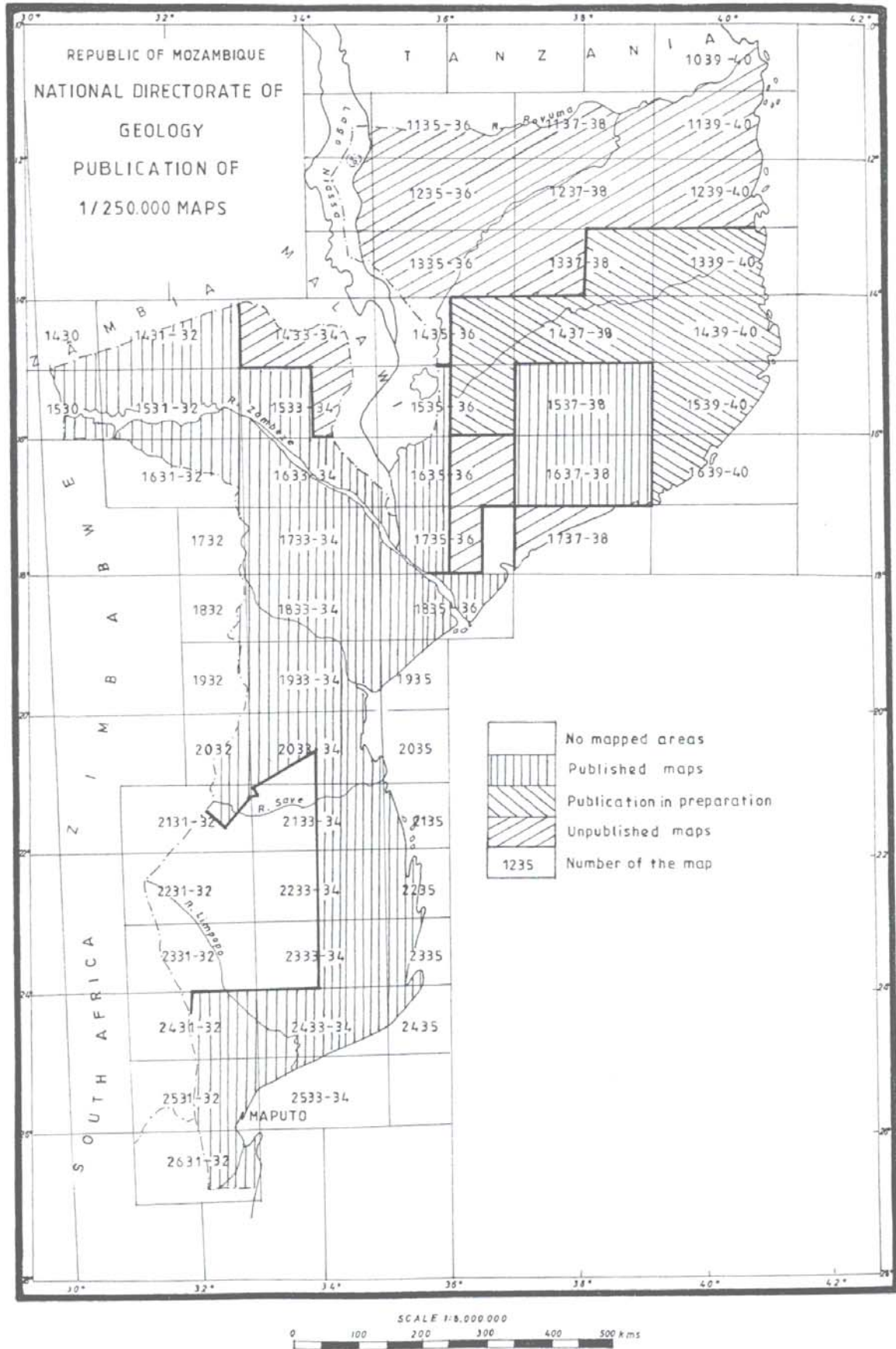


Figure 4 - Available Geological Maps



#### 4.4 SELECTED MINERAL RESOURCES INVESTMENT OPPORTUNITIES

##### Gold

Gold occurs in lode and placer deposits throughout Moçambique. In addition to the better known deposits in Manica and Niassa provinces, as detailed below, extensive alluvial gold occurrences are found in Nampula, Tete and Cabo Delgado provinces. Epithermal evidence indicates the potential for gold in the Marínguè-Canxixe area along the border between Sofala and Manica provinces.

##### Manica Province

Gold occurrences are well known in Moçambique particularly in Manica Province, where from ancient times until the present day, both primary lode and secondary alluvial-alluvial deposits have been mined. Some 30 lode mines, albeit on a small scale, were active at one time in this area. The alluvial areas have been dredged. The overall mineralised zone, covering approximately 450 km<sup>2</sup>,

Occurs within the geologically favourable extension of the Umtali Gold Belt of Zimbabwe, part of the Rhodesian Craton.

The lode deposits are found within the Following lithologic units:

**Figure 6 Gold Mining in Manica**



**Figure 5 Alluvial gold mining in the Manica Province**



- a **Greenstone Belt** - world-wide, a favourable horizon for Archean gold deposits;
- b Associated serpentinites and talc schists perhaps genetically related to the Greenstones;
- c Granitic rocks, especially near the Greenstones;
- d Metamorphosed black shales and other meta-sediments.

Stratigraphically, the Upper Greenstones are perhaps the most favourable.

The lode gold mineralisation can be classified in two groups:

- (a) Ferruginous quartzites (banded iron formation), associated with sulphides, e.g. pyrite, pyrrhotite, arsenopyrite, and chalcopyrite with minor galena and sphalerite - the sulphides making up as much as 30% of the total volume.
- (b) Gold-quartz veins, or associated with sulphides.

Four principal lode mining areas are well known. These are:

- a Chimezi;
- b Chua;
- c Penhalonga/Revué;
- d Mangota.

A recent review of these mining areas, show that some 18 mines, have a minimum resource potential of 22,202 kg of gold averaging 6.7 g/ton, extractable from a total of 3.5 million tons of run of mine ore. It should be noted that this estimate is based on an

average strike length of 250 metres having a width of 3.5 metres.

Reef gold occurrences are known on the Zimbabwe side of the Umtali gold belt in the Penhalonga Valley. Gold occurs in the reefs of granodiorites, or greenstones close to granodiorite. The gold mineralization is believed to be genetically connected to the magmatic intrusion in the dioritic stock, with the main centre of mineralization being near the Resende Mine. The larger mines occur only in the upper part of the Greenstone Series near the basal conglomerates. This kind of mineralization is yet to be located in the Mozambican side.

Another interesting type of gold mineralization characteristic of these zones but not yet located on the Mozambican side of the Greenstone Belt occurs in felsites in the following forms:

- (a) As primary mineralization in the lattice of the arsenopyrite crystal, the crystals occurring in well defined layers parallel to the felsite surface.
- (b) as secondary mineralization at the contact with serpentinite, occurring as fracture filling and found in small flakes.
- (c) as a weakly mineralised zone, at the base of the felsite bodies.

Principal alluvial deposits are found in the rivers Revu , Inhamurra, Muza and Chimezi , while only minor elluvials have been encountered to date in along the Mimosa and Chua rivers. Estimated resource potential based only on the areas studied so far, amounts to 112 000 000 cubic meters of auriferous gravels, averaging 0.2488 g/m<sup>3</sup>, yielding 25,408 kg of

gold. These placer deposits are rather shallow, averaging 10m in depth and are believed to be exploitable by dredging, or by using drag scrapers.

In view of the favourable geologic setting, past history, and known resources, further development of the Manica gold resources appear justified. It is believed that estimates presented herein are conservative, and that further exploration of the lode and placer deposits will substantiate additional reserve-resources both in the existing areas, as well as in the discovery of new mineralised zones.

### **Niassa**

The Northwest corner of this province has a newly found greenstone belt which has been the object of a mini Gold Rush since about 1990/1. Methodical geologic study of the area was recently begun. Production during the last four years from basic panning and digging operations is estimated at some 5 tons per year based on extrapolations from legal sales. These figures are based on Tanzania figures for the frontier zone where most production is sold. A road is being built from the Mozambican side to allow direct access from the provincial capital of Lichinga.

### **Coal**

The Zambeze River Basin is known for its huge reserves of high quality coal. At present coal is being exploited at Moatize near the town of Tete where 2 billion tons of proven reserves of coal have been delineated. Other areas north of the Cahora Bassa Reservoir (north of the Zambeze River) have been investigated and good reserves of coal have been found.

Recent (1981/84) exploration of the area south of the Zambezi River has confirmed other interesting coal basins which are strongly recommended for further exploration work. This area is known as the Luia Dome and Metangula Rift.

The Metangula Rift is characterised by Cretaceous deposits. It can be assumed that coal will occur at the same depth as at the northern end of the Rift. In the southern part of the Rift, it is assumed that the Cretaceous and the Quaternary deposits overlie the basement and probably the lower part of the Karroo sequence as well, at a relatively shallow depth. Lower Karroo rocks have been mapped in the area, which confirms the region's potential for coal. Lower Karroo Sediments have been confirmed east of the Metangula Rift. These rocks extend for approximately 100 km Southeast from Estima.

This area has an advantage over other areas north-west of the Zambeze river because of good road connections, electrical power and close proximity to the Moatize deposits. Detailed geological exploration is needed for the area.

Coal resources of Muarazi-Ncondezi areas are also of particular interest. Based upon the exploration done to date, indicated reserves, at a depth of 100 metres, are 200 million tons of coal (Ash 25-40%, volatile matter 24-40%, swelling index 4.5-6 and calorific value 54007800/kg). Resource potential is estimated at 3 billion tons.

## Carbonatites

### Monte Cone N'gose

#### Monte Muambe

The Mt. Muambe carbonatite body is located to the east of Moatize area in Tete Province. The ring shaped body, intruding Karroo Sandstone, is 780m high with a 6 km external diameter. Fluorite mineralization is found in the carbonatites, along the fractures and in brecciated fenites especially along the contact zones. The metasomatic aureole of the fluorite mineralization in the fenite is up to 50 meters wide.

Fluorites, blue and yellow in colour, appear to meet the specifications of metallurgical grade. The ore is amenable to flotation to produce 98% CAF<sub>2</sub> per chemical grade requirements. The estimated resources are about 1.1 million tons.

Apart from fluorite, the following minerals/elements are known to occur in the carbonatite of Mt. Muambe:

- (a) 1.5 million ton of martite (without TiO<sub>2</sub>)
- (b) High content of Be, Nb, Sr and rare earths.

Detailed studies are warranted in this body to define the reserves and the economic potential of the different minerals. Such work should involve mapping, trenching, drilling, and limited resistivity survey. Further investigation should be carried out on the fluorite in contact zones with carbonatite and fenites.

Data from preliminary geological studies and evaluation is available.

The Mt Cone N'gose carbonatite body lies in the north-western part of the Tete province, marked by the coordinates Lat. 15° 30' 15" 38' and Long. 31° 12' 31" 21'. A preliminary geological, geochemical and mineralogical study, concluded in 1983, outlines possible economic mineralization.

An earlier investigation in 1977 defined the following mineralization in the different types of carbonatites:

- a Grey carbonatites: pyrochlore and monazite;
- b Buff carbonatites: bastinasite and barytes;
- c Dark red carbonatites: brookite and barytes;
- d Phosphatic carbonatites: fluorapatite, pyrochlore and barytes;
- e Silicified carbonatites: fluorapatite.

Phosphate rich rocks occur in the central part of the carbonatite dome. Up to 1m wide veins of apatite are found in the buff carbonatites. Although known average content is only 1 to 2 %, not enough data exist to make a proper evaluation. Concentration in residual soil, though believed to be high, is not known.

The nature of the mineralisations and their varied assemblage deserve detailed geological exploration to establish the true resource potential of this deposit.

exploration has focussed on the Moebase-Mecalonga stretch continuing to the Lipobane peninsula.

## Heavy Minerals

Heavy mineral sand deposits occur extensively along the Mozambican coast.

A preliminary **study** undertaken in 1980/82 outlined several promising areas between Ponta de Ouro and Rio Rovuma, with total indicated heavy mineral resources well in excess of 2 420 million tons.

Three sectors were selected among these promising areas. One from Chinde/Quelimane to Raraga, the other located in the area between Moma to Quinga and the third one in the Limpopo River delta area just north of Xai-Xai the capital of Gaza province. All of these areas are currently undergoing detailed prospecting. The work includes geomorphologic mapping, photogeologic interpretation, ground follow-up, close grid drilling and detailed mineralogical analysis and testing.

Near Quelimane, exploration carried out in the early eighties in a 19 km<sup>2</sup> area between Micaúne-Deia identified a total resource of 2.5 million tons of economic heavy minerals based on a 7.5% cut-off grade. Results are based on some 1 000 drill holes, averaging 5.5m in depth, and from the mineralogic-chemical analysis of about 6000 samples. 90% of the heavy minerals is composed of ilmenite, with minor concentration of rutile, zircon and monazite. Currently further work is being carried out to confirm these results and further define the reserves.

After wide spaced drilling in the zone between Pebane and Raraga,

**Figure 7 Heavy Minerals Exploration in Moebase**



In the Angoche region probable reserves are believed to be of much higher magnitude (1 500 million tons of THM), but with lower cut-off-grade for economic heavy minerals (20 million tons at 3%). Here the dune bodies are up to 30m high. Further work is being done to define the outer limits of the deposit in the *decksand*, old dunes and coastal areas to the north of the Congolone peninsula.



**Figure 8 Geological sketch of the Alto - Ligonha pegmatite deposit, Nampula and Zambézia Provinces**

## **Kimberlites**

### **Niassa Province**

The only known kimberlites in Moçambique as such occur in the Lunho river basin in Niassa Province, confined within the limits of the Maniamba graben. An area of about 1 500 km<sup>2</sup> has been studied. The magmatic activity of the area is related to the Katangan Orogeny.

The area was pan-sampled at a density of 8 samples/km along the major and minor rivers. A magnetometric study and pitting and trenching were also done.

Subsequently, detailed mineralogic studies were undertaken to delineate the kimberlite bodies.

Four important kimberlite areas have been outlined (a) Mefulilitxe-Fugoé, (b) Upper Fugoé (c) Tulo-Namango and

(d) Luimba. NNW and NNE - NE trending faults dominate the regional structural pattern. Both kimberlite dykes and chimneys have been found. The intrusions are believed to be mid-

include magnetite, picroilmenite, olivine, almandine with rare chromediopside, perovskite, rutile, limonite and monoclinic pyroxene. The non-magnetic heavy fraction of the alluvials from the Lunho and Fugóé rivers contain rutile, zircon, monopyroxene, ilmenite, apatite, almandine, pyrope, limonite, hornblende, and phlogopite.

This mineralogic suite is akin to true kimberlites.

The results to date confirm the existence of kimberlites. Their diamond-bearing potential remains to be determined. The kimberlitic magmatism has, until now, been found only in the SW of the Maniamba graben in the Lunho and Fugud river basins. Within this zone, several isometric bodies are found, which could be diatremes or their root-zones.

The kimberlitic bodies should in future be looked for particularly in the northern and north-western extension of the present area, since gangue mineralization of diamond has been found in the Messinge river.

In view of the known environment, especially related to the rift zone, it will be misleading to consider a great chance of successfully locating diamondiferous kimberlites. Yet the positive results obtained, coupled with tectonic idiosyncrasies of the concentration of mineralization in a certain environment, merit further, detailed investigation of the Mozambican kimberlites.

Createceous, common in African kimberlites.

Principal minerals present in the heavy fraction of the Mozambican kimberlites

#### **Alluvial and Elluvial Diamond Deposits**

Based on a favourable geological setting and isolated panning finds of diamonds along the Limpopo River, potential exists for alluvial and alluvial deposits, from the cratons in South Africa and Zimbabwe, along the Libombo mountains in Maputo province and along the length of the Limpopo River Basin in Gaza province particularly near the border with Zimbabwe and South Africa at Pafúri.

### **Pegmatites**

#### **Geological Setting**

The rare metal pegmatites of the Nampula and Zambézia provinces host a large number of minerals of economic interest. These include columbite, tantalite, bismuth, manganese-apatite, beryl, as well as radioactive minerals. Among the larger, better known deposits that have been mined in the past and currently are under review are the tantalite mines of Muiane, Morrua and Marropino.

The pegmatites are located in the Mozambican mobile belt affected by the metamorphic cycles of pre-Lurian (> 1000 M.y.) and Lurian (Kibarian/ ± 1000 M.y.). Emplacement of granites and pegmatites took place during the Pan-African (500 M.y.) time. Basic dykes intrusion, related to the opening of the Moçambique channel, occurred at the end of the Mesozoic.

The Lurian orogenic cycle produced the Namama orogenic (mobile) belt, trending NNE-SSW, demarcating a region of special significance where most of the mineralised pegmatite bodies have been encountered.

Subsequent to semi-detailed regional geological and geochemical investigations, a few areas were selected where the pegmatites bodies' distribution both temporally and spatially appear to be the most interesting in terms of mineralization. The most promising areas are detailed below:

**Nahora area:** 38° 20'E - 15° 52'S (area code 48-54).

A large number of pegmatite bodies are found here. In many of these, beryl, aquamarine, tourmaline is found along with rare metals and gem minerals. Detailed work is warranted to define true potential.

**Namala area:** 38° 40'E - 15° 55'S (area code 56)

Pegmatites contain radio-active minerals, aquamarine and rose quartz. Significance of the area is enhanced due to the coincidence with tungsten anomalies. Further work is warranted.

**Nuaparra area:** 38° 02'E - 15° 47'S (area code 40)

High density of mineralised pegmatite bodies characterise this area. Associated minerals are beryl, lepidolite and bismuth. Much work is needed, as the area has not yet been explored methodically, but only sporadically for isolated gemstones occurrences.

#### 4.5 ONGOING INVESTMENT PROJECTS

The following is a partial list of the more notable mining and exploration projects, which have been undertaken since the enactment of the new Mining Law in 1986 and are currently in operation.

BILLITON (RSA) is investing in the exploration of heavy minerals in the region of Moebase (Zambézia Province). Considerable reserves of Titanium ore were found which made possible to classify as a world scale deposit. The project is in the stage of:

- Drilling in old dunes to increase knowledge of deposits.
- Technolgical studies to improve processing methods
- Marketing studies to monitor changes in the world Market.
- They are waiting improvement of marketing condition to start the feasibility study.

- BHP Minerals from Australia are exploring beach sands in Angoche and Moma in the Nampula Province. Their work allowed the discovery of new mining zones with high potential on heavy minerals, where is believed also to be another world class deposit.

Corridor Sand from South Africa is doing an exploration programme on Heavy Minerals by at Chibuto Gaza Province. Curent situation: Environmental impact study for new option(Export through Chongoene) of a Jetty in Chongoene was concluded.

- Exploration programme on phosphate, apatite and zirconium in Monapo – Nampula Province by the Norwegian enterprise NORSK HYDRO ASA. This work allowed to



identify areas with geological potential on phosphate.

- Investigation and Exploration programa on coal in the Moatize – Tete province by Austral Coal Mozambique a subsidiary of Australian company with the same name and JCI from South Africa Coal.
- Exploration on gold by ASHANTI GOLD FIELD at Canxixe and Maringue, Manica and Sofala Provinces.
- AQUATER SPA from Italy finalised a Pre - Feasibility study for exploitation of heavy minerals in the Xai-Xai and Chonguene areas, Gaza Province. The study concluded that there are reserves of 480mt at 6,0%, 1,4 TiO<sub>2</sub>, 3,2 ilmente + rutilo. The areas remain open for further Investment [US\$ 23 million] is needed to take over the exploitation.
- The development of the Pande natural gas field will serve both the South African and domestic natural gas markets through the implementation of a pipeline construction project from Pande to neighboring South Africa. Last year an agreement was signed with ENRON for the exploration and development of Pande Gas Fields.
- Another projects using gas of Temane and Buzi gas fields respectively for processing iron ore in a hot bricketing plant to be erected in Beira, power generation and use in other downstream industries such as production of ammonia, methanol, urea and so on, are at an advanced stage of development, is undertaken by ZARARA (DUBAI).

- Several companies are now in the process of applying for petroleum exploration rights in several areas of the country. Oil explorations in the Rovuma and Zambeze Basins have started and it is also being promoted for the Limpopo Basin.

- Rio Tinto-Mining & Exploration, Ltd

Since 2001 have been prospecting areas along the coast from the Limpopo valley (Gaza Province) to Jangamo (Inhambane Province).

Identified about 100million tonnes of reserves of heavy mineral sands of high content in FeO<sub>2</sub>. Invested USD2.95 in exploration and preliminary environmental studies

Other areas with potential along Limpopo river and Coastal dunes in Xai-Xai available for potential investors.

- Several mining houses from AUSTRALIA, CANADA, BRITAIN, SOUTH AFRICA, ZIMBABWE, are active in the country doing exploration in gold prospects and more applications for prospecting licenses in several areas are being analyzed.

### **Small Scale Gold and Gemstone Mining**

Small scale gold and gemstones mines are numerous throughout the country but in particular in the Alto Ligonha pegmatite field in the northern Zambézia southern Nampula province. Alluvial gold panning and mining is being carried out in Manica, Tete, Niassa, Zambézia, Nampula and Cabo Delgado provinces. Medium scale gravel, crushed stone and production

of construction materials is carried out throughout the country.

There is a small but successful lapidary industry in Mozambique. There are presently two facilities one belonging to GPL) and the second (Paloma) belonging to Tecnominas, a local private companies.

- Bentonite: Boane, Maputo Province Companhia de Desenvolvimento Mineiro (CDM - Gov't of Moç.) [Investment: US\$ 2 million]
- Bauxite Mine, at Manica Province, operated by Mina Alumina Lda,
- Garnet Mine at Niassa province owned by (SOMEC, Sociedade Mineira de Cuamba)

Further more there are Small scale mines and quarries in production around the all country.

#### 4.6 Operating Mines

The following Mines are currently in operating:

- Bauxite: Manica Province - Mina Alumina Lda. (E. C. Meikles (Pty) Ltd, Zimbabwe) [investment: US\$ 1.5 million]
- Marble: Montepuez, Cabo Delgado Province – Recently privatised (CMC di RAVENA, CREDI COOP & ROVISA) [Investment: US\$ 8 million].

#### 4.7 Mineral Production

Mineral products, which are currently produced in Mozambique de, major ones are Graphite, Bauxite, Bentonite, Pegmatite minerals, the table below shows major mineral product in the country.

**Figure 9 Artesanal gold mining in Mimosa, Manica Province**

Mineral	Unit	1991	1992	1993	1994	1995	1996	1997
Coal	ton	50,832	55,000	66,000	-	-	-	-
Bauxite	ton	7,760	8,340	5,990	9,620	10,663	11,460	8,534.4
Bentonite	ton	660	1500	0	1,781	6,289	796.00	1,218.2
Marble	M <sup>3</sup>	278,9	919	1,385	1,500	1,358	743.00	251.40
Garnet	Kg	1,280	2,250	272,5	2,096	1,952	49,2	1,084.0
Cut Gemstone	Ct	12,906	8,447	7,693	6,446	5,100	2,663	5,457-
Gold	Kg	62,8	393,76	296,06	336	236,17	45,475	0.0
Graphite	ton	-	-	-	430	3,019	3,282.9	5,125.2
Emerald	Kg		75	34	1,145.0	714	-	-

**Table 5 Mineral production in Mozambique mining sector**

Projects to be privatized in the

- Carbomoc E.E. a state owned

corporation which owns all  
underground

Coal mines in Moatize Basin in Tete Province. Is the only one still not privatized State owned company. One of the main constraints to the privatization process is the situation of the railway line, a sort of restructuring and partnership with several mining houses is being discussed. Partners are seeking for rehabilitation of underground mines.

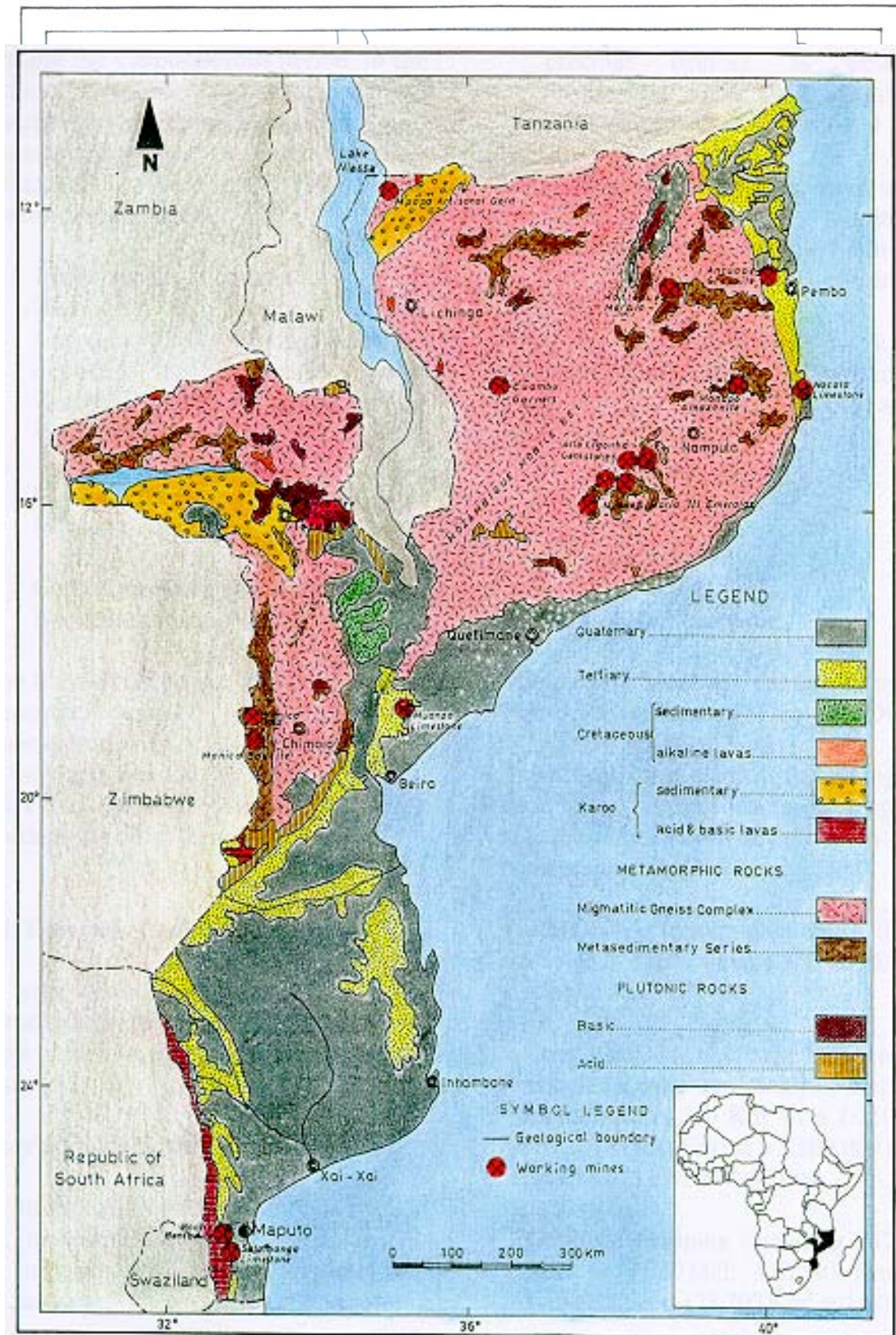


Figure 10 Sketch geological map of Mozambique with location of some current mining operations

#### 4.8 Areas open for Exploration

Mozambique's mineral resource base is huge but remains unexplored. There are; koalin, refractory minerals, high quality graphite, metallurgical grade fluorite, nepheline syenites, rare-earth minerals, zircon and lithium minerals, limestone, asbestos, vermiculite, magnetite, dolomite and diatomite in the Precambrian sequence in Mozambique, the following areas are priority for further exploration.

- Exploration of complex pegmatite in the Mozambique Belt which cover the Zambezi and Nampula provinces
- Greenstone belt in Manica and Niassa Provinces
- Area of Namuno and Balama for study of base metals and gold, Cabo Delgado Province
- Tete Province for gold, base metals, Platinum group metals, coal, and industrial minerals such as, fluorite, graphite among others
- Exploration for Diamond bearing Kimberites rocks and alluvial diamonds in following selected areas:
  - Kimberites rocks in Maniamba Basin and Valley of Lugenda river at Niassa Province
  - Zambezi basin in the Tete, Sofala and Zambezia Provinces.
  - On the edge of Barue formation and
  - On the edge of Karoo formation and sedimentary basin of south Save river.

In addition there are several private projects available for investment directly or in partnership with local entrepreneurs. Some of these are;

- ❖ Marropino Pegmatite deposit for tantalum ore and semi-precious stones production
- ❖ Exploration of pegmatite deposit of Napoxocola
- ❖ Exploration of Nuaparra pegmatite (Mica, quartz and semi-precious stones)
- ❖ Development of a Phosphate fertilizer deposit at Vilanculo, Inhambane Province (from bat-Guano)
- ❖ Exploration of the emeralds deposit of Maria III and Niame deposits, all in the Zambezia Province
- ❖ Amazonite Mining in Monapo
- ❖ Assessment and development of dimension stone quarry in Montepuez, Tete, Nampula and Niassa provinces
- ❖ Exploration of diatomite in Manhiça
- ❖ Development of Memba black granite dimension stone quarry.

## Mining and Geological Policy of Republic of Mozambique

Mineral resources have an important role in the economic development, contributing with raw materials for industry, construction and for exports.

It is the task of the state to promote and to direct the use of those mineral resources. In each point in time, setting objectives for the development of mineral resources and consequently related policies.

The Government of MOZAMBIQUE has established for this current fifth year, the following main objectives:

- Increase in mining production;
- Increase of exports of mineral products;
- Promotion of basic geological exploration with the objective of creating a good geological Data Bank and an updated mapping;
- Institutional development comprising namely the establishment of new operational instruments such as, mining inspection an more attention in training of human resources at all levels in order to increase efficacy of the sector.

### 5.1 Mining and Geological Policy

#### 5.1.1 Basic Mapping and Geological Coverage of the Country

The Government of Mozambique promotes and guarantees geological coverage of the country and encourages

private initiatives and preferential rights whenever in specific legislation, mineral resources of economic interest are discovered.

The Government will direct to this activity grants as well as soft loans from international agencies.

With the purpose of increasing the level of geological coverage of the country, it will be given priority to the following activities:

- Execution of geological mapping, on the scale 1:250.000, covering the square gradients 1436,1536,1636,1636,1736,2132 and 2133 respectively in Niassa, Zambeze, Manica, Sofala, Inhambane and Gaza provinces;
- Mapping of new pegmatite orebodies in Nampula and Tete provinces on an extension of 27.750 km<sup>2</sup>;
- Mapping of Archaean formation with gold mineralisation at Rotanda and the proterozoic formation of the Lago District in Niassa province;
- Mapping of selected areas at national level with mining potential in scale 1:50.000

#### 5.1.2 Rehabilitation and Mining Development

The government of Mozambique will continue to pay particular attention to national or foreign private investors giving them, all guarantees in the form of agreements or licenses as well as, through stable legal and fiscal framework, in special concerning mineral rights, fiscal benefits and foreign exchange incentives set in the mining legislation.

Mining activity takes place in remote areas frequently without infrastructure such as; roads, bridges, railway lines and energy among others. This aggravates and increases the capital to be invested.

The Government will promote erection of infrastructure involving whenever required, mining investors and making sure that they will have a fair return in their “investment “ through appropriate fiscal incentives.

With the purpose of increasing mining production the Government will promote the rehabilitation of old mines destroyed during the civil war and the development of new Mines, namely;

- Rare earth minerals Mines of Morrua and Muiane in the Zambeze province;
- Marble quarries at Montepuez in Cabo Delgado province;
- Gold Mines in Manica province and development of new mines in Niassa and Tete provinces;
- Gemstone Mines in Nampula, Zambeze and Niassa provinces and promotion of new Mines in Cabo Delgado and Niassa provinces;
- Acceleration of the process of starting production of black granites of Nampula province (Monte Mesa);
- Increase in production and local use of bauxite;
- Restart the production of graphite from Ancuabe in Cabo Delgado province;
- Promotion of new initiatives for rehabilitation of coal production in Moatize and in new areas;
- Promotion of initiatives for iron ore projects.

- Promotion of production of heavy Mineral products of beach sands of Angoche in Nampula province and XAI-XAI in GAZA province.

### 5.1.3 Use of Local Raw Material and Local Industrialisation

The Government encourages the development of small Mining units for production of minerals which can be locally processed for the development of small industries or can have a direct use, with the purpose to add value and to increase exports and new labour posts.

The Government will promote the establishment in the country of industries for primary processing of mineral products, for instance lapidary industries of gemstone and jewellery, aluminium and iron processing facilities as well as, smelters for titanium dioxide, giving a states of Free Trade Zones to some of those processing industries and among other incentives, to encourage negotiation of preferential tariffs for electric power.

The Government in this process of applying this policy will deliberately:

- Promote the inventory of mineral occurrences and mineral deposits adequate to those activities;
- Pursue directly or through private investors, studies in order to identify possibilities to construct processing units and to identify stages of transformation of metallic minerals that can be performed within the country taking in consideration competitive costs.

### 5.1.4 Institutional Support

The government policy on this respect of institutional support, it has the purpose of increasing efficacy, dynamism, professionalism through support and expansion of supply of services rendered to the public, decentralization and personal training of staff at all levels. Thus;

a) **Personnel Training**

As far as personnel training is concerned, the Government will give priority to permanent training of human resources in central Departments and management staff of public sectors at all levels with particular attention to intermediate and higher levels. With the respect to the intermediate level, the institute called "INSTITUTO MÉDIO de GEOLOGIA E MINAS de MOATIZE" in Tete province will be strengthened in order to train technicians who will be able to perform in different increasing complex tasks in mining and geological sector.

b) **Geological Exploration**

As far as geological exploration is concerned, laboratories of geology will be strengthened, in order to render services to Government programs as well as, mining investors and particularly to small scale miners who normally do not have access to private laboratories;

Public services which are responsible for compilation, publication and dissemination of data geological information in special maps, which are part of the Data Bank will be update and modernized and made easy accessible to investors.

c) **Inspection and Mining Fiscalization**

As far as Inspection and Mining fiscalization is concerned, the Government policy has the purpose to perform an effective control and rationalization of Mining extraction, mineral

comercialization, strengthen of mining safety and preservation of the environment.

The required human and material resources will be enforced in order to achieve this objective.

d) **Comercialization of Mineral Products**

As far as commercialization is concerned, the Government will pursue a policy of liberalization and licencing of an increasingly number of operators (traders) in order to promote legal trade of minerals and to eliminate illegal traffic of minerals.

Trade fairs, show sells and other forms of collective trading of minerals will be promoted.

e) **Social Consultation**

In order to encourage participation of the private sector in the implementation of policies and strategies of sector, the Government will promote dialogue, regular consultation with the private sector, encouraging the establishment of forms of consultation such as, chamber of Mines, Mining associations among others.

### **5.1.4 Restructuring the Public Sector**

Economic changes which have been taking place in the country, with the objective of restructuring and structural adjustment of the national economy impose the need to adequate the state mining companies to this new reality.

Within this framework, the Government will pursue a policy of restructuring and privatization of mining companies. The state can still retain shares in projects of strategic interest or, where it is participation it is a necessary condition or guarantee for the execution of those projects.



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<b>Egemony Resources, Lda</b>	Av. 82 Babngton Road, Telef. 44-181-7692312 Fax 44-181-949824 Londres / Shiek M. Sheikmadar- Av. Julius Nyerer nº. 954 14º. Andar Flat 28 Dtº. Telefax 497972 Maputo	<b>Tântalo, Ouro e Minerais Associados</b>	Naquissupa/ Zambézia
<b>João Mário</b>	Av. do Zimbabwe nº. 1678 R/	<b>Areia Grossa</b>	R.Incomáti/ Maputo

<b>Salomão</b>	Chão Telef. 490011 Fax 494394 Maputo		
<b>Promaco, Lda</b>	Av. 25 de Setembro n.º. 1509 4.º. Andar Fax 306980 Maputo	<b>Argilas</b>	R. Umbelúzi/ Maputo
<b>S.C.I., Lda</b>	Av. 25 de Setembro n.º. 1465 Telf. 307263/70 Fax 306980 Maputo	<b>Argilas</b>	R. Umbelúzi/ Maputo
<b>Pedreira Albertino Ferreira, Lda</b>	Av. 25 de Setembro n.º. 802 R/ Chão Telef. 22204 Fax 22091 Chimoio	<b>Granitos</b>	M. Macatacata/ Manica
<b>Último João Manjate</b>	Av. Vlademir Lénine n.º. 691 6.º. Andar Flat 5 Telef. 322599 Maputo	<b>Areia Fina</b>	Marracuene/ Maputo
<b>Inertes de Moçambique, Lda</b>	Av. Amilcar Cabral n.º. 1144 Telef. 303839 Maputo	<b>Areia Grossa</b>	R. Umbelúzi/ Maputo
<b>Egemony Resources, Lda</b>	Av. 82 Babngton Road, Telef. 44-181-7692312 Fax 44-181-949824 Londres / Shiek M. Sheikmadar- Av. Julius Nyerer n.º. 954 14.º. Andar Flat 28 Dt.º. Telefax 497972 Maputo	<b>Tântalo, Ouro e Minerais Associados</b>	Naquissupa/ Zambézia
<b>Inertes de Moçambique, Lda</b>	Av. Amilcar Cabral n.º. 1144 Telef. 303839 Maputo	<b>Areia Grossa</b>	R. Umbelúzi/ Maputo
<b>Bala Ussokoti, Lda</b>	Av. 24 de Julho n.º. 851 R/ Chão Telef. 327251 Fax 427 611 Maputo	<b>Areia Grossa</b>	Boane/ Maputo
<b>Pedro Jeremias Manjate</b>	Av. 24 de Julho n.º. 851 R/ Chão Telef. 327251 Fax 427 611 Maputo	<b>Areia Grossa</b>	Namaacha/ Maputo
<b>Icema , Limitada</b>	Av. Da OUA n.º. 486 C.P. n.º. 853 Telef. 405101 Fax 405070 Maputo	<b>Argilas Pretas</b>	Boane/ Maputo
<b>Icema , Limitada</b>	Av. Da OUA n.º. 486 C.P. n.º. 853 Telef. 405101 Fax 405070 Maputo	<b>Argilas Vermelhas</b>	Boane/ Maputo
<b>Icema , Limitada</b>	Av. Da OUA n.º. 486 C.P. n.º. 853 Telef. 405101 Fax 405070 Maputo	<b>Argilas Pretas</b>	Boane/ Maputo
<b>Mikhail Chitchenko</b>	Rua Carlos Alberto n.º. 82 R/ Chão Telefax 307191 Maputo	<b>Esmeraldas, Turmalinas, Berilo, Columbo-Tantalite e Magnetite</b>	Gilé/ Zambézia
<b>Highland African Mining Company,</b>	PoBox 12843 ChioorKop 1624 R.S.A. Telef. 27-11-	<b>Pegmatitos</b>	Marropino/ Zambézia

<b>Ltd</b>	1940393 Fax 27-11-8823464 Cell 27-11-4497532		
<b>José António Mascarenhas</b>	Av. Emília Dausse n°. 305 3°. Andar Telef. 306282 Fax 721610 Cell 082-303177 Maputo	<b>Saibro</b>	Magoanine/ Maputo
<b>Aparício, Lda</b>	Av. Karl Marx n°. 173 7°. Andar Telefax 302443 Maputo	<b>Riolitos</b>	Mafuiane/ Maputo
<b>K.L.M., Lda</b>	Rua Principal- Boane C.P. 3232 Cell 082-303177 Maputo	<b>Areia Grossa</b>	Goba/ Maputo
<b>Baptista José Bata</b>	Bairro da Liberdade I "Q" C Fax 20512 Inhambane	<b>Pedra de Construção</b>	Massinga/ Inhambane
<b>Marlin Granite Moçambique, Lda</b>	Av. 25 de Setembro n°.1230 Prédio 33 Andares 4°. Andar Bloco 5 Fax 300845 Maputo	<b>Gatintos</b>	M.Inhangoma/ Tete
<b>António Cardoso Trindade</b>	Av. Fernão Lopes n°. 210 Matola "C" Cell 082-300845 Maputo	<b>Saibro</b>	Sicuama/ Maputo
<b>Márcia Amélia da Conceição</b>	Av. Filipe Samuel Magaia n°. 970 9°. Andar Flat 27 Telef. 301 653 Maputo	<b>Areia Fina</b>	Xivunguana/ Maputo
<b>G. &amp; W. Base Mineral Industrial, Ltd</b>	Av. 25 de Setembro n°.1230 Prédio 33 Andares 7°. Andar Flat 13 C.P. 4086 Telef. 327581/ 304298 Fax 427578 Maputo	<b>Bentonite</b>	Mafuiane/ Maputo
<b>Inter- Periclis, Lda</b>	Av. Agostinho Neto n°. 1849 R/ Chão Telefax 421975 Maputo	<b>Quartzo, Granadas e Columbo-Tantalite</b>	M'Pahoa/ Zambézia
<b>Ausmoz, Lda &amp; Mozmin, Lda</b>	Antiga estrada de Tete n°. 246 Telefax. 62268 Manica	<b>Ouro</b>	Nhamucuarara/ Manica
<b>EuroExport, Lda</b>	Rua Josina Machel n°. 36 Telefax 06- 215921 Nampula	<b>Turmalinas, água-marinha, mica, tantalite e berilo</b>	Naipa/ Zambézia
<b>Casa Lido, Lda</b>	Av. Samora Machel n°. ...R/ Chão Telef. 04-214643 Fax 04-214644 Zambézia	<b>Pedra de Construção</b>	Mocuba/ Zambézia
<b>Zaid Mahomed Aly</b>	Rua do Bagamoyo n°. 3 C.P. 147 Telef 329351/5 Fax 325060 Sofala	<b>Areia de Contrução</b>	Dondo/ Sofala
<b>Inês Fernando Miguel Leal</b>	Rua do Porto, Talhão 92 Matola "G" Telef. 780574 Cine 7000	<b>Areia de Construção</b>	R. Incomáti/ Maputo



<b>Inês Fernando Miguel Leal</b>	Rua do Porto, Talhão 92 Matola “G” Telef. 780574 Cine 7000	<b>Areia de Construção</b>	R. Incomáti/ Maputo
<b>Companhia Mineira de Morrua, Lda</b>	Rua Valentim Siti nº. 439 R/ Chão Telef. ....Fax 305077 Maputo	<b>Columbo-Tantalite e Minerais Associados</b>	Morrua/ Zambézia
<b>África B. Internacional, Lda</b>	Av. Vlademir Lénine nº.570 1º. Andar Telef. 430639, 324742, 322061/2 Fax 430639 Maputo	<b>Pedra de Construção</b>	Namaacha/ Maputo
<b>Joana Carlos Chaúque</b>	Av. Karl Marx nº. 1880 7º. Andar Esq. Telf. 305855 Maputo	<b>Areia de Construção</b>	Moamba/ Maputo
<b>África B. Internacional, Lda</b>	Av. Vlademir Lénine nº.570 1º. Andar Telef. 430639, 324742, 322061/2 Fax 430639 Maputo	<b>Pedra de Construção</b>	Namaacha/ Maputo
<b>F. A. E. Lda</b>	Av. 24 de Julho nº. 678 C/ V Telfs. 304715 Fax 310992 Cell 082-321184/ 50 Maputo	<b>Areia de Construção</b>	Moamba/ Maputo
<b>Cerâmica de Umpala, Lda</b>	Av. 25 de Setembro nº. 2526 1º.Andar C.P. 4190 Telef. 321170, 321189 e 770007 Fax 422186 Maputo	<b>Argila</b>	Boane/ Maputo
<b>Carlos António Joaquim</b>	Av. Josina Machel nº. 44 1º. Andar 214454 Fax 214183 Quelimane	<b>Pedra de Construção</b>	Mocuba/ Zambézia
<b>Cerâmica de Vila Pery, Lda</b>	Estrada Nacional nº. 6 Telfs. 22380, 22136 Fax. 22136 Chimoio	<b>Argila</b>	Gongola/ Manica
<b>Pedreira Albertino Ferreira, Lda</b>	Av. 25 de Setembro nº. 802 R/ Chão Telef. 22204 Fax 22091 Chimoio	<b>Granitos</b>	Gondola/ Manica
<b>Sulbrita ( Probrita), Lda</b>	Av. Da Namaacha Km 6 Parcela 728 Telef. 780185/ 780357 Fax 780335 Maputo	<b>Pedra de construção</b>	Pemba/ Cabo Delgado
<b>Victor de Jesus Duarte</b>	Av. Dos Heroís de Libertação..... Ao C/ da Dipreme da Zambézia	<b>Tantalite e Minerais Associados</b>	Ile/ Zambézia
<b>Yene Saide</b>	Av. Eduardo Mondlane nº. .... Ao C/ da Dipreme da Zambézia	<b>Pedra de Construção</b>	Namacura/ Zambézia
<b>Cogemo, Lda</b>	Av. Samuel Filipe Magaia nº. 528 2º. Andar C.P. 2712 Telef.431039 Fax 427869 Maputo	<b>Pedra de Construção</b>	Jangamo/ Inhambane
<b>Country Investment And Mining, Ltd</b>	Av. Haggard nº.11 Telef. 011- 4029920 Fax 011-4029920 Johannesburg	<b>Tantalite, Berilo e Turmalinas</b>	Ile/ Zambézia

<b>Álvaro Henriques</b>	Av. Maguiguana n°. 107 Telef. 304035 Fax 304521 Maputo	<b>Basaltos</b>	M. Ondjuene/ Maputo
<b>Drusa, Lda</b>	Ao C/ da DIPREME de Nampula Telef. 212104 Fax 21715 Nampula	<b>Gemas, Tantalite e Caulino</b>	Nuaparra/ Zambézia
<b>Sociedade Minas Chipanga, Lda</b>	99 Kenneth Kaunda Av. Telef. 052-22333 Fax 052- 22318 Tete	<b>Carvão</b>	Moatize/ Tete
<b>Ara Sul, Lda</b>	Av. Samora Machel n°. 30 7º Andar Telef. 306729/30 Fax 306756 Maputo	<b>Riolitos</b>	Mafuiane/ Maputo
<b>P.M. Holdings, Lda</b>	Rua do Hospital, Bairro da Fronteira n°. 148 C.P. 25 Telefax 960043 Namaacha/ Maputo	<b>Tantalite e Minerais Associados</b>	Ilodo/ Zambézia
<b>Inertes de Moçambique, Lda</b>	Av. Amilcar Cabral n°. 1144 Telef. 303839 Maputo	<b>Calhau Rolado</b>	Mavuco/ Maputo
<b>Motrex Construções, Lda</b>	Av. 24 de Julho n°. 2096 6º Andar Esq. Telef.304520/ 307980/1 Maputo	<b>Basaltos</b>	Catuane/ Maputo
<b>Probrita, Lda</b>	Av. Costa d'Almeida n°. 368 Matola- <b>Alter.</b> Av 25 de Setembro n°.1230 6º. Andar Flat 601 C.P. 2693 Telef. 308468/9 Fax 302687 Maputo	<b>Maputo</b>	Mabanja/ Maputo
<b>Caminhos de Ferro de Moçambique (Centro)</b>	Fax. 03-312493 Sofala Ao C/ da DIPREME de Manica	<b>Pedra de Construção</b>	M. Matsinho/ Gondola- Manica
<b>ECMEP de Sofala</b>	Fax. 03-353272 Sofala Ao C/ da DIPREME de Manica	<b>Pedra de Construção</b>	
<b>Chambadejous, Lda</b>	Av. Karl Marx n°. 173 2º Andar Telef. 307403, 306393 Fax 307404 Maputo	<b>Pedra de Construção</b>	Pessene/ Maputo
<b>I.T.M., Lda</b>	Rua Joaquim Kapango n°. 19 R/ Chão Telef. 244-2- 337751/ 3939008 Fax 244-2- 335275 Angola- <b>Alter.</b> Telef. 027-11-3927450 Fax 027-11- 3927458 R.S.A	<b>Tantalite e Minerais Associados</b>	Muiane/ Zambézia
<b>Adelaide M. Furtado Faia</b>	Rua Correia de Brito n°. 169 Telefs. 327789/ 323975/8 Fax 323979 Sofala	<b>Pedra de Ornamentaçã o e Construção</b>	Vanduzi/ Sofala
<b>Sociedade Joubert Enginniering Moç., Lda</b>	Ao C/ da DIPREME de Manica	<b>Perda de Construção</b>	Messica/ Manica

<b>João C. S. Pires Cardeano</b>	Av. Mao Tse Tung n.º. 240 R/Chão Telef. 499905 Fax 499909 Maputo	<b>Gabro-Anortositos</b>	M. Inhangoma/ Tete
<b>Secarp Industrial, Lda</b>	Bairro Ingonane, Rua 1º de Maio n.º....Telef. 072-21346, 20839 Cabo Delgado	<b>Areia Grossa</b>	Muchura/ Cabo Delgado
<b>Secarp Industrial, Lda</b>	Bairro Ingonane, Rua 1º de Maio n.º....Telef. 072-21346, 20839 Cabo Delgado	<b>Areia Grossa</b>	Maringanha/ Cabo Delgado
<b>Salomé Alexandre Nguenha</b>	Bairro Ferroviário das Mahotas, Rua Principal, casa n.º. 355 Maputo	<b>Areia Grossa</b>	R. Umbelúzi/ Maputo
<b>Ruggero Ascari</b>	Rua 1º de Maio n.º.... Telef....Bairro de Cimento- <b>Alter</b> . DIPREME de Cabo Delgado/ Pemba	<b>Águas-Marinhas e Turmalinas</b>	Namogelia/ Cabo Delgado
<b>Roberto Horácio Matavel</b>	Rua Comandante Vasco Rodrigues Talhão 58A Telef. 721913 Matola	<b>Areia Grossa</b>	R. Umbelúzi/ Maputo
<b>Latrinas Melhoradas</b>	Muhala Extensão Telef. 217732 C.P. 785 Fax 216197 Nampula	<b>Areia Construção</b>	Muhala/ Nampula
<b>G.M.C. Gold Mining Corporation, Lda</b>	Av. Emília Daússe n.º. 48 R/Chão Telef. 400319 Cell 082-304023 Maputo	<b>Esmeralads, Água-Marinha e Turmalinas</b>	Morrua/ Zambézia
<b>G.M.C. Gold Mining Corporation, Lda</b>	Av. Emília Daússe n.º. 48 R/Chão Telef. 400319 Cell 082-304023 Maputo	<b>Esmeralads, Água-Marinha e Turmalinas</b>	Naluo/ Zambézia
<b>Twu Folls, Lda</b>	Av. 24 de Julho n.º.3486 1º. Andar Flat 3 Maputo	<b>Ouro</b>	Chua/ Manica
<b>Construtora do Tâmega, SA</b>	Av. Zedequias Manganhela n.º. 520 7º. Anadar Esq. C.P. 1238 Telef. 430876, 430879 Fax 425282 Maputo E- mail Tâmega @ teledata. Mz	<b>Pedra de Construção</b>	Pambarra/ Inhambane
<b>Alberto Saranga Matine</b>	Rua Alfredo Keil n.º. 2 4º. Andar Flat 12 Telef. 310994 Maputo	<b>Pedra de Construção</b>	Mafuiane/ Maputo
<b>Américo Soares Aleixo</b>	Av. 24 de Julho n.º. 979 5º Andar Flat 1 Telef 310164 Fax 310165 Maputo	<b>Areia Grossa</b>	Mavuco/ Maputo
<b>Julieta Maria da Silva</b>	Rua General Perreira D'Eça n.º.348 1º Andar Cell 082-317730 Fax 491827 Maputo	<b>Areia Grossa</b>	Moamba/ Maputo
<b>Condor, Lda</b>	Av. da Independência n.º. 11 Nampula <b>Alter</b> . Ao C/ da DIPREME de Nampula	<b>Pedra de Construção</b>	Nicuta/ Nampula

<b>Sociedade Mulosa, Lda</b>	Av. Ahmed Sekou Touré n°. 2526 R/ Chão Telef. 303806/ 309195 Fax 303814 Maputo	<b>Pedra de Construção</b>	Mafuiane/ Maputo
<b>Construtora do Tâmega, SA</b>	Av. Zedequias Manganhela n°. 520 7°. Anadar Esq. C.P. 1238 Telef. 430876, 430879 Fax 425282 Maputo E- mail Tâmega @ teledata. Mz	<b>Pedra de Construção</b>	Massingir/ Inhambane
<b>Barnabé Yoane Amili</b>	Rua Centro Comercial n°.1869 1º Andar Telef. 082-490529/ 311575/ 326798 Fax 322962 Sofala	<b>Pedra de Construção</b>	Alto-Molócuè/ Zambézia
<b>Pedro Dias dos Santos Pinto</b>	Bairro Maiaia Rua 34 C.P. 32 Telef. 526628/ 212699 Nacala Porto/ Nampula	<b>Turmalinas</b>	Caunrila/ Nampula
<b>G.M.C. Gold Mining Corporation, Lda</b>	Av. Emília Daússe n°. 48 R/ Chão Telef. 400319 Cell 082-304023 Maputo	<b>Ouro</b>	Lupilichi/ Niassa
<b>Enop, Lda</b>	Rua da Imprensa n°. 256 5º Andar Prédio 33 Andares C.P. 366 Telef. 324043/ 324044/ 325572 Fax 421984 E-mail: ern.young @ teledatamz	<b>Pedra de Construção</b>	Mabalane/ Gaza
<b>Maria Luciana Dingana Loforte</b>	Complexo Residencial Matola River Célula 3 “Q” 3 Cell 082-418472/ 425780 Maputo	<b>Areia de Construção</b>	Beluluana/ Maputo
<b>Delta Trading &amp; Companhia, Lda</b>	Av.25 de Setembro n°. 2834 Telef. 310932/ 310934/ 5/ 6/ 7/ 8 e 310941/ 2 Fax. 308870 Maputo / E-maildelta @teledata.mz	<b>Ouro</b>	Monarch/ Manica
<b>Filipe António de Brito</b>	Rua de Bonga C.P.455 Telef. 214940 Zambézia	<b>Tantalite e Minerais Associados</b>	Mugeba/ Zambézia
<b>Filipe António de Brito</b>	Rua de Bonga C.P.455 Telef. 214940 Zambézia	<b>Tantalite e Minerais Associados</b>	Munhamade/ Zambézia
<b>Kenmare Moma Mining (Maurituis) Lda</b>	Chatham House, Chatham St., Dublin 2 Ireland Telef. + 353 1 671 0411 Fax + 353 1 671 0810- E- mail: inf @ kenmareresouces.com <b>Alter.</b> Rua Chuindi n°. 67 R/ Chão Telefax 494921 Maputo	<b>Areias Pesadas</b>	Moma/ Congolone/ Nampula
<b>Genbique S.A.R.L.</b>	Av. 25 de Setembro n°. 420 1º. Andar Bloco A Porta 3	<b>Areias Pesadas</b>	Pebane/ Zambézia

	Telef. 306461 Edificio JAT CONSTROI Maputo		
<b>Corridor Sands</b>	Robert G. Still- PoBox 3968 Randburg, Johannesburg- Randburg 2125 Telef. 00-27- 1178037/5/6 Fax 00-27- 118867020 R.S.A <b>Alter.</b>	<b>Areias Pesadas</b>	Chibuto/ Gaza
<b>Rio Tinto And Exploration Mining Mozambique</b>	Rua José Mateus n°. 27 2°. Andar Telef. 499072 Fax 490160 Maputo	<b>Areias Pesadas</b>	Gaza/ Inhambane