



# Costa Rican mining – a silver lining

by Enid Gamboa

**After little more than one year of exploration Placer Dome has recently announced promising results in its search for gold in Costa Rica. Placer has been working in a new area towards the Nicaraguan border. The target is a low grade, high volume deposit.**

**The results have sparked renewed interest in Costa Rican gold. Barrick Gold is entering the same area. Canadian junior Lyon Lake also has concessions adjacent to Placer Dome's areas. Its prime deposit is the Beta Vargas property.**

Small scale metal mining is believed to have existed in Costa Rica for a long period even if early evidence is scarce. There are reports of gold mining in the 16th century.<sup>1</sup> Towards the end of the 19th century gold was exploited on a bigger scale and Las Juntas de Abangares became the first mining centre of Costa Rica. Later on also Miramar developed into an important mining town. Both these areas are located in the Tilarán mountain range in the north of the country.

Old Spanish mining regulations, called "Ordenanzas Mineras de España", dating from 1783 governed mining activity until the mid 20th century. Mining rights were given in perpetuity with absolute control over the mineral deposits.

The most important concession of that time was the so called Soto-Keith contract, giving the Abangares Gold Fields Company of Costa Rica the right to operate in Costa Rica as a real monopoly until 1930. Between 1897 and 1930, the great gold boom, the company extracted over 200 000 ounces of gold in the areas of Miramar and Abangares, equal to an approximate value of 40 million USD.<sup>2</sup>

This production was one of the most important sources of national income, helping to develop the coffee and banana industry to penetrate international markets.

In the Osa peninsula, in southern Costa Rica, micro scale exploitation of the placer deposits by panning was also started in this period.

Gold in quartz veins was extracted by mercury amalgamation. This simple metallurgical process was suitable to the high grade ores mined, with free gold content of 0.5-1.0 ounce/ton. This method was used both by the mining companies and the small scale panners, called oreros. This resulted in considerable amounts of mercury being discarded into the local rivers and transported into the Pacific Ocean. The river most polluted is the Abangares river flowing through Las Juntas de Abangares.

From 1930 to 1950 there was again a quick decline in mining activities in Costa Rica. The richest veins, the bonanzas were depleted and no new ore bodies were discovered. In 1953 the first modern mining law was promulgated, Código de Minería, no. 1551, replacing the colonial regulations.

The new law was based on national ownership of mineral rights and these could be given for a certain period to suitable exploiters. A state mining authority was set up, Dirección de Geología y Minas (DGM), to administrate the new law.

Strong demand for gold and base metals in the 1950s and 1960s gave a renewed interest in Costa Rican mining under a modern mining regime. Exploration campaigns were started and systematic geological surveys were conducted.

Mines that had been abandoned in the 1930s were reopened. New processes such as the cyanidation to recover gold were introduced. New areas in the Talamanca and Tilarán cordilleras were explored for copper, zinc, aluminium and lead in addition to gold by companies such as CITCO (Cities Service Co, USA), Swiss Aluminium Company of Costa Rica (SAMCOSA a joint venture between Alusuisse, Mitsubishi and British Charter Consolidated set up to do exploration in Costa Rica), Cerro Negros (a subsidiary of American Homestake) and other less well known.

In 1968 DGM published the first geological map of Costa Rica. With international support DGM also undertook further studies to delimit areas of potential interest to mining companies. Aeromagnetic surveys and geochemical sampling of river beds in Nicoya, Tilarán and Talamanca were made in 1975 with UN support.

In 1978 a systematic analysis of the Costa Rican mining sector, "Diagnóstico del Sector Minero"<sup>3</sup> was published together with the Organisation of American Unity (OAU) in 1978. DGM also published a large number of technical notes and made deposit assessments of

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**Costa Rica gold  
explorations licences 1995.**

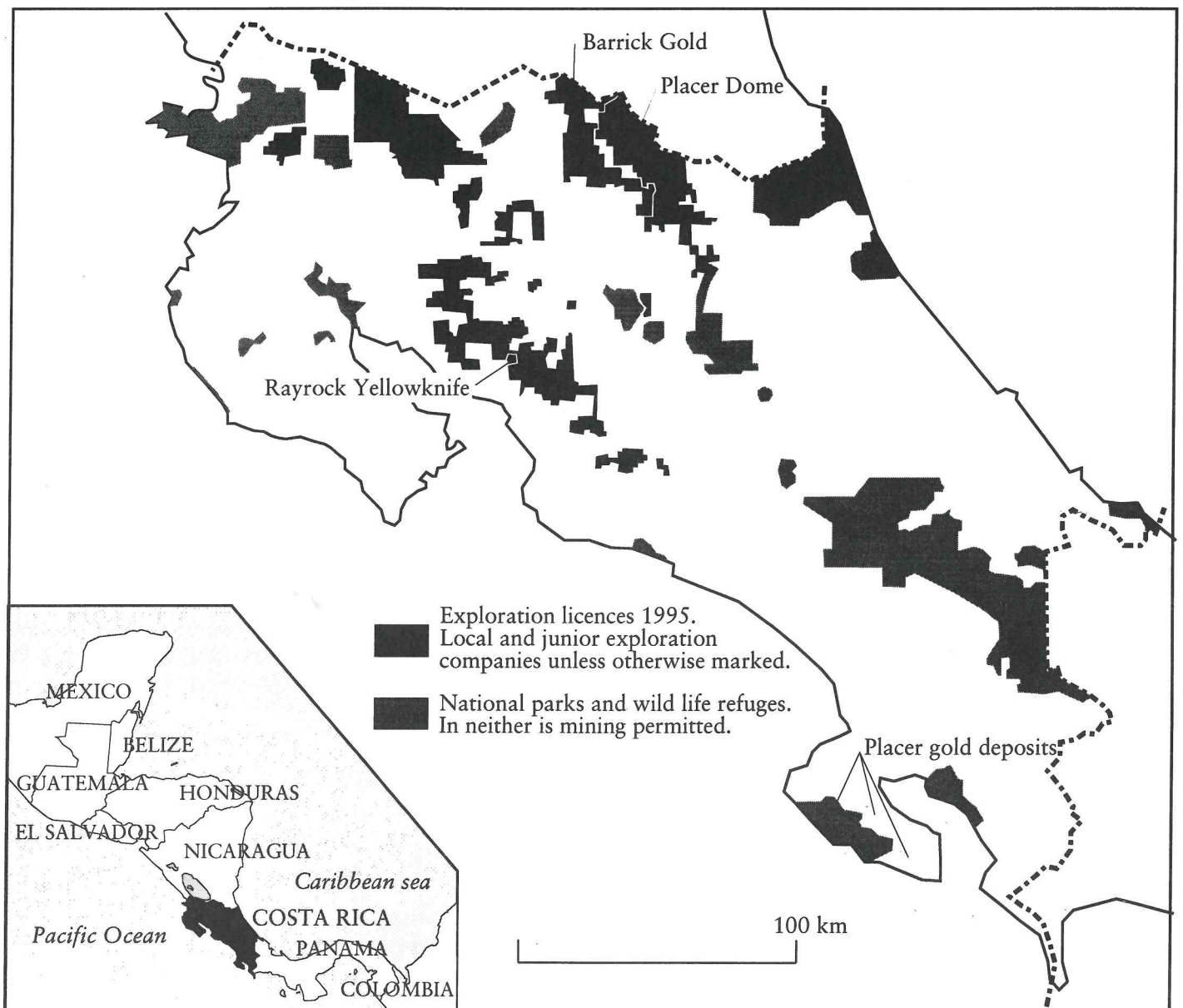
many minerals and detailed geological maps in the 1:50 000 scale.

As another part of this policy of revival the Centralamerican Geological School, "Escuela Centroamericana de Geología", was inaugurated in 1971. Geological departments were also founded in other institutions such as Instituto Costarricense de Electricidad (ICE), Refinadora Costarricense de Petroleo (RECOPE). These institutes mainly provided geological background knowledge.

Beginning in 1978 most of the foreign mining companies began to leave Costa Rica. This was partly due to falling metal prices but mainly to the delays in promulgating of a new Mining law that was needed to deal with new demands from the mining companies. Only the smaller mines, such as Macacona, Unión and Sacrafamilia kept on producing until the end of the decade. Most of them were forced to cease operations due to depleted reserves.

In the early 1980s the panning of gold in the Osa peninsula was intensified with increasing gold price. It was easy to enlarge these operations since no geological exploration is vital.

However, since 1984 these activities have gradually declined because of the low gold price and the strengthened protection of the Corcovado National Park within which most of the placer deposits are found. In order to control production the Central Bank was ap-



pointed the only authorised buyer of gold and started buying in 1981.

It was only in 1982 that a new mining law was promulgated. This law introduced a compulsory Environmental Impact Assessment to proceed both exploration and exploitation and it also introduced some fiscal incentives. Slowly some new exploration activities were started in Costa Rica. By 1984 the junior North American companies Rayrock Yellowknife Resources Inc and La Corporación de Minerales Mallon began to explore closed down mines and also investigated new prospects in the Miramar and Tilarán areas. These companies focused new types of ore, low grade/high volume rather than the bonanzas that had previously been in focus. Rayrock concentrated on the Bellavista mine and Greenstone Resources Inc evaluated a prospect called Recio. The latter was abandoned in the early 1990s.

Starting in 1982 the DGM has developed four initiatives to supply basic geological information to facilitate exploration work:

- "El mapa geológico de Costa Rica", scale 1: 200 000, 1982;
- "El proyecto de fortalecimiento de la capacidad de prospección de minerales en Costa Rica", in 1988;
- "El atlas geoquímico de Costa Rica", published in 1986;<sup>4</sup>
- "Evaluación de los recursos minerales de Costa Rica" in 1987.<sup>5</sup>

### **Hesitance since 1991**

Costa Rican gold mining enjoyed a few promising years in the late 1980s and early 1990s but faced several setbacks in 1992 and 1993. The ambitious "integrated" El Recio gold project, trying to combine commercial gold exploitation with community development and high level of environmental concern was abandoned by Greenstone Resources of Canada in 1992. The North American majors Phelps Dodge and Newmont withdrew from Costa Rica after short stints exploring around closed down mines in the traditional Costa Rican

goldbelt in the Tilaran Cordillera in the northwest parts of the country.

However also in this area the scene is changing. In late January 1995 Canadian Minera Rayrock announced that it intends to go ahead with its Bellavista project, which has been on hold for several years. A final pre-production stage of 14 000 meter of diamond drilling has almost been completed in February 1995.

In all the Ministerio de Recursos Naturales, Energía y Minas (MIRENEM, Ministry of Natural Resources, Energy and Mines) estimates the potential investments to be in the order of magnitude of several hundreds of millions of US dollars if all these projects go ahead. This might not be very likely, but even one or two medium sized gold mines would mean a tremendous boost to the Costa Rican mining industry long underinvested.

Also on a similar scale some developments might take place. The Rio Chiquito deposit has been owned and explored since 1984 by one of the few oil companies that is still engaged in mining, Mallon Resources of Denver. Recent exploration results indicate that the deposit extends beyond earlier limits. In a new 12 months diamond drilling program (10 000 m) Mallon seeks to prove that the mineralised zones are interconnected. Mallon is actively looking for new partners to reactive the mine and plant with an estimated investment of 20 MUSD.

The gold price development is certainly one important factor in explaining these ups and downs of the fortunes of Costa Rican gold mining but as important is the gradual development of Costa Rican mining policies.

In retrospect it has been difficult for the MIRENEM to combine the government's emerging aspirations for a sustainable development with the mining companies' demands for favourable economic conditions of operation.

The 1982 Mining Law, which replaced legislation from the early 1950s was debated during six years before it was finally adopted. The most important new

element introduced into the legal system was a mandatory environmental assessment of all stages and the full lifecycle of a mine, from exploration to mining and beneficiation. During this long period of uncertainty exploration and mine development was at a low level. The law was, however not changed in any important aspects other than the environmental regulations introduced. With security of tenure guaranteed and gold prices raising in the mid 1980s Costa Rica gradually attracted exploration ventures mainly from Canadian juniors. Mallon Resources, Rayrock, Greenstone and other less well known, and sometimes less serious, junior exploration companies from both the US, Canada and Europe as well as local companies were gradually expanding their programmes during the end of the decade.

Under the new minister Rene Castro Salazar, MIRENEM has recently been reviewing the importance of mining investments and is formulating a balanced approach to mine exploitation trying to take into account both the need for economic development and nature conservation. Further the government department responsible for mining, DGM is undergoing reorganisation. The outcome of this reshuffle is not yet finalised but it is discussed to create an organisation where the demarcation line between the departments responsible for promoting the mining industry and those responsible for controlling the environmental and land use aspects becomes more clear than is the case today.

### **Present gold mining**

Gold is the only metal mined at present in Costa Rica. Mining takes place app. 200 km from San José. The Gold Belt is a 100 km northwesterly trending area which includes more than 60 identified gold bearing properties along a favourable geological structure.

At present there is only one active mine close to the small town of Las Juntas de Abangares in the province of Guanacaste.

*Pit and mountains. Rio Chiquito, Costa Rica.*



### **Tres Hermanos mine**

Ariel Resources Ltd is a Canadian junior company that has been engaged in Costa Rica since 10 years.

Its local operating company is El Valiente Ascari SA. The Tres Hermanos mine has been operated by the company since 1984. Present production level is around 300 kg gold/year.

In 1993 the company acquired Minas de Sierra Alta SA (MINSA) which owned the San Martin mine. Production from this mine started in December 1994. Ore from both Tres Hermanos and San Martin mines is delivered to the Mata-palo mill located within trucking distance on the Panamerican highway.

Ariel is gradually acquiring additional deposits around its central Tres Hermanos mine and has a number of concession areas. It is further discussing to purchase the El Recio mine which is adjoining to the Tres Hermanos claim. In the Miramar area Ariel has two claim groups near Rayrock's Bellavista deposit.

Except for Tres Hermanos mine, which is operating successfully employ-

ing state of the art technology in both mining and beneficiation, most Costa Rican mines are operating on an intermittent basis only. A few months' production of a few kilos of gold is used to finance limited exploration programmes and other studies intended to attract joint-venture partner needed to bring in development capital and technology.

### **Other gold mines**

The Moncada mine is controlled by a Costa Rican family by the same name and was operated in joint venture with a Canadian junior company (Westworld Group of Houston) until 1991. Since then only limited work has been carried out. In 1994 production was some 30 kg. The Cuatro Vientos concession is a deposit in the same area as Tres Hermanos mine, which is not actively being developed. Golden Grail of Canada is the latest foreign company engaged in this deposit but left in 1991.

Bellavista in the Miramar area was intensively exploited in the period between 1910 and 1930. From 1960-1975 it was

intermittently operated by local interests producing only 10 kg gold per year. In 1984 Rayrock started renewed exploration. Today they have drilled 26 000 m and established mineable reserves of 700 000 ounces of gold. Further core drilling is expected to increase the ore reserves by another 20 per cent in 1995.

Mina Chassoul is another mine at present operated only intermittently, by its owner Cia Inversionista Gran Jefe, waiting for foreign investors.

The Macacona deposit (also called Santa Clara) has not been producing since 1990. In the early 1980s production averaged some 150 kg and even reached as high as 460 kg in 1986/87. It is located in the Aguacate district. There are environmental problems and further the mine is situated close to the Panamerican highway, which makes it difficult to restart.

The old mine Sacra Familia is controlled by local interests. No production has been reported since 1987. A diamond drilling program was started last year with 800 m drilled. The program is planned to continue also in 1995.

La Union in the Miramar area has not been active recently. The concession is held by local interest. Its problems started with a failed stock introduction in Canada in 1984. Only scant production has been recorded during the last ten years. In January 1995 negotiations were started again with a major Canadian mining company so far not named.

The Libano mine has not been operating since 1990 when the operating company Compañía Minera Esperanza was closed down.

Liberia and the adjoining Turin prospect were studied in the early 1990s by a joint venture consisting of Midland Energy Corp of Canada and Battle Mountain Gold. Since that the concessions have been taken over by Rayrock Minera. At present activities are at a low level but further exploratory drilling was started in January 1995.

#### Micro scale artisanal gold mining

There are two main areas with micro scale gold mining: Las Juntas des Abangares in the Tilarán Cordillera in the north-west and on the Osa peninsula in the south of Costa Rica.

The Boston concession with eight small adits is operated by the Sindicato Nacional de Mineros. This is a cooperative consisting of 84 members most of which are working on the concession. In addition some 25 persons are employed by the cooperative's members. The cooperative also works some deposits belonging to Ariel Resources. In 1994 the cooperative has formed a limited company, Sociedad Minerales Boston, to facilitate some of its activities.

Among the placer deposits in the Osa peninsula activities have gradually decreased. There are two main reasons for this decline:

- Firstly there are many other jobs available in the Corcovado National Park area in the tourist trade.
- Secondly the National Parks guards have been more actively protecting the park area recently.

**Table 2. Gold mining operations in Costa Rica 1995**

Mine	Year	Production kg/year	Owner
Tres Hermanos	1984–		
	1984-92	125	Ariel
	1992–	200	
San Martin	1993 Dec–		
	1994	100	Ariel
	1995	300	
Moncada	1985–90		
	1985/86	10	Westworld
	1986/87	85	
	1987/88	65	
	1988/89	25	
	1991–	Intermit.	Cia Minera Moncada (private Costa Rican)
Mina Chassoul	1990–		
	Intermit	25	Cia Inversionista Gran Jefe SA (private Costa Rican)
Osa Peninsula	1981–		
	1981/82	90	Oreros
	1982/83	250	
	1983/84	250	
	1984/85	250	
	1985/86	250	
	1986/87	725	
	1987/88	125	
	1988/89	80	
	1989/90	10	
	1990/91	160	
	1991/92	100	
1992/93	25		
1993/94	20		

At present the number of diggers, called oreros, is estimated to be around 150 persons that work on average 15 days/month producing 1 g/day, person. Total production is estimated at between 20 and 30 kg/year.

Two joint ventures are at present planning to produce alluvial gold on a slightly larger scale. One is a Costa Rican group of private investors and the other is a joint venture between the US private company Modesa and a Canadian public company.

The planned level of production is reported to be 300 kg/year for both of these projects. If they will go ahead is however doubtful.

#### Exploration and other projects

Placer Dome started exploration in Costa Rica in late 1993. The Las Crucitas gold deposit is in focus. It is situated in the San Carlos region of the Alajuela province on the plains towards Nicaragua north of the Cordillera de Tilarán mountain range.

**Table 2 (cont.) Gold mining operations in Costa Rica 1995**

Mine	Year	Production kg/year	Owner
Santa Clara	<b>1983-88</b>		
	1983/84	143	Minera Macacona (private Costa Rican)
	1984/85	155	
	1985/86	187	
	1986/87	460	
1987/88	80		
El Libaño	<b>1980-88</b>		
	1980/81	25	Minera La Esperanza (private Costa Rican)
	1981/82	20	
	1982/83	95	
	1983/84	210	
	1984/85	110	
	1985/86	50	
1986/87	52		
Rio Chiquito	<b>1987-90</b>		
	Test	35	Mallon
Cuatro Vientos	<b>-1990</b>		
	Test	-	Golden Grail
Bella Vista	<b>1984-</b>		
	Test	-	Rayrock
El Recio	<b>-1990</b>		
	Test	-	Greenstone
Buenaventura 1990-1992	Exploration	-	Phelps Dodge
Turin	<b>1989 -</b>		
	Exploration	-	Rayrock

The deposit is huge and promising. Two million USD has so far been spent on the project employing a professional staff of 6 geologists of which 3 are Costa Rican and the rest from Canada. The company has announced that if the project moves ahead investments in the order of magnitude of 250 M USD is to be expected.

The project initially met with strong opposition from local environmentalists but recently the reaction from the local inhabitants has become much more un-

derstanding. The success of the project will depend not only on the geologists proving a exploitable ore body but also if Placer Dome will manage to convince the Costa Rican politicians and public that the project is environmentally safe.

American Barrick is in the process of entering the country in an area close to the one Placer Dome has acquired. Field work is planned to start during 1995.

The Bella Vista (Montezuma) mine/deposit has been operated intermittently since the late 19th century.

The latest phase in the mines history started in 1984 when a Canadian junior company acquired an interest in the deposit. At present the project is a joint venture between Posesión Gran Galaxie SA (which is controlled by Rembrandt Gold Mines Ltd in its turn owned 60 per cent by Minera Rayrock and 40 per cent by Canadian Westlake Industries).

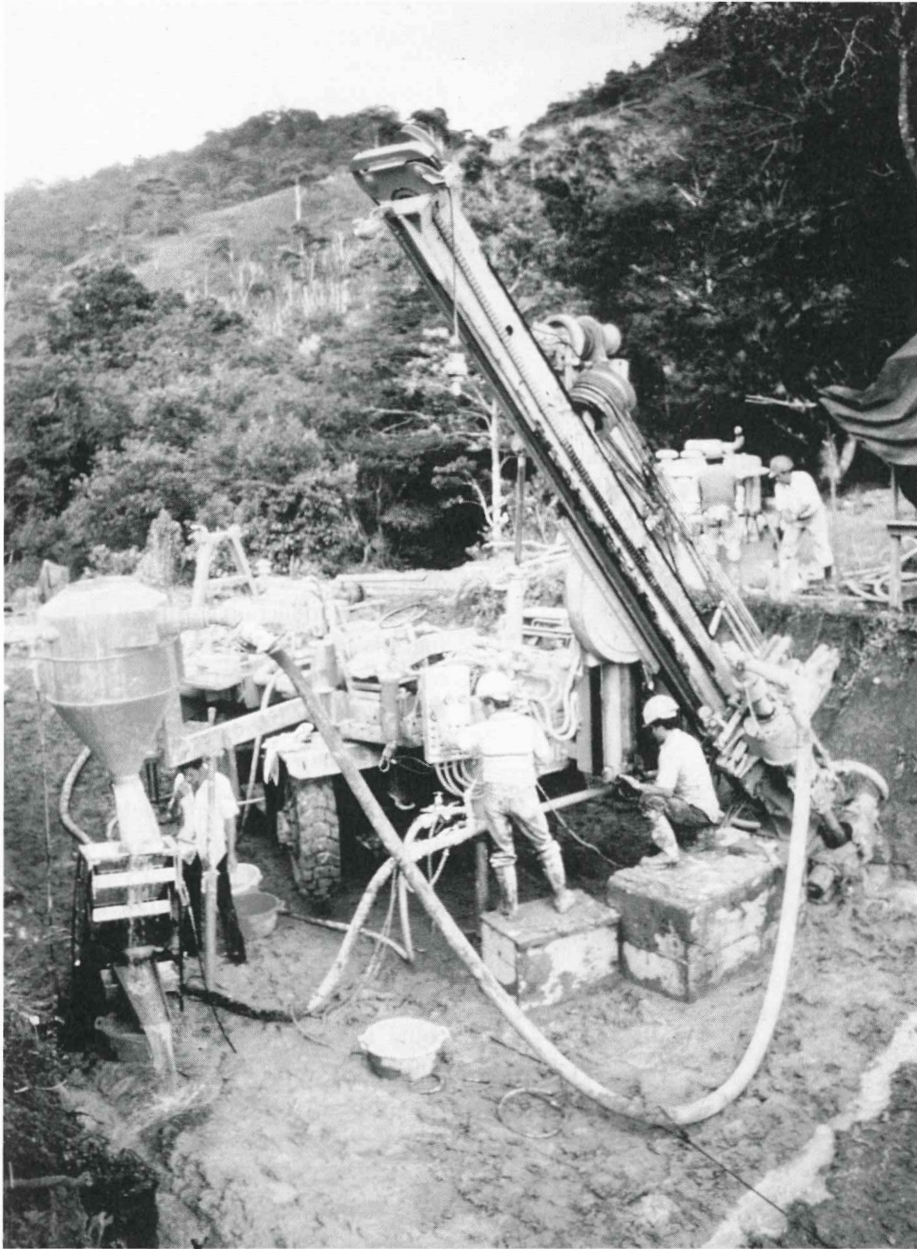
The project is managed by the Canadian owned Minera Rayrock SA since 1987. No production has taken place during this period. At present activities are on a low level and only some limited core drilling was carried out in 1994. The reserves is estimated to be around 1 million ounces.

Total exploration and development expenditure is said to have been 7.5 MUSD between 1984 and the early 1990s. During the recent visit to Costa Rica of the Canadian Minister of Mining it was announced that Rayrock intends to go ahead with a feasibility study which could lead to an investment of around 100 million USD in this deposit.

In the early 1990s Phelps Dodge was also exploring the Buenaventura deposit in the Miramar area but left after not being able to prove sufficient reserves.

The Rio Chiquito mine was originally found by Italian explorers in the 1930s. Mallon, which is a Denver based junior oil company acquired the deposits in 1984. After a few years of initial exploration and development a leach plant was built and production started in 1989. It was however stopped again in 1990 due to the low gold prices at the time. There were further problems with the process due to low recovery. Total production in these two years was 3 300 ounces.

The plant is kept on a care and maintenance basis and the company still employs a staff of 8 including a chemist, a geologist and the managing director who is also the responsible geologist. In 1995 a trenching and drilling program costing 2.7 M USD has begun and a core recovery drilling program is planned with fresh capital from European investors.



*Diamond drilling, March 1995.  
Rio Chiquito, Costa Rica.*

and mining and is fairly competitive in an international perspective without offering any excessive concessions. In a Central American perspective the mining investment climate in Costa Rica is considered by the major companies active in Costa Rica to be less attractive than Mexico and Panama but comparable to the situation in Venezuela.

When the law was adopted it was the first one in Central America to include a compulsory environmental impact assessment. In this respect the law is still in the forefront in the area and it is reflecting the general ambitions of the Costa Rican government in environmental protection and sustainable development.

All minerals belong to the State which can grant exploration and mining permissions provided some specific demands which are stipulated in the Law or the Regulations are met with.

In general all Costa Rican economy has undergone a privatisation and commercialisation process similar to what has been prescribed by the World Bank and other international institutions to many countries in Latin America, Asia and Africa during the last years. An earlier strong state control over most aspects of the mining industry has been replaced by a lack of state interventions over a few years.

### **Privatisation**

Even if the law regulating the mining industry has not been changed over the last decade state policies and structures have been changing radically during the same period. Initially the Costa Rican government took an active interest in this part of the economy. Through its development corporation Corporación Costarricense de Desarrollo SA (CODESA) government was directly involved in mining of industrial minerals for cement and fertilizer production in the two companies CEMPASA and FERTICA, indirectly through a geological department set up within CODESA in order to evaluate and promote mining projects. Further there

Mallon owns 60 per cent of the local company called Corporación de Minerales Mallon SA (CMM). Mallon has been quite successful with its oil business in the US when the majors have gradually been leaving the US scene concentrating abroad. This is probably one of the main reasons for its endurance with the project. Newmont studied the deposit for some time in the early 1990s but was not interested since they estimated it to be less than 1 million ounces.

The so called integrated project of El Recio was ended in 1990. Greenstone Resources of Canada had put a lot of effort into creating a concept that could combine both profitable mining with social initiatives developing the small min-

ing town of Las Juntas. The project was partly financed by a grant from the Canadian International Development Agency. It was mainly the low gold price together with limited ore deposits that made Greenstone shelve the project. There are some discussions with Ariel to sell the property.

### **Legislation**

Exploration and mining in Costa Rica is still governed by the Código de Minería (Mining Law) no. 6797 of 1982 together with the adjoining Reglamento al Código de Minería (Mining Regulations) no. 15442-MIEM from 1984, with later amendments in the early 1990s. The law provides a sound basis for exploration

were two state monopolies for oil and electricity, RECOPE and ICE, that also had geological departments. Water issues were dealt with by Servicio Nacional de Aguas Subterráneas.

All these activities, were carried out under the auspices of the Ministerio de Industria, Energía y Minas (MEIC).

Promotion of the mining industry was later on strengthened further by the establishment in 1984 of a state owned company called Minera Nacional SA (Minasa) with the sole purpose to develop the mining industry. After an energetic start in the early 1980s, a core of experienced staff was built and a network of international contacts was established. Results started to appear in the late 1980s when exploring for gold began. Further progress of Minasa was however slow. It has been reported that this was due to exceedingly high expectations from the Costa Rican government on the benefits that would accrue from its state owned mineralisations that often did not contain proven deposits.

In the end of the 1980s Minasa was gradually changing its approach and became more accommodating to the demands of its foreign counterparts. This change in strategy and tactics was however probably more a reflection of the decline of profitability of gold mining in general and the accordingly lowered values of gold deposits than of a change in Costa Rican policies and expectations.

In 1988 the responsibilities for the development of the mining sector passed over to a newly created ministry, MIRENEM from the MEIC. All issues relating to natural resources, including forestry, natural parks and environmental issues in general were gathered in one ministry. In the same period environmental issues received growing attention all over the world as exemplified by the UN Environment Summit in Rio de Janeiro in 1992. Costa Rica gradually adopted a radical policy on environmental issues and built a reputation as one of the most

advanced countries in the environmental area in all of Central and Latin America.

This trend together with the continuing decline in metal prices and the waning fortunes of most of the Canadian junior companies that formed the backbone of Costa Rican exploration, meant that the optimistic signals heard from several companies exploring in Costa Rica in the early 1990s gradually faded. Most of the exploration activities were either stopped or put on the back burner.

Gradually also several of the practices that had been implemented during the period of more active state engagement in the mining sector were discontinued. Starting in 1992 Minasa gradually ceased to operate and is at present closed down. The former monopoly on buying gold, which had been given to the state owned Banco Central was taken away. The two state owned companies producing fertilizer and cement were privatised in 1994. The earlier support for small scale panning in the south was switched to a more stringent guarding of the Natural Parks. The tourist industry was in focus both in terms of the qualities it demanded and in terms of its sheer size.

At present it is DGM that is responsible for all matters relating to exploration and mining. The tasks of DGM are:

- Promote the mining industry.
- Regulate and control this industry.
- Act as a Geological Survey.

### Socio-economic framework

The Costa Rican mining industry at present contributes only 0.1 per cent to GNP. There are clearly no real possibilities nor any political wishes to increase this share decisively but it is equally obvious that the industry has the potential to contribute to the economic development of Costa Rica at this or a slightly higher level for an extended period of time.

The mining industry in Costa Rica has had very limited impact on the development of society and economy in general. The present universal discussion of sustainable development has a special bear-

ing on a country like Costa Rica that has actively advocated the importance of this concept in several international fora and which tries to obtain an image of strong adherence to these principles. Further the long democratic traditions of Costa Rica, which are considerable in a global perspective and exceptional in a Central American context, are to a large extent based on small and medium scale enterprises in all branches of industry and commerce. Large scale investments into the mining industry will on the one hand bring in companies with technological and financial capacities to handle the full cycle of mining from exploration to rehabilitation in a proper way. On the other hand these mining companies are strong economic forces that could exert considerable pressure on the government to make the official support more tangible. In a more general sense the entrance of large companies, whether in mining or in other branches of industry or services, can only be successful when these delicate issues are seriously dealt with.

### Notes

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