

# Baraka Copper Mine Venezuela

## PROJECT FILE

*Private & Confidential*

Garrard Mining

### **The Copper Mine Simulation**

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Chris Porrin  
Baraka Mine Manager  
Baraka 1658, VENEZUELA

May 31<sup>st</sup>

Dear Chris,

I wanted to congratulate you on your new position, and express my confidence in your ability to manage the Baraka Mine to the high standard we expect.

As you are aware, the Garrard Mining prospecting unit found last year a large copper deposit in the Baraka region of western Venezuela. We moved quickly to acquire a concession to exploit the deposit, via three licence blocks, as well as two adjacent plots of land. The concession includes the right to exploit the deposits for as long as we wish.

For this mine, as well as for all our other mines, it is essential that the Garrard “community policy” is put into practice; that is to say, our projects not only benefit the company, but the environment and local inhabitants as well.

The exploration and environmental phases having been completed, we now need to do some planning and consensus-building for the exploitation phase which is due to start in November. In mid October, I thus have to give the Board a detailed outline of how the deposit will be exploited, as well as confirmation that the group of people that I have identified as stakeholders in this mine are in support of it. I have great pleasure in giving you full responsibility for this mission between now and October 16<sup>th</sup>.

I am sure you will be able to judge how to obtain the stakeholders’ full support; in my view, a mixture of consultation, communication and appropriate modifications to the plan will be key. The remainder of this file contains details on the site, the mine, the potential environmental impact, and the stakeholders.

The best of luck, and don’t hesitate to call if you need any advice.

Pierre Riesman  
Chief Executive – Copper Division

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# VENEZUELA COUNTRY REPORT

Venezuela is a country covering 900,000 sq km, on the north coast of South America. Population is 23 million, and GDP per head £800; after three decades of fluctuating oil prices, Venezuela is sometimes described as a 'nouveau-poor' nation. The main languages spoken are Spanish and Amerindian. Currency is the Bolivar (£1 = approximately 920 Bolivars). Venezuela has had a democratic political system for the last 30 years, but a large number of political leaders have left office after accusations of scandal or corruption.

The population's racial breakdown is:

- 65% mestizo (white, black and indigenous)
- 20% white
- 8% black
- 7% indian (indigenas)

The current economic situation includes a high fiscal deficit, petroleum accounting for 80% of exports, and high inflation (only notes in circulation, coins are worthless).

The Baraka Region is an inland region of 44,000 sq km, and is one of the poorest in Venezuela, although recent geological exploration indicates rich deposits of copper ore and natural gas.

Baraka, the regional capital, with a population of 129,000, is in the east of the region.

## **SITE DESCRIPTION**

The site of the copper deposit is as follows (see the enclosed map):

The three deposit blocks are grouped around the smelter & loading bay plot, next to which is an area of marshland, in an area that runs along the Boash river, 40 km from Baraka.

### Deposit Block 1 (100 hectares) “Settlement”

This block is mostly tropical vegetation, but includes a small settlement of several hundred indigenous Indians, who have apparently been living on this site since the last century.

### Deposit Block 2 (100 hectares) “Redwood”

This block is entirely covered by tall redwood trees, which are fairly common in Venezuela.

### Deposit Block 3 (100 hectares) “Green Parrot”

This block is mostly low level forest, grassland and swamp. It is inhabited by a rare green parrot, whose eating and reproductive habits are well-suited to the combination of dry and wet areas and nesting opportunities.

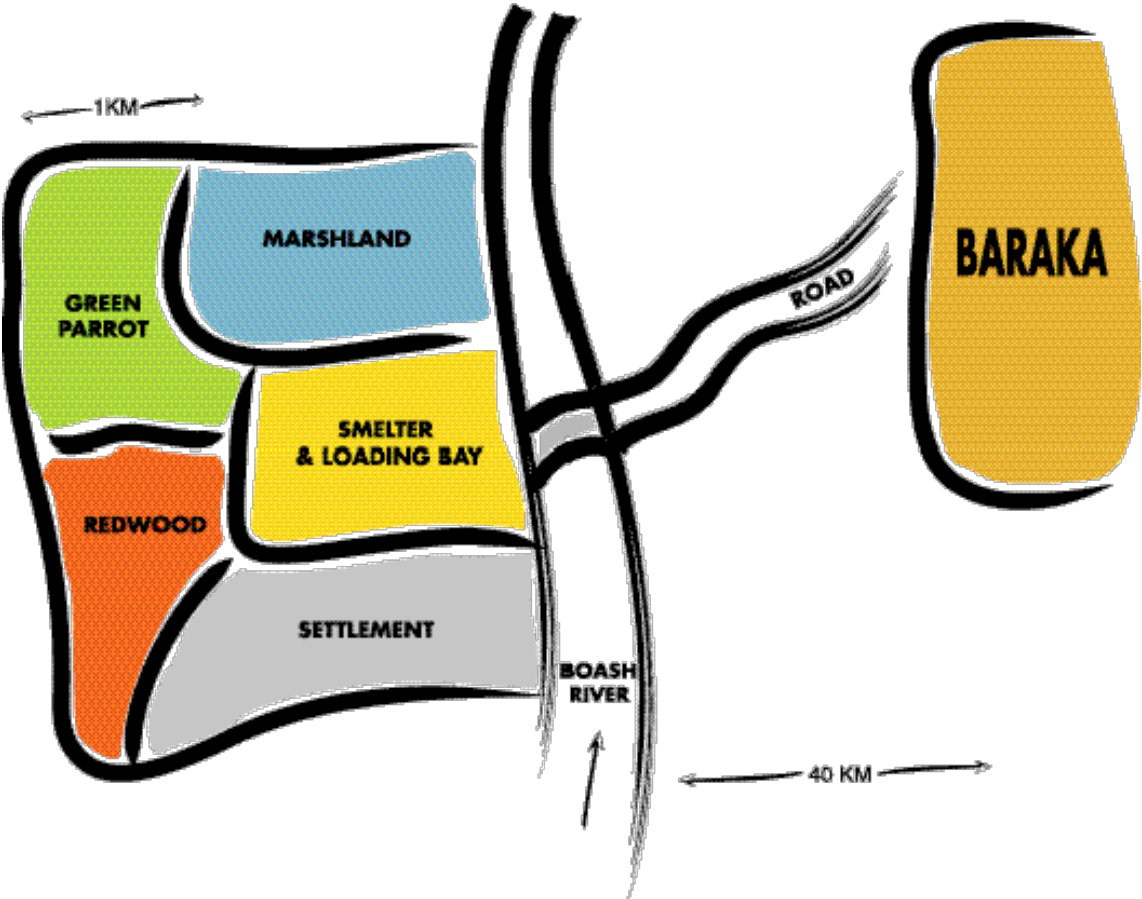
### Smelter & Loading Bay Plot (80 hectares)

This plot is a mix of tropical vegetation and grassland.

### Marshland Plot (90 hectares)

Adjacent to the smelter plot and the river, this is an area of marshland that drains into the river.

# SITE MAP



## **MINE SPECIFICATION OPTIONS**

There are several choices to be made in defining how the copper deposit will be exploited, grouped in three main areas:

### **Mining Technique**

Open pit mine - involves digging up the ground with massive mechanical diggers. It is relatively cheap and rapid, but completely destroys the habitat on the block during the mining period. Garrard's policy is nevertheless to try to reconstitute the block after the deposit is fully exploited.

Underground mine - involves drilling a vertical mine shaft of up to 200m in depth, and then a horizontal shaft to get at the copper ore. It uses an insignificant amount of land above ground, but is considerably more expensive than an open pit, and takes longer to extract the copper ore.

### **Smelter**

The smelter is used to convert the copper ore into refined copper, which includes the extraction of manganese impurities. There are three ways in which these impurities can be dealt with - the first is to simply discharge them into the river; the second is to install a filter within the smelter building; and the third is to build an effluent treatment plant adjacent to the smelter. These options are increasingly effective in reducing the level of manganese discharged into the river, but, unsurprisingly, are also increasingly expensive.

### **Loading Bay**

The loading bay is used to load the processed copper into the trucks used to transport them from the mine. This process creates a huge amount of dust, which has been known to increase the risk of lung disease for our employees working in the bay. You thus have the option of installing an air conditioning unit specifically designed to reduce the amount of dust circulating.

## *Community Development Fund*

Beyond the specification of the mine itself, Garrard has in the past made specific contributions to the local community, and we have been informed that the government has recently launched a campaign to raise funds for the installation of a country-wide web-based computer network in its schools, for which they are seeking a “seed” donation of £50m. There is thus the option of making this donation to the campaign.

## **Summary**

The choices you have to make are thus as follows:

(1) for each of the three deposit blocks,  
**Open pit mine**  
**or Underground mine**

(2) for the smelter,  
**Plant,**  
**Filter**  
**or No treatment**

(3) for the loading bay,  
**Air conditioning unit**  
**or No air conditioning unit**

(4) for the community development fund,  
**Donation**  
**or No donation**

# **ENVIRONMENTAL IMPACT ANALYSIS**

The following report was prepared by ENR Surveys Inc, Houston, Texas, on the basis of a survey carried out in November last year. The report presents the likely impact of the copper mine on Baraka's animal and plant life, rivers, and in terms of its effects on employee health and safety, and disturbance to the local inhabitants.

## **Mining Technique**

For each of the three deposit blocks, an open pit mine will completely destroy the block during the mining period. Landfill and then replanting is able to recreate the plant habitat, but this will take at least 10 years for low level vegetation and 50 years for the redwood trees. On the other hand, the impact of an underground mine is insignificant, since the mine head only takes up 1 hectare of land above ground. The proposed techniques mean that there will be no danger of subsidence and no effect on the water table.

With respect to recreating the habitat after refill, the indigenous Indians will never return to an area of land now perceived as "violated". The third block is inhabited by a rare Green Parrot, which is only found in Venezuela, and these parrots are very unlikely to return. We estimate that over half of Venezuela's Green Parrots inhabit this block.

## **Smelter**

The level of manganese discharge into the river depends heavily on the filtering technique used; if there is no treatment, we estimate that for every tonne of copper ore processed, 50kg of manganese would be discharged into the river. This would have serious consequences not only for the river's wildlife (e.g. fish spawning grounds wiped out for at least 50km downstream from the mine), but also on the population that draws water from the river (e.g. through increased risk of cancer after prolonged exposure). The proposed filter would reduce the discharge to 20kg per tonne, but the most effective technique by far is the specialised plant, which would limit the discharge to only 1kg per tonne, which would certainly eliminate any risk to the downstream human population. However, the plant would destroy the marshland plot adjacent to the smelter.

## **Loading Bay**

Copper ore dust is known to increase the risk of lung disease (in particular pneumoconiosis) for those who are exposed to it on a prolonged basis. We estimate that the risk of contracting at least one form of lung disease if there is no equipment to reduce the level of dust circulation is 100 cases per 10,000 people. The proposed air conditioning unit would reduce this risk to 15 cases.

## **Community Development Fund**

The impact of the proposed donation on Venezuela's schools is outside the scope of this report, but a recent government white paper highlighted the dangers of the country's schools missing out on the information revolution.

# ECONOMIC VARIABLES

## Fixed & Variable Costs; Employees

	Fixed Cost in Year1 (£)	Variable running costs per year (£)	Employees required to run
Open pit mine	100,000,000	10,000,000	1,000
Underground mine	220,000 000	20,000,000	2,000
Smelter (No treatment)	300,000,000	10,000,000	200
Smelter (Filter)	500,000 000	15,000,000	300
Smelter (Plant)	900,000 000	30,000,000	500
Loading bay (No A/C)	100,000 000	10,000,000	20
Loading bay (A/C Unit)	150,000 000	15,000,000	25

## Size of Plot Deposits (tonnes)

Settlement	1 000 000
Redwood	1 000 000
Green Parrot	1 000 000

## Extraction Rates (tonnes/year)

Open Pit Mine	200 000
Underground Mine	100 000

## Manganese River Discharge (tonnes/tonne ore processed)

Smelter (No treatment)	0.050
Smelter (Filter)	0.020
Smelter (Plant)	0.001

## Lung Disease Rates (per 10,000 employees)

Loading bay (No A/C)	100
Loading bay (A/C Unit)	15

## Other Variables

Discount Rate	5%
Market price per tonne refined copper (£)	1,000
Venezuelan Corporate Tax Rate	20%
Suggested Donation to School Fund (£)	50,000,000

# SITE DEVELOPMENT PLAN

DRAFT May 31<sup>st</sup>

The development plan for the Baraka Mine is currently specified as follows:

**Mining Technique**                      Open pit / Underground

Settlement                                  Open pit  
Redwood                                    Underground  
Green Parrot                                Underground

**Smelter**                                      No treatment / Filter / Plant

Filter

**Loading Bay**                                No air con unit / Air con unit

Air con unit

**School Fund**                                No donation / Donation

No donation

# IMPACT REPORT

The mine as specified in the Site Development Plan will have the following impact:

The Settlement block will be	Destroyed
The Redwood block will be	Unaffected
The Green Parrot block will be	Unaffected
The Marshland plot will be	Unaffected
The School Fund will	Not receive a donation
The estimated rate of lung disease (per 10,000 employees) will be	15
The "present value" of the .....	
Manganese Discharge (tonnes) will be	48,205
Number of Employees (man years) will be	37,726
Corporate Taxes paid (£) will be	127,285,222
Profit After Tax to Shareholders (£) will be	509,140,887

## **Garrard Mining**

### **Annual Report Extracts (last year's report)**

Message from the Chief Executive Officer:

“Garrard built on its position this year as the world’s second largest copper producer.

There was an increase in identified deposits on Garrard owned sites of 17%.

Profit After Tax increased by 4%, and employee numbers grew to 58,000 worldwide. Garrard now operates in 13 countries, in all continents.

Garrard’s reputation for “environmental responsibility” has been commented on frequently in the world’s business press, and weighs more and more heavily with our customers and communities.

The Board has recommended a dividend of £ 1.04 for the period.”

### **KEY NUMBERS**

	<b>Year -2</b>	<b>Year -1</b>	<b>Year 0</b>
Employees	45,000	51,000	58,000
Total Identified Copper Deposits (m tonnes)	95	100	117
Share Price ( £ )	15	19	29
Turnover ( £bn )	7.4	8.1	9.3
Profit After Tax ( £m )	295	314	327
Total Assets ( £bn )	8.6	8.9	9.4

# **GARRARD MINING**

## **Key Personnel Profiles**

### **Chris Porrin**

Current Position :Garrard Mining, Baraka Mine Manager

Responsibilities : Baraka Mine operations, community relations

#### Personal Information :

Date of Birth – April 3<sup>rd</sup> 1956

Personal Status - Married, one daughter

Nationality - UK

Languages - English, Spanish

#### Education

1985 - Manchester Business School

Executive MBA

1978 - Manchester University

BA in Geology

#### Past Experience

2000 - Baraka Mine Manager

1991 - 99 Assistant Mine Manager, Tasol Mine, Indonesia

1979 - 91 Mining Engineer, South America

## **Pierre Riesman**

### Current Position

Chief Executive - Copper Division, London

Responsibilities : Worldwide copper mining operations

Date of Birth – August 4<sup>th</sup> 1945

Personal Status - Married, two sons

Nationality - Canadian

Languages - English, French

### Education

1968 - University of Toronto

BSc in Mechanical Engineering

### Past Experience

1991 - Chief Executive - Copper Division

1988 - 91 Director of Mining Operations

1983 - 88 Mine Manager, Tarin Mine, Chile

1968 - 83 Mining Engineer in Asia, Africa mines

## **STAKEHOLDER PROFILES**

### **Manuel Ramon**

#### **Minister of Finance - Venezuelan Government.**

Has held the post since the last general election in 1997.

Keen to promote Foreign Direct Investment.

Reform-minded, but battling against a mainly conservative cabinet.

Ramon has encouraged MNC's to invest in Venezuela.

### **Gan Esperanza**

#### **Mayor of Baraka**

Has been mayor for over 20 years.

Has built a powerful web of political support, particularly from local industrialists.

Was questioned as part of an anti-corruption investigation, but no charges were brought.

He has spent his whole life in local and regional politics.

### **Carla Miro**

#### **Manager - Venezuelan Ecology Association**

Known as a tree-hugger.

Has been single minded in her pursuit of the protection of Venezuela's rain forests.

Organised a series of demonstrations against a large US oil group drilling in the south of the country.

Local employment and taxes are just more dangers to the environment in her book.

**Leon Gonzala**

**Director - Indigenous Indian Reconciliation Council**

Does not speak much English.

Trained as an anthropologist in Caracas.

Formed the Council several years ago to protect the interests of the indigenous people.

He knows Carla Miro very well.

**Jane Tarsh**

**Chief Executive - UK Mining Association**

Role of the UK Mining Association is both to represent the UK mining industry and implement a certain degree of self-regulation.

Jane has built a reputation as a 'firm but fair' manager.

I don't think Jane would be too worried about a bit of rain forest being knocked down.

She likes Garrard's approach to handling the environmental aspects of its foreign mining projects.

**Mike Limpton**

**Operations Director - Borlan Construction**

Borlan does most of the construction work for Garrard's mines.

Mike will be based at Baraka from October onwards.

We have negotiated fixed rates for the various construction components of the mine.

Even though Borlan gets paid more for an underground mine, Mike is wary of the complications involved in the South American jungle.

**Elisabeth Martin**

**Division Head - Industrial Standards Institute (ISI)**

ISI develops a number of standards for industrial operations, including the Management of Environment Standard MES1560

Elisabeth's role is to oversee development and awards of standards in the mining and oil industries

Has good and regular contacts with Manuel Ramon.

She tends to delegate specific judgements on the merits of particular environmentally-related decisions to other experts, such as Borson.

**Bob Burgin**

**Chief Representative - United Union of Mineworkers**

Typically, a majority of the ex-patriate mining employees are members of the UUM.

Bob has his moments when working directly against Garrard's interests would appear to be the main aim.

Bob is an ex-army sergeant, and I think he really cares for his members in the same way he used to for his men.

Bob is unlikely to be too worried about the welfare of the parrots, trees or settlers

**Philippa Borson**

**Professor of Environment - Barcelona Business School**

Philippa was involved in the drafting of the Kyoto Protocol on Climate Change in 1997.

She has written a number of books on environmental management.

Major changes were implemented after one of her articles criticised the plans for an oil well in the Gulf of Mexico.

Philippa's opinion is highly respected and sought after, by both politicians and business people.

### **Alex Ryder**

#### **Director - Sunrise Life Insurance Corp**

Sunrise is a long-term, major shareholder in Garrard, with around 40% of the stock.

Alex seems to be aware of the danger that maximising profits of a given project may compromise long-term shareholder value.

Sunrise does not have any green funds

Alex has one overriding concern - the share price

### **Charles Karel**

#### **Director - Business and the Community Council**

The BCC is based in London, and organises regular conferences on stakeholder issues.

Karel has established a rating system for environmental management by large organisations.

Karel is a regular contributor of articles to well-known journals.

He supports the cause of the green movement, but often raises questions about their methods.

### **Arthur Pont**

#### **CEO - Green Copper**

He has been running Green Copper for nearly 7 years now.

Green Copper has a contract to purchase over 35% of Baraka's output.

Arthur has turned the name of his company, founded in the last century, to his advantage by promoting its green credentials.

I think Arthur deeply believes that carefully considered business activity is in the whole community's best interests.