

# Positive Pre-Feasibility at Borborema

Crusader Resources Limited has completed a positive Pre-Feasibility Study (PFS) of the Borborema Gold Project in the northeast of Brazil confirming a robustly economic project.

The study evaluated a 3Mtpa open cut mining operation with a standard beneficiation circuit that produces up to 180,000<sup>1</sup> ounces of gold per annum.

Commenting on the results of the PFS, Crusader's Managing Director, Rob Smakman said;

*"The results of the PFS highlighted the excellent features of the Project – grid power, a modest strip ratio and the excellent gold recoveries. Borborema has exciting potential to continue it's remarkable growth, with the Resource open both at depth and along strike. The current Mineral Resource of 44.64Mt at 1.30g/t gold for 1.86M ounces will be updated in October, incorporating results from an additional 13,000m of new drilling. This will form the basis of a Bankable Feasibility Study (BFS), expected to commence in October".*

Key highlights of the PFS include:

In-Pit recoverable resource*	27Mt @ 1.39 g/t for 1.18Moz
Mining Throughput Rate	3Mtpa
Mine Life	9 years
Strip Ratio- Life of Mine	4.23:1
Metallurgical recovery	96%
Annual Production <sup>1</sup>	Up to 180koz (ave 131 koz)
Capital Expense (Capex)**	USD \$169M
Operating Expense (Opex)	USD \$558/oz
Pre-tax NPV (10% discount rate)***	USD \$250M
IRR	32.90%

\* In pit resource includes indicated resources of 17.6Mt @1.33 g/t for 750koz and inferred resources 9.4Mt @ 1.56 g/t for 475koz.

\*\* Assumes owner operated and includes 15% contingency. Does not include sustaining capex

\*\*\*NPV and IRR calculations in table above are all calculated using a gold price of USD \$1,300

<sup>1</sup> This is not a production forecast by the Company but an assumption used in the PFS. There remains at present insufficient certainty with respect to whether economically mineable mineralisation exists to reliably estimate future production. Further exploration and studies are required to determine this.

The Company is of the opinion that the Inferred and Indicated resources have a reasonable prospect of eventual economic extraction. Under the JORC Code, this is the level of confidence that is required to estimate a Mineral Resource as opposed to an Ore Reserve. Under the JORC Code, an Ore Reserve is the economically mineable part of an Indicated or Measured Mineral Resource, as at the date of reporting, taking into account mining, metallurgical, economic, marketing, legal, social, and governmental factors (Modifying Factors).

At this stage the Company has not yet progressed the Inferred and Indicated Resource or progressed the modifying factors sufficiently. As such, the production assumptions in the PFS should not be used as a basis for investment decisions about shares in the Company.

## Australian Securities Exchange Information

### ASX Code: CAS

- Ordinary Shares **110,146,040**
- Options **4,250,000**  
(exercise prices: \$0.44 to \$1.30)
- Market Capitalisation **\$130M**
- Treasury **\$20 M (30 Aug 2011)**
- Share price **\$1.18**  
(12 month range: \$0.46 to \$1.50)

## Board of Directors

Non-Executive Chairman  
**David Archer**

Managing Director  
**Rob Smakman**

Executive Director  
**Paul Stephen**

Non-Executive Directors  
**Justin Evans**  
**Murray Hodges**  
**David Netherway**

## CAS Investment Opportunity in Brazilian Projects

- In-country experienced management (inc MD, COO and Exploration Manager), underexplored and high-potential portfolio. Extensive network into new opportunities.
- Aggressive exploration at Borborema Gold has seen resource grow from zero to 1.86Moz in under 12 months. Drilling is continuing.
- Cashflow in 2011 from Posse Fe project to fund expansion and exploration ambitions.

The Borborema Gold Project is located in the state of Rio Grande do Norte, 140km west of the state capital, Natal, and 30km east of the regional town, Currais Novos.

The PFS, managed and coordinated by Crusader, evaluated the mining, treatment and tailings disposal options, examined the capital requirements and operating costs, identified and quantified the risks involved in developing the project and highlighted the areas that need additional work towards production.

Contributors to the current study are as follows:

- Mineral resource model – Mitchell River Group
- Mine design and production schedule – Auralia Mining Consulting Pty Ltd
- Metallurgical testwork and process route definition – Testwork Desenvolvimentos
- Plant design and infrastructure – Onix Engenharia
- Hydrogeology – Hidrológica Ltda
- Rock mechanics – BVP Engenharia
- Environmental and social plan – CERN/Progel
- Capex and opex – Onix/Crusader
- Financial model and risk analysis – Crusader

Combining the known variables into a conservative cash flow model has revealed a robust investment case, supporting Crusader’s view that more detailed investigation by way of a Bankable Feasibility Study should be undertaken.

## Resources and Mining

The deposit currently contains a JORC compliant Indicated and Inferred Mineral Resource at a 0.5g/t cut-off of 44.64Mt at 1.30g/t (1.86M ounces), of which 49% is in the indicated category. The mineable resource contained within an optimised pit at a US\$1150/oz gold price, including 10% dilution and 95% mining recovery is 27.07Mt at 1.39g/t (this includes in-pit inferred resources) for a total of 1.18 Moz.

**Borborema Project Mineral Resource (June 2011)**  
**Estimate by Ordinary Kriging, 12.5mN x 5mE x 5mRL Parent Cell**

Cut-off Grade Applied (g/t Au)	Indicated			Inferred			Total		
	Tonnes (Mt)	Average Grade (g/t Au)	Contained Gold (Moz)	Tonnes (Mt)	Average Grade (g/t Au)	Contained Gold (Moz)	Tonnes (Mt)	Average Grade (g/t Au)	Contained Gold (Moz)
0.5	21.49	1.32	0.91	23.16	1.28	0.95	44.64	1.3	1.86

Note: Rounding errors may occur in the table above

The ore will be mined by conventional open pit methods. The mine design, based on the maximum NPV, US\$1150/oz optimised pit, uses a 55 degree overall hanging-wall pit slope and a final depth of around 230m, generating an overall strip ratio of 4.23:1. Both owner-operated and contractor mining have been evaluated, the former being the preferred alternative due to the high contract mining rates practiced in Brazil.

The main BR226 Federal highway crosses the southern portion of the planned open cut and the mine schedule is based on the assumption that the road will be relocated late in year 2 of the operation, maintaining an intact pillar under and adjacent to the road in the first two years of operation. Crusader believes the road will be moved before the operation commences, however have built in this extra time to allow for unexpected delays.

### **Treatment Circuit**

The ore will be treated in a 3 million tpa carbon-in-leach (CIL) plant, which will be constructed on the immediate footwall of the open pit at an estimated cost of USD \$129.6M, including all associated infrastructure. Plant construction and commissioning is targeted for early 2014, assuming feasibility, licensing and financing all proceed as planned.

The ore is free-milling with relatively low cyanide consumption of 0.7 kg/t, the process route comprising a three-stage crushing circuit to produce an 80% passing 9.5mm product. Milling will be by 2 ball mills aligned in series, followed by a gravity separation step and then leaching in tanks.

Metallurgical testwork indicates a combined gravity plus CIL recovery average of 96%, yielding a maximum gold production of 180k oz in year 8 and an average annual gold production of 131k ozs <sup>1</sup>. Plant operating costs are estimated at USD 12.67/t.

The work index used in the process planning was 17.4 kw/st. This is a relatively high value which requires further investigation. Crusader's metallurgical consultants have suggested that the high work index is due to the high mica content of the ore. The BFS studies will evaluate the potential to remove the mica using cyclones during the milling process. It is expected that if the mica can be removed and if there is no gold associated with the mica, the power consumption in the milling step would be significantly reduced.

Three tailings disposal options were considered in the PFS, with the preferred option co-disposal of thickened tailings paste after cyanide destruction (DToX) with waste rock from the mine. This option maximizes the water available for re-cycling, has a lower capex component and does not need a tailings dam. It is also the preferred option from the environmental perspective, with no cyanide in the waste product.

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## Infrastructure

Grid power will be supplied via a new 30km 138Kv powerline to be constructed from the town of Santa Cruz. The powerline will use a similar route to the existing powerlines that cross the project.

Process water will be drawn from a storage dam which will be constructed 7.3kms downstream from the plant. Hydrological studies have confirmed that a 2,500ha catchment will capture sufficient water for the project.

## Capital (Capex) and Operating (Opex) Expense.

Pre-operational capital expense (Capex) is summarized in the table below;

	USD M
Mine and Equipment (owner operated)	17.4
Civil Works	11.9
3Mtpa Plant	92.4
Power Supply	9
Miscellaneous**	16.2
Contingency (15%)	22
<b>Total*</b>	<b>169</b>

\*Does not include sustaining capex, exploration or study costs.

\*\*Miscellaneous includes owners costs, freight, buildings, first fill, insurances, EPCM, storage dam and administration

Operating expenses are summarized in the table below;

	USD/t of ore treated
Mining cost	9.0
Treatment cost	12.67
Administration	1.12
<b>Total</b>	<b>22.79</b>

## Economic Assessment

Estimated cash operating cost is USD \$558 per ounce of gold produced. Total costs, including depreciation are USD \$735 per ounce.

The base case cash flow analysis at a gold price of USD \$1300 per ounce, shows an estimated project IRR (pre-tax ) of 32.9% and NPV<sub>10</sub>, USD \$250M.

Sensitivity analyses show that the project is relatively insensitive to capex and opex variations, but displays moderate sensitivity to gold price (and/or grade and/or exchange rate) variations. A summary of the economic performance using a variety of gold prices is presented below.

Gold price (USD)	Tax	IRR (%)	NPV <sub>10</sub> (USD M)
1300	Pre	32.9	250
1560	Pre	43.9	398.3
1040	Pre	20.3	101.7

Note. All costs have been converted from Brazilian Reals (BRL) to USD at an exchange rate of 1.6:1)

### **Exploration and Development**

Crusader continues to drill at Borborema with the three rigs currently on site to be joined by an additional two rigs in coming weeks. An updated resource estimate is due to be completed in October. Crusader is proposing to commission a bankable feasibility study (BFS), which will include basic engineering design, in October.

## About Crusader

Crusader Resources Limited (ASX: CAS) is a minerals exploration company focused on the identification, acquisition and development of projects in Brazil and Australia. The company has a diverse portfolio of projects including iron ore, gold, uranium, tungsten and tin. Crusader applies leading edge exploration skills to the discovery of new assets and utilises its strong networks in Brazil, Australia and around the world to identify new opportunities.

Crusader is set to become Australia's latest iron ore production company when production begins at the Posse Iron project (100%). The project is located in the Iron Quadrilateral region of Minas Gerais state, Brazil, and is a low capital cost project with no infrastructure bottlenecks and simple logistics. Posse contains an Indicated Mineral Resource of 4.83Mt at 47.39% Fe and an Inferred Mineral Resource of 31.18Mt at 42.89% Fe. (Refer to announcement made 11 May 2009).

Crusader has two gold projects in Brazil, Borborema and Jurú-Belem. The Borborema gold project is the most important gold project in the northeast of Brazil with historical production of ~250,000 ounces. In June 2011, Crusader updated the JORC compliant Mineral Resource estimate at Borborema (at a 0.5g/t cut-off) to 21.49Mt @ 1.32 g/t for 0.91 Moz Indicated and 23.16Mt @ 1.28 g/t for 0.95 Moz Inferred for a combined Indicated and Inferred resource estimate of 44.65Mt @ 1.30g/t for 1.86 Moz. Crusader is currently aggressively exploring the Borborema project (refer to announcement made 14 May 2011).

Crusader also has an extensive portfolio of gold, tin, indium, REE and tungsten projects within Brazil.

Crusader Resources Limited has 110,146,040 ordinary shares on issue.

## Disclaimer

The information in this report that relates to Exploration Results is based on information compiled or reviewed by Mr. Robert Smakman, who is a Member of The Australasian Institute of Mining and Metallurgy and is a full-time employee of the company. Mr. Smakman has sufficient experience in the type of deposits under consideration and the activities being undertaken to qualify as a Competent Person as defined in the December 2004 Edition of the Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves and consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. Mr. Smakman accepts responsibility for the accuracy of the statements disclosed in this report.

The information in this report that relates to Mineral Resources is based on information compiled by Mr. Lauritz Barnes and Mr. Brett Gossage who are both Members of The Australasian Institute of Mining and Metallurgy. Messrs Barnes and Gossage are both independent consultants to Crusader Resources Limited. Both Messrs Barnes and Gossage and have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Messrs Barnes and Gossage consent to the inclusion in the report of the matters based on the information in the form and context in which it appears.

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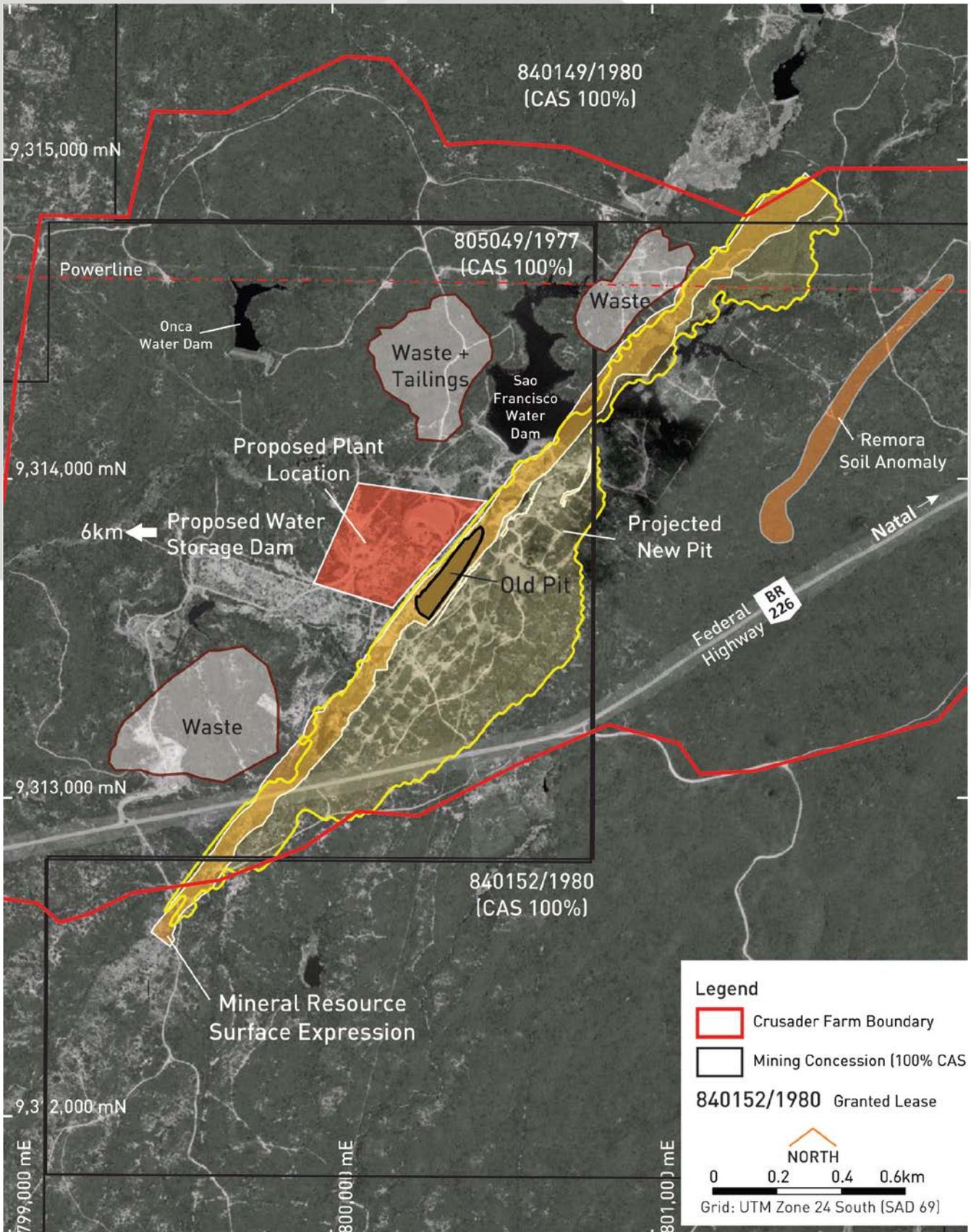
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# Borborema General Layout Plan



# Borborema Plant Design

