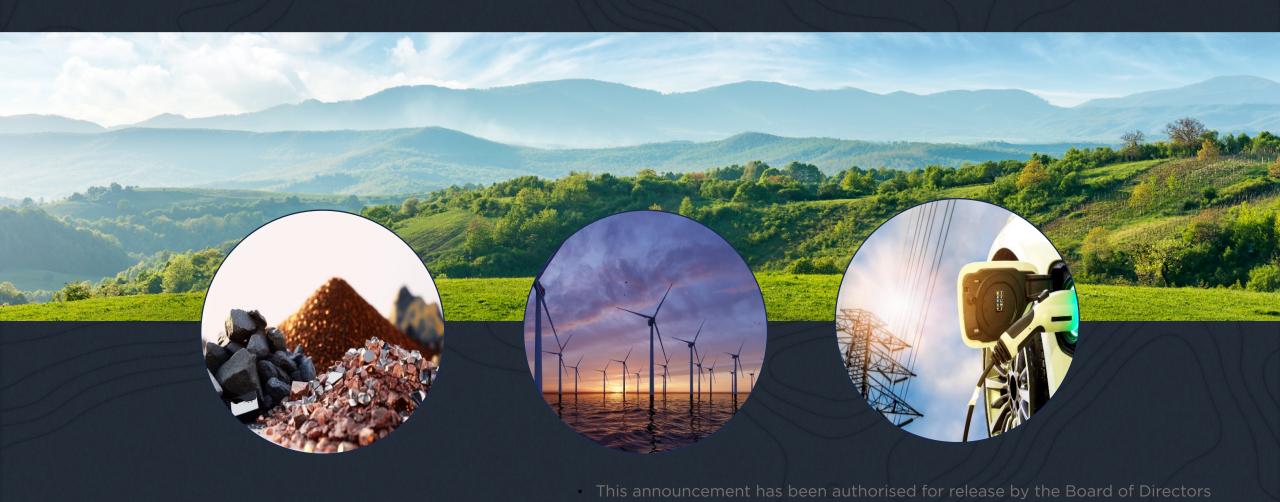


An Emerging Brazilian Rare Earth and PGM Developer Set For Rapid Growth



Disclaimer



THIS PRESENTATION HAS BEEN PREPARED BY BBX MINERALS LIMITED (COMPANY).

This important notice and disclaimer applies to this presentation and any information provided in relation to or in connection with the information contained in it.

This presentation contains information in summary form. Some of the information is based on publicly available sources, has not been independently verified or may not be complete. It should be read in conjunction with the Company's other continuous and periodic disclosure announcements lodged with Australian Securities Exchange, which are available at www.asx.com.au.

This presentation contains forward-looking statements which involve a number of risks and uncertainties. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this presentation.

No representation or warranty is made as to the accuracy, completeness, reliability, fairness, or correctness of the information contained in this presentation. To the maximum extent permitted by law, no person, including the company and their related bodies corporate, officers, employees, and representatives (including agents and advisors), accept any liability or responsibility for loss arising from the use of such information.

This presentation is not a bidder's statement, prospectus or a product disclosure statement under the Corporations Act 2001 (Cth) or offering document under any other law. It has not been lodged with the Australian Securities and Investments Commission. This presentation is for information purposes only and is not financial product or investment advice or intended to be used as a basis for making an investment decision. It has been prepared without taking into account the investment objectives, financial circumstances, taxation position or particular needs of investors.

This presentation does not constitute an offer to issue or sell, or to arrange to sell, securities or other financial products. In particular, this presentation and the information contained in it does not constitute a solicitation, offer or invitation to buy, subscribe for or sell any security in the United States or to or for the account or benefit of any U.S. Person (as defined in Regulation S under the U.S. Securities Act of 1933, as amended (the US Securities Act)). The securities referred to in this presentation as being offered or sold have not been, and will not be, registered under the US Securities Act. Securities may not be offered or sold in the United States unless they have been registered under the US Securities Act or an exemption from registration is available.

The release, publication or distribution of this presentation in jurisdictions outside Australia may be restricted by law. Any failure to comply with such restrictions may constitute a violation of applicable securities laws.

COMPETENT PERSON STATEMENT

The information in this report that relates to exploration results is based on information compiled by Mr. Antonio de Castro, BSc (Hons), MAusIMM, CREA, who acts as BBX's Senior Consulting Geologist through the consultancy firm, ADC Geologia Ltda. Mr. de Castro has sufficient experience which is relevant to the type of deposit under consideration and to the reporting of exploration results and analytical and metallurgical test work to qualify as a competent person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Castro consents to the report being issued in the form and context in which it appears.

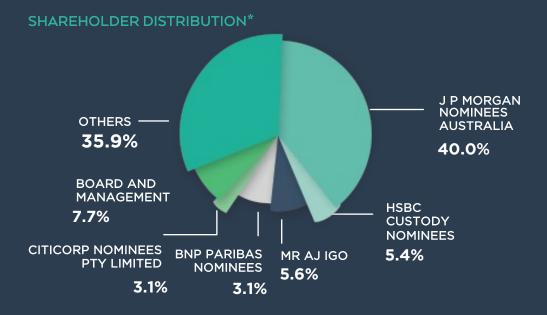
The information in this report that relates to the Adelar target Mineral Resource is based on and fairly represents information compiled by Mr. Antonio de Castro and Mr. Leonardo Soares, (employee of GE21 Consultoria Mineral Ltda). Mr. Soares is a member of Australasian Institute of Geoscientists. Both have sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserve Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specially, Mr. de Castro is the Competent Person for the database (including all drilling information), the geological and mineralisation model plus completed the site visits with Mr. Soares. Mr. Soares is the Competent Person for the construction of the 3D geology/mineralisation model plus the estimation. Mr. de Castro and Mr. Soares consent to the inclusion in this report of the matters on their information in the form and context in which they appear.

EXPLORATION RESULTS AND MINERAL RESOURCES

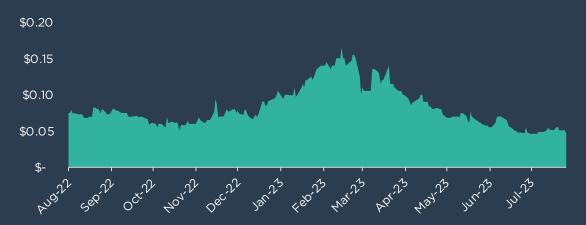
The information in this Presentation that relates to Exploration Results and Mineral Resources is based upon and fairly represents information previously released to the ASX on 26 May 2022, 30 May 2022, 1 June 2022, 9 June 2022, 10 June 2022, 5 July 2022, 7 July 2022, 14 July 2022, 21 July 2022, 27 July 2022, 29 July 2022, 5 August 2022, 19 August 2022, 26 August 2022, 2 September 2022, 9 September 2022, 16 September 2022, 23 September 2022, 4 October 2022, 14 October 2022, and 25 October 2022.

Corporate Overview

An emerging Brazilian explorer and developer well supported by key shareholders, directors, and management.



SHARE PRICE PERFORMANCE





CAPITAL STRUCTURE

Australian Securities Exchange Code Frankfurt Stock Exchange Symbol**	BBX FZ7
Shares on issue	512,250,722
Listed options (\$0.12, 31 Dec 2025)	48,142,857
Performance Rights (various terms)	10,700,000
Market Cap (31st Aug)	\$17.4M
Cash as 30 June 2023	\$1.655M

 $^{{}^{**}} Frankfurt\ Stock\ Exchange\ listing\ is\ an\ over-the-counter\ listing.\ WKN:\ AODNPY\ |\ Symbol:\ FZ7$

SHAREHOLDER DISTRIBUTION*

Top 20 Shareholders	72.21%
Top 100 Shareholders	89.16%

^{*}Shareholder distribution as at 27 July 2023

BOARD & MANAGEMENT

BOARD	MANAGEMENT
KEN KLUKSDAHL Non-Executive Chairman	ANDRE DOUCHANE Chief Executive Officer
JEREMY ROBINSON Non-Executive Director	ANTONIO DE CASTRO Exploration Manager - Geologist
GREG VAN STAVEREN Non-Executive Director	EDMAR MEDEIROS Technical Manager
ABBY SMITH Non-Executive Director	MIKE SCHMULIAN Administrator - Brazil

Investment Opportunity



STRONG DEMAND FOR **REEs AND PGMs**

- Strong demand driven by clean energy technologies.
- RFF demand continues to grow for EV and wind energy markets. EV sales expected to increase to 80m units per annum by 2050.
- PGMs highly important to hvdrogen technologies.



EXCEPTIONAL IONIC REE OPPORTUNITY

- Two key REE projects covering a huge area of over 700 km².
- 9 exploration licences.
- Initial positive ammonium sulphate testing confirm presence of ionic rare earths.
- Vastly underexplored region - new rare earth district.



FAST MOVING REE EXPLORATION

- Aggressive (3 rigs) auger drilling program underway.
- Mineralisation at surface.
- Samples regularly sent to the lab constant news flow.
- REE MRE expected within Q1 2024.
- Pipeline of potential REE acquisitions.



WORLD CLASS OPEN **PGM DEVELOPMENT**

- Existing JORC compliant PGM MRE of 725koz.
- Mineralisation at surface.
- Excellent bioleaching results. (~16g/t 5E PGM).
- PGM MRE upgrade expected following completion of bioleaching pilot plant testing.



EXPERIENCED BOARD AND MANAGEMENT

- · Highly regarded inhouse technical expertise.
- Broad range of skills including exploration, project development, operations, finance, and governance.
- · Track record of discovering, developing, and mining.



RESPONSIBLE & SUSTAINABLE MINING

- Focused on investment in cleaner technologies and building a sustainable business.
- Assets in cleared farmland.
- Strong and long-term relationship with community leaders.

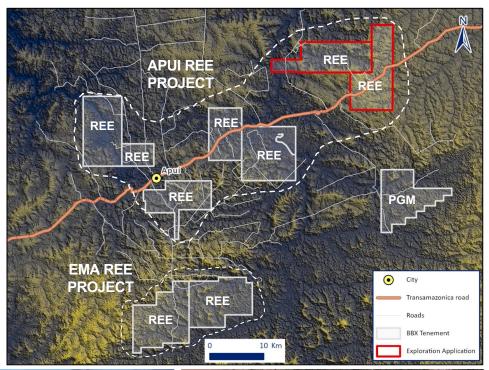


Brazilian REE landscape

BBX IS WELL POSITIONED TO BENEFIT FROM EIGHT LARGE REE FOCUSED TENEMENTS IN A PROVEN MINING JURISDICTION.

COMPARABLE BRAZILIAN ASSETS







Serra Verde mine site





Serra Verde mine pit

Serra Verde plant under construction

EMA REE PROJECT

- Two large tenements 189 km2
- Significant TREO values from 13 selected drill holes, including 4 metres at 2,631 ppm TREO.
- Rhyolite hosted very similar to Chinese Ionic REE producers (target 800 - 1,200 PPM) - mineralisation from surface
- A basic 2% ammonium sulphate leach demonstrate excellent REEs recoveries, confirming the presence of IAC REEs.
- Large Area potential for large or multiple deposits
- Extensive auger drilling program underway
- Maiden MRE expected within Q1 2024

APUI REE PROJECT

- Newly acquired, seven tenements totally 510 km2
- Significant results including 4 metres at 930 ppm TRFO.
- Similar mineralization and surface proximity to Ema REE Project
- Grades compatible with typical Ionic REE deposits such as Makuutu in Uganda
- Extensive auger drilling programme underway.



Ema Project

LOCATION

- 30km south of Apuí with year-round access by gravel roads;
- Covers an area of 189km2;

SIGNIFICANT REE RESULTS

- EMRC002: 8 metres at 1,607 ppm
 TREO from surface including 4m at 2,631 ppm TREO from 2m.
- o EMD017: 9 metres at 890 ppm TREO from 10m.
- o EMD022: 7.8 metres at 776 ppm TREO from 4m,
- o Results pending for 26 Auger holes targeting higher grade trend
- —Results suggest that the Ema deposit is similar to most common iREE deposits in China. These are deposits developed on top of felsic volcanic rocks and account for nearly 38% of the total of such type deposits in South China. These deposits are typified by good quality, a high percentage of iREEs (>65%), and high metallurgical recoveries.

AMMONIUM SULPHATE TESTING

—Initial ammonium sulphate leach has returned excellent recoveries, confirming the presence of Ionic Adsorbed REE mineralisation at Ema and Ema East.

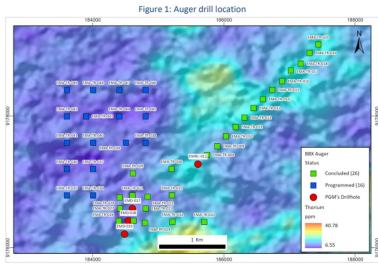
DRILLING

- —BBX has drilled a total of 2,246 meters at the Ema Project.
- Additional REE focused auger drilling commenced, with 26 holes completed.

TRIAL MINING LICENCE

—Trial mining license granted in 2019. It allows BBX to mine 50,000 tonnes of mineralised rock per annum. The license is renewed annually. BBX has applied for renewal.







Apui REE project

LOCATION

— Seven tenements surrounding the Apui town, covering an area of 510km².

SIGNIFICANT REE POTENTIAL

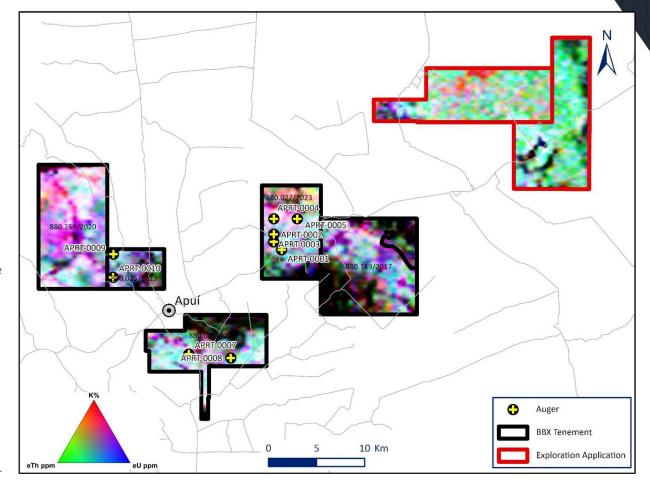
- —Close proximity to the Ema project
- —Significant results include:
 - o APTR 001: 12 meters at 606 ppm TREO from surface
 - o APTR 002: 12 meters at 714 ppm TREO from surface
 - APTR 004: 9 meters at 815 ppm TREO from surface, including 4m at 930 ppm TREO from 5 meters
- —The Company has identified a specific sedimentary unit consisting of siltstones, fine sandstones, and claystone which shares the same ternary radiometric signature, and geological, climatic, and topographic characteristics with the Makuutu iREE project in Uganda.

LICENCE

- Four tenements with active exploration licences granted.
- —Two leased tenements yet to be published.
- —Two new tenements with exploration applications.

DRILLING

—Extensive auger drilling programme underway with three drill rigs.



Apui project after acquisitions, over ternary radiometric image.



Potential for ionic adsorption clay (IAC) ree project

Ammonium sulphate leach returned excellent recoveries, confirming the presence of Ionic Adsorbed REE mineralisation at Ema and Ema East

AMMONIUM SULPHATE LEACH

- Average recovery of the light magnetic REEs Pr + Nd was 51%.
- Average recovery of heavy magnetic REEs, Tb + Dy was 39%.

REO	12-14m	14-16m	16-17.5m	17.5-19m	AVERAGE
La2O3	39%	46%	52%	35%	43%
CeO2	12%	9%	20%	10%	13%
Pr6011	45%	56%	59%	40%	50%
Nd2O3	46%	57%	59%	42%	51%
Sm2O3	43%	52%	55%	39%	47%
Eu2O3	18%	23%	22%	16%	20%
Gd2O3	38%	48%	49%	36%	43%
Tb407	34%	46%	46%	33%	40%
Dy2O3	32%	44%	42%	29%	37%
Ho2O3	32%	44%	43%	31%	38%
Er2O3	32%	44%	44%	31%	38%
Tm2O3	66%	88%	82%	61%	74%
Yb2O3	34%	45%	48%	33%	40%
Lu2O3	30%	40%	42%	28%	35%
Y2O3	31%	44%	41%	31%	37%

EMA REE RESULTS AND ELEMENTS DISTRIBUTIONS FROM SPECIFIC INTERSECTIONS

- EMRC002: 8.0 m at 1,607 ppm TREO from surface
- EMD013: 10.0 m at 458 ppm TREO from 11 metres
- EMD017: 9.0 m at 890 ppm TREO from 10 metres
- EMD022: 7.8 m at 776 ppm TREO from 4 metres
- EMD025: 10.0 m at 633 TREO ppm from 2 metres

Classification	Element	Element	REE ppm	Factor	Oxide	REO ppm	REO/TREO %
	Lanthanum	La	154.4	1.1728	La2O3	181.1	24.8
LREE	Cerium	Ce	176.9	1.2284	CeO2	217.3	29.7
LKEE	Praseodymium	Pr	38.9	1.2082	Pr6011	47.0	6.4
	Neodymium	Nd	130.7	1.1664	Nd2O3	152.5	20.8
	Samarim	Sm	18.7	1.1596	Sm2O3	21.7	3.0
	Europium	Eu	3.6	1.1579	Eu2O3	4.2	0.6
	Gadolium	Gd	13.9	1.1526	Gd2O3	16.1	2.2
	Terbium	Tb	1.8	1.1762	Tb407	2.1	0.3
	Dysprosium	Dy	10.1	1.1477	Dy2O3	11.6	1.6
HREE	Holmium	Но	2.0	1.1455	Ho2O3	2.2	0.3
	Erbium	Er	5.2	1.1435	Er2O3	6.0	0.8
	Thulium	Tm	0.8	1.1421	Tm2O3	0.9	0.1
	Ytterbium	Yb	5.0	1.1387	Yb2O3	5.7	0.8
	Lutetium	Lu	0.7	1.1371	Lu2O3	0.8	0.1
	Ytrium	Υ	48.9	1.2699	Y2O3	62.1	8.5
	Totals		612			731	100



REE Market

Strong demand driven by energy transition. Geopolitical tensions driving demand for alternative, resilient supply.

REEs ARE ESSENTIAL TO THE GLOBAL ENERGY TRANSITION

- The Global Energy Transition will require significantly more metal over the next 30 years than today.
- Demand for rare earths continues to grow for EV and wind energy markets [2]. EV sales expected to increase to 80m units per annum by 2050.
- Each Electric Vehicle (EV) requires approximately 1kg to 2kg of NdPr which is used in rare earth magnets forming part of an EVs electric motors.

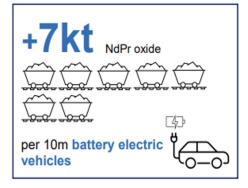
CHINESE CONSOLIDATION AND GLOBAL EXPANSION

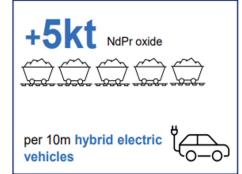
"The Middle East has oil. China has rare earth metals" - Deng Xiaoping (1987)

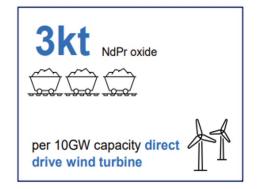
- China dominates every value accretive step in the conversion of mined REEs to value added products.
- China has approved the merger of three State Owned Enterprises (SOEs) to further consolidate the industry. This group will control 70% of China's rare earths output.

HIGH SUPPLY RISK

- China is reportedly considering an export ban on rare earth magnet technology. This move would counter the US's advantage in the high-tech arena.
- Global desire to develop alternative rare earths supply chains to protect manufacturing and defence.









REE Market

The scramble for rare earths carries big geopolitical risks

But without these metals there are limited solutions to our planetary problems

MISHA GLENNY + Add to myFT



DEFENSE

Pentagon suspends F-35 deliveries after discovering materials from China

The issue does not affect flight operations of F-35s already in service.



"DOE, DOD, and the Department of State signed a memorandum of agreement (MOA) to better coordinate stockpiling activities to support the U.S. transition to clean energy and national security needs."

White House Briefing, 22 February 2022

"Lithium and rare earths will soon be more important than oil and gas. Our demand for rare earths alone will increase fivefold by 2030. [...] We must avoid becoming dependent again, as we did with oil and gas. [...] We will identify strategic projects all along the supply chain, from extraction to refining, from processing to recycling. And we will build up strategic reserves where supply is at risk. This is why today I am announcing a European Critical Raw Materials Act."

"We have to build a more resilient supply chain, supporting projects and attracting more private investment from mining to refining, processing and recycling."

European Commission President von der Leyen recalled some hard facts: without secure and sustainable access to the necessary raw materials, our ambition to become the first climate neutral continent is at risk.



14 September 2022



Três Estados Project

LOCATION

- 60km southeast of Apuí;
- Covers and area of 8,172.25 hectares;

GEOLOGY AND MINERALISATION

- Tenement located over a series of gabbroic intrusions defined by prominent E-W and NE-SW magnetic anomalies, local gold-in-soil geochemical anomalies and shallow artisanal gold workings;
- The principal NE-SW magnetic feature and geochemical anomaly is about 1 km wide and 4 km long;

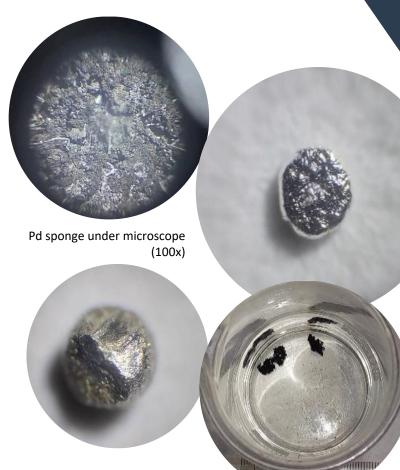
JORC RESOURCE (OPEN PIT)

- MRE containing 725,230 ounces of combined platinum, palladium, iridium, rhodium and gold.
- The MRE covers only 9% of the known gabbroic bodies at Tres **Estados:**
- The Mineral Resource is located **at or near surface** and is very amenable to surface mining techniques.

CONTINUING BIOLEACH TEST WORK (BBX BRAZIL)

- Highly positive bioleach recoveries (16.2 g/t PGM) following 8-day leach.
- In-country (Brazil) lab scale pilot plant operating
- Significant MRE upgrade expected following bioleach assays.
- Metal recovered following bioleaching process

METAL RECOVERY - TED 020



Pd sponge

Open pit jorc resource - Três Estados Project

725,300 OUNCES OF 5E PGM1 AT 1.152G/T

MINERAL RESOURCE ESTIMATE²

Inferred JORC Mineral Resource Estimate for Três Estados contains a total of 725,300 ounces of combined platinum, palladium, iridium, rhodium and gold.

ADELAR TARGET

Zone	Class	Tonnes Mt	Pt g/t	Rh g/t	Pd g/t	Au g/t	lr g/t	5E PGM g/t	5E PGM koz
Oxide		4.98	0.874	0.015	0.015	0.016	0.126	1.047	167.6
Fresh	Inferred	13.16	0.919	0.017	0.010	0.040	0.158	1.144	484.2
Total		18.14	0.907	0.016	0.012	0.033	0.149	1.117	651.7

TABOCAL TARGET

Zone	Class	Tonnes Mt	Pt g/t	Rh g/t	Pd g/t	Au g/t	lr g/t	5E PGM g/t	5E PGM koz
Oxide		0.65	1.73	-	-	-	0.001	1.731	36.2
Fresh	Inferred	0.86	1.21	-	-	-	0.147	1.357	37.4
Total		1.51	1.43	1	-	1	0.083	1.513	73.5

Summed amounts may not add due to rounding.

1. 5E PGM refers to the sum of platinum (Pt), palladium (Pd), iridium (Ir), rhodium (Rh) and gold (Au) expressed in units of g/t

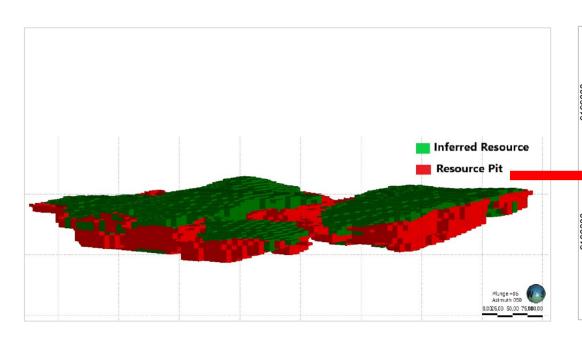
2. Refer to ASX Announcement dated 25 January 2023

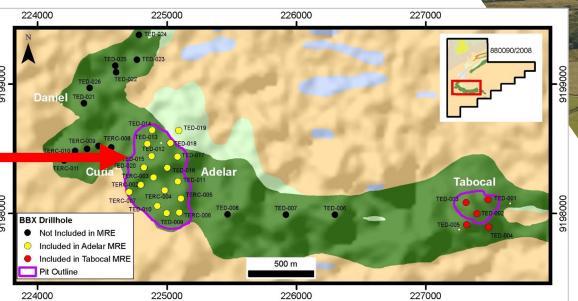




Pit-shell over Adelar target area

The Inferred Mineral Resource covers an area of 31 Ha which represents only 9% of the known gabbroic bodies at Tres Estados.







Bioleaching test work

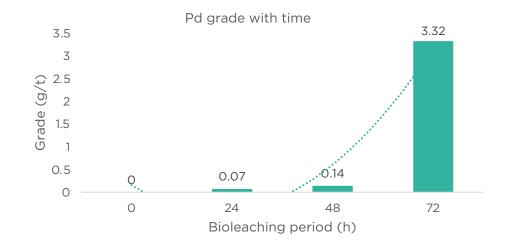
- Dedicated pilot plant designed and commissioned by EcoBiome at its facility in The Woodlands, Texas, USA.
- Test results¹ show a significant increase in reported precious metals following bioleaching process.
- Positive results from pilot plant tests demonstrate the suitability of this bioleaching process.
- Bioleaching is a simple and effective technology for metal extraction from low-grade ores and mineral concentrates.
- Metal produced following bioleaching process.

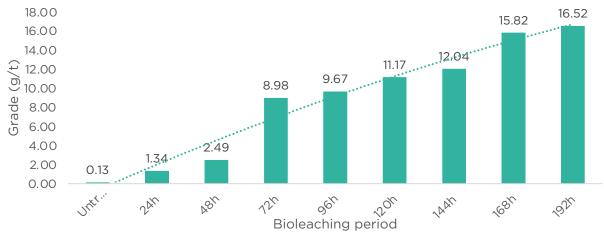
FIRST PILOT PLANT TEST

	Au g/t	Pd g/t	Pt g/t	Rh g/t	Ir g/t
Assay Ni fusion	0.01	-	0.01	0.02	0.01
Ecobiome treated ore (72h)	0.04	3.32	-	n/a	n/a

SECOND PILOT PLANT TEST

	Au g/t	Pd g/t	Pt g/t	Total g/t
Assay Ni fusion	0.04	0.09	-	0.13
Ecobiome – treated (192h)	0.62	15.90	-	16.52





Investment summary

RARE EARTHS

- Emerging REE explorer/developer
- 9 tenements totalling 700KM²
- Aggressive auger drilling program underway
- Constant news flow
- Positive initial ammonium sulphate results
- REE MRE Q1 2024

PGMs

- Tres Estados project PGM open pit resource
- Bioleach optimisation has produced significant results
- Physical metal recovery following bioleaching process
- Bioleaching pilot plant underway
- MRE upgrade based on bioleach re-assay.

Thank You

AUSTRALIA

Brookfield Place, Level 11, 125 St Georges Terrace,

Perth WA 6000



+61 8 6383 7820

BRAZIL

Av. Jornalista Ricardo Marinho 360 Ed. Cosmopolitan - Sala 113 CEP 22631-350 Barra de Tijuca, Rio de Janerio



+55 21 2439 5700

www.bbxminerals.com

ANDRE J. DOUCHANE, CEO

adouchane@bbxminerals.com



+1 5208507529 USA







STRONG DEMAND DRIVEN BY GREEN ENERGY TECHNOLOGIES

During early 2021, all the PGM except platinum traded significantly above historical levels, as constrained supplies and an improvement in demand created acute liquidity squeezes.

War in Ukraine has created significant risks to supply given Russia's position as a main producer.

From July 2021, all Chinese heavy duty diesel trucks were fitted with PGM catalysts.

PGMs are critically needed for green hydrogen technologies.

Palladium markets expecting shortages from 2023.

COMBINED PT, PD, RH AUTOMOTIVE DEMAND





OTHER USES ARE:











PILOT PLANT TESTING

	Full optimisation expected to be completed by no later than Q1 2024.
\bigcap	Positive results from initial pilot plant test work demonstrate the suitability of this bioleaching process.
\Diamond	Enhancements identified in initial tests to be implemented prior to further testing.
\Diamond	200kg of material from four drill holes sent to EcoBiome.
\bigcirc	Additional pilot plant testing and optimisation.

PILOT PLANT IN BRAZIL

Υ	Pilot plant to be built in Brazil, near BBX's existing laboratory in Catalao.
\Diamond	Regulatory process to import microbes into Brazil has commenced.
\Diamond	The plant will contribute to the continuous improvement of the process recoveries, operating efficiency, and cost profile.
\Diamond	Its main purpose will be to produce metal that can be analysed, determining the best markets for BBX to sell products into.
\triangle	Setup expected to commence in Q1 2024

STATIC BIOLEACHING TESTING

Ç	Company to commence bioleaching testing of drill holes in a controlled environment.	
¢	Testing will include initially drill holes from the Três Estados MRE, and subsequently drill holes from the	e Ema project.
¢	Work expected to be completed within Q1 2024.	

The intention is to biologically assess each drill hole as to how they compare with the nickel assays.



BBX is developing an environment compatible and sustainable beneficiation process that extracts precious metals using a unique bio leach process. This leadingedge process, that extracts precious metals naturally, is being developed initially for the primary purpose of economically extracting Platinum Group metals from the Três Estados mineral deposit. It is expected that such technology will be transferable and relevant to many other PGM projects.

BBX believes that this processing technology is critical in the environmentally timely PGM space and supports a societal need to move toward a carbon neutral hydrogen fuel economy.

Our sustainability strategy





Our Sustainability Strategy



CREATE ECONOMIC

BENEFITS

RESPECT HUMAN RIGHTS



PROTECT HEALTH & SAFETY



Environmental, Social and Corporate Governance

BBX is committed to becoming a leading example. We abide by all government regulations and adhere to international best practice in sustainability, community relations and corporate governance.



LOCAL PARTNERSHIPS

- Establish and maintain solid relationships with communities and governments.
- Community acceptance of BBX's projects.
- Utilise local labour and spend locally where possible.
- Contribute to community programmes including health and education.



ENVIRONMENTAL IMPACT AND IMPROVEMENTS

- Proactively mitigate environmental impact. Key assets in clear farmland.
- Place high priority on environmental impact studies.
- Strive for the least possible impact on the environment.
- Improve standards by implementing international best practice.



CREATING POSITIVE SOCIAL CHANGES

- Develop skills locally and target local employment.
- Aim to procure goods and services locally.
- Building sustainable communities.
- Promoting a safe working environment.
- 11 years operating in Brazil without a single lost-time accident.

Why Brazil

- Brazil is the 9th largest global economy¹
- Latin America's largest pro-mining jurisdiction
- Vastly under-explored relative to other major mining jurisdictions
- Skilled workforce. Internationally accredited technology, engineering, manufacturing and construction companies
- Extensive infrastructure to support project development
- Transparent mining code and favourable fiscal regime
- Brazil has issued a list² of critical minerals which include REEs and PGMs. These minerals are deemed of special interest to the country³



¹ https://worldpopulationreview.com/countries/by-gdp

² https://www.in.gov.br/web/dou/-/resolucao-n-2-de-18-de-junho-de-2021-327352416

³ https://www.mining.com/brazil-to-ease-licencing-of-newly-listed-strategic-minerals/