ASX Announcement

Released 30th October

QUARTERLY ACTIVITIES REPORT

For the period ending 30th September 2024

Highlights

- BCM commences Ema project development program on multiple work fronts
- Infill drilling program to increase Mineral Resource confidence from Inferred to Indicated JORC category well advanced
- Scoping Study utilising Ausenco and WSP initiated
- Metallurgical test work with ANSTO continued through final stages of process flow sheet design steps
- Environmental baseline assessment commences with Brazilian specialist company CERN
- 63% recovery from column tests (heap leaching) of MREO (Nd/Pr/Dy/Tb) after only 18 days of leaching
- MoU signed with Brazilian Permanent Magnet Producer
- Initial results from the Ema infill drilling confirm the Mineral Resource estimate

Significant results[1]:

- **9.3m@1,347ppm** TREO from 4m (EMA-TR-196), including **5m@1,570ppm** TREO ending in 891ppm TREO
- **6m@1,103ppm** TREO from 8m (EMA-TR-182), including **3m@1,531ppm** TREO ending in 1,767ppm TREO
- **8m@1,026ppm** TREO from 2m (EMA-TR-192), including **3m@1,452ppm** TREO ending in 1,418ppm TREO
- **9m@931ppm** TREO from 1m (EMA-TR-172), including **5m@1,181ppm** TREO ending in 1,193ppm TREO

- Cash position of $1.09m as of September 30th 2024.

Brazilian Critical Minerals Limited (ASX: BCM) ("BCM" or the "Company") is pleased to provide details of its activities during the quarter ended 30 September 2024 in the Apuí region of Brazil (Figure 1).

Safety

There was 1 lost time accident recorded during the quarter when a contractor as part of the drilling team at the Ema project sustained a small cut to his knee which required medical attention offsite.

Figure 1 - BCM project's location in the Apui region of Brazil.

BCM is progressing with an aggressive multi-pronged approach to the Ema project development over the remaining portion of 2024.

The EMA ionic REE project is unique amongst Brazilian REE projects in that it shares almost identical characteristics with the ionic REE deposits developed over felsic volcanic rocks in southwest China, the world's largest known ionic clay region, where a substantial portion of the world's Total Rare Earth Oxides (TREO) raw material production is currently being mined.

Infill Resource Drilling

Exploration drilling is conducted with hand-held auger drills, which offer the advantage of low-cost, rapid deployment and mobility. One key constraint of auger drilling is the depth limitation, with the deepest holes, generally containing the highest-grade results, drilled to no more than 20m depth. Most of the exploration to date has been conducted on widely spaced (800m) drill centres, with infill drilling to 400m centres in the central resource area which is the current drilling focus.

BCM embarked on a 270-hole auger drilling program which will be completed during Q4 2024. The primary aim of the drilling is to convert sufficient tonnage of material from the JORC Inferred category to Indicated which will support the initial mining/treatment operations currently being considered and an updated Mineral Resource Estimate (MRE) which will form the foundation of the Scoping Study.

First assays from 45 holes received from the Mineral Resource infill drilling program show grades and thicknesses that are consistent with earlier drilling programs, validating the reliability of the resource model.

Persistent high NdPr grades were observed in the lower horizon (10-20m below surface), indicating a robust

zone of mineralisation that could enhance the project's economic viability. Several exceptional high-grade intercepts were identified, warranting further investigation to define priority zones for In Situ Recovery (ISR) extraction methods. These high-grade zones have the potential to significantly impact resource extraction strategies. 70% of the drilling program is now completed, with completion by end of November.

The high priority area, red dashed line area (Figure 2) comprises approximately 24% of the previously drilled MRE area. Drilling commenced on the western portion of this area (Figures 2 and 3) with initial assays received for 45 holes on the western margin of the infill-drilled area (Figure 3).

Assays returned over 500 ppm TREO across multiple holes, generally over widths of 5-10 meters, confirming the consistency of mineralisation across broad areas. Results indicate a strong increase in grade towards the base of the weathering profile, with notable concentrations of magnet rare earth oxides (MREO's) located deeper within the profile.

Several holes encountered water at the bottom of holes, preventing the obtaining of samples through the high-grade zone.

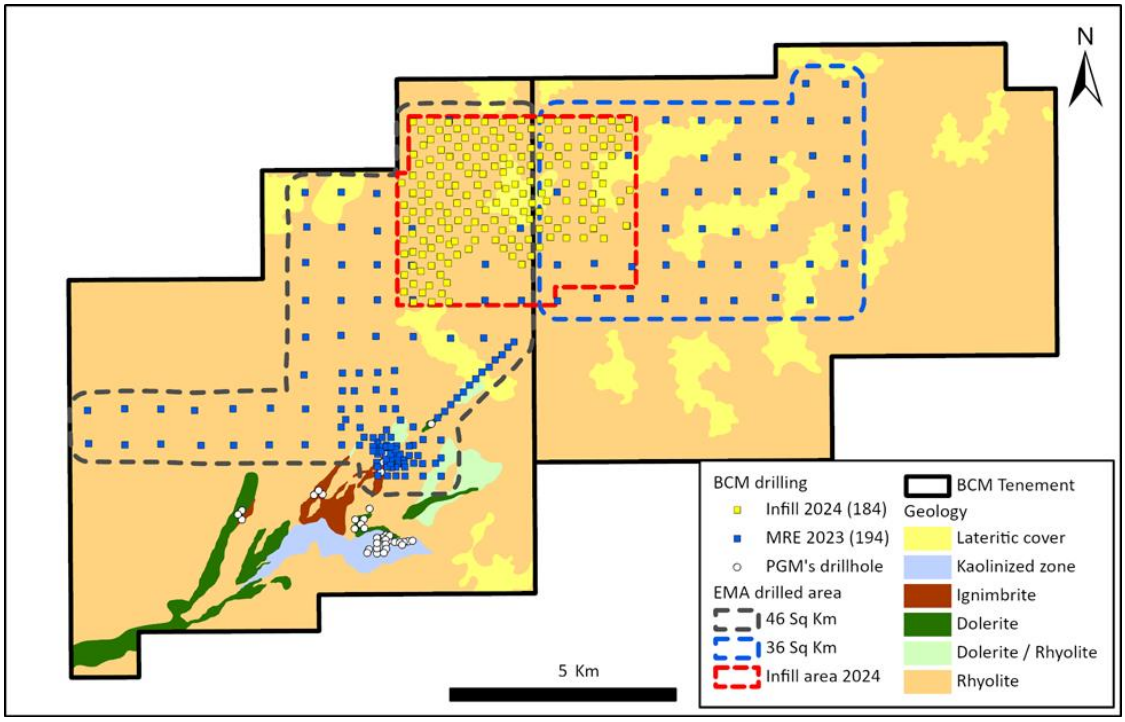

Figure 2 - Ema REE project – Mineral Resource covering 82 km2 with auger holes on 800m spacing and infill auger holes on 400m centres over 20 sq km.

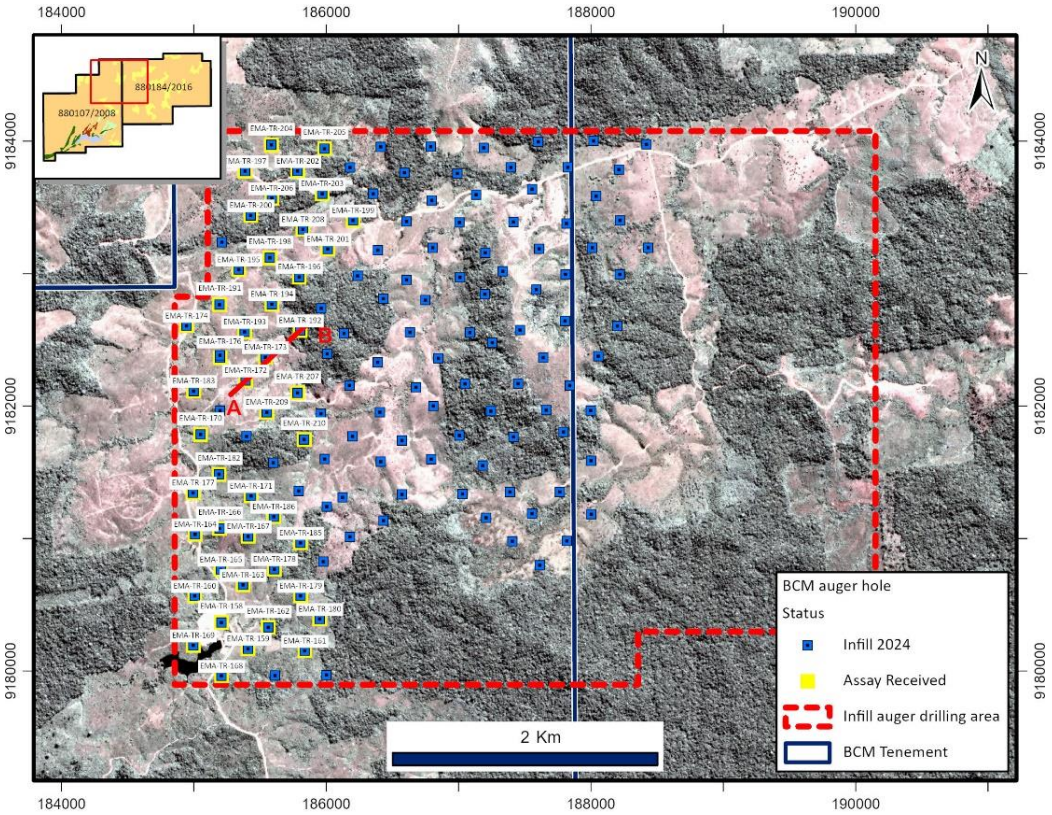

Figure 3 - Location map of the auger infill holes with assay results received to date.

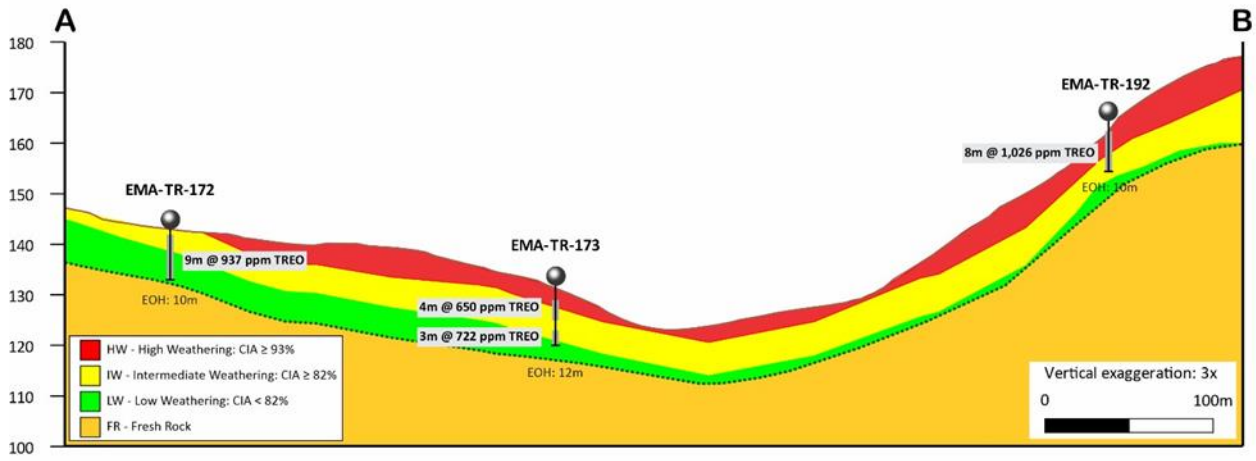

Figure 4 - Cross section from EMA-172 to 192

Despite the variability in collar elevations of the drilled holes, the typical enrichment of Neodymium (Nd) and Praseodymium (Pr) is consistently encountered at a similar depth within the lower saprolite zone, located just above the fresh rock. The enriched zone generally measures around 10 meters in thickness indicating a continuous mineralised horizon. This widespread occurrence strongly suggests the presence of continuous high-grade zones across the project area.

The TREO grade exhibits a marked increase with depth, ranging from approximately 500ppm near the top of the enriched zone to values reaching up to 1,880ppm at greater depths. Importantly, the proportion of valuable heavy rare earth elements (HREEs) increases to over 31% at the end of the holes, highlighting the economic potential of the lower saprolite zones.

Holes EMA-TR-182, 192 and 196 (Figure 5) are examples of the lower enrichment zone with the presence of high NdPr grades at the base of drilling in the lowest weathering zone. It is anticipated that this enrichment will be present in all holes in which the low weathering horizon is intersected.

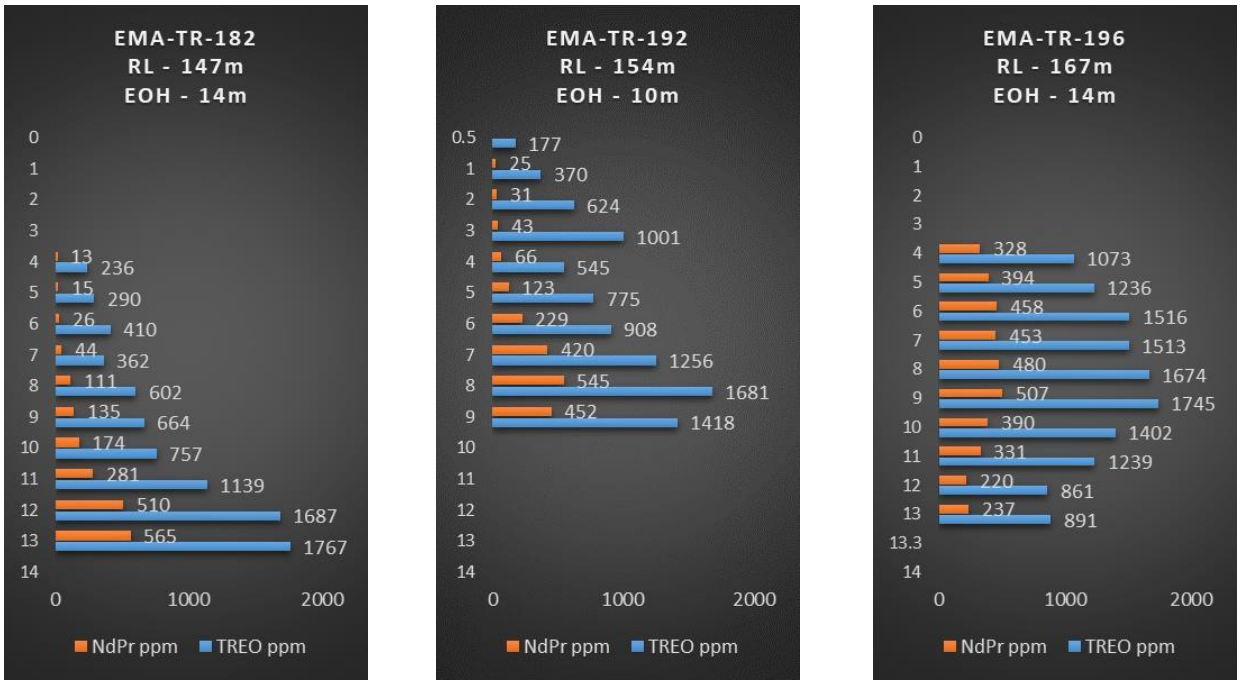

Figure 5 - Drill-hole profiles showing typical enrichment zone with high NdPr grades close to the fresh rock interface.

Scoping Study

In April 2024 the Company announced a large Mineral Resource Estimate[2] and subsequently very high rates of economic recovery[3], with the Board approving a formal Scoping Study on the technical and economic development of the Ema project which will examine the potential for a standalone low capital treatment/development pathway for the project.

The company has now engaged several specialist companies to commence activities with respect to the Ema rare earth scoping study. The team members all have extensive experience in rare earths. The study will cover project aspects including heritage, environmental, metallurgy, mining engineering, geology and hydrogeology.

The scoping study will assess potential in-situ leach processing of the Ema project. It is estimated that the bulk of the hydrology-related data gathering will be concluded by year's end.

- Ausenco: to provide engineering services for high-level scoping engineering outputs;
- WSP: to demonstrate the suitability of ISR and to gather hydraulic data (aquifer properties, pumping/injection rates to assess ISR feasibility and to provide information for the development of a numerical groundwater model based on field trials).
- GE21: to complete an updated mineral resource estimate based on JORC 2012 Code standards;

and

- CERN: to conduct baseline environmental assessment with a view to preparation of Environmental Studies report for submission of a preliminary license application.

The final scoping report is due for delivery to the Company around mid-December, with announcement of results in Q1 2025.

ANSTO Metallurgical Test Work

Work being undertaken by ANSTO over the last several months has resulted in very high recoveries of NdPr[4].

IMPURITY LEVELS

Impurities affect REE recovery and precipitation efficiencies and are a vital component of the process to understand. Control of the most troublesome impurities (Al, Fe, Th, U) depends on their concentration and the degree of purity required in the MREC.

ANSTO reported the final slurry leach test results which confirm very low concentrations of deleterious or impurity elements for the Ema material.

Table 1. Impurity values following optimised testing and leaching of Ema master composite sample.

	Uranium	Thorium	Aluminium	Iron	Calcium	Silica
mg/l	**0.2**	**0.02**	**73**	**< 1**	**11**	**6**

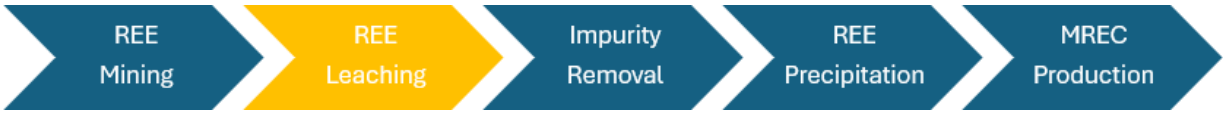

Figure 6. Key steps in the process flow sheet for ionic clay MREC production. REE Leaching section highlighted represents stage of processing where results from Table 1. above were sourced.

The Company is now confident that these low uranium and thorium values can be removed through simple pH adjustment during the next stage of impurity removal leading to a final MREC product that meets European, North American and Asian offtake partners for specification testing to advance discussions regarding commercial offtake.

HEAP LEACH TEST WORK SUMMARY

ANSTO investigated a heap leaching option through column testing (Table 2 and Figure 7). Two 50mm diameter columns were operated with a bed height of 1.14m, with the following specifications to test two reagents:

Table 2. Column testing setup specifications

	0.3M Ammonium Sulfate	0.5M Magnesium Sulfate
Bed Height	1.14 m	1.14 m

Column Diameter	50 mm	50 mm
Ore mass	2,970 g	2,970 g
Reagent	$(NH_4)_2SO_4$	$MgSO_4$
Concentration	0.3 M	0.5 M
pH	4.5	4.5
Binding Addition	300 g/t	300 g/t
Irrigation Rate	5 L/m^2/hr	5 L/m^2/hr

This heap leach test work is a key part of the Company's ongoing strategy to grow and progress the Ema Inferred Mineral Resource towards development, which currently sits at **1.02Bt @ 793ppm**[2]. The final calculated leach liquor and residue recovery of **63%** was materially in line with previously announced slurry recovery results[2].

Column leach liquor results using magnesium sulfate returned recovery values*:

Time Period	Nd (%)	Pr (%)	Dy (%)	Tb (%)
4 days	42	41	30	34
6 days	52	51	36	41
11 days	57	55	40	45

*Calculated based on head assay and leach liquor analysis

Final recovery based on head assay and residue analysis after 18 days of leaching followed by washing recorded;

Combined Recovery	**63%**	**MREO (Nd/Pr/Dy/Tb)**

- The ore agglomerated readily in the test liquor (no additional acid was required) and the agglomerated ore remained competent in the column test
- Permeability of the column bed was good, with minimal bed slump of 1% calculated
- Test conditions involved REE desorption utilising 0.5 M magnesium sulfate ($MgSO_4$) or 0.3 M ammonium sulfate $(NH_4)_2SO_4$, ambient temperature at pH of 4.5
- Acid consumption was calculated to be < 1 kg/t

These results have given the Company confidence that there is an increased likelihood that in-situ leaching of the rare earths is now possible. This is largely feasible due to the mineralogy of the Ema mineralisation which is almost 50% quartz and hence this sandy clay material allows for good percolation and fluid flow at rates which could be economic.

Agglomeration of clay ores does not produce typical agglomerates, rather it is required to wet the ore and bind the fines together. A small amount of binding solution was added followed by the test lixiviant solution

(at pH 4.5) to a target moisture content of ~23 wt% (Figure 7).

The two column tests were run in transparent PVC columns of 1.2 m x 50 mm (ID). A bed height of just over 1 m was obtained by loading agglomerated ore (~3 kg dry) into the column and curing for 24 hours. Both columns were run concurrently and were operated at room temperature.

The lixiviant solution was fed to the top of the column by peristaltic pump, with an initial target irrigation rate of ~5 L/h/m2.

Irrigation was stopped on day 18 and draining commenced, this was followed by 2 days of washing using tap water.

Figure 7 - Column setup and agglomeration of ore at the ANSTO facility in Sydney.

Field permeability and lab testing for In-situ Leaching

A series of preliminary controlled field experiments (slug tests) performed by the BCM team was completed on 10 dry drill holes (Figure 8). These tests estimate the hydraulic properties of aquifers, in which the water level in a controlled open dry drill hole is caused to rise suddenly and the subsequent water-level response (change from static) is measured through time at regular intervals.

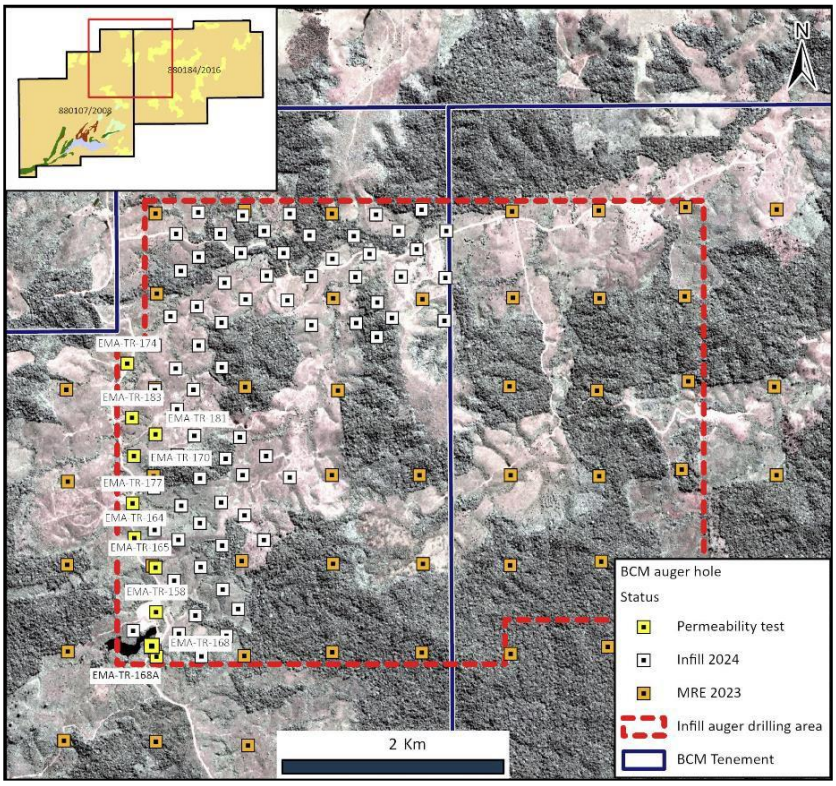

Figure 8. Location map of the 10 drill holes which were tested for permeability.

The slug tests were designed as a rising-head test, in which a measured volume of 50l of water was placed into 10 holes, instantaneously raising the water level in the well by a known amount.

The goal of a slug test is to estimate the hydraulic properties of an aquifer system such as hydraulic conductivity.

Percolation data shows that the majority of the water inserted into each hole was lost or permeated into the surrounding walls within the first 60 minutes (Figure 9). The second phase is the stable percolation stage, where the water adsorption nears completion, and the percolation rate gradually decreases.

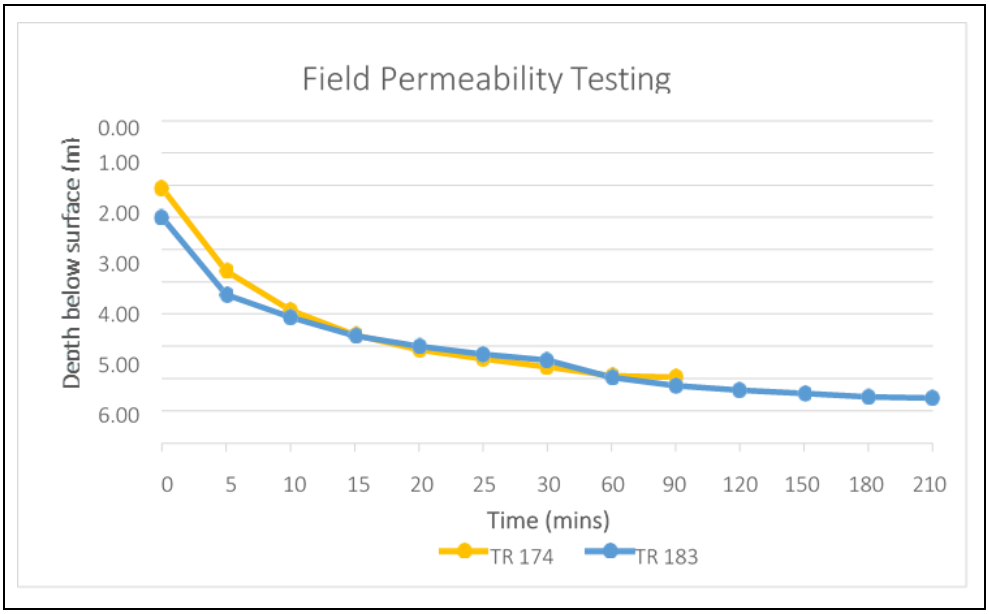

Figure 9. Hydraulic conductivity results from drill holes (TR174 & TR183). Tests show a rapid fall in water level over the first 60 minutes post the water insertion. Data from the 10 holes is collated in table 3.

Percolation rates varied from 0.98m/hr to 2.34m/hr and show that there is a **high degree** of permeability within the clay horizons containing the rare earths. Field pumping trials are scheduled to commence during Q4 2024.

The percolation characteristics of clay minerals are influenced by multiple factors, including ore composition, pore structure, permeability, and the properties of the leaching solution.

Time (mins)	TR 158	TR 168	TR 168A	TR 164	TR 165	TR 177	TR 170	TR 181	TR 174	TR 183
0	4.42	7.35	5.95	5.40	5.82	9.92	0.70	0.35	2.09	3.00
30	9.00	10.94	6.58	8.55	10.63	9.95	4.84	5.40	7.63	7.43
60	9.52	12.13	7.90	8.77	11.32		5.06	5.82	7.90	7.96
90	9.82	12.46	8.18	8.80	11.64		5.20	5.98	7.95	8.22
120	9.94	12.58	8.35	8.86	11.78		5.26	6.09		8.36
150	9.98	12.70	8.39		11.88			6.12		8.46
180					11.97					8.57
210										8.60
Static Water level (m)	9.98	12.70	dry	8.86	12.30	9.95	dry	dry	7.95	8.60
Percolation m/hr	2.22	2.14	0.98	1.73	2.05	n/a	2.28	2.31	2.34	2.24
Hole Depth (m)	12.00	19.80	8.39	12.00	15.00	13.00	5.26	6.50	12.00	19.80

Table 3. Hydraulic conductivity results from the 10 dry drill holes tested. Tests show a rapid fall in water level (in metres) over the first 60 mins post the water insertion.

Lab Diffusion Testing

Agitated elution tests allow rapid access of reagent to the mineral surface and thus rapid desorption of the eluted species, however, in an in-situ scenario this access is limited by solution flow through discrete channels in the ore bed and diffusion through interstitial spaces.

While macroscopic solution flow in in-situ operations can be modelled with hydrological models based on field observations, the local transport reaction kinetics of the elution process needs to be tested separately.

A series of diffusion tests were conducted in a stagnant bed leach apparatus developed by Petersen [1] as shown in Figure 10. A bed of 100 g of clay mineralisation was carefully moulded into the bottom of a beaker to a height of about 10 mm, and 200 mL of lixiviant (0.5 M and 0.1 M $MgSO_4$) was very carefully poured on top of the bed so to not stir up solids. The solution was gently agitated with an overhead stirrer. Liquid samples (3–5 mL) were taken every day for 30 days. The samples were analyzed by ICP- MS.

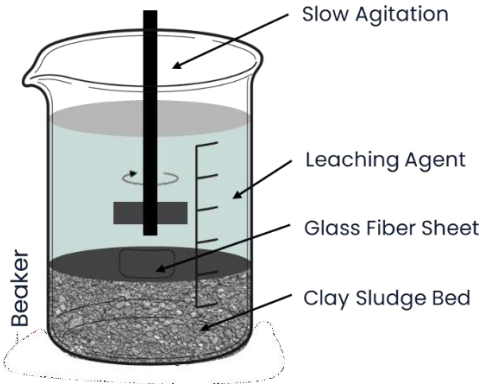

Figure 10. Stagnant bed diffusion test developed by Petersen.

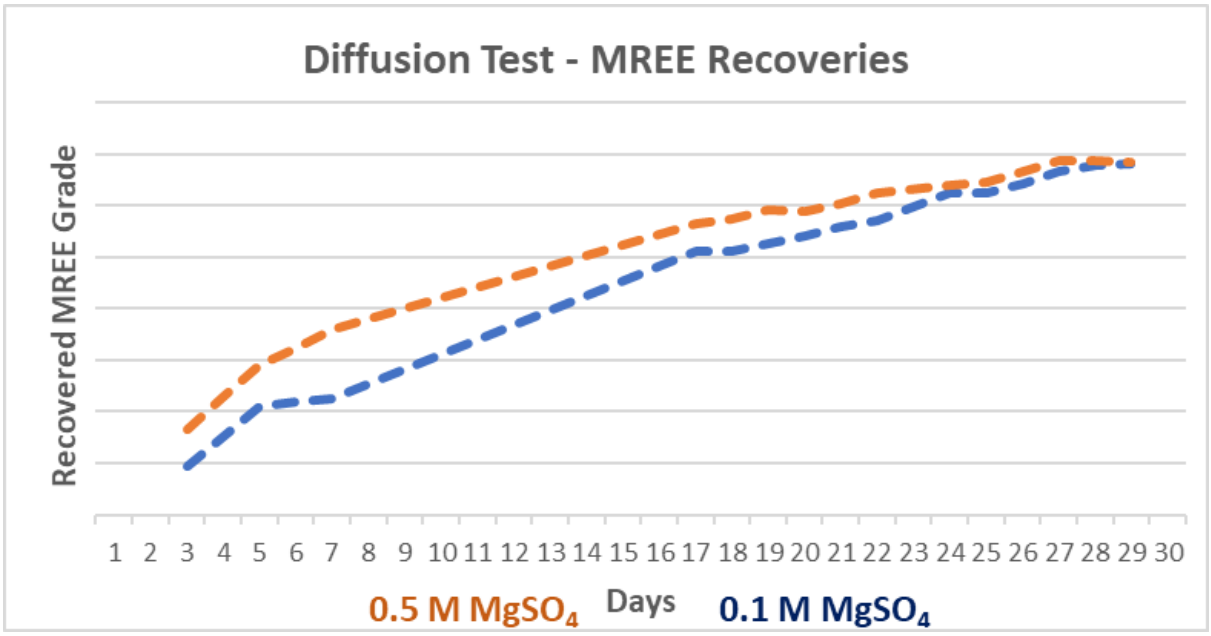

Figure 11. Overall cumulative recoveries from diffusion testing utilizing magnesium sulfate at 0.5 M and 0.1M concentrations over 30 days.

The results of the stagnant bed diffusion test are shown in Figure 12. All of the magnet rare earth elements leached in significant quantities; (Nd, Pr, Dy, Tb) are shown. The curves show the characteristic profiles for a diffusion-governed process, reaching equilibrium extraction (that is the extraction to be expected if solid and liquid were perfectly mixed) over 30 days.

ISR is a proven cost effective and environmentally acceptable extraction process, which accounts for approximately 57% of world uranium mined, and is used in Australia, USA, Kazakhstan, and Uzbekistan.

Mou Signed With Brazilian Permanent Magnet Producer

The Company signed a five year non-binding Memorandum of Understanding (MoU) with SENAI Regional Department of Minas Gerais, owner of the permanent magnet facility unit Lab Fab (CIT SENAI ITR) (Lab Fab)

Lab Fab is developing the first permanent magnet manufacturing facility in Latin America and the two parties will cooperate in the technological development of rare earth magnet manufacturing processes.

Lab Fab is a permanent magnet technology developer, aiming to advance the rare earths industrial chain in Brazil and produce a range of high-end technology products suited for a range of electric motor industries requiring rare earth magnets.

The facility plans to commence operation later this year and the Federation of Industries of Minas Gerais plans to grow production to 200 tonnes of magnets annually.

The non-binding MoU will establish the bases for cooperation between BCM and SENAI Regional Department moving forward, with a view to jointly develop research, development and innovation for the demonstrative production of rare earth magnets at Lab Fab, in Lagoa Santa, Minas Gerais, by identifying activities of mutual interest, namely:

1. **Supply of Raw Materials**: Arrangement for the supply of raw materials from BCM, for conducting pilot production of rare earth magnets.
2. **Strengthening Partnerships**: Actions aimed at reinforcing the relationships between participants and industries that are interested in rare earth magnet technologies.
3. **Joint Research Projects**: Development of collaborative projects that focus on applied research, evaluation activities, experiments, training, consultancy, and specialized technological services.
4. **Implementation of Joint Activities**: Initiating various other collaborative activities and programs, including pilot and experimental initiatives in areas of mutual interest, as agreed upon by the involved parties.

Corporate

Rare Earth price fundamentals strengthened during the quarter with prices for NdPr up 20%. Supply and demand fundamentals are strengthening, which should be reflected in upward pressure on pricing in the coming months. This could be aided by the ongoing fighting in Myanmar close to the clay rare earth mining hubs disrupting supply.

The Company is fielding a number of enquiries and leads with respect to offtake agreements. The Company is focused on delivering a scoping study which can then be used as the basis for binding offtake discussions.

For the purpose of Section 6 of the Appendix 5B, all payments made to related parties have been paid in relation to director fees.

References

[1] Brazilian Critical Minerals (ASX:BCM) ASX Announcement "Infill Drilling Confirms Ema Resources" 08.10.24

[2] Brazilian Critical Minerals (ASX:BCM) ASX Announcement "Massive Maiden Mineral Resource Estimate for Ema Project" 22.04.24

[3] Brazilian Critical Minerals (ASX:BCM) ASX Announcement " World Leading Recoveries Confirmed at Ema Project" 07.05.24

[4] Brazilian Critical Minerals (ASX:BCM) ASX Announcement "Excellent Heap Leach Recoveries Ema Project" 06.08.24

Additional Information required under Listing Rule 5.3.3

Tenements held at the end of the quarter	Area (Ha)	Percentage ownership
ANM Permit Number 880.107/08 Location Brazil (Ema)	9,839.91	100% Exploration Licence
ANM Permit 880.184/16 Location Brazil (Ema East)	9,034.00	100% Exploration Licence
ANM Permit Number 880.090.08 Location Brazil (Três Estados)	8,172.25	100% Exploration Licence
ANM Permit Number 880.025/2023 Location Brazil (Apuí iREE)	2,417.00	100% Exploration Licence
ANM Permit Number 880.026/2023 Location Brazil (Apuí iREE)	6,591.90	100% Exploration Licence
ANM Permit Number 880.027/2023 Location Brazil (Apuí iREE)	5,856.00	100% Exploration Licence
ANM Permit Number 880.259/2020 Location Brazil (Apuí iREE)	9,092.01	100% Exploration Licence
ANM Permit Number 880.149/2017 Location Brazil (Apuí iREE)	9,815.15	100% Exploration License
ANM Permit Number 880.076/2023 Location Brazil (Apuí ENE iREE)	8,475.30	100% Exploration application

ANM Permit Number 880.077/2023 Location Brazil (Apuí ENE iREE)	8,856.84	100% Exploration application

The Activity Report for the September quarter 2024 has been authorised for release by the Board of Directors.

Appendix 3. Company data in relation to MREE recoveries and conditions for leaching

Code	Company	Project	Head Grade (ppm)	MREO:TREO (%)	MREE recovery (%)	NdPr recovery (%)	DyTb recovery (%)	Leaching Agent	pH	Temperature	No. of Samples	Lab	Reference
BCM.ASX	BCM	Ema	965	31	68	69	48	$(NH_4)_2SO_4$	4.5	ambient	62	ANSTO	this announcement
ARA.TSX	Aclara	Carina	1,510	23	46	43	48	$(NH_4)_2SO_4$	3	ambient	1418	SGS	Aclara (TSX:ARA) Aclara announces discovery of 168Mt ionic clay mineral resource at its Carina Module in Goias, Brazil 12.12.24
ALV.ASX	Alvo Minerals	Blue Brush	1,014	24	50	58	42	$(NH_4)_2SO_4$	4	ambient	13	SGS	Alvo (ASX:ALV) Metallurgical Tests Confirm Bluebush as Ionic Adsorption Clay REE Project 02.11.23
VMM.ASX	Viridis	Colossus	4,665	31	60	62	57	$(NH_4)_2SO_4$	4	ambient	91	SGS	Viridis (ASX:VMM) Colossus Achieves Highest Overall Bulk Ionic Recoveries Globally 18.04.24
MEI.ASX	Meteoric	Caldeira	3,642	23	63	63	43	$(NH_4)_2SO_4$	4	ambient	101	ANSTO	Meteoric Resources (ASX:MEI) Metallurgical Testwork Confirms Outstanding Ionic Clay Recoveries for Caldeira REE Project 07.12.23

For more information contact:

Andrew Reid
Managing Director
Andrew.reid@braziliancriticalminerals.com

Competent Person Statement

The information in this report that relates to exploration and metallurgical results released by the Company to the ASX on 13 March, 22 April, 7 May, 8 July, 2 August, 6 August, 21 August, and 8 October 2024 is based on information compiled by Mr. Antonio de Castro, BSc (Hons), MAusIMM, CREA, who acts as BCM´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 Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcement and, in the case of mineral resource estimate, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. Refer to ASX announcement dated 22 April 2024.

About Brazilian Critical Minerals Ltd

Brazilian Critical Minerals Limited (BCM) is a mineral exploration company listed on the Australian Securities Exchange.

Its major exploration focus is Brazil, in the Apuí region, where BCM has discovered a world class Ionic Adsorbed Clay (IAC) Rare Earth Elements deposit. The Ema IAC project is contained within the 781 km² of exploration tenements within the Colider Group.

BCM has defined an inferred MRE of **1.02Bt** of REE's with metallurgical recoveries averaging **68%** MREO.

The Company is currently converting a portion of this MRE from Inferred into the Indicated category with an extensive drill program which will inform the scoping study and economic analysis due for completion in late 2024.

Ema REE Project 2024 Mineral Resource Estimate – by cut-off grade

JORC Category	cut-off ppm TREO	Tonnes Mt	TREO ppm	NdPr ppm	DyTb ppm	MREO ppm	MREO:TREO %
Inferred	0	1,340	694	163	15	178	26
Inferred	**500**	**1,017**	**793**	**199**	**17**	**216**	**27**
Inferred	600	863	836	218	18	236	28
Inferred	700	685	885	237	20	257	29
Inferred	800	494	936	259	21	280	30
Inferred	900	331	977	278	22	300	31