Shard Capital

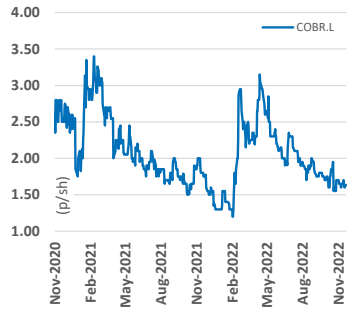
25th November 2022

Sector: Mining

Gold, Rare Earth Elements and Copper

Market data

Markets	LSE Main Market
Ticker	COBR
Price (p/sh)	1.55
12m High (p/sh)	3.2
12m Low (p/sh)	1.1
Ordinary shares (m)	515.2
FD share capital (m)	595.5
Mkt Cap (£m)	8.0



Source: Alpha

Description

Cobra is defining a multi-mineral resource at the Wudinna Project in South Australia's prolific Gawler Craton. The focus is shallow gold and rare earth element mineralisation. Cobra is also advancing a pipeline of IOCG targets.
www.cobraplc.com

Board & key management

Chairman	Greg Hancock
CEO	Rupert Verco
NED	Dan Maling
NED	David Clarke
Exploration Manager	Robert Blythman

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Cobra Resources plc

Defining a new critical metal resource district

We initiate coverage on Cobra Resources, an exploration company with a diversified portfolio of gold, copper and rare earth assets at the Wudinna project in South Australia. Cobra has been actively drilling to expand on the current 211koz gold resource and an updated gold Mineral Resource Estimate (MRE) is due in the New Year. The recent discovery of extensive high-grade rare earth mineralisation overlying and proximal to the gold resource has added an intriguing new angle to Cobra's district-scale landholding. Cobra aims to release a maiden rare earth MRE in December 2022.

- **Tier 1 location.** Cobra has a district-scale landholding of 3,261km^2 in the prolific Gawler Craton region. South Australia is consistently ranked in the top 10 destinations globally for investment attractiveness and prospectivity and represents a low-risk jurisdiction. Meanwhile, the Gawler Craton is host to world-class deposits, particularly IOCGs (iron-oxide-copper-gold), including Olympic Dam. **3-pronged approach.** Targeting commodities to support a carbon neutral future, Cobra is pursuing a diversified exploration strategy for gold, rare earths and copper (IOCGs).

- **Gold resource set to grow.** Wudinna has an existing JORC-compliant gold resource of 4.4Mt at 1.5g/t Au for 211koz Au. The imminent MRE update will include an additional 10,000m of RC drilling including numerous high-grade gold intercepts from the Clarke prospect which lie outside of the current resource envelope, e.g., 33m at 1.03g/t Au including 9m at 2.09g/t Au. Over 500m of gold mineralised strike has been intersected at Clarke, remaining untested at depth and open along strike. We see clear regional potential to build on this resource base. High gold grades and near surface mineralisation could potentially support a low-strip open pit operation in the future.

- **REEs still critical.** Rare Earth Elements (REEs) remain an indispensable input into a host of critical applications. The manufacture of permanent magnets used in everything from laptops to motors and generators for electric vehicles and wind turbines are the fastest end-use, accounting for 35% of the market by volume and over 90% by value. Despite this, the REE market remains dominated by China (responsible for over 95% of rare earth metals) attributable to the country's vast ion-adsorption clay deposits (IACs). This situation is widely recognised and as the need to secure commercial REE resources outside China becomes even more urgent, Australia is becoming the Tier 1 destination of choice to supply a growing market deficit. *See page 10.*

- **Ionic clay advantages.** IAC hosted REE deposits although lower grade than hard rock deposits have several key advantages which makes them highly sought after. Exploration for IACs can be fast-tracked with low cost aircore drilling and due to their shallow nature are often amenable to low strip, low-cost bulk mining methods (no blasting). With no need for crushing and grinding and with simple metallurgy, IACs can deliver a high payability product via a less complex, lower cost flowsheet. Critically, IACs can contain much lower levels of radionuclides than hard rock deposits. This all translates to potential for accelerated development timelines, lower upfront capex and lower operating costs. IACs also tend to have elevated ratios of heavy and critical rare earths relative to the overall rare earth oxide content which can result in a high magnet REE content (Nd, Pr, Dy & Tb) and a corresponding premium mineral assemblage and considerably higher basket price. IACs contain fewer of the lower value REEs such as La and Ce - *details in the note, page 14.*

- **Poised for growth.** In only 12 months since the identification of REEs at Wudinna, Cobra has outlined an extensive regional-scale occurrence. Large intersections and high REE grades already draw comparisons to other listed REE developers and Wudinna's 22.5km^2 REE footprint is growing fast with significant intersections identified at >15 prospects. Early metallurgical testwork has identified conditions supportive of ionic adsorption to clays. Cobra has an advanced understanding of the metallurgy which may drive higher recoveries, lower costs and a more environmentally friendly flowsheet than some peers. Cobra is planning an extensive aircore drill programme aimed at doubling the current REE footprint in addition to announcing a maiden REE resource later this year. **The association with gold mineralisation at Wudinna could also offer some unique and compelling development synergies and an easier pathway to financing** with REEs backed up by a gold asset. Cobra is the only company that we are aware of that has this special situation.

- **Upcoming catalysts:** Maiden REE MRE (Dec), project JV 75% earn-in milestone, RC drilling results, geophysical survey (EM and TEM) results. Gold MRE update (Jan), REE testwork. *See page 25*.

Cobra has a unique opportunity to develop what we see as one of Australia's most exciting rare earth plays. The combination of a defined gold resource with expansion potential and a high-growth REE strategy is compelling. The REE potential at Wudinna is completely unconstrained and we see significant scope for Cobra to become a major player in the sector with a concomitant increase in the company's market value. The current low-cost entry point is not likely to persist for much longer.

Shard Capital

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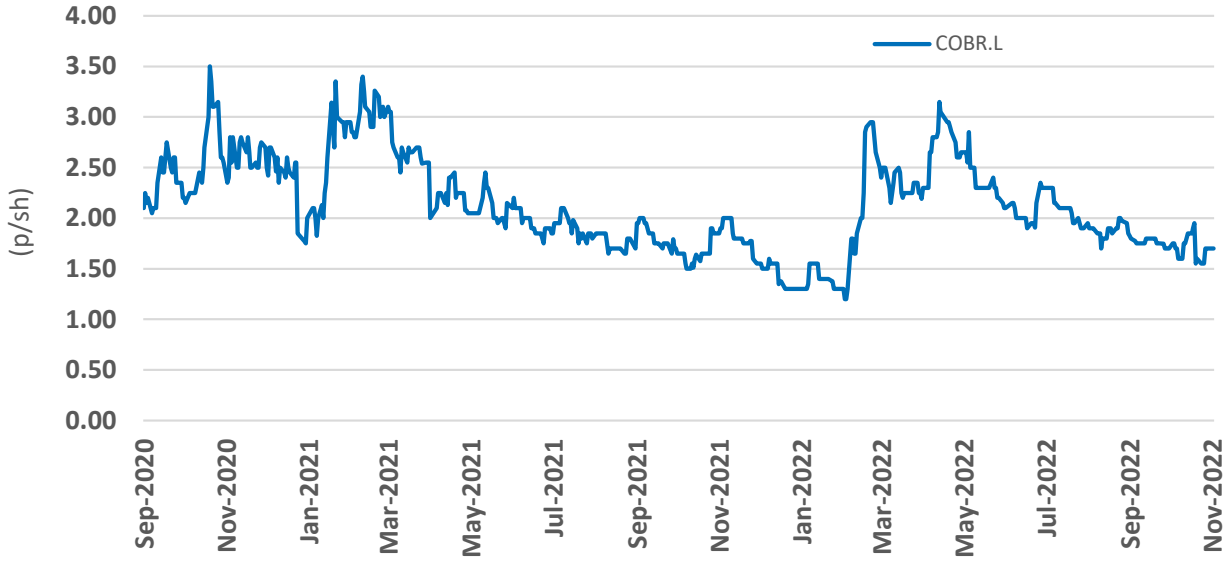
Focus on commodities to advance green mobility

Tier 1 jurisdiction – South Australia

Cobra Resources plc is an exploration company focused on defining a unique multi-mineral resource base within a district-scale licence package in South Australia. The company's licences are located within the prolific and highly prospective Gawler Craton region, a tier 1 jurisdiction which hosts numerous world class mines. Cobra is pursuing a three-pronged approach with commodity exposure to gold, rare earth elements ("REE") and copper. The company's flagship asset is the Wudinna Project where the company has already outlined a 211 koz JORC-compliant gold mineral resource. Increasing focus is being putting on investigating the recent discovery of extensive REE mineralisation overlying and proximal to the gold mineralisation at Wudinna.

Cobra is listed on the Main Market of the London Stock Exchange under the ticker "COBR". There are currently 515,249,550 ordinary shares in issue and the company's market capitalisation is £8.0m. The company acquired its Australian projects through a reverse takeover of Lady Alice Mines in early 2020. Lady Alice was the sole owner of a 100% interest in the Prince Alfred licence and also had an entitlement to earn up to a 75% equity interest over 5 tenements at Wudinna under the terms of an agreement with Andromeda Metals Limited (ASX: ADN).

Figure 1 - Cobra Resources - 2-year share price chart



Source: Shard Capital, Alpha Terminal

Capital structure

Cobra completed a placing to raise £1.3m (at 1.5p/sh) in October 2022.

In addition to the 515.2m ordinary shares in issue, there are 67.5m options (3p, 2022) and 15.7m options (3.3p, 2025) outstanding.

Figure 2 – Cobra Resources – Significant shareholders over 3% holding as of 1st November 2022

Shareholder	Shareholding (shares)	Issued Capital (%)
Penn Nominees Pty Ltd (Melbourne)	47,810,082	9.28%
Mr Craig P Ball & Mrs Suzanne K Ball (Adelaide)	45,636,166	8.86%
David Clarke (Director)	45,636,166	8.86%

Source: Cobra Resources

Board and management

Greg Hancock - Chairman

Greg has over 25 years' experience in capital markets and corporate finance. He has extensive experience in Australia and the UK through close links to the stockbroking and investment banking community. He has specialised in mining and natural resources and has a background in finance and management of small companies.

Rupert Verco - Managing Director and Chief Executive Officer

Rupert is a mining specialist with over 15 years' experience in Australia and internationally. His key areas of focus include resource definition, reserve optimisation, mine planning, and mine operation. He has managed operations through all phases of the mining cycle on projects that cover a range of commodities including gold, copper, uranium, tin, and iron ore. Rupert is a fellow of the Australasian Institute of Mining and Metallurgy and holds a First Class Honours in Geology.

Dan Maling - Non-Executive Director

Dan is a Chartered Accountant and member of both the Australia & New Zealand and England & Wales professional bodies. He has over 25 years of senior corporate and commercial management experience primarily in the natural resource and technology sectors. He has worked with several AIM, ASX and TSX listed companies providing corporate finance, business development and strategic advice. Daniel is a partner of Orana Corporate LLP, an accounting and corporate advisory boutique based in London.

David Clarke - Non-Executive Director

David is a geologist with more than 50 years' professional experience and 25 years' as a director of public companies. He was a geologist with the Commonwealth Department of the Interior and a Chief Geologist at Santos. David played a role in the discovery, development and production of the million-ounce Tuckabianna gold mine in Western Australia, the Newrybar mineral sand mine in New South Wales, the Mud Tank vermiculite mine in the Northern Territory, and the Mindarie mineral sand mine in South Australia.

Robert Blythman – Exploration Manager

Robert has over 15 years' experience as an exploration geologist, focused on South Australia, Victoria and the Northern Territory. He has both mining and exploration experience in orogenic style gold projects and his experience covers a range of commodities including gold, copper, uranium and rare earths. Robert is responsible for delivering Cobra's field programmes safely and successfully while ensuring the best possible outcome for all stakeholders.

Wudinna: Au, REEs, Cu

Diversified project – one area, three targets

A huge 3,261km² land package in the prolific Gawler Craton

Wudinna, Cobra's flagship exploration project is located on the Eyre Peninsular in South Australia and comprises six granted exploration tenements covering a total area of 1,928km², part of Cobra's wider 3,261km² landholding in the Gawler Craton. The Wudinna project area is located 400km northwest of Adelaide and accessible via a sealed highway from Port Augusta (140 km to the east).

Cobra is pursuing a unique multi-mineral strategy at Wudinna. Gold has always been the focus, alongside early-stage exploration for copper hosted in IOCG (Iron-oxide-copper-gold) deposits. However, the recent discovery of substantial rare earth element mineralisation overlying and proximal to the gold mineralisation at multiple prospects has naturally caused the exploration strategy to expand to include REEs. Wudinna has an existing 211koz JORC-compliant mineral resource estimate and recent drilling indicates excellent potential to expand the resource base. On the REE front, recent drilling indicates that widths and grades of mineralisation appear to be comparable to other Ion Adsorption Clay deposits being pursued by other listed companies.

Tier 1 Location

Although it's relatively easy for investors to pick and choose gold asset exposure in a variety of countries and jurisdictions to fit individual portfolio risk appetites, it's a harder proposition to select suitable rare earth element projects and to some extent copper assets. Quality projects and assets for the latter tend to be disproportionately located in riskier countries or regions of poor infrastructure. The task is even more challenging if the investor seeks exposure to both gold and REEs in the same project. China currently dominates the rare earth industry.

The location of Cobra's assets provides a Tier 1 solution to this problem: South Australia, which is consistently ranked as one of the top jurisdictions for mining globally. In the most recent *Fraser Institute Annual Survey of Mining Companies (2021)*, South Australia is ranked as 10th in terms of investment attractiveness. The ranking is based on a variety of detailed rankings with the overall Investment Attractiveness Index constructed by combining the Best Practices Mineral Potential index, which rates regions based on their geological attractiveness, and the Policy Perception Index, a composite index that measures the effects of government policy on attitudes toward exploration investment.

Supportive Government.

Cobra has been awarded funds from South Australia's Accelerated Development Initiative

The Government of South Australia provides an attractive framework to support exploration and mining activities in the state. This includes the extensive reforms to the Mining Act (1971) and regulations to stimulate the development and use of innovative exploration technologies and data analysis techniques. In 2021, the government announced an extension to the A$21.5m Accelerated Development Initiative (ADI) up until 2025 and committed an additional A$15m for a range of programs to assist explorers through Geological Survey of South Australia (GSSA) initiatives. South Australia also has an attractive royalty regime, 5% on mineral ores and concentrates, 3.5% on refined mineral products. New mines benefit from a reduced rate of 2% for up to 5 years.

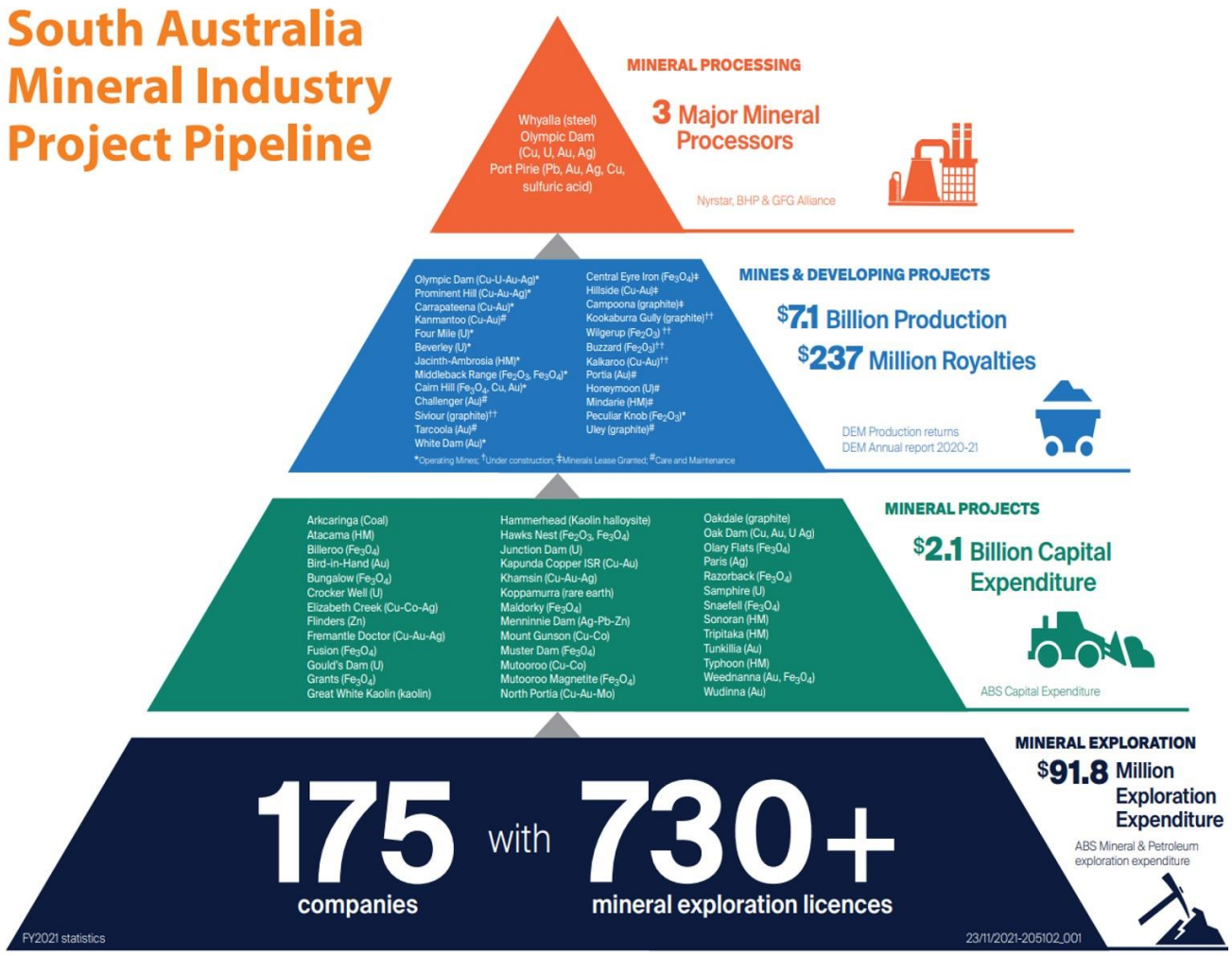
The prolific and highly prospective Gawler Craton

Gawler Craton – home to world class deposits such as Olympic Dam, Prominent Hill and Carraparteena

The Gawler Craton is an extensive region of Archaean to Mesoproterozoic crystalline basement underlying approximately 440,000 km² of central South Australia. The craton is host to several world class IOCG mines including Prominent Hill (Oz Minerals ASX:OZL) with a current resource of 150Mt at 1.4% CuEq for 1,400kt contained copper. Other major mines include BHP's Olympic Dam, and Oz Minerals' Carrapateena mine.

Despite the clear endowment of the Gawler Craton region, the area still remains vastly underexplored, in part due to the varying thickness of sedimentary cover which has impeded exploration progress. Exploration technology has advanced considerably and raft of modern geophysical and geochemical techniques are starting to be employed to unlock the potential of the Craton which has all the geological prerequisites to host additional world-class mineral deposits. Cobra's tenement area has seen very little in the way of modern exploration prior to the company's current programme.

Figure 3 - South Australia's Minerals industry project pipeline shows the breadth of projects progressing through the value chain

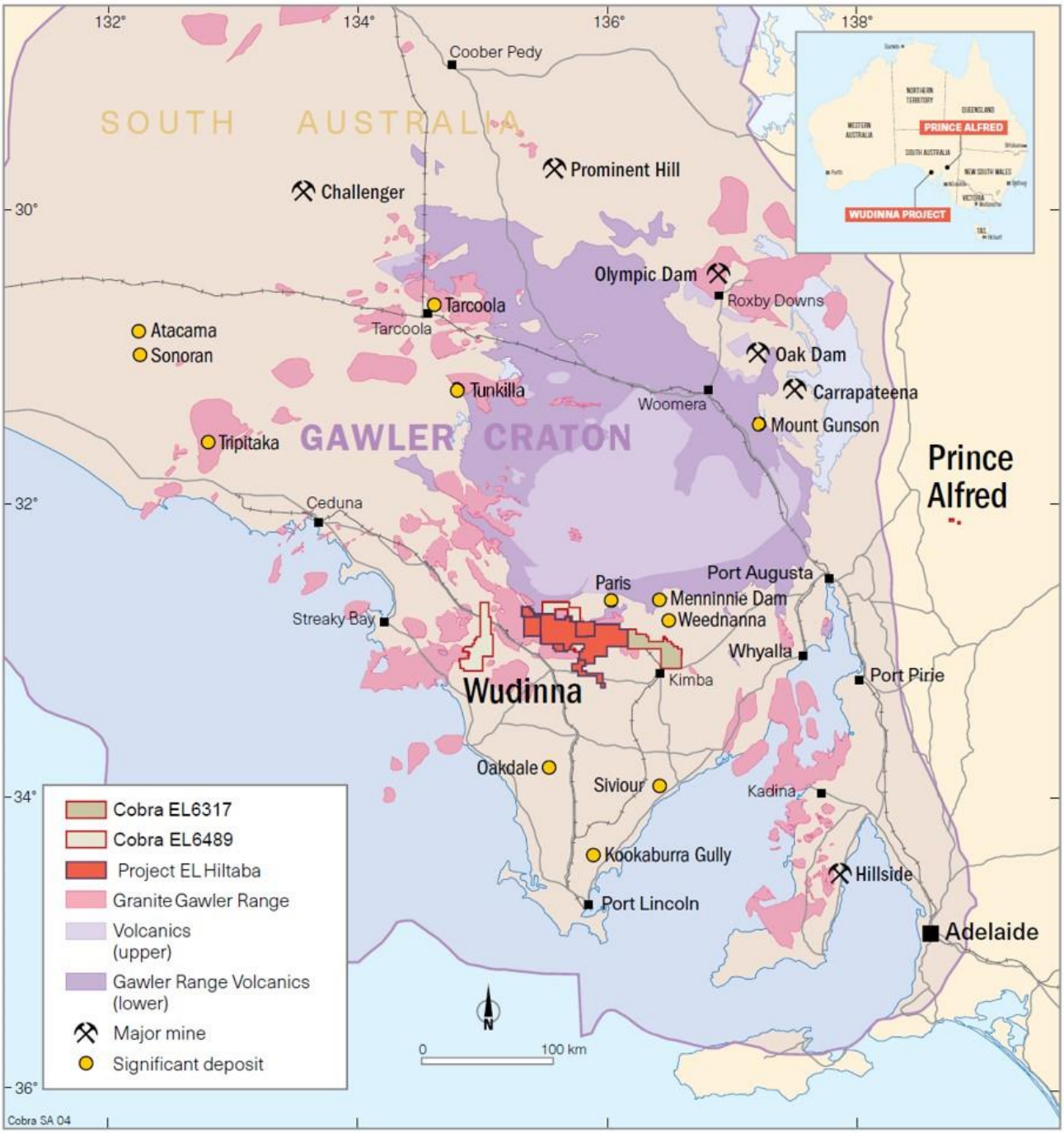


Source: Government of South Australia, Department for Energy & Mining

Background to the Wudinna project

Wudinna comprises a cluster of deposits including Barns, Baggy Green and White Tank which collectively contribute to the existing 211koz JORC-compliant gold mineral resource (see page 7). The Wudinna project area was previously part of a Newcrest Mining ASX: NCM) tenement until 1999 when Newcrest disposed of it to Andromeda to concentrate on exploration success in the Cadia district. The 3 deposits at Wudinna were discovered by Andromeda between 2000 and 2003 by drill testing of calcrete geochemical anomalies. Cobra is in the process of earning into a 75% interest in the Wudinna tenements for A$5m expenditure. Since the Lady Alice acquisition in early 2020, Cobra has been pursuing an active gold exploration programme.

Figure 4 - Location of Cobra's Wudinna and Prince Alfred projects in South Australia



Source: Cobra Resources plc

Wudinna Mineral Resource estimate

The current Mineral Resource Estimate for Wudinna dates from May 2019. Following geological reinterpretation of the Barns, White Tank and Baggy Green deposits by Lady Alice Mines in 2018, Cobra instructed Optiro Pty Ltd, a well-renowned mining services company based in Perth, Western Australia to re-estimate the gold resources in accordance with the JORC (Joint Ore Reserves Committee) 2012 Guidelines.

The updated Mineral Resource increased to 4.43Mt at 1.5 g/t gold for 211,000 ounces of gold. The previous resource estimate was 3.85Mt at 1.6 g/t gold for 200,300 ounces. Each of the deposits remains open and Cobra intends to update this gold MRE in January 2023. The current resource is predicated only on the Barns, White Tank and Baggy green deposits and does not include any of the high-grade gold intercepts from the Clarke prospect or include any other data from drilling over the last 3 years since the last 2019 MRE.

The current MRE does not include any results from the 2020, 2021 and 2022 exploration programmes.

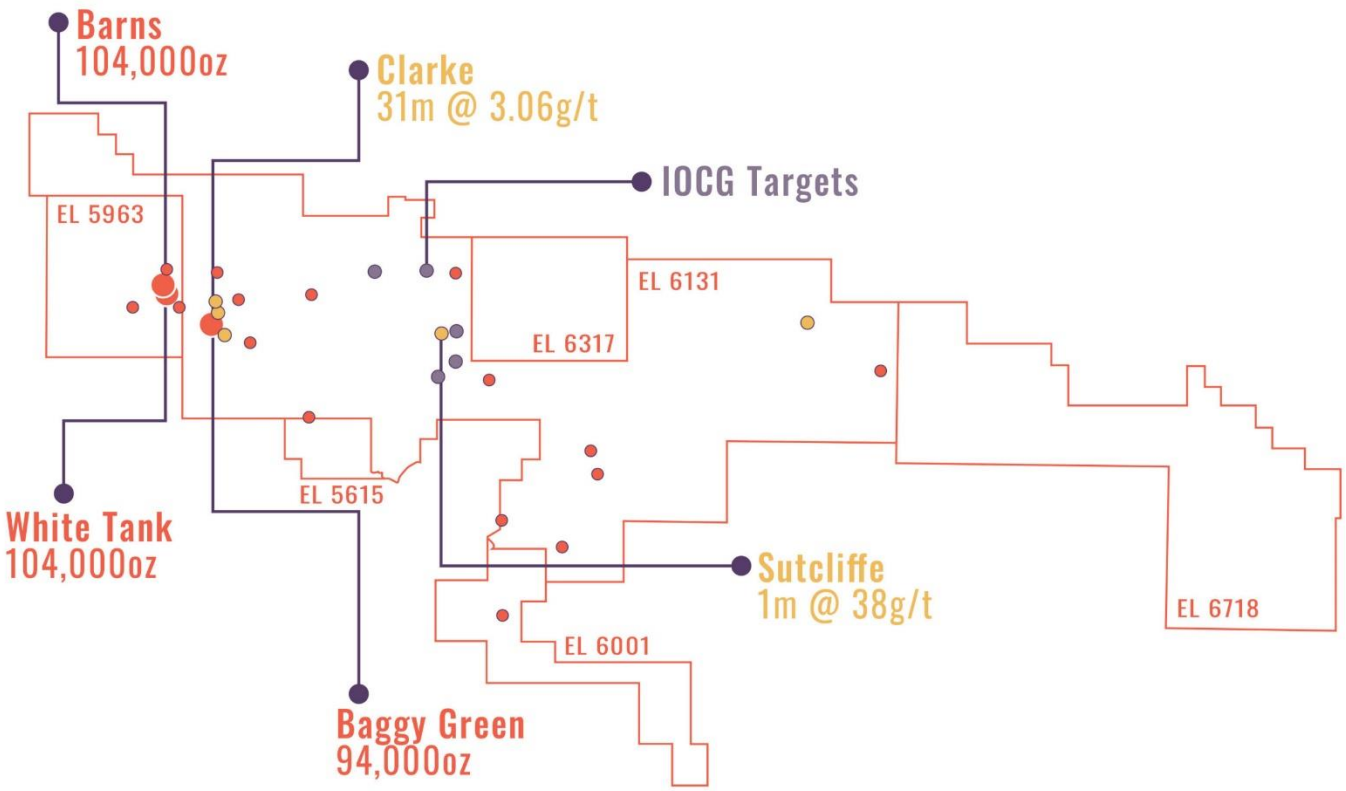
Figure 5 - Wudinna project – 2019 Mineral Resource Estimate (JORC 2012)

Deposit	Classification	Tonnes (kt)	Grade (g/t Au)	Gold Ounces
Barns	Indicated	410	1.4	18,000
	Inferred	1,710	1.5	86,000
	Sub total	2,120	1.5	104,000
White Tank	Inferred	280	1.4	13,000
Baggy Green	Inferred	2,030	1.4	94,000
Total		**4,430**	**1.5**	**211,000**

Reported at a cut-off of 0.5g/t Au

Source: Cobra Resources

Figure 6 - Wudinna tenement map showing location of current JORC-compliant resources



Source: Cobra Resources plc

Examples of intercepts outside current resource:

31m at 3.06g/t Au

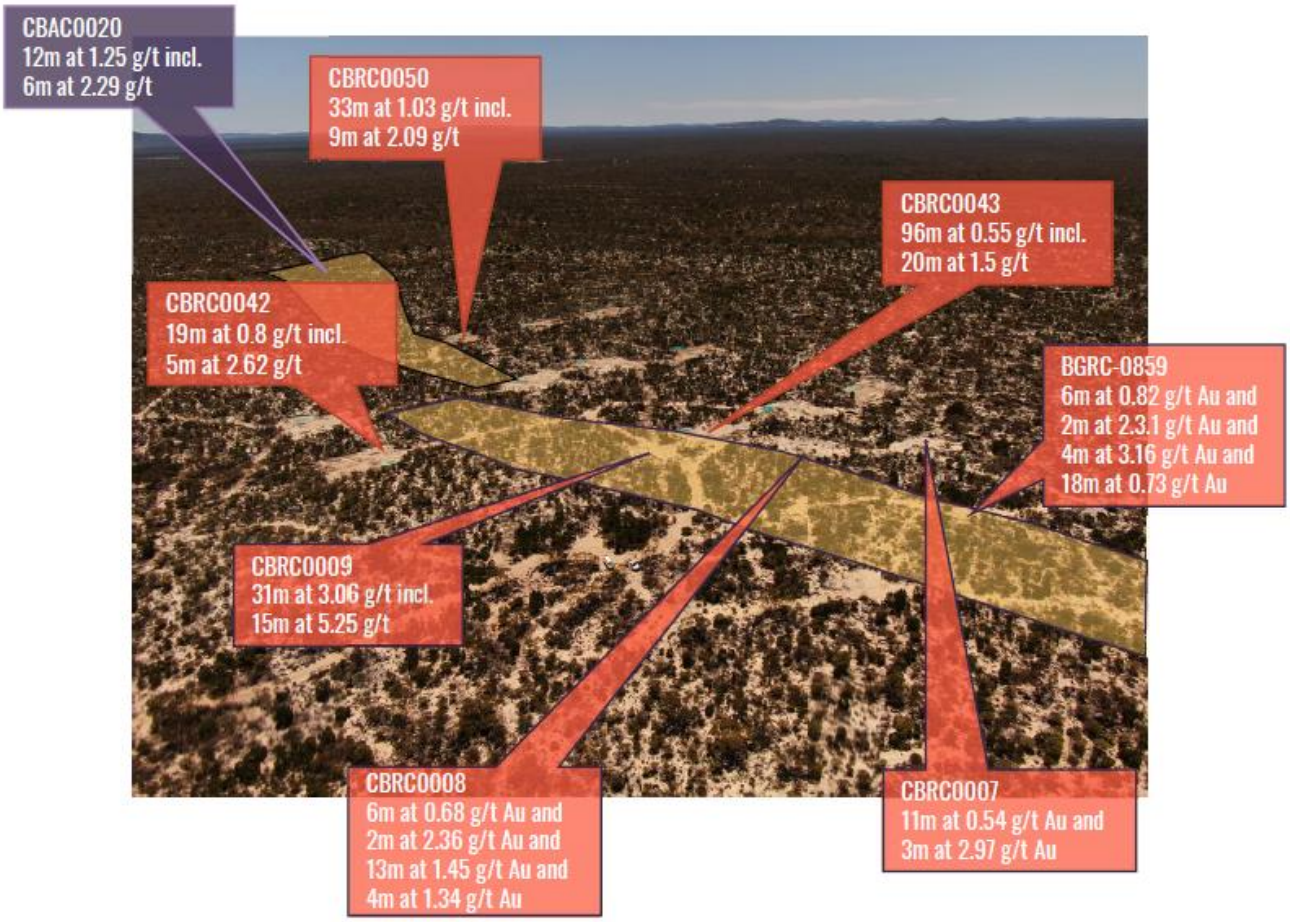
15m at 5.25g/t Au

33m at 1.03g/t Au

12m at 1.25g/t Au

- **Resource expansion upside** - numerous high grade gold intercepts have been drilled at Clarke outside of the current resource envelope. Of particular note, RC drilling in 2020 returned several encouraging intercepts including 31m at 3.06g/t Au from 69m including 4m at 3.18g/t Au, 1m at 1.21g/t Au and 15m at 5.25g/t Au. Aircore drilling also defined anomalous gold in saprolite to the north including 12m at 1.25g/t Au including 6m at 2.29g/t Au.
- A follow up RC drill programme was designed to test a further 250m of strike and in-fill previously defined gold mineralisation. This round of drilling also provides more drill data for an update to the MRE and provide bulk samples for metallurgical studies. **Mineralisation at Clarke remains untested at depth and open along strike.**

Figure 7 - Clarke prospect – expansion potential, high-grade gold intercepts outside the MRE



Source: Cobra Resources plc

- **See page 26 onwards** for a detailed review of both gold and REE exploration progress to date.

Rare Earth Elements in context

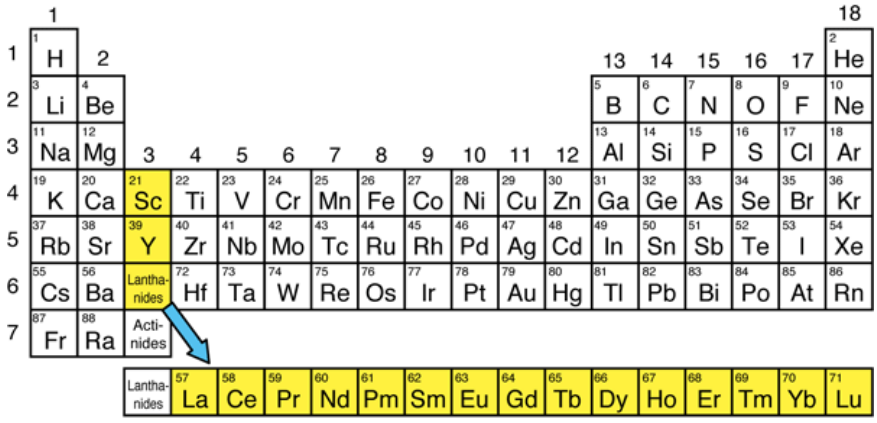
Brief re-cap of rare earth elements

Rare earth elements (REEs) are typically considered to represent the 15 lanthanide elements on the periodic table, along with scandium and yttrium. Yttrium is classified as a rare earth element because of its similar ionic radius to the lanthanides, as well as its similar chemical properties, whereas scandium is classified as a rare earth element because of its tendency to concentrate into many of the same minerals[1].

Some definitions. REEs are somewhat arbitrarily classified as light rare earth elements (LREEs) and heavy rare earth elements (HREEs). LREEs have an increasing number of unpaired electrons in their 4f shells, starting at lanthanum (which has zero unpaired electrons, through to gadolinium, which has seven unpaired electrons). For HREEs, they have paired electrons (a clockwise and counter-clockwise spinning electron). Yttrium's physical and chemical properties resemble those of HREEs, thus it is categorised as such. REEs are not particularly rare in nature in terms of crustal abundance, more the issue that they are not often concentrated sufficiently to justify commercial extraction and processing.

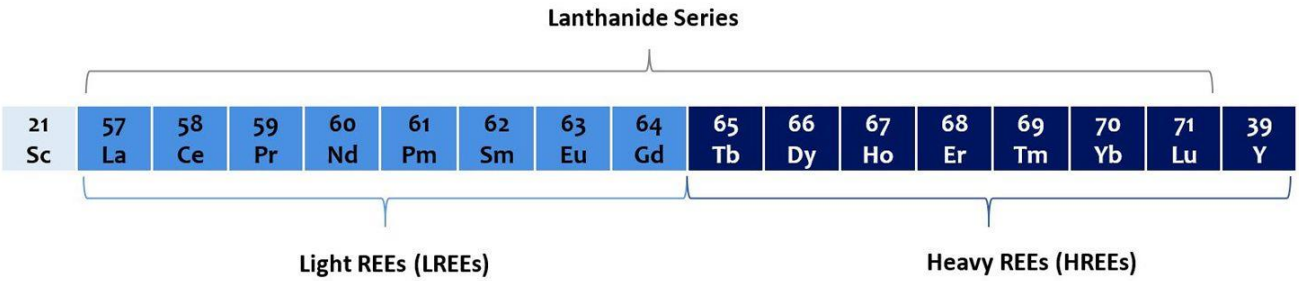
Rare earth element assays are typically reported as "**TREO**" which stands for Total Rare Earth Oxides and includes all the rare earth oxides including yttrium oxide: La_2O_3, CeO_2, Pr_6O_{11}, Nd_2O_3, Sm_2O_3, Eu_2O_3, Gd_2O_3, Tb_4O_7, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3, Lu_2O_3, Y_2O_3.

Figure 8 - Rare earth elements in the periodic table



Source: Spring-8

*Figure 9 - Rare earth elements are split into **Light REEs**[2] (LREE) and **Heavy REEs** (HREE). Additionally, REEs can be further subdivided into **Magnet REEs** (MREE) typically defined as Nd, Pr, Dy and Tb and **Critical REEs** (CREO) namely Nd, Dy, Eu, Y, Tb)*



Source: REIA

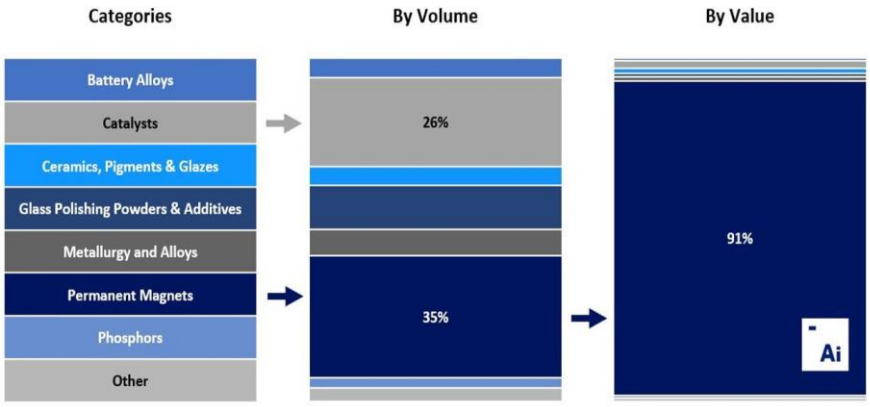
[1] REIA (Rare Earth Industry Association)
[2] Also referred to as REO (rare earth oxide) e.g. MREO = magnet rare earth oxides

End uses. The specific physical and chemical properties of REEs mean that they are crucial for use in a wide variety of end use applications. This includes the use of REEs in the production process and/or in the final product. REEs are indispensable in a host of magnetic, electronic, optical and catalytic applications where they are used to improve energy efficiency and enable digital technology. They are used extensively in alloys for both batteries and steel, and in the ceramics industry. In fact, it is thought that REEs are used in the largest range of consumer products of any group of elements. However, the two most important end-use applications of REEs are for use in catalysts and permanent magnets:

Permanent magnets have emerged as the most important driver of REE consumption.

- **Catalysts** account for c.26% of the REE market by volume with REEs being a key component of catalytic converters for both petrol and diesel vehicles. In particular, cerium carbonate is used in the catalyst substrate. Both cerium and lanthanum are used fuel/fluid cracking catalysts for the crude oil refining process for the manufacture of petrol, diesel, gas and jet fuel. Nevertheless, catalyst use accounts for perhaps only 3-5% of the REE market by value.
- **Permanent Magnets**. The dominant and fastest growing application for REEs is in the manufacture of permanent magnets. Permanent magnets are so called due to their ability to generate and retain their own magnetic field. These magnets are typically **neodymium**-iron-boron type magnets (NdFeB) but some of the Nd can be replaced by **praseodymium** (Pr) and to a lesser extent, **dysprosium** (Dy). High-strength permanent magnets enable the production of numerous electronic gadgets such as mobile phones and laptops, as well as power dense energy-efficient electric motors and generators used in electric vehicles, wind power generators, energy efficient appliances and hundreds of other applications.[3] Permanent magnets account for 35% of the REE market by volume but 91% by value. It is estimated by *Adamas Intelligence* that magnet rare earth oxides (MREO) could account for 99% of the market value by 2031. MREO prices have increased 200% since 2019.

Figure 10 - Catalysts and permanent magnets are the largest drivers of REE demand



Source: Global REIA (after Adamas Intelligence)

- **The demand driver**. REE use is increasingly being aligned with the global push to reduce carbon emissions and enable electric mobility by use in a wide variety of "green" industries, primarily, permanent magnet traction motors for electric vehicles (EVs) and permanent magnet generators in power-generating wind turbines. Around 9/10 of all electric vehicles use a REE type of permanent magnet motor. According to *Adamas Intelligence*, whilst traditional ICE (internal combustion engine) cars use c.700g of NdPr oxide for small electric motors (for powering accessories), EVs and hybrids can require an additional 1kg per for the traction motor.

[3] Global REIA

As such, the impact of the continued build-out of global EV capacity hardly needs explaining. *Adamas Intelligence*[4] forecasts that NdFeB magnet demand will increase at a CAGR of 8.6% as a result of double digit growth in EV and wind power sectors. Adamas predicts the market for magnet REOs will increase 3-fold by 2035 with the value of the market increasing from US$15.1bn to US$46.2bn over the same period. Adamas forecasts an annual shortage of 206,000t of NdFeB and 68,000t of NdPr oxide by 2035, constrained by lack of new supply and limited options for existing producers to increase output.

- **Chinese dominance**. It is widely recognised that China continues to dominate the REE market, producing circa 70% Nd & Pr and >77% Dy & Tb. In addition to the mining side of the business, China also retains a firm foothold on the downstream processing and separation portion of the value chain, a critical step in producing saleable and on-spec REEs. Separation into separate rare earth oxides is often regarded as one of the most challenging aspects of processing.

Chinese dominance of HREE in particular stems from the country's prevalence of ionic clay deposits.

It is thought that China is responsible for around 70% of mined REE production but separates ~87% of commercial REO's and >95% of RE metals, supported by a multi-decade government led strategic REE policy. In particular, Chinese mining operations supply >90% of heavy rare earths due to the abundance of vast ionic clay deposits.

The extent of this Chinese monopoly does look set to wain *slightly* in time with several projects outside of China (namely US, Australia and Africa) in development. However, the need to develop further domestic sources of strategic rare earth production remains critical for many western world countries. Chinese refining dominance is likely to remain for the foreseeable future and more western investment in rare earths is needed.

REE deposit types

Whilst REEs occur in a wide range of igneous, sediment and metamorphic rock types, broadly speaking, REE deposit classification is split into primary and secondary deposits.

- **Primary.** Associated with igneous and hydrothermal processes and include carbonatites, alkaline igneous rocks, Iron-REE deposits and other hydrothermal deposits. These are more commonly referred to as hard rock or "mineral" REE deposits.
- **Secondary** deposits tend to refer to REE deposits that form by concentration by sedimentary processes and weathering. This group includes placer, laterite and clay deposits. The latter are termed ion or ionic adsorption clays (with the right conditions), the same type of mineralisation that Cobra is delineating at Wudinna.

There are further subdivisions based on geological processes or genetic associations, but for the purpose of this note we refer to ionic clay deposits vs hard rock deposits. Rare Earth mineralisation itself is not particularly rare but finding the right kind of mineralisation and mineral assemblage that can be commercially developed and processed is a challenge.

Ion (ionic) adsorption clays are Cobra's target

As detailed elsewhere in this note, in the process of exploring for gold at Wudinna, Cobra has identified what is starting to look like a significant ionic adsorption clay REE occurrence.

Ionic adsorption clays ("IAC") or simply ionic clays are residual clay deposits formed from the weathering of REE-enriched granites. The occur extensively in southern China, but new deposits are starting to be discovered, notably in Australia. The REE-rich weathered clay zones tend to range from 5m to greater than 30m in thickness, but with a high degree of local variability. Due to the tropical weathering requirement, IAC deposits tend to occur in the 20°-30° latitude north and south of the equator.

The REEs are released from various mineral phases into the weathering profile during clay formation and can be adsorbed to the surface of clay minerals, usually kaolinite or halloysite, by processes including meteoric water leaching and in migration. Thus, the concentration of REEs within these deposits is dominantly a supergene process.

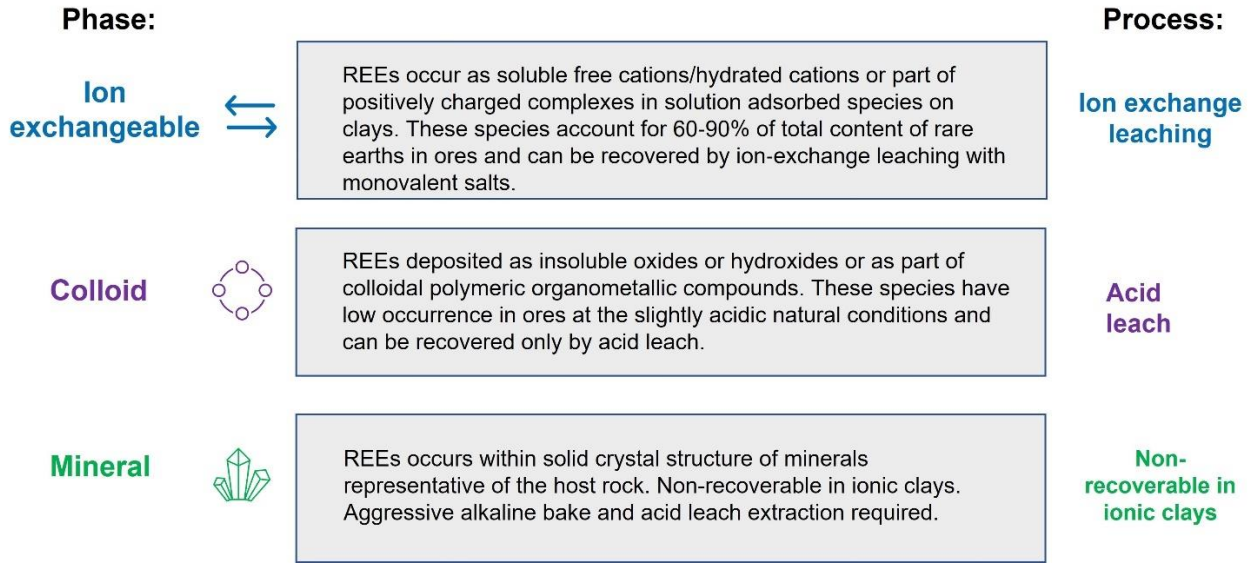
[4] Rare Earth Magner Market Outlook to 2035, April 2022 press release

Not all clay deposits created equal, not many true IAC deposits

A specific set of conditions required. In addition to the prerequisite of REEs being present in the source rock (favourable protolith required) in sufficient quantities to generate a deposit with sufficient grade, there are several other factors that control whether or not an IAC deposit is formed in the first place and whether it has the required attributes to potentially be economic. Critically, the processing and recovery potential of REEs depends on where the REEs occur within the clay deposit, thus an IAC is a distinct type of clay deposit – not all clay deposits are equal!

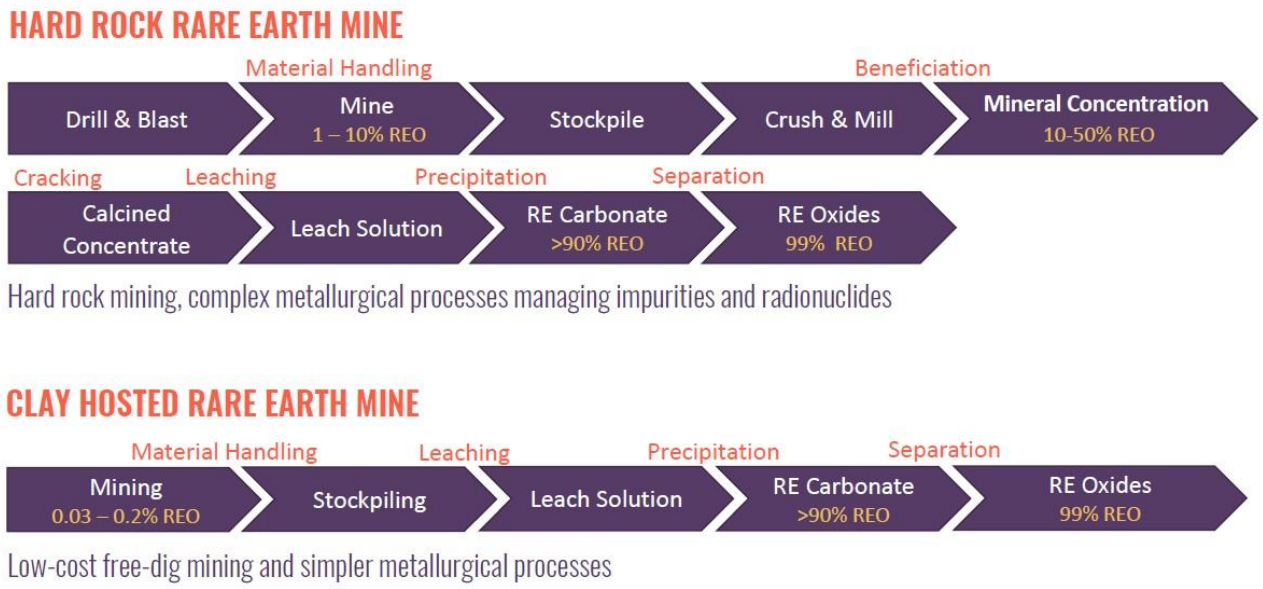
REEs occur in ion adsorption clays in three different phases (fig 11) and each phase requiring a different processing solution to recover the REEs. Ion exchangeable and colloidal phases are preferable for economic recovery as REEs occurring in the mineral phase require aggressive and costly processing techniques to liberate and recover.

Figure 11 - Categories of REEs present in clay deposits and processing implications



Source: Cobra Resources plc, adapted by Shard Capital

Figure 12 - Clay vs hard rock comparison – clay hosted deposits offer several advantages including a streamlined processing flowsheet



Source: Cobra Resources plc

Key attributes of IAC REE deposits (vs hard rock)

IAC (clay) deposits present a different commercial opportunity to hard rock deposits, with several key advantages (and some disadvantages) as detailed below:

IACs lower grade but significant mining & processing (capex and opex) advantages

- **Lower grade.** Clay deposits typically have a significantly lower grade than hard rock REE deposits. IAC grades range from the 500-3,500ppm TREO (0.05% to 0.35%) whereas hard rock deposit (carbonatites, alkaline/peralkaline, skarn/IOCG) grades are typically greater than 1,000ppm TREO (0.1%) and in some cases greater than 50,000ppm (5%). Nevertheless, the grades between the two deposit types have limited comparability in an economic sense due to the large variance in mining and processing costs. REEs can be produced commercially from IAC deposits with a lower REE grade relative to hard rock deposits.

MREO = Nd, Pr, Dy, Tb

- **High value assemblage IACs - the main source of Heavy Rare Earths**. IAC deposits tend to contain both HREOs and LREOs and have elevated HREO+CREO ratios relative to the overall TREO content. CREOs are critical rare earth oxides, namely Nd, Dy, Eu, Y and Tb, defined as critical by the US Department of Energy based on their use in clean energy and due to supply risk. As such, IACs tend to have an attractive mineral assemblage which lends itself to a high proportion of MREO's (Nd, Pr, Dy, Tb) and a typically higher basket price. The percentage of magnet rare earths in IACs is typically 23%-35% which can compare favourably with some types of hard rock deposit. As discussed, MREO's already contribute around 95% of REE market value and this is projected to grow to 99% by 2031 according to *Adamas Intelligence* forecasts**.**
- **Hard rock tends to be LREE enriched.** In contrast, hard rock deposits tend to be composed predominantly of LREEs which means although they contain Nd and Pr (LREE), they tend to contain much less Tb and Dy (HREE). Hard rock deposits also have a much higher proportion of Ce and La, low value REEs and effectively waste products (c.$1.5/kg price). Total Ce and La in hard rock deposits can be >65%.
- **Exploration considerations.** IAC exploration is a lower cost process than hard rock, amenable to the use of low cost shallow aircore drilling. This also helps to expedite the exploration timeframe. Hard rock deposits require more use of costly and time-consuming diamond drilling.
- **Mining considerations.** Due to their shallow nature, IACs are amenable to surface bulk mining techniques. As a result of being clay and softer weathered horizons, blasting is not typically required. As IACs tend to form within the first 30m of the subsurface, mining strip ratios are low. This translates to a lower cost for both mining and rehabilitation. In most cases mining and ongoing rehabilitation is a simultaneous process. In contrast, hard rock mining may require more expensive mining techniques to selectively mine and maintain grade control. Hard rock deposits would also require blasting.

Low Opex, Low Capex. IACs could offer a low start-up capital cost and low ongoing operating costs. Clay operations may also provide more flexibility in terms of modular development and scalability

- **Processing / refining considerations.** IACs are amenable to much simpler processing techniques. They do not require the costly crushing and grinding at the comminution stage because the REEs have already been substantially liberated during the weathering phase. IACs are also amenable to much simpler metallurgical processing flowsheets utilising acid leach at ambient temperature and low pressure and other methods such as ion-exchange leaching. In contrast, after crushing and grinding, hard rock ore usually requires a complex and higher cost flow sheet that may include flotation in order to produce a concentrate. Whilst IACs can produce a high-grade, high payability, feedstock product suitable for direct input to REE separation plants, a hard rock REE mineral concentrate may require further metallurgical, hydrometallurgical or pyro metallurgical processes. This may include high-temperature concentrate "cracking" before intensive leaching, otherwise a lower intrinsic value concentrate must be sold.
- **Lower carbon footprint and environmental impact.** IACs have a distinct environmental advantage over hard rock deposits in that they contain very low levels of radioactive elements such as uranium or other radionuclides. Hardrock deposits tend to contain higher levels of radioactive elements and other impurities which effectively become concentrated in the tailings during the processing stages. This makes tailings disposal complex and more costly to mitigate environmental issues. The carbon footprint of IAC mining and processing is also much lower due to lower power, transport, reagent costs etc.

REE value drivers

The technical, development and commercial considerations required to support the successful development of a rare earth project are naturally more complex than a straightforward precious or base metal project. There are several key factors that must align to drive REE value and determine whether a project can actually be brought into production. We believe that Cobra ticks all the boxes to support future development potential

- **Jurisdiction**. Fairly obvious, but locality can be crucial on a number of fronts including permitting, government and regional legislative framework and governance. At the ground level, access to infrastructure is also critical including access to roads, power, water etc and the infrastructure to support logistics. Given the generally restricted latitude occurrence of ionic clay deposits, the 20-30° north and south of the equator translates to large swaths of Africa, Central and South America, and China/Asia. As such, Australia stands out from the crowd as a favourable and low risk jurisdiction. It's no good pursuing an asset that can't be permitted into production. Australia's mining legislation supports assets being developed on the basis of the highest international standards.

Cobra has a comprehensive Sustainability plan:

https://cobraplc.com/sustainability

- **ESG considerations.** As with all minerals, but especially those with applications in electric vehicles, the focus on environmental, social and governance criteria will continue to grow. ESG initiatives to promote responsible production and certification for end products will require that companies adhere to a wide range of principals from biodiversity and human rights to rehabilitation and pollution. The entire supply chain is coming under increased scrutiny and given the lack of non-Chinese supply, only those REE projects with superior ESG credentials are likely to get the green light for development. Cobra already has a distinct advantage in this regard and released a comprehensive Sustainability plan in 2022 to develop an industry-leading approach to ESG.
- **Resource / mineral assemblage**. Beyond resource size and scalability to justify the initial capex spend, the nature of the deposit is crucial. REE deposits can be highly variable and the potentially achievable revenue is based on the mineral assemblage of the deposit. Specifically, the relative proportions of LREEs, HREEs and magnet REEs which determine the basket price of the end product. As discussed elsewhere in this note, IAC deposits tend to have a higher HREE component and favourable proportion of magnet REEs. The dominant and growing position of permanent magnets in REE market value means that IAC deposits could be favoured over hard rock development opportunities.
- **Financing challenges.** Despite the structural shortage of key rare earth minerals, financing remains a major hurdle. Unlike gold, copper and other metals, rare earth concentrates are all different. Consequently, securing an off-take agreement can be essential to unlock project financing. Recent off-take deals include: Arafura (ASX: ARA) with a binding 7-year off-take with Hyundai for up to 1,500tpa of NdPr oxide from the Nolans Project and Hastings Technology Metals (ASX:HAS) with a 10-year off-take for (60% of annual production for the first 5 years) with thhyssenkrupp. If exploration and development continue to be successful, Cobra should be well placed, in our view, especially with a complementary gold resource that could widen the potential field of financing options.
- **Technical considerations.** Everything has to fall into place from a technical perspective in order for a project to have development potential. This includes the technical expertise to support ore characterisation and metallurgy to drive the optimal process flowsheet. A full understanding of the mineralisation and occurrence of REEs in various phases is required to design a process with robust recovery outcomes. Cobra has already undertaken a great deal of research in this regard.

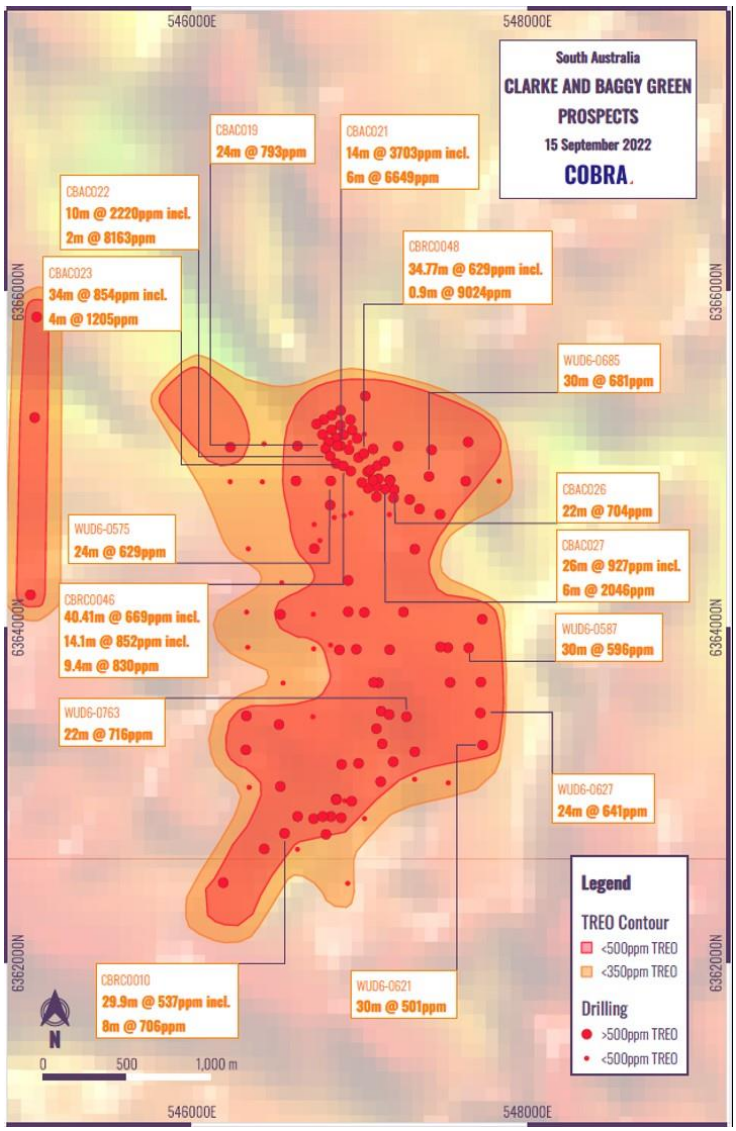
Huge REE potential at Wudinna

The recent discovery and confirmation of rare earth mineralisation at Cobra's Wudinna tenement has radically altered the company's strategic direction. Due to the growing strategic and economic importance of REEs, Cobra submitted pulps from drilling at its Wudinna Gold Project for REE analysis. The results demonstrated significant intersections with TREO assays in excess of 500 ppm within the kaolinised clays of the saprolite across all 14 RC drillholes. This prompted both widescale reanalysis of existing drill samples and new drill programmes to target both gold and REE mineralisation.

REE footprint has been expanded from 4km² to 22.5km² in a mere 12 months

- **Extensive REE occurrence.** Significant REE intersections have been defined at over 15 prospects in the Wudinna area. REE mineralisation has been found to be regionally extensive in weathered (saprolite) zones developed on basement rocks. Prior to commencing the 2022 field programme, a comprehensive re-analysis programme defined extensive REE mineralisation over a 4 km² footprint. Further reanalysis of historical drill holes at the Thompson prospect contributed an 18.5km² footprint to increase the total REE footprint at Wudinna to 22.5km² including the Clarke, Baggy Green and Thompson prospects, where rare earth mineralisation intersections lengths average over 15m.

Figure 13 – Gold and REE upside potential at Clarke and Baggy Green prospects

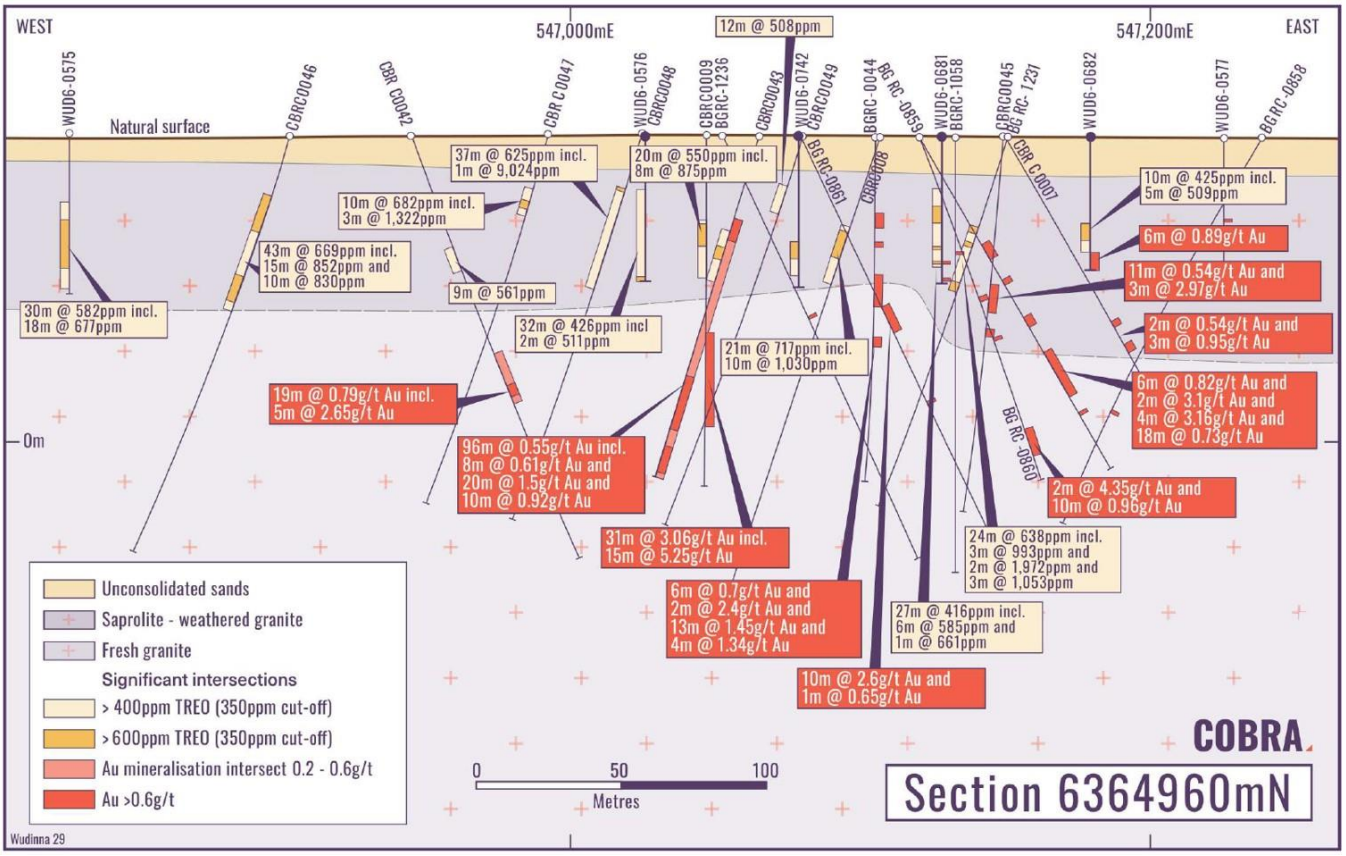


Source: Cobra Resources plc

Gold and controlling structures may be the catalyst for REE mineralisation

- **Unique gold association.** After Cobra's initial discovery of rare earth mineralisation, further exploration work identified that the best intersections of REE mineralisation is situated both above and proximal to the already identified gold mineralisation at the Clarke and Baggy Green prospects at Wudinna. This makes the project unique versus other clay-hosted rare earth deposits. Cobra believes that the controlling structures associated with gold mineralisation also have a genetic relationship with REE mineralisation by acting as a catalyst for rare earth oxide mobilisation.

Figure 14 – Cross section at Clarke, rare earths overlying gold mineralisation



Source: Cobra Resources plc

- **Enhanced economics?** The occurrence of both gold mineralisation and rare earth mineralisation may help to increase the commercial rationale for any potential mining development. Firstly, the additional opportunity for revenue from REEs in the saprolite which would otherwise be classified as waste requiring pre-stripping to access any underlying gold mineralisation. This could in some areas cause a reduction in the strip ratio with a positive knock-on effect to the economics of gold extraction. Of course, in some areas, REE mineralisation does not overlie gold mineralisation or is only proximal, or in a nearby location. Nevertheless, this could offer some synergies in term of development and general and mining infrastructure.

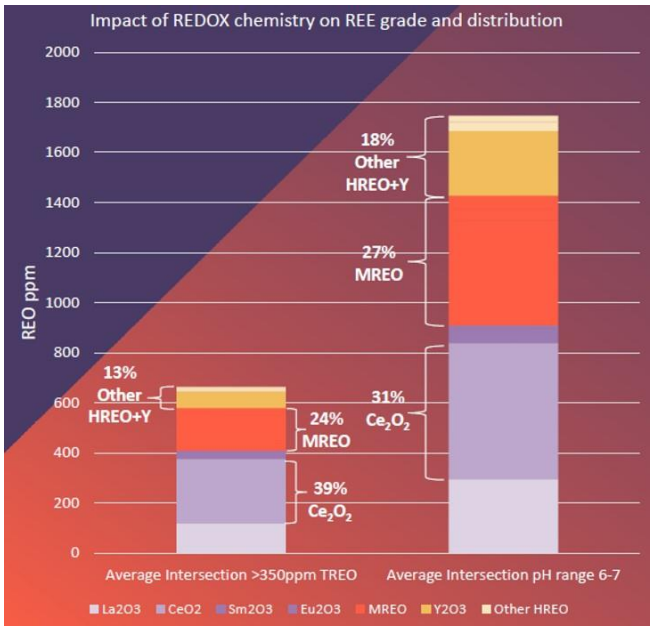
Cobra has recently identified new REE mineralisation at other prospects such as at Thompson.

- **Upside currently unconstrained.** REE mineralisation at Wudinna remains open and unconstrained in most directions. Cobra's rare earth exploration strategy is at a relatively early stage as a result of the fact that rare earth potential was only recently discovered. Hence, **we believe that the current extent of known REE mineralisation could increase significantly"** given the geological potential and rapid delineation of a substantial REE footprint. For example, at the Clarke prospect, of the 159 holes drilled or re-analysed, 88% of holes yielded greater than 15m at 602ppm TREO and 72% of drill holes yielded greater than 9.5m at 789ppm TREO.

High correlation between REE grade and pH 6-7 and pH 9-10 conditions and negative cerium anomaly (reduced Ce content) – see fig 16

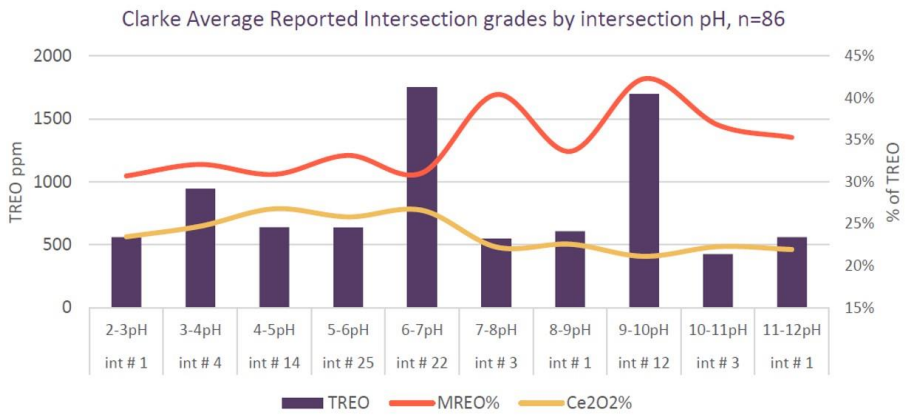
- **Desirable lithologies at Wudinna.** REE mineralisation occurs within weathered saprolite horizons indicative of highly desirable crustal elution or ionic clay hosted rare earths. Logged mineralisation coincides with kaolin, montmorillonite and illite clays that have high adsorption capacities.
- **Conditions supportive of ionic adsorption.** Extensive pH testing of drill samples demonstrates variable conditions across prospects, saprolite horizons, and types of clays that are associated with high REE adsorption capacity. Intersections elevated in both heavy and magnet rare earths have a strong correlation to pH 6-7 and pH9-10, an environmental condition that results in increased adsorption potential of clays that yield, low cost, high metallurgical recoveries. As detailed elsewhere in this note, the identification of ion adsorption is important due to favourable mining and metallurgical characteristics.
- **Implications for grade, mineral assemblage and economics.** This emerging association between pH conditions, grade and magnet rare earth content has important implications. Cobra can now use this as a effective exploration tool with the highest TREO grades associated with these empirical observations (pH 7-6 and low Ce). This may help identify the drivers for grade and mineral assemblage variability given that assemblage variability has a significant impact on achievable basket price. The REO mineral assemblage varies between locality and the Thompson and Anderson prospects are becoming priority targets.

Figure 15 – Impact of redox chemistry on REE grade and distribution



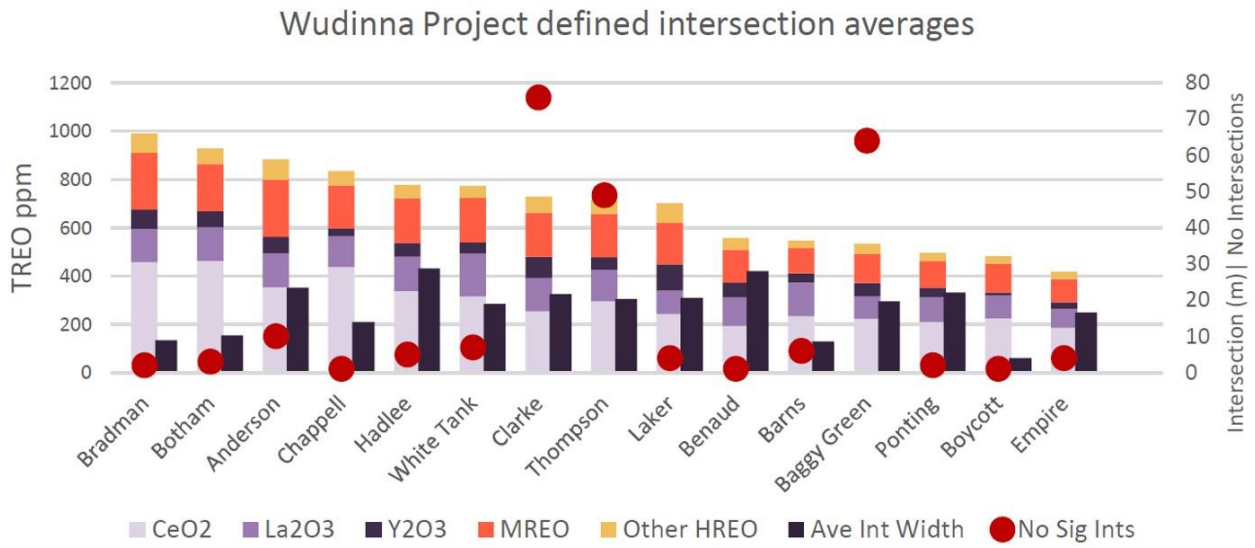
Source: Cobra Resources plc

Figure 16 – Correlation between pH and TREO grade at Clarke



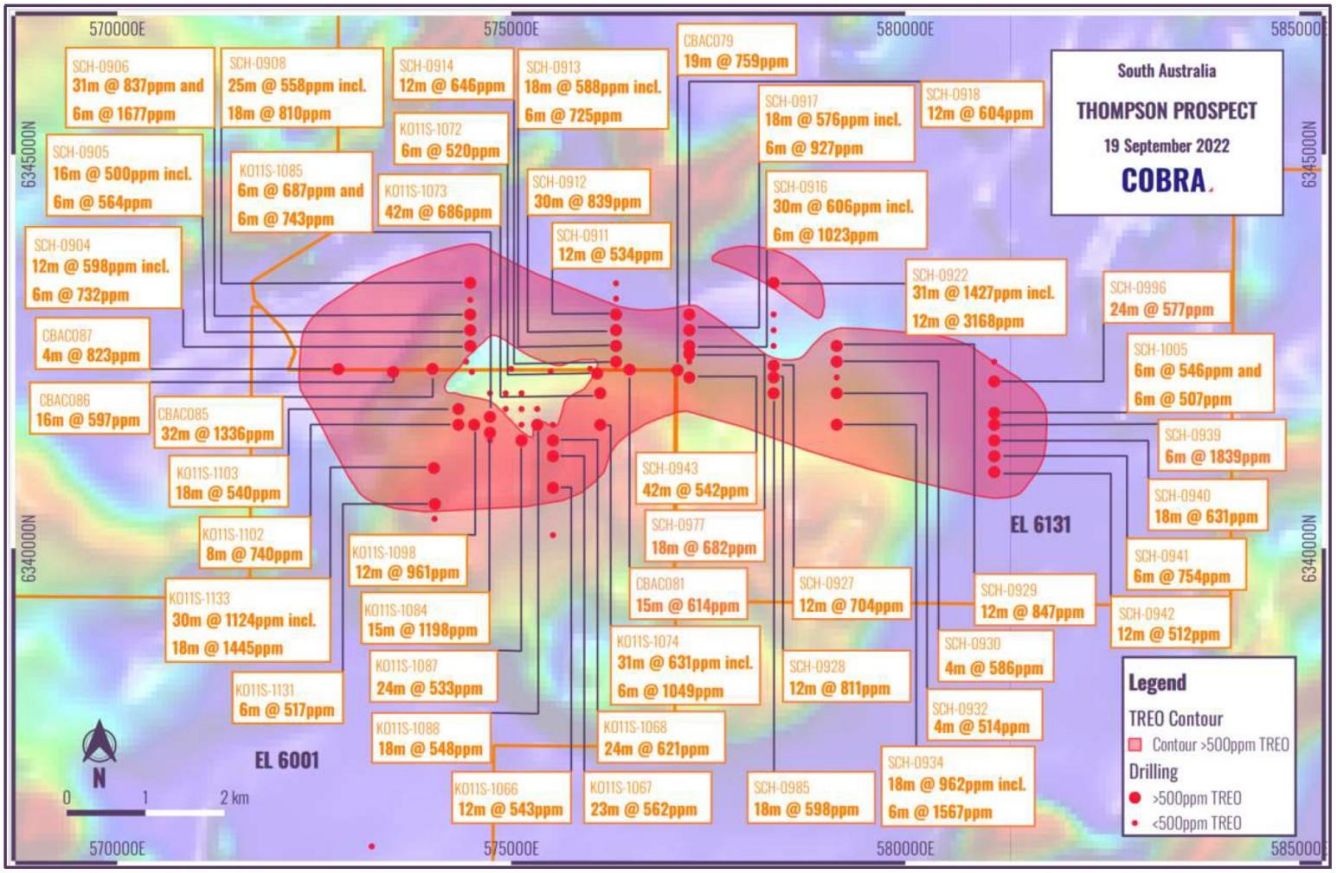
Source: Cobra Resources plc (both figures)

Figure 17 - Wudinna project defined TREO intersections



Source: Cobra Resources plc

Figure 18 - 18.5km² of REE mineralisation defined at the Thompson prospect taking Wudinna's total to 22.5km² and counting



Source: Cobra Resources plc

- **Low impurities.** Assay data indicates that REE mineralisation at Wudinna is low in deleterious radioactive elements such as uranium, thorium and other impurities that may cause processing issues, environmental issues or reduce the basket price.

Figure 19 – Wudinna project in context

	The Rare Earth Market	Wudinna Project
Market Peers	Ionic Adsorption Clay (IAC) deposit mineralisation is highly desirable providing it produces a balanced basket of REO elements	REO basket within intercepts are high in magnet rare earths. Market peers generating considerable market interest – Cobra's preliminary results are more than comparable
Advantage	China dominates world supply, producing over 90% of rare earth oxides. Only 1 rare earth ionic clay resource in Australia	The Wudinna Project offers a unique opportunity to vertically integrate IAC mineralisation with defined gold resources underpinning project economics
Location	Growing requirement for rare earth minerals to be sourced with environmental standards and ethically mined.	Favourable jurisdiction to promote and develop the project to capitalise on forecast market growth. Excellent infrastructure with roads, power and ports nearby
Strategic Importance	Growing demand for rare earth minerals being driven by the transition to green energy and decarbonisation	Cost effective strategy to define a maiden IAC resource with significant upside potential. Dual commodity mining approach reduces environmental footprint

Source: Cobra Resources plc

- **Metallurgy a key focus going forwards**. Although there has only been a short timeframe since the discovery of REE mineralisation, Cobra has already undertaken crucial metallurgical test work. Samples have been analysed from two holes at the Clarke prospect across the saprolite zone. The testwork has focused on extraction techniques adopted to ionic phase mineralisation. Preliminary metallurgical testwork has provided positive indications that target REE mineralisation is bound to clay particles. The identification of a technique or techniques to optimally recover rare earth metals from the saprolite mineralisation requires further testing.

  - The standard desorption test targeting the ionic phase of mineralisation yielded low (<10%) recoveries using $(NH4)_2SO_4$ as a lixiviant.
  - Recoveries were much higher from leach testwork from reduced pH and increased leach time with one sample yielding recoveries of up to 34.1% TREE+Y.

- **Recoveries should increase with further test work.** These results imply a moderate to high component of REE bursary is likely to be colloidal (oxidised) mineralisation. This means that acid leaching is likely to result in much higher recoveries than ion exchange leaching. Cobra believes that significant improvements in recovery can be achieved through washing steps, changing lixiviants, increased leach residence time and pH variation. Therefore, with subsequent process optimisation, Cobra believes that recoveries could ultimately be in line with other Australian clay REE projects, where other peer companies have started with acid leach recoveries in the 10% to 30% range and optimised the flowsheet to end with recoveries in the 45% to 75% range.

Cobra is focused on identifying and characterising the ionic component in the clays at Wudinna

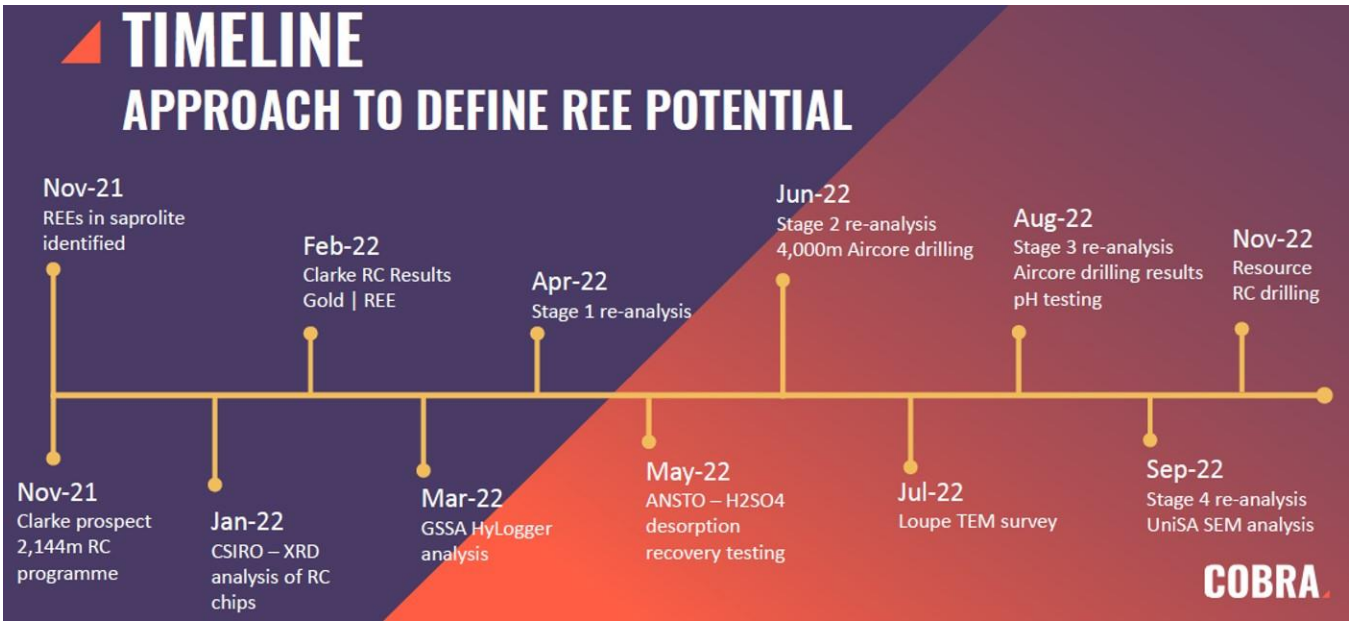
- **Early understanding of metallurgy.** Cobra has undertaken considerable work in terms of ore characterisation, mineralogy and chemistry with specific reference to understanding the occurrence of rare earths in various phases within the clay (figure 11). Cobra believes that leaching via H_2SO_4 offers a potentially better metallurgical pathway to drive better recoveries and lower operating costs. In contrast, some of Cobra's peer companies are pursuing Weak Aqua Regia or HCL metallurgical routes which may not offer the same advantages in terms of desorption potential. Cobra on the other hand is putting an increased focus on H_2SO_4 leaching and the environmental and lithological conditions supportive of ionic adsorption with specific reference to the occurrence of REEs in various phases. Cobra has also undertaken some pioneering work to understand the correlation between pH and and REE occurrence and grade. Ultimately, cobra hopes that this will drive better recoveries, lower operating costs and a more environmentally friendly processing flowsheet.

- **Academic collaboration.** Cobra is ahead of the peer curve and has been collaborating with several academic and scientific partners to fully understand the nature of mineralisation at Wudinna. This has also included work to define areas of desorption potential through recognizing the controlling catalysts of mineralisation. For example, XRD analysis performed by CSIRO (Commonwealth Scientific and Industrial Research Organisation) to investigate REE adsorption to clays, and HyLogger Spectral analysis performed by GSSA (Geological Survey of South Australia) on chips of five Clarke RC holes demonstrated strong associations between elevated rare earths, kaolinite quantity, and reducing crystallinity.

- **In-situ opportunity?** Given the emerging widespread distribution of REE mineralisation at the project and the lack of radioactive impurities, there may be potential to look at an in-situ leach type of extraction for processing.

Figure 20 – Cobra's REE exploration timeline – fast track exploration success in just one year

In a mere 12 months, Cobra has rapidly progressed from the initial discovery of rare earth mineralisation to being on the cusp of reporting a maiden REE Mineral Resource Estimate



Source: Cobra Resources plc

Peer positioning & thoughts on valuation

Although the focus on rare earth element mineralisation is a relatively recent development for Cobra, the company already stacks up very well versus peer companies on several fronts, in our view. We believe that several key factors point to the potential to outline a large resource base to support a long-life REE mining operation. Clearly, there is much work to be done, not least, further exploration, resource evaluation work and technical studies but our view is that Cobra has a solid base to work from on the back of significant exploration successes in a short space of time. Delineating consistent thicknesses and grades and making early progress on metallurgy.

- **Early scale potential.** It is becoming evident from initial drilling and testwork that the average thickness of REE mineralisation intercepts is firmly within the range of more advanced peer projects, and in some cases considerably thicker. Naturally, this could have positive implications for any potential future development strategy, for a future mineral resource estimation, and for scalability. The limited drilling to date across various prospects at Wudinna is highly encouraging in this regard. E.g. At Clarke and Baggy Green – 88% of drill holes yielded mineralised intersections of >15m (at 602ppm TREO) and at Thompson 49 holes yielded an average intersection of 21.8m (at 725ppm TREO). We view this as an early win for Cobra, as in combination with a potentially low strip ratio, this ticks one of the prerequisite boxes in order to start building a potentially large resource inventory. Although further work is required in terms of defining continuity and grade, Cobra is in the fortunate position not to be dealing with narrow and sporadic intervals, and this gives the Wudinna project an immediate commercial angle, in our opinion.
- **Grades on par.** As exploration for REEs progresses at Wudinna, a picture of high-grade potential is starting to emerge. Although the total TREO grade of REE deposits needs to be treated with care (due to variations in mineral assemblage for example), it remains a good indicator of potential. Cobra has demonstrated a favourable balance of LREEs and HREEs, and a high proportion of MREEs (magnet rare earths) as a percentage of total TREO.

Cobra believes leaching via H_2SO_4 offers the most economic pathway – see page 31

- **Recovery shaping up.** The metallurgical recovery on Wudinna material is at present, slightly lower than most other peer projects in Australia. However, this is largely a function of the early stage of testwork, with only one round of metallurgical testwork undertaken. Acid leach recovery for Wudinna material has been reported up to 34%, but with additional process optimisation this could increase substantially. Cobra points to other peer projects having a similar recovery level prior to optimisation.

Cobra has an enhanced understanding of the factors that ultimate lead to REE recovery

- **Cobra's advanced understanding.** Despite being at an early stage in the testwork process, we believe that Cobra already has a superior understanding of mineralogy and the factors controlling distribution and grade and the chemistry that controls ionic adsorption potential. This understanding will be critical in designing an appropriate processing and recovery pathway.

Figure 21 - Rare Earth peers (exploration and development) – metrics are highly variable

Company	Ticker	Mkt Cap £m equiv	Project	Type	Location	Stage	Resource Mt	Grade* ppm TREO	Magnet (MREO) (Nd, Pr, Dy, Tb)	Contained TREO (t)	Met recovery** %
Clay deposits											
Cobra Resources	COBR.L	8.0	Wudinna	Clay	Aus (SA, VC)	Exploration	-	500-3,500	23-26%	-	34%
Heavy Rare Earths	HRE.AX	5.7	Cowalinya	Clay	Aus (WA)	Exploration	28	625	25%	17,500	-
OD6 Metals	OD6.AX	32.5	Splinter Rock/Grass P	Clay	Aus (WA)	Exploration	-	-	-	-	-
Itech Metals	ITM.AX	17.9	Eyre Peninsula	Clay	Aus (SA)	Exploration	-	812	25%	-	26-45%
Abx Group	ABX.AX	18.1	Deep Leeds	Clay	Tasmania	Exploration	-	1,000-4,000	22-34%	-	48-71%
Mount Ridley Mines	MRD.AX	18.3	Mt Ridley	Clay	Aus (WA)	Exploration	-	1,036	26%	-	76-80%
Australian Rare Earths	AR3.AX	25.7	Koppamurra	Clay	Aus (SA, VC)	Resource	81	785	24.50%	63,899	65%
Aclara	ARA.TO	27.0	Penco	Clay	Chile	PEA	45	2,426	22.4%	109,400	18.5%
Ionic Rare Earths	IXR.AX	82.4	Makuutu	Clay	Uganda	Scoping	532	640	43%	340,480	44%
Hardrock deposits											to conc
Mkango	MKA.L	29.6	Songwe/Pulawy	Carbonatite	Malawi/Poland	Feasibility	49	13,646	33.7%	662,805	74%
American Rare Earths	ARR.AX	48.5	La Paz	Alkali Granite-Gneiss	US (Az)	Resource	170	469	24.1%	79,730	68%
Rainbow Rare Earths	RBW.L	53.6	Phalaborwa	Carbonatite tailings	South Africa	PEA	31	4,300	30.4%	132,010	65%
Pensana	PRE.L	136.1	Longonjo/Saltend	Carbonatite	Angola/UK	Construction	313	14,300	22.8%	4,475,900	45%

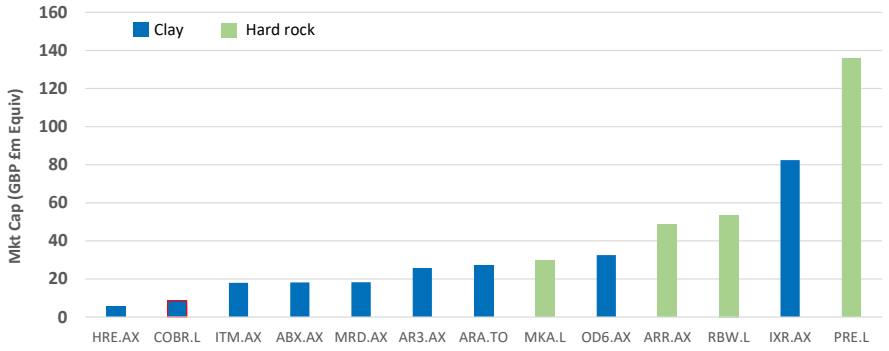
*Where no MRE exists, indicative grades from exploration results used

**Reported ranges from test work or economic studies

Source: Shard Capital, Cobra Resources, company reports & public disclosure, 21-11-2022

Market cap. Cobra currently has nearly the lowest market valuation within its REE peer group in terms of market capitalisation. Due to asset location, the majority of clay REE peers are listed on the ASX. Figure 22 below sets out the market cap spread (on a £ equivalent basis) but not enterprise value adjusted. The average market cap of this peer group is £41.2m.

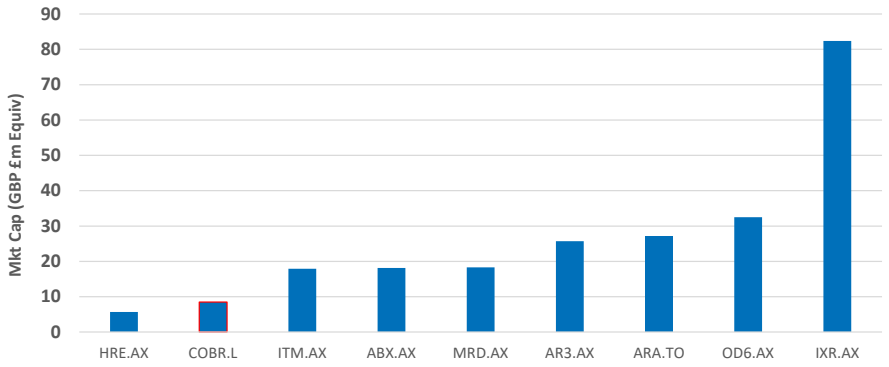
Figure 22 – Market cap (£m equivalent) – listed REE exploration and development peers



Source: Shard Capital, Alpha, data as of 21st November

On a junior clay REE only basis the average market cap is £28m, or £20.8m excluding Ionic Rare Earths (IXR.AX) which skews the data set with a market cap of £82m equivalent. As with all natural resource companies, the market tends to reward scale and stage of operations, and for exploration success. For example, OD6 Metals' share price has more than doubled from 23¢/sh on the 9th November to 54¢/sh currently on the back of promising drill assay results (press release 10-11-2022) from its Splinter Rock clay REE project in Australia.

Figure 23 – Market cap (£m equivalent) – listed REE peers, clay only



Source: Shard Capital, Alpha, data as of 21st November

We believe that Cobra has a good opportunity to grow into a leading rare earths company with demonstrated ionic potential, scalability and a Tier 1 jurisdiction.

Value considerations. Our view is that Cobra's current market capitalisation of £8.0m is at the lower range of what we would expect given the company's assets, progress to date and future potential. Direct comparisons between companies remain challenging due to asset mix, multiple assets, different jurisdictions, limited comparability and varying stages of exploration/development. As such we haven't published metrics such as EV/resource etc, which is in any case difficult due to lack of data, with most junior REE companies being pre-resource. Most of the companies in our peer table also have multiple projects which limits the resource valuation read-through. Prior to the first iteration of an economic study (Scoping, PEA etc) it is too early and there is insufficient data to produce a DCF model of Cobra's assets to derive valuation ranges. Nevertheless, the intercept widths and grades reported by Cobra at Wudinna to date are comparable to other rare earth projects in Australia held by listed companies with higher market valuations.

Gold and REE combination. Whilst Cobra is clearly accelerating its REE exploration strategy on the back of encouraging results, it's worth remembering that the company has a 211koz gold resource at Wudinna. We remain cautious on the use of EV/ounce metrics but even at a modest junior gold benchmark of US$15/oz (reference Cora Gold, albeit more advanced), this underpins around a quarter of the current market cap. Cobra is working towards the near-term goal of updating the current gold MRE and a defining a maiden rare earth MRE. Despite the relatively early stage of REE exploration, Cobra has already demonstrated that along with intercept widths and grades, that the REE mineralisation at Wudinna has have excellent potential to be scaled up. As such, with further exploration success and given where Cobra's current market cap sits versus peers, we see good potential for further value accretion.

The gold and REE combination could unlock development synergies and ease the financing pathway

Thus, Cobra is a hybrid company where the value proposition comes from the consideration of both gold and rare earths. Unlike other companies with disparate assets, that fact that Cobra's gold and REE assets are proximal/overlying means that development synergies can be unlocked. Although it is difficult to assign value to this aspect at this early stage of the exploration process, it adds another tangible element that could be critical in developing a possible commercial mining operation on the licence

Funded for ongoing exploration. Post-period end (June 2022), Cobra had £788k cash on the balance sheet. In October 2022, the company announced a £1.3m placing at 1.5p per share. As such, Cobra is currently well funded to continue pursuing its exploration strategy at Wudinna. The use of proceeds is outlined below:

- **Extensive Rare Earth Elements ("REE") Expansion Drilling:** Cobra's forward-looking approach to resource development is aimed at systematically advancing both REE and gold resource growth. The Company plans to execute an extensive 10,000m aircore programme aimed at doubling the footprint of known REE mineralisation at Clarke and Thompson, infill to improve resource confidence, and advance priority target areas such as Bradman, Lilliee and Anderson that have gold in calcrete signatures and are identified as being prospective for ionic clay hosted REE mineralisation.
- **RC Resource Definition Drilling:** 5,000m of follow-up drilling is planned, aimed at expanding gold and REE resources at Clarke with follow-up drilling targeting depth, and further along strike extensions to gold mineralisation. Additionally, near resource drilling will be completed at Barns to test north-western gold in calcrete anomalies. Cobra will also test supportive indications for additional gold mineralisation from aircore drilling and provide quantitative samples for further metallurgical rare earth recovery testing.
- **Mineral Speciation and Recovery Testwork**: the framework for a comprehensive multi-stage optimisation study is being developed to improve the extractability of high-value REEs at Thompson, Clarke, and Baggy Green prospects among others.
- **Re-negotiation of Native Title Agreement:** the current working native title agreement with the Barngarla People lies with Peninsula Resources Limited. A new agreement enabling the Company to continue exploration within Barngarla's traditional land is expected to be negotiated.
- **Pipeline Target Advancement:** advancing a number of gold, REE and IOCG targets through refined geophysics. Cobra has successfully implemented Loupe TEM to advance REE prospectivity, and a ground gravity survey of IOCG targets 4 and 5 is planned, as well as electromagnetics surveys to advance camp scale prospects east of the Clarke prospect. Funds will also be applied to advance the 100% owned Wudinna tenements to maiden drill testing.
- **Working cap.** The balance of the proceeds of the Placing will be used by the Company for general working capital purposes.

Upcoming catalysts

Remaining 2022 work programme

Cobra has a strong quarter of news flow ahead to close out 2022. Multiple exploration initiatives are underway which should yield a steady flow of drilling and geophysical results. The key catalysts in terms of potential to drive a share price re-rating will be the resource updates planned for December 2022 and January 2023. This will include an update to the current gold mineral resource estimate (January), enabling the Clarke prospect to be incorporated into the overall Wudinna gold MRE. Additionally, Cobra plans to announce a maiden rare earth MRE (December):

Upcoming catalysts and expected news flow:

November 2022

- Results of Accelerated Discovery Initiative ("ADI") co-funded Controlled Source Audio-frequency Magneto-tellurics ("CSAMT") EM survey.
- Initial Reverse Circulation ("RC") drilling results from 2,000m, 16-hole programme at Clarke for in-fill and to test for further REEs above gold strike intersections. Results will also contribute to the updated gold MRE planned for January 2023.
- Project JV 75% earn-in milestone – Cobra is set to achieve this milestone with Andromeda Metals with A$5m in exploration expenditure. Cobra seeking to simplify structure by switching Andromeda's interest from project to top company level.

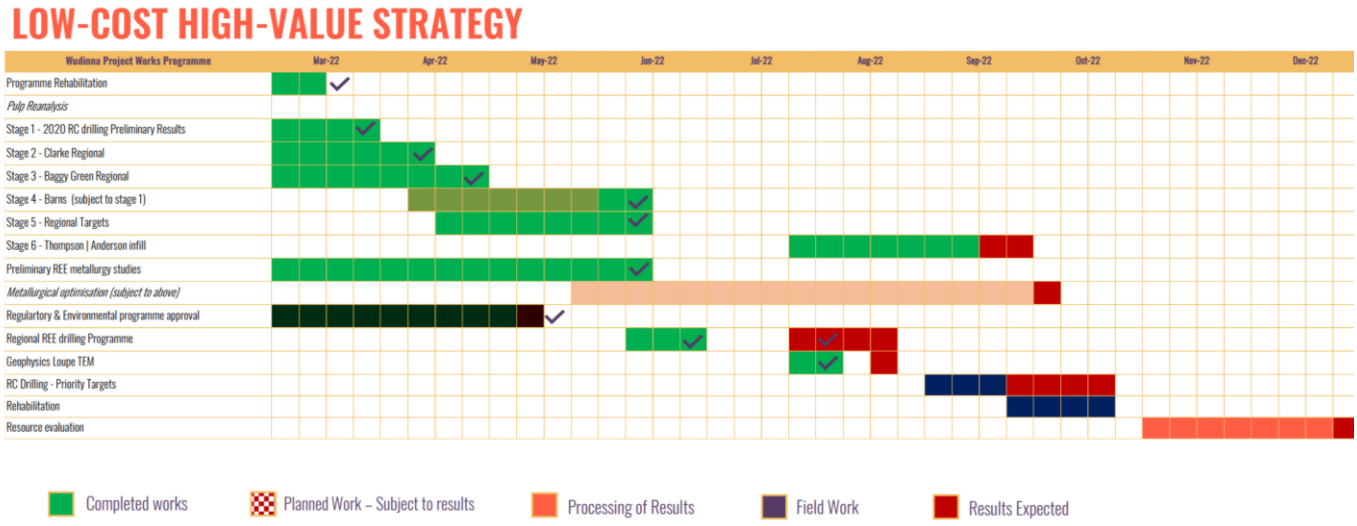
December 2022

- RC drilling results (final)
- **Maiden rare earth resource estimate**

January 2023

- **Updated gold mineral resource estimate**
- Follow up REE metallurgical testing results targeting variable saprolite conditions
- REE sizing beneficiation and metallurgical recovery results

Figure 24 - Cobra – exploration workflow and catalysts for the remainder of 2022



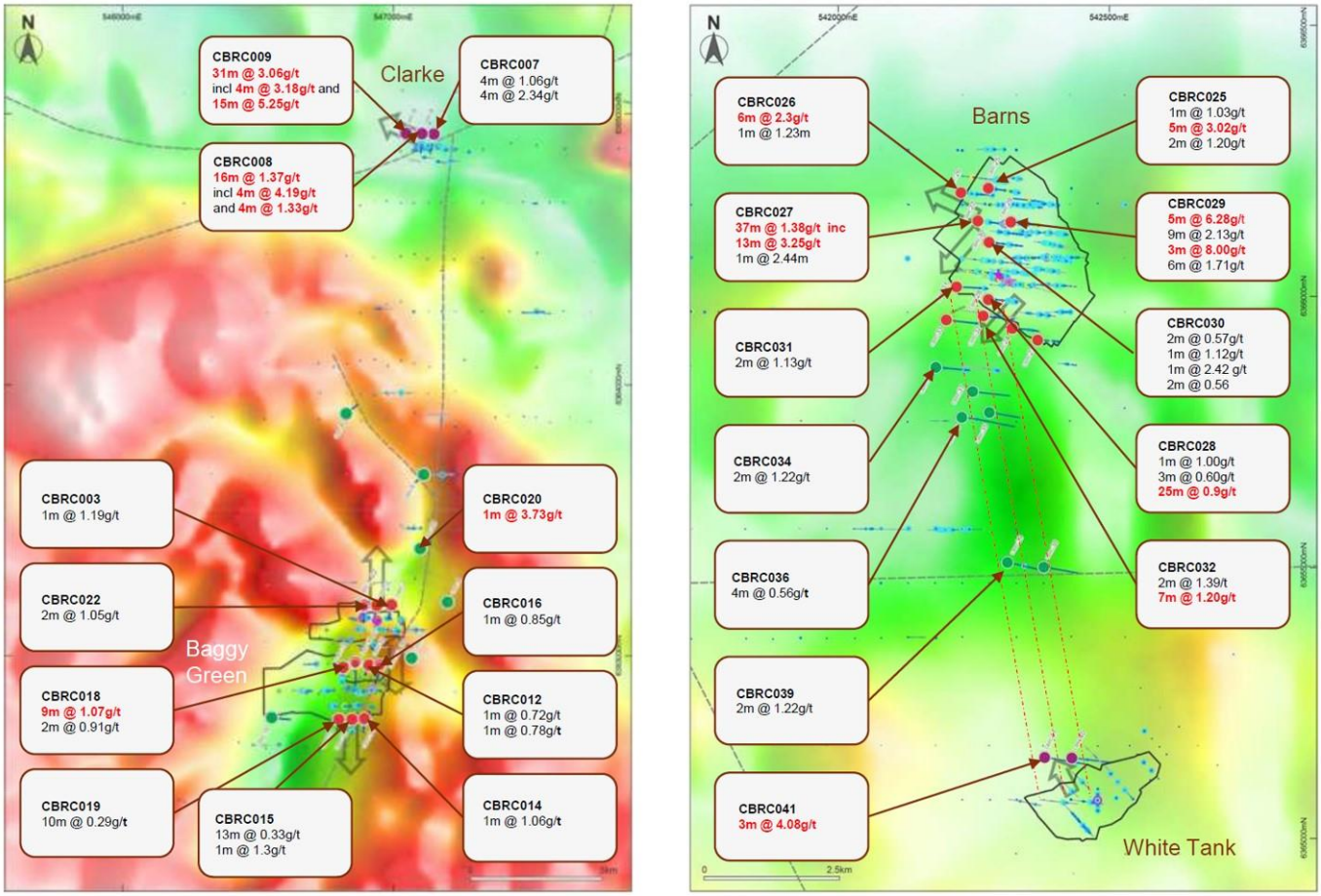
Source: Cobra Resources plc

Overview of exploration progress to date

2020 work programme

- **3 stage geochemical sampling programme** in H1 2020 with the aim of improving the definition of gold targets at Wudinna prior to drilling. The programme included 1. a calibration programme, 2. Brownfields / Extensions at Barns, Baggy Green and White Tank and 3. Greenfields, focusing on new regional targets including geochemistry and sampling of historical RC samples. The results of Stage 2 confirmed the presence of anomalous pathfinder elements indicating the potential for significant resource extensions, particularly at Baggy Green, along with demonstrating the relationship between structures, pathfinder elements and gold mineralisation.
- **2020 RC drilling.** 41 Reverse Circulation (RC) holes were drilled by Cobra for a total of 6,090 m between September and November 2020, with encouraging alteration observed indicative of gold mineralisation. The 2020 work programme successfully identified a strike extension of mineralisation at the Clarke prospect, with an intersection in Hole CBRC009 of 31m at 3.06 g/t of gold (including 15m at 5.2 g/t).

Figure 25 - 2020 Exploration results



Source: Cobra Resources plc

2021 work programme sees the discovery of REE mineralisation

- **Phase 1. Geochemistry drill programme** - 875 holes for 7,335m drilled across 8 priority targets. At Clarke, the results defined elevated gold (up to 0.76 g/t) indicating a large 1.1km zone of mineralisation, a significant increase to the target zone. This zone at Clarke sits outside of the current MRE. The work also indicated anomalous gold in saprolite (up to 1.04g/t Au) at Benaud as well as anomalous gold and silver at Barns and Baggy Green respectively. This phase of exploration resulted in Cobra moving to 65% ownership of the project, from 50% previously.
- **Gravity survey over 3 IOCG targets** at Wudinna completed in December 2021 confirmed gravity anomalies and defined priority targets for drilling. Gravity contrasts supportive of IOCG hematite alteration were defined.
- **Phase 2. 14-hole RC programme at the Clarke prospect.** Drilling completed in December 2021 intersected a broad zone of gold mineralisation, increasing the strike of gold mineralisation from 200m to over 400m at Clarke. Importantly, this drilling programme Discovered clay hosted rare earths within the weathered saprolite above and in close proximity to gold mineralisation.
  - **Gold results –** best intersections included:

33m at 1.03 g/t Au - including 9m at 2.09 g/t Au

96m at 0.55 g/t Au - including 20m at 1.5 g/t Au

19m at 0.79 g/t Au - including 5m at 2.62 g/t Au

  - **REE results –** best intersections included:

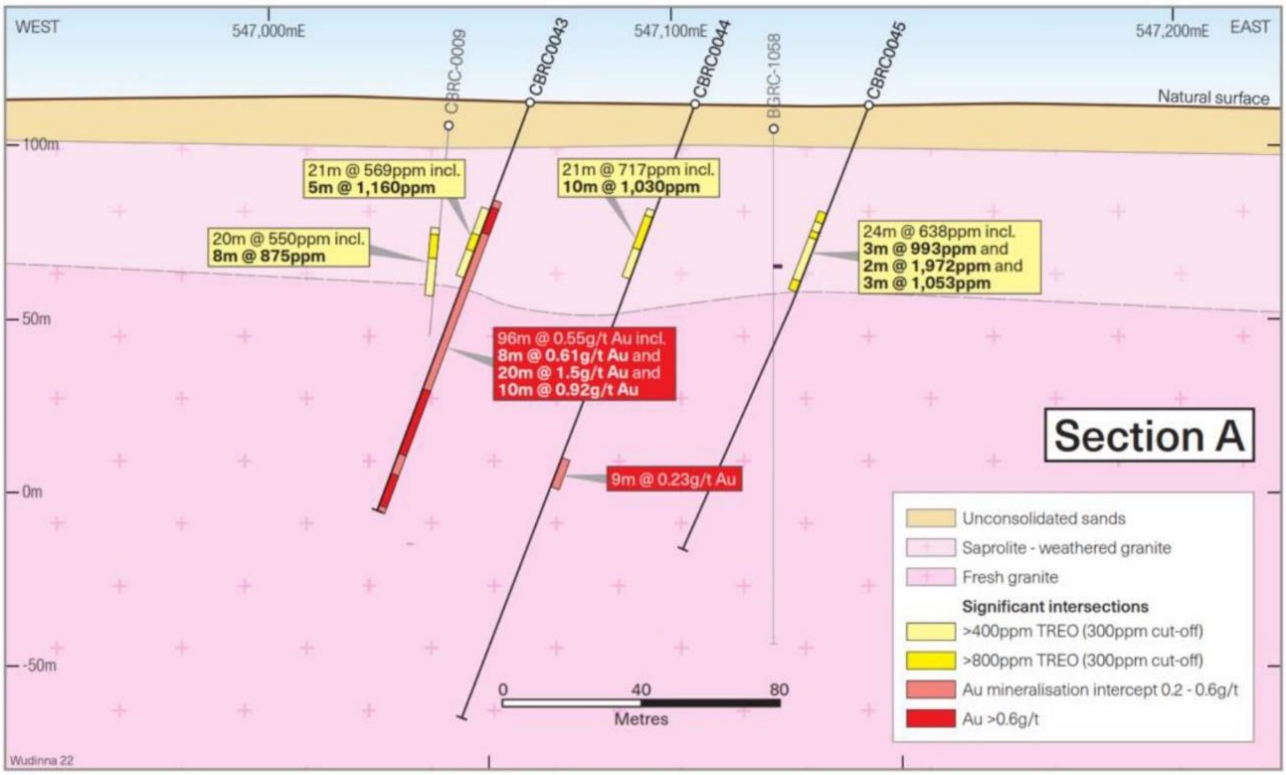
9.4m at 1,030 ppm TREO

4.7m at 1,160 ppm TREO

6m at 1,446ppm TREO

All holes intercepted REE mineralisation, with an average true width of mineralisation of 18.7m and an average Total Rare Earth Oxides ("TREO") grade of 597 ppm. The highest 1m intercept was 9,024ppm TREO

Figure 26 - Section showing key gold and REE intercepts from the 14-hole RC programme at Clarke



Source: Cobra Resources plc

2022 programme. Strategy: REE growth and MRE update

75% earn-in to be achieved

Cobra's fully funded 2022 work programme (£0.95m placing 15-2-2022) focused on rapidly expanding the REE discovery and updating the 211koz gold mineral resource estimate. Cobra expects that the expenditure incurred for the 2022 programme will be sufficient to see the company achieve its 75% earn-in to the Wudinna Project milestone in Q4 2022.

One of the primary aims of the 2022 programme (Fig 27) was to accelerate exploration to test the extent of REE mineralisation proximal to existing gold occurrences. Prior to the commencement of the 2022 programme Cobra had already defined potential ionic clay rare earth mineralisation over a 0.5 km^2 area at the Clarke prospect. In additional to further drilling, an important part of this strategic aim is the thorough re-analysis of samples from previous drilling which were not comprehensively tested for REE potential. This is a cost-effective step to rapidly expand the database and potentially expand the footprint of REE mineralisation.

Figure 27 - 2022 Exploration work programme at Wudinna

Stage 1: Re-analysis of Cobra 2020 drilling

Metallurgical testing is underway to test recovery through standard desorption leach methods

14 holes from Baggy Green (550 samples)

Two holes from Barns (67 samples)

One hole from White Tank (39 samples)

All samples from 1m downhole samples

Validation of REE potential at existing defined gold resources

Results to demonstrate true REE grade potential

Stage 2: Re-analysis of historic drilling at Clarke

200m x 200m definition

Variable downhole composite lengths (2-6m) limits resolution of true grades but provides an indication of spatial continuity

38 holes (272 samples)

Stage 2 increases tested area from 0.5 km^2 to 1.8 km^2

Stage 3: Re-analysis of historic drilling at Baggy Green

200 x 200m definition

Variable downhole composite lengths (2-6m) limits resolution true of grades but provides an indication of spatial continuity

66 holes (551 Samples)

Tests 2.6 km^2

Stage 4: Re-analysis of drilling at Barns and White Tank (subject to Stage 1 results)

50 - 70 holes (600 - 800 samples)

Stage 5: Test regional targets

Re-analysis of pervious drilling - approximately 100 holes (1,200 - 1,400 samples)

Field Work Phase 1:

Rotary Air Blast ("RAB") saprolite drilling programme to test for REEs across regional targets and testing the northern continuity of Clarke mineralisation

Pathfinder and multi-element analysis of basement with the aim of de-risking follow-up Reverse Circulation ("RC") drilling

Field Work Phase 2:

RC drilling of gold and IOCG priority targets in Q3 2022, including:

Testing the northern continuity of mineralisation at Clarke beyond drillhole CBRC0050 (33m at 1.03 g/t gold)

Drilling resource extensions at Barns, including infill drilling of high-grade zones to improve resource confidence

Testing anomalous pathfinder results at Benaud

Maiden drill testing of IOCG targets 1-3

Source: Cobra Resources plc

2022 programme: Scale of REE being revealed

Footprint expanded

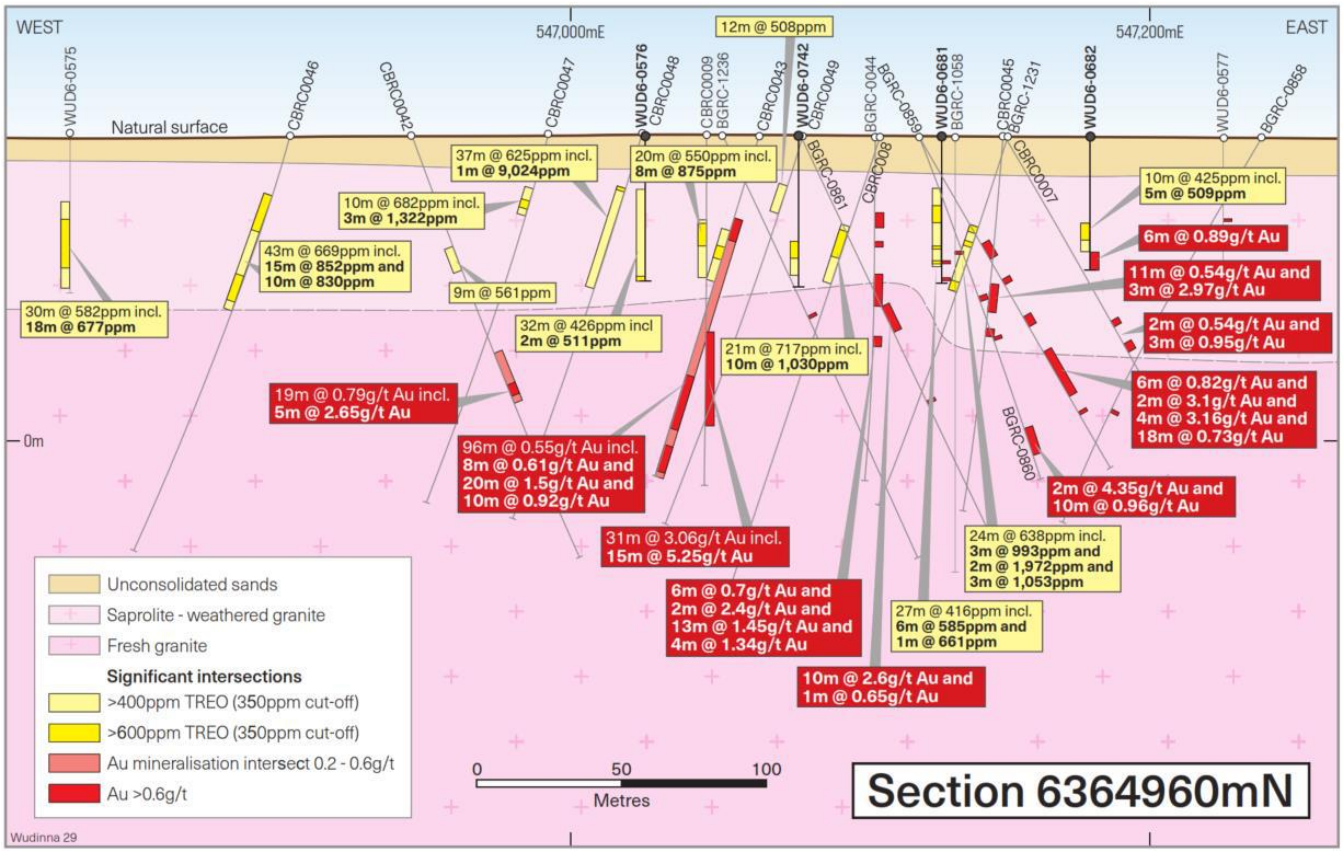
High quantity of high-value magnet rare earths

At a 350 ppm TREO cut-off grade, 89% (85/96 holes) produced significant intersections where the average grade is 530 ppm TREO over an average true width of intersection of 15.4m

- **Re-analysis of 15 RC holes.** Results from the re-analysis of 15 RC holes drilled at Baggy Green, Barns, and White Tank in 2020 validated the potential for a rapid expansion in the defined footprint of REE mineralisation which was intersected in all drillholes. The results confirmed the potential for desirable clay hosted, Ion Adsorption ("IAC") mineralisation within the saprolite horizon above and proximal to existing gold resources. Furthermore, the quantity of high-value magnet rare earths is consistent with results from the previously reported Clarke discovery, with the combined average neodymium/praseodymium quantity being 20.2% of the TREO, and dysprosium equating to 1.8% of the TREO.
- **Re-analysis of a further 96 RC holes** from historical drilling across the Baggy Green and Clarke prospects intersected a broad region of REE mineralisation connecting the Baggy Green and Clarke prospects and extending the defined REE mineralisation footprint at Wudinna to approximately 4 km2, with mineralisation open in multiple directions. Data from this re-analysis suggests that there is a strong correlation between high-grade Rare Earth Oxide ("REO") intersections and their proximity to structures hosting gold mineralisation with the highest-grade intersections occur proximal to gold mineralisation at Clarke, demonstrating significant potential to define higher grade zones coincident with the priority along-strike gold target.

The quantity of magnet rare earths remained consistent with that previously reported with the average combined neodymium/praseodymium quantity being 20% and dysprosium equating to 1.8% of the TREO.

Figure 28 - Section across the Clarke prospect, Re-analysed REE results plotted with 2021 RC drilling results



Source: Cobra Resources plc

- **91-hole aircore programme.** Results from the 4,000m programme were reported in August; 16-8-2022 (29 holes), 31-8-2022 (23 holes) and September; 12-9-2022 (32 holes). The aircore programme was designed to de-risk the upcoming RC programme being planned enable intersected gold mineralisation at Clarke to be incorporated into an updated MRE, and to in-fill and extend REE mineralisation.
- **Aircore drilling yields exceptional gold and REE results.** The first set of results from 29 holes and 23 holes at the Clarke prospect confirmed the along-strike continuity of gold and rare earth mineralisation and confirmed the presence of exceptional high-grade clay hosted rare earths **above and proximal to gold mineralisation**.

Gold mineralisation zone at Clarke now >500m

Cobra has been successful in securing A$73,250 of funding from the South Australian State Government, to advance exploration and subsequent resource definition at the Clarke prospect under the ADI programme

  - **Gold results** - notable results include hole CBAC0014 that intersected 12m at 1.25 g/t Au from 18m and includes 6m at 2.29 g/t Au. the shallowest defined gold mineralisation encountered at the project to date. Additionally, highly anomalous gold in saprolite was recorded in broad zones north of previously intersected gold mineralisation (in 16 holes). The results support the thesis of further gold mineralisation both down-dip and along strike at Clarke.

  - **REE results - 1st batch.** 26 out of 29 holes yielded intersections with a length weighted average intersection of 13.3m at 934 ppm TREO and an average Magnet Rare Earth[5] ("MREO") equating to 24% of the TREO. Notable intersections:

14m at 3,703 ppm TREO from 18m, including 6m at 6,648 ppm TREO from 22m

10m at 2,220 ppm TREO from 42m, including 2m at 8,163 ppm TREO from 48m

  - **REE results - 2nd batch.** 30 out of 34 holes yielded a length weighted average intersection, where a length weighted average intersection of 14.4m at 865 ppm TREO, where the MREO equates to 24.3% of the TREO. Notable intersections:

18m at 814 ppm TREO from 14m, including 2m at 1,226 ppm TREO from 28m

23m at 911 ppm TREO from 18m, including 9m at 1,391 ppm TREO from 32m

8m at 1,421 ppm TREO from 24m, including 2m at 3,880 ppm TREO from 24m

  - **REE results – 3rd batch.** The final tranche of 32 holes at the Thompson, Anderson and Bradman prospects delivered further extensive clay hosted REE mineralisation defined across six further target areas, with high-grade mineralisation supporting a scalable footprint. Notable intersections:

28m at 557 ppm TREO from 22m

10m at 869 ppm TREO from 32m, including 4m at 1,662 ppm TREO from 32m

18m at 701 ppm TREO from 12m, including 4m at 1,047 ppm TREO from 16m

32m at 920 ppm TREO from 24m, including 4m at 2,174 ppm TREO from 24m

8m at 2,535 ppm TREO from 18m

- **Re-analysis of historical holes increases REE footprint from 4km² to 22.5km².** Cobra reported (26-9-2022) the final tranche of lanthanide re-analyses of historical drillholes from the Thompson and Anderson prospects, where high-grade, clay-hosted REEs have previously been identified. The results of this re-analysis support a substantial increase in the footprint of identified REE mineralisation at Wudinna, with Thompson adding an 18.5km² footprint defined by 49 holes. This brings the combined footprint at Clarke, Baggy Green and Thompson of over 22.5 km2, where rare earth mineralisation intersections lengths average over 15m. Key intersections overleaf:

[5] Nd, Pr, Dy, Tb

Exceptional high-grade REE intersections were defined within saprolite clays at several regional targets that are headlined by:

SCH-0922 intersects 31m at 1,427 ppm TREO from 12m including 12m at 3,168 ppm TREO with 28.4% combined neodymium/praseodymium (Nd/Pr) and 1.7% dysprosium (Dy)

WUD1-0231 intersects 18m at 2,024 ppm TREO from 24m with 23.7% combined Nd/Pr and 2.8% Dy

KY1-0399 intersects 37m at 1,304 ppm TREO from 18m with 22% Nd/Pr and 1.5% Dy

These results contain some of the highest grade REE intersections reported from the project to date with high quantities of high-value magnet rare earths including neodymium, praseodymium and dysprosium. *See RNS 20th June 2022.*

Summary of 2022 programme. The results from the aircore programme indicate the clear potential to expand the current gold resource base with a number of high-grade and decent width intercepts outside of the current resource areas. The drilling also proved that REE mineralisation is regionally extensive with 73 of the 91 holes (80%) drilled returning intersections above a 350 ppm TREO cut-off grade, whilst 61 holes return intersection grades greater than 500 ppm TREO. The REE grades and widths returned from the programme indicate the potential for a highly scalable magnet rare earths province.

Key takeaways from 2022 programme:

- Clear scope to extend and expand on the current JORC 211koz gold resource with multiple high-grade intercepts outside of the current resource envelope.
- The extent of gold mineralisation remains untested at depth and along strike
- REE mineralisation has been found to be regionally extensive with significant intersections at multiple prospects. REE footprint now 22km^2.
- REE mineralisation is typically shallow, and assay results indicate a mineral assemblage with good levels of high-value REES, including MREEs.
- Preliminary metallurgical and mineralogical testing supportive of Ion Adsorption Clay hosted mineralisation[6].
- An IOCG discovery could still be on the cards given the prospective geology and recent promising geophysics results.

Promising results from first metallurgical REE test work

Preliminary metallurgical test work (reported 20-6-2022) on samples from two drillholes at Clarke confirmed the presence of leachable REE mineralisation, with **leach recoveries of up to 34.1%** TREE (+Y) using acidic water as a lixiviant (H_2SO_4).

The work was completed by the Australian Nuclear Science and Technology Organisation ("ANSTO") and Cobra reports that the results are comparable to the preliminary results presented for other South Australian clay hosted rare earth projects.

The testwork confirmed the presence of ion phase REE mineralisation and more abundant colloidal REE mineralisation. This means that the REE mineralisation is more likely to be amenable to low-cost processing techniques. Acid consumption was low to moderate for all samples tested. Ionic phase mineralisation is controlled by a number of environmental factors including pH, varying ground water conditions and the presence of sulphides in bedrock. Cobra now intends to conduct follow-up validation metallurgical optimisation test work and to evaluate recovery potential over broader areas of mineralisation.

[6] For context on the REE results, see the section “Rare Earth Potential”.

Underexplored region in the IOCG heartland

Cobra's Wudinna tenements are also highly prospective for IOCG type deposits; iron oxide copper gold, being located in the Gawler Craton. The Craton is home to the Olympic Dam IOCG province, host to some of the largest IOCG deposits in the world, including namesake Olympic Dam, Prominent Hill and Challenger. Cobra's Wudinna project lies in a relatively unexplored region, just to the south of this IOCG province.

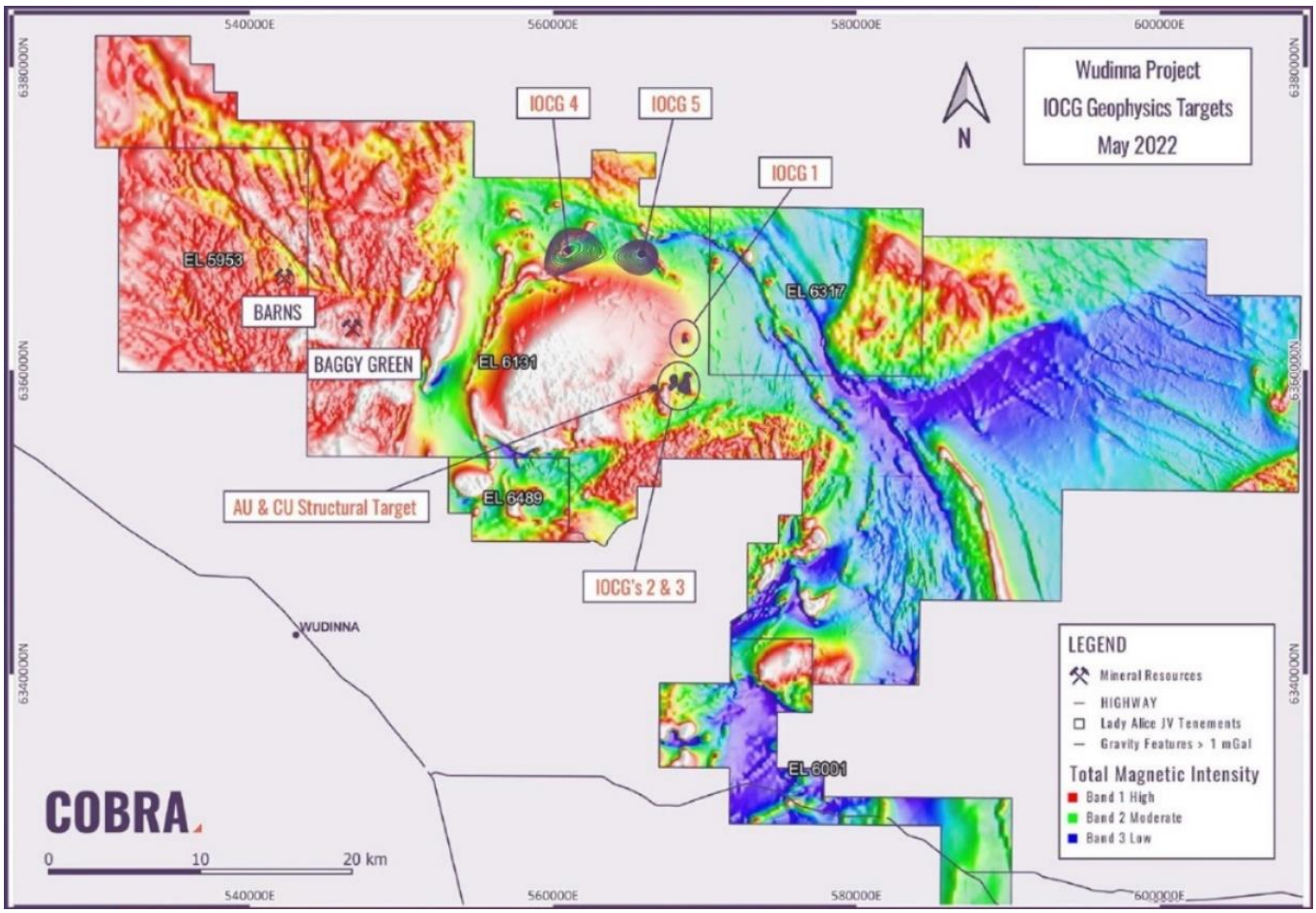
An Olympic Dam type deposit is a prize worth exploring for. The current MRE for Olympic dam is 10,070Mt at 0.62% Cu for the open pit sulphides (62Mt of contained copper!) and 1,041Mt at 1.68% Cu for the underground sulphide deposit.

Note that REE mineralisation has also been identified from 9 holes drilled across IOCG targets

The potential for IOCG mineralisation at Wudinna is supported by several shallow geophysical anomalies and geochemistry. In the Gawler Craton, economic IOCG deposits are predominantly hematite hosted and associated with gravity and magnetic anomalies which are non-coincident. However, other IOCG deposits, such as Ernest Henry - Cloncurry, Queensland, show more coincident gravity and magnetic responses and magnetite is more common in the host sequence. Therefore, all of the Company's IOCG targets surveyed to date have geophysical responses that may reflect varying styles of IOCG mineralisation.

Cobra has 5 primary IOCG targets and one Au-Cu structural target which are being refined through further geochemistry and geophysics before drilling is undertaken. A detailed ground gravity survey was completed across 3 targets in 2021 and geochemistry indicated highly anomalous copper (100-200ppm) and elevated pathfinders, confirming the prospectivity of IOCG targets 1-3. Recent geophysics work indicates that the targets potentially sit at relatively shallow depths.

Figure 29 - IOCG targets at Wudinna



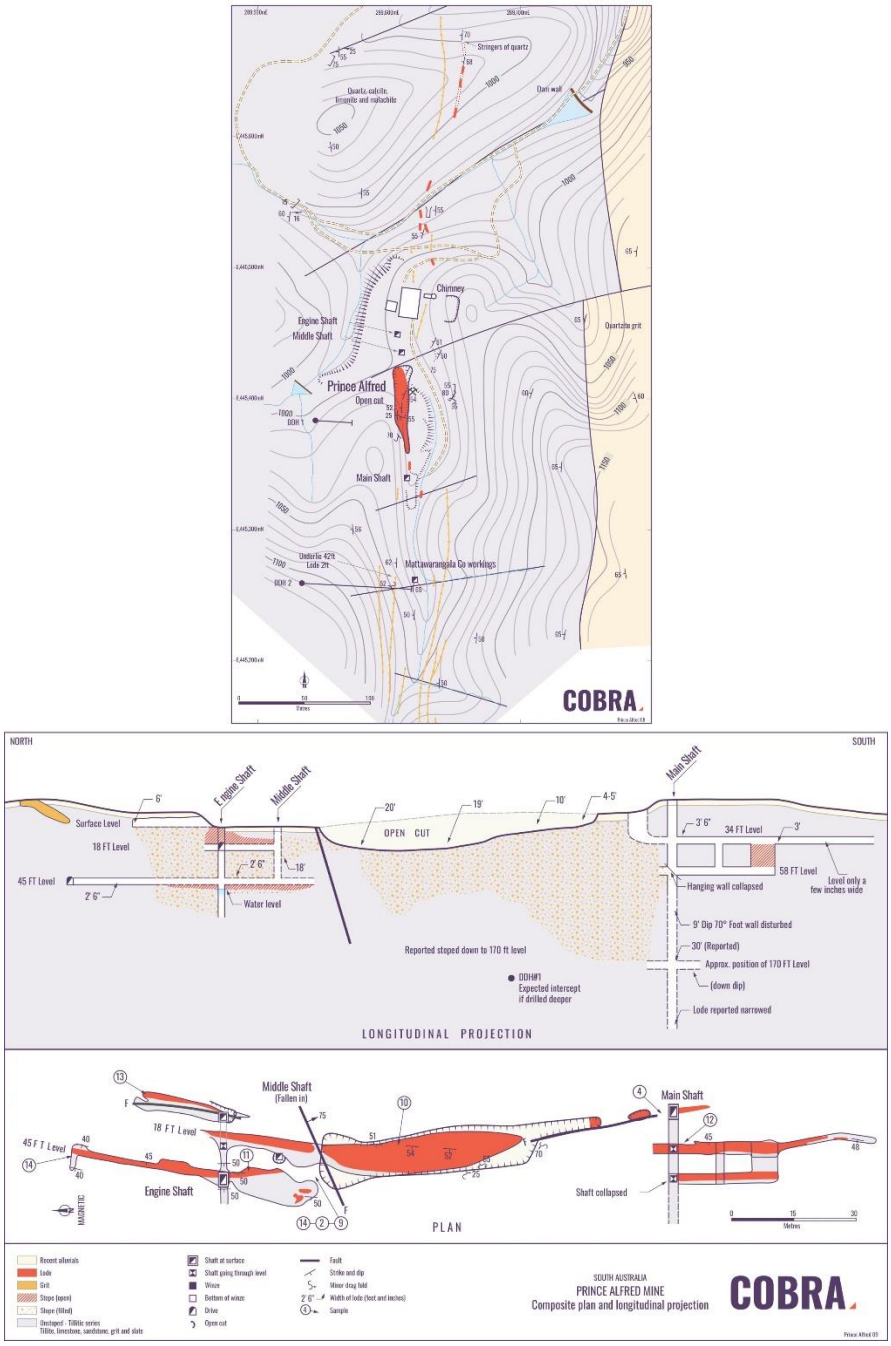
Source: Cobra Resources plc

Portfolio projects:

Prince Alfred copper

Cobra also has a 100% interest in the Prince Alfred copper project located within the Adelaide Fold Belt. The tenement covers the formerly producing Prince Alfred copper mine which operated in the early 1900s. Despite historical mineralisation reported in the 3-5% Cu range, the area has seen little in the way of focused exploration over the last century. Any future exploration by Cobra here would be targeted to test the depth continuity of existing copper mineralisation, but we understand that the company's current focus is on gold and REEs at the flagship Wudinna project.

Figure 30 - Prince Alfred location map and cross section of historical workings



Source: Cobra Resources plc

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