



ALIGN
RESEARCH

Altona Rare Earths

7th February 2023

Creation of a multi-asset Rare Earth Element vehicle in Africa with a number of projects that can be put into production rapidly or sold

Altona Rare Earths is the old Altona Energy which joined AIM in 2005. Its large, troublesome coal project in Australia never really got off the ground and with delisting looming, Altona moved onto the Acquis Exchange. Christian Taylor-Wilkinson took over the reins in March 2020 with a new management team that disposed of the coal interests and sought a long-term sustainable mining solution which could be in production within 3 years. They smartly chose Rare Earth projects, guided by consultant geo Cédric Simonet (now COO) who has a superlative knowledge of African resources projects.

Energy and renewables expected to drive the Rare Earth market

It is hard to think of a better mining market to be in at the moment. China maintains a stranglehold on the mining/processing of REE market, so end-user manufacturers are searching for alternative supplies, spurred on by western governments which seek to secure supplies of such critical materials.

Cracking REE project No 1 should attract a lot of attention on LSE listing

Altona is rapidly moving its Monte Muamba REE project up the valuation curve. Already, a 57Mt @ 1.65% TREO JORC Exploration Target has been established close to the surface with more to come. A maiden JORC Resource and Scoping Study are set to be released in Q1 and Q2 2023 respectively and should start to suggest the potential size of the prize.

Rapidly evaluating a hit list of Ionic Clay opportunities in Africa

So far only a handful of the other types of REE projects have been discovered in Africa like the hot Ionic Clay Adsorption REE and residual monazite projects. COO Cédric Simonet has a hit list of other such opportunities. Some might be small, but they could still be swiftly put into production, generating potentially US\$25million annually over a mine life of well over 5 years, or sold.

Peer group analysis suggest 300% potential upside

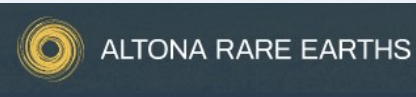
Our highly conservative valuation leads us to initiate coverage of Altona Rare Earths with a **target price of 33.7p** and **Speculative buy** stance.

Table: Financial overview. Source: Company accounts & Align Research

Year to end June	2021A	2022A	2023E	2024E
Revenue (£'000)	-	-	-	-
PTP (£'000)	(733)	(810)	(2,050)	(4,000)
EPS (p)	(7.73)	(2.72)	(4.91)	(4.76)

This investment may not be suitable for your personal circumstances. If you are in any doubt as to its suitability you should seek professional advice. This note does not constitute advice and your capital is at risk. This is a marketing communication and cannot be considered independent research.

SPECULATIVE BUY
Target price 33.7p



Key data

EPIC	REE
Share price	5.625p
52 week high/low	12.75p/5.625p
Listing	AQSE
Shares in issue	37.48m
Market Cap	£2.1m
Sector	Mining

12 month share price chart



Analyst details

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IMPORTANT: Altona Rare Earths is a research client of Align Research. Align Research own shares in Altona Rare Earths. For full disclaimer & risk warning information please refer to the last page of this document.

Business overview

Altona Rare Earths' Operations

Altona Rare Earths PLC is a UK listed mining exploration company focused on the development of Rare Earth Element (REE) mining projects in East and Central Africa. The company's move to the LSE Standard market ought to attract a lot more attention to the company and its projects and also allow the Board to accelerate current and new projects. Altona's strategy is to acquire controlling interests in multiple mining assets, some of which have already seen many years of exploration work in order to reduce risk, while at the same time providing a higher chance of success.

- **Monte Muambe (Mozambique)** – Altona has, currently, a 20% interest in the Monte Muambe Project in Mozambique. This is a world-class REE project in a mature and safe mining region. The project is located in Tete Province in Northwestern Mozambique under Prospecting Licence 7573L. Altona can gain a 70% stake by taking the project through feasibility studies. Phase 1 (2021) drilling confirmed two known REE targets and identified a further two new REE targets. Phase 2 is ongoing and so far has led to the discovery of four additional targets through soil sampling (REE and Niobium). **Initial drilling results have been outstanding with up to 7.24% TREO for individual intercepts.** A JORC Exploration Target estimate was announced in July 2022 of up to 56.6Mt at 1.65% TREO including a high-grade zone of 11.5Mt at 2.41% TREO. Phase 2 is expected to be completed in Q1 2023 with the delivery of a maiden Mineral Resource Estimate (MRE) for REE and Niobium, a Preliminary Metallurgical Study and a Preliminary Economic Assessment and Valuation.

- **M&A** - Further opportunities are under review where the focus is on a short timeframe to production. The management team is undertaking a thorough analysis of a series of overlooked projects with commercial grade REE.



Resource drilling at Monte Muambe. Source: Company

Rare Earth Elements

Rare earth elements (REEs) are a set of 17 chemical elements in the periodic table which consist of the 15 lanthanides along with two others: scandium and yttrium. Scandium and yttrium are deemed to be REEs as they occur in the same ore deposits where lanthanides are found and share similar chemical properties. Despite their name, REEs are not actually that rare, however economically exploitable ore deposits are few and far between.

Rare Earth Elements		
Scandium or Sc (21)	Promethium or Pm (61)	Holmium or Ho (67)
Yttrium or Y (39)	Samarium or Sm (62)	Erbium or Er (68)
Lanthanum or La (57)	Europium or Eu (63)	Thulium or Tm (69)
Cerium or Ce (58)	Gadolinium or Gd (64)	Ytterbium or Yb (70)
Praseodymium or Pr (59)	Terbium or Tb (65)	Lutetium or Lu (71)
Neodymium or Nd (60)	Dysprosium or Dy (66)	

The 17 chemical elements listed in order of their atomic number that are defined as rare earth elements. Source: Rare Earth Technology Alliance

REEs have been found to be vital for many modern technologies such as consumer electronics, computers, communications and advanced transportation.

Application	Rare Earths	Demand Drivers
Magnets	Nd, Pr, Sm, Tb, Dy	Automotive, wind turbines, drivers for computers, mobile phones, MP3 players, cameras, voice coil motors (in loudspeakers), hybrid and electric vehicles, cordless power tools, sensors and medical imaging (MRIs).
LaNiH batteries	La, Ce, Pr, Nd	Hybrid vehicle batteries and hydrogen absorption alloys for re-chargeable batteries.
Phosphors	Eu, Y, Tb, La, Dy, Ce, Pr, Gd	LCDs, PDPs, LEDs and energy efficient fluorescent lights/lamps.
Fluid cracking catalysts	La, Ce, Pr, Nd	Petroleum production – greater consumption by heavy oils and tar sands.
Polishing powders	Ce, La, Nd	Mechano-chemical polishing powders for TVs, monitors, tablets, mirrors and (in nano-particulate form) silicon chips.
Auto catalysts	Ce, La, Nd	Tighter NO ₂ and SO ₂ standards – platinum is re-cycled but the recycling REE is not economic.
Glass additive	Ce, La, Nd, Er	Cerium cuts down transmission of UV light, whilst La increases glass refractive index for digital camera lens.
Fibre optics	Er, Y, Tb, Eu	Signal amplification.

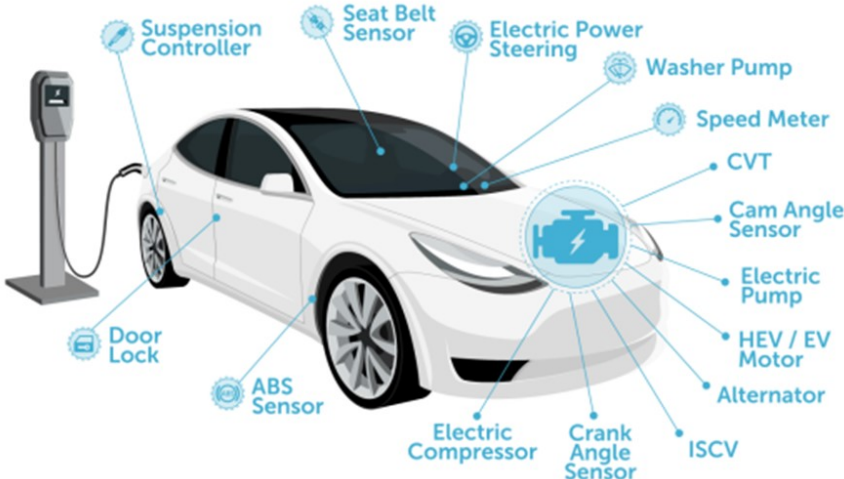
Uses of rare earth elements. Source: Rainbow Rare Earths

Rare Earths are essential in building a clean energy future and can be seen to be a vital cog in the Green Energy Revolution. The most important use of REEs is currently in the manufacture of permanent magnets which use neodymium (Nd) and praseodymium (Pr). These two REEs are attracting most of the attention at the moment as although NdPr makes up just 20% of the REE market in volume terms, they account for 80% in terms of value. Due to this important function, Nd and Pr represent the most significant elements in the lanthanide group.

Supply and demand

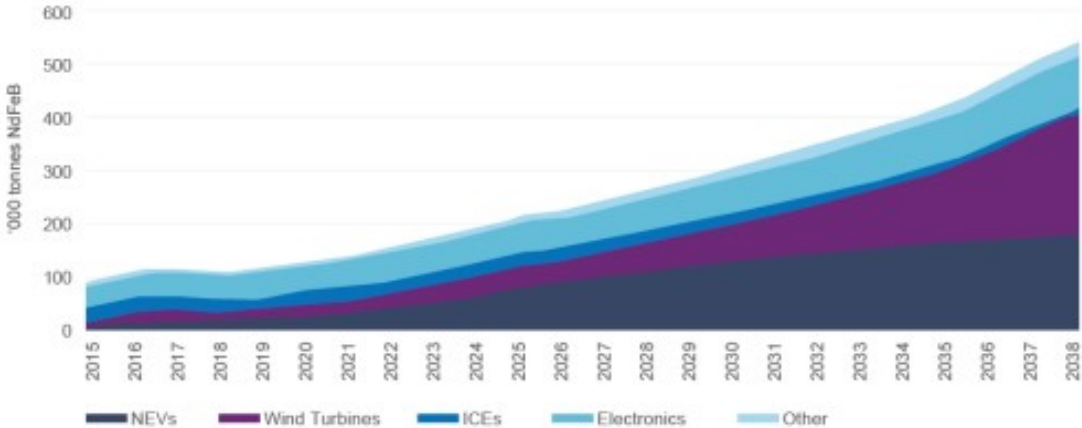
There is now little doubt that the green energy transformation of the global economy relies on a secure and long-term supply of REEs. **Altona’s Monte Muambe Project is highly important as it represents one of a limited number of potentially world class rare earth projects outside of China.**

Metals research firm Roskill believes China was responsible for 85% of global refined production in 2021, followed by the remainder of Asia at 13% and Europe at 2%. China continues to be the global leader in the production of both mined rare earth products and refined rare earth compounds. But over recent years the country has been cracking down on illegal mining operations, which were thought to responsible for a third of global supply.



NdFeB magnet components in hybrid and battery EVs. Source: Arafura Resources

The fastest growing market for NdPr is in NdFeB Magnets. The effectiveness of these magnets is down to the use of NdPr which has allowed the creation of the strongest commercially available magnets today. NdFeB Magnets have allowed a host of everyday items to become smaller, lighter, mobile, more efficient and a lot more affordable. That is because NdFeB, an alloy of neodymium, iron and boron, offers the best power to cost ratio. The end result is that powerful motors and generators have been created with reduced size and weight - critical in a number of rapidly growing markets, notably electric vehicles (EV), smart phones and wind turbines. CRU International has forecast that demand for NdFeB magnets for all applications (new EVs, wind turbines, internal combustion engines, electronics and other) will increase by 3.9 times over the 2021 to 2038 period, which equates to a CAGR of 8.3%.

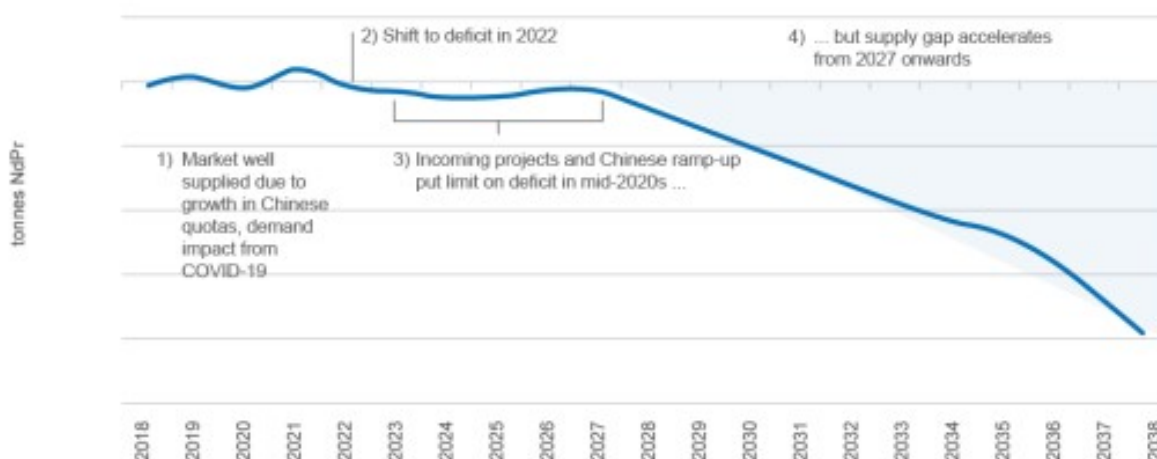


NdFeB magnet demand by applications. Source: Rare Earths Market Outlook CRU International August 2021 via Hastings Technology Metals

There is little doubt that EVs are seen as being the main catalysts for NdPr growth in demand and there is a whole host of forecasts coming out from researchers to back this up. Accelerating EV demand comes on the back of green legislation being adopted in many countries, including the UK, India, Germany, France, Norway and China, which is expected to lead to an increasing NdPr supply-demand deficit. Argus Media Group sees the projected growth in EV sales resulting in an increased demand for NdPr of 25-90% by 2030. Each new EV requires between 1-2kg of NdPr, with Curtin University reckoning that the average annual NdPr demand from EVs is forecast to increase by something like 4,200tpa to 9,600tpa from 2020-25. Adamus Intelligence sees the value of global magnet rare earth oxide consumption increasing from US\$2.98bn to US\$15.65bn by 2030.

Wind turbines are also driving the NdPr demand for permanent magnet electricity generators. Figures from Curtin University suggest that wind turbines need something like 600 – 830kg of rare earth oxides per megawatt. Argus Media estimates that the offshore wind turbine market will grow at approximately 25% per annum in the 2020-30 period with an additional 235GW of capacity installed. Looking further ahead, by 2050 total wind capacity is estimated to grow to more than 1.9TW under NDRC-Energy Research Institute ‘Aggressive Scenario’.

In their 2021 REE forecasts, CRU International saw an imbalance in the NdPr market, with a sizeable supply gap emerging towards the end of the current decade due to the slow speed of investment into new mine production. CRU is not alone in forecasting that demand for rare earth permanent magnets will exhibit strong growth over the coming years. This is expected to further distort the rare earth demand ratios, with Nd, Pr and Dy forming a greater proportion of demand. The feeling seems to be that La and Ce will continue to form the majority of rare earths demand by volume for their use in the catalysts industry.



NdPr market imbalance. Source: CRU International January 2021 via Hastings Technology Metals

China continues to dominate supply and a large part of demand. However, global demand is also rising, with buyers increasingly seeking to develop supplies of rare earths from outside of China by sourcing REEs from places including Australia, Russia, Greenland, California and Africa. Electronics manufacturers, led by the German giant Siemens, seem to have moved to source supplies from outside of China. This is a trend that only really seemed to build up speed after the Chinese cut off supplies to Japan in 2010 over a long-standing territorial dispute. In recent years, concerns about constrained REE supplies and the vulnerability of China’s monopoly over these vital elements have been mushrooming. This has led to key initiatives by the Biden administration and the EU to support alternative supplies of these critical minerals.

Background

The company listed on AIM in 2005 under the name of Altona Resources, which was then involved in coal tenements in Australia where a JORC compliant resource of 1.287 billion tonnes of coal was determined. The name changed to Altona Energy in December 2008 to illustrate the shift in focus towards the Arckaringa coal-to-liquids and co-power generation project. This went on to a planning and development footing, following the completion of the technical pre-feasibility studies.

In all, the company found some 8 billion tonnes of coal and by 2010-11 Altona Energy was trading at a £90 million market cap. However, the coal was 200-350m underground beneath an underground reservoir, which provided water for agriculture and there was probably little chance of it ever being mined. It was not really until 2018 that shareholders rumbled the underlying problem which resulted in a series of boardroom changes as the shares collapsed in value. In the end, no Nomad would take the company on and in early 2019 the new board chose to move the stock listing to the NEX Exchange, the precursor to the Aquis Exchange (AQSE), rather than go private.

Christian Taylor-Wilkinson was initially appointed as a Non-Executive Director in February 2019, Interim CEO in March 2020 and then Chief Executive in December 2020. Under Christian's leadership, the management team at Altona disposed of the coal interests and began the search for a long-term sustainable mining solution which could be put into production in three years. In August 2020 Cédric Simonet joined the company as a consultant geologist and was appointed a Non-Executive Director within a matter of months.

In May 2020 Altona cancelled an Open Offer due to it not raising the minimum amount required to acquire a Petroleum Exploration Licence Application it was pursuing in South Australia. At that stage Altona reported that discussions were taking place with three companies seeking to gain an AQSE listing via a reverse takeover. However, Altona chose to steer its own course and unveiled REE ambitions with news that the company had entered into a Memorandum of Understanding with Akatswiri Mineral Resources to acquire a majority stake in a rare earth mining project in the Chambe Basin in Malawi. This was followed by the signing of Heads of Agreement for a Ugandan Rare Earth Project.

The company had been in a challenging financial situation, which resulted in Altona being suspended on AQSE. In December 2020, trading in the shares on AQSE was restored following a small placing and Christian Taylor-Wilkinson became full-time CEO.

The funds raised were mainly used to complete due diligence on the two acquisition targets, with which the company had exchanged Heads of Agreements, and also to commence the company's planned move of its stock market listing from AQSE to the London Stock Exchange. At that time, the company was able to report that it had received indications of being able to raise at least £1 million on admission to either AIM or the Standard segment of the LSE.

The planned change of stock market listing was seen as allowing the company to tap a much larger source of capital which would be necessary to commence its planned initial-stage Rare Earths mining exploration programmes in Malawi and Uganda. In February 2021 the company changed its name to Altona Rare Earths to better reflect the new corporate strategy.

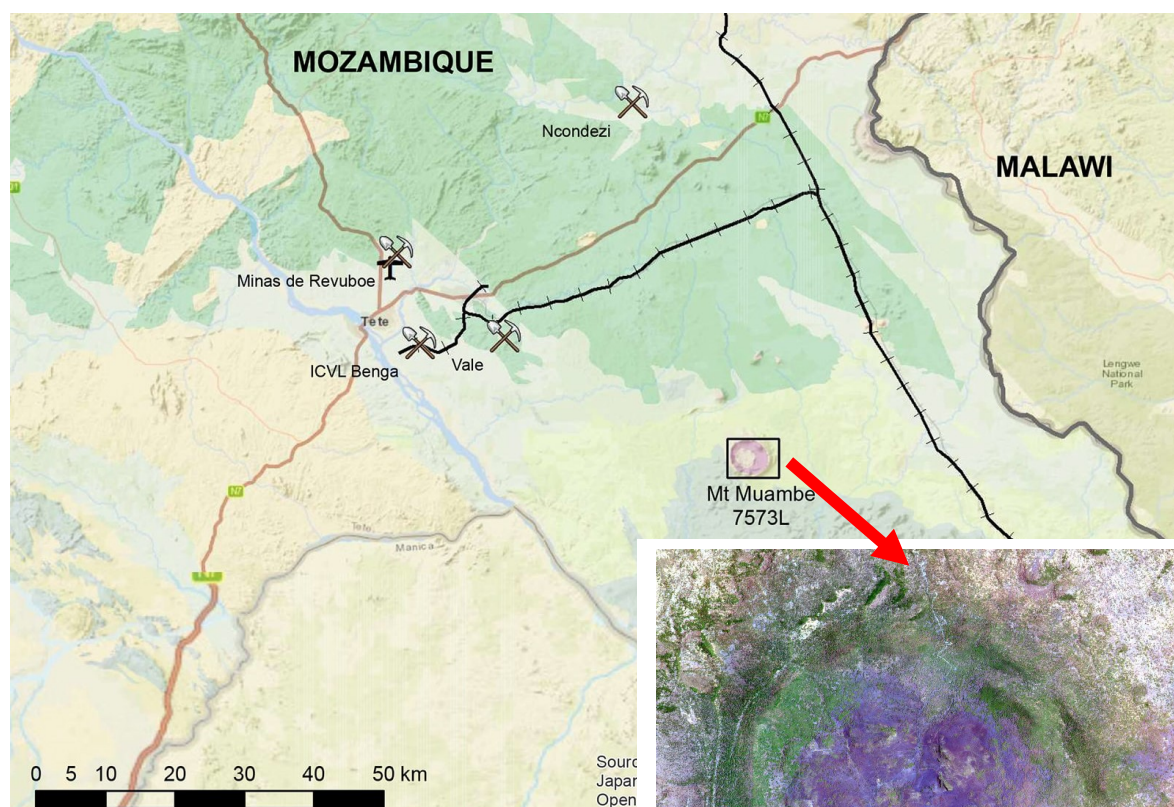
The company made its first investment in June 2021 based on the new REE strategy with a farm-in deal with Monte Muambe Mining Lda and Ussokoti Investimentos Sociedade Unipessoal, which at the time held Prospecting Licence 7573L in Mozambique. This Monte Muambe Licence area had seen past exploration for fluorspar which had led to the discovery of possible commercial grades of REEs. Agreements concerning projects in Malawi and Uganda have not been taken any further. In November 2022, Altona gained a Standard listing on the LSE, a move which will allow a lot more investor attention to be focused on the stock.

Operations

Altona is focused on the development of REE mining projects in East Africa. The company has acquired a carbonatite REE project in Mozambique, which it plans to take to production, due to the potentially high value of Rare Earth Metals the asset contains and the suitability of the project to conduct low strip-ratio open-pit mining. In addition, the company is seeking to acquire majority stakes in additional Carbonatite projects, in Ionic Clay REE assets, and possibly in hydrothermal veins REE projects.

Monte Muambe Rare Earths

Altona is currently working on the development of its first rare earths project, Monte Muambe, in Mozambique. **The project's tenement is located in Tete Province, Northwestern Mozambique, under Prospecting Licence 7573L which covers a 4km diameter circular carbonatite intrusion, where significant REE intercepts have shown grades up to 7.24% TREO lying quite close to the surface.**



*Location of Monte Muambe.
 Insert – satellite photo. Source: Company*



Altona entered into an agreement in June 2021 with Ussokoti Investimentos Limitada to acquire up to a 70% interest in the Monte Muambe Rare Earths Project, via an earn-in arrangement. Initially, the company took a 1% interest in the now licence owning company Monte Muambe Mining Limitada (MMM) for a consideration of £40,000. Currently, the company has a 20% stake and will have a 51% interest following a completion of the Mineral Resource Estimate and Scoping Study.

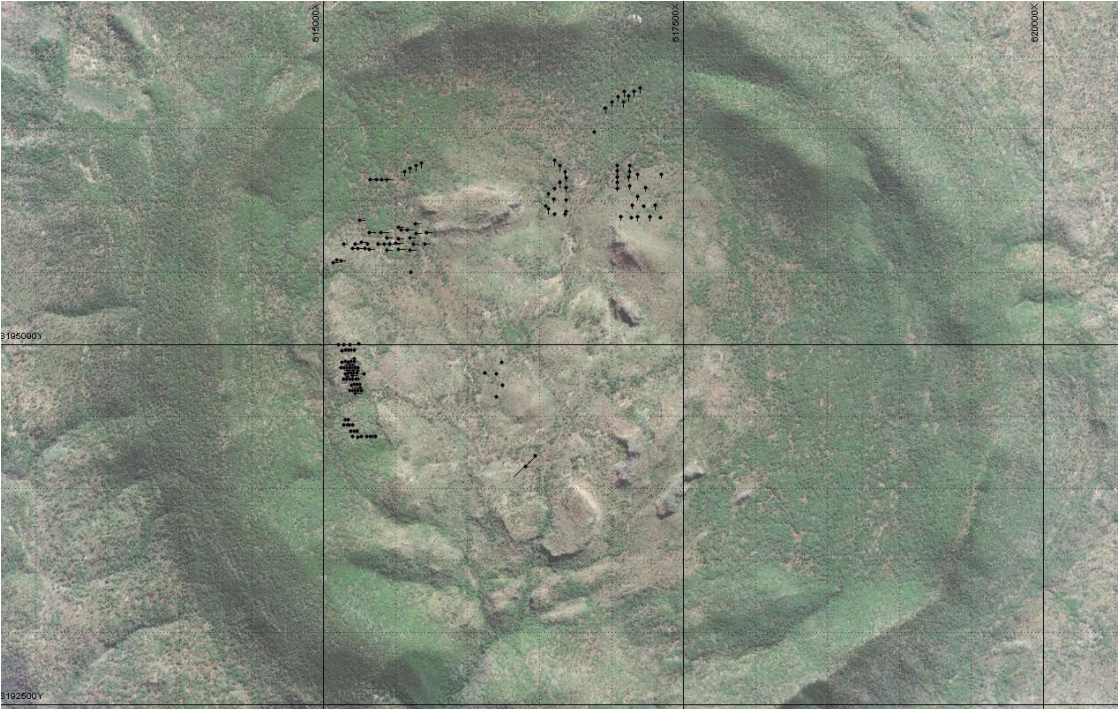
Altona can gain a 70% interest over the next 2-3 years by moving the project through exploration and feasibility studies, thereby completing certain milestones. Under the agreement for this project, Altona funds all the exploration costs and importantly, holds a majority boardroom position in MMM and therefore has full control over the asset.



Monte Muambe Rare Earths Project Mozambique encompasses a 19km² long-extinct volcanic crater. Source: Company

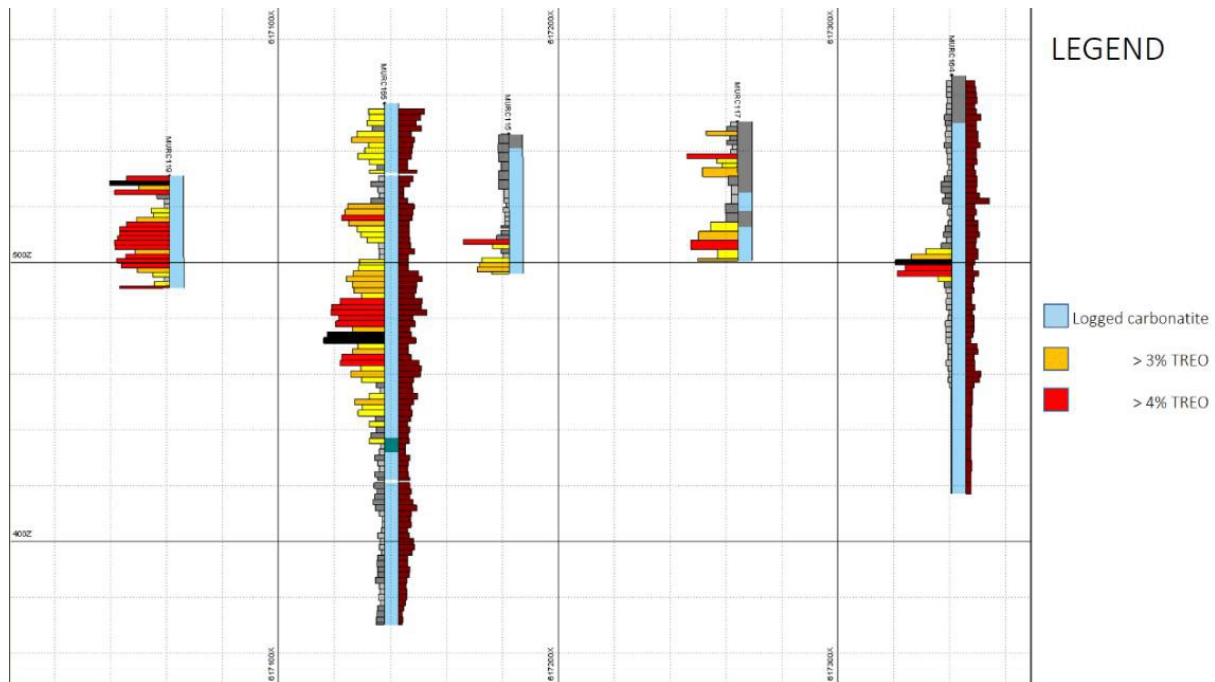
This project has seen a long history of exploration. Coupled with the geological formations of the crater which forms the licence area, this gives the board a lot of confidence that the project will demonstrate significant REE mineralisation. Past exploration work included a helicopter-borne magnetic and radiometric survey in 1998. Globe Metals and Mining undertook a Reverse Circulation (RC) programme for the exploration of the mineral fluorspar between 2010 and 2012 which involved 165 drill holes totalling more than 12,000m. Drill holes intersected REE mineralisation in at least four different zones within the intrusion.

Importantly, at all these four zones, REE mineralisation is open in several directions. Here it has to be pointed out that this 12,000m plus of drilling just covered something like 5% of the surface area of the intrusion, which at that time left significant potential for further discoveries. The image below really shows how little of the carbonatite was actually drilled in that early work.



Location of the 2010-12 RC holes. Source: Monte Muambe CPR July 2021

When Altona first got involved, the available data suggested that REE mineralisation was at least partly bastnaesite-hosted with individual REE intercept grades reaching as high as 4.1% of Total Rare Earths Oxide (TREO). Some of the best intercepts from historical data were 49m at 2.51% TREO, 36m at 2.53% TREO and 96m at 2.2% TREO. These were all from surface which suggests that the deposit could offer the potential to be amenable to low-cost open pit mining, but there was at the time no information about the lateral extent and continuity of these occurrences.



*Section along fence lines drilled in Zone BB showing REE mineralised intersections.
Source: Monte Muambe CPR July 2021*

Altona commissioned GeoAfrica Prospecting Services Limited, lead by REE expert Pete Siegfried, to undertake an independent Competent Persons Report (CPR) on the geology and resources of Monte Muambe which they saw as being a carbonatite volcano. GeoAfrica pointed out that carbonatites have complex geological controls and often many overprinting rock types occur in close proximity. Geological contacts and relative age relationships cannot be defined through the use of RC drilling. The importance of weathering control was also to be considered and these, often subtle contacts, are a challenge if not impossible to recognise in RC chips. Given all the above, GeoAfrica recommended that diamond drilling (DD) was essential in the area, aimed at both twinning some of the historic RC drill holes, as well as extending the depth of investigation. The consultants ended up by recommending that DD holes, combined with drilling more cost-effective RC holes, should expand the REE exploration potential significantly.

Phase 1 Exploration Programme

Initially, Altona not only sought to expand the mineralised zones but also to identify additional mineralised zones. At the same time, the team was also seeking to begin work to determine the metallurgical characteristics of the ore, which is an important consideration for REE projects.

Type of hole	Number of holes drilled	Number of holes planned	Total depth drilled	Total depth planned
Diamond Drilling	5	4	590m	550m
Reverse circulation	38	35	2,541m	2,450m
TOTALS	43	39	3,131m	3,000m

Details of the 2011 drilling programme. Source: Company

Following the receipt of necessary environmental permit, the company commenced Phase 1 exploration drilling in October 2021 and completed 43 holes totalling 3,131m by late November 2021 on time and within budget.

Hole ID	From (m)	Length (m)	TREO (%)	NdPrOx (%)
MM001	0	120.60	1.920	0.248
Including	17.54	12.15	2.759	0.317
Including	36.71	11.99	2.562	0.317
Including	61.71	27.53	2.731	0.318
including	98.09	11.88	2.060	0.290
MM039	29.78	52.16	2.109	0.344
Including	36.43	2.11	3.586	0.668
Including	48.38	7.28	2.387	0.408
Including	70.85	10.04	4.044	0.594
MM039	96.5	2.54	1.937	0.274
MM040	38.92	1.52	3.237	0.753
MM040	57.4	26.3	2.409	0.378
Including	61.54	2.3	2.792	0.463
Including	64.17	2.88	3.869	0.545
Including	67.75	1.47	3.142	0.519
Including	72.69	1.53	4.091	0.535
MM040	89.88	0.72	3.843	0.639
MM040	106.75	15.25	3.245	0.441

Significant intercepts in Phase 1 drilling in RC holes at Monte Muambe. Source: Company

Hole ID	From (m)	Length (m)	TREO (%)	NdPrOx (%)
MM002	51	12	0.954	0.134
MM003	19	12	1.993	0.300
MM005	27	30	1.444	0.352
MM006	24	15	1.261	0.331
MM021	28	68	1.646	0.251
MM036	3	18	1.205	0.263
MM037	61	9	1.714	0.418
MM042	0	16	1.507	0.369
MM042	37	15	3.306	0.462
MM043	0	32	1.895	0.323
Including	14	15	2.578	0.414
MM044	0	9	2.469	0.340
MM047	28	30	1.665	0.281

Significant intercepts in Phase 1 drilling in DD holes at Monte Muambe. Source: Company

TREO% = sum of all rare earth oxide assay results including Yttrium

NdPrOx% = sum of Pr₆O₁₁ and Nd₂O₃ assay results

This drilling programme had been designed to gain an initial handle on the extent of REE deposits across the licence area. Drilling was focused on testing both the lateral extension of known REE mineralisation in the crater and also exploring four new targets. The company's geologists had been looking for favourable locations for hosting REE deposits and identified a number of locations of possible deep carbonatite weathering which made up the four new targets.

May 2022 saw the results of Phase 1 Exploration Drilling announced, where assay results showed significant REE levels across multiple target areas with significant levels of NdPr identified. Individual intercepts ran as high as 7.24% TREO with up to 1.21% NdPrOx. In total six target areas had been drilled, of which four were discovered to have significant REE mineralisation which demanded follow-up work. Satisfyingly enough, these included the two new discoveries.

Phase 2 Exploration Programme

Even following Phase 1, less than 20% of Monte Muambe was thought to have been explored. This provided the potential for significantly more additional zones to be discovered. From the outset, Phase 2 was seen to involve a 100-hole drill programme for a total of some 8,000m which would further investigate the best targets based on the assay results. Ahead of that, Phase 2 groundwork began in March 2022 and involved further soil sampling combined with ground geophysics to identify potential new targets.

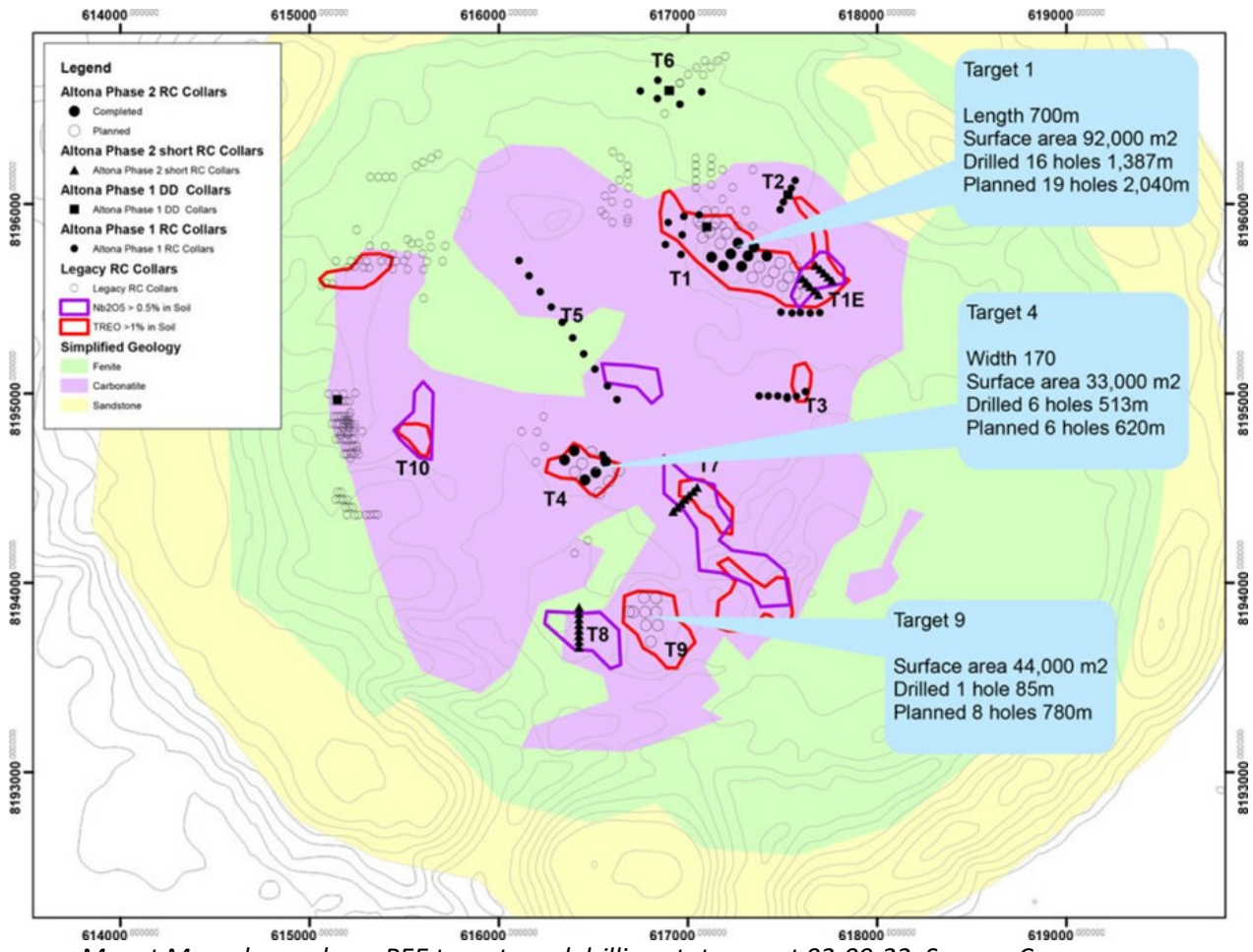


Drilling at Monte Muambe. Source: Company

The goal of Phase 2 was to determine a maiden JORC resource which is planned to be announced by Q1 2023, with a Scoping Study by Q2 2023. This 8,000m drill programme involved 1,200m RC scout drilling on new targets (Targets 1 East, 4, 7, 8 and 9) and more drilling on the best of Phase 1 identified targets (Target 1). The second tranche initially planned to be 6,800m of RC resource drilling, meant to allow for the determination of a maiden Mineral Resource Estimate (MRE), was optimised thanks to the acquisition of a REE-capable pXRF analyser which allowed quasi-real-time preliminary assay of RC drilling cuttings. A preliminary metallurgical study planned for later on in 2022.

Preliminary Phase 2 exploration results were reported in June 2022 which made for good reading. The company was able to unveil improving REE grades and that the potential orebodies were also growing in scale. Altona went on to highlight that Monte Muambe had the potential to be one of the highest-grade Carbonatite REE projects in Africa and spoke about the project being a world class for the first time.

Early 2022 saw the company undertaking an extensive soil sampling programme (1,700+ samples) across the whole intrusion. This resulted in the discovery of four new drilling targets for REE and Niobium (up to .99% TREO and up to 1.75% Nb₂O₅ in soil) which have already seen shallow RC drilling. In May 2022, RC drilling began on Targets 1 and 4 and Altona was able to make comments on the grades seen in drilling based on the use of portable X-ray Fluorescence (pXRF) used on site. A pXRF is an extremely useful handheld device that can be used in the field to measure chemical composition by the analysis of X-rays. Preliminary analysis using pXRF cannot be used for JORC Resource Estimates but provides information rapidly on site and can be used for a JORC Exploration Target with sufficient QAQC measures and a reference laboratory results database in place. This can be used to really target exploration efforts, with all mineralised samples subsequently assayed at a certified laboratory.



Monet Muambe geology, REE targets and drilling status as at 02-09-22. Source: Company

The length of Target 1 extended from 100m to 700m with Phase 2 RC drilling results showing thick intercepts with TREO grades as high as 7.85%; with mineralisation encountered to 70m below surface and open at depth.

Although by June 2022, drilling on Target 4 had not been completed, results so far had outlined a target width of thickness of at least 170m with grades up to 6.37% TREO, with mineralisation encountered to 80m below surface, open at depth and towards the SouthEast. At that time, the company was also preparing to access to the newly discovered Target 9 in the southern zone of the carbonatite, which also shows a high potential for REE.

The 2022 drilling programme was similar in scale to that of the previous year. In 2022, drilling consisted of a total of 36 RC holes for a total of 3,360m. The results of this final stage of drilling showed new high levels of REE across all holes where the drilling has intercepted thick, high-grade mineralisation. These included: Hole MM096: 60m at 2.66% TREO, from 68m depth and Hole MM098: new near-surface ore shoots - 22m at 3.32% TREO, including 10m at 5.48% TREO from 12m depth. Apparently, the final samples were shipped in early December to allow the company to meet its publishing target in Q1 2023 for the JORC Mineral Resource Estimate.

JORC Compliant Exploration Target Estimate

The company announced a JORC compliant exploration target estimate in early August 2022 of up to 56.6Mt at up to 1.65% TREO (in compliance with JORC1 2012) based on its ongoing exploration work – which included a well-defined high-grade zone of 11.5Mt at 2.41% TREO. The range of values estimated served to illustrate the globally significant size and grade of the Monte Muambe REE Project. At the time CEO Christian Taylor-Wilkinson commented that “...*Monte Muambe is shaping up to be a significant rare earths project, with the estimated potential size and grade surpassing the results of some of our much larger LSE and ASX listed peers...*”

Cut-off grade TREO%	Tonnes (millions)		TREO% ¹	
	0.5% Grade Shell	1.0% Grade Shell	0.5% Grade Shell	1.0% Grade Shell
1.0%	56.6	21.7	1.65	1.78
2.0%	11.5	6.5	2.41	2.47

¹ - TREO% is calculated as the sum of Nd, La, Ce and Y oxides and is mostly derived from portable XRF assay results.

Exploration Target estimate (08 August 2022). Source: Company

The Exploration Target estimate shown above relates to Monte Muambe’s Targets 1 and 4 and uses data from drilling carried out over a 5-month programme up to 5 July 2022. The estimates were calculated using ordinary kriging (a geostatistical technique of interpolation of spatial data) for Target 1 and inverse distance to the power of 3 for Target 4, using grade shells based on a 0.5% TREO% cut-off and a 1.0% TREO% cut-off to constrain the block model estimations. It was prepared by Rock and Stock Investments (Pty) Ltd, an independent South African consultancy based in the Western Cape, in accordance with the 2012 Edition of the JORC Code.

The announcement of the JORC Exploration Target also contained a drilling update. **Since mid-June 2022, Altona had drilled 9 more holes for 868m on Target 1 and new Target 9, including two 150m long holes. Best Target 1 intercepts include: 36m @ 3.182% TREO from 17m (Hole MM074), 30m @ 3.031% TREO from surface (Hole MM053) and 57m @ 2.170% TREO from 29m (Hole MM079).**

The company was able to report that REE mineralisation had now been documented from surface to a depth of 120m. The latest drilling was seen to support the model prepared for the Exploration Target estimate, as well as also supporting the outline of a continuous higher-grade zone in the northern part of the orebody, which we are being told will be reflected in the MRE.

Meanwhile, 20 representative ore samples had been dispatched to the laboratory for XRD and QEMSCAN testing in preparation for the preliminary metallurgical study. XRD (X-Ray Diffraction Analysis) is used to determine the crystallographic structure of a material and QEMSCAN stands for quantitative evaluation of minerals by scanning electron microscopy, which provides a quantitative analysis of minerals. **Altona is on track to complete its maiden Resource Estimate in Q1 2023 and the project’s Scoping Study by Q2 2023.**

Strategy for Growth

REEs are rapidly being seen as being the seeds of green technology, with energy and renewables expected to drive the Rare Earth Market. Of the REEs, most of the talk is of NdPr which are the key metals used in the manufacture of permanent magnets for the drivetrains for EVs and wind turbines. They are seen to be irreplaceable. China maintains a stranglehold on the Rare Earths Market but belatedly the West is now attempting to secure its own alternative supplies of such critical metals through establishing processing facilities and refineries across Europe, the UK, the US and Australia.

Altona has made great strides with its Monte Muambe Project in Mozambique. Management first contacted the owners at the end of 2020 leading to the signing of a farm-in agreement in June 2021. This followed due diligence which involved sampling work to verify the impressive REE grades that were found by accident during 160+ holes (12,000m) of drilling in 2010-12 targeting fluorspar. Mapping kicked off in August 2021 and drilling started in September 2021. Phase 1 saw the company drilling more than 30 holes in a systematic fashion resulting in some very promising results. Comprehensive soil sampling of the intrusion has led to the discovery of new anomalies. All of this has resulted in the identification of two large orebodies – based on which highly experienced geological consultants have prepared a JORC exploration target up to 57Mt at 1.65% TREO.

JORC exploration targets can sometimes be based on quite questionable data. This is not the case here as the exploration target for Monte Muambe has the backing of very solid drilling data. The samples have not been assayed yet at the laboratory, but the exploration target is based on XRF data. Altona has a pXRF which is calibrated for REEs and good QAQC systems in place as they have been correlating the readings from this device based on the assayed results of 1,500 XRF samples. The maiden JORC resource is not that far away, following the completion of the Phase 2 drilling in the coming months. With the assay work at the laboratory, it is expected to be announced in Q1 2023.

So far, two large main orebodies have already been identified at Monte Muambe with the first consisting of a high grade 2.6 – 2.7% TREO which accounts for a third of the volume. This lies alongside another orebody which is 0.8-0.9% TREO with some niobium and represents the other two thirds of the structure. The Scoping Study, expected to be announced in Q2 2023, will be able to determine if it is more economic to mine high grade material or blend in some of the low grade and also extract the niobium ore. Monte Muambe is highly attractive and is fast shaping up to appear very similar in size but at a far higher grade than Mkango's Songwe Hill which has just published a feasibility study. Resources are a function of exploration spend. REE deposits do not need to be hundreds of millions of tonnes in size to be highly economic projects. Interestingly enough, the likes of Pensana and Peak Resources identified resources of such a scale but when it came down to it the actual mineable bit was c. 20-30Mt – on which cracking projects are now being swiftly developed.

Altona's team on the ground in Mozambique is seeking to avoid the considerable spend and time required on proving up a tremendously large resource by focusing on what is mineable from the start. Drilling work has been managed on the ground using pXRF which provides an almost immediate analysis of grade, rather than waiting months for core material to be shipped to the lab and assayed. It is fast becoming obvious that the orebody at Monte Muambe has been found to be easy to follow and consistent along strike. Such consistency means that a high density of drill holes is not required for confidence. The company has drilled relatively close already and with a high degree of confidence. **This means that a large part of the maiden JORC resource is likely to be in the Indicated category (as opposed to Inferred).** If things work out as well as they look today, with the geology so nicely laid out, Altona will be faced with the decision to sell or put Monte Muambe into production. So, it has the real scope to possibly become a major REE supplier to the UK, Europe and the USA within 4 – 5 years.

The topography at Monte Muambe seems to offer a very low strip ratio as this deposit lies close to or is on the surface. Satellite photos show that the project lies inside a ring of mountains that represents an extinct volcano crater. This area is a barren wilderness with no wildlife or people and enough space to put in an open pit and processing plant which would remain unobtrusive from the surrounding plain.

The project is lucky enough to be located in Tete Province in West Mozambique, which is a mining hub. Just 50km away from the project area are 3 or 4 large coal mines as well as a major iron and steel project and numerous operating gold mines, with a hydropower plant nearby. This leads to a plentiful supply of mining and processing professionals along with qualified personal. This was well illustrated by the company having a choice of six different local candidates when negotiating the drilling contract.

Investors could see some M&A action as Altona seeks to achieve its goal of acquiring majority interests in multiple rare earths projects. Carbonatites like Monte Muambe are big structures that are highly visible on the landscape in Africa. There are many of them but the time to production is not that swift due to the in-depth work that needs to be taken ahead of the final investment decision and the funding required. Altona wants to get a project into production quickly, not sit on one for 10-20 years. For all these reasons, the company has a lot of interest in developing Ionic Clay projects, which are a relatively new concept. Such projects only appeared in the 1970s in China and so have only been fully developed for the last 20 years. To date, only three Ionic Clay projects have been found in Africa including Chambe, which Altona has checked out but not followed up. Chambe lies up a mountain in a UNESCO Biosphere Reserve which would make it tricky politically and environmentally, so it was never going to really be an ideal first project.

There is good potential in East and South Africa for Ionic Clay projects, but the exploration just has not been done. **Altona's COO Cédric Simonet has 25 years' experience exploring, developing and mining mineral deposits in Africa. In that time, he has looked at a wide variety of projects and gained an in-depth knowledge of where the correct geological settings for REE projects might be found.** Altona is making up for lost time and has already been able to identify several Ionic Clay targets in their region of Africa. Three of them have been sampled and the company will be looking to apply for licences. Ionic Clay projects are a dream for a company of Altona's size as such projects can be assessed rapidly in weeks before spending serious money. A few important parameters such as the size of the surface area can be gleaned from geology or geophysics with the thickness determined from shallow drilling (5m – 15m) with the grade initially determined by XRF. Also, it has to be checked that the REEs present are actually Ionic Clay adsorbed and not there for some other reason. Naturally, the clay must be permeable, which can be determined in the lab to make sure that the REEs can be extracted by leaching.

One thing that stands out is that Ionic Clay REE projects are low grade (compared to carbonatites), ranging from 500ppm (0.05%) up to 3,000ppm (0.3%), and are the best seen in China. They might be lower grade, but the mining cost is far lower. In fact, a magnitude lower than carbonatites which need to be drilled, blasted, and hauled to the processing plant where the run of mine material is then milled (the biggest cost) and floated to get a concentrate which is then treated further. It is a lot more straightforward with Ionic Clay, where the clay is mined by excavator and put on a leach pad in much the same way as copper and gold ores are all over the world.

However Ionic Clays only need saltwater or ammonium sulphate (in a low concentration) to weaken the bond between the REEs and clay. REEs go into a solution which can be used as the feed stock to produce more advanced products. The solution is then recycled into the leaching pad. Ionic Clay projects that Altona might unearth in Africa can be put into production rapidly, generating potentially US\$25 million revenue annually for a 10+-year mine life, or so. This would be useful cashflow allowing Altona to make progress without continually diluting shareholders.

On AQSE, there is no doubt that Altona has made a lot of progress. But away from the spotlight of AIM or the main market, there has been little interest. Since 2021, the board has been working on a Standard Listing on the LSE and the move to this far larger market will bring the stock to the attention of a lot of serious investors that have made good money backing early stage REE plays and understand the risk/reward ratio and the obvious value that the company exhibits today.

Financials & current trading

Altona is a mining exploration company and after a pursuing a number of different corporate strategies, the company is now firmly focused on REEs where the team is assembling a growing portfolio of interests.

Y/E 30 June £'000s	2018A	2019A	2020A	2021A	2020A
Revenue	-	-	-	-	-
Pre-tax profit/loss	(645)	(11,657) ¹	(226)	(733)	(801)
Net profit/loss	(1,220)	(11,844)	(226)	(733)	(799)

Altona Rare Earths five-year trading history. Source: Company accounts

¹ write-off of Australian coal assets

2022 results

The twelve months ended 30th June 2022 marked the company's first full financial year in the Rare Earths sector. The period saw the completion of the initial exploration programme and the start of the second phase of resource drilling, which has generated highly encouraging results. The operating loss for 2022 came out at £0.801 million after £0.742 million of administrative expenses and £0.059 million of exploration costs. Altona recorded a pre-tax loss of £0.801 million with no tax payable and a total comprehensive loss attributable of £0.799 million. The loss per share came out at 2.72p.

Recent developments

August 2022 saw Altona announce the completion of a significant milestone, which was the estimation of the Exploration Target of up to 56.6Mt at up to 1.65% TREO, based on ongoing exploration work. This estimate was ahead of the publication of a JORC Mineral Resource Estimate, which is on track for Q1 2023.

Monte Muambe has the potential to become an important part of the global rare earths supply chain. In October 2022, the CEO commented that, *"Should the results of our Scoping Study and Preliminary Economic Assessment be positive, which we expect them to be when they are published in Q1 2023, we will be looking to fast-track Monte Muambe through its Feasibility Study and into production, in order to meet the rising global demand for rare earth metals."*

December 2022 saw the completion of the 2022 drilling programme at Monte Muambe which consisted of 36 RC holes for 3,360m. The results of this final stage of drilling showed new high levels of REE across all holes where the drilling has intercepted thick, high-grade mineralisation. These included: Hole MM096: 60m at 2.66% TREO, from 68m depth and Hole MM098: new near-surface ore shoots - 22m at 3.32% TREO, including 10m at 5.48% TREO from 12m depth.

In early February 2023, the company announced a New Convertible Loan Facility, Extension of Loan Facility, Proposed Placing of £1.25 million and an update on its LSE Listing. Altona has entered into a convertible loan agreement with clients of Optiva Securities for up to £275,000. This will fund the completion of the MRE, allowing the company to up its stake Monte Muambe to 51%. Interest is payable at 15% p.a. and the loan is convertible into equity at the placing price of the upcoming IPO on the LSE. Meanwhile, the £150,000 loan facility (provided by Align) has been extended for 3 months.

The board was also able to report in this announcement that the company was at an advanced stage of its LSE listing process and was only subject to the final approval of a prospectus by the FCA. In August 2022, the market learned that Altona had raised £1.1 million, conditional on the company's admission to the Official List. As the admission process has dragged on a bit, the back-stop date for the August fundraise has passed and so the company did not raise these funds. So, in light of this Altona is now seeking to raise around £1.25 million.

Risks

Geological risks

There are a series of technical risk factors concerning the amount of understanding of the geology of the project areas, the mineralisation style being targeted and the distribution and magnitude of the indicators that have been identified in exploration work.

REE price risks

REE prices are highly cyclical and can have a negative or positive impact on the valuation of the company's projects and revenue from the sales of these metals that are critical to so many aspects of modern living and the slowing down the progress of climate change.

Exchange rate risks

Movements in the value of currencies will have an effect on the company's accounts on translation from Mozambican Metical, as well as US dollars into sterling. Fluctuations in the value of the Mozambican Metical, along with the US dollar against sterling, may influence the valuation that Altona is awarded by the market.

Future funds

The market for raising funds for small cap companies looks to have had improved from the worse conditions a couple of years ago when the global spread of the COVID-19 pandemic meant that equity markets had become extremely difficult. Even though the planet has begun to live more freely once more, the ratcheting up of political tensions concerning Ukraine, steeply rising gas prices and growing global inflation has made the market turn its back on risky plays. This has led to a number of recent fund raisings in the resources sector seeing share prices being undermined by incoming investors demanding 30-50% discounts to provide the necessary capital.

Political risk

Mozambique and many other countries in eastern Africa are developing countries where there is always some degree of political risk attached to the mining industry. However, by and large, these governments seem to be supportive of the mining sector, which represents an important source of foreign earnings.

Board of Directors

Christian Taylor-Wilkinson – Chief Executive

Christian has been closely associated with Altona since 2014, as the financial PR adviser to the company, through his agency, Leander PR, which he founded in 2009. He has spent his professional career in the City and has over 28 years' experience advising and working alongside companies of differing sizes and across many sectors, and where he has built up a solid reputation and contact base within the small-cap arena.

His background spans investment banking (as a corporate broker at UBS), before moving into investor relations and financial PR in 2001. He has a broad perspective of the capital markets landscape, as well as a deep understanding into the needs of businesses and their shareholders.

Christian was appointed Interim CEO on 20 March 2020 and then Chief Executive on 1 December 2020.

Cédric Simonet – Chief Operating Officer

Cédric holds a PhD in Geology and has 25 years' experience exploring, developing and mining mineral deposits in Africa and in France. He was Head Geologist and Open Pit Manager at SOGEREM fluorspar mine (Alcan, France) and Africa Region Manager with IGE Resources AB. He is a co-founder of Akili Minerals Services, a Nairobi based exploration services company, and has been involved in several exploration projects on REE-carbonatites in Kenya including Ruri, Homa Mountain, Buru and Mrima. He is also a former Chairman of the Kenya Chamber of Mines, and well experienced in operating in this and many other African countries.

Cédric is a member of the European Geologists Federation (Eur Geol no 739). He qualifies to act as a Competent Person (JORC) and as a Qualified Person (NI43-101) on REE-carbonatite exploration projects.

Martin Wood – Non-Executive Chairman

Martin is the founder and Managing Director of Vicarage Capital, an FCA registered, full-service brokerage house which provides assistance to junior and mid-cap resources companies. He established Vicarage Capital in 2003 and has advised many companies on their AIM listings and long-term mining strategies.

Martin was the CEO of ASX listed, Kogi Iron Limited between 2017 and 2019, where he secured a community development agreement with key stakeholders, arranged indicative offers for full bank debt-based project financing, as well as completing various on-going milestones, including a Scoping Study and metallurgical test work, as part of the Definitive Feasibility Study.

Martin is Non-Executive Director of Royal Helium Limited, a Canadian listed critical resource company currently in the process of dual listing in London. He was specifically asked to join to add corporate governance and UK listed company board experience.

Between 1993 and 2003, Martin worked in corporate finance at NM Rothchild & Sons, Standard Bank, London and Benfield Advisory, providing services to resources companies. He has an MBA from Exeter University which he gained in 1993

Audrey Mothupi – Non-Executive Director

Audrey Mothupi is CEO of South African based SystemicLogic Group, a global financial innovation, data and technology disruptor, specialising in emergent business models. Her extensive knowledge of the African markets enables her company to deliver tailor-made solutions, providing strategic direction and strong corporate relationships. Prior to joining SystemicLogic, Audrey was head of inclusive banking at Standard Bank Group, where her division in 2013 was awarded the BAI-Finacle Global Banking Innovation Award for innovation in societal and community impact.

Audrey serves as independent Non-Executive Director on the boards of Pick ‘n Pay, Life Healthcare Group and Arden Capital, all in South Africa. She is the Chairperson of Roedean School (SA) and was Chairperson of Orange Babies of South Africa, as well as sitting on the boards of Nordic Female Business Angel Network and the Numeric Board of South Africa. Audrey is a Fellow of the African Leadership initiative, a member of the International Women’s Forum (IWF) and has been named one of Africa’s 1,000 most powerful women. Audrey has over 18 years of business experience.

Senior Management**Gavin Beer – Consultant Metallurgist**

Gavin is a metallurgist with more than 30 years’ experience in technical and operational roles and has spent the past 13 years exclusively working within the rare earth and energy materials sector. He has been employed by or has consulted to more than a dozen rare earth companies including Arafura Resources, Peak Resources, Hastings Technology Metals and Pensana Metals. He is presently engaged by Neometals in the role of General Manager Metallurgy and has been retained by RareX and Hexagon Resources as a Technical Advisor.

Gavin is a Member and Chartered professional of the Australian Institute of Mining and Metallurgy. He is recognised as a Competent Person for JORC and as a Qualified Person for NI 43-101 with respect to his metallurgical expertise and is globally recognised as a leading metallurgical expert in the rare earth industry.

Forecasts

We initiate coverage of Altona with forecasts for the full years ending 30th June 2023 and 2024. The year to 30th June 2023 is expected to see the publication of the maiden JORC resource and the Scoping Study which is expected to result in increased costs. In addition, the company will be continuing due diligence on a number of additional REE projects, plus there are the costs associated with the LSE listing. In light of this, we estimate that administration costs will rise to £1.00 million. Exploration costs from the work at Monte Muambe are expected to increase to £1.00 million. The loss before tax is forecast to be £2.00 million. As no tax is payable that means the loss for the period is expected to come out £2.05 million after some small financing costs, with the total comprehensive loss attributable to Altona being £1.98 million. The loss per share comes out at 4.91p.

Year End 30 June (£'000s)	FY 2021a	FY 2022a	FY 2023e	FY 2024e
Continuing operations:				
Administration expenses	(547)	(742)	(1,000)	(1,000)
Exploration costs (not capitalised)	(182)	(59)	(1,000)	(3,000)
Operating loss	(729)	(801)	(2,000)	(4,000)
Finance costs	(4)	-	(50)	-
Loss before taxation	(733)	(801)	(2,050)	(4,000)
Income tax	-	-	-	-
Loss for the year from continuing operations	(733)	(801)	(2,050)	(4,000)
Total loss for the year attributable to:				
Owners of Altona Rare Earths Plc	(733)	(774)	(1,980)	(3,860)
Non-controlling interests	-	(27)	(70)	(140)
	(733)	(801)	(2,050)	(4,000)
Other comprehensive income				
<i>Items that may be reclassified subsequently to profit and loss:</i>				
Exchange differences on translation of foreign operations	-	2	-	-
	(733)	(799)	(2,050)	(4,000)
Total comprehensive loss attributable to:				
Owners of Altona Rare Earths Plc	(733)	(773)	(1,980)	(3,860)
Non-controlling interests	-	(26)	(70)	(140)
	(733)	(799)	(2,050)	(4,000)
Earnings/ (loss) per share (p)	(7.73)	(2.72)	(4.91)	(4.76)
Weighted average number	9,485,000	29,466,000	40,348,355	81,159,086
Total shares plus options and warrants	19,279,533	55,938,800	78,671,729	108,880,062

Source: Company/Align Research

The year to 30th June 2024 is expected to see substantial progress at Monte Muambe and the start of initial exploration at other REE projects. Given the likely workload we estimate that administration costs will stay at £1.00 million plus £3.00 million will be spent on exploration. On this basis the loss before tax is estimated at £4.00 million. With no tax payable, we estimate a loss for the year of £42.00 million, with the total comprehensive loss attributable to the company coming out at £3.86 million. The loss per share would be 4.76p.

The number of shares is seen to rise significantly in the year to 30th June 2024 due to warrants being exercised. This is based on our thinking that the company will be seeking to reward investors at the proposed £1.25 million placing at IPO stage in line with the manner that was set out for the previous planned £1.1 million placing (announced August 2022). Funding the company's aspirations looks like it will cost £3 million in calendar year 2023 for Muambe alone plus additional funds for initiating exploration at one or more new projects. There are likely to be some 20.83 million options stemming from the coming placing at IPO at 12p (which could bring in £2.50 million). Here, the company is offering a piggyback option at 18p with a three-year life to investors who exercise their 12p warrants within the trigger period (deemed as being within 30 days of the shares trading above 12p on a VWAP basis). The idea of the piggyback option is that it would ensure that option holders would not dump the stock on exercising their options but would remain holding. Piggyback options themselves could potentially bring in up to £3.749 million more in the fullness of time.

Valuation

We have set out to determine a meaningful valuation for Altona in order to calculate a realistic target price. In our analysis we have sought to value the company by peer group comparisons – which really shows the sort of valuations that the company’s competitors are currently attracting in the stock market.

A valuation matrix was developed based on the range of Enterprise Value per tonne of TREOs from a number of quoted REE exploration and development companies (see table overleaf) which are advancing their projects through feasibility studies. There were seen to be large variations in value assigned to resources which may be dependent on the type of deposit, the location, processing technology, management, the backers and PR effort.

Cut-off grade TREO%	Tonnes (millions)		TREO% ¹	
	0.5% Grade Shell	1.0% Grade Shell	0.5% Grade Shell	1.0% Grade Shell
1.0%	56.6	21.7	1.65	1.78
2.0%	11.5	6.5	2.41	2.47

¹ - TREO% is calculated as the sum of Nd, La, Ce and Y oxides and is mostly derived from portable XRF assay results.

Exploration Target estimate (08 August 2022). Source: Company

Currently, Altona has a JORC compliant exploration target estimate for Monte Muambe of up to 56.6Mt at up to 1.65% TREO (in compliance with JORC1 2012) which was announced in August 2022. This estimate is based on its ongoing exploration work – which included a well-defined high-grade zone of 11.5Mt at 2.41% TREO. At present the company has a 20% interest in this project but this is set to rise to 51% early next year following the publication of a JORC-compliant MRE and the Scoping Study. Further investment in additional exploration work and feasibility studies, will allow Altona to gain a maximum interest of 70% in the fullness of time. We used the 51% interest figure in our analysis to remain conservative.

Valuation matrix

Scenario	Monte Muambe JORC compliant exploration target
Mt	56.6
TREO grade %	1.65
TREO Kt	934
Altona’s interest	51%
Attributable TREO Kt	476
Potential valuations	£ million
DEFINITIVE FEASIBILITY STUDY EV/t range: £48 – 365	23 - 174
PRE-FEASIBILITY STUDY EV/t: £46	22
SCOPING STUDY (PEA) EV/t range: £42 – 1,000	20 - 476
JORC RESOURCE EV/t: 888	423

Company	Deposit	EV £ million	Attributable TREO Resources			EV/t £
			Mt	Grade %	TREO Kt	
DEFINITIVE FEASIBILITY STUDY						
Arafura Rare Earths (ASX:ARU) Share price: A\$0.625 Market cap: £759m	Nolans, Australia Shovel ready world class NdPr project NdPr enrichment 26.5%	744	56	2.6	1,456	511
Australian Strategic Materials (ASX:ASM) Share price: A\$2.37 Market cap: £227m	Dubbo, Australia Construction ready light & heavy REEs and critical minerals	203	75.18	0.74	556	365
Mkango Resources (LSE:MKA) Share price: 15p Market cap: £32m	Songwe, Malawi Integrated REE company – mine, refine, recycle	32	48.57	1.37	664	48
PRE-FEASIBILITY STUDY						
Rare Element Resources (OTCQB-REEME) Share price: US\$0.38 Market cap: £74m	Bear Lodge, USA Planned pilot plant NdPr enrichment 22.8%	57	49.9	2.49	1,242	46
SCOPING STUDY (PEA)						
Ucore Rare Metals (TSX-V:RES) Share price: C\$0.97 Market cap: £34m	Bokan Mountain Alaska Providing separation and mining services to mining industry	34	5.23	0.653	34	1,000
Rainbow Rare Earths (LSE:RBW) Share price: 12.00p Market cap: £64m	Phalaborwa ¹ , SA (higher than typical ionic clay grade) & Gakara, Burundi (high grade 7 – 12% TREO	58	26.81 ¹	0.43 ¹	115 ¹	504
Ionic Rare Earths (ASX:IXR) Share price: A\$0.035 Market cap: £79m	Makuutu, Uganda (51%) Ionic Adsorption Clay skipping PFS and moving straight to BFS	65	271	0.064	173	375
Namibian Critical Metals (TSX-V:NMI) Share price: C\$0.13 Market cap: £16m	Lofdal, Namibia Heavy rare earths project hosted in carbonatite dykes & structural zones	15	53.43	0.17	91	165
Defense Metals (TSX-V:DEFN) Share price: C\$0.315 Market cap: £41m	Wicheeda, Canada Composite layered syenite-carbonatite sill complex	39	34.5	1.99	687	57
Leading Edge Materials (TSX-V:LEM) Share price: C\$0.23 Market cap: £24m	Norra Karr, Sweden Alkaline igneous intrusion 52% heavy REOs	23	110	0.5	550	42
JORC RESOURCE						
American Rare Earths (ASX:ARR) Share price: A\$0.29 Market cap: £74m	La Paz Rare Earths & Scandium, USA New twin ore body exploration target 724- 929Mt	71	170.595	0.0469	80	888

Exchange rates A\$ 1.77, C\$ 1.57 and US\$1.12

Peer group analysis. Source: Align Research

The EV/t multiple for American Rare Earths, which has declared a JORC Resource, may look high, but this might be because its La Paz Scandium and Rare Earths Project has the potential to be the largest rare earth project in North America. It also contains very low penalty elements such as radioactive thorium and uranium.

Looking at the valuations of companies at the Scoping Study, PFS and DFS stage clearly shows EV/t valuation ranges/points of £42 - £1,000, £46 and £48 - £511 which does broadly highlight the increasing valuation awarded as the project moves through feasibility studies. Altona has set itself a quite rapid timeline for this project, with a goal of publishing a JORC compliant resource in Q1 2023, a Scoping Study (PEA) in Q2 2023, leading through to a BFS/DFS by early 2025.

Selected valuation

In choosing a valuation and a target price for the next 18 months, we have looked to where the project might be within that time period. **At that stage the project is expected to be at the PFS stage with a corresponding EV/t of £46. Our matrix suggests that would have a valuation of £22 million, a figure which we have used in our SOTP table.**

There is plenty of scope to generate an increasing substantially higher valuation by emulating the strategy and efforts of the more highly rated REE exploration companies as the project is pushed up the valuation curve.

Asset	£million
Monte Muambe (51%)	22.0
Debt	-
Cash	1.25
Sub-total	23.25
Per share	
Based on the number of shares in issue post IPO (54,109,999)	43.0p
Fully diluted basis	
Funds coming from warrants being exercised	3.3
Total	26.55
Based on the number of shares on a fully diluted basis (78,671,729)	33.7p

Sum-of-the-parts valuation. Source: Align Research

Our SOTP valuation totals £23.25 million. Based on the number of shares expected to be in issue post the IPO (54,109,999) the per share valuation would come out at 43.0p. Using the same assumptions, on a fully diluted basis (78,671,729), we have added the funds that would result from the warrants being exercised of £3.3 million. **This gives a total of £26.55 million, or a share price of 33.7p, which looks to us to be the most appropriate target price for the stock over the next 12-18 months.**

Conclusion

Geo-political tensions and just plain good business sense are seeing many end-user manufacturers searching for alternative supplies of rare earth metals outside China. This is being spurred on by governments in the West who wish to have security over supplies of critical metals including REEs. Given all that, it is little surprise that the Rare Earth sector is expected to show continued growth over the next 10 years, and probably a lot longer if the various countries around the world want to have any chance of meeting their carbon net zero targets by 2050. **It is difficult to think of a more compelling market opportunity in today's mining industry.**

Altona has a strategy of acquiring majority interests in multiple rare earths projects to reduce shareholder risk by removing the reliance from a single mining asset, as well as reducing risk further through having a goodly mix of REE assets of differing geological natures. This means a spread between low grade/low operating cost Ionic Clay type deposits and the high grade/high operating costs carbonatite deposits.

The focus is to acquire known REE assets and also prospecting targets in East and South Africa along the East African Rift System, which is known to be the home of some of the richest Carbonatite-hosted REE deposits on the planet. A facet of the company's multi-asset and multi-country strategy is that the team has widened its net to include a number of different geological settings for REE projects that also encompasses Ionic Clays, hydrothermal and tailings. Although the presence of Ionic Clay REE deposits has only been recognised relatively recently in this region, they are ideal targets for Altona's exploration work.

After all the disappointments, a couple of years ago Altona was being forced into the position of going private. Instead, the management team opted to list the company on the precursor of the Aquis Exchange. This has been a useful stop gap where £3 million has been raised, sufficient to move the flagship project through Phase 1 and part way through Phase 2. Altona raised funds initially on AQSE at 6.5p (in December 2020 & March 2021 all the way up to 14p, (September 2021), but since then has watched the share price drift lower to the 8p level on the back of a single large investor unwinding his position. **There is a large price disconnect here as we believe that such a derisory price is completely unrepresentative of the value that is being created, highlighted by the analysis of peer group comparisons.**

Altona is just at the start of its journey, and we believe that the share price could enjoy a good ride on successful drilling results, feasibility studies and the announcement of new projects, plus, the additional uplift on REE supply and demand concerns. Peer group companies like Rare Element Resources and Rainbow Rare Earths are currently trading on market capitalisations of £86 million and £62 million respectively, which really shows the sort of valuation that can be achieved in this hot sector. **Against such a backdrop, Altona still has that entire journey ahead of them. We see excellent opportunities being created for investors and thus initiate coverage of Altona Rare Earths with a Speculative Buy stance and a share price target of 33.7p.**

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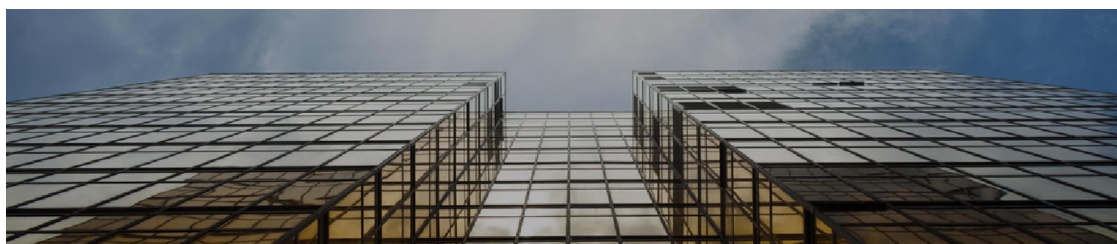
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