ASX RELEASE
15 November 2019

Preliminary Feasibility Study

Pensana Metals Ltd (ASX: PM8) is pleased to provide the results of the Preliminary Feasibility Study (''**Study**'') for the Longonjo NdPr Project ("**Longonjo Project**") located in an infrastructure rich region of Angola.

The Study has been coordinated by Wood Group and is based on open pit mining and two-phase development of a 2 million tonnes per year processing plant and associated infrastructure, producing on average 56,000 tonnes per year of NdPr concentrate for export.

The Study supports a sustainable operation with initial capital costs of approximately US$131 million and strong cashflows from the first year of production.

Cautionary Statement

The Study capital costs are prepared to an overall accuracy of -15% +35% by Wood and are based on the material assumptions outlined in Table 1 following and elsewhere in this report.

The Mineral Resources underpinning the production target have been prepared by Rodney Brown of SRK Consulting (Australasia) Pty Ltd, who is a competent person in accordance with the requirements of the JORC Code (2012).

The production target and forecast financial information in this report are based on both Indicated Mineral Resources (80%) and Inferred Mineral Resources (20%). There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target and forecast financial information will be realised.

Nonetheless, the Company believes there are reasonable grounds for the inclusion of production target and forecast financial information in this report based on Inferred Mineral Resources for the following reasons:

- The viability of the project is underpinned by initial production from Indicated Mineral Resources and the payback period is based solely on Indicated Mineral Resources. Inferred Mineral Resources are not the determining factor in the project's viability.

- The Company has taken a conservative view in limiting the amount of Inferred Mineral Resources in the production schedule to under 20% of the total amount of Inferred Mineral Resources available and that is contained within an optimised economic pit shell.
- The historic conversion by the Company of Inferred Mineral Resources to Indicated Mineral Resources by infill drilling and the consistent and disseminated nature of the mineralisation, which occurs as a thick horizontal blanket at surface at surface suggests that this factor is a conservative conversion factor.
- The Company has contracted further infill drilling that is scheduled to commence in November 2019 and is aimed at demonstrating the conversion of additional Inferred to Indicated Mineral Resources.
- The supporting studies are based on extensive testwork and research completed to a high level of detail by a competent group of consultants.

The Company advises that the Study is based on technical and economic studies not yet sufficient to support the estimation of Ore Reserves. There is no certainty that further exploration work and economic assessment will result in the eventual conversion of Mineral Resources to Ore Reserves or that the production target itself, assumptions used in the Study and resulting economic outcomes will be realised.

The stated production target is based on the company's current expectations of future results or events and should not be solely relied upon by investors when making investment decisions. Further evaluation work and appropriate studies are required to establish sufficient confidence that this target will be met.

Engineering studies support capital and operating cost estimates and are based on standard extraction and processing techniques. Non-binding discussions are underway with interested parties for offtake of planned production. Discussions with third party infrastructure providers are underway. Extensive environmental baseline studies have been completed and no social, environmental, legal or regulatory impediments to development have been identified.

Highlights

Strong Project Economics Indicated

- An upfront capital cost of US$ 131 million, including mine development, process plant and infrastructure, and 15% cost growth allowance.
- Estimated 14 months construction and commissioning.
- Project economics have been evaluated under base, high and low price forecasts developed by Roskill.

	Gross Revenue	**EBITDA**	**Pre-tax IRR**	**Payback**
	$ million	$ million	%	Months
High	2,733	2,068	129%	11
Base	1,984	1,319	101%	13
Low	1,448	782	64%	17

Notes: See Table 1 for material assumptions.
Financial highlights are reported in US dollars on a 100% project basis. The production target and financial information is based on the stated Material Assumptions and additional information in the following sections of this report. Financial highlights are reported before corporation and other taxes including royalties.

Rare earth concentrate price assumptions on which the financial evaluation is based are derived from forecasts by independent industry experts as stated in Section 20 of this report.

Pensana will require new funding for its 84% share in the Longonjo Project in order to achieve the stated financial outcomes, which will result in some dilution of existing shares, the quantum of which will depend on the final equity ratio of the financing package that is yet to be arranged

- Access to major rail and power infrastructure significantly reduces the capital cost and allows for the development of the mine as a simple flotation operation producing a concentrate for export avoiding the need to invest in a complex and expensive chemical processing plant.
- The open pit mine, which has an average depth of 25 metres and a negligible strip ratio may be extended if infill drilling of some of the large amount of Inferred Mineral Resources is successful. There is also the potential to extend the near surface of blanket weathered mineralisation in several areas where it remains open along strike through additional drilling.
- As the mine progresses it will expose the underlying fresh rock material from which the company has reported some promising intersections with the potential to add a further new dimension to the project.
- The mine will be a significant NdPr producer outside China and the first major rare earth mine to be developed since 2012.
- For the first three years of operation, the project intends to process 1.5 mtpa higher grade resources, producing 60,000 tonnes of concentrate in each year and containing 4,600 tpa NdPr and 20,700 tpa TREO. From the fourth year of

operation the front end of the plant will be expanded to process 2 mtpa and maintain concentrate and NdPr production.

- Detailed front-end engineering studies have commenced, including investigation of the potential deferral of capital expenditure thereby further reducing the initial capital cost.

ESG designed in from day one

- The Company is designing into the project the highest standards of ESG compliance from the outset. The main frameworks which have been used are the Equator Principles, the very highest environmental standards and Scope 1, 2 and 3 emissions under the Green House Gas protocol (GHGP).

- Access to low carbon power from the Luaca hydro-electric dam via the national grid and local PV and storage facilities at the mine site and the use of rail rather than road transport for the concentrates will give the mine a low carbon footprint.

- The operation will use a closed circuit zero discharge process water circuit and a tailings storage facility designed to store benign tailings during operations which will be rehabilitated at the end of the mine life.

- The mine will have a positive impact on the local community by providing training for the approximately 260 jobs the mine will create, Local businesses will benefit from the opportunity to provide services to the mine. Community consultations are well advanced and ongoing with baseline studies completed. A particular focus is on training young women for technical and engineering roles.

Neodymium oxide market moving into deficit

- A number of commodity analysts have forecast that the NdPr oxide market will move into deficit in the next few years as demand takes off for magnets in EVs and other forms of transport, offshore wind turbines, military applications and a growing universe of green energy applications.

- Adamas Intelligence noted in its report Rare Earth Elements: Market Issues and Outlook Adamas Intelligence Q2 2019 that "Demand for Neodymium oxide will substantially exceed global average production by 2030 leading to shortages of these critical magnet metals if additional sources of supply are not developed"

- The processing of rare earth concentrates is limited to a small number of Chinese companies which control nearly 90% of the market. The market for sustainably sourced concentrates is expected to grow as processors come under pressure from the Chinese government and the magnet suppliers come under pressure from their international automotive customers to diversify concentrate supply away from the environmentally damaging local sources.

- In addition, due to the strategic importance of rare earths in general and neodymium in particular, a number of Governments and companies around the world are looking to develop local processing capability. These are seen as potential future customers for the mine.

Angola invites foreign investment in mining

- Under President Lorenção's government, Angola has introduced new reforms, tackled corruption, de-monopolized the supply chain, undertaken banking reforms and has set about diversifying the economy away from its dependence on oil, gas and diamonds and encouraging investment in tourism, agriculture and mining.
- The Chinese government as part of its US$217 billion investment in Africa since 2008 has invested over US$20 billion in Angola most recently in the upgrade of the port facilities at Lobito and the US$1.8 of the Benguela rail line which links the Longonjo project to the port.
- Angola is now highly rated by a number of bilateral agencies and is regarded as the UK's number one investment destination in Africa. Following Angola's application to join the Commonwealth UK Export Finance has provided over €450 million in support for healthcare and power projects.
- The Longonjo Project has received significant government support and national media interest as a flagship foreign investment in the government's efforts to diversify the economy.

Chairman Paul Atherley commented:

"We are delighted with the overall results of the Pre-Feasibility Study and in particular the project's strong economics which have set the Longonjo on the pathway to becoming a long-term sustainable producer of rare earth elements.

Once in production Longonjo will become a major supplier of neodymium in concentrate outside China at a time when demand for neodymium oxide is set to take off due to increasing demand for permanent magnets in EVs and offshore wind turbines.

The work by the team in ensuring that the upfront capital costs are low whilst designing in the highest standards of ESG and Scope 3 Emissions compliance will make the project very attractive to offtake parties and financiers.
We are also grateful for the support from the Angola Government and the British Embassy in Luanda for their ongoing support for our investment."

CEO Tim George commented:

"Our primary focus has been to take advantage of the world class rail, port and power infrastructure and keep the capital costs low and generate strong early cashflows to ensure that the project can be readily financed. We have achieved this and built into the low-cost design the very highest ESG standards.

The mine will have a low carbon footprint and we are working with the local community to ensure that the investment will have a positive impact by creating jobs, opportunities for local businesses and investment in community projects.

We very much appreciate the strong support of the local community, local and national authorities, the Huambo Province administration and the National Angolan government.

We have commenced detailed engineering studies and are looking forward to rapidly advancing the mine to the commencement of construction activities early in 2020."

Forward-Looking Statements

The results of the Study are based on forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Forward-looking information includes such things as: exchange rates; the proposed mine plan; projected concentrate production and recovery rates; uncertainties and risks regarding the estimated capital and operating costs; uncertainties and risks regarding the development timeline, including the need to obtain the necessary approvals.

Material Assumptions and Outcomes

Key assumptions which underpin the Study production target include an initial open pit and on-site processing plant operation at 1.5 million tonnes per annum throughput followed by an expansion to 2.0 million tonnes per annum from the fourth year of production. The Study results assess the economics of an operation based on the near surface weathered zone mineralisation.

The open pit is a free dig operation with a very low strip ratio. The processing plant uses flotation to produce a high-grade rare earth concentrate that will then transported via the nearby railway to the Atlantic port at Lobito for shipment to customers.

The Study capital cost estimate (Capex) and the basis used for building that estimate were prepared by Wood. All costs are estimated in United States dollars (US$) as at 4 July 2019 and are judged to have an accuracy of -15% +35% and are considered Class 4 H as defined in the AACE document 18R-97. Owner's project execution costs and contingency have been excluded.

Key assumptions and outcomes of the results of the Study are set out in Table 1 below.

Table 1: Material Assumptions and Outcomes

PRODUCTION ASSUMPTIONS		
Life of Mine	9	years
Average grade, NdPr*	0.61	%
Average strip ratio	0.1:1	waste:feed
Average concentrate production	55,900	tpa_{dry}
Average contained NdPr in concentrate	4,200	tpa
OPERATING COSTS		
Average annual operating cost	65.5	USD million
Total site operating cost per tonne	36.2	USD / tonne
CAPITAL COSTS including growth allowance		
Mine	3.2	USD million
Process Plant	50.5	USD million
Plant Infrastructure & TSF	20.7	USD million
Area Infrastructure	3.3	USD million
Regional Infrastructure	9.7	USD million
Miscellaneous	6.3	USD million
Indirect Costs	18.0	USD million
Growth Allowance	19.3	USD million
Total Capital Pre-production	130.6	USD million
Year 4 Expansion Capital cost (funded by cashflow)	12.5	USD million
TSF expansions (funded by cashflow)	19.4	USD million
Average Annual sustaining Capital	2.9	USD million from year 6
FINANCIAL METRICS (BASE CASE)		
Consolidated total revenue	1,984	USD million
Consolidated average annual revenue	220	USD million
Total Consolidated cash generation (pre tax and royalties)	1,130	USD million
Average annual EBITDA	146	USD million
IRR pre-tax and royalties	101	%
Payback period (from start of operations)	13	months
CONCENTRATE ASSUMPTIONS		
Concentrate grade	7.5	% NdPr
Concentrate Price (year 1)	3,821	USD / tonne

*TREO = total rare earth oxides, the sum of 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
*NdPr = Neodymium + praseodymium oxide and is included within TREO
NdPr is expected to represent approximately 91% of the potential value of the concentrate

The Company has adopted a seamless approach to identifying risks and prioritising risk mitigation in its final investment decision. The Company believes that the following additional work will enable completion of a definitive feasibility study:

- Conversion of further Inferred Mineral Resources to Indicated Mineral Resources;
- Optimisation of metallurgical process capital deployment and completion of pilot plant test-work, to demonstrate off-takers' acceptance of the mine's production;
- Application of fiscal incentives established in the Company's Mining Investment Contract;
- Completion of option studies on tailings storage facility;
- Completion of current geotechnical studies.

Contents

1 Development Strategy

Pensana's vision is to rapidly develop the Longonjo NdPr Project into production in time to meet the increasing demand for magnet metal raw materials that is widely predicted for the electrification of vehicles, wind turbines and a growing universe of green energy applications.

The Company has a simple development strategy for Longonjo that reduces risk and capital requirements. Taking advantage of the modern infrastructure already in place on the project's doorstep to establish early production from a free dig open pit mine and flotation processing plant, Longonjo will produce a high-grade rare earth concentrate for direct sale to international customers.

Pensana is well positioned to develop the impressive in-situ resource, building on the existing infrastructure and supportive environment in Angola, with technical expertise from Australia, and access to international investors through London capital markets. The Company aims to make a major investment in the resurgence of the Angolan mining sector, supporting the Government's diversification policy and providing valuable investment.

The Company has engaged Wood Group, an internationally recognised engineering house, to continue the Study for near term, low cost production from Longonjo, with the opportunity for subsequent expansion of the plant.

Pensana has identified a practical path to early development that aims to position Longonjo as an important supplier of NdPr raw materials in time to meet looming demand from renewable electrification

1.1 Financial Support

Pensana's Board and management have extensive experience in financing and developing mid-tier scale mining projects. The Company is very mindful of the difficulties some junior developers have experienced securing funding in recent times and as a consequence some of them have paid high costs for finance and suffered excessive equity dilution. In order to alleviate these risks, the Company has designed the project to be financeable from the outset.

Based on the Board's recent experiences in funding similar sized projects in the sector and following recent discussions with likely debt and equity financiers in relation to the Longonjo Project the key requirements were to minimize the upfront capital requirement and ensuring that there is strong free cashflow generated in the early years.

The capital cost to construct the mine and concentrator has been estimated at US$131 million. As explained elsewhere in this document the project benefits from access to world class power and rail infrastructure which results in a considerably lower funding requirement than that for many other projects of equivalent size. In addition, the strong early cashflows result in an early payback making the project suitable for debt financing.

The Company has commenced discussions with a wide range of financiers from institutional equity, through conventional project finance, bond finance to various forms of private equity finance. In addition, the Company has received approaches from royalty streamers and other financiers and intermediaries to fund the project. Fidelity UK, one the country's largest fund managers has taken a 10% stake in the Company and RFC Ambrian has introduced the Company to over 90 institutions in London - a large number of whom have expressed strong interest in funding the Company once listed on the LSE. The Company has recently presented to over 25 institutional investors in Munich and Zurich, a number of which have expressed strong interest in investing in the Company. Through an advisor the Company has received in-principle advice from three Scandinavian banks that they are happy to provide debt funds to the project in Angola (these banks are already lenders to the Angolan oil and gas sector).

In the last 12 months there were a number of lithium and base metal concentrate projects that successfully completed funding arrangements. These projects were financed by a range of different methods, including traditional equity, strategic equity, senior secured loan facilities, sale of royalty, joint ventures, mergers, takeovers, and sale of a minority interests, including:

- Altura Mining Ltd (Mar 2019) – completed a A$38mm financing package comprising an institutional placement and SPP to fund its Altura lithium project in Australia;
- Core Lithium Ltd (Jun 2019) – completed A$8mm strategic investment via the sale of a 2.5% royalty from its Finniss lithium project in Australia, and also secured A$29mm of offtake prepayment from Sichuan Yahua Industrial;
- Kidman Resources Ltd (May 2019) – entered into a scheme of arrangement whereby Wesfarmers will acquire Kidman and its Mt Holland lithium project in Australia for a transaction value of approximately A$776mm;
- Kidman Resources Ltd (May 2018) – entered into a binding lithium hydroxide offtake agreement with Tesla for a 3-year fixed-price take-or-pay offtake from its Mt Holland lithium project in Australia;
- Galaxy Resources Ltd (Mar 2019) – completed US$280mm sale to POSCO of a package of tenements located to the north of its Sal de Vida lithium project in Argentina;
- GXY also entered into a strategic placement in Alliance Mineral Assets Ltd (ASX.A40) in May 2019 subscribing for A$22.5mm in equity.

- Alliance Mineral Assets Ltd (May 2019) – completed A$32mm strategic and institutional placements to provide funding for capital expenditures at its Bald Hill lithium and tantalum mine in Australia;

- Liontown Resources Ltd (Aug 2019) – completed A$18mm equity raising to fund development of its Kathleen Valley lithium project in Australia;

- Mineral Resources Ltd (Aug 2019) – announced revised sale terms whereby Albemarle will purchase 60% of its Wodgina lithium project in Australia in return for US$820mm in cash and a 40% interest in the first two 25ktpa lithium hydroxide conversion units currently being built by Albemarle in WA;

- Pilbara Minerals Ltd (Mar 2019) – commenced a partnering process that will consider a range of potential transactions including the sale of a minority interest of between 20% and 49% in its Pilgangoora lithium project, offtake arrangements for the Stage 3 expansion and/or the creation of a newly established joint venture to develop a second chemical conversion facility, either locally or internationally;

- Tawana Resources Ltd (Apr 2018) – merged with Alliance Mineral Assets Ltd with the combined entity having a market capitalisation of A$446mm and undertook a A$20mm underwritten placement to fund ongoing commissioning of the Bald Hill mine. Alliance also undertook a A$25mm underwritten placement at the same time;

- Nemaska Lithium Corporation (July 2019) – announced an underwritten right offering for C$600mm to be led by Pallinghurst Group, a UK-based resources private equity investor. Nemaska is developing an integrated spodumene-to-hydroxide project in Quebec, Canada, and raised US$805mm in 2018 through equity, debt and royalty financings to initiate project construction;

- Lithium Americas (Apr 2019) – announced a US$160mm project equity investment by Ganfeng Lithium to fund the construction of the Cauchari lithium brine project in Argentina. Ganfeng has additionally committed US$250mm of debt to Lithium Americas as part of the company's project financing; and

- Bacanora Lithium (May 2019) – announced strategic investments by Ganfeng Limited aggregating £22mm to underpin the US$420mm financing required to develop Bacanora's lithium clay project in Sonora, Mexico.

The capital raisings, financings and transactions achieved above demonstrate the availability of appropriate funding for similar type and scale projects in a range of different jurisdictions around the world.

The Company considers that given the nature of the Longonjo project, funding is likely to involve debt and equity and possibly strategic investors and end user customers, with potential funding sources including, but not limited to traditional equity and debt, offtake prepayments and streams, royalty prepayments and streams, and strategic equity, at either the company and/or project level.

The Company is debt free and is in a good financial position, with approximately US$1.8 million cash on hand and is expecting to undertake an institutional equity raise following the release of the Study around the time of the listing on the LSE.

Pensana's Chairman Paul Atherley was previously an Executive Director of HSBC where he undertook a wide range of debt and equity financings for mid-tier mining companies. More recently he was CEO at Berkeley Energia which raised over US$155 million in debt and equity funding to develop the Salamanca uranium project in Spain - a project similar in scope to the Longonjo project.

Mr Atherley was also based in Beijing for nearly ten years and was Chairman of the British Chamber of Commerce and Vice Chairman of the China Britain Business council representing British business interests in the country. He developed strong relationships with Chinese government and state-owned enterprises. He is drawing on this experience working with various government and non-government enterprises in securing offtake and other arrangements to assist in the marketing of the Company's concentrate.

CEO Tim George is a Minerals Engineer, leveraging over 30 years of experience in the mining and engineering sectors, with a broad experience in mining project development throughout Sub-Saharan Africa. He holds an honours degree in Minerals Engineering from Leeds University and has spent over a decade in production management at several Anglo-American operations in Africa. He was also involved in the plant design and feasibility studies in various base and precious metal projects. He has a history of experience in Angola in 1999-2002 as MD of construction & engineering projects totaling over $80m in Luanda and between 2005-7 raising over £10m to fund exploration for AIM listed Xceldiam Ltd subsequently bought out by Petra for £32m.

COO, Mr. Hammond has over 28 years' technical, resource definition and project development experience in Africa, Australia, and South America. Until recently, he held the position of the Technical Director with Peak Resources Ltd for seven years where he led all exploration, resource definition, and technical study teams, from the second drill hole of the deposit through resource, reserve, to scoping study and prefeasibility. David holds a Master of Science (M.Sc.) and a Diploma of Imperial College (DIC) from the Royal School of Mines Imperial College London. He is a member of AUSIMM and a competent person for JORC reporting.
NED, Mr. Hohnen has experience in the Japanese, Chinese and Korean markets, all of which play a significant role in the production of lithium-ion batteries and the development of electric vehicle technology. Mr. Hohnen has been involved in the mineral resource sector since the late 1970s. He has had extensive international business experience in a wide range of industries including mining and exploration, property, investment, software, and agriculture. He has held a number of directorships in both public and private companies and was founding Chairman of

Cape Mentelle and Cloudy Bay wines, as well as being on the board of oil and coal company Anglo Pacific Resources Plc. Mr. Hohnen was the director of Kalahari Minerals and Extract Resources, during which time he successfully negotiated the sale of both companies to Taurus (CGN). He also served as chairman of ASX listed, Boss Resources Limited and director of Salt Lake Potash Limited

NED, Mr. Maclachlan has over 35 years' investment banking experience in Europe, South East Asia, and Australia and extensive experience in public company directorships. He currently serves as chairman and a major shareholder in Markham Associates, a private UK partnership, which undertakes financial consultancy and direct investment activities in the junior mining sector in Europe, Australia, and South East Asia. Mr. Maclachlan was a director of Extract Resources Ltd and Kalahari Minerals Plc. Both Extract Resources and Kalahari Minerals were the subjects of successful takeovers for $2.1 billion and £651 million respectively. Having been on the boards of several companies listed on the ASX, AIM, and TSX, Mr. Maclachlan has considerable public company experience in the mining sector.

Pensana's shares are listed on the Australian Securities Exchange ("ASX") and the Company in the process for applying for a standard dual listing on the Main Board of the London stock exchange. This listing will give the Company direct access to a wide range of generalist institutional investors which have expressed interest in owning a company with exposure to one of the metals highly leveraged to the energy transition thematic. This sector is an area of growing interest in the UK capital markets.

As a result, the Board has a high level of confidence that the Longonjo Project will be able to secure funding in due course, having particular regard to:

- Required capital expenditure;
- Pensana's market capitalization;
- Recent funding activities by Directors in respect of other resource projects;
- Recently completed funding arrangements for similar or larger scale development projects;
- The range of potential funding options available;
- The favorable key metrics generated by the Project; and
- Investor interest to date.

1.2 ESG vision

The Company is designing into the project the highest standards of ESG compliance from the outset. The main frameworks which have been used are the Equator Principles, the very highest environmental standards and Scope 1, 2 and 3 emissions under the Green House Gas protocol (GHGP).

The Company is designing the project in an environmentally and socially responsible manner through, *inter alia,* minimising the project footprint, maintaining a zero discharge policy and the use of renewable power from the new hydroelectric dams recently commissioned in Angola. This sustainable and ethical approach to development also makes good business sense for a commodity of such importance to the reduction of greenhouse gases and generation of green energy.

There is no habitation on the envisaged mine footprint area. The land being covered by bushland or some small-scale farming and grazing by the surrounding local people. The Company and Longonjo Project enjoy the strong support of the local community, local and national authorities, the Huambo Province administration and the National Angolan government. The project is recognised as a long life, sustainable operation that represents a diversification of Angola's resource industry currently dominated by oil and diamonds. The development of Longonjo will also bring welcome foreign investment, employment, training and economic benefits. The government supports the Company and the Longonjo Project as an illustration that Angola is 'open for business' to foreign investment in its resources sector.

2 Study Team

The Company has appointed a range of top tier mining industry consultants to complete the Study, led by the Wood Group:

Area of Expertise	Consultant
Lead Engineer, TSF, infrastructure, mining, process plant engineering, cost estimation, surface water management	Wood Group
Mineral Resource estimate and model	SRK Consulting
Environmental and social impact assessment (ESIA) and baseline studies	HCV Africa
Environmental and Social assessment, stakeholder engagement - Angola	Grupo Simples
Angola Legal	AVM Advogadas
Australian Legal	DLA Piper
Metallurgical consultant	Mr Vic McLaglen
Metallurgical testwork facility - flotation	Auralia Metallurgy
Metallurgical testwork - comminution	Bureau Veritas Minerals
Mineralogy testwork	ALS Mineralogy
Geological Consultant	Dr Wally Witt
Geotechnical studies	ARQ Consulting
Hydrology, Borefield testing and modelling	HCV Africa
Transport and rare earth concentrate market	Conrad Partners
Sample Assays	Nagrom Laboratories

3 Location

The Longonjo NdPr Project is located in Angola just four kilometres from a modern rail line leading directly into the Atlantic port of Lobito. A sealed national highway also lies 4 kilometres north of the project and links the provincial capital of Huambo and its airport (60 kilometres to the east) to the port at Lobito.

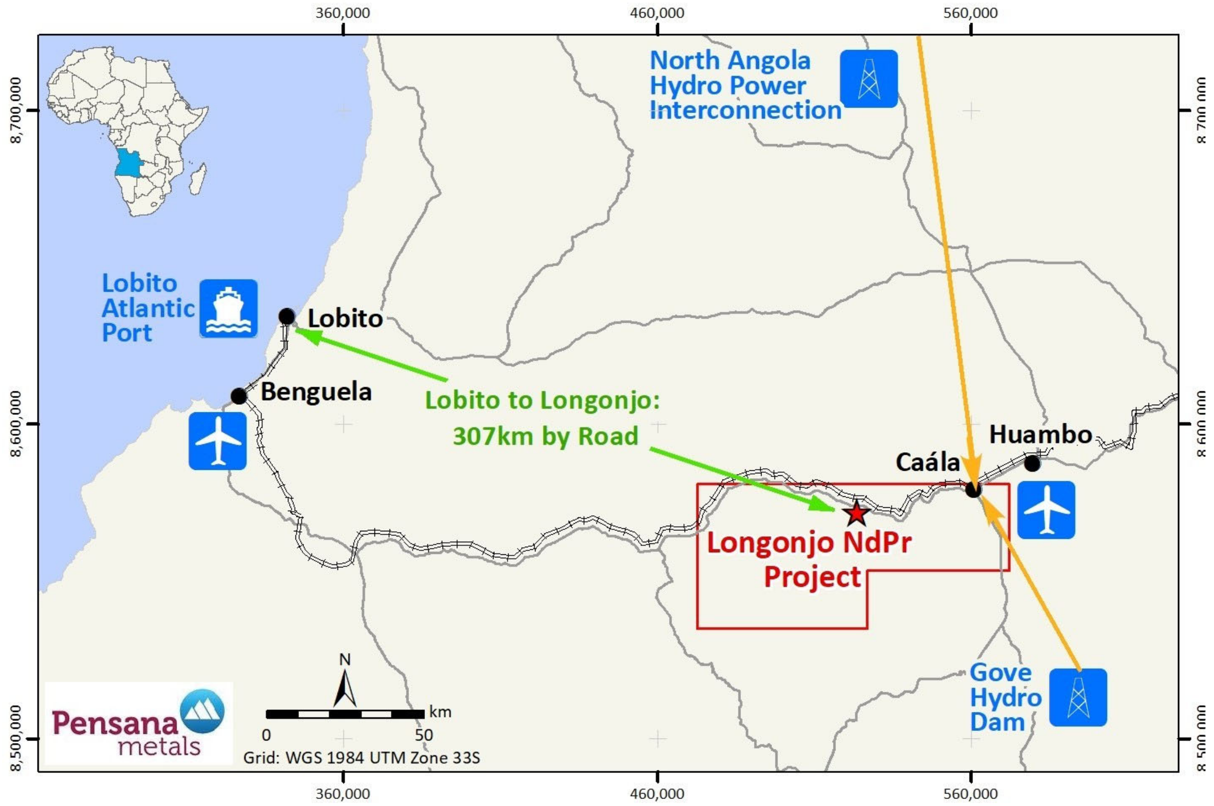


Figure 1: Longonjo is located adjacent to the Chinese-built US $1.8 billion Benguela rail line, which links the project with the Atlantic port of Lobito and on to potential customers in China. The new hydro power scheme transmission line is only 40 kilometres from the project

Huambo is approximately 600km southeast of the country's capital, Luanda.

The municipality of Longonjo has four districts including Longonjo (consisting of 60 villages), Catabola, Chilata and Lépi and has a population of approximately 90,000 people.

Figure 2: Longonjo is favourably located close to existing infrastructure that includes a sealed national highway and rail linking the Longonjo Project to the deep water sea port at Lobito to the west, and the provincial capital of Huambo 60km to the east.

4 Title and Ownership

The Longonjo NdPr Project lies within granted Prospecting Licence (013/03/09T.P/ANG M.G.M/2015) that covers a land area of 3,670 kilometres.

Pensana Metals Ltd holds an 84% interest in Longonjo through its 84% holding in Angola registered company Ozango Minerais, S.A (Ozango), which owns 100% of the Prospecting Licence. The Angolan government holds a 10% interest and the Company's Angolan partners hold the remaining 6%.

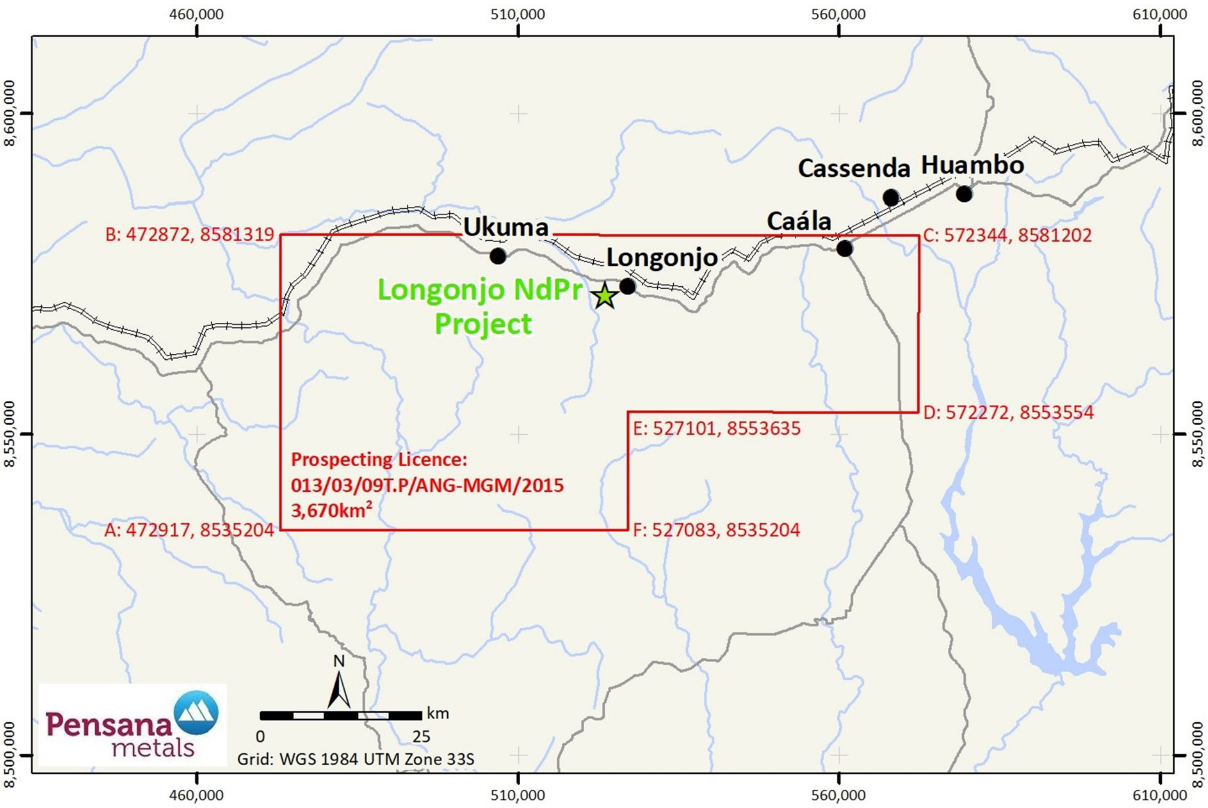


Figure 3: The Longonjo NdPr Project lies close to modern road and rail infrastructure within a large Prospecting Licence, providing ample room for development infrastructure

5 Geology

NdPr rare earth mineralisation occurs within the partially eroded Longonjo Carbonatite, a sub circular vertical diatreme (an explosive volcanic pipe) 2.2 kilometres in diameter. A ring of hills surrounds the volcanic breccia pipe composed of more resistive alerted granitic country rock (fenite).

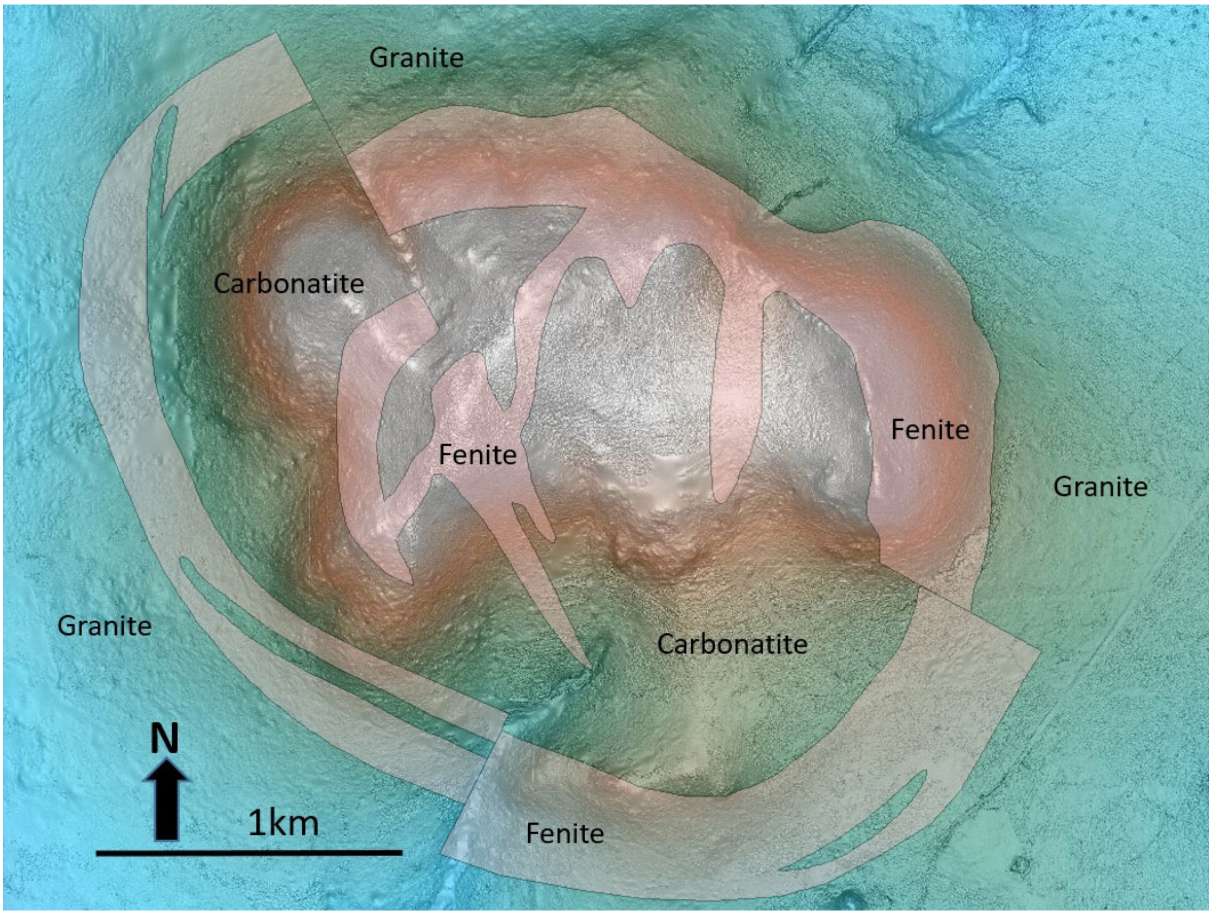


Figure 4: simplified map of the circular Longonjo Carbonatite and associated fenite rim over topographic image. The northern portion of the carbonatite is topographically elevated.

Disseminated rare earth mineralisation is particularly enriched in the near surface weathered zone, which forms a sub horizontal residual blanket of soft iron rich material. Mineralisation also occurs in fresh rock beneath the weathered zone horizon.

Natural weathering processes have removed the original carbonate minerals in the weathered zone through dissolution, thereby enriching the NdPr rare earth minerals left behind. The weathered zone and associated veneer of locally transported soil and gravel typically ranges between 20 to 30 metres in thickness but reaches 70 metres in some areas.

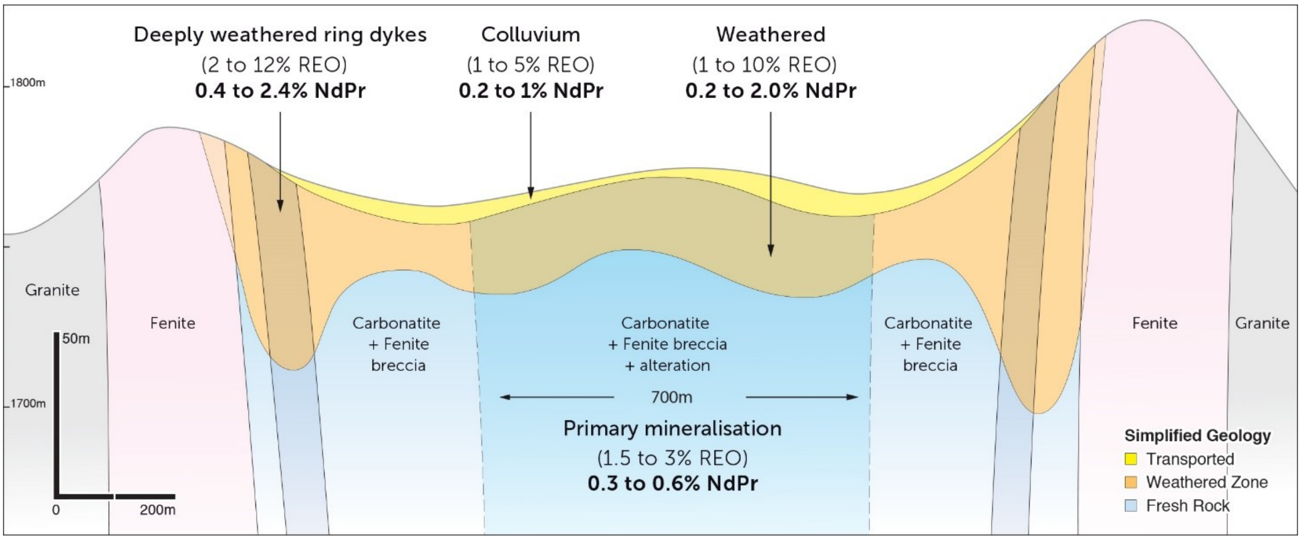


Figure 5: Schematic geological cross section across the Longonjo carbonatite showing the styles and typical grades of NdPr mineralisation. Note vertically exaggerated scale.

Rare earth minerals within the weathered zone are predominantly monazite with some bastnaesite occurring in peripheral areas.

6 Mineral Resource estimate

An updated Mineral Resource estimate has been completed for the Longonjo NdPr Project by independent consultants SRK Consulting (Australasia) Pty Ltd to incorporate data from the 66 reverse circulation and 17 diamond drill holes completed in 2019.

The Mineral Resource estimate for the Longonjo Project at a 0.1% NdPr lower grade cut off is reported in accordance with the JORC 2012 Code and Guidelines and comprises Indicated Mineral Resources and Inferred Mineral Resources:

226 million tonnes at 1.47% REO including 0.33% NdPr for 3,320,000 tonnes of REO including 735,000 tonnes NdPr

*NdPr = neodymium+praseodymium oxide. REO = total rare earth oxides. A 0.1% NdPr cut is applied. Tables 11 to 13 summarise the estimate at a range of cut off grades, material types and total rare earth oxide grades. See Table 2 for Inferred and Indicated Mineral Resources breakdown.

Within the new Mineral Resource estimate 31% of the contained NdPr is in the higher Indicated Mineral Resource category. Table 2 below provides a breakdown of the Indicated and Inferred Mineral Resources estimate at the 0.1% NdPr cut:

Table 2: Longonjo Mineral Resource estimate at 0.1% NdPr lower grade cut

Mineral Resource estimate category	Tonnes (million)	REO grade (%)	NdPr grade (%)	Contained REO (Tonnes)	Contained NdPr (Tonnes)
Indicated	59.9	1.86	0.39	1,100,000	230,000
Inferred	167	1.33	0.30	2,230,000	504,000
Total:	**226**	**1.47**	**0.33**	**3,320,000**	**735,000**

** REO includes NdPr. Figures may not sum due to rounding. See Table 13 for average distribution breakdown of individual REOs.*

The 2019 drilling was designed to infill a portion of the higher grade weathered zone mineralisation that is anticipated to be the area of initial mining to provide data to support an Indicated Mineral Resource estimate for the Study work programmes.

Drilling was also completed along the southern margin of the carbonite where mineralisation remained open along strike. Diamond drilling was included as part of the 2019 programme to provide samples for metallurgical testwork, for geotechnical information and as twins to the RC drill holes.

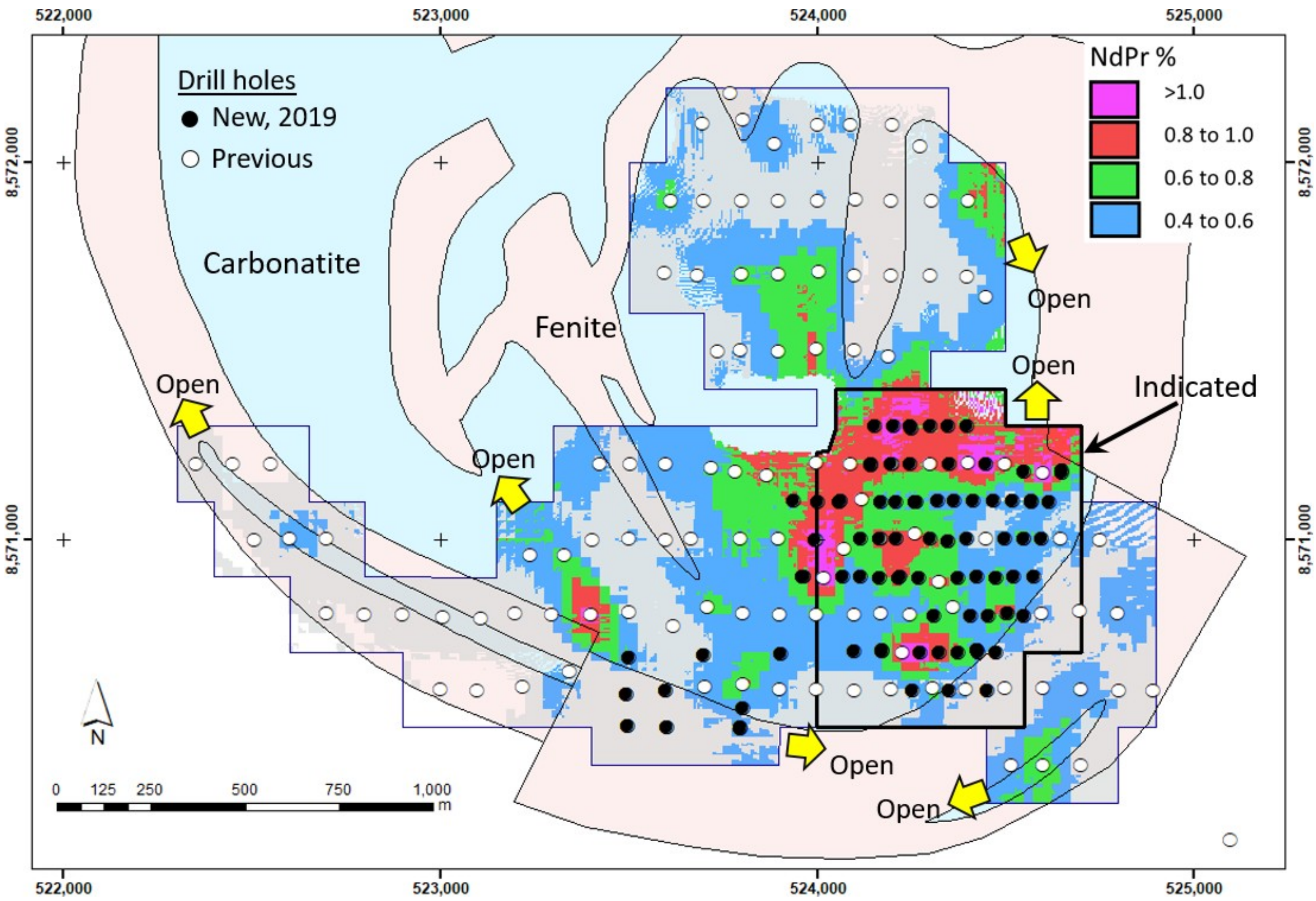


Figure 6: Plan view of 2019 drilling and the Mineral Resource block model for the weathered zone coloured by average NdPr grade over simplified geology of the Longonjo Carbonatite. Area of Indicated Mineral Resource estimate shown by black outline.

As the plan in Figure 6 shows, the high grade, near surface mineralisation still remains open in several directions, offering the potential for further extensions to the Mineral Resource estimate with additional drilling.

Further infill drilling also has good potential to increase the proportion of Indicated Mineral Resource mineralisation.

Further breakdowns of the Inferred and Indicated Mineral Resource estimate are reported in Tables 10 to 12 in the Appendix for the Total, Weathered and Fresh Rock mineralisation at a range of NdPr cut-off grades. Data and estimation criteria used in the estimates are detailed in the Material Information Summary and in JORC Code (2012) Sections 1, 2 and 3 in the Appendix.

The focus of the Study is on the initial development of the highest grade portion of the near surface weathered zone mineralisation, which is a subset of the above total Longonjo Project Mineral Resource estimate. At a higher grade cut–off of 0.2% NdPr the weathered zone Mineral Resource estimate is:

58.8 million tonnes at 2.15% REO including 0.48% NdPr for 1,260,000 tonnes of REO including 284,000 tonnes NdPr.

Table 3: Longonjo weathered zone Mineral Resource estimate at 0.20% NdPr grade cut-off

Mineral Resource estimate category	Tonnes (million)	REO grade (%)	NdPr grade (%)	Contained REO (Tonnes)	Contained NdPr (Tonnes)
Indicated	14.9	2.86	0.60	426,000	89,600
Inferred	43.9	1.90	0.44	836,000	195,000
Total:	**58.8**	**2.15**	**0.48**	**1,260,000**	**284,000**

** REO includes NdPr. Figures may not sum due to rounding. The Weathered Zone Mineral Resource estimate is contained within and is a sub-set of the total Mineral Resource for Longonjo shown in Table 2. See Table 13 for individual rare earth oxides break down*

Geology and geological interpretation

The project area covers a near vertical sub circular carbonatite plug known as the Longonjo Carbonatite that is intruded into older Neoproterozoic granitic rocks. The carbonatite is a diatreme – an explosive volcanic vent - that has been partially eroded to form a ring structure approximately 2.5 kilometres in diameter.

A more resistive fenite ring of altered granitic country rocks forms a horseshoe shaped ring of hills around the carbonatite. High level explosion breccias of mixed carbonatite and fenite form the bulk of the carbonatite body with carbonatite ring dykes and plugs cutting the northern and southern margin of the diatreme.

NdPr rare earth mineralisation is particularly enriched in the weathered zone of the carbonatite and associated colluvium. Weathering processes have removed the original carbonate minerals, leaving behind a residually enriched, ferruginous mineralised zone typically ranging from 10 to 60 metres in thickness. Mineralisation also occurs in fresh rock within a north south orientated central zone and peripheral ring dykes.

For Mineral Resource estimation, a total of five estimation domains were defined:

- Transported: A brown ferruginous surface layer of soil, iron oxide and locally transported pisolithic gravel typically 2 to 10 metres thick
- Oxide: in-situ highly weathered carbonatite and mixed carbonatite – fenite breccia. Typically, 10 to 40 metres in thickness and up to 75 metres
- Fresh: Unweathered pale grey to white carbonatite or carbonatite – fenite breccia beneath the weathered zone
- High Calcite: A small sub-domain within the oxide zone that delineates a localised zone of high calcite
- High Apatite: A small sub-domain near the oxide / fresh contact that delineates a localised zone of high apatite

The domains are defined by Pensana geologists on the basis of geological logging with geochemistry as a validation. The figure below illustrates the wireframe surfaces that constrain the mineralisation domains and grade interpolation.

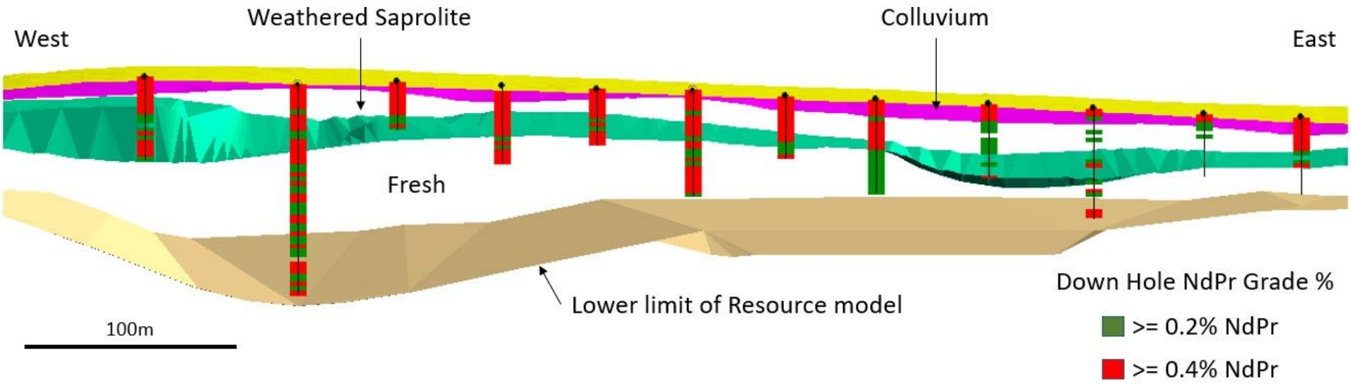


Figure 7: a detail from vertical cross section 8,571,000N displaying drilling, NdPr grade and the wireframes used in the Mineral Resource modelling to define the lithological domians: Collivium, Weathered and Fresh (Unweathered).Yellow is surface, red the base of colluvium, green the base of weathering and brown the lower limit extent of the model

Drilling techniques

Drilling within the Longonjo Carbonatite is vertical to achieve optimum sampling in the horizontal colluvium mineralisation and variable (predominantly horizontal) weathered bedrock mineralisation. Drill hole spacing is 100m x 200m with the Indicated Mineral Resources mineralisation infilled to a 50m x 100m hole spacing. The type and number of holes completed are summarised in the Table below:

Table 4: Summary of holes drilled at Longonjo**.**

Year	Drilling Type	Number of Holes	Total Metres	Typical Depth
2014	RAB	22	657	30
2017	Diamond	10	655	50
2018	RC	108	4,209	40
2019	Diamond	17	481	30
	RC	66	2,032	30
	Totals	**223**	**8,034**	

Reverse Circulation (RC) drilling (131mm diameter drill bit) was the primary drilling technique and was chosen to drill the weathered bedrock due to variably hard formations. A combination of blade in the first few metres (0 – 10m on average but up to 15m) with face hammer sampling to end of hole was used to achieve optimum sample recovery and quality.

The diamond drilling was undertaken using a PQ-sized (116mm) bit, except for LJD002 which was collared using PQ to 51.85m below surface and completed with a HQ bit to a depth of 100.4m below surface. Triple tube barrels were employed in the drilling process to ensure maximum core recovery.

Rotary Air Blast (RAB) drilling was carried out to blade refusal, or when samples returned wet. A 4.5" blade drill bit was used together with 3m rods. RAB geological logging was used as a reference to assist in building the geological model but the assays were not used to estimate the Mineral Resource.

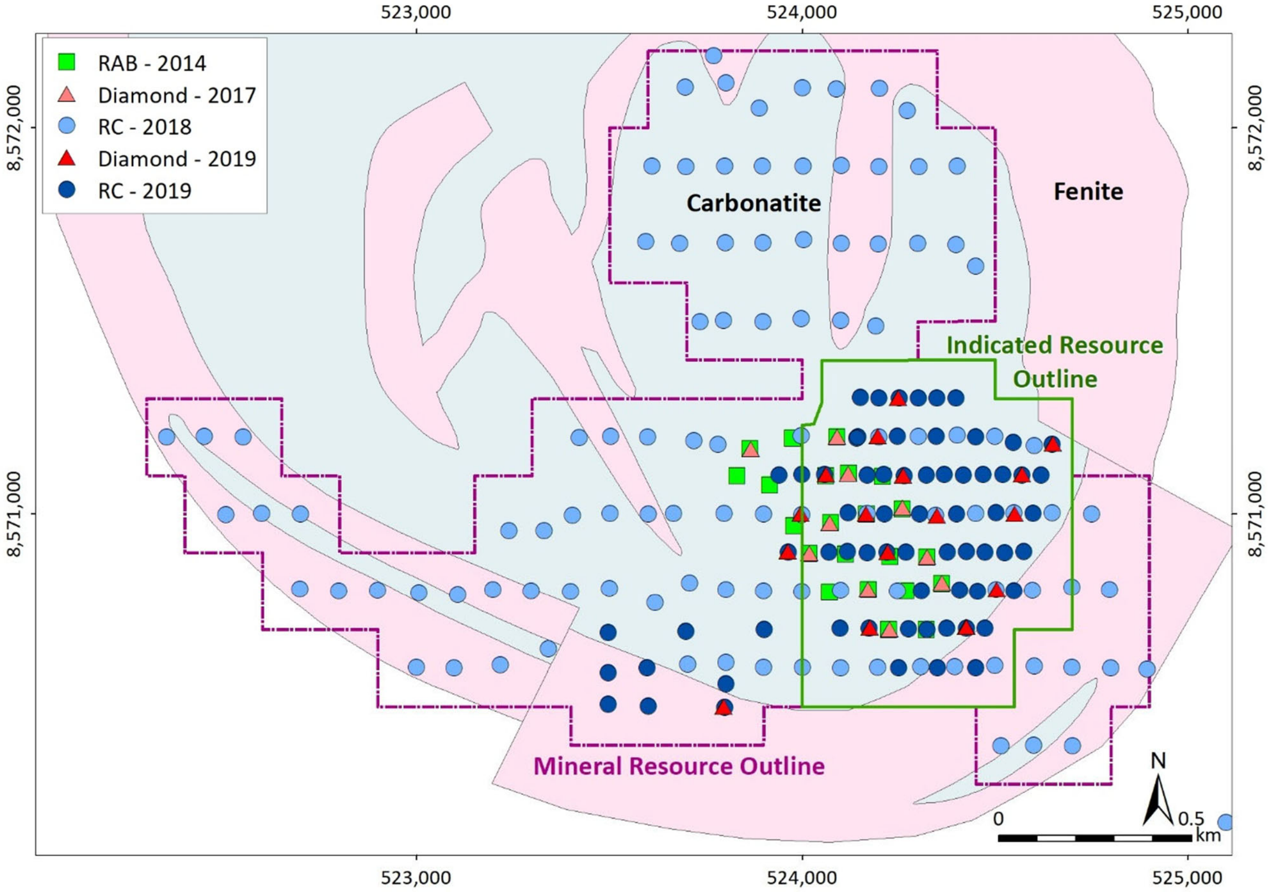


Figure 8: New Mineral Resource estimate block model extents (magenta) and drilling types on which the model is based. Geological information was used but no assay data from RAB drilling. Plan also shows extent of extrapolation from drill data – a maximum of 100m, or half the maximum drill spacing

Sampling and subsampling techniques

The Longonjo NdPr deposit has been evaluated using RC, diamond core and RAB drilling.

RC: Samples from RC drilling were collected at 1m intervals into woven polypropylene bags. Samples were riffle split using a 3-tier splitter to obtain approximately 4kg of sample from the one metre rig sample for sample preparation and combined to provide 2m composite samples for assay. All samples were riffle split when dry. Wet samples were sun-dried in a protected environment prior to sampling.

Core: Diamond core samples were collected over a nominal length of 2m within lithological units. Quarter core samples were submitted for sample preparation. The diamond core samples were cut on site using a diamond saw by an experience field technician. The less competent material such as colluvium and weathered material was quartered using a knife.

RAB: Assays from the early RAB drilling (four metre composite samples of 1m rig samples) were not used in the Mineral Resource estimate but geological logging of 1m samples collected from the rig was used to help define the geological domains. Entire down hole lengths were sampled from surface to end of hole and all samples were sent for assay.

Field duplicates, certified reference material and blanks were inserted at random and on average every 27 samples as part of company QAQC protocols to check sample preparation, analytical accuracy and sampling variance. Laboratories also run and report internal QAQC checks including assay and preparation duplicates.

Sampling analysis method

A total of 34 elements were analysed to provide accurate information on rare earth and associated gangue element concentrations.

Samples were prepared by oven drying of the full 3-4kg 2m composite RC sample, splitting to a representative 1kg sample, pulverising to 85% passing 75 micron and splitting to a representative 100g sample pulp.

On average 3kg of diamond core material was pulverised to produce a 30g charge for fusion and ICP-MS analysis, undertaken by Nagrom Laboratories, Perth, Western Australia.

Samples were assayed for Al, Ba, Ca, Ce, Dy, Er, Eu, Fe, Gd, Hf, Ho, K, La, Lu, Mg, Mn, Nb, Nd, P, Pb, Pr, S, Si, Sm, Sr, Ta, Tb, Th, Ti, Tm, U, Y, Yb, Zn, by peroxide fusion followed by ICP analysis (MS or OES as appropriate) at Nagrom Laboratories, Perth, Western Australia.

Estimation methodology

Resource estimates were prepared using conventional block modelling techniques. A single model was prepared to represent the defined extents of the mineralisation and drilling. The resource modelling and estimation study was performed using Datamine Studio RM®, Supervisor®, and X10®.

The drill spacing and the domain geometry were used to assist with the selection of a parent cell size of 25m x 50m x 2m, with a subcell size of 5m x 5m x 1m (XYZ). The model cells were flagged using the domain wireframes. A digital elevation model prepared from the topography data was used to remove cells located above the current surface.

Prior to grade estimation, the model cells were transformed relative to local datum planes, such that cells within similar parts of the profile were assigned similar elevations. Identical transforms were applied to the drill hole data to retain the original geometric relationship between the samples and model cells. These transformations were applied to improve estimation control.
Local estimates were prepared for all the analytes contained in the drillhole file. Ordinary Kriging (OK) was used for grade interpolation and all domain contacts were

treated as hard boundary constraints. Kriging neighbourhood analysis (KNA) studies were used to assist with parameter selection. Estimates were made into the discretised parent cells.

A three-pass search strategy was implemented using discoid-shaped search ellipsoids. The dimensions were primarily based on the variography studies, and the ellipsoid orientation was adjusted to match the ring structure characteristics of the carbonatite (dynamic anisotropy).

For each lithological domain, a single variogram model defined using the REO dataset was used for all analytes to ensure that any grade relationships in the estimation dataset were reproduced in the model. The REO variograms were very similar to those generated for Nd_2O_3 and Pr_6O_{11} (the other constituents of prime importance). Octant searching and keyfield (drill hole) restrictions were invoked for additional estimation control. Default grades, which were equivalent to the average grades of estimation datasets for each domain, were assigned to any cells that did not receive estimated grades. Extrapolation was limited to approximately half of the drill spacing and the vertical limit of drilling. After estimation, the model cells were back transformed to their original locations.

Dry in situ bulk density tests were performed on 231 core sample. These results were grouped according to material type (based on the weathering and rock type logging codes) and the dataset averages were used to define a default density for each of the major lithologies. These defaults were then used to assign a density value to each interval in the estimation datasets according to the interval's logging codes. These datasets were used to estimate the local dry bulk density for each parent cell in the volume model, using the same domain control, estimation approach, and estimation parameters that were used for the local geochemical grade estimates.

The average dry bulk densities for all lithology types within the three main estimation weathering domains are: Transported 1.51t/m^3; Oxide 1.42 t/m^3 and Fresh 2.53t/m^3.

Classification criteria

The Mineral Resource estimates have been classified in accordance with the JORC Code, 2012. The classifications have been applied to the Mineral Resource estimates based on consideration of the confidence in the geological interpretation, the quantity and quality of the input data, the confidence in the estimation technique, and the likely economic viability of the material. Drill hole spacing was considered to be the limiting factors. A classification of Indicated Mineral Resource was assigned to estimates in the areas with a nominal drill hole spacing of 100 x 50m. A classification of Inferred Mineral Resource was assigned to estimates in the surrounding area with a nominal drill hole spacing of up to 200 x 100 m. Extrapolation beyond the drill hole coverage was limited to approximately half of the drill hole spacing.

Resource tabulations, which were prepared for a range of NdPr cut-off grades, are presented in Tables 10 through to Table 12.

Cut-off grade

The adopted reported cut-off grade of 0.1% NdPr is selected on the basis of the current and future potential value of an NdPr concentrate, internal estimates of processing costs, the demand for NdPr and for comparison to other projects.

Mining and metallurgical methods and parameters

Selective mining of NdPr mineralisation from an open pit has been assumed for the entire deposit. The higher grade weathered mineralisation occurs as a thick blanket from surface and is likely to be predominantly free dig material with a very low waste to mineralisation ratio.

Metallurgical testwork on fresh rock and weathered mineralisation has indicated that the weathered zone mineralisation is most amenable to upgrade to a high grade concentrate using a multi stage flotation process. Optimisation work on this process is continuing. Fresh rock mineralisation is similar to other known deposits. Preliminary metallurgical testwork including gravity separation, magnetic separation and flotation processes provided some encouragement in the potential to concentrate these additional styles of mineralisation. The long mine life initially supported by the weathered mineralisation provides the company with the opportunity to optimise these processes, which could be introduced at a later stage of the operation to develop the large tonnages of this style of mineralisation available.

Tables 10 to 12 in the Appendix summarise the Mineral Resource estimate at a range of NdPr cut off grades and mineralisation styles.

7 Mining and production schedule

Mining studies completed by Wood indicate the viability of a long life, low cost open pit operation based on the weathered zone component of the Longonjo Mineral Resource estimate as completed SRK Consulting and summarised in this report.

7.1 Mining Method

The thick blanket of friable mineralisation at surface lends itself to excavation with hydraulic excavators. Haulage of plant feed and waste to their respective destinations is proposed by small haul trucks. A bench height of 5 metres has been selected to suit the geometry of the mineralisation and the readily available mining equipment. The benches can be mined in 2.5 metre flitches, where it is warranted by increased selectivity. The plant feed will be hauled to the ROM pad and dumped on dedicated stockpiles. Plant feed blending is achieved by front end loader feeding the primary breaker.

Grade control drilling will be carried out on a campaign basis with a reverse circulation drill rig. The holes are expected to be drilled in a 10m by 10m pattern. Samples are taken at 2.5 metre intervals corresponding to flitch heights.

Contractor mining is envisaged for the operation. Wood has identified reputable contract mining and earthmoving contractors with operations in Angola or the wider region, who have supplied budget quotes on the basis of preliminary mining schedules. Two contractors have provided quotations and nominated mining equipment. Both contractors nominated 70 tonne hydraulic backhoes as main excavation equipment and either Mercedes Benz Actros 25 tonne payload tippers or Bell B45E 41 tonne payload articulated dump trucks.

7.2 Geotechnical Assessment

The geotechnical site investigation comprised geotechnical logging, sampling and testing of a suit of cored exploration drill holes. This preliminary assessment is based on the geotechnical and structural logging of 16 vertical HQ3 diamond drill holes, total length 469m, plus an initial geotechnical laboratory test programme. Hydrogeological studies are in progress. Static water table generally ranges from 10 to 16 metres from surface in the mining area and mine de-watering will provide a useful source of water for the plant. Modelling of pump test data is in progress.

The geotechnical assessment identified the saprolite and weathered saprock as free-dig material, while less -weathered and more competent saprock might require dozer ripping. Although mineralised, the saprock is not classified as potential feed for the current plant. As the saprock underlies the weathered mineralised horizons, only minor amounts of saprock at the footwall mineralisation contact will be mined. Wood has assumed that these are amenable to dozer ripping.

In accordance with the geotechnical pit slope recommendations Wood has designed the pit slope configurations as shown in Table 5.

Table 5: Pit slope configuration

Pit Bench Design Configurations				
Horizon	Bench Height	Berm Width	Face Angle	Inter Ramp Angle
Residual	5m	5m	54°	30°
Saprolite	5m	5m	54°	30°
Saprock, fresh rock	5m	3m	69°	45°

7.3 Optimisation

The value of the mineralisation is based on seven rare earth oxides (Nd_2O_3, Pr_6O_{11}, Dy_2O_3, Tb_4O_7, La_2O_3, Eu_2O_3, Gd_2O_3), hence the cut-off value is expressed as monetary value, rather than equivalent grades in the optimisation process. The cut-off value is US$34.79/t during the first three years of operation, when the concentrator has a nameplate capacity of 1.5 million tonne per year. In Year 3, the concentrator is expanded to a nameplate capacity of 2 million tonne per year and the expansion is commissioned early Year 4. At 2 million tonne per year capacity, the cut-off is lower at US$30.78, due to the economies of scale.

Given the consistent nature of the mineralisation and the lithology controlled thick mineralisation, dilution of plant feed and mining losses are assumed to be insignificant. Wood has assumed no dilution and no losses for this study. Because of the lack of sterile overburden material, there is no requirement for a pre-strip.

8 Mine Design and Schedule

The mine plan envisages commencement in the areas of the laterally extensive deposit, in which the identified Indicated Mineral Resources are located.

A staged pit design was selected based on practical push back dimensions, to provide a consistent plant feed and the proposed mining rates.

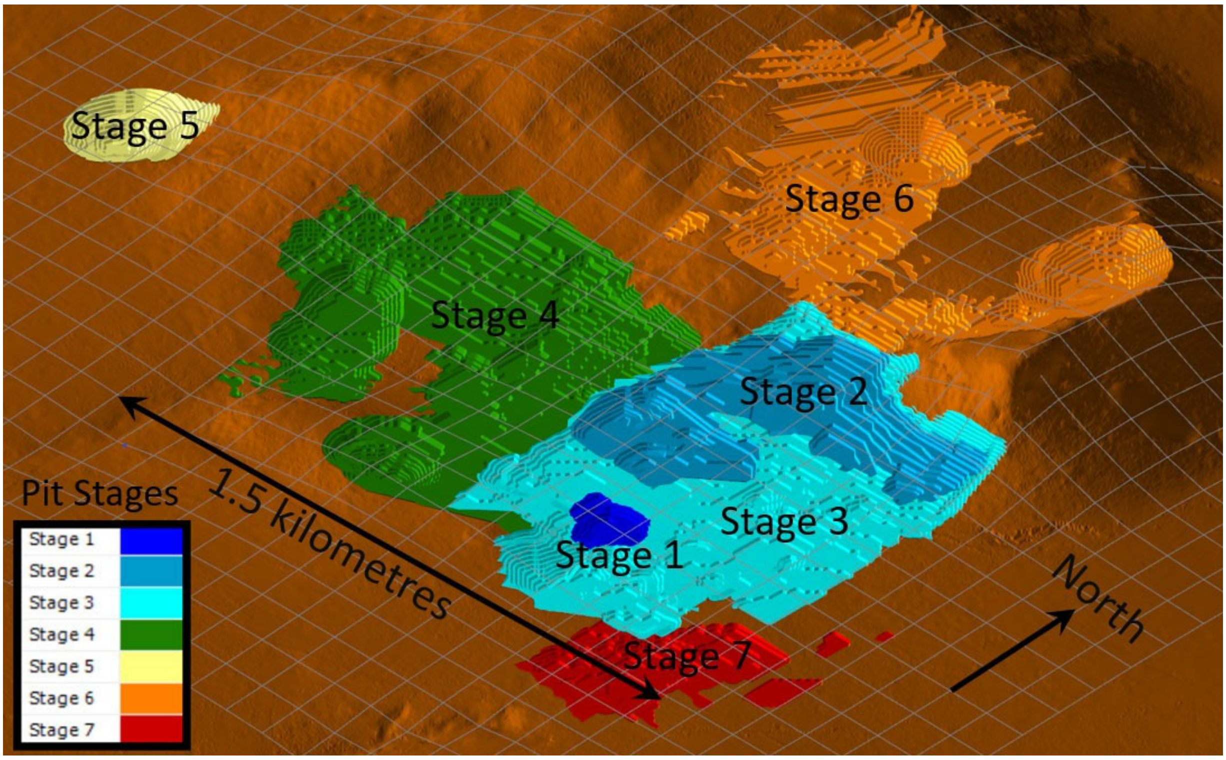


Figure 9: seven stage shallow open pit design for Longonjo weathered zone mineralisation

The first three stages were based on the Indicated Mineral Resources-only pit shells to limit the amount of Inferred Mineral Resource material being produced during early mining. The final stages were based on the Indicated and Inferred Mineral Resources material pit shell and sought to extend the Stage 3 design to the west and capture isolated mining areas as independent pit stage designs so that they could be mined independently of other stages in order to bring higher revenue forward in time.

The final pit has a large footprint of 171ha, but as the rare earth mineralisation occurs as a weathered horizontal blanket from the surface through the weathered regolith zone into the unweathered profile, the overall strip ratio is favourably low at a waste to feed ratio of 0.10 t/t. In total, only 2.0 million tonnes of waste are mined and deposited on the waste dump at the southern extension of the open pit.

Figure 10 illustrates the position of the mining pit after 2.5 years of production. The pit is mined in different stages that can partly be mined independently. Where possible, in-pit ramps are avoided; benches are accessed by out of pit haul roads. For the purpose of this study haul roads have not been designed but are accounted for in the capital estimates as allowances.

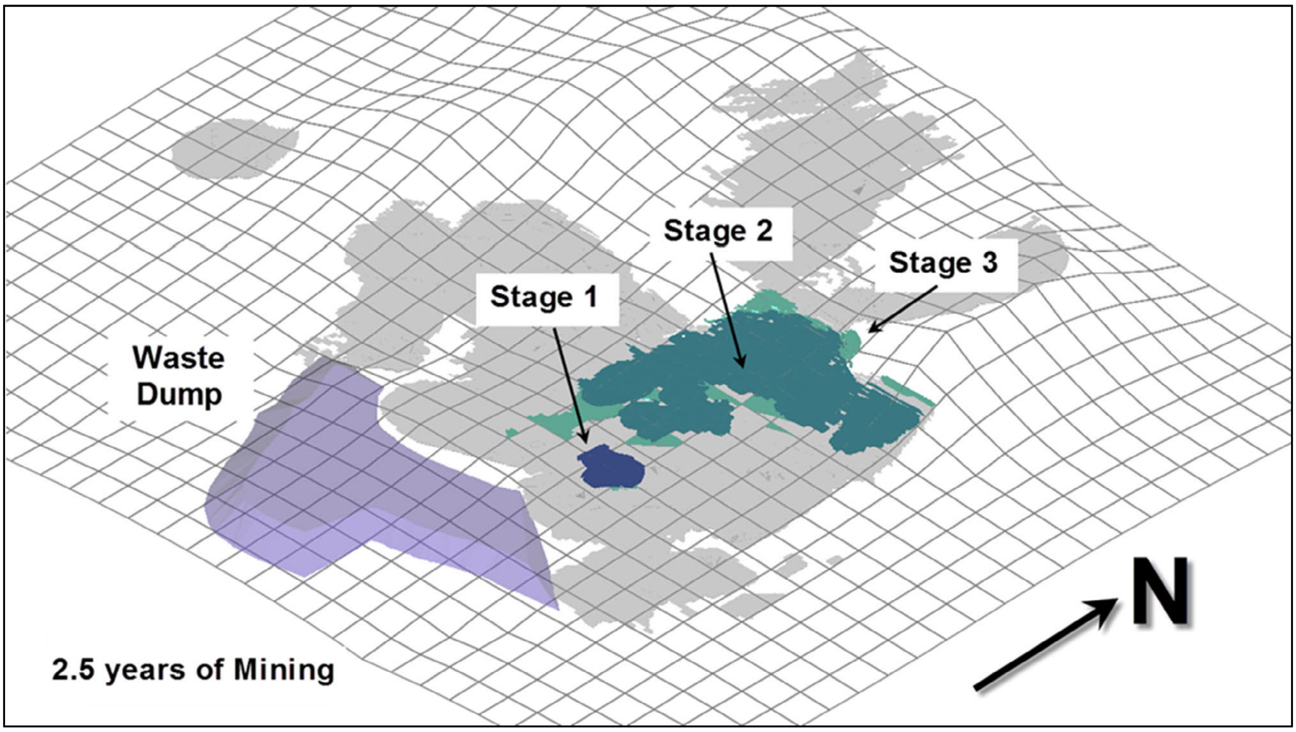


Figure 10: Perspective view of Longonjo Pit after 2.5 years. The grid is 100m by 100m. The grey shaded area illustrates the final pit.

During the first 2.5 years of production, all material fed into the processing plant is sourced from Indicated Mineral Resources. Small amounts of Inferred Mineral Resource material are mined during this period but will be stockpiled and processed later in the schedule.

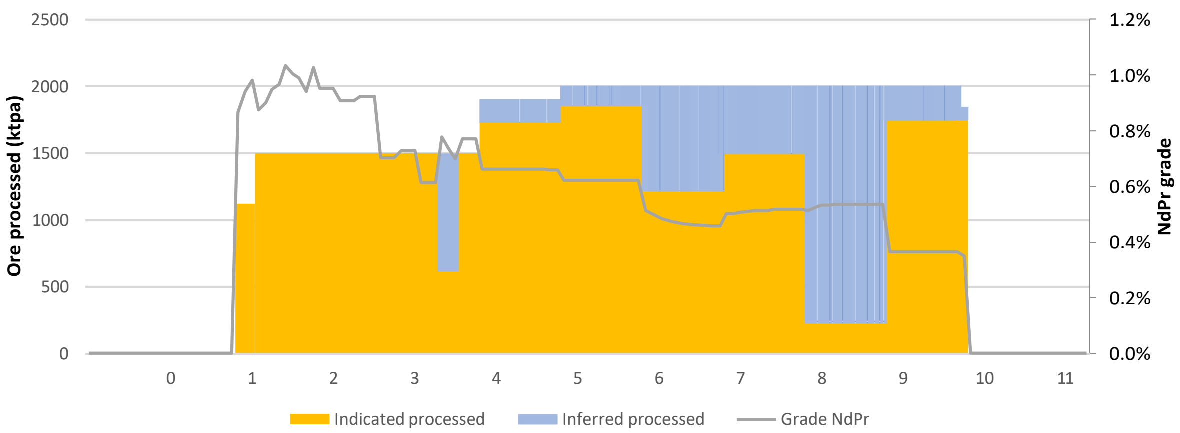


Figure 11: Grade and process plant feed by Mineral Resource category

9 Mineral Resource in Mine Plan

The Mineral Resource included in the mine plan discussed above is summarised as follows:

Table 6: Mineral Resource in mine plan

Mineral Resource in mine plan					
Plant Feed sourced from	Tonnes (Mt)	Grades (%)		Contained REO	
		NdPr Oxides [1] (%)	Payable REO Oxides[2] (%)	NdPr Oxides (kt)	Payable REO Oxides (kt)
Indicated Mineral Resources	12.5	0.64%	1.47%	79	183
Inferred Mineral Resources	3.8	0.54%	1.12%	21	43
Total	16.3	0.61%	1.39%	100	226

[1] NdPr figures include Neodymium and Praseodymium Oxides
2 Payable REO includes all REO of commercial value consisting of Nd, Pr, Dy, Tb, La, Eu, Gd oxides and excludes Ce, Sm, Ho, Er, Tm, Yb, Lu and Y oxides,,for which no value is attributed

10 Metallurgical development

Pensana has completed extensive metallurgical testwork on a range of samples in both Australia and China and has identified and demonstrated a simple but robust and effective flow sheet for Longonjo's NdPr rare earth mineralisation.

An initial programme of evaluation and sighter work testwork on a range of mineralisation styles across the deposit from fresh rock to weathered, identified that the weathered zone mineralisation responds well to metallurgical treatment and should be initially targeted for development. This is due to:

- A high in situ rare earth grade from surface
- Low content of carbonate and phosphate minerals gangue minerals, which have been removed by the natural weathering process
- Good liberation and grainsize characteristics for physical separation
- Soft friable mineralisation requiring reduced energy to crush and grind.

Pensana, through extensive comminution, bench scale and locked cycle flotation test work on Longonjo samples has developed and demonstrated a conventional but bespoke beneficiation process for the Longonjo weathered mineralisation.

The process consists of:

- Comminution – the physical liberation of rare earth minerals from host gangue minerals by crushing and grinding. The mineralisation is soft and naturally fine and has a relatively low work index, requiring only moderate crushing and grinding.
- An initial flotation stage to remove interfering gangue minerals
- Flotation targeting the recovery and concentration of rare earth minerals

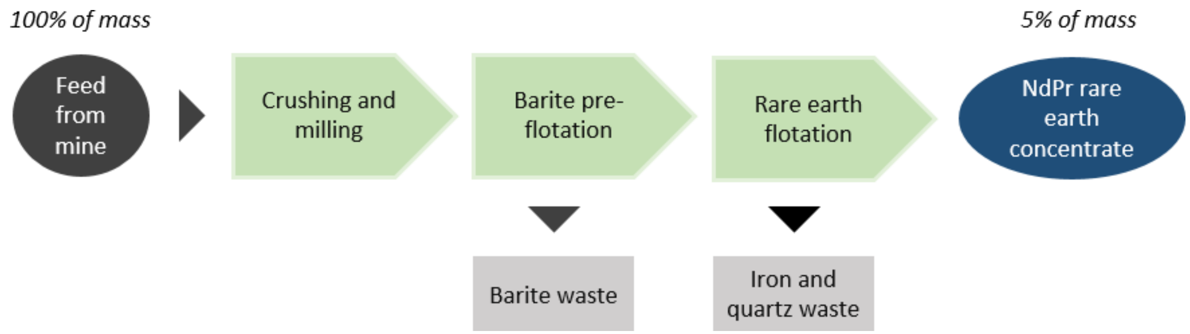


Figure12: Longonjo simplified process flow sheet

The multi-stage flotation process successfully rejects up to 95% of the original feed mass to produce a high grade rare earth mineral concentrate. The locked cycle test returned improved rare earth grades and recoveries, the results of which were adopted for the Study design.

Figure 13: Flotation tests

Additional work (*Figure 13 left*) is currently in progress on a range of new diamond drill core samples of weathered mineralisation to evaluate the potential to simplify the process and further optimise the concentrate grade and recoveries. If successful, the work has the potential to further enhance the project economics.

Test work is also in progress on samples of fresh rock mineralisation to determine the potential to provide additional feed for the operation later in the life of the project.

A bulk 60 tonne sample of Longonjo's weathered zone mineralisation has been collected and is being transported to Australia to feed planned confirmatory pilot plant testwork on the final optimised process flow sheet. The pilot work results will also provide engineering data for detailed Front-End Engineering Design (FEED), and product samples for assessment by potential customers.

10.1 Onsite Processing Plant

Pensana, with lead engineers Wood Group, have designed and completed cost estimates for a processing plant and associated infrastructure on site at Longonjo. The plant will produce a high grade NdPr mineral concentrate to be shipped from the rail siding at Longonjo station located 4 kilometres to the north of the project.

The flowsheet adopted for the Longonjo plant design is supported by test work data and incorporates mechanical equipment with a proven track record in the industry.

Tailings and product dewatering design has been based on data from similar projects and will be confirmed by vendor test work. The plant design does not feature sophisticated control systems in keeping with the desire to have a plant that is simple to operate and maintain whilst being able to accommodate variable feed mineralogy.

The Longonjo flowsheet consists of the following major process operations:

- ROM feed handling – mineralised feed receival and oversize rejection
- Comminution – open circuit primary milling followed by closed circuit ball milling and size classification using hydrocyclones
- Pre-flotation – removal of barite and other minerals
- Rare earth flotation – rougher + four stages of flotation to produce a rare earth concentrate
- Product dewatering – thickening and filtration of rare earth concentrate to a moisture content of 12 to 15% by weight
- Product packaging – bagging of filtered concentrate
- Tailings dewatering – thickening of pre-float and rare earth tailings
- Tails disposal – pumping of thickened tails to the tails storage facility (TSF)
- Decant water treatment – return of decant water from the TSF and filtration to remove rare earth flotation reagents prior to re-use in the pre-flotation circuit.

Process design criteria incorporate key results from recent flotation work and mine design/scheduling, in conjunction with pertinent data from Wood's engineering database. Key design criteria are as follows:

- Annualised processing rate of 1.5 million tonnes per annum for the first three years after ramp-up
- Expansion of the circuit to a processing capacity of 2 million tonnes per annum from Year 4
- Design operational total utilisation of 85%
- Design feed grade of 0.93% NdPr oxide
- Design concentrate production caters for peaks 0f 68,000 dry tonnes per year with an average of 56,000 dry tonnes per year

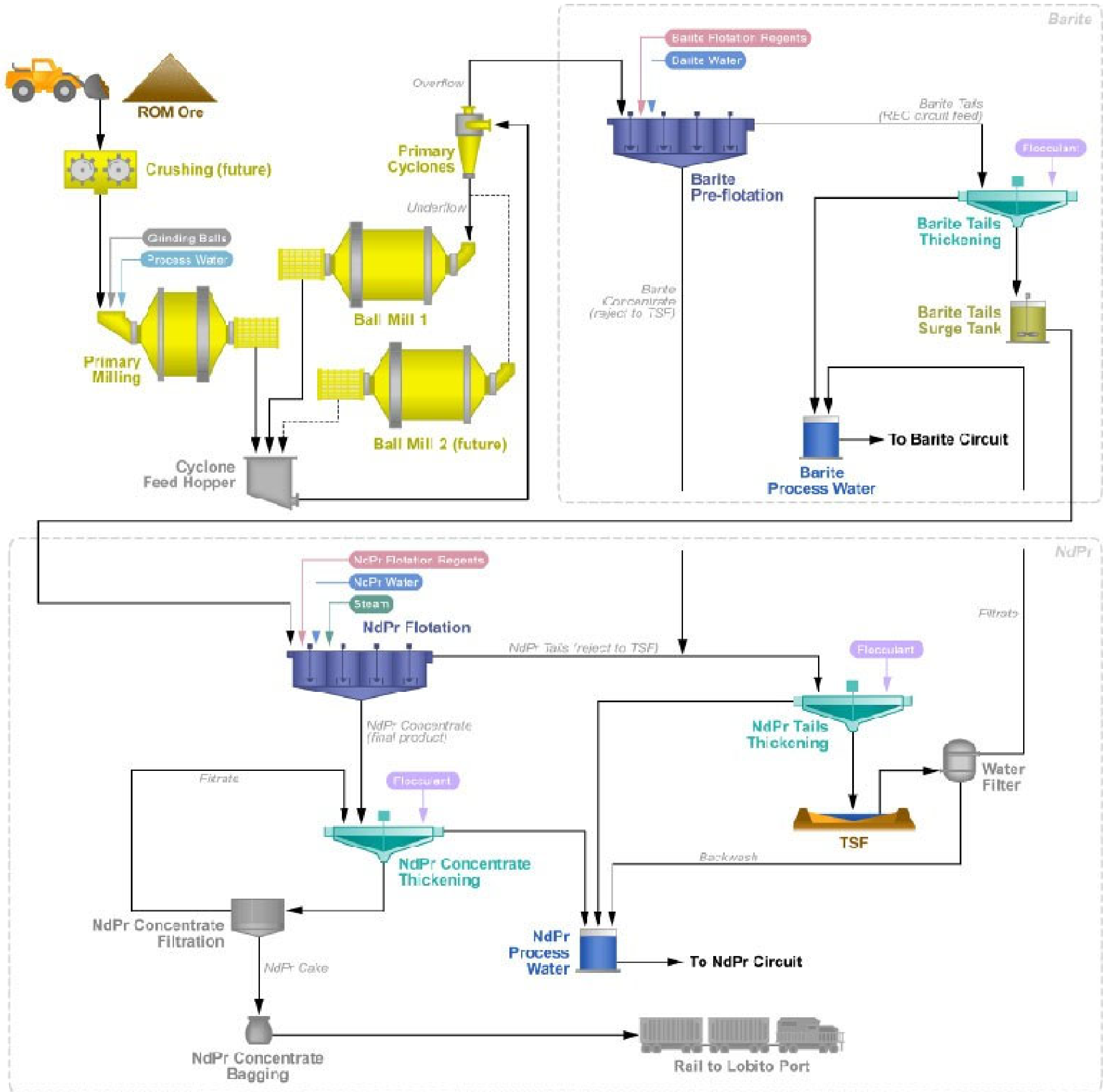


Figure 14: Simplified conceptual flowsheet.

Rare earth concentrate contained in bulk bags within sea containers will be transferred by road from the mine site to the rail siding near Longonjo town, where they will be loaded onto rail cars and transported via the Benguela railway to the Atlantic port of Lobito for export to international customers.

11 Site Infrastructure and Services

The provisional site layout has been arranged to keep the physical footprint of the operation to a minimum. The preliminary layout design for the Longonjo site is depicted in Figure 15. The site layout design has been progressed in parallel with social and environmental studies in order to minimise any potential impacts.

The layout also optimises the location of site infrastructure with respect to the open pit mine whilst considering topography, local infrastructure and several options currently under review for the location of tailings storage facilities.

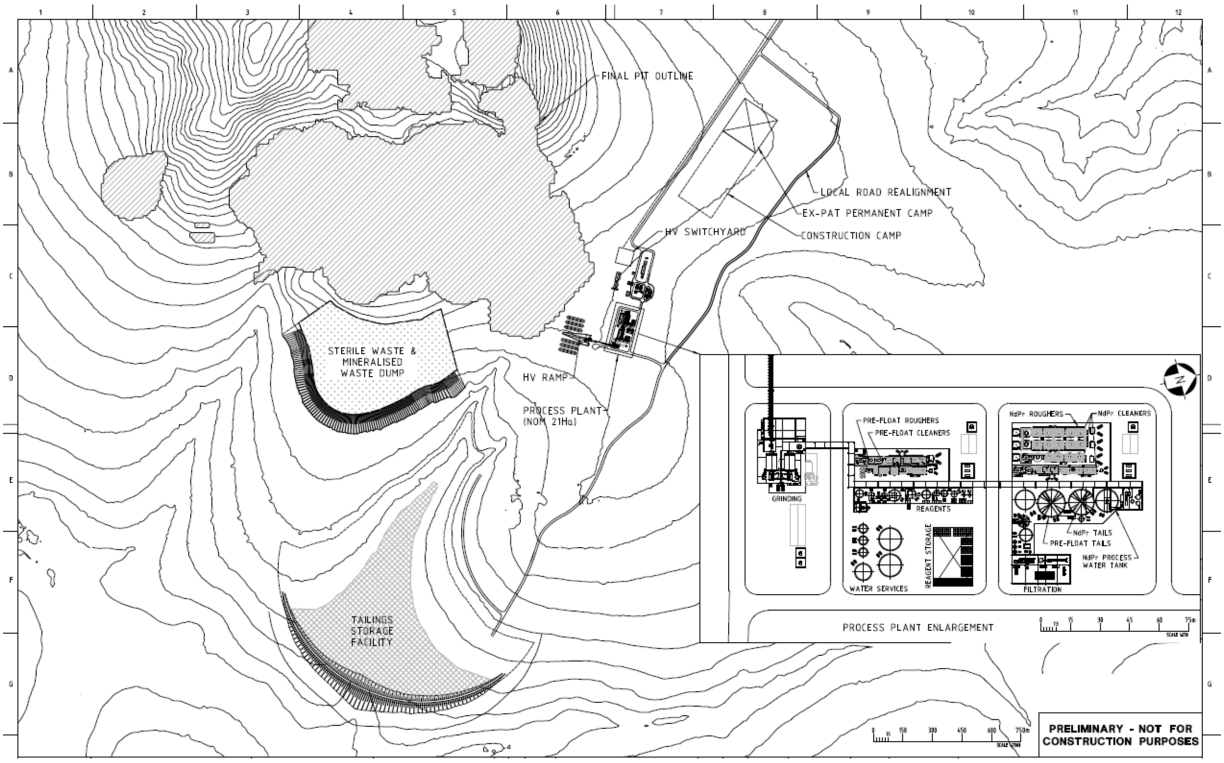


Figure 15: Site Layout

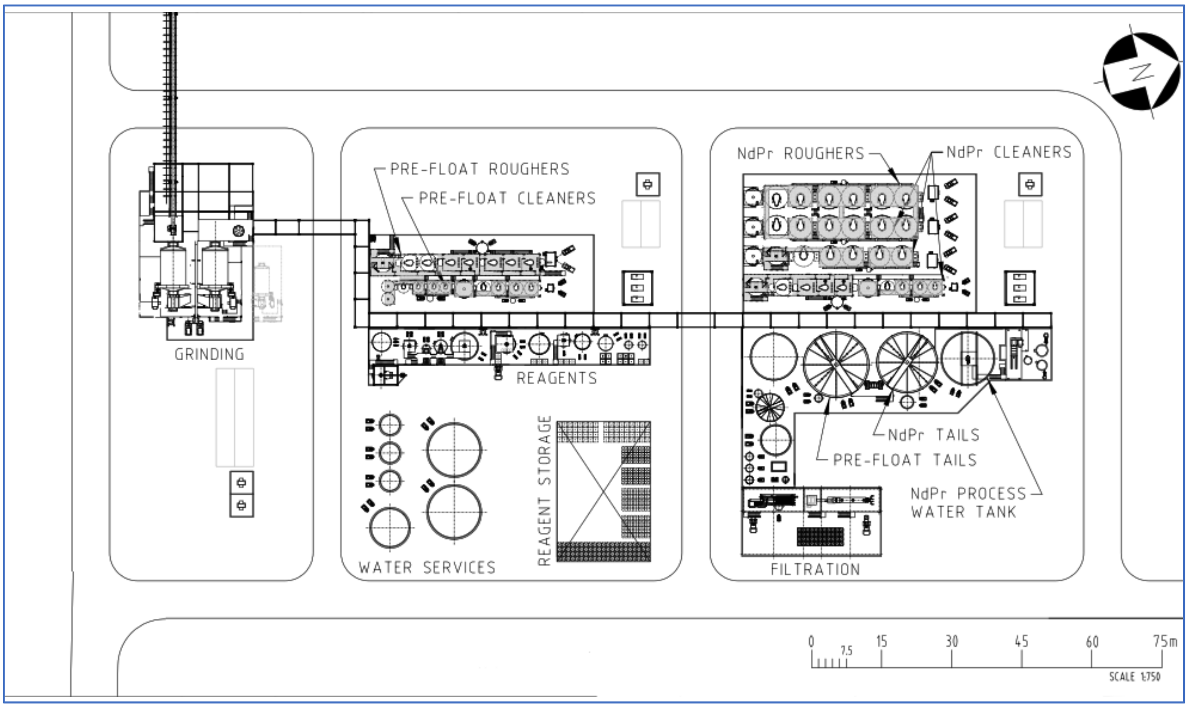


Figure 16: Plant Layout

As well as the open pit mine, ROM pad, tailings storage facility, major components of the site layout for which allowance has been made in the cost estimates also include electrical power supply, HV switchyard, water bore field, accommodation village, internal site roads, fuel storage, communications system, stormwater management infrastructure, sewerage treatment, emergency back-up power, fire protection, mobile equipment, weighbridge, site offices and workshops.

12 Electrical Power Supply

The total electrical power requirements of the operation are 15MW, with an average draw of 10MW after expansion in Year 4. Electrical power is ultimately planned to be supplied from the National grid powered by hydro schemes via a substation at Caala, located 40 km east of the project.

During construction power can be sourced from an existing hybrid solar – diesel and potential battery supplemented generator power plant at Longonjo that currently has considerable spare capacity. The local power station, located 4km from the project, has a capacity of 5MW will be able to supply the approximately 1MW required during the construction phase through a dedicated 30kV line.

The Company is considering a proposal to supply start-up power to the project by temporary expansion of the hybrid power plant's generation capacity by and independent contractor at a fixed rate during the payback period in order to reduce the initial project capex requirement

13 Water supply and recycle

Water requirements for the operation is influenced by seasonally dependant reclaimed water and rainfall from the TSF, ranging from 40 to 65L/s. Water will be recycled by filtration of process plant water and the plant's water circuit is a closed system, with no discharge to the environment being considered. Make up water will be sourced from bore fields located nearby. Water exploration completed in October 2019 has demonstrated the presence of groundwater in three areas within the carbonatite.

For the Study a borefield comprising ten production bores and associated pipe and pump network is included in the cost estimates.

14 Accommodation village and site buildings

For the initial period following start-up, operational staff will be housed in the construction camp facilities, with more on boarding of personnel occurring as construction crew numbers ramp down. Angolan local employees will be housed in Longonjo within existing accommodation.

One of the key drivers deferring initial permanent facilities is the opportunity for use of the tailings as construction material.

Cost allowances include for a series of fully fitted out and equipped commercial type buildings on site at Longonjo, based on transportable types of sufficient size for offices, change rooms, amenities, stores, laboratory, security, ablutions, and plant operation complex.

Industrial type buildings have been costed by applying concrete, steelwork and cladding rates etc. to calculated quantities. Workshop costs include all maintenance equipment and services.

15 Tailings storage

The Longonjo Project is situated in flat to mildly undulating terrain with the mine resources area located on a prominent hill rising from the surrounding lower relief (RL 1,450 m). The climate is warm, semi-arid to arid with a distinct dry and wet season. The area is sparsely vegetated with small crops and farming activities supplied from local water courses. The hilly area containing the mineral resources peaks out at around RL 1,725 m and consisted of several small incised valleys, particularly to the south, where small catchments from the top of the hill which direct run-off towards local creeks and regional main drainage courses.

The conceptual tailings storage facility (TSF) is based on the 2012 ANCOLD (Australian National Committee on Large Dams) "Guidelines on Tailings Dams". These guidelines specify some design objectives and safety standards that are recommended to be adhered to and are in general accordance with international tailings standards such as the Canadian CDA's Mining Dams Bulletin which addresses mining dams within the CDA dam safety guidelines. Angola is in medium earthquake hazard area. Based on this and the assumptions in this study, the consequence category for the proposed facility was selected as ‘‘HIGH C‟.

The assessed options for tailings storage included three valley storages on the side of the mine site hill and are based on safety, financial, environmental, operational and design requirements. In-pit storage and dry stacking options are being considered although they were not fully explored at this stage. The preferred valley storage site and deposition method has been initially selected based on a qualitative and semi quantitative methods.

An initial geotechnical site investigation has been undertaken to assess the proposed TSF foundation conditions for main embankment, seepage potential of the TSF basin and availability of construction materials for TSF embankments. Test pitting and laboratory testing was undertaken for this investigation which also investigated other civil and mining infrastructure.

The TSF will be constructed as a starter zoned embankment using local borrow material or selected open pit mine waste with three downstream raises to achieve the necessary capacity. The TSF design is likely to incorporate a compacted soil liner throughout the basin area and upstream face, stormwater diversion trench, emergency spillway to protect overtopping events and an underdrainage system.
Deposition will be from the embankment upstream and water will be returned to the plant for re-use, with the emphasis in operation to keep water away from the embankment and to keep the TSF as dry as possible.

Dam safety monitoring plan will include piezometers, monitoring bores and frequent survey monitoring.

A provisional closure concept is likely to include a final land use as “pastural” or “farming”. The closure concept will include some landform reshaping to fit with surrounding topography, visual impacts and long-term erosional stability.

16 Regional Infrastructure

The Longonjo NdPr Project has an enviable location compared to many NdPr projects, being located in an infrastructure rich part of Angola close to modern road and rail links to a new Atlantic port development, and recently commissioned hydro power scheme with excess low-cost power. The project lies just 60km west of Angola’s second largest city –Huambo – where services, a work force and airport are all available.

The project lies just 4km from the recently refurbished Benguela railway and sealed national highway that run from the Atlantic port of Lobito 300km to the west, to the provincial capital of Huambo. The high-tension national grid interconnector transmission line, from the massive new Laúca hydro power scheme in the north of Angola with a projected 2GW output, has been activated this year and currently extends to Caala, 40km to the east of the Longonjo Project.

The Company plans to access this modern infrastructure, including the existing rail siding at Longonjo where concentrate produced on site at Longonjo will be loaded and transported to Lobito port. A transmission line will be extended to Longonjo to supply low cost, green power to the project.

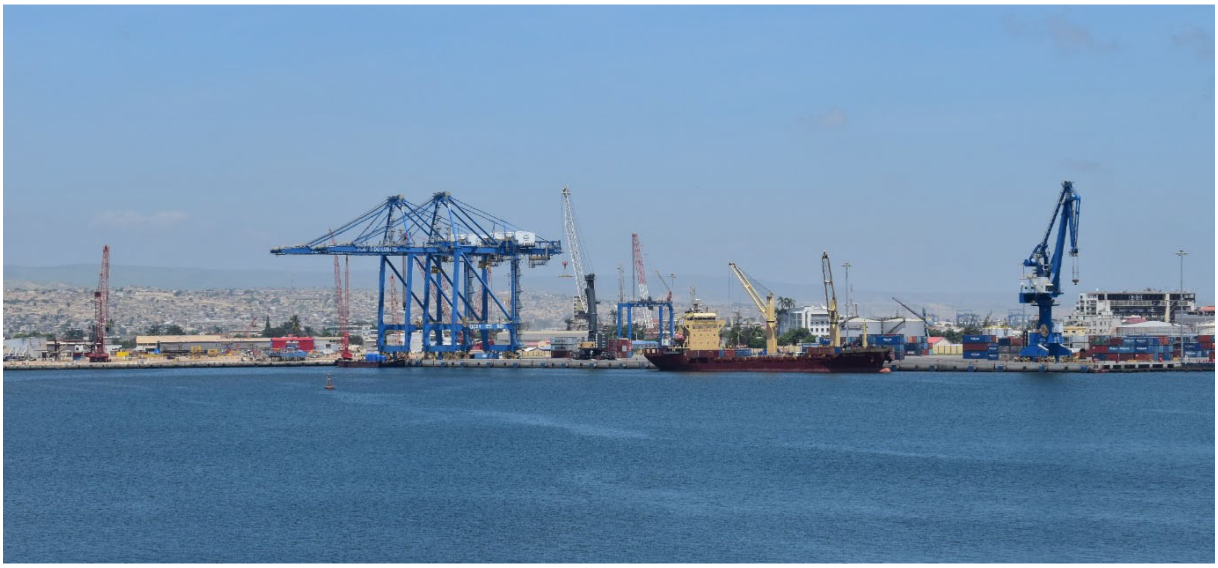
The refurbished National Highway EN260 connects Angola’s second largest city of Huambo through the municipality of Longonjo to the Atlantic port of Lobito. The rehabilitation of the road was reported to have cost US$128 million.

The Benguela Railway was reconstructed between 2006 and 2014 by the China Railway Construction Corporation at a cost of US$1.83 billion employing 100,000 Angolans. The railway extends from the border with the Democratic Republic of Congo and services the ports of Benguela and Lobito on the Atlantic coast of Angola.

The railway is Cape gauge, 1,067 mm (3 ft 6 in), which is used by most mainline railways in southern Africa. The maximum design speed is 90 km per hour. The design capacity is 20 million tons of cargo and 4 million passengers per year. There are 67 stations and 42 bridges along the route of the railway.

Figure 17: the Benguela rail line connects directly into the Lobito container (above) and dry (below) ports, which have plenty of spare capacity for additional freight

The Angolan Government invested approximately US$2 billion for the rehabilitation of the Lobito port and associated infrastructure. The new rail system links directly into the dry port, container and ore terminals at the port of Lobito. The container terminal is 414 metres long, the ore terminal has a 310-metre jetty and the dry dock has an area of 90,000 square meters.



Figures 18: Above and following: modern, underutilised infrastructure at the Lobito port

The new Laúca hydropower plant is located in the north of the country in middle part of the Kwanza River. The project consists of a main power-house with six units and an eco-power house with one unit. Total capacity of HPP Laúca will be 2,070 MW with a head of about 200 metres. It supplies renewable energy to meet the rapidly growing demand of the capital Luanda and also feeds into the national grid to the south, to the city of Huambo and to within 40 kilometres of Pensana's Longonjo

Project. The Cambambe (700MW) and Capanda (500MW) hydro schemes also connect into the grid, providing an excess of power capacity to the region.

Figure 19: Construction works on the massive new Laúca hydro power plant are now complete. Low cost hydro power now extends to within 40 kilometres of the Longonjo Project and there is an excess of 'green' power in the region

17 Environment and Social

An environmental and social impact assessment report is required to support an application for an operating licence for Longonjo. The Company has appointed specialist consultants HCV Africa to conduct the international (bankable) environmental and social impact assessment (ESIA), while Angolan based consultants Grupo Simples have been appointed to conduct the regulatory ESIA.

The Longonjo NdPr Project has been registered with the Angolan Ministry of Environment and Terms of Reference have been specified by the Ministry for the ESIA studies.

Environmental studies are at an advanced stage with dry and wet season baseline surveys for herpetofauna, botanical, avifauna, mammals, aquatic, soils and hydrology all completed. Stakeholder meetings with local communities, District and Provincial officials have been held and the project enjoys the strong support of the community and administrators. Studies are on track for the completion of a final regulatory report by the end of this year.

Outlined below are a selection of influential factors for the Longonjo Project:

- Benefit is anticipated from the development remains of the rail / road corridor for local construction materials (borrow pits, aggregate, cement batching plants)
- Angola heavily relies on imports, and emphasis placed on maximising the use of available sources will contribute to regional development
- Ex oil & gas service industry skills / expertise are available on market due to depressed oil price & reduced exploration activities
- Human capital availability in Angola, young population keen for work
- Construction camp will be temporary accommodation and used during pay-back period of operations
- Construction phase plans to make use of existing Longonjo hybrid solar plant 2MW capacity
- Borefield / in situ water sources to avoid use of local water river resources
- Facilitation of a local business opportunity for tunnelled hydroponic farming to supply food for mine complement of approximately 260 people
- Consideration of initiation of TSF pre-production to mitigate start-up water requirements until water balance achieved by TSF recovery
- Rehabilitation program of the TSF from the outset with vegetation of walls etc
- Tailings have been identified as potential raw material for brickmaking to feed into mine infrastructure development as the project matures & is de-risked
- Waste containment self-sufficiency alongside recycling, essential given no existing service provision in the area
- Human impact on water consumption reduced through use of dry composting toilets, communal ablution & laundry facilities

18 Climate

Huambo Province is located in Angola's humid sub-tropical climate zone. Two seasons can be distinguished, namely a dry cooler season from May to July and November to December and wet and warm season from January to April and again from September to October. September is the warmest month, July the coldest, October the wettest and June the driest. Figures 20 and 21 provide an indication of the average monthly temperatures and precipitation respectively for Huambo.

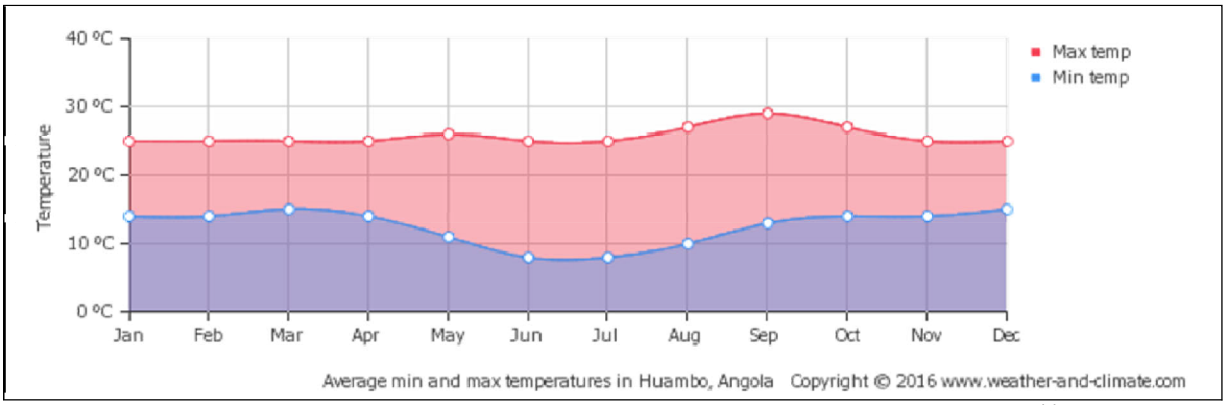


Figure 20: Average Maximum and Minimum temperatures for Huambo. Source: https://weather-and-climate.com/average-monthly-min-max-Temperature,Huambo, Angola)

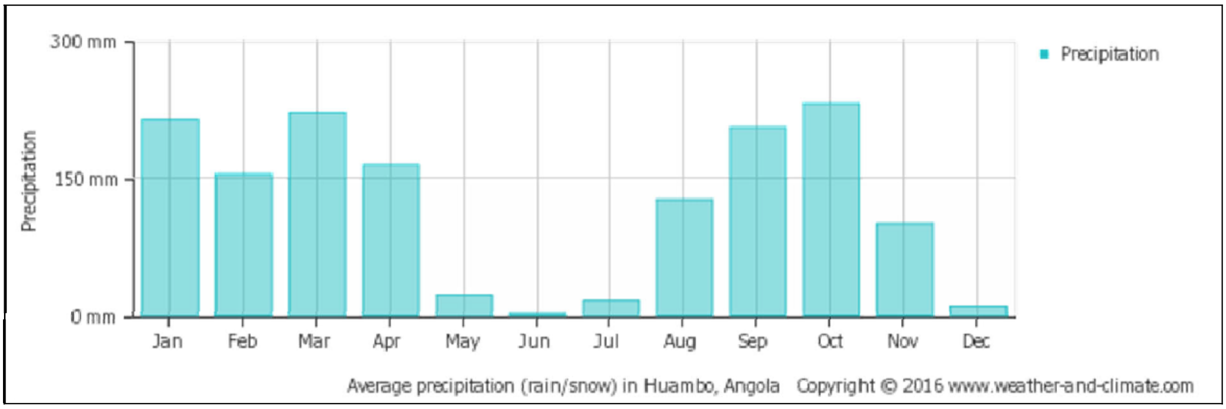


Figure 21: Average Monthly Precipitation for Huambo. Source: https://weather-and-climate.com/average-monthly-precipitation-Rainfall,Huambo, Angola

19 Magnet metal rare earth markets and prices

From wind turbines through electric vehicles, bikes and trains to trucks, drones, industrial tools, automation and robotics, the electric motor is the driving force behind a cleaner energy future. As most industries prepare to make the shift to zero-emission solutions, demand for super-strong NdPr permanent magnets is increasing.

Due to their physical properties and features, NdPr raw materials offer industries a plethora of applications and are well-recognized for their long-term success in the heavyweight automotive and industrial power industries. While lithium can be used for energy storage alone, NdPr finds application in both electricity generation and subsequent conversion to mechanical energy.

In 2017, there was an 80% increase in prices of NdPr, and current prices are expected to significantly increase by 2025. A number of commodity analysts have forecast that the Neodymium oxide market will move in to deficit in the next few years as the demand for magnets in electric and hybrid powered vehicles, other forms of transport, increasingly for offshore wind turbines, military applications and a growing universe of green energy applications takes off. Part of the issue lies in the monopoly over NdPr: currently, over 87% of the world's production of NdPr is controlled by China.

Adamas Intelligence recently noted that "Demand for Neodymium oxide will substantially exceed global average production by 2030 leading to shortages of these critical magnet metals if additional sources of supply are not developed"

Roskill's view:

The rare earth industry continues to be an important part of not only the development and manufacture of high-end technologies, but also as a geopolitical tool in an increasingly unstable and unpredictable global market. Disruptions to supply chains caused by tariffs, the imposition of sourcing restrictions for some products and uncertainty over the future of major producers has resulted in a renewed focus on diversifying the source of rare earth products, particularly outside of China. Simultaneously, the Chinese industry has continued to introduce legislation to 'clean-up' their domestic rare earth industry, tackling the environmental, social and governmental impact of historical production.

In 2019, China is forecast to account for 77% of global rare earth production, with six state owned enterprises forming the majority of supply. Despite its dominance of the global industry, China's production of mined rare earths has been impacted in recent years by the introduction of environmental legislation and industry consolidation. Environmental legislation has led to many operations, predominantly in southern Chinese provinces, suspending production. As a result, Chinese processors have looked to alternative sources of rare earth raw materials, creating opportunities for producers both in the Chinese domestic market and in the rest-of-world. Ion adsorption clay ores, monazite mineral concentrates and recycled rare earth materials have all been imported and processed by facilities in China, to meet growing demand for rare earth products. Illegal production remains a significant source of raw materials in China, though efforts by local and central government have reduced illegal production by almost 50% since 2016.

Rare earth production at operations outside of China is limited to a small number of locations in 2019, though there are multiple projects under development in Australia, Canada, the USA and Africa with the potential to supply rare earth concentrates to the market. The production of refined rare earth production outside China is even scarcer than the supply of mined raw materials and has been identified as a supply chain risk by some consumers.

Demand for rare earths is diverse, with rare earth products being consumed in many end-use applications which may only require one or two separated rare earth compounds or products. Roskill forecast rare earth demand to grow by over 5% in 2019, driven by the increased use of rare earth permanent magnets in automotive and renewable energy applications, supported by underlying demand growth in catalysts, ceramics and polishing powders. Rare earth magnets are forecast to form 28% of total demand in 2019, consuming a mixture of rare earths including Nd, Pr, Gd, Dy and Ce. By 2025, rare earth magnets are forecast to exceed a third of total demand, changing the focus of rare earth producers and processors. The changing emphasis towards rare earth magnet raw materials is expected to impact rare earth pricing mechanisms, with operations becoming increasingly dependent economically on a small number of individual rare earths.

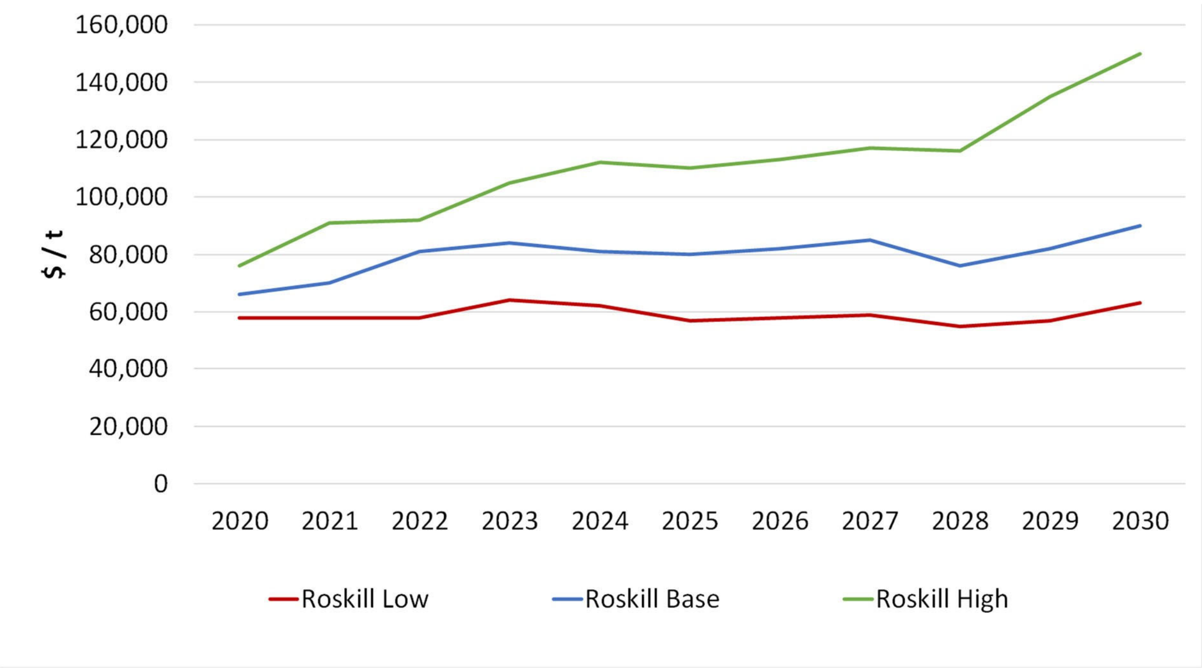


Figure 22: Roskill NdPr oxide price forecasts

20 Concentrate Pricing

Forecast concentrate prices are derived from the value of contained rare earths and assumed payability of each component based on indicative non-binding offtake terms. Conrad Partners advise that there is strong interest from identified customers in China to purchase concentrates for further refining and recovery of the contained rare earth oxides, particularly the neodymium and praseodymium content, which accounts for the majority of the concentrate value.

Concentrate prices forecast to be achieved from the mine are derived from Roskill's High, Base, and Low scenarios for NdPr prices. No value is assigned to the rare earth oxides of Ce, Sm, Ho, Er, Tm, Yb, Lu, Y. Prices of other rare earth components are assumed to move proportionally with the NdPr price.

Based on the planned specification of concentrate derived from metallurgical testwork, an initial concentrate price of US $3,821 / tonne is implied in the base case once operations commence.

Given the high value of NdPr oxides, transport and logistics costs represent a smaller proportion of the concentrate value than for other commodities.

21 Capital Cost Summary

The capital cost estimate (Capex) and the basis used for building that estimate were prepared by Wood. All costs are estimated in United States dollars (US$) as at 4 July 2019 and are judged to have an accuracy of -15% +35% and are considered Class 4 H as defined in the AACE document 18R-97.

The estimated costs include all site preparation, mining area clearing, process plant and associated ancillaries, first fills, site buildings, road works including site access road, offices and accommodation camp.

The estimate excludes contingency, escalation, capital expenses prior to October 2019. Sustaining capital, rehabilitation and mine closure estimates have been included as part of the financial model.

Pensana has focussed on minimising the initial capital spend with the purpose of allowing improvements funded by cashflow once the operation successfully ramped up. Future costs will include:

- Permanent camp development
- Sealed roads
- Communications infrastructure
- Sophisticated automation
- Full site offices

Certain portions of the process flowsheet only become necessary as mining progresses, and whilst capital provision has been made in year 3, are excluded from the start-up capital requirement, including:

- Mineral sizer (due to the friable nature of the upper zones) to handle increasing ore competency of the orebody
- Addition of extra flotation cells to preserve circuit residence time at increased throughput
- Addition of an extra secondary ball mill to maintain target grind size at the higher throughput
- Minor expansion of plant services equipment (additional blower and steam boiler) The cost of the Phase 1 Tailings facility and subsequent lifts, as described in section 20, are included in capital costs.

A sustaining capital expenditure allowance of 2% of initial capital per year has been included from year 6 onwards.

A rehabilitation / mine closure fund is included at 5% of upfront capex.

Table 7: Capital Costs

CAPITAL COSTS	Amount	
Mine	3.2	USD million
Process Plant	50.5	USD million
Plant Infrastructure & TSF	3.3	USD million
Area Infrastructure	20.7	USD million
Regional Infrastructure	9.7	USD million
Miscellaneous	6.3	USD million
Indirect Costs	18.0	USD million
Growth Allowance	19.3	USD million
Total Capital Pre-production	130.6	USD million
Year 4 Expansion Capital cost (funded by cashflow)	12.5	USD million
TSF expansions (funded by cashflow)	19.4	USD million
Average Annual Sustaining Capital	2.9	USD million pa from year 6

As determined by Wood

22 Operating Cost Summary

The operating costs estimate was prepared by Wood with a base date of September 2019 to an accuracy level of -15+35%.

Costs were estimated for operating the mine, process plant and general and administration functions and are stated exclusive of duties, taxes and royalties.

The operating costs were determined from first principles using inputs from numerous sources including:

- Contractor quotations for contract mining
- Scheduling of the fleet requirements
- Grinding power requirements derived from comminution testwork
- Reagent consumption from metallurgical testwork
- Reagent & consumable costs from supplier quotations
- Logistics & transport costs from supplier standard rates
- Manning levels developed from typical organisation charts and work rosters
- Personnel salaries & overheads sourced from Angola
- Previous study assessments.

Table 8: Mine Operating Cost breakdown

Operating cost	Per t concentrate	Per t feed
	$/t	$/t
Mining	314	9.7
Processing	719	22.2
G&A	141	4.3
Site total	**1,173**	**36.2**
Product transport cost	150	4.6
Total	**1,323**	**40.8**

23 Financial Assessment

The value of the Longonjo Project was assessed on a cash flow basis, with an assumed start date at commencement of construction. Physical and financial forecasts were developed for the operation in a standalone model. The evaluation is based on assumptions as described above and as listed in Table 9 below.

The evaluation has been conducted on a pre-tax basis thus excludes corporation tax, surface taxes and royalties. The mining investment contract provides for certain reliefs including relief during an initial 6-year period, subject to the EVTEF study approval, following which the principal forms of taxation will be a 5% royalty and an income tax rate of 25%. The Company will provide an update when material information is available.

Table 9: Financial criteria

Criteria	Assumption
Evaluation date	From start of capital investment
Working capital	60 debtor days (inc. product transport) 30 creditor days
Concentrate price	3,821 $/t in year 1 (Base Case) based on Roskill NdPr price forecast and company assessment

A summary of the project economics for each of the low, base and high cases is presented in Table 10 below.

Table 10: Key Financial Metrics

	Gross Revenue	EBITDA	Pre-tax IRR	Payback
	$ million	$ million	%	Months
High	2,733	2,068	129%	11
Base	1,984	1,319	101%	13
Low	1,448	782	64%	17

24 Project Approvals

After the exploration and project assessment operations based on the Prospecting Licence rights are concluded, the Company will, under Angola law prepare and submit a Financial, Technical and Economic Feasibility Study ("EVTEF") in order to demonstrate the feasibility of the Project. The approval of the EVTEF by the Ministry of Mines and Petroleum is a condition for the issuance of a Mining Title, as well as to the verification that all legal and contractual obligations of the Company (including tax obligations and contributions related to Social Security) have been complied with. The EVTEF will be based on the findings of the Study and submitted in 2019 Q4 and is subject to a 3 month review process.

An Environmental Impact Study ("EIA") will also be prepared and submitted by the Company. During the Study, the terms of reference for the ESIA were received from the Ministry of Environmental in May 2019 and the ESIA will be submitted in 2019 Q4 and is subject to a 3 month review process.

The permitting and approvals process in Angola is well defined, well understood, involves public participation and is transparent. Land access agreements are in place and ongoing engagement and consultation continues with key stakeholders. Strategic plans to support the Environmental Social Management System are in the development phase and will address impacts identified in the drafts to date of the Environmental Social Impact Assessment.

Whenever the investment amount and the technical complexity of the project so requires, the Ministry may ask for the Company to provide an independent audit to the EVTEF and the EIA. The auditor can be appointed by the Ministry or the Company itself, if the Ministry agrees with the one suggested by the Company.

25 Project Execution

The development of the Longonjo Project will be managed by the Company who will utilise the services of experienced contractors during the detailed design and optimization phase and into the construction phase.
The project execution schedule is based on a 7 month period of detailed engineering definition alongside permitting, followed by a 12-month construction and 2 month commissioning period.

The three main contractors responsible for the construction phase will be:

- EPCM Contractor – Design, procurement, construction and commissioning of the process plant and associated infrastructure.
- Mining Contractor – Supply of clearing and mining activities
- Tailings Dam Contractor – Installation of tailings dam and associated earthworks.

Local contractors will be engaged to undertake works as required to de-risk the project schedule and provide the best commercial outcome. This includes early works to prepare for the Contractors arrival to site including:

- Accommodation camp preparation
- Power reticulation
- Borehole development
- Site access roads

An operational readiness plan will be developed to ensure that the Company has all the systems, standards and procedures in place and an operations team recruited, trained and ready to accept care, custody and control of the project assets when handed over by the development team.

26 Key Opportunities

The positive interim results from these studies provide the Company with the confidence to continue to progress towards a definitive feasibility study to ultimately fast track development studies aimed at establishing production as soon as possible.

Several technical programmes are currently in progress or are planned in the near term that are aimed at capturing further upside in the project and if successful have the potential to further enhance the already highly encouraging project economics.

Some of the important technical programmes include:

Drilling Programmes

The Company plans to commence significant additional drilling programmes from November 2019 aimed at:

- expanding the amount of Indicated Mineral Resource category weathered zone mineralisation with infill drilling of the higher grade areas of Inferred Mineral Resource category (*areas A to D on the map following*)

- defining a Measured category Mineral Resource estimate for the first years of production by infill drilling of a higher grade portion of the Indicated Mineral Resource estimate (*see plan*)

- extending the current Mineral Resource estimate by testing for the extensions to mineralisation that remains open along strike (*yellow arrows*)

- evaluation of an area of high-grade fresh rock mineralisation identified over a 500 metre x 200 metre area beneath the weathered zone mineralisation (*Dashed area 'Fresh Target'*)

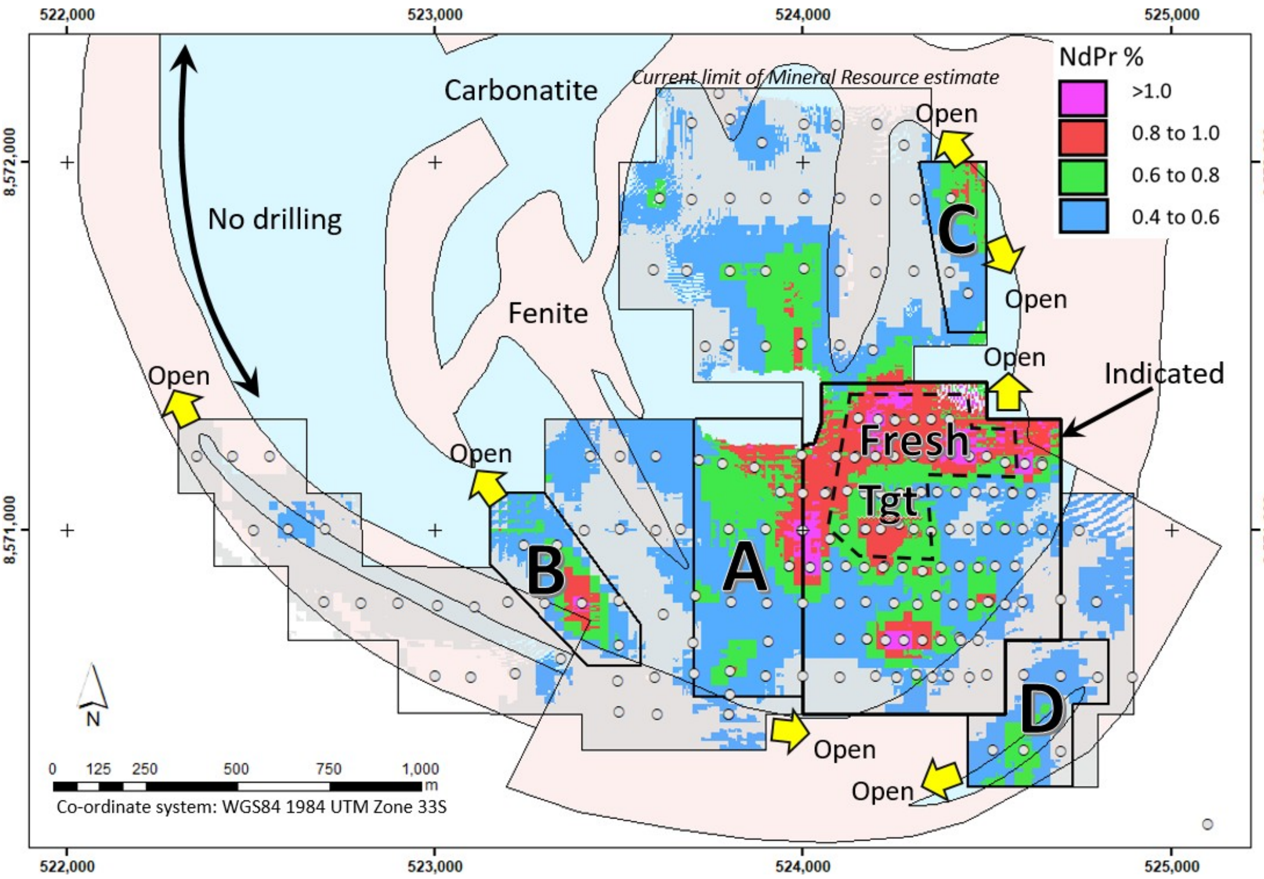


Figure 23: Plan view of Mineral Resource block model for the weathered zone coloured by average NdPr grade over simplified geology. Inferred Mineral Resource category mineralisation in areas A to D is targeted for infill drilling to support conversion to Indicated Mineral Resource category. Drilling is also planned to test areas of potential extensions to the current defined mineralisation as highlighted by the yellow arrows. Infill drilling of the higher grade weathered zone mineralisation within the Indicated Mineral Resource category area is also planned, including the extension of some holes in the dashed line fresh rock exploration target.

Metallurgical Testwork Programmes

Additional test work programmes are currently in progress to evaluate the potential to improve concentrate grades and recoveries by optimisation of the demonstrated process flow sheet. The potential to simplify the current flow sheet and reduce reagent consumption is also being evaluated.

New diamond core samples of high-grade fresh rock hosted mineralisation are undergoing further metallurgical testwork aimed at determining the grade and recovery of the concentrate that can be produced from this second style of mineralisation at Longonjo. Fresh rock mineralisation is not included in the Study. Multiple end of hole high grade intersections in fresh rock over a large area suggest the potential for large amount of fresh rock hosted mineralisation at Longonjo immediately beneath the weathered zone mineralisation.

Pilot Plant Testwork

Once the current work on the optimisation of the process flow sheet for the weathered zone mineralisation is completed, the Company plans to complete a pilot plant operation to provide detailed engineering design data and quantities of concentrate product for assessment by potential offtake customers. To this end the Company has collected a 60 tonne bulk sample of mineralisation that will be shipped to Australia via the Benguela Railway and Lobito Port as feed for the plant.

Figure 24: Pilot Plant bulk sampling in progress

27 Competent Persons Statements

The information in this report that relates to Geology, Data Quality and Exploration results is based on information compiled and/or reviewed by David Hammond, who is a Member of The Australasian Institute of Mining and Metallurgy. David Hammond is the Chief Operating Officer and a Director of the Company. He has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and the activity which he is undertaking to qualify as a Competent Person in terms of the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves. David Hammond consents to the inclusion in the report of the matters based on his information in the form and contest in which it appears.

The information in this report that relates to the 2019 Mineral Resource estimates is based on work done by Rodney Brown of SRK Consulting (Australasia) Pty Ltd. Rodney Brown is a member of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 edition).

The information in this report that relates to the Study, including the mining, process design, tailings, preliminary engineering, operating and capital cost estimates summaries is based on work completed by Wood Group.

Table 11: Longonjo NdPr Mineral Resource estimate – Total

Cut-off NdPr (%)	Indicated					Inferred					Total				
	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)
0.1	58,900,000	0.39	1.86	230,000	1,100,000	167,000,000	0.30	1.33	504,000	2,230,000	226,000,000	0.33	1.47	735,000	3,320,000
0.2	48,300,000	0.44	2.13	214,000	1,030,000	119,000,000	0.36	1.62	430,000	1,920,000	167,000,000	0.39	1.77	644,000	2,950,000
0.3	35,500,000	0.51	2.47	182,000	880,000	67,100,000	0.45	2.04	301,000	1,370,000	103,000,000	0.47	2.19	483,000	2,250,000
0.4	20,800,000	0.63	3.01	131,000	625,000	31,700,000	0.56	2.55	178,000	808,000	52,500,000	0.59	2.73	309,000	1,430,000
0.5	13,100,000	0.74	3.51	96,500	460,000	18,100,000	0.65	2.96	118,000	535,000	31,200,000	0.69	3.19	214,000	995,000
0.6	9,010,000	0.82	3.93	74,200	354,000	9,520,000	0.75	3.42	71,000	325,000	18,500,000	0.78	3.67	145,000	679,000
0.7	6,530,000	0.89	4.25	58,200	278,000	4,620,000	0.85	3.97	39,400	184,000	11,100,000	0.88	4.14	97,600	461,000
0.8	4,180,000	0.97	4.62	40,500	193,000	2,320,000	0.96	4.58	22,300	106,000	6,500,000	0.97	4.60	62,800	299,000
0.9	2,440,000	1.06	5.03	25,800	123,000	1,010,000	1.10	5.63	11,100	56,800	3,450,000	1.07	5.21	36,900	180,000
1.0	1,350,000	1.15	5.46	15,600	74,000	569,000	1.22	6.45	6,920	36,700	1,920,000	1.17	5.75	22,500	111,000
1.1	705,000	1.24	5.92	8,760	41,700	347,000	1.32	7.04	4,600	24,500	1,050,000	1.27	6.29	13,400	66,200
1.2	362,000	1.33	6.36	4,830	23,000	235,000	1.41	7.59	3,320	17,800	597,000	1.36	6.84	8,140	40,900

NdPr is contained within and is a subset of REO. REO = total rare earth oxides, the sum of 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. See Table 4 for breakdown of all individual rare earth oxides. Figures may not sum due to rounding

Table 12: Longonjo NdPr Mineral Resource estimate – Weathered* mineralisation

Cut-off	Indicated					Inferred					Total				
NdPr (%)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)
0.1	16,000,000	0.57	2.71	91,400	433,000	55,700,000	0.38	1.61	213,000	899,000	71,700,000	0.42	1.86	304,000	1,330,000
0.2	14,900,000	0.60	2.86	89,600	426,000	43,900,000	0.44	1.90	195,000	836,000	58,800,000	0.48	2.15	284,000	1,260,000
0.3	12,600,000	0.67	3.20	83,800	402,000	31,500,000	0.52	2.28	164,000	719,000	44,100,000	0.56	2.54	248,000	1,120,000
0.4	10,600,000	0.73	3.51	76,800	371,000	22,300,000	0.59	2.64	132,000	589,000	32,900,000	0.63	2.92	209,000	960,000
0.5	8,860,000	0.78	3.79	69,100	335,000	14,900,000	0.66	2.99	99,000	446,000	23,800,000	0.71	3.29	168,000	782,000
0.6	7,230,000	0.83	4.05	60,100	293,000	8,390,000	0.75	3.40	63,000	286,000	15,600,000	0.79	3.70	123,000	579,000
0.7	5,520,000	0.89	4.33	49,000	239,000	4,210,000	0.86	3.94	36,100	166,000	9,730,000	0.87	4.16	85,100	405,000
0.8	3,520,000	0.96	4.71	34,000	166,000	2,170,000	0.96	4.50	20,900	97,800	5,700,000	0.96	4.63	54,900	264,000
0.9	2,020,000	1.05	5.16	21,300	104,000	942,000	1.10	5.55	10,300	52,300	2,970,000	1.07	5.28	31,700	157,000
1.0	1,100,000	1.15	5.63	12,600	61,900	526,000	1.22	6.40	6,440	33,700	1,620,000	1.17	5.88	19,000	95,600
1.1	561,000	1.24	6.13	6,950	34,400	327,000	1.33	7.00	4,350	22,900	888,000	1.27	6.45	11,300	57,300
1.2	291,000	1.33	6.56	3,860	19,100	216,000	1.43	7.58	3,090	16,400	507,000	1.37	6.99	6,940	35,500

**The Weathered Mineral Resource is contained within and is a subset of the Total Mineral Resource and comprises the Transported, Oxide, High Calcite and High Apatite domains described in the Mineral Resource section of this report.*

Table 13: Longonjo NdPr Mineral Resource estimate – Fresh rock* mineralisation

Cut-off	Indicated					Inferred					Total				
NdPr (%)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)	Tonnes (t)	NdPr (%)	REO (%)	NdPr (t)	REO (t)
0.1	42,900,000	0.32	1.54	139,000	663,000	111,000,000	0.26	1.19	291,000	1,330,000	154,000,000	0.28	1.29	430,000	1,990,000
0.2	33,400,000	0.37	1.80	125,000	600,000	74,800,000	0.31	1.45	235,000	1,090,000	108,000,000	0.33	1.56	359,000	1,690,000
0.3	23,000,000	0.43	2.08	98,500	477,000	35,600,000	0.38	1.83	137,000	651,000	58,600,000	0.40	1.93	235,000	1,130,000
0.4	10,200,000	0.53	2.49	53,900	254,000	9,390,000	0.49	2.33	46,200	219,000	19,600,000	0.51	2.41	100,000	473,000
0.5	4,240,000	0.65	2.94	27,400	125,000	3,130,000	0.60	2.84	18,800	89,000	7,370,000	0.63	2.90	46,100	214,000
0.6	1,770,000	0.79	3.44	14,000	61,000	1,130,000	0.71	3.51	8,000	39,800	2,900,000	0.76	3.47	22,000	101,000
0.7	1,010,000	0.91	3.82	9,170	38,600	406,000	0.81	4.35	3,290	17,700	1,420,000	0.88	3.97	12,500	56,200
0.8	659,000	0.99	4.11	6,550	27,100	148,000	0.94	5.76	1,390	8,540	807,000	0.98	4.41	7,940	35,600
0.9	420,000	1.08	4.43	4,520	18,600	67,800	1.06	6.66	719	4,520	487,000	1.08	4.74	5,240	23,100
1.0	257,000	1.16	4.72	2,980	12,100	42,500	1.12	7.09	477	3,020	299,000	1.16	5.06	3,460	15,100
1.1	144,000	1.25	5.10	1,810	7,360	20,200	1.21	7.62	244	1,540	164,000	1.25	5.41	2,050	8,900
1.2	71,500	1.36	5.55	969	3,970	18,900	1.22	7.66	229	1,440	90,400	1.33	5.99	1,200	5,410

**The Fresh rock Mineral Resource is contained within and is a subset of the Total Mineral Resource*

Table 14: Longonjo Mineral Resource estimate: Individual rare earth oxide grades and % of total REO

Rare Earth Oxide		Weathered		Fresh		Total Average	
		Grade (%)	% of REO (%)	Grade (%)	% of REO (%)	Grade (%)	% of REO (%)
Lanthanum	La2O3	0.429	23.09	0.316	24.48	0.352	23.93
Cerium	CeO2	0.842	45.33	0.597	46.21	0.674	45.86
Praseodymium	Pr6O11	0.093	4.99	0.063	4.91	0.073	4.94
Neodymium	Nd2O3	0.332	17.87	0.215	16.68	0.252	17.16
Samarium	Sm2O3	0.050	2.69	0.030	2.34	0.037	2.48
Europium	Eu2O3	0.011	0.62	0.007	0.55	0.008	0.58
Gadolinium	Gd2O3	0.024	1.32	0.015	1.18	0.018	1.23
Terbium	Tb4O7	0.003	0.14	0.002	0.13	0.002	0.13
Dysprosium	Dy2O3	0.012	0.64	0.007	0.58	0.009	0.60
Holmium	Ho2O3	0.002	0.10	0.001	0.09	0.001	0.09
Erbium	Er2O3	0.004	0.22	0.003	0.20	0.003	0.21
Thulium	Tm2O3	0.000	0.02	0.000	0.02	0.000	0.02
Ytterbium	Yb2O3	0.002	0.12	0.001	0.11	0.002	0.11
Lutetium	Lu2O3	0.000	0.02	0.000	0.02	0.000	0.02
Yttrium	Y2O3	0.053	2.83	0.032	2.50	0.039	2.63
Total REO	**TREO**	**1.858**	**100.00**	**1.291**	**100.00**	**1.471**	**100.00**

**Above distribution is estimated for all mineralisation at a 0.10% NdPr lower grade cut.*

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	• The database compiled by Pensana for the Longonjo Project contains 223 drillholes, totalling over 8 km of drilling, and comprises diamond coring (DDH), reverse circulation (RC), and rotary air blast (RAB) drilling. The drillhole dataset used directly for Mineral Resource estimation comprised a total of 10 DDH holes (655 m) and 173 RC holes (6,213 m). The RAB data were used to assist with the geological modelling but were not used for resource estimation. DD holes that twinned existing RC holes were not used directly for estimation. • Diamond core samples were collected over a nominal length of 2 m within lithological units and core blocks. Quarter-core samples were submitted for sample preparation. • Samples from vertical RC drilling were collected on 1 m intervals and field composited to 2 m intervals, with approximately 4 kg splits collected for laboratory submission. • RAB samples were collected on 1 m intervals and field composited to 4 m intervals, with approximately 4 kg splits collected for laboratory submission. • The full length of each hole was sampled. • Sampling was carried out under Pensana QAQC protocols, which Pensana considers follows best practice approaches. Triple-tube drilling was undertaken to assist in maximising core recoveries for the diamond drill campaign. During RC drilling, the drill string was cleaned by flushing with air and the cyclone cleaned regularly. RC sample returns were closely monitored, managed and recorded, with a reference weight used to regularly calibrate the weighing scale. • RC and RAB samples were riffle split using a 3-tier splitter, which was cleaned between every sample. During the RAB drilling campaign, regular air and manual cleaning of the cyclone was undertaken to remove clay accumulations. • The diamond core sample preparation and testing were performed by Nagrom (Perth). The samples, which typically weighed 3 kg, were pulverised to produce a 30 g charge for laser ablation ICP-MS analysis. The analytical suite included Ag, Al,

		Ba, Be, Ca, Ce, Cu, Dy, Er, Eu, Fe, Gd, Hf, Ho, K, La, Li, Lu, Mg, Mn, Nb, Nd, P, Pb, Pr, Si, Sm, Sn, Sr, Ta, Tb, Th, Tm, U, W, Y, Yb, Zn, and Zr. • The RC 2 m field composites sample preparation was performed by Analabs (Windhoek). The samples, which typically weighed 3-4 kg, were dried, split, and pulverised, with a 100 g pulp sample collected for assaying. Assaying was performed by Nagrom (Perth), with laser ablation used to assay for Al, Ba, Ca, Ce, Dy, Er, Eu, Fe, Gd, Hf, Ho, K, La, Lu, Mg, Mn, Nb, Nd, P, Pb, Pr, S, Si, Sm, Sr, Ta, Tb, Th, Ti, Tm, U, Y, Yb, and Zn. • RAB geological logging was used as a reference to assist in building the geological model, but the assays were not used to estimate the Mineral Resource. • All commercial laboratories used use industry best practice procedures and QAQC checks. • For each hole, the entire hole length was submitted for assay.
Drilling techniques	• Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	• The diamond drilling was undertaken using an Atlas Copco Mustang track-mounted drill rig. The diamond drilling was undertaken using a PQ-sized (116 mm) bit, except for LJD002 which was drilled to 51.85 m using PQ3 coring equipment, and then completed to 100.40 m using HQ3 equipment. Diamond drilling conducted in 2019 was completed using a Sandvik 710 track mounted rig. • RC drilling was completed using a Super Rock 100 drill rig with a face sampling hammer button bit of 131 mm diameter and 5 m rods. A 131 mm diameter blade RC bit was used in some holes in the weathered zone (generally in the first 10 m). • RAB drilling was carried out to blade refusal, or when samples returned wet. The rig was equipped with a 4.5” blade drill bit and 3 m rods.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples. • Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• The diamond core runs were marked and checked against the drillers’ core blocks to ensure any core loss was recorded. • Recoveries for the diamond drill core varied from 52% to 100%, with the average being 90.8%. The average recovery for fresh carbonatite was 92% with a minimum of 70%. An average recovery of 87% was achieved for the saprolite, and an average recovery of 89.7% was achieved for the transported material. • RC recoveries were monitored closely, recorded and assessed regularly over the drilling program.

		• Every 1 m sample from the rig was weighed using a frequently calibrated set of scales. The moisture content for each 1 m interval was estimated and recorded. • RAB recovery and meterage were assessed by comparing drill cutting volumes (sample bags) for individual metres. Routine checks for correct sample depths were undertaken for every rod. RAB sample recoveries were visually checked for recovery, moisture and contamination. • Triple-tube barrels and short runs were used in the diamond drilling process to ensure maximum core recovery. RC sample weights were compared against expected weights for the drill diameter and geology. Drill pipes and cyclone were flushed and cleaned regularly. • Some short intervals (typically 1-3 metres) of reduced sample recovery occurred in the soft weathered zone. Data analysis has not identified any significant relationship between recovery and grade.
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. • Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography. • The total length and percentage of the relevant intersections logged.	• The entire length of each hole was geologically logged by trained geologists. All relevant features, such as lithology, mineralogy, weathering, structure, texture, grain size, alteration, veining style and mineralisation, were recorded in the geological log. • All logging was qualitative. • All diamond core trays and RC chip trays were photographed.
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all core taken. • If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique.	• Quarter-core was taken for laboratory submission. The diamond core samples were cut on site by an experienced field technician using a diamond saw. The less competent material, such as transported and weathered material, was quartered using a knife. • The 1 m RC samples and 2 m field composites were riffle split using a 3-tier splitter. All samples were riffle split when dry. Wet samples were sun-dried in a protected environment prior to splitting and sub-sampling.

	• Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. • Whether sample sizes are appropriate to the grain size of the material being sampled.	• The samples were prepared using conventional industry practices, which involved oven drying the full 3-4 kg sample, splitting to a representative 1 kg sample, pulverising to 85% passing 75 micron and splitting to a representative sample pulp. • Field duplicates, certified reference materials (CRMs) and blanks were inserted at random, with a resultant average frequency of 1 in 30 samples. • The laboratories also conducted and reported their own internal QAQC checks, including assay and preparation duplicates. The QAQC results do not show evidence of significant sampling issues. • The sample sizes are considered suitable for the disseminated mineralisation style and grain size of material sampled. Repeatability of assays was observed to be good.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. • For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. • Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	• The analysis was carried out by an accredited independent assay laboratory: Nagrom Laboratory, in Perth, Western Australia. • Diamond core samples were assayed for Ag, Al, Ba, Be, Ca, Ce, Cu, Dy, Er, Eu, Fe, Gd, Hf, Ho, K, La, Li, Lu, Mg, Mn, Nb, Nd, P, Pb, Pr, Si, Sm, Sn, Sr, Ta, Tb, Th, Tm, U, W, Y, Yb, Zn, and Zr by LA ICP-MS (Laser ablation inductively coupled plasma mass spectrometry) analysis. • RC samples were assayed for Al, Ba, Ca, Ce, Dy, Er, Eu, Fe, Gd, Hf, Ho, K, La, Lu, Mg, Mn, Nb, Nd, P, Pb, Pr, S, Si, Sm, Sr, Ta, Tb, Th, Ti, Tm, U, Y, Yb, and Zn, LA by ICP-MS. • The assay technique is considered to give total analyses. No geophysical or portable analysis tools were used to determine assay values stored in the database. • In addition to the laboratory's internal QAQC protocols, CRM, and blanks were included at random with the field samples at an average of 1 of each type for every 30 primary samples. • Samples were selected periodically and screen tested to ensure pulps are pulverised to the required specifications. • Analysis of QAQC data results indicates acceptable levels of accuracy and precision.
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel. • The use of twinned holes.	• Significant intersections were verified by Pensana management staff. • Sixteen diamond holes were completed as twins to RC drill holes, with collars sited approximately 3 metres from the twin. Analysis of geology and assay results between RC and diamond drilling techniques shows a good correlation between

	• Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. • Discuss any adjustment to assay data.	the holes and drilling techniques, except for two holes where a short range variation in geology intersected was observed. • Field data were logged into an OCRIS logging package and uploaded to the main, secure database in Perth. The data collection package has built-in validation settings and look-up codes. All field data and assay data were verified and validated upon receipt. The database is managed offsite by an independent and professional database manager. • Data collection and entry procedures were documented and training was given to all staff. • Scans of original field data sheets are stored digitally without alteration. • Digital data entry is checked and validated against original field sheets if not entered directly. • The laboratory reported the assay data in elemental form and were converted into oxide form during data storage and management using the following conversion factors: • La to La_2O_3 – 1.1728 • Ce to CeO_2 – 1.2284 • Pr to Pr_6O_{11} – 1.2082 • Nd to Nd_2O_3 – 1.1664 • Sm to Sm_2O_3 – 1.1596 • Eu to Eu_2O_3 – 1.1579 • Gd to Gd_2O_3 – 1.1526 • Tb to Tb_4O_7 – 1.1762 • Dy to Dy_2O_3 – 1.1477 • Ho to Ho_2O_3 – 1.1455 • Er to Er_2O_3 – 1.1435 • Tm to Tm_2O_3 – 1.1421 • Yb to Yb_2O_3 – 1.1387 • Lu to Lu_2O_3 – 1.1371 • Y to Y_2O_3 – 1.2699.

		• Intersection grades are reported as NdPr (the sum of Nd2O3 and Pr6O11) as well as total REO, which includes all of the oxides listed above.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• The survey data have been collected and reported using the WGS84 UTM Zone 33S grid system. • A digital elevation model (DEM) covering the Longonjo Project area was prepared by Core GPX using data acquired from *Ortho-Ready Standard Level 2A WorldView-3* stereo imagery captured in September 2018. Ground control points were surveyed by Geosurveys using RTK DGPS equipment. The DEM covers an area of approximately 3.5 × 3.5 km centred over the project region. For modelling purposes, SRK extracted a sub-area of approximately 335 ha centred over the drilling and extending slightly beyond the planned model limits. • On completion of the drilling program, the drillhole collars were surveyed by Geosurveys using RTK DGPS equipment. All holes were planned and assumed to be vertical. A spirit level was used to confirm that the drill rig mast was vertical prior to drilling each hole. Downhole surveying was not conducted. Prior to use for resource modelling, the drillhole collars were registered to the DEM, with the final collar elevations derived from the topographic data.
Data spacing and distribution	• Data spacing for reporting of Exploration Results. • Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• The drilling was conducted on a nominal hole spacing is 200 × 100 m (north × east), with the central zone infilled to 100 × 50 m). Samples were collected over 2 m downhole intervals. • The drill spacing is considered suitable for the identification of zones of NdPr and REO mineralisation at a confidence level sufficient to allow the assigned classification of the Mineral Resource. • The 1 m RC drill samples were combined in the field after riffle splitting to prepare 2 m composite samples for submission to laboratory. • The use of 2 m composites is considered adequate for the resource estimation for this style of mineralisation.
Orientation of data in relation	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the	• The high grade NdPr mineralisation at Longonjo occurs as a sub-horizontal blanket of disseminated mineralisation averaging 20 m or more in thickness and with good

to geological structure	extent to which this is known, considering the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	lateral continuity. The vertical drilling and 2 m sampling are considered appropriate for this style of mineralisation. • No significant sampling bias is considered to have been introduced by the drilling orientation.
Sample security	• The measures taken to ensure sample security.	• Sample security is managed by Pensana. After collection from the drill site, the samples are stored at camp in locked sea containers. • A customs officer checks and seals the samples into containers on site before transportation by the Company directly to the preparation laboratory. The preparation laboratory submits the samples to the assay laboratory by international air freight, with the samples again being inspected by customs and sealed prior to despatch. • The laboratories audit the samples on arrival and report any discrepancies back to the Company. No such discrepancies occurred.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• SRK has conducted a review of the primary and QAQC data. The database is compiled by an independent consultant and is considered by the Company to be of sufficient validity to support the results reported. In addition, from time to time, the Company carries out its own internal data audits.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• The Longonjo Project is located within Prospecting Licence 013/03/09T.P/ANG-M.G.M/2015. Pensana owns an 84% holding in the project with Ferrangol (10%), an agency of the Angolan government, and other Angolan partners (6%). • The concession is in good standing and no known impediments exist.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• Previous workers in the area include Black Fire Minerals and Cityview Corporation Ltd.
Geology	• Deposit type, geological setting and style of mineralisation.	• The Longonjo NdPr deposit is a rare earth enriched carbonatite with particularly high grades occurring within the weathered regolith zone from surface as a result of the dissolution of carbonate minerals and residual enrichment. Some mineralisation also occurs within the underlying fresh carbonatite. • Mineralisation is disseminated in style. The Longonjo Carbonatite is a subcircular and subvertical explosive volcanic vent (diatreme) approximately 2.6 × 2.4 km in diameter. Primary rock types include carbonatite lava and magma, extensive mixed carbonatite - fenite breccia, and tuffaceous deposits. • The iron-rich weathered zone that is host to the higher-grade mineralisation discovered to date extends over much of the carbonatite.
Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: − *easting and northing of the drill hole collar* − *elevation or RL (Reduced Level – elevation*	No new exploration results are included in this Mineral Resources report. All exploration results have been fully reported previously in ASX announcements: • 24/08/2017: Positive diamond drilling results at Longonjo • 10/09/2018: First results confirm new areas for further high grade NdPr • 31/10/2018: First drill results extend NdPr mineralisation at Longonjo

	above sea level in metres) of the drill hole collar – *dip and azimuth of the hole* – *down hole length and interception depth* – *hole length.* • If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	• 29/11/2018: Second drill results at Longonjo extend mineralisation • 27/12/2018: New drill results extend NdPr Mineralisation at Longonjo • 17/01/2019: Wide high-grade intersections from surface. • 15/05/2019: High-grade intersections confirm thick blanket of NdPr • 24/06/2019: Final RC results confirm and extend high-grade NdPr • 08/07/2019: Diamond drilling reports spectacular NdPr intersections.
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated. • Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	• No new exploration results are reported. A cut-off grade of 0.20% NdPr oxide was used for the reporting of intersections and 0.40% NdPr oxide for high grade 'Highlights' in the reports listed above. No upper grade cuts have been applied for the reporting of intersection grades. • Intersections are reported as length-weighted averages above the specified cut-off grade. Length-weighted grade averages for REO and NdPr are presented. • Intercepts may include a maximum of 2 m internal dilution. • No metal equivalent values have been used for the reporting of these Exploration Results.
Relationship between mineralisation widths and intercept lengths	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. • If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	• The mineralisation occurs in sub-horizontal layers and the drillholes are all vertical. As such, the mineralised zones are approximately orthogonal to the drillholes, and the reported drillhole intercepts can be considered true thicknesses.

Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	• Appropriate plans and sections are included in the accompanying documentation and the exploration reports listed above.
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• No new Exploration Results are included in this Mineral Resource report.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Previously reported evaluations of the NdPr mineralisation at Longonjo, including the September 2017 Maiden Mineral Resource estimate and drilling program results, and the February 2019 Mineral Resource estimates, are contained within previous ASX releases.
Further work	• The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). • Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Infill RC drilling is planned in key areas with the aim of acquiring information to support and increase the amount of Indicated Mineral Resources, and also to define some Measured Resources. • Mineralisation remains open in several directions and further drilling will be planned to test these extensions and the potential to expand the current Mineral Resource. • Appropriate diagrams are provided in the accompanying documentation. • Test pits are currently being excavated for the collection of samples for metallurgical testing.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in Section 1 and where relevant in Section 2, also apply to this section.)

Database integrity	• Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. • Data validation procedures used.	• The drillhole data for the Longonjo Project are stored in a secure central OCRIS database managed by Expedio. • All assay and survey data loading was done by electronic transfer from checked primary data sources. Most geological logging data were entered onto templates for direct import via the OCRIS interface. Any manually entered data was cross-checked. • The Longonjo data were provided to SRK as database extracts in MS Excel tables. The datasets were checked by SRK for internal consistency and logical data ranges prior to using the data for Mineral Resource estimation.
Site visits	• Comment on any site visits undertaken by the Competent Person and the outcome of those visits. • If no site visits have been undertaken indicate why this is the case.	• Competent Person (CP) sign-off for the Mineral Resource estimates has been performed Rodney Brown, who is a full-time employee of SRK. Rodney Brown conducted a site visit in August 2019, which provided an opportunity to examine and discuss the geology and some aspects of the field programmes with Pensana staff.
Geological interpretation	• Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. • Nature of the data used and of any assumptions made. • The effect, if any, of alternative interpretations on Mineral Resource estimation. • The use of geology in guiding and controlling Mineral Resource estimation. • The factors affecting continuity both of grade and geology.	• The main controls on mineralisation were interpreted by Pensana in section and linked to form a 3D geological model. The geological interpretation is considered consistent with drilling and mapping data, and with site observations. The interpreted setting is also consistent with the generally accepted understanding within the mining community for this style of mineralisation. • Lithology definition was primarily based on a combination of geological logging and geochemical data, with boundaries typically corresponding to distinct changes in physical and geochemical characteristics. Because the main mineralisation is hosted within carbonate, the domain geometry is complex in places, and the irregular weathering profile has a significant impact on grade and lithological continuity.
Dimensions	• The extent and variability of the Mineral Resource expressed as length (along strike or otherwise),	• As described in Section 1, the mineralisation is hosted within and upon a carbonatite pipe, with elevated REO concentrations occurring both within the

	plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	weathered and fresh carbonatite, and in the colluvial cover material. Mineralisation has been modelled over an irregular area that has lateral extents of approximately 2.6 km in the east-west direction and 1.9 km in the north-south direction. The defined resources have an area extent of approximately 200 ha. • For resource modelling, a total of three main domains, and two sub-domains were defined: • Colluvium covers approximately 80% of the resource area, and has an average thickness of approximately 4 m, with a maximum thickness of approximately 12 m. • Weathered carbonatite covers essentially all of the resource area and has an average interpreted thickness of approximately 20 m, and a maximum thickness of 70 m. • Fresh carbonatite was intercepted in approximately 90% of the holes and has been interpreted over the full resource extents. None of the drilling intersected the base of the fresh carbonatite and, for estimation purposes, the modelling base was set to immediately below the base of drilling. This resulted in an average interpreted thickness of 20 m. • High calcite domain. Intersections with elevated calcite concentrations were identified in the oxide domain in 4 drillholes. These were modelled separately because of the potentially impact of calcite on processing. • High apatite domain. Intersections with elevated apatite concentrations were identified in the vicinity of the oxide/ fresh interface in 25 drillholes. These were modelled separately because of the potential impact of apatite on processing.
Estimation and modelling techniques	• The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used. • The availability of check estimates, previous estimates and/or mine production records and	• The Mineral Resource estimates were prepared using conventional block modelling and geostatistical estimation techniques. • A single model was prepared to represent the defined extents of the mineralisation. The resource modelling and estimation study was performed using Datamine Studio RM®, Supervisor®, and X10®. • Kriging neighbourhood analyses (KNA) studies were used to assess a range of parent cell dimensions, and a size of 25 × 25 × 2 m (XYZ) was considered appropriate given the drill spacing, and grade continuity characteristics. Sub-celling down to 5 × 5 × 1 m was applied to enable the wireframe volumes to be accurately modelled. • The lithology wireframes were used as hard boundary estimation constraints.

	whether the Mineral Resource estimate takes appropriate account of such data. • The assumptions made regarding recovery of by-products. • Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation). • In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. • Any assumptions behind modelling of selective mining units. • Any assumptions about correlation between variables. • Description of how the geological interpretation was used to control the resource estimates. • Discussion of basis for using or not using grade cutting or capping. • The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	• Probability plots were used to assess for outlier values, and grade cutting was applied to a small number of samples. • The parent cell grades were estimated using ordinary block kriging. Search orientations and weighting factors were derived from variographic studies. Unfolding and dilation were used to more accurately reproduce some of the grade trends in the profile. Dynamic anisotropic searching was used to adjust the local lateral search orientations to more closely match the ring structure of the carbonatite pipe. • A multiple-pass estimation strategy was invoked, with KNA used to assist with the selection of search distances and sample number constraints. Extrapolation was limited to approximately half the nominal drill spacing. • Local estimates were generated for a total of 33 elements expressed in oxide form. These included the rare earth elements, the major gangue elements, and a suite of minor elements that could potentially have processing or marketing implications. Estimates were also prepared for several derived constituents, including TREO, HREO, LREO, and NdPr. • A complete list of constituents is included in the accompanying resource estimation summary. Model validation included: • Visual comparisons between the input sample and estimated model grades • Global and local statistical comparisons between the sample and model data • An assessment of estimation performance measures including kriging efficiency, slope of regression, and percentage of cells estimated in each search pass • A check estimate using nearest neighbour and inverse distance cubed interpolation.
Moisture	• Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	• The resource estimates are expressed on a dry tonnage basis, and in situ moisture content has not been estimated. A description of density data is presented below.
Cut-off parameters	• The basis of the adopted cut-off grade(s) or quality parameters applied.	• A total NdPr Oxide cut-off grade of 0.1% has been used for resource reporting. • The range of mineral resource cut-off grades has been selected for transparency and to facilitate a comparison with the 2017 estimates (NdPr represents

		approximately one fifth of total REO, and therefore a cut-off grade of 0.2% NdPr = 1% REO). • Cut-off grades are based on assumptions made by Pensana that are considered realistic in terms of considerations of long-term historical and predicted NdPr prices, processing and mining costs and the demand for the NdPr products. • Higher cut-off grades of 0.6-0.8% NdPr have been included for the weathered material mineralisation to reflect the typical geological grade distribution of this material type, which is expected to form the early years' feed in the Preliminary Feasibility Study currently in progress.
Mining factors or assumptions	• Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	• Mine planning studies conducted as part of a December 2017 Scoping Study indicate the mineralisation will likely be exploited using conventional selective open pit mining methods, utilising small-scale hydraulic excavator mining and dump truck haulage. No blasting is expected to be needed as the weathered zone is soft material, and the blanket-style morphology of the main mineralised zones indicates that stripping ratios, ore loss and dilution are expected to be low. It is anticipated that both ore and waste will be excavated on 2.5 m flitches (5 m benches) • Mining dilution assumptions have not been factored into the resource estimates.

Metallurgical factors or assumptions	• The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	• A metallurgical process to produce a high-grade concentrate has been developed and demonstrated at bench and locked cycle testing by Pensana for the weathered zone mineralisation and is currently being further developed and optimised. The process uses a 2-stage flotation approach. • Fresh rock mineralisation is similar to other known deposits for which effective metallurgical treatment processes have been developed. Less rigorous metallurgical testwork has been completed to date on the fresh material by Pensana but preliminary metallurgical testwork, including gravity, magnetic separation and flotation techniques, support the potential for their effective treatment. The long mine life initially supported by the weathered mineralisation provides the Company with the opportunity to optimise these processes, which could be brought in at a later stage of the operation to develop the large available tonnages of this style of mineralisation.
Environmental factors or assumptions	• Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	• The deposit is contained within the approved lease boundary. • Waste landforms are to be developed adjacent to existing landform features to minimise the environmental impact. • An in-waste tailings landform is being designed for process residues to be stored within mine waste material in order to limit the footprint of the overall waste landform and reduce the requirement for additional mining. • There is no evidence of acid rock drainage due to the oxidised nature of the mineralisation, the carbonate rock host, and the absence of sulphide minerals. • Approvals for process residue storage and waste dumps have not yet been sought. • An Environmental Impact Assessment (EIA) is planned and will be completed prior to the commencement of mining.
Bulk density	• Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of	• Bulk density tests were performed on a total of 231 core samples. The tests were performed by recording the weight of each sample and estimating the volume from measurements of the core length and diameter. The core samples were weighed prior to drying, and then again after oven drying at 95°C for 48 hours. The results

	the measurements, the nature, size and representativeness of the samples. • The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit. • Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	were grouped according to geological logging code, and the average value for each group was used to define a default density for each material type. These defaults were then used to assign a density value to each interval in the estimation datasets according to the interval's logging codes. • The datasets were used to estimate the local dry bulk density for each parent cell in the volume model. The local densities were estimated using the same domain control, estimation approach, and estimation parameters that were used for the local geochemical grade estimates. • The drilling did not encounter any large voids, and the tonnage estimates have not been factored to account for any potential void occurrences.
Classification	• The basis for the classification of the Mineral Resources into varying confidence categories. • Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data). • Whether the result appropriately reflects the Competent Person's view of the deposit.	• The classifications have been applied to the resource estimates based on a consideration of the confidence in the geological interpretation, the quality and quantity of the input data, the confidence in the estimation technique, and the likely economic viability of the material. • Based on these considerations, the largest source of uncertainty is in the reliability of the local estimates and the accuracy of the lithological interpretation (both of which are influenced by drillhole spacing). • A boundary was interpreted approximately half the drill spacing beyond the extents of relatively uniform drill coverage and used to define the lateral extents of the resource. A model base was interpreted immediately below the base of drilling. • A classification of Indicated Mineral Resource was assigned to all estimates within the area with a nominal drill spacing of 100 × 50 m, and a classification of Inferred Mineral Resource to estimates within the area with a nominal drill coverage of 200 × 100 m.
Audits or reviews	• The results of any audits or reviews of Mineral Resource estimates.	• An independent review of the Mineral Resource estimates has not been completed.
Discussion of relative accuracy/ confidence	• Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or	• The Mineral Resource estimates have been prepared and classified in accordance with the guidelines that accompany the JORC Code, and no attempts have been made to further quantify the uncertainty in the estimates. • The validation checks indicate good consistency between the model grades and the input datasets. The largest source of uncertainty is considered to be the local

	geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used. • These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	accuracy of the geological interpretation and grade estimates, due to the mixing of brecciated carbonatite and fenite material. SRK prepared check estimates using a lithological indicator approach and obtained similar regional and global estimates, but some local differences. • The Mineral Resource quantities should be considered as global and regional estimates only. The accompanying model is considered suitable to support concept studies and subsequent exploration programs but is not considered suitable for detailed design studies.

Section 4 Basis for Forward-Looking Statements

No Ore Reserve has been declared. This ASX Release has been prepared in compliance with the current JORC Code (2012) and the ASX Listing Rules. All material assumptions on which the PFS production target and forecast financial information is based have been included in this ASX Release and disclosed in the table below and in the JORC Code (2012) Table 1 above.

Consideration of Modifying Factors (in the form of Section 4 of the JORC Code (2012) Table 1)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve. • Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	• **No Ore Reserve has been declared.** • Mineral Resource estimates are therefore reported exclusive of any Ore Reserve
Site visits	• Comment on any site visits undertaken by the Competent Person and the outcome of those visits. • If no site visits have been undertaken indicate why this is the case.	• Mr Rodney Brown of SRK Consulting, the Competent Person for the Mineral Resource estimation, has completed a site visit and reviewed the geology and data collection procedures and is satisfied with the industry standard practises followed and the appropriateness of the geological interpretations.
Study status	• The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves. • The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.	• **No Ore Reserve has been declared.** • This Preliminary Feasibility Study has been completed to an AACE Class 4 estimate standard. • Wood Group was lead engineer and study manager and are experienced with large-scale greenfield rare earth development projects. Wood completed the mining studies detailed in this report. • Material Modifying Factors have been considered and are detailed within the body of this report. • A team of experienced specialist consultants have contributed to the study as listed in Section 2.

Criteria	JORC Code explanation	Commentary
Cut-off parameters	• The basis of the cut-off grade(s) or quality parameters applied.	• Refer to Section 7 of this report. • A total NdPr Oxide cut-off grade of 0.1% has been used for Mineral Resource reporting and the block model on which mining studies are based. • Cut-off grades are based on pricing assumptions made by Pensana and detailedin this report that are considered realistic in terms of considerations of long-term historical and predicted NdPr prices, and the demand for the NdPr products, together with the processing and mining costs. • The value of the mineralisation is based on seven rare earth oxides (Nd_2O_3, Pr_6O_{11}, Dy_2O_3, Tb_4O_7, La_2O_3, Eu_2O_3, Gd_2O_3), hence the cut-off value is expressed as monetary value, rather than equivalent gradesin the optimisation process.

Criteria	JORC Code explanation	Commentary
Mining factors or assumptions	• *The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).* • *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre- strip, access, etc.* • *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre- production drilling.* • *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* • *The mining dilution factors used.* • *The mining recovery factors used.* • *Any minimum mining widths used.* • *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* • *The infrastructure requirements of the selected mining methods.*	• **No Ore Reserve has been declared.** • Refer to Section 7 of this report • The thick blanket of friable mineralisation at surface lends itself to open pit mining with excavation with hydraulic excavators. • Open pit optimisation studies have been completed by Wood and are detailed in 7.3 of this report. The optimisation is based on the Mineral Resource model November 2019 supplied by SRK and as stated in this report. • Grade control drilling will be carried out on a campaign basis with a reverse circulation drill rig. The holes are expected to be drilled in a 10m by 10m pattern. Samples are taken at 2.5 metre intervals corresponding to flitch heights. • Given the consistent nature of the mineralisation and the lithology controlled thick mineralisation, dilution of plant feed and mining losses are assumed to be insignificant. Wood has assumed no dilution and no losses for this study. Because of the lack of sterile overburden material, there is no requirement for a pre-strip.

Criteria	JORC Code explanation	Commentary
Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.* • *Whether the metallurgical process is well-tested technology or novel in nature.* • *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* • *Any assumptions or allowances madefor deleterious elements.* • *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.* • *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?*	• Refer to Section 10 of this report • The Preliminary Feasibility Studies are based on the weathered zone component only of the Mineral Resource estimate, and for which an effective metallurgical process has been defined and demonstrated by Pensana. • A metallurgical process to produce a high-grade concentrate has been developed and demonstrated at bench and locked cycle testing by Pensana using representative samples of the weathered zone mineralisation. Metallurgical samples are composites of diamond drill core from across the weathered zone mineralisation. The process uses a 2-stage flotation approach. • A pilot plant using bulk sample has yet to be completed. • Process engineering studies and mass balance developed from the testwork findings support an overall NdPr recovery rate of 39% and overall TREO recovery of 35%.
Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.*	• Refer to Section 17 of the Study • The deposit is contained within the approved lease boundary. • Waste landforms are to be developed adjacent to existing landform features to minimise the environmental impact. • An in-waste tailings landform is will store process residues within mine waste material in order to limit the footprint of the overall waste landform and reduce the requirement for additional mining. • There is no evidence of acid rock drainage due to the oxidised nature of the mineralisation, the carbonate rock host, and the absence of sulphide minerals. • Approvals for process residue storage and waste dumps have not yet been sought. • An Environmental Impact Assessment (EIA) is in progress and will be completed prior to the commencement of mining

Criteria	JORC Code explanation	Commentary
Infrastructure	• *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.*	• Refer to Sections 11, 12, 14 and 16 of the Study • The Company's existing mining tenements cover the full mining area including process plant, waste rock dump, tailings storage facilities, borefield, accommodation camp, office buildings, workshops, power generation plant, fuel storage and communications facilities.
Costs	• *The derivation of, or assumptions made, regarding projected capital costs in the study.* • *The methodology used to estimate operating costs.* • *Allowances made for the content of deleterious elements.* • *The source of exchange rates used in the study.* • *Derivation of transportation charges.* • *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* • *The allowances made for royalties payable, both Government and private.*	• Refer to Section 20 and 21 of the Study. • No allowance for deleterious elements since testwork to date has not shown the presence of any. • The Study has been fully denominated in USD. • The Angolan rail transportation cost components are based on gazetted rates provided by the CFB and Port of Lobito authorities. • Shipping costs are based on independent indicative proposals with an expected accuracy of ±15%. • Refer to Section 23 of the Study. • The Study has been conducted on a pre-tax basis thus excludes corporation tax, surface taxes and royalties. The mining investment contract provides for certain reliefs including relief during an initial 6-year period, subject to the EVTEF study approval, following which the principal forms of taxation will be a 5% royalty and an income tax rate of 25%. The Company will provide an update when material information is available.

Criteria	JORC Code explanation	Commentary
Revenue factors	• *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.* • *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co- products.*	• Refer to Section 23 of the Study. • The Project's operating costs havebeen presented on an CIF China basis, which includes all transportation costs.
Market assessment	• *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.* • *A customer and competitor analysis along with the identification of likely market windows for the product.* • *Price and volume forecasts and the basis for these forecasts.* *For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.*	• Refer to Section 19 of the Study
Economic	• *The inputs to the economic analysis to produce the net present value (NPV) in the study, the sourceand confidence of these economic inputs including estimated inflation, discount rate, etc.* • *NPV ranges and sensitivity to variations in the significant assumptions and inputs.*	• Refer to Section 23 of the Study

Criteria	JORC Code explanation	Commentary
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	• Refer to Section 24 of the Study
Other	• *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* • *Any identified material naturally occurring risks.* • *The status of material legal agreements and marketing arrangements.* • *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent* • *on a third party on which extraction of the reserve is contingent.*	• No Ore Reserve has been declared. • No material naturally occurring risks have been identified and the Project is not subject to any material legal agreements and/or binding marketing arrangements. • The Company has consulted extensively with Government departments. All Project approvals required to date have been received within expected timeframes. The Company has reasonable grounds to expect that all necessary future Government approvals will also be received within the timeframes anticipated in the Preliminary Feasibility Study.
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.* • *Whether the result appropriately reflects the Competent Person's view of the deposit.* • *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).*	• **No Ore Reserve has been declared.** • Refer to Schedule 3 for Mineral Resource information

Criteria	JORC Code explanation	Commentary
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• **No Ore Reserve has been declared.** • Refer to JORC Table 1 for Mineral Resource information
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.* • *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• **No Ore Reserve has been declared.** • Refer to Schedule 3 for Mineral Resource information • Mineral Resource estimates on which this study is based are considered global estimates.