PENSANA
RARE
EARTHS

19 October 2020

Coola exploration programmes in full swing

Pensana Rare Earths Plc (LSE: PRE, ASX: PM8) ('Pensana' or 'the Company') is pleased to provide an update on exploration activity in progress at the Company's new Coola Project adjacent to its advanced stage Longonjo NdPr* Project in Angola.

Initial field programmes have commenced to test defined targets prospective for a range of high technology critical commodities including heavy rare earths (HREE), light rare earths (LREE), scandium, niobium, tantalum, hafnium and fluorspar. These commodities are listed as critical by the European Commission and would complement future production of magnet metal raw materials from the Company's advanced stage Longonjo Project located just 16 kilometres to the south.

- First assay results have been received from early reconnaissance work at the Coola Carbonatite and confirm rare earth mineralisation in rocks and soils up to 2.99% REO**.
- Outcropping fluorspar mineralisation has been located at Coola and systematic soil sampling and geological mapping has been completed over the 6 kilometre by 2.5 kilometre complex. Fluorspar, as well as being of direct interest, is also a positive indicator of the potential for additional technology metals. Assay results are awaited.
- Targeted exploration programmes of soil, stream sediment and rock sampling together with geological mapping are also in progress at the Monte Verde and the 13 kilometre by 5 kilometre Sulima alkali systems.
- Monte Verde is a sub circular volcanic feature that measures approximately 4.5 kilometres by 3.5 kilometres. The Sulima complex comprises two adjacent ring structures that together extend over a 12 kilometres by 5 kilometre area.
- Geophysical data processing has been completed and ten strong geophysical anomalies identified that could represent additional prospective geological systems. Follow up field reconnaissance and stream sediment sampling is underway.

The Coola Project covers an area of 7,456 square kilometres adjacent to Longonjo and is similarly well located in terms of modern road, rail, port and hydropower infrastructure.

**NdPr= the magnet metal rare earths neodymium and praseodymium*
***REO = rare earth oxides*

Dave Hammond, Chief Operating Officer, commented:

"The Coola Project contains several high quality 'walk-up' targets prospective for a suite of key strategic 'new technology' metals forecast to be in undersupply and that could complement future NdPr and rare earth production from Longonjo.

The early reconnaissance sampling results are a great start in already confirming the Coola complex as a fertile mineralised system. The presence of substantial outcrops of fluorspar, which may have direct economic potential, is also a positive indicator of mineralisation of other technology metals within the geological system. Systematic sampling of the 6 kilometre by 2.5 kilometre complex has now been completed and samples despatched for assay.

Exploration programmes are currently in progress over two other prospective alkaline - carbonatite geological systems together with stream sediment sampling and geological reconnaissance of key geophysical anomalies.

We look forward to reporting further results from this exciting new exploration region on Longonjo's doorstep."

Authorised by the Board of Pensana Rare Earths Plc

For further information:

Pensana Rare Earths Plc

Website:	www.pensana.co.uk
Paul Atherley Chairman / Tim George, CEO	contact@pensana.co.uk
Buchanan (UK Financial PR)	+44 (0) 207 466 5000
Bobby Morse/ Augustine Chipungu /James Husband	pensana@buchanan.uk.com

Technical Report

The Coola Project and critical high technology metals

Of the 27 raw materials identified by the European Commission as critical, nine are commonly found in association with alkaline rocks and carbonatites[1]: heavy rare earth elements (HREE); light rare earth elements (LREE); niobium; fluorspar; phosphate / phosphorus, hafnium, tantalum and scandium. In terms of geological prospectivity, there is a greater chance of a carbonatite complex having resources economic to mine than any other rock.

The Company identified the occurrence of several carbonatite and alkaline complexes in the Coola region with geological prospectivity for these high technology critical commodities that could complement future NdPr rare earth production from the Company's advanced stage Longonjo Project, located just 16 kilometres to the south.

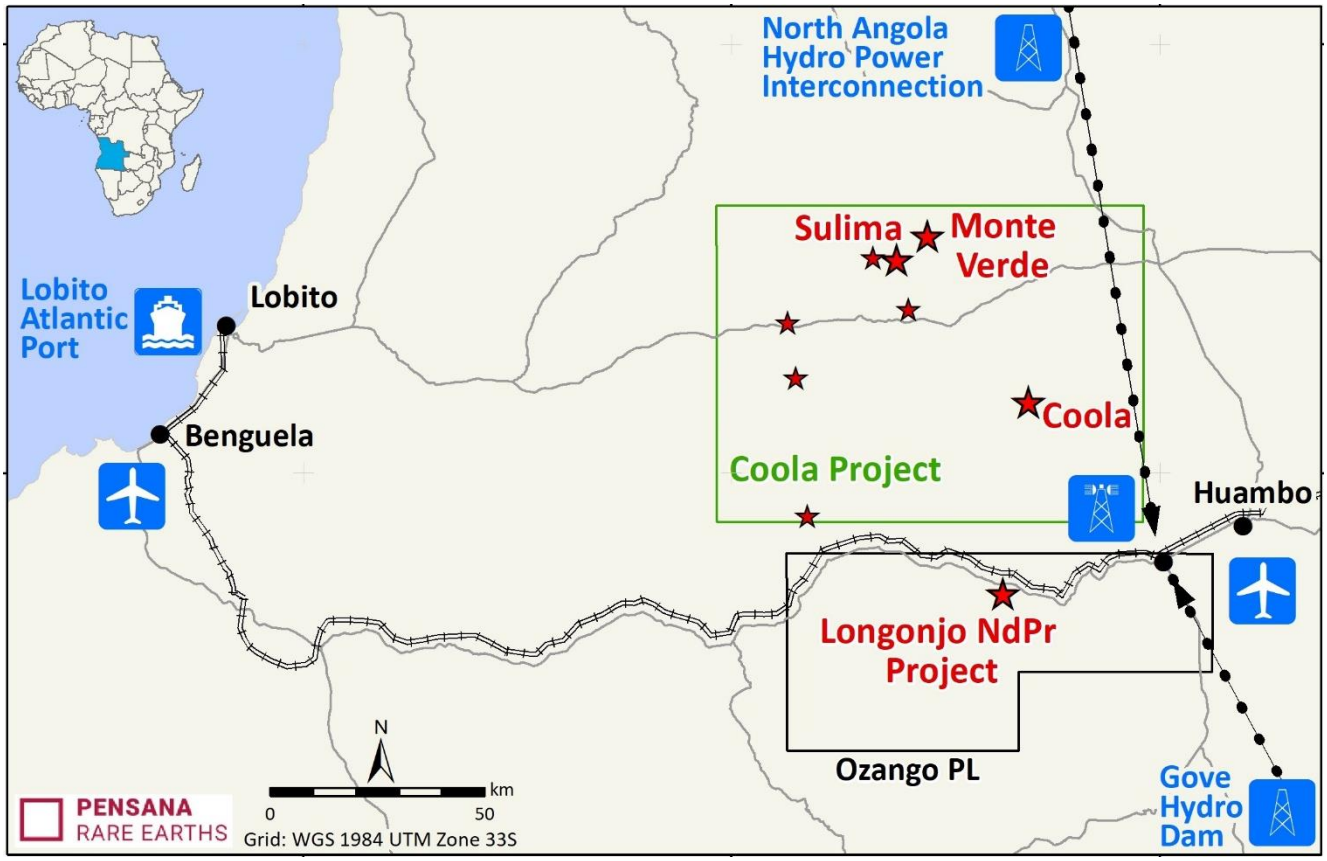

Figure 1: Location of new Coola Licence and known mineralised carbonatites and other alkaline complexes prospective for rare earths adjacent to Pensana's Longonjo Project and established modern infrastructure

[1]: HiTech AlkCarb project funded by European Union's Horizon 2020 Research and Innovation programme.https://www2.bgs.ac.uk/hiTechAlkCarb/downloads/Publishable_summary_070520.pdf

The Company was pleased to announce the grant of the Coola licence in May 2020. Pensana holds a 90% beneficial interest in the licence with two Angolan partners each holding 5%. The licence was granted for a period of two years, renewable to seven years.

The Coola Project is similarly located to Longonjo, close to modern road and rail infrastructure that links the project to the Atlantic port of Lobito. Low cost hydropower is available at Caala, located 40km to the west and the provincial capital of Huambo lies about 60 kilometres to the west.

Two known carbonatites with reported NdPr rare earth mineralisation, Coola and Monte Verde, together with four additional alkali systems and five strong geophysical anomalies represent immediate and well defined 'walk – up' exploration targets.

Coola Carbonatite

The Coola Carbonatite forms part of a larger 6 kilometre x 2.5 kilometre intrusive geological system and associated fenite alteration. Previous academic work identified rare earth enrichment to 3.64% REO from limited rock sampling (Alberti et al., 1999)[2].

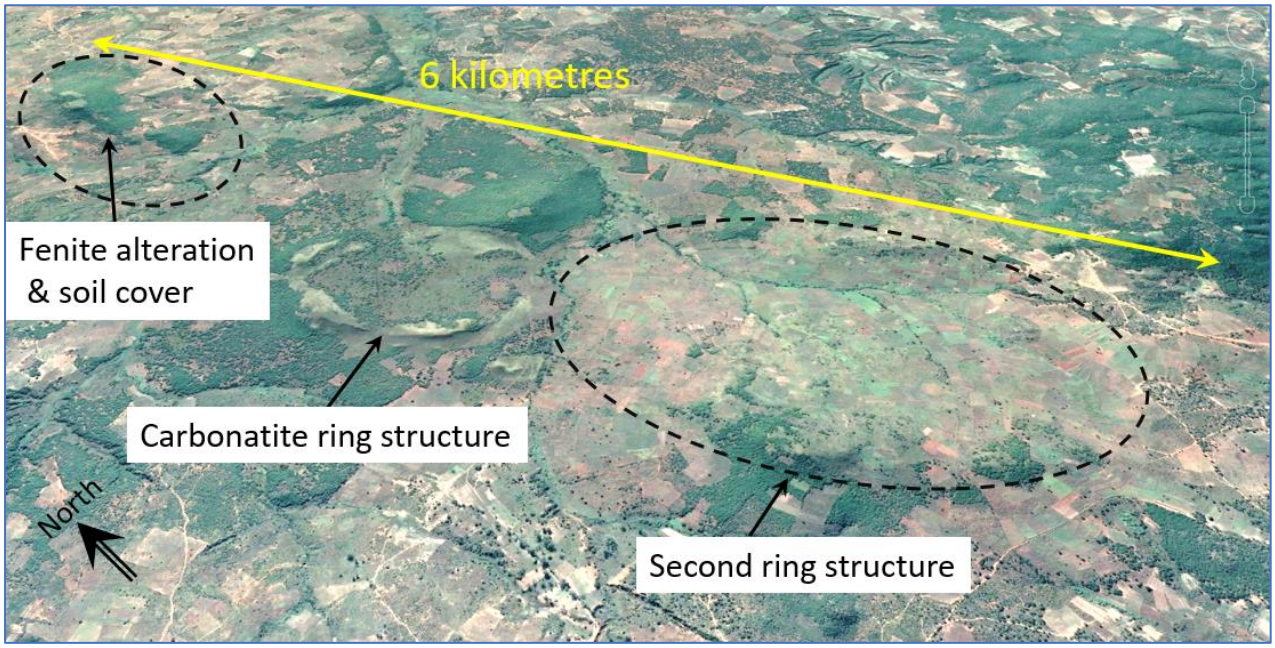

Figure 2: Angled view of the Coola carbonatite intrusive complex looking north east. Two ring structures and a third area of fenite (alteration associated with carbonatite intrusion) extend over 6 kilometres and are largely soil covered.

[2] *Alberti A. et al., 1999: Geochemical characteristics of Cretaceous carbonatites from Angola, Journal of Earth Sciences.*

Assay results from initial reconnaissance work completed by Pensana confirms rare earth mineralisation in soils and rocks up to 2.99% REO.

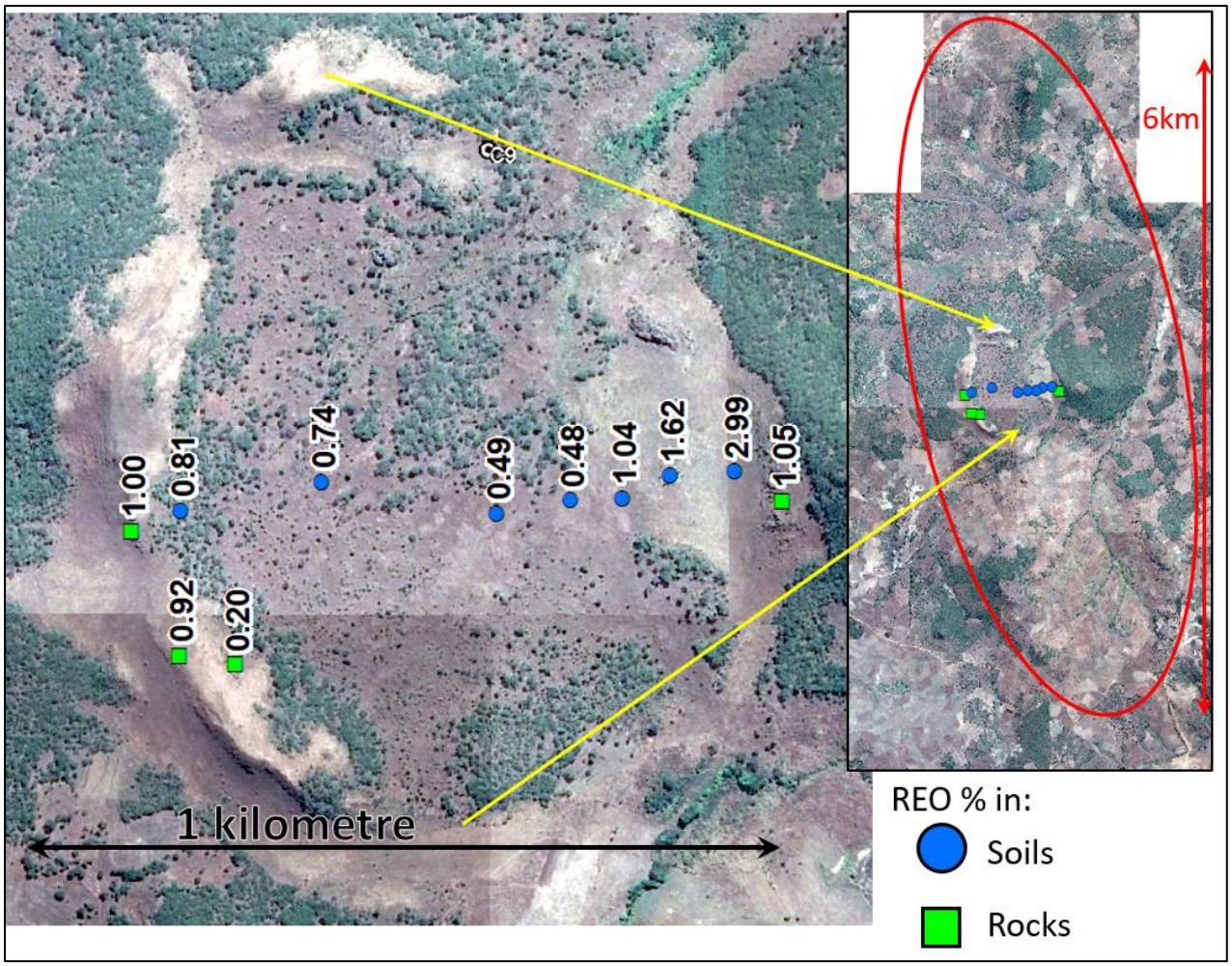

Figure 3: Rare earth oxide assay results from soil and rock sampling completed by Pensana during a reconnaissance field visit. The ring structure is formed by a carbonatite dyke. The central area lies entirely under soil cover and geological models suggest the potential for an untested carbonatite body.

The Company's experienced field team have now completed systematic soil sampling and geological mapping over the entire 6 kilometre long complex, together with rock sampling and the excavation and sampling of several shallow pits in soil covered areas.

Extensive fluorspar mineralisation has been located within the Coola complex (Figure 4). As well as being listed as a critical commodity and having direct economic potential in its own right, fluorspar is also a positive indicator of the potential for additional technology metals in this geological setting.

Figure 4: Band of fluorspar (blocky outcrop in centre) at Coola with detail inset showing massive style of purple fluorspar mineralisation. Geological hammer for scale is 35 centimetres long.

Samples have been despatched from site and assay results are awaited.

Monte Verde alkali –carbonatite complex

The Monte Verde alkali-carbonatite igneous complex comprises syenite and carbonatite with associated fenite alteration over a 4.5 x 3.5 kilometre area. Substantial parts of the complex lie under shallow transported cover and a carbonatite ring dyke has been mapped (Amores-Casals et al., 2019)[3].

Previous geological research by academic workers has returned up to 0.93% REO from limited rock sampling during geological mapping, confirming the presence of rare earth mineralisation in the system. The mineral occurrence database of Angola notes occurrences of 'pyrochlore, apatite and barite in carbonatite and monazite and zircon in syenites' at Monte Verde. Mineral concentrations are not recorded but this suite of minerals, as well as having potential economic significance in their own right, can also be indicators of concentrations of rare earths and niobium.

[3] *Amores-Casals S. et al., 2019: Nb and REE Distribution in the Monte Verde Carbonatite-Alkaline-Agpaitic Complex (Angola), Minerals, 2020.*

Figure 5: Geologist Geraldine Tchimbali geological mapping with Senior Geologist Benedito Madaleno at the Monte Verde alkali – carbonatite complex and sampling on regional targets.

Systematic soil sampling and reconnaissance geological mapping and rock sampling has now been completed over the Monte Verde alkali-carbonatite complex and assay results are awaited.

Sulima alkali complex

The Sulima alkali complex is noted on regional geological maps and is identified in geophysical data sets and satellite images as two adjacent circular features each approximately five kilometres in diameter (Figure 6).

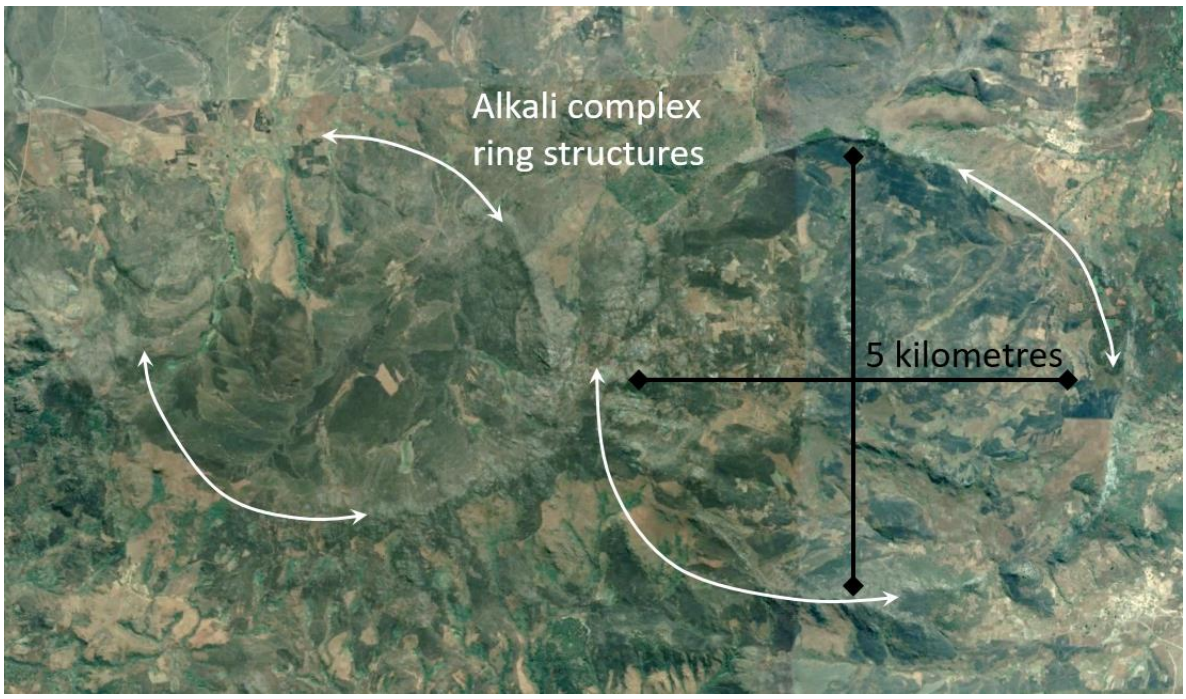

Figure 6: Two adjacent ring structures each approximately five kilometres in diameter can be observed from satellite image data at the Sulima alkali complex.

The mineral occurrence database of Angola notes the occurrence of 'monazite, zircon, apatite and barite' at Sulima. Mineral concentrations are not recorded and records of any historical economic assessment of the complexes have not been identified.

Geophysical targets

In addition to the above identified targets, the Company has identified a further ten discrete geophysical signatures that have a similar character to the known carbonatite – alkali complexes.

Pensana's geological team has commenced field investigation and stream sediment sampling of these target areas. The Company will also evaluate the potential for other minerals including copper, nickel and within the Coola licence area. Covering an area of 100 x 75 kilometres, a range of rock types and geological ages offers the potential for additional geological styles of mineralisation.

Figure 7: Stream sediment sampling of regional geophysical target areas, Coola Project.

The Company looks forward to advising the market of the sampling assay results from this series of exploration programmes as they are received.

Competent Persons Statement

The information in this report that relates to geology, exploration results and prospectivity 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.

APPENDIX

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections)

Criteria	JORC Code explanation	Commentary
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.*	• Soil samples are -180# sieved soils collected from below 30 centimetres depth. • Rock samples are insitu representative rocks of approximately 4 to 5 kilogrammes collected from a single point of outcrop by experienced geologists.
	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	• Soils: surface soil is removed before sampling at 30 centimetre depth to minimise contamination from recently transported material. • A larger soil sampling of approximately 5 kilogrammes is sieved to -180# to remove coarse rock fragments and give a consistent sample • Experienced geologists collect representative rocks from a outcrop point within a 50cm x 50cm area
	• *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.*	• No drilling has been completed • Rock samples are pulverised and riffle split to a 200g representative subsample that is submitted for assay. • Rock and soil samples are split to produce a 25g charge for assay • Samples are assayed at 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 at Nagrom laboratories, Perth, Western Australia. • All commercial laboratories used use industry best practise procedures and QAQC checks.
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,*	• No drilling is reported

Criteria	JORC Code explanation	Commentary
	whether core is oriented and if so, by what method, etc).	
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.*	• No drilling is reported
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.*	• Rock chip samples are geologically logged • Samples are not used for Mineral Resource estimation • Logging is qualitative
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.* • *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.*	• No core drilling is reported • The preparation of samples follows industry practice. This involves oven drying of the full 4 to 5kg rock sample or 150g soil sample, pulverising to 85% passing 75 micron and splitting to a 100g sample pulp. • Field duplicates, certified reference standards and blanks were inserted at random but on average every 27 samples for each as part of Pensana QAQC protocols as per industry best practise. Laboratories also have and report internal QAQC checks including assay and preparation duplicates

Criteria	JORC Code explanation	Commentary
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• The sample sizes are considered more than adequate for this disseminated style and grainsize of material sampled. Repeatability of assays is 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.*	• The analysis was carried out by an accredited independent assay laboratory. • Samples are assayed at 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, hydrochloric leach and followed by ICP analysis at Nagrom laboratories, Perth, Western Australia. • The assay technique is 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.*	• Laboratory data only. No geophysical or portable analysis tools were used to determine assay values stored in the database.
	• *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Certified reference materials (CRM's) –standards and blanks - were submitted at random with the field samples on an average of 1 of each type every in 27 field samples basis, as well as the laboratory's standard QAQC procedures. • 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.*	• All samples are point samples, no intersections
	• *The use of twinned holes.*	• No drilling is reported.
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	• Field data was logged onto field data collection sheets and entered into Excel before being uploaded to the main, secure, database in Perth once complete. The data collection package has built in validation settings and look-up codes. All field data and assay data was verified and validated upon receipt. The database is managed by an independent and professional database manager offsite • Data collection and entry procedures are documented and training given to all staff • Scans of original field data sheets are stored digitally and never altered • Digital data entry is checked and validated against original field sheets if not entered directly
	• *Discuss any adjustment*	• Laboratory assay data for rare earths is received in element form and converted to oxides for the

Criteria	JORC Code explanation	Commentary
	to assay data.	reporting of rare earth results using molecular weight conversion and the oxide states 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
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.*	• No drilling is reported • Rock and soil samples are located using a hand held GPS with an observed accuracy of +/-5 metres • The grid system used is WGS84 UTM Zone 33S. All reported coordinates are referenced to this grid.
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.*	• Rock samples are single point grab samples • Soil samples are collected along a single east west traverse at approximately 100 metre intervals. • The data is not designed to support a Mineral Resource estimate • No sample compositing is applied
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key*	• The single soil sampling traverse crosses the centre and entire diameter of the Coola carbonatite circular ring structure • No drilling is reported

Criteria	JORC Code explanation	Commentary
	mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	
Sample security	• *The measures taken to ensure sample security.*	• Sample security is managed by the Company. After collection in the field the samples are stored at camp in locked sea containers. • A customs officer checks and seals the samples before transportation by the Company directly to the preparation laboratory. The preparation laboratory submits the samples to the assay laboratory by international air freight – the samples again being inspected by customs and sealed prior to despatch. • The laboratories audit the samples on arrival and reports 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.*	• No external audit has been completed. The database is compiled by an independent consultant and is considered by the Company to be of sufficient quality 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.)

Criteria	JORC Code explanation	Commentary
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.*	• Prospecting License 059/02/01/T.P/ANG – MIREMPET/2020 covers an area of 7,456 square kilometres. Pensana holds a 90% beneficial interest in the licence with two Angolan partners each holding 5%. The licence was granted for a period of two years, renewable to 7 years. • The concession is in good standing and no known impediments exist.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Academic research workers named in the text have completed limited rock sampling and geological mapping at Coola and Monte Verde.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The targets tested consist of alkaline-carbonatite volcanic and / or intrusive centres and associated fenite alteration forming ring structures several kilometres in diameter. • These geological features are prospective for disseminated heavy rare earth (HREE); light rare earth (LREE); niobium; fluorspar; phosphate / phosphorus, hafnium, tantalum and scandium mineralisation.

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 above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
		• No drilling is reported

Criteria	JORC Code explanation	Commentary
	• *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.*	
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 grade cuts are applied • No intersections are reported and no data aggregation is applied • 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').*	• No drilling or intersections are reported. Results are point samples
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of*	• Appropriate plans are included in this release.

Criteria	JORC Code explanation	Commentary
	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.	
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.*	• All new exploration results are reported.
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.*	• Geological descriptions are included in the text of the alkaline – carbonatite systems investigated • No exploration data is excluded
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).*	• Systematic gridded soil sampling programmes have been completed at the Coola and Monte Verde carbonatite – alkali complexes and assay results are awaited. • Wide spaced soil sampling is planned at Sulima. • Regional stream sediment sampling and geological reconnaissance has just commenced over the sider region • Geological mapping and rock sampling will accompany the regional sampling. • Trenching and drilling programmes will be implemented to test priority targets once assay data from the above programmes is received
	• *Diagrams clearly highlighting the areas of*	• Appropriate diagrams accompany this release.

Criteria	JORC Code explanation	Commentary
	possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	