

Namibian Carbonatite REE's--- and others

An e-mail string from a group of six (very) senior geologists, musing on REE's.

Aldoro Resources, a company I hold shares in, recently announced a deal to acquire an interest in an REE bearing carbonatite in Namibia. As it's your home patch I'd be interested to hear your opinion on whether this was/was not a good project to get into.

Very interesting I'd say. And I know the area briefly, takes me back!!! I've had REE experience – and to get an idea of how this sits REE resource-wise in a hard-rock carbonatite deposit sense (most everyone else is chasing clay hosted regolith IAC deposits at present) I'd look at Mountain Pass in the US and Mt Weld in WA.

Yes, certainly interesting and the comparison with Mountain Pass and Mt Weld adds to the story. I know SFA about REE deposits but have wondered about the metallurgy of the clay-hosted prospects so popular amongst explorers at present.

I reckon the clay metallurgy is probably crap? as is most of the reporting.....As for carbonatites, also take a look at ASX-listed Aguia...I think their hard rock phosphate project in Brasil is a carbonatite? Carbonatites will have no chance in the media.

Id humbly say that you might look up my recent (late last year) IGR on REEs for HRE for an IPO. They have a IAC deposit at Cowalinya in WA (near Norseman) which they are drilling. I gave an extensive summary of the REE industry in the IGR. Apologies for all of the acronyms.

Tres Estrada, Brasil is a carbonatite....see Phase 2. There is a stack of releases on it

No one has been able yet to explain to me why a steeply dipping hard rock deposit grading ~4% P₂ O₅ is viable when a flat lying soft rock deposit grading ~16% is not.....??

Also take a look at Rarex...Cummins Range up in the Kimberley. Certainly a carbonatite...and there are not many of them in Oz. Mt Weld is the best and biggest by a long shot.

The clay hosted things are a complete con...they cannot work at the grades they are talking about...and that's the view of a metallurgist I know who has worked on them.

Thanks ...you have vindicated my scepticism.....

I'm with you on the P grade, which seems relatively low in that Brazil deposit.

I think the phosphate thing in carbonatites is all about the grade and scale – and also “other” associated minerals. Check out the huge Phalaborwa mine in South Africa, which memory tells me was actually a copper mine with add-on phosphate and REEs.

Phalaborwa works on a COG of 5% so 4% is unlikely to work.

I had a cursory look at REE in carbonatites some years ago including the Kalkveld carbonatite cluster (not specifically Kameelburg). I focussed on the Eisenberg carbonatite, which seems to be off the license, might have the highest grade, but difficult to extract due to the iron association. REE mineralisation in the cluster is in the 1 to 2% range (rarely more) and mainly reports as ancylite (Sr-Ce-La carbonate). Overall I thought the grades were rather low and LREE rather than the more sought-after HREE (=I did not pursue the targets), with the caveat that the carbonatites on this license are not well explored yet. The carbonatites all contain large amounts of apatite (4 to 5% P₂O₅) and although this would be an exploration focus, Th and REE may also be of interest. At Eisenberg most of the Th appears as thorianite, although the fine grained and intergrown nature with the iron suggests that it may be difficult to extract. Up to 2% ThO₂ has been analysed but most samples report 0.5% to 0.7% ThO₂. The area is extremely radioactive with dose rates more than 20 000 cps being measured. Hopefully the Kameelburg carbonatite stands out as being different and higher grade than the rest of the cluster.

Carbonatites are strange beasts, that's for sure, and you'd want lead underwear by the sounds of it. Whilst several saleable end products, it sounds like grade at Kameelburg might be the big question, we'll see what develops. As an aside, I bought into Aldoro on basis of a large mafic intrusive (Narndee) they hold in WA with some Julimar similarities, but PGE's and Ni/Cu grades in drilling to date a bit on the shy side.

Thanks also to everyone else who joined in, an interesting discussion. Rob's independent geos report for HRE an excellent summary that even I could understand (well at least most of it!)

And the Final Word...

Carbonatites are good places to start for REE exploration but only a small portion of a complex may be mineralised. Good analogues with a phosphate connection include Kangankunde (held by Lindian), Bear Lodge (Rare Element Resources), Cummins Range (RareX), Nolan's Bore (Arafura) as well as current mines Mt Weld and Mountain Pass.

Most of these have variable phosphate enrichment. Mt Weld's phosphate resources are lesser known than the CLD but details can be found on Lynas's website (viz Coors, Crown, etc).

Avenira's phosphate resources are quoted above 15% which from memory is at least what is needed but if the phosphate is coming out as a by-product (eg Arafura) from rare earth production then more subdued phosphate levels could be of interest.

Aldoro's release of 20 March 2023 provides some interesting information:

Thorium enrichment is a negative but details are scant.

The oxides for Cr, Pr and Tb have been incorrectly calculated but will not significantly affect totals.

The distribution of REE in soils and surface rocks indicates LREE enrichment with NdPr (two of the more valuable REE) approximately 18% of total TREO, these levels are on the low side.

Previous drill results are not discussed in detail, cross sections and more details would be useful.

Th and U levels are important.

The REE mineralogy is at the more difficult end of the metallurgical processing (apatite is still a challenge) spectrum but more details would be useful.

Pending plotting of previous drilling results, there appears to be enough data to undertake an initial drilling program.

The regolith flanking the hill could be interesting in terms of ionic adsorption potential. The soils could easily be tested with $(\text{NH}_4)_2\text{SO}_4$ at pH4 sulphuric. High pH levels developed over the carbonatite may have inhibited significant breakdown of primary REE phases though those listed are not refractory like monazite.