

Rare earths expert Alastair Neill on Vital Metals

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“Overall Vital appears well on the way to producing commercial quantities of rare earth concentrate, a first in Canada.” – Alastair Neill, President, Critical Minerals Institute

[Vital Metals Limited](#) (ASX: VML | OTCQB: VTMXF) is an Australian listed company whose subsidiary, [Cheetah Resources](#), is developing the Nechalacho project in the Northwest Territories of Canada. The deposit was previously owned by [Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF), and they sold the rights in 2019 to Cheetah for the material 150 meters above sea level. Avalon retained the rights to the basal zone deposit which is underground. The deposit is reported to have 94.7 million tonnes at 1.46% REO (0.1% Nd/Pr cutoff). The mineral hosting the rare earths is bastnaesite, which is good as this mineral has been processing successfully for many years.

Vital raised A\$45 million recently through a targeted share placement at A\$0.04 per share. According to their [press release](#) the funds will be used for:

- Finalisation of construction activities and undertake commissioning, ramp-up and operations at its Rare Earth Extraction Facility in Saskatoon, which will produce a rare earth carbonate product
- Accelerated development of Tardiff deposit at Nechalacho, Canada, including mining studies

A strong balance sheet for ongoing working capital requirements

This project is the most advanced rare earth project currently in Canada. The initial focus is the North T zone which has a

resource of 101,000 metric tonnes at 9.01% contained Total Rare Earth Oxides (TREO). Based on tests run at their Saskatoon rare earth extraction plant they can get a 75% recovery to produce a 43.7% concentrate. Based on this, the deposit would produce 6,825 metric tonnes of TREO which would contain 1,600 tonnes of Neodymium (Nd) and Praseodymium (Pr). Tests have been done using X-ray Transmission (XRT) to sort the ore as the ore is hosted in quartz, which is white, and the rare earth mineral which is red. This is a simple way to upgrade the TREO content at site.

There is an offtake agreement with REEtec, a Norwegian company that is developing a new rare earth separation process. The agreement is for Vital to deliver 1,000 tonnes per year (TPY) of TREO (excluding Cerium (Ce)). Based on that Ce will be eliminated before shipping the concentrate to Norway. This is a step that has been done before by Molycorp in the 1980s. It reduces the material handling by 50% and obviously the size of downstream processing equipment. The North T zone will provide 3,400 of the 5,000 tonnes which means Cheetah will have to open the Basal zone to meet the balance of the supply contract.

Looking at today's prices on Shanghai Metal Market (SMM) the separated value of this contract is over US\$286 million. Assuming Vital gets 1/3 of the value for the concentrate this would produce revenues of over US\$95 million of which US\$92 million would come from Nd/Pr. Details of the agreement are not revealed so REEtec may be a toll arrangement which could produce more revenue for Vital though I expect the initial target would be to sell La, Nd and Pr in Europe as there are customers in Europe.

Interestingly the extraction plant is located beside the Saskatchewan Research Council (SRC) which has announced that they will be building a rare earth separation facility to

process monazite by 2024. SRC has two rare earth experts from China on staff. SRC is also putting in an Nd/Pr metal facility which takes the oxide to the next level in the supply chain.

In addition to the Nechalacho project, Vital has a project in Tanzania called Wigu Hill. Vital has signed a project development and option agreement with Montero Mining & Exploration Ltd. (TSXV: MON), to acquire and develop the Wigu Hill project. The Wigu Hill project is a light rare earth element deposit and consists of a large carbonite complex with bastnaesite mineralization with a NI 43-101 Inferred resource estimate of 3.3Mt at 2.6% light REOs. This is also a bastnaesite mineral.

Overall Vital appears well on the way to producing commercial quantities of rare earth concentrate, a first in Canada. Questions that do need to be answered are what are the costs of operating an open pit mine in Northern Canada and the costs to transport material to Saskatoon.

Vital Metals new Rare Earths Extraction Plant planned adjacent to SRC's Separation Plant

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Vital Metals on track to become a rare earths carbonate producer in 2021

In news out today rare earths carbonate developer Vital Metals Limited (ASX: VML) ('Vital'), through its 100% owned subsidiary Cheetah Resources, has [signed a binding Term Sheet](#) with the Saskatchewan Research Council ('SRC') to negotiate definitive agreements for the construction and operation of a Rare Earth Extraction Plant to produce a mixed rare earth carbonate product. The capital cost estimate of the Rare Earth Extraction Plant is A\$5.25m.

The Rare Earth Extraction Plant is planned to be located adjacent to a recently [announced](#) Rare Earth Separation Plant in Saskatchewan, Canada, and could provide a rare earth carbonate feedstock to produce a commercial grade separated rare earth oxide. The proximity makes it natural for SRC's Separation Plant to be a potential customer of Vital/Cheetah's mixed rare earth carbonate product from their planned Extraction Plant.

Vital Metals' Managing Director Geoff Atkins comments

"The signing of this Term Sheet with SRC marks an important milestone for Vital and the development of the Nechalacho Project," said Vital Metals' Managing Director Geoff Atkins. "Whilst the Definitive Agreements continue to be finalised in line with the Term Sheet, the Company is excited about the prospect of the construction and operation of a rare earth demonstration extraction plant, as well as it being co-located with SRC's recently announced rare earth separation plant. Being the only rare earth project in Canada with near term production capability, co-located with Canada's only Separation Facility, provides Vital the opportunity to be a cornerstone of the North America Critical Minerals Strategy."

Vital Metals low CapEx strategy to become a rare earths carbonate producer in Canada

Traditionally rare earth miners would look to build a huge plant to make a rare earths end product, however Vital Metals has a different strategy to reach production quicker and with a much lower CapEx, as well as supporting a much needed **non-China rare earths supply chain**.

Vital is an explorer and developer with highly prospective mineral projects, focusing on their world-class rare earth Nechalacho Project in Canada. **Their strategy is to be the largest independent supplier of clean mixed rare earth feedstock outside of China**, with a goal to produce a minimum 5,000 tonnes of contained rare earth oxide (REO) by 2025. A key component to the plan is a much smaller scale plant with an extremely low CapEx of just A\$20m to produce rare earth carbonate. Subject to the various hurdles such as funding, Vital Metals hopes to begin production at their Nechalacho Project in 2021. Once in production, Vital's strategy is to generate low cost near-term cash flow to fund the development of large-scale operations.

Vital Metals Nechalacho Project and Stage 1 strategy



[Source](#)

Vital owns two world class rare earth projects – Nechalacho in Canada with [~95mt at 1.46% TREO](#), and Wigu Hill in Tanzania with 3.3mt at 2.6% TREO.

The Nechalacho Project (Canada)

The Nechalacho Project is a rare earth project located in Northwest Territories, Canada. The current resource estimate is [94.7mt at 1.46% REO](#) (measured, indicated and inferred). The

North T Zone at Nechalacho hosts a high-grade resource of 101,000 tonnes at 9.01% LREO ([2.2% NdPr](#)). Vital is targeting production of rare earth oxide in 2021 with early production from the North T starter pit.

More than \$120 million has been spent by previous owners on drilling, permitting and project development at Nechalacho, which includes a 40-person camp and airstrip. The Project is **fully permitted for a 600kt mining and ore sorting operation** and is 100km from Yellowknife. The local infrastructure is well established with access to the Canadian National Railway at Hay River. Access to the site is via barge in summer and ice road in winter.

The metallurgy is a simple process involving a 35%+ initial beneficiation via ore sorting and 97% recovery into solution via hydrochloric acid using an industry standard process.

Vital has already completed detailed engineering for the ore sorting plant, defined capital and operating costs, and begun site preparation works. Off-take negotiations are reported to be progressing well with a number of non-China buyers.

Vital Metals next steps and map showing the Tardiff Zones



[Source: company presentation](#)

Management [is highly experienced](#). For example, Managing Director Geoff Atkins has 25 years of project and corporate development experience, including four years as Corporate Planning Manager at Lynas Corporation where he oversaw the strategic planning process and the development of the Mt Weld Concentration Plant and Lynas Advance Materials Plant in Malaysia.

Today's news from Vital suggests that, assuming progress

continues successfully, the SRC will support Vital in its construction and operation of their Nechalacho Project. Subject to execution of definitive agreements, processing operations are planned to start in the third quarter of 2021.

The current market cap of Vital Metals is A\$52m.

Lifton and Avalon's Bubar discuss how to start a new rare earths supply chain outside of China quickly

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"We are moving forward with the original plan we developed with them (Cheetah Resources Pty Ltd.) which was to start with a very small scale project to develop a resource in a separate deposit that occurs on the property (Nechalacho Project). A small satellite deposit called the T-Zone that had work done on historically where there is a small but very interesting resource very rich in bastnaesite in a pegmatite. The mineralogy is so simple that we can make a concentrate with just using sensor-based ore sorting technology which makes it very low cost to implement and relatively easy to permit because you are not creating any toxic waste that creates environmental concerns... It could be possible to get something started there in as little as a year and start to show the world on how you can do things a little bit differently to start a new rare earths supply chain outside of China." States Don Bubar, President, CEO and Director

of [Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF), in an interview with InvestorIntel's Jack Lifton.

Don went on to say that there is a lot of interest in the government circles in both Canada and the US to establish a new rare earths supply chain. He continued by providing an update on Avalon's Letter of Intent signed with a private US company, Coal Strategy Advisors, LLC, to earn up to a 50% interest in the Will Scarlett Rare Earths Recovery Project located near Marion, Illinois. He said that Will Scarlett is a closed coal mine site where Coal Strategy Advisors discovered a very high level of rare earths enrichment in the acid mine drainage and in the precipitates generated from lime treatment of the acid mine drainage to neutralize the acidity. He said that Will Scarlett provides Avalon with an opportunity to extract rare earths out of previously-mined waste materials at a relatively low cost.

To access the complete interview, [click here](#)

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Don Bubar on Avalon's rare earths partnership with Cheetah Resources

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"We are delighted to have a liked minded partner, like Cheetah Resources, partner with us on the Nechalacho Project. They were actually interested when they saw our news release back in

October where we talked a little bit about having some ideas about how we can take advantage of some of the near surface bastnaesite rich rare earth resources at Nechalacho in the T-Zone and another zone called the Tardiff Zone and look at how they might be developed at a relatively small scale to produce a bastnaesite concentrate to recover neodymium-praseodymium from.” States Don Bubar, President, CEO and Director of [Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF), in an interview with InvestorIntel Corp. CEO Tracy Weslosky.

Tracy Weslosky: The news you just announced with your partner Cheetah Resources for the [development of the Nechalacho rare earths project](#), has the industry all abuzz. Can you tell us all about it please?

Don Bubar: Sure. We are delighted to have a liked minded partner, like Cheetah Resources, partner with us on the Nechalacho Project. They were actually interested when they saw our news release back in October where we talked a little bit about having some ideas about how we can take advantage of some of the near surface bastnaesite rich rare earth resources at Nechalacho in the T-Zone and another zone called the Tardiff Zone and look at how they might be developed at a relatively small scale to produce a bastnaesite concentrate to recover neodymium-praseodymium from. We also were starting to look at how we could use simple new ore sorting technology to make that concentrate. They saw that news release and contacted me afterwards and said, that is a really good idea, we have been thinking about doing the same thing on another project we have. Why don't we talk about getting together on it? I said sure and the conversation started there and resulted in the arrangement we announced last week.

Tracy Weslosky: I am delighted to hear this news. I sent you a quick congratulations and would like to clarify to the

InvestorIntel audience that the target here are the magnet metals. Is that correct?

Don Bubar: That is where the best opportunity is right now Tracy. As you and your listeners may well know, the demand for high-strength permanent magnets using neodymium, praseodymium, dysprosium has not diminished since the days of the rare earth bubble. In fact it is increasing now with the demand being created by electric vehicles and those electric motors requiring high-strength permanent magnets made with neodymium. That supply chain never really did get created outside of China to any meaningful extent so we are starting to see the same circumstances arise again that arose in 2009-2010 with the world realizing that the supply sources for these critical elements are indeed limited. The opportunity is there I think to start to look at how that supply can be brought to market. I think we have got to start looking at new creative models on how to do that in more efficient ways using new technology.

Tracy Weslosky: Don I could not agree with you more on your assessment on what is happening in the market right now with rare earths. Can you tell us a little bit more about how this partnership with Cheetah may actually work?

Don Bubar: We looked at different variants on the model there. They were really just most interested in the T-Zone and the opportunity that that provided on the Tardiff Zone. We decided to keep it simple and carve off a piece of the entire asset we have there for them to take ownership of and move forward on that model with, with us still helping them with the overall project management. Then see if we can get something going there with them. We will still retain a royalty interest in the whole property...to access the complete interview, [click here](#)

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