

Rare earths giant MP Materials invests heavily to rebuild a U.S. magnetics supply chain

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Taking private companies public through alternative investment vehicles, such as special-purpose acquisition companies (SPAC), was a popular trend in 2020 and 2021. SPAC and other deals, such as Fortress Value Acquisition Corp (FVAC), have come under scrutiny by some parties as a cash grab. However, there are multiple success stories that have been able to secure investor trust.

One company who did not fall victim to this hype is [MP Materials Corp.](#) (NYSE: MP). In fact, MP Materials has continued to impress investors since the company went public through a FVAC in December 2020. Operating the only rare earth mining and processing facility in the United States, MP Materials is poised to continue to deliver rare earths (RE) to US customers whose appetite for these materials is nearly endless.

MP Materials primarily provides lanthanum, cerium, and neodymium-praseodymium oxide. Interestingly, MP Materials has both support from the commercial and military sectors. We reported back in [December](#) that General Motors (GM) struck a deal with MP Materials to supply U.S.-sourced and manufactured rare earth materials, alloy, and finished magnets for GM's electric vehicle programs. MP Materials plans to ramp up production to support this effort in 2023, but it remains to be seen if they can meet that aggressive timeline.

The Department of Defense will help contribute to the continued operation of the Mountain Pass facility. MP Materials was

awarded a [\\$35 million contract](#) through the Industrial Base Analysis and Sustainment Program to support heavy rare earth elements (HREE) mining. These materials are critical to the development of permanent magnets that are key components in various products, from wind turbines to missile systems.

The Mountain Pass facility already has the capability to mine and process light rare earth elements (LREEs). The added capability to mine HREE will enable MP Materials to mine all rare earths for high-performance magnet production. The company will also be able to recycle all recoverable rare earths from end-of-life magnets and magnet production scrap.

The company is currently [building](#) a 200,000 sq. ft. greenfield metal, alloy, and neodymium-iron-boron (NdFeB) magnet manufacturing facility in Fort Worth, Texas. This facility will also serve as the business and engineering headquarters for MP Magnetism. Materials mined at Mountain Pass will be processed and transformed into products at the Texas-based facility. Construction of this facility began in April 2022.

These exciting new developments and other macroeconomic forces have led to a positive outlook for MP Materials. The company had a promising [first quarter](#) of 2022 and beat market expectations. MP Materials posted revenues of \$166 million—surpassing the \$132 million expected—and boasted earnings per share of \$0.50 (as opposed to the \$0.38 expected).

Revenue increased 177% year-over-year from increases in the realized price of rare earth oxide from higher demand for rare earths. The increase in revenue was also in part due to the amount of rare earth oxide sold, which occurred due to higher production volumes and shipment timings.

MP Materials also had a significant amount of free cash flow in quarter one, but that will likely change throughout the rest of

2022. The company plans to continue to heavily invest in its assets this year. These investments could result in a negative free cash flow in 2022.

It remains to be seen whether MP Materials can meet the bold promises that management is aiming for. Improving rare-earth supply chains in the United States is a massive challenge, but currently, MP Materials has a chance to get there.

Ucore targets to fill the processing gap in a Western rare earths supply chain by 2024

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As most investors familiar with the critical materials sector know, China currently dominates the space, especially in downstream critical materials 'processing'. This leaves the Western world very vulnerable to supply chain interruptions that can threaten the supply of end-user products such as electrical and electronic components, electric vehicles, wind turbines, solar panels, and/or military systems.

Today's company, [Ucore Rare Metals Inc.](#) (TSXV: UCU | OTCQX: UURAF) (Ucore), is working to bridge that gap, domestically, and become a USA 'processor' first of the rare earths, and ultimately of other key critical materials. They also plan to be a vertically integrated individual, separated, heavy rare earths

producer.

Ucore is focused on initially developing an Alaska-based Strategic Metals Complex (SMC) rare earths' central processing facility with commissioning targeted for 2024. After that Ucore plans to develop its own magnet rare earths' deposit located on Bokan Mountain on Prince of Wales Island, Alaska. The ultimate plan for Ucore is to have their Bokan-Dotson Ridge REE Project – containing the heavy rare earths' Dysprosium (Dy), Terbium (Tb) & Yttrium (Y) – feed their first, Alaska located, SMC processing facility. The underlying technology for this and other planned SMCs is the RapidSX™ REE separation technology platform, which will be operated by Ucore's wholly owned subsidiary, Innovation Metals Corp. (IMC).

Ucore plans to fill the processing gap in creation of a Western rare earths supply chain with their SMC facilities



Source: [Ucore news January 2022](#)

A key part of getting the Alaskan SMC processing facility up and running is to secure material supply agreements. The facility will have an initial 2,000 tpa total rare earth oxide (TREO) separation and purification capacity, ramping to at least 5,000t/year TREO by 2026.

Feedstock agreements are progressing well for Ucore's planned Alaskan SMC processing facility

[In October 2021](#) Ucore signed a non-binding Memorandum of Understanding (MOU) with [Vital Metals Limited](#) (ASX: VML | OTCQB: VTMXF) for the supply of a mixed rare earth carbonate, beginning H1 2024. The deal is for "Vital to sell to Ucore a minimum of 500t REO (ex-cerium)/year, commencing H1 2024. Vital to expand

production to support a minimum of 50% of Ucore's envisioned 5,000t TREO/yr processing capability by 2026."

It also was [announced last week on April 20, 2022](#), that Ucore and Germany's ThyssenKrupp Materials Trading had executed a feedstock supply MOU for the Alaska SMC. Under the MOU "ThyssenKrupp Materials Trading is expected to begin the supply of a minimum of 1,000 tpa of mixed rare earth carbonate to Ucore in 2024 for ten years." The announcement also states that the non-binding MOU allows for increasing quantities in subsequent years and that the two parties will work towards a 10-year binding contract.

The above MOU is a great achievement and positive endorsement for Ucore, as ThyssenKrupp Materials Services is [the biggest mill-independent materials distributor](#) and services provider in the Western world with around 380 locations, in more than 30 countries.

The loud and clear message for investors is that Ucore is putting together a North American individual rare earths supply chain from mixed rare earths carbonate (concentrate) all the way to the final product of separated individual rare earth oxides, used to make rare earth metal alloys (including magnets) such as those required for many critical and green energy products. It will be a key initial step for the USA to gain rare earths processing independence from China, which currently dominates the sector.

Ucore is also developing processing technology for other critical metals in Ontario

As [announced](#) on April 19, 2022 Ucore is improving the management and technical team for their Ontario RapidSX™ Commercialization and Development Facility (CDF). The demonstration plant construction is ongoing and is scheduled for commissioning in

mid-2022.

What I find most interesting is that Ucore is also working on nickel laterite ore processing technologies as well as lithium-ion battery recycling, including working with clients such as Li-Cycle Holdings Corp.

Full details on Ucore's 2022 plans can be read [here](#) and include:

- A commercial demonstration plant for their RapidSX™ technology in Ontario.
- Development of the Alaska SMC Project.
- Exploring the potential of developing an SMC in Canada.
- Accelerating the development of the Bokan Project as a vital US supply chain component to provide a long-term secure source of HREEs; the most expensive and scarce inputs of the permanent magnet alloys.

Ucore's business summary – Includes a target for construction of the Alaska SMC by 2023, subject to finance



Source: [Ucore Rare Metals Inc. website – Alaska 2023](#)

Closing remarks

The Western world needs to develop its own complete end-to-end supply chains for critical strategic metals. In the case of rare earths, Ucore is advancing well and steadily moving towards becoming a U.S. individual separated rare earths producer by 2024, all going to plan. Of course, investors should remember these dates are the best guide from the company only and are subject to variables such as successful funding.

Ucore Rare Metals Inc. trades on a market cap of [C\\$37 million](#). Ucore still has a long way to go with several hurdles and risks

ahead, partially explaining the very low market cap. Still, if they succeed the potential reward could be significant.

Auxico Resources, producing and selling ores of critical EV metals and precious metals

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Today we take a look at a company that is focused on some of the most valuable metals, critical and precious, globally. This company has both mining and exploration stage project interests in multiple countries as well as its own high-value metals cracking and leaching technology. It is also involved in non-fuel minerals marketing and trading.

[Auxico Resources Canada Inc.](#) (CSE: AUAG) (“Auxico”) is focused on the production and trading of critical and other high-value metals such as tantalum, niobium, iridium, tin, and the rare earths; as well as gold and the platinum group metals. Auxico owns directly or through joint ventures mineral rights in the Democratic Republic of Congo, Bolivia, Colombia, Brazil, and Ivory Coast. Auxico also has the worldwide rights to an environmentally friendly, non-mercury, non-cyanide gold and silver extraction process; and it is proposing to build mercury and cyanide-free gold and silver processing plants. Auxico’s cracking and leaching extraction technology (UAEx) can be used in the processing of a variety of critical and high-value metals to improve yields and economics.

Auxico's global projects location map



Source: [Auxico Resources company presentation](#)

Auxico's high-grade rare earths projects, plus tantalum and niobium

Auxico's recent focus is on two very high-grade rare earths projects, in Colombia and Brazil, with a strategy of positioning the Company to be a major supplier of rare earths to North America.

Auxico Columbia properties

Auxico has acquired a total of [1,482](#) hectares of mineral rights and surface rights to properties (Minastyc, Agualinda) located in the municipality of Puerto Carreño, Colombia. The Properties are located within a strategic area designated by the Colombian Government for its potential for tantalum, niobium and the rare earths.

Auxico [state](#) (January 2022 company presentation):

"AUXICO has made a significant discovery of high-value rare earth ore in Colombia, **with a total rare earth content of 56.81%**. Subsequent to a sampling program of 23 pits, samples from the Company-controlled property were sent to Canada and analyzed by Coalia Research Institute in Thetford Mines, Canada. Test results on a sample from a separate pit on the property **resulted in 47% tin content**, as well as with tantalum, niobium, scandium and rare earth credits. The pitting program was conducted on the property subsequent to a satellite imagery interpretation study which identified in excess of 20 priority exploration targets that are in the process of being sampled."

Note: Bold emphasis by the author.

Auxico Columbia has the highest global TREO content by weight at 56.81 wt%



Source: [Auxico Resources company presentation](#)

Auxico Brazil JV

Auxico has an option to enter into a JV for the development of their properties in Brazil with a total rare earth oxide content of up to [63.49%](#). This is also exceptionally high.

Auxico's business strategy is a mix between high value metals exploration, processing, marketing & trading from multiple projects globally



Source: [Auxico Resources company presentation](#)

Note: Coltan is an ore that contains niobium and tantalum. Niobium was originally named "columbium" thus columbium and tantalum = coltan.

In addition to the above rare earth projects, Auxico has an MOU agreement with Minampro Asociados S.A.S for the exploitation and trading of industrial sands (tantalum ore) originating from Vichada, Colombia.

Auxico also recently signed [a JV to acquire a 70% interest in a rare earth property](#) in Bolivia. What is very interesting is that the property has "confirmed the presence of pegmatite veins containing lithium mineralization, as well as high-grade cesium and rubidium mineralization, and various rare earths."

High-value metals extraction and processing

Auxico has several agreements in place to process high-value metals. In Columbia, Auxico plans to build a 10,000 square meter rare earth refining facility. In the DRC, Auxico has signed a JV agreement with Kibara Minerals for the concentration and export of tantalum and niobium ores.

Auxico [state](#): “AUXICO has licensed a patent-pending environmentally friendly extraction technology (UAEx) for the processing of high-value metals. The UAEx process is very effective on high-value rare earth samples, achieving +80% recoveries of select rare earth elements over a 2-hour leaching time.”

Marketing and trading of metal ores

Auxico is also involved with marketing and selling [manganese ore from Brazil](#), an [MOU for exploitation and commercialization](#) of tantalum, niobium, iridium and tin from industrial sands located in Bolivia, and has a [LOI for the exploitation and trading](#) of tantalum and iridium bearing minerals from the Ivory Coast.

Closing remarks

Auxico is certainly an adventurous company with projects in several high-risk countries. However, by diversifying across many countries, many projects, many valuable metals, and mining exploration and processing, marketing & trading; Auxico aims to lessen the risks and achieve success. In many ways, Auxico reminds me of a very early stage version of Glencore.

Auxico Resources Canada trades on a market cap of [C\\$44 million](#) and looks suitable for adventurous and risk-tolerant investors hoping to prosper from Auxico's efforts across a wide range of valuable metals. A very interesting company with plenty of paths

to profitability and success.

Search Minerals is looking pretty foxy for 2022

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All I want for Christmas is money, is what [Search Minerals Inc.](#) (TSXV: SMY | OTCQB: SHCMF) must be saying after it recently announced plans to re-stock the treasury with a \$15 million non-brokered [private placement offering](#). For a Company with a market cap of roughly C\$69 million prior to the closing of this share issuance, that seems like a pretty good Christmas present. I'm sure there are a few other items on their Christmas wish list but things have been going along fairly well for this rare earths explorer in Newfoundland and Labrador.

As background, Search Minerals is focused on creating value through finding and developing rare earth mineral assets in SE and central Labrador, Canada. The Company is the discoverer of the Port Hope Simpson – St. Lewis Rare Earths District, a highly prospective belt located in southeast Labrador that is 62 km long and up to 2 km wide. Search owns 100% of two advanced rare earth resources called the [Foxtrot Project](#) and [Deep Fox Project](#), and the more recently announced Foxtrot-like prospects [Fox Meadow](#), Silver Fox and Awesome Fox. In addition, the Company has identified more than 20 other Foxtrot-like prospects in the District. Several of the Foxtrot-like prospects require exploration drilling programs and may provide additional resources to a central processing facility that would be situated within the District.

The interesting thing about Search is that they have a little more going on than just exploring for rare earths. The Company has developed a breakthrough technology for the processing of its material called the Patented Direct Extraction Metallurgical Process. With the mining of many commodities, it's not as simple as taking the rock from the ground, crushing it up and sending it to market, and the mining of rare earths can create their own environmental nightmare if not addressed properly. Fortunately, Search has found an elegant answer with an environmentally conscientious solution for managing waste residue that also significantly reduces CAPEX and operational costs along with eliminating unnecessary steps, lowering capital and operating costs and producing a dry stackable waste residue that reduces the environmental footprint, pilot plant testing has clearly demonstrated the ability to produce a high purity mixed rare earth oxide (REO) concentrate. You can read more about the process [here](#), but this could be a big deal.

On the exploration front, Search had over 6000 assays from its 7000m drill program at Deep Fox that were [reported Nov 15th](#) with all 38 drill holes showing significant rare earths throughout the mineralized zone and mineralization observed in all levels (25m, 50m, 100m, 150m, 200m). At Fox Meadow, 500m of channel sampling work has been completed and samples are being logged and prepared for shipment to the assay laboratory in preparation for a preliminary drill program in 2022. Additionally, Silver Fox is drill ready for 2022 and the Company is preparing a preliminary drill program there as well. Lastly, the Deep Fox drill data will be used to prepare a new resource estimate which will be incorporated into an upcoming preliminary economic assessment report expected in Q1 2022. The combination of the Deep Fox and Foxtrot resources will potentially allow for an increase in the production rate compared to the 2016 PEA on Foxtrot alone. Especially given assays from Deep Fox have shown

higher grades of the key rare earth elements used in the permanent magnet market (Neodymium, Praseodymium, Dysprosium and Terbium) as compared to Foxtrot.

It has been an exciting few months for Search Minerals hence my suggestion that its Christmas wish list might be a relatively brief one. Maybe one wish is for a short, mild, winter so they can get back to drilling sooner than later after they replenish the bank account. Nevertheless, with the US, Canada and EU collaborating to build a secure rare earth supply chain, Search Minerals is in the right jurisdiction to participate in breaking global reliance on China. Assuming they are successful in raising the full \$15 million the Company will be in great shape to hit the ground running to start 2022.

Perhaps I'll finish the year with a bad pun before I wish everyone a happy and safe holiday season, but to me this looks like a pretty foxy investment. I hope they've at least seen a fox or two on their exploration properties.

Merry Christmas everyone and see you in 2022!

Multitasking across the critical material supply chain, Auxico Resources is focused on rare earths in

Colombia

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Every once in a while, I get to discuss a company of which it is hard to capture the true essence. For the most part, when we look at junior mining (exploration and early development) companies, they are focused either geographically or by resource, but one way or the other, they are a junior mining, basically exploration, company. Occasionally, they are also dabbling in special or creative ways to process the particular ore at the heart of their operations. But today we are going to dig into a company that does all of the above, as well as getting into the marketing and sales of the finished products, whether it be theirs or not. And at first glance, it's almost hard to tell which opportunity has the most upside. Given my background, my bias is the marketing side of things, but I will try and keep an open mind as we dig into this interesting and somewhat unique company.

Without further ado, let's have a look at [Auxico Resources Canada Inc.](#) (CSE: AUAG), which is a combination project generator, miner, processor and marketer all rolled up into one. Auxico is a Canadian company, founded in 2014 and based in Montreal, engaged in the acquisition, exploration and development of mineral properties in Colombia, Brazil, Bolivia, Mexico, the Democratic Republic of the Congo and the Ivory Coast (so far). Across these countries, Auxico is involved in gold, silver, coltan (which I had never even heard of before but is a dull black metallic ore from which the elements niobium (aka, columbium) and tantalum are extracted), iridium, tin, manganese and last but certainly not least a full basket of Rare Earths.

Perhaps you might be starting to get a feel for why this is a tough Company to talk about but wait there's more...a lot more.

The Company has numerous agreements in place to market various products to generate cash flow today, which is not typical for a junior mining company. A great example is [manganese ore sales from Brazil](#) to India, China and the UAE. Auxico has purchased and sold a total of 15,000 metric tons of manganese ore, with a minimum grade of 46% Mn (~15% net profit margin), as part of two contracts with customers to provide for shipments of up to 120,000 MT per month cumulative of manganese ore. Additional marketing agreements include an [MOU for exploitation and commercialization](#) of tantalum, niobium, iridium and tin from industrial sands located in Bolivia, and an [LOI for the exploitation and trading](#) of tantalum and iridium in Ivory Coast. These and other similar arrangements serve the company in two ways. As noted, it provides a source of revenue to the Company, so they don't always have to go to the market and raise cash to drill more on their exploration properties and it gets them into the deal flow to potentially acquire interests in some of these mining plays if they so desire.

I also made mention early about being an innovator on the processing side of the equation. On July 30th Auxico [signed a technology license agreement](#) with Central America Nickel for the use of a patent-pending ultrasound assisted extraction process ("UAEx") for mineral extraction. The UAEx process is a sustainable metallurgical process for the refining of critical minerals using ultrasound technology. In particular, artisanal gold miners, who produce an estimated 15 million ounces of gold yearly, use mercury in their process plants. The UAEx process is able to extract gold and silver in less than one hour in a closed-loop system and does not use cyanide or mercury, which can solve the environmental issues created by artisanal mining. Additionally, this process will dramatically reduce capital and operating costs as most known metallurgical processes that use sulfuric acid, cyanide or hydrochloric acid do so in a 24-hour

cycle. As you could well imagine, this could be Auxico's diamond in the rough, but it might not even be the most exciting aspect of the Company.

I think I've saved the best for last, at least as things currently stand for Auxico, and that's the rare earths project in Columbia. Auxico has [discovered high-value rare earths](#) with total rare earth oxide content over 56% at the Company controlled Vichada property. And if that's not good enough, they've also [discovered platinum group metals](#) on the property along with tantalum, niobium and tin. The Company has an MOU agreement with the Colombian company Minampro Asociados S.A.S., to earn a 70 % interest. Auxico's partner has an exclusive purchase agreement for industrial sands within 20,000 hectares of land owned by the indigenous community Guacamayas-Maipore.

The graph below is an eye opener:



Source: Auxico Resources MD&A for the period ended June 30, 2021

My head is starting to spin thinking about all the things on the go at Auxico so I will leave it here for now. To summarize they have impressive exploration prospects, a sustainable, environmentally friendly mineral extraction process, and marketing agreements that are already generating revenue. That's quite a bit going on for a company that currently has a market cap of roughly \$84 million. I don't think I'd even know where to start to try and value all the various parts, but the Colombian assets have definitely caught my eye.

One of the world's richest rare earth deposits continues towards resolution of issues with Burundi partner

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Rainbow Rare Earths' production in Africa to be expanded through extraction from South African mine tailings.

When it comes to rare earths it is important to identify the most valuable ones. Rare Earth permanent magnet production accounted for 91% of the total monetary value of rare earth consumption in 2019, and neodymium and praseodymium (NdPr) are the two key rare earth elements used in permanent magnets, particularly neodymium. This explains why most rare earth miners target NdPr. They are simply the most in demand and are highly valuable.

[Rainbow Rare Earths Limited](#) (LON: RBW) ("Rainbow") is a rare earths miner targeting NdPr production at their two African rare earth projects. Rainbow's strategy is to become a globally significant producer of magnet rare earths. Rainbow has two African-sited projects, each of which has a special attribute leading to potentially lower cost mining. Rainbow also has [exclusive rights](#), across the SADC region of Africa, to privately owned American specialty chemical engineering company's (K-Tech) rare earths continuous ion chromatography separation technology.

The K-Tech process targets individual separation of rare earth from natural mixtures in fewer stages with more flexibility than traditionally used solvent extraction thereby saving on upfront CapEx and ongoing OpEx and potentially producing a higher end-value separated oxide rather than a carbonate. Testing is [ongoing](#).

Rainbow's two rare earths projects are:

- The [Phalaborwa Project](#) in South Africa.
- The [Gakara Project](#) in Burundi, East Africa.

The Phalaborwa Project (70% earn-in agreement)

The Phalaborwa Project comprises an Inferred Mineral Resource estimate of 38.3Mt at 0.43% Total Rare Earth Oxides (TREO) contained within gypsum 'tailings' stacked in unconsolidated dumps derived from historic phosphate fertilizer hard rock mining. Being a tailings resource eliminates the need for hard rock mining, which is expected to lead to lower operational costs. The Resource has a high-value NdPr content representing 29.1% of the total contained rare earths, measured as oxides, with economic dysprosium and terbium, key rare earths for high temperature operation of permanent magnets, as valuable by-product credits. The Project has 5-10 times higher grade NdPr than a typical ionic clay style rare earth deposit (see table below). It also has low levels of radioactive elements which means easier processing and lower costs.

Being on the site of a past mining operation, the Phalaborwa Project has excellent infrastructure and transport logistics. The Project is largely permitted and positioned in an

established mining region.

The Gakara Project (90% interest)

Rainbow [states](#) that “the Gakara Rare Earth Project is one of the world’s richest rare earth deposits.” Rainbow has a 90% interest in the Gakara Project with a non-dilutable 10% owned by the Burundi State. The mining permit covers a large area of over 39km² and has a 25-year mining license that began in March 2015.

Gakara was placed on [care and maintenance](#) in June 2021 at the request of the Government of Burundi. Primary concerns of the Burundi Government are understood to relate to the pricing of the mineral concentrate currently sold under a long-term off-take agreement with a German company’s (ThyssenKrupp), trading arm. Rainbow [states](#): “Rainbow continues to engage constructively with stakeholders to resolve the issue and allow trial mining to recommence as soon as possible.”

Closing remarks

Rainbow has two exciting African rare earth projects.

The Phalaborwa Project has several advantages including:

1. An ore tailings source, so no need for hard rock mining, crushing, or milling and hence lower production costs.
2. High-value Nd and Pr oxide content representing 29.1% of the total contained rare earth oxides, with low levels of radioactive elements, and
3. An existing mining site with great infrastructure and logistics available.

The Gakara Project has outstanding NdPr grades in visible

“veins” and is amenable to simple physical separation of minerals from waste rock to produce a high value rare earth concentrate. This makes for a low OpEx project. The Project is currently on care and maintenance pending the expected resolution of certain legal issues with the government of Burundi.

Risks are typical of those for junior rare earths miners including funding risk and in this case, sovereign risk in Africa.

Rainbow Rare Earths Limited trades on a market cap of [£ 78 million](#) (~US\$105 million). One to follow with great interest.

Search Minerals’ MOU with USA Rare Earth Advances Canada’s Participation in a non-Chinese Rare Earths’ Supply Chain

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Canadian rare earth junior miners are starting to see increasing interest in their projects with off-take [agreements and MOUs](#) signed recently. The pieces of a future European and USA vertically integrated ‘rare earths to magnets’ total supply chain are being put in place.

Last week it was [announced](#) that [Search Minerals Inc.](#) (TSXV: SMY | OTCQB: SHCMF) (“Search”) has entered into a [non-binding MOU](#) with [USA Rare Earth LLC](#) for the future delivery of a rare earth

mineral concentrate supply containing 500 tpa of the “magnet” rare earths product, neodymium/praseodymium (NdPr). The 500 tonnes/year of contained NdPr is to come from future production at Search’s Deep Fox or Foxtrot deposits, located in Labrador, Canada.

Just the week before that Australia’s [Vital Metals Limited](#) (ASX: VML) [announced](#) a similar off-take deal from future production at Vital’s Nechalacho mine-site, in Canada’s Northwest Territory, with Ucore Rare Metals Inc. which followed on from Vital’s off-take deal with Norwegian rare earth metals/alloys start-up, REEtec, as you can read [here](#).

Search Minerals Inc. MOU for rare earths concentrate off-take supply to USA Rare Earth

The announcement [stated](#):

“This MOU is part of Search’s and USA Rare Earth’s development plans to expand the collaboration to include discussions regarding separation, marketing and offtake of a portion of the future production at Deep Fox and Foxtrot. **These discussions are in line with Search’s ambition to be an important contributor to the development of a North American Critical Material supply chain and USA Rare Earth’s strategy of Mine-to-Magnet production, and the development of a complete and sustainable North American rare earth supply chain.**”

Search Minerals and USA Rare Earth to collaborate further

USA Rare Earth is supporting Search’s efforts as it helps it to achieve its place in a North American total supply chain. Once operational, USA Rare Earth’s NdFeB magnet plant has an initial target production of 2,000 tonnes annually of high-performance, neodymium-iron-boron type rare earth magnets, with the ability to scale production further based on growing market demand.

About Search Minerals

[Search Minerals Inc.](#) is an emerging rare earths miner with three properties in Labrador, Canada. The three are:

- The Port Hope Simpson (PHS) property (flagship) – Includes Foxtrot, Deep Fox, Silver Fox, Awesome Fox, and Fox Meadow deposits.
- The Henley Harbour Area in Southern Labrador.
- The Red Wine Complex located in Central Labrador, plus some newer [acquisitions](#).

Search Minerals' resources contain the permanent magnet rare earth elements (neodymium, praseodymium, dysprosium and terbium). Search is currently working on advancing the testing of its proprietary Direct Extraction Process, developed with noted rare earth processing expert, Professor (UBC) David Dreisinger. The company also is advancing work on a resource upgrade, and on a Preliminary Economic Assessment ("PEA"), which work is fully funded.

Search's strategy

Search aims to deliver added shareholder value by leveraging the Foxtrot PEA (and soon the combined Deep Fox and Foxtrot PEA), using its proprietary, lower cost, hydrometallurgical process, and continuing to explore its highly accessible district-scale opportunity, as foundations with which to forge strategic partnerships and additional offtake agreements. The aim is to facilitate early monetization and more rapid delineation of additional resources intended to strengthen the Company's position as a reliable, strategically located, low-cost producer.

Next steps

The next steps for Search include:

- A Q1 2022 PEA based on the combined Deep Fox and Foxtrot deposits. Search is already [fully funded](#) to achieve the PEA. More details [here](#).
- Continued environmental baseline studies.
- Raising an 80 tonne bulk sample of deposit material for testing the magnetic separation [demonstration plant](#) due to be operational (subject to funding) in 2022.
- A full-scale rare earths hydrometallurgical processing plant to be under construction by the end of 2023 (subject to funding).

Demand for magnet rare earths is forecast to boom

Adamas Intelligence [forecasts](#):

- “The value of global magnet rare earth oxide consumption will rise five-fold by 2030, from US\$2.98 billion this year to US\$15.65 billion at end of the decade (2030).”
- “Global shortage of neodymium, praseodymium, and didymium oxide will collectively rise to 16,000 tonnes in 2030, an amount equal to roughly three-times Lynas Corporation’s annual output, or three-times MP Material’s annual output of neodymium and praseodymium oxide.”

Search Minerals now has a resource, a proprietary extraction process, a MOU for separation, and an MOU for off-take



Source: [Search Minerals company presentation](#)

Closing remarks

Search Minerals continues to make positive steps towards a production start-up, albeit still at the early stages. Search has achieved a resource, a PEA, has a propriety extraction technique, a separation technology MOU, and now an MOU for an

off-take (not yet a binding agreement). The most recent MOU, for mined product, with USA Rare Earth, is a strong endorsement of Search Minerals' Port Hope Simpson Project, notably the Deep Fox and Foxtrot deposits.

Search Minerals trades on a market cap of C\$66 million. One to follow closely given that it is now moving at a good pace in the right direction.

Vital Metals' Rare Earths off-take MOU with Ucore positions Vital as a key supplier for a non-Chinese Total Rare Earths' Supply Chain

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A key element for junior miners to demonstrate progress is to secure off-take agreements. This then typically leads to a greater degree of confidence that the company is credible as a supplier and that there is demand for its mined material. Such progress attracts not only investors but also potential project financiers. In the case of Vital Metals, the production of ore concentrates containing the key magnet rare earths neodymium & praseodymium (NdPr) that commenced in the summer of 2021 in the past year coincided with [strong price gains](#) that confirm strong demand.

Neodymium 1 year price chart shows strong price gains the past year



Source: [Trading Economics](#)

Vital Metals MOU with Ucore

[Vital Metals Limited](#) (ASX: VML) (“Vital”) recently [announced](#) news of signing a non-binding MOU with Ucore Rare Metals Inc. (TSXV: UCU | OTCQX: UURAF) for the supply of a mixed rare earth carbonate, beginning H1 2024. Ucore’s Alaska Strategic Metals’ Center, SMC, facility is planned to be commissioned in the first half of 2024 with an initial 2,000tpa total rare earth oxide (TREO) separation and purification capacity, ramping to at least 5,000t/year TREO by 2026.

That means Ucore is looking to secure concentrate supply over 2.5 years in advance of when it is needed, showing the strength of demand for Western produced rare earths concentrate. It also means Vital has a growing off-take partner, making it a win-win relationship for both parties.

Vital Metals’ Managing Director Geoff Atkins [stated](#): “Vital to commence product acceptance with Ucore in Q4 CY21 by supplying a sample of concentrate produced from its Nechalacho rare earths project in NWT, Canada....**The MOU will position Vital as a key supplier of rare earths in the North American market**, building on its offtake agreement with REEtec in Europe.....We are continuing to grow our operations in Canada and are well-placed to supply both geographies with the complete suite of rare earths.”

Ucore Chairman and CEO, Mr. Pat Ryan, P.Eng, [stated](#): “This partnership with Vital is an integral step in the development of

the Alaska SMC, as Ucore continues to cultivate relationships with potential like-minded upstream and downstream partners in the evolving Western world market; with the ultimate goal of ensuring that original equipment manufacturers transforming to an electrified economy continue to have access to a comprehensive North American raw material and finished goods supply chain.”

A reminder about Vital Metals

Vital is already mining ore at its Nechalacho Mine in Canada’s Northwest Territories (NWT), with commencement of ore processing, at Vital’s now under construction Saskatoon cracking and leaching facility, expected to begin in 2022. The Nechalacho Mine is a high grade, light rare earths (bastnaesite) project with a world-class resource of 94.7Mt at 1.46% TREO (measured, indicated and inferred). Nechalacho’s North T Zone hosts a high-grade resource of 101,000 tonnes at 9.01% LREO (2.2% NdPr). Vital’s strategy is to develop Nechalacho in two stages. Stage 1 of the operations focuses on the North T Zone resource, now in production, and is fully funded; Stage 2 will involve the development of the much larger Tardiff deposit.

Vital Metals’ Nechalacho rare earths project in the NWT’s of Canada – production of beneficiated ore commenced in June 2021



Source: [Vital Metals Annual report – June 2021](#)

Vital has successfully produced a beneficiated product which is to be further processed at the Company’s, now under construction, extraction facility in Saskatoon targeted to commence by late 2021 and with [commercial production by mid-2022](#). Vital aims to produce a minimum of 5,000 tonnes of contained REO by 2025.

Vital's off-take summary

- Binding off-take agreement with Norwegian company REEtec for Stage 1 production with the supply of 1,000t REO (ex-Cerium)/yr for an initial five-year period. This was recently increased to rare earth carbonate product containing a minimum of 750t NdPr, contained within [2,000t/year total rare](#) earth oxides (TREO) with a maximum of 25% cerium. Amended agreement extends Vital's product sales to REEtec to 2028 with option for an additional expanded 10-year agreement.
- Non-binding MOU with Ucore Rare Metals Inc. to sell to Ucore a minimum of [500t REO \(ex-cerium\)/year](#), commencing H1 2024. Vital to expand production to support a minimum of 50% of Ucore's envisioned 5,000t TREO/yr processing capability (ie: 2,500t TREO/yr) by 2026.

The off-take agreements above combined, if completed, amount to 2,500t REO/yr (2,000 + 500) out of Vital's production target to achieve "5,000 tonnes of contained REO by 2025". It looks quite likely the Ucore off-take will be increased later.

Vital Metals' Nechalacho rare earths project is a simple open pit operation in northern Canada's NWT's



Source: [Vital Metals Annual report – June 2021](#)

Closing remarks

Vital is now the first rare earths producer in Canada and only the second in North America, from their Nechalacho rare earths mine, with commercial production set to be reached in mid-2022. Vital's extraction facility in Saskatoon will be built and produce a rare earths concentrate from about June 2022. Vital

has secured off-takes in Europe with REEtec and now with Ucore in North America. These companies will take Vital's concentrate for further separation and purification.

Vital has agreed to acquire the Zeus heavy rare earth project (& 68% of the Kipawa Project) in Canada and it also owns a second light rare earths project in Tanzania.

Vital Metals Limited trades on a market cap of A\$248 million and certainly looks to be a company with a very bright future in the non-Chinese total rare earth supply chain.

Vital Metals stock is up 308% the past year as they commence rare earths production in NWT Canada

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It is always interesting to look back and see if what was written comes true. About 9 months ago I wrote an article here describing how [Vital Metals was on track to become a rare earths carbonate producer in 2021](#). Fast forward to today and Vital Metals has delivered on their plan.

On July 6 [Vital Metals Limited](#) (ASX: VML) ("Vital") [announced](#) that the Company has commenced rare earth production at Nechalacho. This is a tremendous achievement and means Vital joins an elite group of only 2 or 3 North American rare earths producers (includes MP Materials and for rare earths processing

Energy Fuels). It also means Vital has become the first Canadian rare earths producer. Congratulations to Vital Metals from the team at InvestorIntel!

Mining at Vital's Nechalacho's North T Zone in Canada's Northwest Territories (NWT) is underway as part of Stage 1 production strategy. Vital is now crushing and sorting ore before sending it to a Saskatoon cracking and leaching facility later in 2021. Vital has also commenced drilling to define a mine plan for Stage 2 at Nechalacho as it works to develop a larger scale, longer life rare earths project.

Vital Metal's Nechalacho Rare Earths Mine in NWT Canada location and key zones



[Source](#): Vital Metals

Nechalacho hosts a world-class resource of **94.7Mt at 1.46% REO** (measured, indicated and inferred). Nechalacho's North T Zone hosts **a high-grade resource of 101,000 tonnes at 9.01% LREO (2.2% NdPr)**, making it one of the highest grade rare earths deposits in the world. The resource has the potential to grow further as shown in recent drilling results that [reported](#) "broad high grade REO in near surface drilling at Tardiff Zone...thickness in excess of 60m in width and with grades up to 13.8% intersected". Vital stated in the release that high value Nd/Pr content was an impressive 24.2% of TREO and that Zone 1 was open in all directions. These results will form part of a new resource upgrade to be part of the Stage 2 expansion plans at Nechalacho.

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.

In more good news, in May 2021 it was [announced](#) that Vital's offtake partner REEtec has formally accepted Vital's rare earth carbonate sample. Vital will provide REEtec with 1,000 tonnes REO (ex-cerium) per year for five years with the option to increase volume by up to 5,000 tonnes REO per year over 10 years.

Mid-term strategy and goals

Vital aims to become the lowest cost producer of mixed rare earth oxide outside of China by developing one of the highest grade rare earth deposits in the world and the only rare earth project capable of beneficiation solely by ore sorting. Vital also aims to be the largest independent supplier of clean mixed rare earth feedstock outside China.

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.

Vital aims to produce a minimum of 5,000 tonnes of contained REO at Nechalacho by 2025, or earlier.

Closing remarks

Achieving rare earths production in the West is no easy task. The process towards production, including permitting, can take over a decade. Vital has now achieved a low scale small CapEx rare earths production start-up operation, with big plans to expand in the years ahead. Given management's exceptional track record to date, it is looking good for Vital to achieve their expansion plans in the years ahead.

The production of rare earths on North American soil is not only a great step forward for Vital Metals, but it is also a significant step forward for the West to secure a safe rare

earths supply.

Vital Metals now trades on a market cap of A\$208 million after a great past 1 year return of [308%](#).

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.