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

written by InvestorNews | June 14, 2022

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 Magnetics. 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.

Hunting the big North American rare earths elephant

written by Jack Lifton | June 14, 2022
"Amazing discovery… I keep making this point that there is a deficit of rare earths worldwide and Appia is the premier rare earths discovery in North America." – Jack Lifton, Global Critical Materials Expert

A mineral discovery is the natural occurrence of a specific chemical compound or a mix of chemical compounds, which may be processed mechanically and chemically to isolate one or more forms of individual chemical elements, and then be purified and converted into useful forms for industrial use. If the discovery is extensive enough and the contained chemical compounds are of a sufficiently high enough grade for efficient and economical separation of them from each other and then can be further processed into forms that can be utilized industrially, then the large-scale production and concentration of the initial mineral concentrate is called mining.

How do you evaluate a rare earth discovery? The best way is to determine if it contains "valuable" rare earth elements, which can be economically and efficiently recovered in the jurisdiction in which it is located, in such quantities that the capital expended can be recovered at a profit.

The old-timers (aka, experienced exploration geologists and mining engineers) have just two simple metrics they use in first determining whether or not there is any point in answering this question: Grade and accessible tonnage.

Appia Rare Earths & Uranium Corp.'s (CSE: API | OTCQB: APAAF) rare earth discovery at Alces Lake, Saskatchewan, meets the first of the above requirements, and the company is now in the process of a comprehensive drill program to determine if the second one is met as well.

The Appia discovery is of the mixed rare earth mineral, monazite, the most desirable rare earth bearing mineral on the planet. Monazite was the original rare earth mineral mined commercially in the late nineteenth century, not for rare earths, but for its contained thorium, which was heated, as an oxide in the form of a mixed ceramic mantle, with natural gas, to produce a brilliant white light for illuminating the stage in theatrical performances. Monazite fell out of favor as a mineral resource after World War II because of thorium's natural radioactivity being highlighted as a danger in the early atomic age. Of course, electric lights, had by then long eclipsed the need for thorium.

In the 1950s though, thorium again became of interest when it was discovered that nuclear reactors for the commercial production of electricity could be fueled with thorium, which could not easily be used to make nuclear weapons. Anglo-American Mining in that period discovered the highest-grade thorium and

rare earths deposit then known in the world in South Africa and began producing thorium for the UK's civilian nuclear reactor program. Thorium reactors fell out of favor by the mid 1960s and thorium (monazite) mines were shut down, even though they were associated with high grade rare earths, because of the problems of disposing of the thorium and the then extremely expensive processes for separating the rare earths from each other, ion exchange, and fractional crystallization.

The discovery of a huge primary, accessible, mineable deposit of the rare earth mineral bastnaesite at Mountain Pass, California, in the late 1940s, and the development in the 1960s of the commercial application of solvent extraction to the separation of the rare earths, led to the eclipse of the use of high thorium monazites by bastnaesite as the primary mineral for rare earth mining.

The development of the rare earth permanent magnet in the late 1970s, at first using the rare earth element, samarium, and the rare earth elements neodymium and praseodymium, revived interest in monazite, because monazite contains 50% more, by weight, of neodymium and praseodymium, than bastnaesite.

However, the low thorium bastnaesite in California, because of its accessibility, became the world's largest source of the magnetic rare earths, samarium , neodymium and praseodymium by the early 1980s. It was eclipsed by the bastnaesite recovered, more economically, as a byproduct of iron mining in China's Inner Mongolia by the late 1980s. The Chinese iron deposits also contained some monazite, and this was processed there also to recover the rare earths. The thorium co-produced was stored, but its radioactivity ultimately led China to bring its control under the aegis of its China Nuclear Corporation (CNC), which stored it along with any other thorium produced as a byproduct of rare earths or its own uranium minerals processing.

Today, as Chinese bastnaesite grades seem to have declined from high grading and as pollution (environmental) consciousness has come of age in China, monazite, as a source of magnetic rare earths has revived dramatically in China. And China has become the world's largest processor of monazite. Chinese mining and processing companies already import nearly 40% of their rare earth ore needs annually. They get bastnaesite from California and CNC is licensed to process up to 5o,ooo tons per year of monazites containing up to 30,000 tons of rare earths. All monazite imported into China must first go to CNC for thorium and uranium removal, before it goes to the Chinese purchaser, which will then recover the rare earths contained. China buys monazites as ore concentrates from the USA (until very recently), Brazil, Madagascar, Australia, and Myanmar, and Chinese companies are scouring the world seeking more.

The Chinese had the use of monazites as a source of magnetic rare earths to themselves until 2017, when Australia's Lynas Rare Earths (ASX: LYC) went into commercial production and separation of the individual rare earths from its massive monazite mine at Mt. Weld, Australia. Then. in 2020, the only privately owned licensed uranium ore processor and thorium storage facility in the USA, Energy Fuels Inc. (NYSE American: UUUU | TSX: EFR), began a project to process monazite for its rare earths and to stockpile and sell the uranium recovered and store the thorium. Energy Fuels is and remains the sole such facility in the Americas. Its business plan is to become vertically integrated by building, on-site, a separation facility, and a rare earth metals and alloys operation also.

Energy Fuels has acquired domestically produced American monazite from the heavy mineral sands operations of The Chemours Company, and is actively seeking additional materials both domestically and internationally. Energy Fuels has already produced and sold commercial quantities of mixed rare earth

carbonates cleaned of uranium and thorium.

Now, at last, we come to Appia and Canada's entry into the rare earths' mining and processing arena.

Australia's Vital Metals Limited (ASX: VML | OTCQB: VTMXF) is now mining bastnaesite just outside of Yellowknife in Canada's Northwest Territory from a high-grade deposit discovered by Avalon Advanced Materials Inc. (TSX: AVL | OTCQB: AVLNF) and licensed to Vital. The ore concentrate will be first sent to an operation being built by the Saskatchewan Resource Council (SRC), a Crown Corporation, where the uranium and thorium will be removed and a mixed rare earth carbonate produced for use in further downstream processing. The first such production has already been pre-sold to both American and European processing customers.

But the SRC has plans to construct not only a cracking, leaching, and radioactive recovery and storage system (Saskatchewan is Canada's largest uranium mining and processing province, so the business there is well established and understood), but also a rare earths separation system in the form of a dedicated solvent extraction facility, the first of its kind in Canada.

Now we come to Appia Rare Earths & Uranium Corp., a Canadian company, originally exploring for uranium in Saskatchewan's world-famous Athabasca Basin. About 5 years ago its then geologist discovered a dramatically high-grade sample of monazite on the company's Alces Lake Property in Saskatchewan. He soon found that the sample had come from an outcrop showing extensive monazite veining. He continued to explore the area and predicted that the monazite field was extensive. Analysis of samples he took showed that it was also the highest grade neodymium rich monazite ever found in North America.

I was a speaker that year at a Metal Events' Rare Earth Conference in Henderson, Nevada, and the Appia geologist, James Sykes, was an attendee. I had never met him, but we shared a cab to the airport, and he excitedly told me the Alces lake, monazite, story. I was intrigued, but I had reservations about the thorium and uranium that would be present in such a high-grade material. I thought of the highest grade rare earths deposit ever worked, Steencompskraal, in South Africa, which was actually worked as a thorium mine with no interest (in the 196os) in the rare earths contained. I didn't then know of the monazite project in China or CNC's role in it. I listened politely to Mr Sykes and wondered what anyone would do with this discovery if it were confirmed to be extensive enough to qualify as a NI 43-101 resource.

Did I mention that James Sykes also said that he believed the extended discovery to be near surface, so that a quarrying operation would obviate the need for underground operations?

It is now the Spring of 2022, and Appia has raised approximately $15.5 million in the last year. This funding is for a drilling program which is underway to prove a resource.

Energy Fuels is processing monazite, the Saskatchewan Resource Council has approved $31 million to acquire monazite, and other rare earth ore concentrates, and build a first of its kind in Canada cracking and leaching and separation facility dedicated to rare earths, and Canada's Ucore Rare Metals Inc. (TSXV: UCU | OTCQX: UURAF) has begun construction of a Strategic Metals Center in Alaska for the central processing of critical metals, beginning with rare earth mixed carbonates from a variety of sources including Canadian and Australian monazites.

Appia's drilling results so far are very encouraging, and have been extensively reported.

I think we may see the highest grade neodymium-rich monazite in the America's flow from Alces lake before 2025. If so, It will certainly be in high demand.

Did I mention that the Appia monazite discovery contains 1% of xenotime, the hard rock mineral source of yttrium, dysprosium, and terbium? A one-stop-shop for magnet makers?

The stars and this planet are coming into alignment for this one. Monazite is back.

Disclosure: Jack Lifton is a member of Appia Rare Earths & Uranium Corp.'s Advisory Board and the Advisory Board for Energy Fuels Inc., and may hold securities or options in some of the companies mentioned in the above article.

A uranium company making waves in the rare earths space

written by InvestorNews | June 14, 2022

"One Ring to rule them all" is a central plot element in J. R. R. Tolkien's fictional novel ***The Lord of the Rings***, as well as Peter Jackson's movie trilogy, both of which I highly recommend. The One Ring was one of the most powerful artifacts ever created and was crafted by Lord Sauron. Sauron's intent was to enhance his own power, and to exercise control over the other Rings of Power as he hoped to gain lordship over the Elves and all of the other races in Middle-earth. A pretty powerful theme for a fictional story, but where might I be going with this in real life today? Bear with me, it'll take a bit to follow the tangled

way my brain works.

At the recently concluded G7 meeting there was seeming consensus to chastise both China and Russia for various assorted reasons. It's a reasonable bet that those nations may not be as cooperative with their abundant natural resources on a go forward basis as a result of being singled out. The G7 communique noted the need for supply chain resilience and technology standards so that democracies are aligned and supporting each other. I read into that, rare earths that the developing world requires to meet its climate objectives, amongst other things. Right now China basically owns that space between control of resources and the processing of those resources into useable products. Assuming the West isn't already too late in light of what InvestorIntel's Jack Lifton wrote about in this article, we shall soldier on.

The West needs its One Ring, albeit not to rule them all, but to control its destiny. The leading North American candidate to craft that ring (so to speak) is Energy Fuels Inc. (NYSE American: UUUU | TSX: EFR). To quote President and CEO, Mark Chalmers "Without a doubt, Energy Fuels is making major strides toward restoring critical U.S. rare earth supply chains. In late-March, we began to ramp up production of an intermediate rare earth product at our White Mesa Mill in Utah using monazite from Chemours. This is expected to be a high-value product ready to be separated and refined into value-added rare earth products at Neo Performance Materials Inc's (TSX: NEO) plant in Europe. At this time, no other U.S. company is producing a product this far down the rare earth value chain. However, we have much bigger rare earth plans, and the momentum is building rapidly as we execute our purposeful strategy. We are now taking real steps toward designing and building fully integrated, U.S. rare earth production capabilities."

The 800 pound gorilla in North American rare earths right now is MP Materials Corp. (NYSE: MP) but they are focused on their own production at Mountain Pass and have an offtake agreement with Chinese based entities. Additionally, they are still in their Stage 2 development process which would only get them to where Energy Fuels is capable of today. The other differentiator with Energy Fuels is that many, if not most, rare earths ores contain low levels of radioactive materials, including uranium and thorium, necessitating extensive radioactive materials licensing requirements. Energy Fuels 100% owned White Mesa Mill has existing infrastructure (licensed, constructed and in operation) with a 40 year history of "responsibly managing low-level radioactive materials". Energy Fuels is in a unique, industry-leading position with this asset to process monazite ores into rare earth carbonate. In other words, a recipe for success in light of the current political environment.

The Company has several collaborations with the U.S. government and national laboratories on various rare earth initiatives, including being granted a $1.75 million contract by the U.S. Department of Energy to perform studies that complement work to develop rare earth separation capabilities at their White Mesa Mill. As well, Energy Fuels has deals with The Chemours Company and Hyperion Metals Limited to process ore from their respective mines at the Offerman Mineral Sand Plant in Georgia and the Titan project in Tennessee. Energy Fuels will process the monazite sands into a mixed rare earth carbonate for use as feed material for Neo Performance's separated rare earth production plant in Europe.

Energy Fuels and its White Mesa Mill are uniquely situated as the only North American facility to be able to process an intermediate rare earth product. The company is flush with cash, with approximately $57 million having finished Q1/21 with $44 million plus raising $13 million throughout April and May via an

at the market share issuance. Additionally, the Company has an available inventory of saleable uranium and vanadium with a market value of approximately $28 million. The fact that it is also a uranium company is responsible for the wash out in the stock price yesterday (down 9.4%) on news of a potential issue at a Chinese nuclear facility. This news caused a broad brush destruction of market cap across the whole uranium sector. However, if you see the rare earth side of the Energy Fuels business being the potential future of the company then perhaps this is a buying opportunity.

Gianni Kovacevic with John Kaiser on China and Deglobalization of the Rare Earths Industry

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“What enabled China to do so well was this whole concept of globalized trade…It became a thing of who can produce the metal the cheapest and who will pay the most for it. Everything went all around the world to whoever wanted it. It was in this context of globalization that the rare earth mania 1.0 happened. It was, I believe, a major blunder by China.” States John Kaiser, Founder of Kaiser Research Online, in an interview with Gianni Kovacevic, CEO of CopperBank Resources Corp. (CSE: CBK).

John went on to say that China controls more than 90% of the world’s rare earths and how a skirmish with Japan panicked the

market and caused a 10-20 fold increase in rare earths prices. He continued, “To some degree this was a strategy by China to force technology to move to China where they could have access to these rare earths without worrying about it…now we have something weird happening. We have deglobalization happening and that changes the logic completely.”

Now we are witnessing well known Silicon Valley investors funding a re-floatation of Mountain Pass citing the very reasons John and Gianni have been saying for some years and touch on throughout this detailed conversation… to access the full conversation, click here

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Jack Lifton on MP Materials (Molycorp) Return

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“Molycorp spent $1.8 billion to redevelop the (Mountain Pass) mine and vertically integrate that output through a separation plant to salable, separated rare earths products. It didn’t work. At the end they were not able to operate the separation plant, Project Phoenix, and the company shutdown because it ran out of money.” States critical materials expert Jack Lifton, in an interview with the Technology Metals Show hostess Tracy Weslosky.

Jack went on to say, “Two years later a company that became MP Materials purchased the mine and the refinery project from the bankruptcy trustee and they began to operate it as a mine. In the last 12 months that mine has produced 50,000 tons of rare

earths concentrate containing 12,000 tons of rare earths included in which are about 2000 tons of magnet metals, neodymium and praseodymium, which could make 6000 tons of magnets.”

In the interview Tracy and Jack discussed some of the challenges awaiting MP Materials in becoming a vertically integrated domestic rare earths company. Jack also provided an update on Lynas and explained how it will be affected as MP Materials progresses with its plan.

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