Jack Lifton says the ‘best choice’ for a producing rare earths mine in North America is…

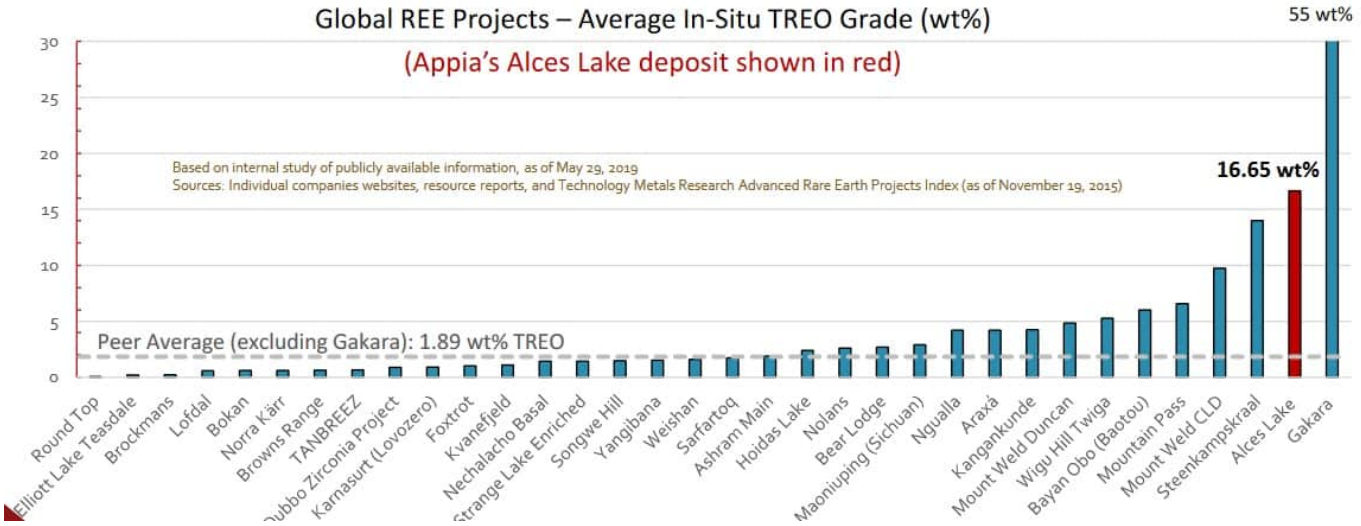
As the electric vehicles (EV) decade begins the need for quality rare earths in top tier locations is becoming a key focus for governments, OEMs, and electric motor manufacturers. Safer supply chains that can provide critical rare earths such as Neodymium (Nd) and Praseodymium (Pr) for electric motor magnets are becoming critically important, as we saw this week with the US Senate bill on rare earths.

Appia Energy Corp. (CSE: API | OTCQB: APAAF) is currently exploring and developing uranium and rare earth deposits in its Alces Lake property, in the Athabasca Basin area of northern Saskatchewan, Canada. They also have a promising uranium-rare earths project in Ontario, Canada.

Alces Lake Rare Earth Project

What is unique about Alces Lake is that it hosts some of the highest rare earth elements (REE) grades in the world (2nd highest average grade as shown on the chart below). At a 4 wt% total rare earth oxide cutoff, Alces Lake average grade is 16.65 wt% Total Rare Earth Oxides (TREO).

A grade comparison of global rare earth projects



Source

Alces Lake has excellent mineralogy with high value rare earths

At Alces Lake all the REEs have simple mineralogy and are hosted 100% within 'monazite', which means it can be economically extracted.

Even better is that the monazite is enriched in valuable critical rare earth elements, namely Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy), and Terbium (Tb). These 4 elements account for between 23-25% of the TREO, or ~85% of the potential value at Alces Lake.

Alces Lake has high-grade outcrops and drill hole intersections comprising an average of 27% monazite. Locally up to 85% monazite is naturally pre-concentrated

Source

Appia have access to a nearby pilot plant and extraction lab in Saskatchewan, Canada

The Alces Lake Project is located close to a pilot plant and REE extraction lab in Saskatoon, Saskatchewan, which is the same Provincial jurisdiction as the Project. It has a capacity of 2,000 tonnes of material per annum. This gives Appia a significant advantage by having a low start up CapEx to commence some production via a fully permitted plant and extraction facilities at the Saskatchewan Research Council (SRC). Unlike competitors this means the rare earths can be produced in North America and not China.

Considering environmental regulations, especially due to safe handling and disposal radioactive materials, the Province of Saskatchewan, and SRC, are miles ahead of other global jurisdictions because they permit high-grade uranium mines in the northern parts of the province. A country like India, or USA, has policies in-place that are detrimental to processing monazite for REEs because of the presence of Uranium/Thorium. In Saskatchewan, and working with SRC, a lot of these problems are already resolved, as Saskatchewan is a global jurisdiction that continuously leads efforts in safely working with radioactive materials.

Appia's projects summary and strategy

Alces Lake Rare Earths Project

Based on mineralization discovered to date, Appia would "ideally" consider a surface and near-surface operation to start production, smaller than open pit scenario, easier to permit and manage, potentially low CapEx and OpEx. Given the nearby pilot plant and extraction facility in Saskatchewan the Project will be easier to put into small scale production of rare earth oxides.

Saskatchewan Uranium Projects

Appia also holds surface rights to exploration for about 57,048 hectares (140,968 acres) in Saskatchewan. Within this area Appia has high-grade uranium deposits in the prolific Athabasca Basin area; including Loranger, Eastside and North Wollaston properties.

Elliot Lake Uranium-REE Project

This Project is located in northern Ontario. Elliot Lake has a NI 43-101 Mineral Resource Estimate of 8.0 million lbs contained metal U3O8 and 47.7 million lbs contained metal TREE Indicated; and 47.7 million lbs contained metal U3O8 and 133.2 million lbs contained metal TREE Inferred. Indicated TREE grades are 1,647ppm, and CRE 344ppm.

The next step for Appia is to raise additional capital to fully fund aggressive property-wide exploration on Alces Lake as well as the Saskatchewan uranium properties for the next 12 to 24 months, with a view of producing a mineral resource estimate at Alces Lake.

Experts view

Rare earths expert and host of the Technology Metals Show Jack Lifton quoted to InvestorIntel:"Appia Energy's Alces Lake deposit in Saskatchewan is probably the best choice for

development into a producing rare earth magnet materials' mine in North America."

Closing remarks

The rare earths sector looks highly likely to follow in the foot-steps of uranium, which recently got a huge boost from the US Government. A rare earths funding bill has now been put to the US Senate with the intent to help revive the U.S. rare earths industry.

Investors can look to capitalize on the positive sentiment in the rare earths sector, especially those companies in safe countries with lower start-up CapEx.

Appia Energy offers a North American high grade rare earths project with a low CapEx pathway to production via a third party existing fully permitted plant and extraction facility in Saskatchewan. Plus Appia also has uranium projects.

Rare earths expert Jack Lifton and the man who coined the term "technology metals" is also very positive on Appia Energy, making them a top tier junior for investors to consider.

Note from the Publisher: To become a member of the Technology Metals Report, go to TechnologyMetals.com

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Rare Earths Make Ceramics Hydrophobic

Another week, and another new use for the rare earth elements. Mechanical engineering postdoctoral researcher Gisele Azimi, and Associate Professor Kripa Varanasi, along with two graduate students and another postdoctoral researcher at the Massachusetts Institute of Technology (MIT) have announced a big advance in hydrophobic materials. Hydrophobic materials are materials that prevent water from spreading over a surface, and sticking to it. The surface turns the water into tiny water shedding droplets that hardly touch the surface at all. Up till now, hydrophobic materials are mostly thin polymer coatings that degrade when heated, and quickly suffer from abrasion. A big and costly limitation in industry.

Not anymore thanks to MIT, where they have developed a new class of hydrophobic ceramics. Guessing correctly that the rare earths would be hydrophobic, the team set out to test 13 of the 14 rare metals with the normally hydrophilic (water attracting) ceramics. Ceramic have the advantage of being very resistant to extreme temperatures and wear, which is why they were used on the NASA space shuttle. Promethium wasn't tested due to its radioactivity.

"We thought they should all have similar properties for wetting, so we said, 'Let's do a systematic study of the whole series,'" said Professor Varanasi, who is the Doherty Associate Professor of Ocean Utilization

Using powder oxides of 13 rare metals, the team made sintered pellets by compacting and heating them towards their melting point fusing them onto a solid ceramic material. The team was able to demonstrate that all 13 metals produced hydrophobic ceramics that retained their hydrophobicity even when subjected to abrasion and heated to 1,000 degrees centigrade.

We’ll leave the last word to the researchers at MIT:

“These materials therefore provide a pathway to make durable superhydrophobic surfaces as well, and these coatings can be fabricated using existing processes. This makes it amenable to retrofit existing facilities,” Ms. Azimi stated. Professor Varanasi added, “no one has really addressed the key challenge of robust hydrophobic materials. We expect these hydrophobic ceramics to have far-reaching technological impact.”

From the MIT press release:

“Water-shedding surfaces that are robust in harsh environments could have broad applications in many industries including energy, water, transportation, construction and medicine. For example, condensation of water is a crucial part of many industrial processes, and condensers are found in most electric power plants and in desalination plants.”

My guess is that this will quickly develop into a big new market for the cheaper rare earth elements. Time to take another look at Molycorp and Lynas perhaps.

Rare earth oxides make water-repellent surfaces that last
Ceramic forms of hydrophobic materials could be far more durable than existing coatings or surface treatments.
Link