

The EV sector sizzles, will rare earths be next? Spotlight on Appia Energy...

The electric vehicle (EV) sector has been one of the hottest sectors the past 3 months as investors chase everything 'electric'. For example, Tesla (NASDAQ: TSLA) is up over 7 fold the past 14 months and is now the world's most valuable car company. The past 3 months NIO is up 3 fold and Nikola is up 5 fold. The battery manufacturers have also surged.

So what's next? Following the EV thematic one would say the EV metal miners should be next, and that includes the rare earths miners, as rare earths are a key component in the most powerful magnets used in EV motors. Last year Roskill reported that "Tesla extends EV range using '*permanent magnets*' motors in Models S, X, and 3. This resulted in a 10% increase in the overall drivetrain efficiency of Tesla's EVs, and hence an improvement in range. Roskill then expressed the following view:

"Permanent magnets that offer the best performance and optimisation potential in electric motors are rare earth neodymium-iron-boron (NdFeB) magnets. Over 90% of EV models currently use NdFeB-based permanent magnet motors as part of the EV drivetrain."

Additionally, the US Senate will soon consider various Acts, including the ORE Act, that aim to secure US supply of critical elements such as rare earths. This has the potential to be another catalyst for the rare earths sector in the near future.

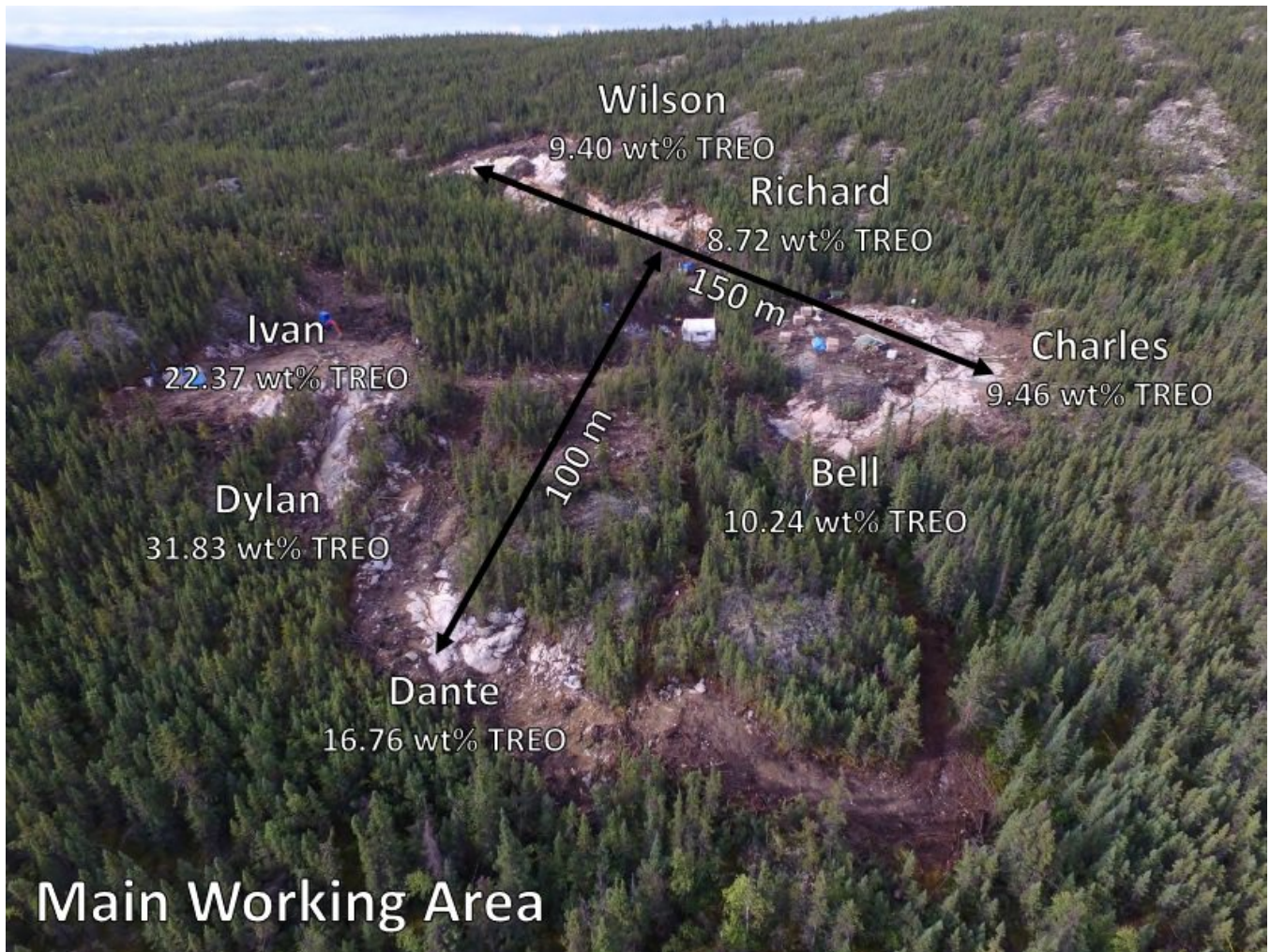
One of the most promising rare earths junior miners is Appia Energy Corp. (CSE: API | OTCQB: APAAF). Appia is currently exploring and developing uranium and rare earth deposits at

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.

Appia 100% own the Alces Lake property spread over 14,334 hectares. The Alces Lake property has monazite ore that is enriched in valuable critical rare earth elements, particularly 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 hosts the 2nd highest average REE grade in the world.**

At a 4 wt% Total Rare Earth Oxides (TREO) cutoff, Alces Lake average grade is exceptionally high at 16.65 wt% TREO. By comparison rare earths producer Lynas Corporation's Mt Weld mine has an average grade ~10 wt% TREO, and is perhaps the most successful non-Chinese rare earth mine in the world today.

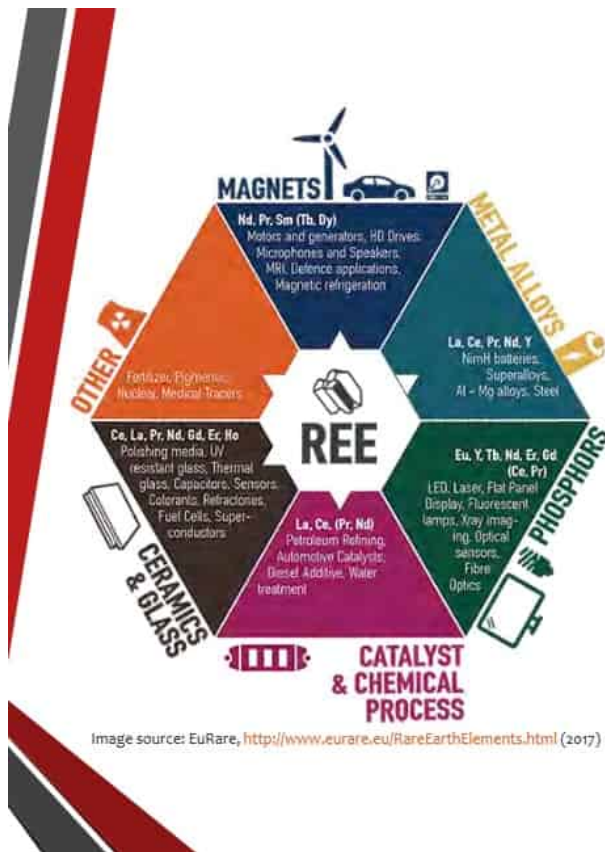
Appia Energy's Alces Lake property has exceptionally high grade critical rare earths in Northern Saskatchewan, Canada



Source: Appia Energy company presentation

The high grade TREO at the Alces Lake Project hosted in monazite is an ideal potential western located source of the most valuable key rare earths needed in future industries such as EV motors and catalysts etc.

Rare earths key uses include powerful magnets (21% of demand and growing) used in EVs, electronics, and wind turbines etc



Rare Earth Elements Basics (2019)

- REE, a.k.a. the “Seeds of Technology”
- **Critical for high-tech applications, clean energy, transportation, communication, robotics, nanotechnology, medical equipment, antibiotics and medicines**
- Global demand is growing (>10% over last couple of years)
- Primary demand: 21% magnets which are used in the EV market where growth is accelerating
- Global Production: 210,000 tonnes of REO (oxides)
- 66% REO (oxides) global production sourced from China, China is now a net importer
- Over 90% magnet production from China
- Lack replacement, recycling or re-invention

The Alces Lake Project’s rare earths are near surface and hence suitable for an open pit mine. Permitting should be smooth being in northern Saskatchewan Canada and the CapEx and OpEx should be reasonably low given the good grades and near surface resource. There is also an existing pilot plant and extraction facility in Saskatchewan the Project can use to start up a small scale production of rare earth oxides.

Appia Energy’s Alces Lake ticks all the right boxes

The Criteria for a Viable REE Project

- Grade
- Mineralogy
- Composition
- Pilot Plant
- Radiation and Environmental Management
- **Appia's Alces Lake project meets all of these criteria**



Appia Energy President and CEO, Tom Drivas, stated exclusively to InvestorIntel:

“Appia is currently exploring its Alces Lake project located in Saskatchewan Canada. Alces Lake has a number of surface zones with up to 85% monazite and can become one of the highest grade critical rare earth producer in the world. Appia could supply the critical rare earth needed to the developing industry in the US and Canada.”

Appia recently announced that they have begun further exploration at the Alces Lake property. It is expected that between late July and early August Appia will commence -2,000 to 3,000 m of a drilling program to potentially expand the resource.

Closing remarks

Appia Energy trades on a market cap of just C\$14 million, which is very low given their super high grades, valuable critical rare earths, and good location. The only possible explanation can be the relatively early stage of the project.

Rare earths expert Jack Lifton recently stated Appia Energy's Alces Lake "is probably the best choice for development into a producing rare earth magnet materials' mine in North America."

Finally, Appia also offer investors exposure to several other projects in Canada that are highly prospective for both rare earths and uranium. Early investors in junior miners such as Appia have the potential for tremendous returns, especially if the Alces Lake project achieves funding and production. The recent surge in EV related companies, the US Senate considering rare earths Acts, and Appia's potential for excellent near term news flow should all serve as strong catalysts for the stock in the year ahead.