

Becoming a significant rare earths and uranium junior, Matt Bohlsen does a review on Appia

Two of the best-performing commodities in the past year have been the key rare earth magnet material blend, neodymium, praseodymium (NdPr), and the energy metal, uranium. Today's company has established itself as a leading rare earths junior in Canada, but recently changed its name and expanded its uranium portfolio. This means investors get exposure to both the key magnet rare earths and also uranium. Even better it controls 3 projects/properties.

The Company is Appia Rare Earths & Uranium Corp. (CSE: API | OTCQB: APAAF) (Appia) formerly known as Appia Energy. Today I give a brief update on Appia's Alces Lake rare earths project and an introduction to their newly acquired uranium mineral claim block (Otherside) and uranium properties all located in Northern Saskatchewan, Canada. Plus, I touch on Appia's Elliot Lake uranium and rare earths property in Ontario, Canada.

Appia's very high-grade rare earths project at Alces Lake

For background on Appia's rare earths projects you can read some past articles here which focus on Appia's tremendous asset at Alces Lake, Canada which has the 2nd highest average rare earth's grade in the world, at 16.65 wt% TREO. High-grade zones are up to 49 wt% TREO. The rare earths are hosted in favorable 'monazite' ore at or near surface spread over 27sq km of tenements. There is a 23-25% Critical Rare Earth Oxide (CREO) component, including neodymium (Nd), praseodymium (Pr), dysprosium (Dy), and terbium (Tb).

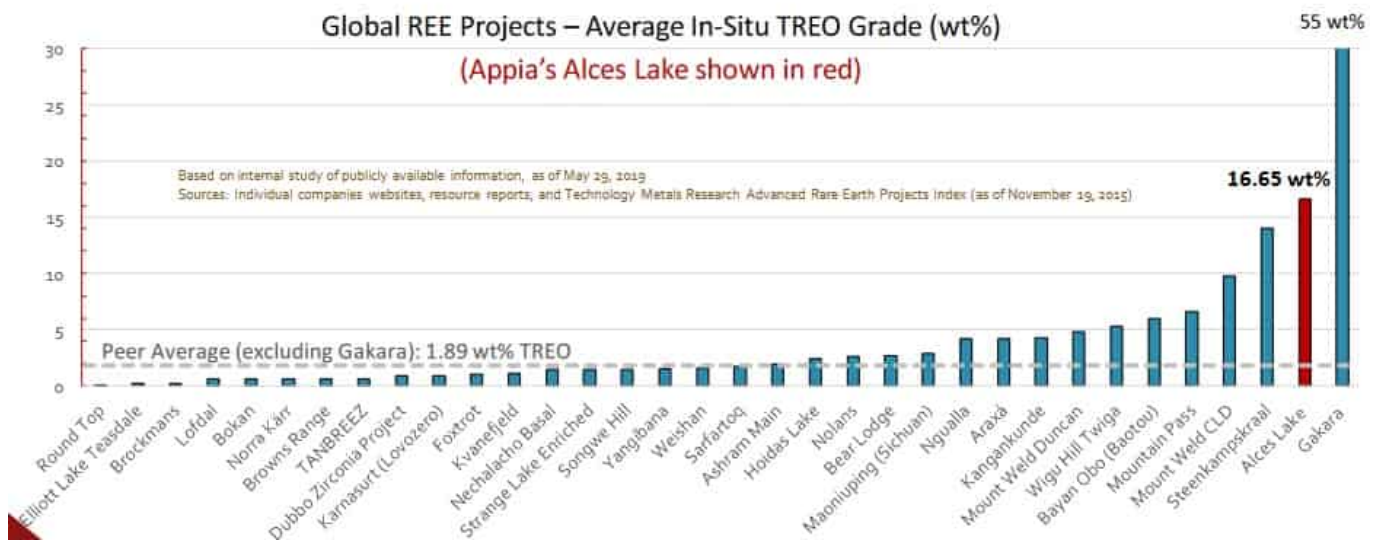
Appia's 100% owned Alces Lake Project has the world's second

highest average grade of TREO

Alces Lake Project - Grade

- High-Grade is KING... this is true for any commodity
- **Alces Lake hosts some of the highest REE grades in the world (2nd highest average grade)**
- At 4 wt% Total Rare Earth Oxide cutoff, **Alces Lake average grade is 16.65 wt% TREO***
- **Appia considers "high-grade" as greater than 4.0 wt% TREO**
- Only the highest grade REE deposits have been developed into mines (Bayan Obo, etc.)
- To illustrate the grade at Alces Lake, **one metric tonne of high-grade mineralization from Alces Lake would contain ~166.5 kg of TREO of which ~38.5 kg are CREO** (the potential quantity and grade are both conceptual in nature. There has been insufficient exploration to define a mineral resource. It is uncertain if further exploration will result in the delineation of a mineral resource)

Note: See Appendix A on slide 35 for individual element grades supporting TREO results



Source: Company presentation

Appia has access to use the Government funded Saskatchewan Research Council (SRC) processing facility in Saskatoon, Canada. Existing pilot facilities there (1,000 tpa capacity) have already optimized a monazite processing flow sheet for Appia. The SRC production-scale processing facility is expected to be partially operational in early 2023.

Appia plans a smaller surface and near-surface operation to start production with an open-pit scenario which is easier to permit and manage and should have a low CapEx/Opex.

Appia's latest results include:

- Drill results at Wilson North (Alces Lake) with average 17.5 wt% TREO over 9.38 metres with up to 37.9 wt% TREO.

- High grade REE mineralization identified over an estimated 27 square kilometre area. Channel sample of 14.71 wt % TREO from Sweet Chili Heat and 11.94 wt % TREO from Diablo. 10.35 wt % TREO returned from grab sample at Zesty. 7.86 wt % TREO returned from grab sample along the Oldman River trend. New discovery of REEs with 2.27 wt % TREO grab sample from “Train Domain”. Elevated critical electronics metal, Gallium, values have also been returned for all samples enriched in TREO.
- Promising Results from Initial Metallurgical Tests on a Composite Sample from Alces Lake. Laboratory heavy liquid separation tests recovered 95% of the total rare earth oxide (TREO). Appia President Frederick Kozak stated: “TREO recoveries and the percentage of TREO in concentrate are comparable to other producing global rare earths projects, supporting the potential for Alces Lake as a future monazite rare earths supply.”

Appia is waiting on further drilling core and channel sample assay results from the 2021 program. In terms of major near-term catalysts, Appia states: “Analysis of 2021 drilling and assays may lead to NI 43-101 report early 2022.”

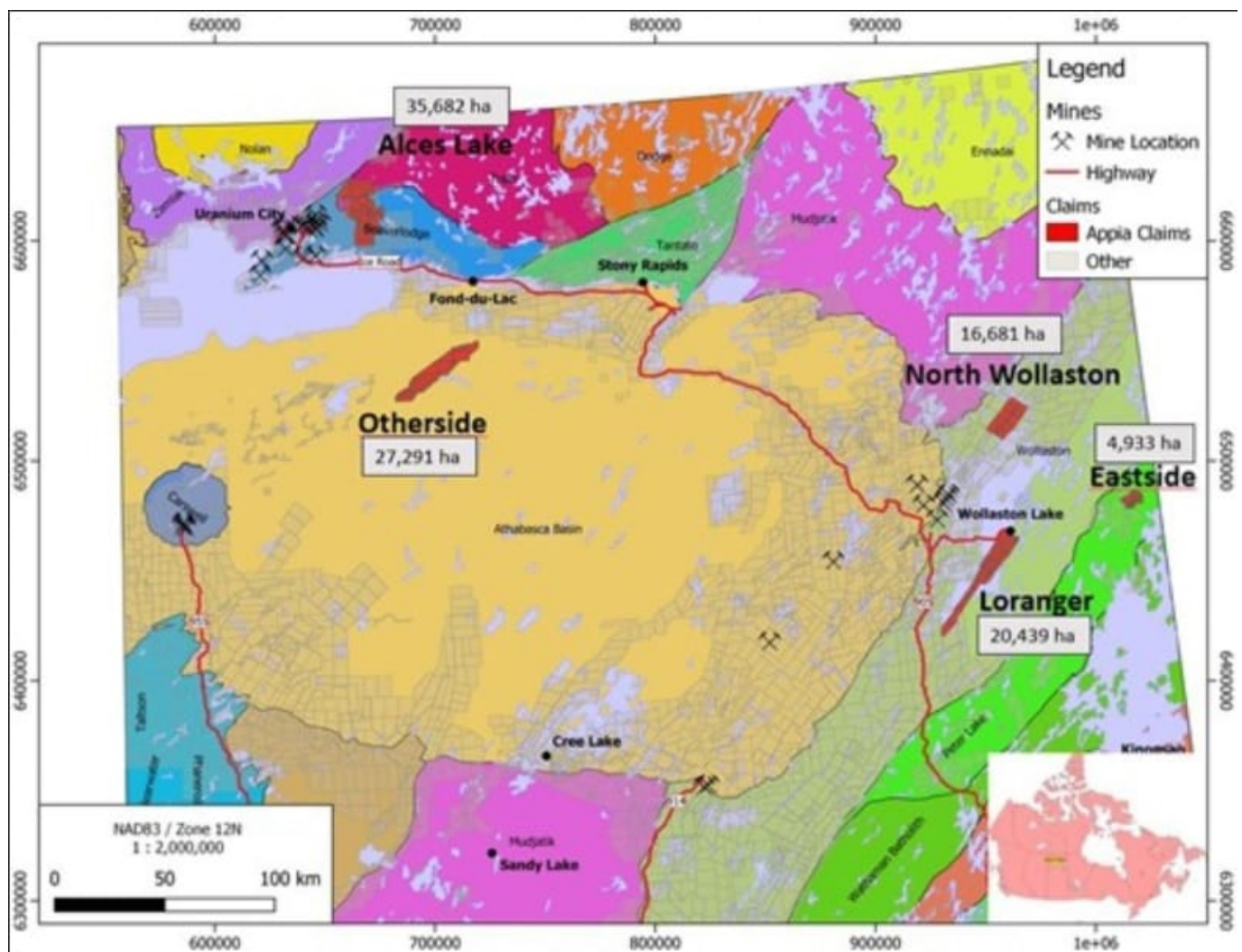
Saskatchewan Uranium Properties

Appia recently announced that they significantly increased their uranium claims by acquiring the Otherside claim block of 27,291 contiguous hectares. Appia states: “The claims were staked on the basis of similar geological and geophysical signatures to the Company’s Loranger property as well as other known high-grade, large-tonnage uranium deposits in the Athabasca Basin including Fission Uranium Corp’s Triple R deposit, NexGen Energy’s Arrow deposits and others.”

Appia now owns 4 uranium properties/claims over a total of 69,344 hectares – Loranger, North Wollaston, Eastside, and Otherside. The properties are well located with proximity to

infrastructure such as roads, highway, powerline, an airstrip as well as two uranium mills. The properties are ready to explore, with at or near-surface high-grade uranium, no sandstone cover, and negligible overburden.

Saskatchewan Uranium Properties – Loranger, North Wollaston, Eastside, and Otherside



Source: Company news January 10, 2022

Appia stated on January 10, 2022 that the next steps are: “Appia has commenced the permitting process for a winter drilling program on the Loranger property and anticipates commencement of drilling in approximately one month, depending on weather and permits. The Company is fully funded for this program.”

Elliot Lake (Ontario, Canada)

Appia also has a 100% interest in 12,545 hectares (31,000 acres), with rare earth element and uranium deposits over five mineralized zones in the Elliot Lake Camp, Ontario. The Resource details are shown in the table below.

Elliot Lake NI 43-101 Compliant Resource

NI 43-101 Compliant Resource*								
Indicated Resource					Inferred Resource			
Teasdale Lake Zone								
	Tonnage (M tons)	Average Grade (lbs./ton)	Contained Metal U ₃ O ₈ (M lbs.)	Contained Metal TREE (M lbs.)	Tonnage (M tons)	Average Grade (lbs./ton)	Contained Metal U ₃ O ₈ (M lbs.)	Contained Metal TREE (M lbs.)
U ₃ O ₈	14.4	0.554	8.0		42.4	0.474	20.1	
REE	14.4	3.30		47.7	42.4	3.14		133.2
Banana Lake Zone								
U ₃ O ₈					30.3	0.912	27.6	
TOTAL	14.4		8.0	47.7	72.8		47.7	133.2

* "A Technical Report on the Appia Energy Corp. Elliot Lake Uranium-Rare Earth Property", by Watts, Griffiths and McQuat Limited (July 30, 2013). Mineral resources are not mineral reserves and do not have demonstrated economic viability.
Numbers may not add to total due to rounding

Source: Company presentation

Closing remarks

Appia really is becoming a significant rare earths and uranium junior. Appia now owns three very promising projects – Alces Lake (very high grade and critical rare earths), Saskatchewan Uranium Properties (Loranger, North Wollaston, Eastside, and Otherside), and Elliot Lake (rare earths & uranium).

Appia trades on a market cap of C\$54 million. Don't miss this one.

Canada's entry point to a domestic North American rare earths products production center

Why is Appia Energy Corp.'s (CSE: API | OTCQB: APAAF) Alces Lake discovery of an accessible extensive hard rock deposit of the rare earth bearing mineral, monazite, so very important to the non-Chinese world's demand for magnet rare earths? It is because Appia's monazite is, in fact, the neodymium rich variant, which is the most desirable for the production of rare earth permanent magnets. It is not only rich in neodymium (Nd) and praseodymium (Pr), but also contains 1% of xenotime, the best heavy rare earth bearing hard rock mineral.

Monazites are typically up to 50% higher in contained Nd and Pr than bastnaesite, the ore mined at Mountain Pass by MP Materials Corp. (NYSE: MP) and the residual mineral from China's Baotou region iron mining, which up until recently was the world's most-produced source mineral for light rare earths. Lynas Rare Earths Limited (ASX: LYC) is currently the world's largest producer of rare earths derived from monazite deposits at Mt. Weld in a remote area of northern Australia.

Monazites are produced today as a byproduct of the processing of heavy mineral sands to recover zircon and ilmenite, respectively the ores of zirconium and titanium. Until recently processing monazite for rare earths was inhibited by the fact that monazites always contain radioactive thorium and sometimes uranium. The monazites were thus returned to the tailings from these operations and in the USA the environmental regulations required that they be returned to the worked-out deposits and distributed so that the residual background radiation was equal to or less than it was before

the deposit was worked.

In the last five years as Chinese bastnaesite deposit grades have declined and mining created pollution has become a big problem in China the Chinese rare earth industry has begun to import very large quantities of monazites from the USA, Madagascar, South Africa, Brazil, and Australia. All of this material was produced as a byproduct of heavy mineral sands processing for zircon and ilmenite.

In order to solve the thorium/uranium problem, China requires that all imports of monazite go first to China Nuclear Corporation, which removes the thorium and uranium, and then ships a clean mixed rare earth carbonate to the Chinese refiner that ordered the material. China nuclear is licensed to process up to 50,000 tons of monazite containing up to 30,000 tons of total rare earths a year.

In the USA the only licensed uranium mill, Energy Fuels Inc.'s (NYSE American: UUUU | TSX: EFR) White Mesa Utah facility, has replaced China as the destination for monazite produced from its heavy mineral sands operations in Georgia by US Chemical Group, Chemours. Energy Fuels removes the uranium, which is a payable for Energy Fuels, and is storing, legally, the thorium, which has been committed to a medical radioisotope group. The first clean mixed rare earth carbonate produced by Energy Fuels from the Chemours' monazite has already been sold to and shipped to Neo Performance Materials Inc.'s (TSX: NEO) European solvent extraction rare earth separation facility.

Appia is working with Canada's and the world's most attractive (Report's the Fraser Institute) mining investment jurisdiction, the Province of Saskatchewan. The Province's Saskatchewan (Mining and Refining) Research Center, the SRC, has agreed to develop a hydrometallurgy for Appia's monazite and the SRC has already designed and begun the construction of a 3000 ton per annum rare earth solvent extraction separation facility, where the separation and purification of Appia's

monazite will be proven and piloted in what will be Canada's anchor for a total rare earth permanent magnet supply chain. Saskatchewan is the home of Canada's uranium mining industry and so the sale of any recovered uranium and the storage (or use) of any recovered thorium is not a problem.

North America is well on its way to becoming a world center of monazite processing, and Appia is Canada's entry point to a domestic North American rare earth products production center.

Appia Energy's monazite 'a particular gem in the world of rare earths'

Appia Energy Corp. (CSE: API | OTCQB: APAAF) is a company focused on strategic minerals in Canada, specifically uranium and rare earths. The company has a high-grade rare earths project at Alces Lake and is also targeting uranium in three additional properties, all of which are located in the Athabasca Basin in northern Saskatchewan. In addition, the company has uranium (and associated rare earths) in a property near the town of Elliot Lake, Ontario. Thirteen underground mines on this property produced approximately 360 million pounds of U308 from 1955-1996.

After a very successful summer drilling program on the Alces Lake property, the company has raised new equity in the form of non-brokered private placements of equity and flow-through shares. In early December 2020, the company closed a non-brokered \$0.4 million flow-through financing. This was preceded by another flow-through and equity raise announced in

October, which raised a total \$1.8 million in new equity. In addition, the company raised a further \$0.8 million through the exercise of share purchase warrants between September 14 and November 5, 2020. All of the new capital raised is intended for continued exploration on the company's uranium and rare earth properties in Saskatchewan.

Particularly important to the company and shareholders, the rare earths continue to draw more market attention. For industry watchers and participants, the recent global activities are bringing the scarcity and security of supply of rare earths to the fore. So much so that at the end of September 2020, President Trump signed an executive order regarding critical materials, declaring a national emergency as related to rare earths. To further exacerbate the global focus on rare earths, on December 1, 2020, China implemented its Export Control Law, which is going to have impact on the export of rare earths from the country. China arguably has the world's most complete rare earth industry chain, which means in order to make full use of the rare earths mined in various countries, they must come to China for processing. China produces approximately 80% of the world's rare earths but can only supply about 30% of the input.

Reminiscent of other industries and other parties' attempts to corner particular markets, the world of rare earths appears to be undergoing a seismic shift. Governments outside of the US are also recognizing this trend and the provincial government of Saskatchewan (Canada), via the Saskatchewan Research Council (SRC), announced in August 2020 plans to have an operational rare earths processing facility completed and operational in late 2022. Unknown to most people, the SRC has world renowned rare earths experts who have over 30 years experience in the sector. This facility is a first of its kind in Canada and is strategic for the rare earths properties in western Canada.

All of these global activities are relevant to Appia and the

rest of the exploration industry's move away from a stranglehold on rare earths supply from China. In particular, according to the company, the Alces Lake property has the second highest average grade of rare earths in the world. Combine this with access to infrastructure in the immediate area and the further potential of the Alces Lake property (less than 1% of the property explored with diamond drilling), including six new areas of the rare earths system on the property.

One word – monazite. The significance of the Alces Lake property should not be underestimated. Why? The rare earths on the property are 100% hosted within monazite, which has proven simple extraction methods dating back to the 1950s. But more importantly, the monazite at Alces Lake occurs as isolated grains, 1 – 3 cm thin lenses and as isolated clusters with further metres thick massive clusters which have been found to be outcropping at surface. The monazite ore has critical rare earths Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy), and Terbium (Tb) which are necessary for the permanent magnet industry and represent approximately 85% of the potential value at Alces Lake.

While it is far too early to declare Appia Energy a leader in the global race to develop new supply sources outside of China, their Alces Lake asset is compelling and the timing is excellent. Investors should be watching this company keenly, as the global rare earths story evolves.

New rare earths processing

facility announced in Appia Energy's backyard

Government announcement is more good news following Appia's successful results and expansion

Any mining company will tell you that success is the result of a combination of good decisions and good fortune, and Appia Energy Corp. (CSE: API |OTCQB: APAAF) ("Appia") has recently had both.

On August 28 the Saskatchewan Research Council ("SRC") and the Government of Saskatchewan announced their plan to develop a "first-of-its-kind" Rare Earth Processing Facility in Saskatchewan, Canada – essentially in Appia's Alces Lake high grade rare earths project's backyard. This is a highly significant announcement as it has enormous potential to benefit Appia down the track, as they can potentially leverage of what is already provided by the local government. The facility is planned to be fully operational in late 2022 and will be capable of processing both hard rock ores (monazite and bastnaesite), and converting them into saleable individual rare earth oxides. This matches perfectly with Appia's shorter term needs and would be North America's first rare earths processing facility.

Speaking exclusively to InvestorIntel, Appia President and CEO, Tom Drivas, welcomed the news. "Appia congratulates the Saskatchewan Research Council and the Government of Saskatchewan for their initiative to develop a first-of-a-kind rare earth processing plant in Saskatchewan, Canada," he told InvestorIntel. "Appia is very pleased and excited to learn that the Saskatoon rare earth processing plant will be up and

running by the end of 2022, especially since it is in such close proximity to Appia's high-grade critical rare earth Alces Lake project. Having the SRC plant in the same province as our project will substantially benefit Appia and its shareholders. Appia's Alces Lake project's rare earths are hosted in monazite, which the SRC plant will be processing. Appia has a well-established working relationship with SRC."

This comes on the heels of a recent string of exploration and other news for Appia. In July 2020 Appia reported a 1.0 meter channel sample line grading 0.471 wt% total rare earth oxide ("TRE0") at Appia's Loranger Property. Appia also found over 65 metres of continuous uranium mineralization at surface grading 0.018 wt% U₃O₈ at their Eastside Property.

"The composite U₃O₈ grades from Eastside are comparable to other world-class open pit uranium mines," said Appia Vice-President, Exploration and Development, James Sykes, "such as the Rössing and Husab uranium mines in Namibia. Based on historic assay results and those obtained from Line 3 of Area 51, we believe zones with higher uranium grades are possible on the Property. The Property remains underexplored."

On August 4 Appia announced that it had staked 8,014 additional acres at its high-grade rare earth Alces Lake Property, expanding the total property to an area of 17,577 hectares (43,434 acres). The new staking around Hawker ensures that all of the historic surface occurrences and potential geological trends are located within the Alces Lake Property. The two new land acquisitions now provide Appia with an additional 11 km of prospective trends to explore for additional high-grade rare earth element and uranium zones, bringing the total to 41 km along a continuous regional geological trend.

On August 6 Appia announced that they had discovered at least seven surface rare earth and uranium zones on the Alces Lake Project. Mr. James Sykes said: "We continue to discover more

of the REE mineral system at surface, and for many kilometers outside of the main area where we've been focusing exploration for the past couple of years. This suggests we're looking at a very large system across the property and also at depth."

Some uses for rare earths and hence a strong decade ahead



Source

The Alces Lake Property (100% owned by Appia)

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 four 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. 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. Finally the recent development by the Government of Saskatchewan to develop a "first-of-its-kind" Rare Earth Processing Facility in Saskatchewan is extremely promising for Appia.

Appia Energy Alces Lake Project has one of the highest grade rare earths in the world with favorable monazite ore

High-grade outcrops and drill hole intersections, on average, comprising **27% monazite**, locally up to **85% monazite** (these are naturally pre-concentrated)



Source

Closing remarks

Appia Energy continues to expand their rare earths and uranium resource potential via a very significant neighboring land acquisition and further exploration in their Summer campaign. Phase 1 has already uncovered numerous targets and phase 2 plans 2,000 to 3,000m of new diamond drilling on their Alces

Lake Project.

The announced new SRC Saskatchewan rare earths processing facility is a potential game changer for Appia. All the pieces of the puzzle are coming into place – very high grade rare earths, expanded land package with exploration upside and success, and finally a nearby processing facility. As the renewable energy and EV boom take off this decade the demand for a secure supply of western-made rare earths will intensify. It is starting to look like Appia Energy can be a significant player one day with continued good results and good fortune.

Tom Drivas on Appia's high grade critical materials (rare earths, uranium) and MP Materials

“Alces Lake, Appia's project which is located in northern Saskatchewan, has a number of surface and near surface zones with very unusual mineralization. There is upto 85% monazite right on the surface and upto 50% total weight percent rare earths. It is unique. It is high grade and it has the right mineralogy. All of the rare earths are contained in one mineral which is monazite, in the right province, in the right area and very close to pilot plant processing facilities...What we are working and like to see next is come up with our first resource and follow up with a PEA and prove to the market that we have an economically viable project.” States Tom Drivas, CEO, President and Director of Appia Energy Corp. (CSE: API |

OTCQB: APAAF), in an interview with InvestorIntel's Tracy Weslosky.

Tom went on to say that Appia's has both rare earths and uranium assets and the company is on track with its exploration and drilling programs. He also said that MP Materials' listing on NYSE will be very good for the rare earths industry and it will bring a lot of attention to Appia Energy. Appia's market cap is less 1% of that of MP Materials but Appia has a similar project in Canada the initial grades of which look much better than MP Materials' rare earths grade.

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

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