

Kenny on Frontier Rare Earths positive PFS results and mine-to-money strategy for rare earth production

June 17, 2015 – In an **InvestorIntel** interview, Publisher Tracy Weslosky speaks with James Kenny, Director and CEO of Frontier Rare Earths Ltd. (TSX: FRO | OTCQX: FREFF) on the recent positive pre-feasibility study (“PFS”) results for the Zandkopsdrift Rare Earth Project in South Africa. Results discussed include the increase in Frontier’s NPV (net present value), revenue projections for Phase One and how Frontier Rare Earths’ business mandate is to go from mining to production of 14 high-purity individually separated rare earths.

Tracy Weslosky: James, it’s my understanding that your PFS is one of the most detailed ones that have ever been put out on the rare earth sector and it actually positions you as one of the top frontrunners for production in the sector.

James Kenny: Thanks Tracy. We’re very pleased with the outcome on the detail of the study that it went into. You bring up a good point, there have been several economic studies published by various rare earth perspective developers, but a lot of those studies don’t go the full way through from mining through the end separated product. Our business plan and our strategy has been consistent over the last several years and we are going from mining through to producing a range of 14 high-purity individually separated rare earths, which I think is unique amongst those emerging rare earth developers.

Tracy Weslosky: Well, not only is it unique, but for our InvestorIntel audience that may not be familiar with the

story, not sure how you couldn't be, cause we've done a lot of coverage of Frontier Rare Earths over the years, but presently they have \$25 million in the bank and they're trading almost at market cap right now with your cash. Is that not correct?

James Kenny: \$22 to be exact, but I think your point about us trading at or close to our cash value is correct.

Tracy Weslosky: So now I want to ask you, if you don't mind, about your PFS, what do you think are the highlights from it because I read it and I thought the NPV was very interesting. If we could just discuss this and then, of course, I do want to talk to you about your unique critical rare earth oxides and your permanent magnets rare earths as well.

James Kenny: Sure. Yes, I mean, the financial profile of the project is very strong. The prefeasibility study has been done at a range of discount rates to take a midpoint of 10%, in that range, as I think you're referring to, generates a project net present value of in excess of \$2 billion dollars, which is obviously very encouraging and an internal rate of return post tax of approximately 30%. These are very strong metrics I think both in their own right and compared to the peer universe in which we operate.

Tracy Weslosky: I felt additionally one of your competitive attributes had to do with the revenue that you were projecting from phase one. Can you talk to me a little bit about that?

James Kenny: Yes Tracy. Our plan for Zandkopsdrift is to develop the project in two phases...to access the complete interview, [click here](#)

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Frontier Rare Earths positioned to be the next major REE producer outside of China?

✘ Frontier Rare Earths Ltd. (TSX: FRO | OTCQX: FREFF), announced news May 12th that could lead to their being the major producer of rare earths outside of China. They released a Pre-Feasibility Study (PFS), of their Zandkopsdrift deposit in South Africa. The deposit contains the highly desired critical rare earths (CRE's), and magnetic rare earths. The major news is not just the quality of the deposit, but that Frontier will do the processing themselves.

The main points were:

- The CREs present are neodymium, europium, dysprosium, terbium and yttrium
- Magnet REEs are neodymium, praseodymium, dysprosium and terbium
- Net Present Value (NPV) of \$2.98b, after taxes and royalties, at an 8% discount rate
- NPV of \$2.2 billion, after tax and royalties, at a 10% discount rate
- NPV of \$1.58 billion, after taxes and royalties at a 12% discount rate
- Annual revenues of approx. \$440m at Phase 1 capacity and approx. \$880m at Phase 2 capacity
- Approximately 76% of Project revenues are derived from critical rare earth oxides and 75% from magnet related REOs

The NI 43-101 compliant report is perhaps the most detailed study of a deposit outside China. The economic evaluation of the project lists an internal rate of return of 30%, after tax and royalties. The PFS details 14 rare earth products that Frontier will be processing nearby. As well, power, water desalination, and by-product processing will also be part of the operation. One of the by-products, manganese, was formerly thought of as a waste product, but Frontier plans to process the element into high quality fertilizer and other agricultural products to add to profits.

The separation facility and the desalination plant will be located in the Industrial Development Zone at the deep water port of Saldanha Bay, approximately 300 km south of Zandkopsdrift. The desalination plant will be run by Sedex Desalination (Pty) Ltd. a subsidiary of Frontier Rare Earth Pty Ltd. This plant is necessary due to the high demands on water by mines, and mining camps, and the arid climate of South Africa.

The processing will involve an innovative process for which Frontier has applied for a patent, according to CEO James Kenny. They will be replacing kiln's with fluidized bed reactors, using sulphuric acid cracking. Their process will be the first time their method has been used for rare earth processing. The process will be done in connection with Outotec as consultants. Outotec is the world leader in sulphuric acid plant designing. This new process could make Frontier the most efficient, and the most environmentally friendly processor not just outside of China, but anywhere.

The production capacity is estimated a 8,000 tonnes per annum (tpa), of high purity, separated total rare earth oxides (TREO) for the first four years of operation (Phase 1). Then doubling to 16,000 tpa TREO from year five onwards (Phase 2). According to the report the proven and probable reserves of 788,700t of TREO is sufficient for a 45 year life of mine.

The supply from the Chinese is covering current demand. But with the end of quotas and the increased environmental regulations, and the forced restructuring that will cause for many Chinese producers, demand may begin to outstrip supply within the next few years. It's more when, than if the Chinese will no longer be able to meet demand, and Frontier could become one of only 3 or 4 companies that will be able to supply the world with critical Technology Metals.

The detailed report released May 12th confirms the quality of Frontier's Zandkopsdrift deposit. The amount of CRE products that they will process themselves puts them in a unique position. They have potentially the highest quality and quantity deposit outside of China. And unlike other producers, they will be processing their own product nearby. This is good news not just Frontier but the availability of Technology Metals for years to come. The unique processing method could also make them world leaders in separation technology. We will see how long it takes Frontier to bring these remarkable advantages to market.

Interview: Rare earth leader Frontier Rare Earths on track to deliver Pre-Feasibility Study in 2014

✘ James Kenny, CEO of Frontier Rare Earths ('Frontier', TSX: FRO), a rare earth play in South Africa, spoke to Tracy Weslosky, Publisher and Editor-in-Chief of InvestorIntel about the Zandkopsdrift rare earth element project in the Northern

Cape Province of South Africa. Frontier is currently focused on completing a pre-feasibility study for an area in Zandkopsdrift in partnership with the Korea Resources Corporation (KORES). KORES holds a 10% interest in the Zandkopsdrift project. It also has rights to offtake and 10% of production in a deal that has made Frontier one of the few junior rare earth miners to have secured a strategic partnership.

Frontier has also clearly identified the main ore, monazite, from which it will extract its rare earth products. Monazite offers well known and cost effective processing possibilities because the ore contains cerium, neodymium, praseodymium and lanthanum. Kenny said that "all studies completed and we are performing metallurgical test programs, which should be ready by end of Q1, 2014". Kenny pointed out that the project is very economically viable. Indeed, Zandkopsdrift will certainly be one of the first of the various rare earth companies that have emerged in recent years to start producing high quality separated rare earth products outside of China at a projected 20,000 tons/year.

Kenny noted that the preliminary economic assessment published in 2012 projected 900 million dollar capital cost for the plant construction is actually efficient considering the net present value to Frontier of 3.6 billion dollars. "Project finance will be difficult and securing of capital will be a challenge but Frontier has put together a compelling investment prospect, based on low capital and operating costs at Zandkopsdrift are significantly lower than in many other rare earth projects" and it can be assumed that the labor costs will be lower compared to North America while its open pit mining makes it cheaper than underground mining and Kenny notes that "two projects with the same capital costs can have fundamentally different economics", which means that a number of factors must be considered to evaluate cost effectiveness.

In Q2, metallurgical testing work will be completed leading to

pre-feasibility study in Q3 and the definitive feasibility study starting at the end of Q3 and lasting for the next 9 months. What will the market conditions be? “Nobody really knows –said Kenny – but if capital requirements are removed, construction timeframe for the separation plant will be two years and commencement of production in 2017”. Moreover, the important consideration in rare earth projects is to identify the ones with deposits in accessible locations and near critical infrastructure: “we will need a reasonable volume of water ...we have assumed that we will not be accessing groundwater but rely on a reverse osmosis desalination plant and pump the water to Zandkopsdrift, 35 km away”, said Kenny. As for the rare earth separation plant, it is not something you would normally associate with mining; essentially it is a chemical plant, which should ideally be developed in an industrial setting where you have even greater infrastructure requirements.

In this regard, Kenny concludes that “we are again quite fortunate that there is the coastal town of Saldanha Bay where we will set up our separation plant and we are very well serviced by transportation and infrastructure”.

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