Imperial Mining Sets Comprehensive 2021 Plan at Crater Lake after $2.6M Financing

After a positive summer drill program at its flagship **scandium-rare earth** Crater Lake Property in northeastern Quebec, Imperial Mining Group Ltd. (TSXV: IPG) successfully closed a $2.6 million financing in December to accelerate the project forward in 2021.

Imperial Mining plans to use the proceeds to complete definition drilling at Crater Lake's "TG Zone", and to deliver both a 43-101 Resource Report and a Preliminary Economic Assessment (PEA) by the end of June 2021.

Last trading at $0.16, Imperial Mining Group has a market cap of $20 million and a PEA could re-rate the company, shifting it closer to the $175 million market cap of NioCorp Developments Ltd. (TSX: NB | OTCQX: NIOBF) that has a Feasibility Study at its Elk Creek niobium-scandium project in Nebraska, United States.

Peter Cashin, President & CEO of Imperial Mining Group, recently commented, "I am very pleased of the positive response that the market has shown for our private placement. The financing was oversubscribed, and we believe that it was motivated by the recent significant announcements in the critical metal space, in particular for scandium and the rare earths."

Scandium Alloys at Home and in Space

Manufacturers in many industries, including automotive, aerospace, and defense, recognize that scandium-modified

aluminum alloy materials could become a critical input into their production processes.

With the push for lighter and stronger materials to make vehicles more fuel-efficient and the need for tough and durable metal alloys for the resurgence in space activity, scandium-aluminum “superalloys” have been already used by NASA and the European Space Agency (ESA).

In a March 2020 speech at the Satellite 2020 Conference, Elon Musk, founder of Tesla (NASDAQ: TSLA) and SpaceX stated that the aerospace engineers at SpaceX were going to switch to a different alloy “pretty soon” to replace the current stainless-steel alloy, known as 301.

Scandium-aluminium alloys are highly valued as an important lightweight material and are one-third the weight of steel and 60 % of the weight of titanium alloys.

Scandium-aluminium alloys are also corrosion-resistant and can be used in a variety of industries, including aerospace, automotive, and consumer products, such as baseball bats, bicycle frames, and golf clubs.

A small percentage of scandium alloyed with aluminum enables aluminum to be effectively welded to another piece of scandium-aluminum alloy, without the need for heavy hardware to join the pieces together.

Scandium-aluminium alloys are currently being used by California-based Relativity Space, a private aerospace manufacturing company. Relativity Space’s massive 3D printer can create a rocket from raw material to flight in 60 days.

The automotive industry could be a large market opportunity for scandium. With scandium-aluminum’s self-welding abilities, engine blocks could be constructed using 3D printers.

In addition, according to a recent report, the average

passenger vehicle contains over 150 kilograms of aluminum and the average light truck contains over 230 kilograms of aluminum. If only 1% of the traditional aluminum used in the approximately 17 million light vehicles (cars and light trucks) produced in the United States each year, switched to scandium-aluminum, that impact would create a demand for 35 tonnes of scandium each year.

With current scandium production estimated between 25-35 tonnes per year as such, this type of demand would immediately double the current supply requirement.

Scandium

Scandium is an element, sometimes classified as a rare earth metal, and currently, there are no primary scandium mines. Supply comes from the by-product of other mineral extractions from deposits in China, Russia, and more and recently, Australia.

Scandium is not traded on any metal exchange and the price is negotiated between buyer and seller. According to the most recent USGS data sheet on scandium, over the past five years, the price for scandium-oxide has averaged $4,560 per kilogram.

Scandium and other “critical metals” were thrust into the spotlight last year when President Trump signed an Executive Order addressing the threat to the United States’ supply chain from relying on “critical minerals” from “foreign adversaries”, specifically identifying China. The 35 mineral commodities deemed critical under the definition included aluminum, gallium, graphite, lithium, manganese, niobium, the rare earth elements group, and scandium.

Crater Lake Property – Scandium & Rare Earth Metals

The 100%-owned Crater Lake Project is located 200 kilometres northeast of Schefferville, Quebec, and covers 2,780 hectares (approximately 6,900 acres). The project hosts three zones of

mineralization (Boulder, TG Zone (TGZ), and STG), determined by scandium-rich outcrops, boulders, and recent drilling.

Highlights from the summer drill program included Hole #CL20037 from the TGZ that returned intervals grading up to 253 grams per tonne (g/t) Scandium Oxide (Sc_2O_3) over 29.14 metres (m), including 9.3 m grading 299 g/t Sc_2O_3 and 21.69 m grading 271 g/t $Sc_2O_3$3 including 9.16 m grading 299 g/t Sc_2O_3.

Importantly, the true thickness of the scandium mineralized zone is estimated to be up to 110 m and is open at depth and along strike.

The company sees major positive factors with the project, including:

- The resource is exposed at the surface, so it is amenable to a low-cost open-pit operation.
- The deposit is high grade relative to its peers and could reduce the CapEx to develop the mine and the OpEx to run the mine.
- The preliminary metallurgy showed strong scandium mineral recoveries.
- The project is in the mining-friendly jurisdiction of Quebec and supported by Quebec’s recently launched $90 million “critical minerals” development fund and Plan Nord, Quebec’s economic development strategy to develop natural resource extraction in northern Quebec.
- The deposit is located in close proximity to the 9 aluminum smelters and one alumina refinery in Quebec.

Final Comment

Look for the definition drill results, 43-101 Resource Report, and the PEA to potentially lift the stock price higher this year.

Jack Lifton with Geoff Atkins on Vital Metals' expected 2021 rare earths production start at Nechalacho

The Technology Metals Show host Jack Lifton talks with Geoff Atkins, Managing Director of Vital Metals Limited (ASX: VML), about Vital Metals' planned production at its Nechalacho rare earths project in Canada. "In terms of the time frame, we are currently working on a schedule to commence production next year," Geoff said.

In the interview Geoff provided an update on Vital Metal's offtake agreements and business model. Vital Metals has a management team with experience in building and operating rare earth plants. He also explained what the company is doing to ensure reduced capital cost and time to market.

To access the complete interview subscribe to the **Technology Metals Show** and get exclusive access to member-only content through this exclusive site. Or Log-In Here for the latest conversations, debates, updates and interviews with the leaders, thought leaders and investors focused on issues relating to sustainability in the critical materials sector.

For more information on the **Technology Metals Show** email us at info@technologymetals.com or reach us direct at +1 (416) 546-9233.

Geoff Atkins on Vital Metals' 2021 rare earths production and new extraction facility

InvestorIntel's Tracy Weslosky speaks with Geoff Atkins, Managing Director of Vital Metals Limited (ASX: VML), about Vital Metals' Nechalacho rare earths project in Canada.

"Nechalacho is on track to be in production next year," Geoff said. "We are constructing an extraction facility with SRC [Saskatchewan Research Council] and that will take our product from Nechalacho and produce a mixed rare earth carbonate product."

Geoff went on to provide an update on Vital Metals' management team. "Our entire team has been involved in Lynas and some of them have also been involved in Northern Minerals' Browns Range Project," he said. "We have 10-15 years' experience in building and operating rare earth plants."

Commenting on the competitive advantages of Vital Metals Geoff said, "The bottom line is about being low cost. From a capital cost perspective, we are looking at under AU$20 million to build this plant. The second is near term operation. We are going to be operation within 12 months."

To watch the complete interview, click here

Disclaimer: Vital Metals Limited is an advertorial member of InvestorIntel Corp.

The Rare Earths War

Technology Metals Show host Tracy Weslosky moderates a timely discussion on how China poses a serious threat to the rare earths supply chain security of the United States, talking to international rare earths expert Jack Lifton and the Editor of "The Rare Metals War" Guillaume Pitron. Guillaume observed that Donald Trump as the President has been tackling the rare earths supply chain issue like no one ever done in this role. He added, "If he is re-elected, I believe, that is going to impact in a good way the US production of rare earth minerals and rare earth metals."

Jack agreed with Guillaume and added, "Trump is the first president to refocus on globalization, and he is trying to de-globalize critical materials for the security of the United States." Highlighting the seriousness of the rare earths supply chain problem, Jack said that Shin-Etsu and Hitachi, two large Japanese companies that supply rare earth magnets to the US military, have most of their production in China.

Jack also revealed that China recently announced that they would cut off Northrop Grumman, an American defense technology company, from all Chinese rare earth materials. "What Americans don't seem to be paying attention to," Jack continued, "is Grumman is the producer of the F-35 fighter plane, the greatest air superiority weapon in history. Grumman needs those rare earths to build those planes. This is going to bring real pressure on the defense department."

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leaders, thought leaders and investors focused on issues relating to sustainability in the critical materials sector.

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Trump amends Defense Production Act for Rare Earths

My first email this morning read “Game changer!” and included a link to the *Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended*. It reads, on July 22, 2019, US President Donald Trump stated: “By the authority vested in me as President by the Constitution and the laws of the United States of America, including section 303 of the Defense Production Act of 1950, as amended (the “Act”) (50 U.S.C. 4533), I hereby determine, pursuant to section 303(a)(5) of the Act, that the domestic production capability for Rare Earth Metals and Alloys is essential to the national defense.

Without Presidential action under section 303 of the Act, United States industry cannot reasonably be expected to provide the production capability for Rare Earth Metals and Alloys adequately and in a timely manner. Further, purchases, purchase commitments, or other action pursuant to section 303 of the Act are the most cost-effective, expedient, and practical alternative method for meeting the need for this critical capability.”

Having seen the undeniable increase in interest in rare earths as of late, we published a historical overview of the market yesterday titled The U.S. rare earths saga continues… The intent was to highlight how a similar series of events created a most memorable boom to bust cycle from 2010-2014.

This memo should provide a great short-term boost to the rare earths sector as well as a confidence boost for investors in the rare earths sector, which we will be covering. We presently cover regularly the following companies that are leaders in this sector:

- Alkane Resources Ltd. (ASX: ALK | OTCQX: ANLKY)
- Avalon Advanced Materials Inc. (TSX: AVL | OTCQB: AVLNF)
- Critical Elements Lithium Corp. (TSXV: CRE | OTCQX: CRECF)
- Scandium International Mining Corp. (TSX: SCY)
- Search Minerals Inc. (TSXV: SMY)

A rare earths war – What should investors do next?

This past week the Chinese press has hinted that China may limit the supply of rare earths to America. Although quotas/bans haven't been implemented (yet), tensions escalated Tuesday morning (May 28) when the editor in chief of a Chinese tabloid, Global Times, tweeted: "Based on what I know, China is seriously considering restricting rare earth exports to the US. China may also take other countermeasures in the future." The People's Daily weighed in with a rare Chinese phrase that means "don't say I didn't warn you." What could be ringing alarm bells is, that wording was used by the paper just before China went to war with India in 1962.

China dominates global rare earth production with ~80-90% market share

Used as components in most electronic devices, electric vehicles, wind turbines, and the aerospace industry; Chinese restrictions on rare earth sales to the US could put significant supply strains on these sectors. In 2018 under the National Defence Authorization Act, Chinese rare earth magnets imports were banned in the US, however, the US Administration did a flip less than a month later and left rare earths minerals and the electric vehicle sector metals off a 194-page tariff list.

In what China probably sees as a trade blow to the US, a rare earth ban would risk its reputation as a trade hub with the rest of the world. The global supply chain is so complicated and intertwined it would undoubtedly affect many other countries that rely on rare earths.

What are the alternatives for the US to source rare earths minerals?

The answer is almost zero. Given 80-90% are produced in China the US would then be forced to source from the remaining 10-20%. The US's only domestic mine is California's Mountain Pass rare earths mine, owned by MP Materials. In an unnoticed rare earths switch, China has actually begun importing semi processed rare earth ore from the Mountain Pass mine.

The other main option for the US is Australia's Lynas Corporation. But Lynas already has contractual agreements and may struggle to meet all of the US's needs.

Lynas Corporation stated exclusively to Investorintel this week:

"Rare earths are essential to digital age technologies and Lynas is the world's second largest supplier of rare earth materials. This sustainable position is based on our long

life, high-grade resource at Mt Weld in Western Australia, and our proven operating assets. Lynas is well placed to continue to supply high purity rare earth materials to manufacturing supply chains around the world."

Investor options in rare earths (non-Chinese companies)

Below gives the range of choices for investors looking to invest in the non-Chinese rare earth companies, as well as an ETF. The main issue is the vast majority are not yet producers. Below in bold are the companies we follow closely at Investorintel.

- **Alkane Resources Ltd. (ASX: ALK | OTCQX: ANLKY)**
- **Avalon Advanced Materials Inc. (TSX: AVL | OTCQB: AVLNF)**
- Arafura Resources (ASX: ARU)
- **Critical Elements Corp. (TSXV: CRE | OTCQX: CRECF)**
- Lynas Corporation (ASX: LYC)
- Northern Minerals Limited (ASX: NTU)
- Peak Resources Limited (ASX: PEK)
- Rare Element Resources Ltd. (OTCQB: REEMF)
- **Search Minerals Inc. (TSXV: SMY)**
- Ucore Rare Metals Inc. (TSXV: UCU | OTCQX: UURAF)

A final thought

Investing in the quality rare earth miners is a good long term strategy, as rare earth demand is set to outstrip supply. That being said investors buying now have missed a great run-up in prices this week, so some caution is required in case we get some pullbacks.

Investors should also be aware in 2014, the World Trade Organization (WTO) ruled that China can't put limits on rare earth exports. Whatever China does next, the US would be sure to counter-retaliate, and we would move into a spiral of trade decline, a global slowdown, and perhaps a global recession. At some point, the US and China will need to both act like reasonable trade partners, which quite frankly is to remove

all tariffs and all government interference (including subsidies) in trade. Only then can businesses get back to doing business.