

# Imperial Commences Phase III Scandium Metallurgical Work Program, Crater Lake Project, Quebec

written by Raj Shah | July 28, 2020

July 28, 2020 ([Source](#)) – Imperial Mining Group Ltd. (“Imperial”) (TSX VENTURE: IPG) is pleased to announce that it has engaged MPlan-Dorfner ANZAPLAN to carry out the Phase III metallurgical work program on the Crater Lake Project scandium mineralization. This program will focus on the development of an efficient hydrometallurgical process to recover a high-purity scandium oxide product from the scandium-rich mineral concentrates.

*“Given the positive results from the Phase II metallurgical test work, which showed improved scandium mineral recoveries, the next step is to develop an appropriate hydrometallurgical process flowsheet for these mineral concentrates,” said Peter Cashin, Imperial’s President & CEO. “To date, we have observed that the Crater Lake scandium mineralization can be concentrated by relatively simple, low-cost recovery techniques such as magnetic separation. An efficient hydrometallurgical process will allow us to produce a high-purity scandium oxide product to provide a low-cost, local source of scandium for Quebec’s aluminum industry.”*

## **PHASE III METALLURGICAL WORK PROGRAM**

*Phase III metallurgical work will be performed on two mineralogically distinct bulk samples similar to those used for the Phase 2 development program (see Press Release: March 2,*

2020) from which mineral concentrates will first be recovered. The Phase III program will then confirm, at the bench-scale, a hydrometallurgical process flowsheet for cost-effective extraction of scandium as 99.5% pure scandium oxide and recovery of a mixed rare earth oxide co-product. This involves dissolving the concentrates in an acidic solution to generate a pregnant leach solution (PLS) from which the contained scandium and the rare earths ("REE") will then be extracted. In addition, the work program will look at the amenability of Crater Lake mineralization to acid soak/water leach or heap leaching techniques in solubilizing scandium and REE with the main objective of reducing reagent (acid) cost while optimizing payable metals recovery

The program will commence upon delivery of MET01 and MET02 samples to Dorfner ANZAPLAN GmbH (Germany) laboratories in early August 2020. Estimated completion time from the date samples are delivered is four months, which brings program's completion date to Q4 2020.

In the Phase II program, a scandium mineral concentrate was produced from the Crater Lake mineralization by using simple low-cost magnetic separation techniques. A combination of low intensity magnetic separation (LIMS) and wet high-intensity magnetic separation (WHIMS) produced a mineral concentrate yielding an impressive 88% scandium as well as 69% recovery of the REE for one sample. A combination of LIMS and WHIMS on the second sample with differing scandium mineralogy also yielded encouraging recoveries of 78% Sc and 56% TREE.

Additional testwork utilizing Sensor-based ore sorting and heavy liquid separation (HLS) methods confirm that X-Ray Transmission (XRT) sensor-based sorting and dense media separation (DMS) offer additional low-cost alternatives for inexpensively producing a mineral concentrate without the need of grinding,

chemical reagents or extensive water consumption. DMS separation yielded recoveries of 90.6% Sc and 89.2% TREE in the mineral concentrate.

‘We believe these next metallurgical development steps will allow us to design an efficient extraction process for this unique scandium deposit environment,” said Dr. Yemi Oyediran, Imperial’s Manager of Metallurgical Development. “Given it’s potentially critical contribution as an important supply source of scandium to Quebec’s aluminum industry, it is inherent on my team to develop an elegant and cost-effective flowsheet that maximizes returns from the envisaged operation.”

## **ABOUT THE SCANDIUM MARKET**

*Scandium (Sc) acts as a grain-refiner and hardener of aluminum (Al) alloys. Al-Sc alloys combine high strength, ductility, weldability, improved corrosion resistance and a lower density. The combination of these properties makes aluminum-scandium alloys well-suited for industries that require next-generation lightweight structural materials for their platforms. Sc-modified Al alloys are highly valued as a critical lightweighting material as it is one-third the weight of steel and 40% lighter than titanium alloys, yet has equivalent mechanical strength characteristics.*

The broader adoption of Sc in the aluminum alloys sector has been constrained by the limited availability of the metal in western commercial markets from the primary supply sources in China and Russia. The lack of reliable long-term supply sources to provide material for additional applications has also constrained market growth. This has resulted in much higher prices for Sc compared to competing alloy materials, such as titanium and carbon composites, limiting its broader use. The current price of the metal oxide published by USGS indicates

that it trades in a range of **approximately US\$2,000-4,000/kg for 99.99% purity.**

Rio Tinto recently announced that they developed a new process to extract the critical metal scandium from by-products generated at its RTFT metallurgical operation in Sorel-Tracy, Quebec, a facility that produces titanium dioxide from ilmenite mined at the Lac Tio open-pit mine near Havre-Saint-Pierre. Developed by researchers at the Rio Tinto Fer et Titane (RTFT) Research & Development Centre, the company has been producing scandium oxide that meets market specifications since the second half of 2019 as part of a pilot project. “This breakthrough on scandium is a great example of how we are looking at our operations across the world with fresh eyes to see how we can extract value from by-product streams,” Rio Tinto CEO Jean-Sébastien Jacques said in a press release. “This exciting breakthrough in processing technology leverages our existing mining operation to provide what can be a scalable, high-quality and low-cost source of scandium oxide to markets and manufacturers.”

The announcement is also a critical validation that a major mining player recognizes that scandium-aluminum alloys have significant market potential and, with the continued availability of sustainable sources of scandium supply, will likely see incremental growth where a strong, lightweight, heat and corrosion resistant material is required by manufacturers.

## **QUALIFIED PERSON**

The technical content in this press release was reviewed and certified by Dr. Yemi Oyediran, an Ontario-registered P. Eng., Imperial’s Manager of Metallurgical Development.

## **ABOUT IMPERIAL MINING GROUP LTD.**

*Imperial is a Canadian mineral exploration and development company focused on the advancement of its copper-zinc, gold and technology metals properties in Québec. Imperial is publicly listed on the TSX Venture Exchange as “IPG” and is led by an experienced team of mineral exploration and development professionals with a strong track record of mineral deposit discovery in numerous metal commodities.*

## **ABOUT M.PLAN INTERNATIONAL LIMITED**

*M.Plan International Limited is a joint venture between two internationally recognized consulting companies, Dorfner Anzaplan GmbH and Micon International Limited, combining their expertise in global geological and mining consulting with analytics, processing and engineering with significant experience in the specialty minerals and metals sector.*

*M.Plan has deep project experience from initial mineral resource estimation through to process development, engineering design and project development. M.Plan and its joint venture owners have been involved in several rare earth element projects globally and hundreds of development studies in the mining sector, including independent lenders’ engineer assignments and as due diligence lead for multiple European and North American capital providers.*

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