

# Initial 2019 Crater Lake Drilling Results Indicate Encouraging Scandium and Rare Earth Grades Over Significant Widths

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## Highlights:

- *Partial TG Zone drilling results returned up to 48.2 m grading 385 g/t Scandium Oxide ( $\text{Sc}_2\text{O}_3$ ), including 8.8 m grading 528 g/t  $\text{Sc}_2\text{O}_3$  and including 12.5 m grading 474 g/t  $\text{Sc}_2\text{O}_3$ .*
- *Elevated levels of total rare earth oxides plus yttrium (TREO+Y) of up to 0.622% characterize the scandium horizon.*
- *The entire scandium mineralized package was found to be between 60 and 90 m in true thickness and is open at depth below 200 m down-dip and along strike.*

MONTREAL, May 22, 2019 -- [Imperial Mining Group Ltd.](#) ("Imperial") (TSX VENTURE: IPG) is pleased to announce that encouraging initial scandium and rare earth (REE) assays have been received from the first two holes completed during the winter 2019 diamond drilling of the TG Zone target, Crater Lake project, northeastern Québec (Figure 1).

A five-hole diamond drilling program for 1,014 m was completed on April 20, 2019 over the TG Zone (TGZ) target to evaluate the scandium potential of a high-intensity magnetic anomaly (Figure 2, Table 2). The new drilling is located 600 m north of a historical drill hole which had returned scandium grades of up to 506 g/t  $\text{Sc}_2\text{O}_3$  over 19.0m along the western side of the Crater Lake intrusion on the same magnetic trend. The current results represent partial analyses from the first two holes of the drill program (CL19031 and CL19032, Table 1). Results for the remainder of holes CL19031 and CL19032 as well as CL19033-19035 are pending. The diamond drill contractor was Avataa Rouillier Drilling Inc. of Amos, Quebec.

Table 1 - Crater Lake Drilling Partial Assay Results:

Hole #	From (m)	To (m)	Interval (m)	* $\text{Sc}_2\text{O}_3$ ** (g/t)	Sc (g/t)	TREO+Y (%)
CL19031	115.80	145.00	29.2	325	212	0.344
Including	115.80	123.00	7.2	370	241	0.399
Including	134.15	145.00	10.9	423	276	0.408
CL19031	193.35	204.00	10.7	327	213	0.366
CL19032	151.35	164.00	12.7	368	240	0.551
CL19032	171.85	220.00	48.2	385	251	0.440
Including	171.85	180.70	8.8	528	344	0.622
Including	188.25	200.70	12.5	474	309	0.552

NOTES: - \* 1 ppm of Sc metal equals 1.5338 ppm scandium oxide ( $\text{Sc}_2\text{O}_3$ ) ; \*\* 1 g/t equals 1 ppm

"We are very pleased with the initial diamond drilling results from the winter program, as they confirm that the high-intensity magnetic anomalies tested to date on the property represent areas of significant scandium and rare earth enrichment," said Peter Cashin, Imperial's President & Chief Executive Officer. "From the evaluation of our geophysical surveys completed on the property to date, we interpret the scandium-bearing horizon to now be traceable for at least 4.5 km in strike length. The evident increase in scandium grades with depth is also very encouraging, however more work remains to be done to fully quantify the scandium and REE resource potential on the property."

## TG Zone Geology

Drilling has intersected a 60-90 m thick, steeply east-dipping, arcuate Crater Collapse ring-fault zone breccia containing large fragments and clasts of felsic syenite in a matrix of pyroxenite-rich material. The felsic fragments, which contain little to no scandium, can constitute up to 60 % of the rock in the mineralized interval. These can probably be removed after primary crushing using low-cost, ore-sorting technology. The pyroxenite-rich matrix contains all of the scandium and REE in the mineralized system. Individual assays from this material grade as high as 730 g/t  $\text{Sc}_2\text{O}_3$ . The mineralized zone has been traced from surface to at least 200 m down-dip and remains open at depth and along strike. A 15-20 m wide alteration halo is observed in the rocks adjacent to the scandium mineralized ring structure. There is an apparent increase in scandium grade at depth along the drill section.

In addition to the diamond drilling, two (2), 100 kg bulk samples were collected from the split core and will be sent for metallurgical testing. Initial testwork completed in 2018 by SGS Lakefield indicates that a combination of low-cost gravity and magnetic or electrostatic separation methods will yield a high-grade scandium mineral concentrate from the zone. The bulk samples are currently being prepared for shipment to a Canadian-based metallurgical contractor.

Table 2 - TG Zone Diamond Drilling Locations

Hole #	Easting (UTM) NAD83 Zone 20N	Northing (UTM) NAD83 Zone 20N	Elevation (meters)	Azimuth (degrees)	Dip (degrees)	Depth (meters)
CL19031	440889	6133709	538	305	-55	219
CL19032	440921	6133683	539	305	-60	267
CL19033	440653	6133385	504	305	-50	222
CL19034	440752	6133321	536	305	-50	153
CL19035	440857	6133726	551	305	-47	153
Total						1,014

## Scandium Markets

The broader adoption of scandium in the aluminum alloys sector has been constrained by the limited availability of scandium 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 limited scandium market growth. This has resulted in much higher prices for Sc compared to competing alloy materials, such as titanium, and has limited 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.

*Scandium acts as a grain-refiner and hardener of aluminum alloys. Aluminum-scandium alloys combine high strength, ductility, weldability, improved corrosion resistance and a lower density. The combination of all these properties makes aluminum-scandium alloys well-suited for the aerospace, automotive and defense industries. Scandium-modified aluminium alloys is highly valued as an important lightweighting material as it is one-third the weight of steel and is 60 % of the weight of titanium alloys.*

As new technologies motivate manufacturers to identify new sources for scandium, the element could be widely adopted by major industries in the years to come. Likely early adopters of scandium-modified aluminum alloys will be the automotive manufacturers seeking to lighten electric vehicle (EV) and combustion-engine cars and trucks to extend battery range and improve fuel efficiency, respectively. Recent data from Nemak, S.A.B. de C.V. (2019), one of the world's largest automotive OEM, shows that high strength aluminium components is an \$11-billion dollar target market by 2025 for them. Estimates show that as much as 0.17 kg of scandium could be required for high-strength and high-temperature applications in new EVs. If 30 million EVs are produced annually by 2030 (Bloomberg, 2018), this could equate to annual demand of 5,100 tonnes of  $\text{Sc}_2\text{O}_3$  for this platform alone.

## QA-QC Protocol

Strict QA/QC protocols have been implemented for the Crater Lake Project, including the insertion of certified

reference materials (standards), duplicates and blanks at regular intervals throughout the sequence of samples.

A total of 179, including 12 QA-QC, samples were sent to an analytical laboratory. All sample preparation and analytical work was carried out by Actlabs at their facilities in Ancaster, Ontario. Several analytical techniques were used to characterize the samples, which are combined at Actlabs into the analytical package "8-REE". This package includes whole-rock and trace element analytic techniques. Whole Rock analyses are done via a lithium metaborate/tetraborate fusion inductively coupled plasma (ICP) finish. Trace elements are also analyzed by fusion ICP/MS.

The technical content in this press release was prepared, reviewed and certified by Pierre Guay, P. Geo., Imperial's Vice-President, Exploration, a Geologist and Qualified Person as defined by NI43-101.

ABOUT [Imperial Mining Group Ltd.](#)

*Imperial is a Canadian mineral exploration and development company focussed 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.*

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Photos accompanying this announcement are available at:

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