

Ucore Provides Update on the Commercialization of IMC's RapidSX Rare-Earth-Elements Separation Technology

written by Raj Shah | December 30, 2021

- Independent third-party expert evaluation testing of RapidSX™ technology is complete, and the independent report describing the findings is expected in January 2022
- RapidSX™ hardware design and the commercial demonstration plant engineering layout are complete
- Procurement of components and construction of the commercial demonstration plant are well underway
- Ucore is advancing its coordinated ALASKA2023 Plan, including Strategic Metals Complex engineering, feedstock sourcing and testing, product offtake arrangements, metal and alloy making strategic alliances, and solidification of funding sources

December 29, 2021 ([Source](#)) – [Ucore Rare Metals Inc.](#) (TSXV: [UCU](#)) (OTCQX: [UURAF](#)) (“Ucore” or the “Company”) is pleased to provide the following update regarding the Company’s wholly owned subsidiary, [Innovation Metals Corp.](#) (“IMC” or the “company”), and their activities concerning the commercialization of RapidSX™ technology for the separation and purification of rare-earth elements (“REEs”), at IMC’s Commercialization and Development Facility (“CDF”) in Kingston, Ontario, Canada.

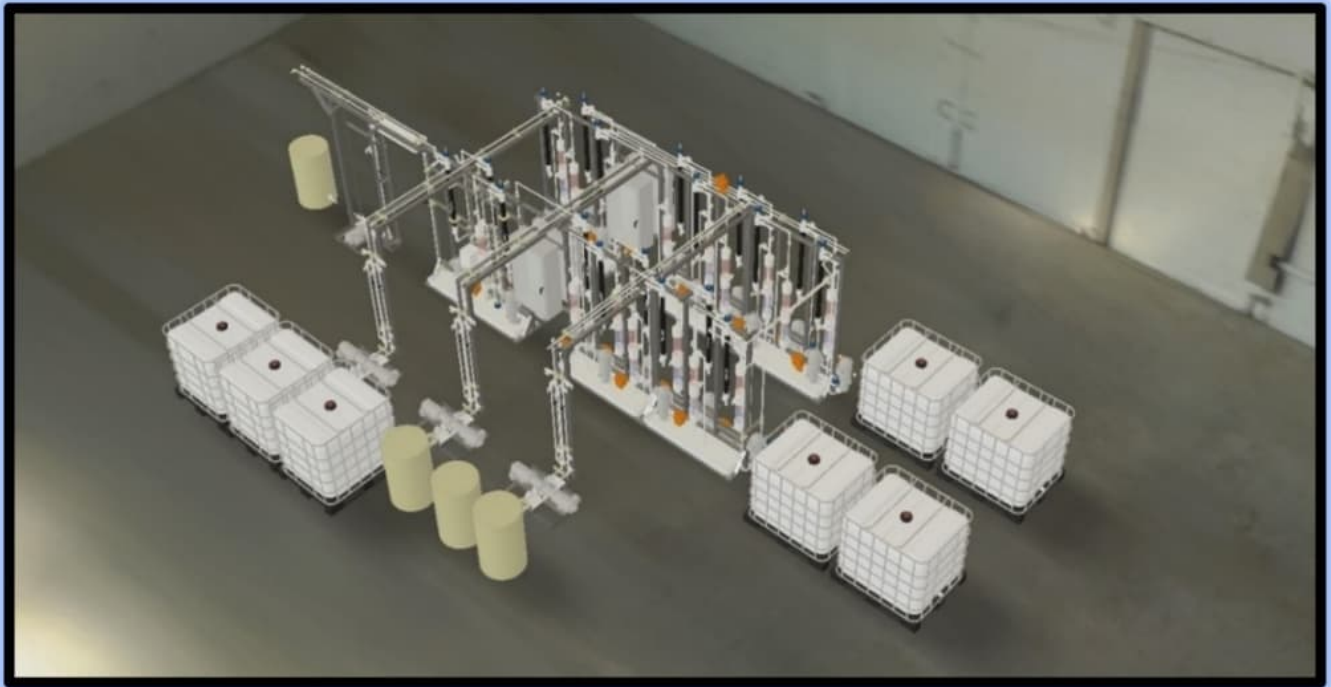


Figure 1 – 3D CAD Model of the IMC Demo Plant Design (showing the layout of the RapidSX™ contactor-separator pairs and selected additional supporting hardware)

After completing extensive process and hardware design activities this year, the commissioning of the RapidSX demonstration-scale plant (“**Demo Plant**”) is currently scheduled to begin in Q1-2022. Following a comprehensive, independent techno-economic study and the subsequent design of a commercial-scale REE separation facility, Ucore and IMC anticipate that the RapidSX technology will be ready for commercial adoption and implementation in Ucore’s Alaska Strategic Metals Complex (“**SMC**”) engineering development program by Q2-2022, coupled with IMC’s roll-out of a revenue-producing licensing model by the end of 2022.

*“**Dr. Gareth Hatch** and the entire IMC team have put forth a tremendous effort in recent months towards the commercial realization of the RapidSX rare earth separation technology; a technology that we believe is the critical link in reestablishing a North American rare-earth-element supply*

*chain,” stated Ucore Chairman and CEO, **Pat Ryan, P.Eng.** “Our belief is led by our actions, and we have supported and funded IMC’s efforts for the development of RapidSX and the coordinated plan for its subsequent deployment into the first modern rare-earth separation plant in North America, the Alaska SMC – on schedule for production of individual rare-earth oxides in H1-2024.”*

Independent Evaluation

Following initial extraction-rate testing in the summer of this year, the team at Kingston Process Metallurgy (“KPM”) subsequently completed a series of additional extraction-rate tests to further validate the approach being taken and to quantify the effects of the underlying phenomenon being exploited using the RapidSX columns. Such tests utilized various mixed REE solutions, including commercially-available feedstocks procured from a US-allied source.

A subset of the tests was observed by an independent third party as part of the Independent Evaluation of the RapidSX technology, initiated earlier in the year. With the associated empirical work now concluded, an independent report describing the findings is scheduled for January 2022.

Completion of RapidSX Hardware Design and Demo Plant Layout

IMC has completed the initial design and layout of the individual column assemblies for the RapidSX Demo Plant, as well as the pump and piping networks and other physical hardware required. The company is in the final stages of selecting and subsequently procuring the components of the instrumentation and control system that will be utilized for the Demo Plant. The layout of the RapidSX columns that make up the Demo Plant had been further optimized to reduce the overall footprint at the CDF, as shown in Figure 1.

Working with IMC's laboratory partner, KPM, the company has undertaken initial Hazard Identification and Analysis ("HAZID / HAZAN") work at the CDF, ahead of completing a standard Hazard and Operability ("HAZOP") study for the Demo Plant. HAZID / HAZAN is an important 'best-practice' risk-assessment process for engineering projects of this type, and the associated HAZOP study will be an essential means of ensuring safe, efficient and reliable plant operations.

Construction and Commissioning of the Demo Plant

Procurement of the other components for the Demo Plant is well underway, with some fabricated sub-assemblies and off-the-shelf items already having been received. The current target for the completion of construction is the end of Q1 2022, with commissioning and operation during an initial test campaign to commence shortly thereafter. IMC is carefully managing the procurement process, cognizant of the current volatility in the general supply chain at present as a result of the Covid-19 pandemic.

Mathematical Process Modeling

IMC has made significant progress in recent months on the mathematical modelling of the chemical processes that occur during the operation of the RapidSX technology. These models will form the basis of the proprietary software that will be utilized at the commercial scale for the control of RapidSX-based separation facilities to optimize parameters for the physical hardware platform. The mathematical models have already been effectively used in the development of REE separation flowsheets and regimes for extraction-rate testing and will assist in the finalization of the flowsheet for the initial campaign, which will be undertaken using the Demo Plant.

Yttrium Removal

In addition to the ongoing RapidSX development work, IMC has also been working with researchers at the University of Toronto to develop and evaluate proprietary, cost-effective methods of reducing the quantity of yttrium (“Y”) in heavy-REE (“HREE”)-rich feedstocks, prior to separation using RapidSX. The empirical work is being overseen by IMC Technical Advisory Board member Prof. Gisele Azimi, associate professor in the Departments of Chemical Engineering & Applied Chemistry and Materials Science & Engineering.

Y is a lower-value REE, and reducing the quantity of Y in HREE feedstocks (such as from the Bokan-Dotson Ridge Rare Earth Element Project) prior to subsequent separation, has the potential to reduce operating costs, as well to reduce the required plant size, thus reducing capital costs. The work has progressed very well to date, and Ucore looks forward to reporting on further developments in early 2022.

The advancements made by IMC are just one of many steps in the development of the [ALASKA2023 Plan](#) that Ucore is currently progressing, including:

- Securing third-party allied-sourced feedstock for the Alaska SMC ([see Ucore’s October 19, 2021, news release regarding the MOU with Vital Metals](#))
- Engineering planning for the Alaska SMC REE separation & purification plant founded on modern RapidSX technology
- Securing offtake agreements for the sale of rare-earth oxides
- Forming strategic alliances for the production of rare-earth metals and alloys
- Working with prospective partners for various sources of project funding:
 - Debt Financing, Offtake Pre-Purchase & Supply, USG Matching Grant Funds, Lease Back Arrangement ([see](#)

[Ucore's October 7, 2021, news release regarding the MOA with Southeast Conference](#)), Other Funding

- Engineering and testing for the Bokan-Dotson Ridge Zone mill flowsheet
- Community and stakeholder engagement to ensure prudent environmental, social and corporate governance (“ESG”) activities.

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About Ucore Rare Metals Inc.

Ucore is focused on rare- and critical-metals resources, extraction, beneficiation, and separation technologies with the potential for production, growth, and scalability. Ucore has a 100% ownership stake in the Bokan-Dotson Ridge Rare Earth Element Project in Southeast Alaska, USA. Ucore’s vision and plan is to become a leading advanced technology company, providing best-in-class metal separation products and services to the mining and mineral extraction industry.

Through strategic partnerships, Ucore’s vision includes disrupting the People’s Republic of China’s control of the US REE supply chain through the development of a heavy-rare-earth processing facility – the Alaska Strategic Metals Complex in Southeast Alaska and the long-term development of Ucore’s heavy-rare-earth-element mineral-resource property located at Bokan Mountain on Prince of Wales Island, Alaska.

Ucore is listed on the TSXV under the trading symbol “[UCU](#)” and in the United States on the OTC Markets’ OTCQX® Best Market under the ticker symbol “[UURAF](#).”

For further information, please visit www.ucore.com.

About Innovation Metals Corp.

IMC has developed the proprietary RapidSX™ process, for the low-cost separation and purification of rare-earth elements, Ni, Co, Li and other technology metals, via an accelerated form of solvent extraction. IMC is commercializing this approach for a number of metals to help enable mining and metal-recycling companies to compete in today's global marketplace. IMC is a wholly owned subsidiary of Ucore Rare Metals Inc.

For more information, please visit www.innovationmetals.com.

About the RapidSX™ Technology

IMC developed the RapidSX separation technology with early-stage assistance from the United States Department of Defense (“**US DoD**”), later resulting in the production of commercial-grade, separated rare-earth oxides at the pilot scale. RapidSX combines the time-proven chemistry of conventional solvent extraction (“**SX**”) with a new column-based platform, which significantly reduces time to completion and plant footprint, as well as potentially lowering capital and operating costs. SX is the international rare-earth-element (“**REE**”) industry's standard commercial separation technology and is currently used by 100% of all REE producers worldwide for bulk commercial separation of both heavy and light REEs. Utilizing similar chemistry to conventional SX, RapidSX is not a “new” technology but represents a significant improvement on the well-established, well-understood, proven conventional SX separation technology preferred by REE producers.

Forward-Looking Statements

This press release includes certain statements that may be deemed “forward-looking statements” regarding, among other things, the Company's ALASKA2023 Business Plan as well as the upcoming prospective financing activities involving the Company and AIDEA. All statements in this release (other than statements

of historical facts) that address future business development, technological development and/or acquisition activities (including any related required financings), timelines, litigation outcomes, events, or developments that the Company expects, are forward-looking statements. Although the Company believes the expectations expressed in such forward-looking statements are based on reasonable assumptions, such statements are not guarantees of future performance or results, and actual results or developments may differ materially from those in forward-looking statements. In regard to the disclosure in the "About Ucore Rare Metals Inc." section above, the Company has assumed that it will be able to procure or retain additional partners and/or suppliers, in addition to IMC, as suppliers for Ucore's expected future Alaska Strategic Metals Complex ("Alaska SMC"). Ucore has also assumed that sufficient external funding will be found to prepare a new National Instrument 43-101 ("NI 43-101") technical report that demonstrates that the Bokan Mountain Rare Earth Elements project ("Bokan") is feasible and economically viable for the production of both REE and co-product metals and the then prevailing market prices based upon assumed customer offtake agreements. Ucore has also assumed that sufficient external funding will be secured to develop the specific engineering plans for the Alaska SMC and its construction. Factors that could cause actual results to differ materially from those in forward-looking statements include, without limitation: Innovation Metals Corp. ("IMC") failing to protect its intellectual property rights in RapidSX™; RapidSX failing to demonstrate commercial viability in large commercial-scale applications; Ucore not being able to procure additional key partners or suppliers for the Alaska SMC; Ucore not being able to raise sufficient funds to fund the specific design and construction of the Alaska SMC and/or the continued development of RapidSX; adverse capital-market conditions; unexpected due-diligence findings; the emergence of alternative superior

metallurgy and metal-separation technologies; the inability of Ucore and/or IMC to retain its key staff members; a change in the legislation in Alaska and/or in the support expressed by the Alaska Industrial Development and Export Authority ("AIDEA") regarding the development of Bokan and/or the Alaska SMC; the availability and procurement of any required interim and/or long-term financing that may be required; and general economic, market or business conditions.

Neither the TSXV nor its Regulation Services Provider (as that term is defined by the TSXV) accept responsibility for the adequacy or accuracy of this release.

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