

ASX Announcement

17 February 2020

RapidSX™ Agreement Signed with US Rare Earth Development Company Ucore Rare Metals

Hexagon Energy Materials Limited (Hexagon or the Company) (ASX:HXG) is pleased to announce the execution of a Technical Services Agreement (TSA) for test processing of customer material using the RapidSX™ rare-earth element (REE) separation technology. Innovation Metals Corp. (IMC) – Hexagon’s partner in the commercialisation of RapidSX for REE separation¹ – has entered into the binding agreement with Ucore Rare Metals Inc. (Ucore) (TSXV:UCU) (OTCQX:UURAF). The purpose of the TSA is to assess RapidSX for the separation of REE concentrate materials into high-purity REE oxides (REOs) from Ucore’s flagship Bokan-Dotson Ridge REE Project located in Alaska, USA, and/or other commercially available, U.S. allied-sourced, mixed REE concentrate sources currently under nearer-term consideration for potential utilisation at the company’s planned Alaska Strategic Metals Complex in the United States.

Hexagon’s management team in North America and Australia was instrumental in bringing the parties together and advancing the TSA, highlighting the Company’s contribution of marketing and commercial skills to the IMC-Hexagon joint venture entity to be named, American Innovation Metals LLC (AIM).

Hexagon’s Managing Director, Mike Rosenstreich commented *“Ucore’s interest in and commitment to evaluating RapidSX is significant; they are a REE industry stalwart in the USA with an advanced project with US\$145 million in designated financing from the Alaska Industrial Development and Export Authority (AIDEA)². Ucore plans to develop heavy and light REE downstream processing capabilities through its planned Alaska Strategic Metals Complex to produce separated high-purity REOs.”*

¹ Please refer to Hexagon Energy Materials Limited’s ASX Announcement dated October 10, 2019, entitled [‘Hexagon Enters US-Based Rare Earths Downstream Processing Industry’](#)

² Please refer to Ucore Rare Metals Inc. announcement dated February 10, 2020, entitled, [‘AIDEA Bolsters Support for Heavy REE Separation Plant & Renews Commitment to Ucore’s Bokan Heavy REE Project’](#)

“Ucore brings a tremendous amount of third-party validation to RapidSX, underscoring Hexagon’s focus on the commercialisation of this important technology,” Mr. Rosenstreich explained. “Over the past several years, Ucore has evaluated a range of alternative REE-separation processes, resulting in the selection of solvent-extraction chemistry, which led to their interest in the proprietary RapidSX REE separation technology, offering significant CapEx and OpEx savings compared to current conventional SX-based commercial REE separation. With RapidSX, existing REE producers and project developers can integrate the addition of downstream REE separation to produce REOs, thus significantly increasing margins, saleable products and, most importantly – to effectively compete with Chinese operators.”

Chairman and CEO of IMC, Dr. Gareth Hatch stated, *“The lack of US-based operational REE separation capacity presents a serious vulnerability to U.S. national and economic security and the security of its allies, as REEs are critical for defence technologies, electrification and U.S. economic growth plans. Without the downstream capacity to separate and purify REEs, the USA and its allies are vulnerable to potential supply disruptions, price spikes and trade disagreements related to REEs. It is our intention to remedy this situation with the successful commercialisation of the RapidSX technology for processing and purifying REEs. IMC, with Hexagon, is very pleased to work with Ucore in its efforts to establish commercial REE separation capabilities on U.S. soil.”*

Hexagon regards IMC’s TSA with Ucore as a strong, industry endorsement of the RapidSX REE-separation technology and its potential to enable emerging producers to capture extra value in the REE supply chain on a highly cost-effective and competitive basis with the Chinese REE industry. This is the first of a planned series of agreements with both existing and emerging REE concentrate producers to commercialise RapidSX.

Per Hexagon’s December 18, 2019 ASX Announcement ([HXG Commences Funding the Commercialisation of RapidSX™ Rare-Earth Elements Separation Technology](#)), the Company looks forward to reporting the filing of a provisional patent application on RapidSX in the United States, in addition to awarding the Front-End Engineering Design study contract for the RapidSX Commercial Demonstration Plant to an independent engineering firm.

Full details are available in the attached Ucore announcement of 14 February 2020 “Ucore Announces Technical Services Agreement with Innovation Metals Corp. for RapidSXTM Rare Earth Element Separation Technology Testing”

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About Hexagon Energy Materials Limited

Hexagon Energy Materials (Hexagon) (ASX:HXG) is an Australian-listed company which is seeking to commercialise a revolutionary rare-earth elements (REEs) processing technology called RapidSX™, which has the potential to disrupt China's monopoly over virtually the entire REE supply chain; from the mine, to separation into REE oxides (REOs) to the manufacture of REE permanent magnets (REPMs).

REOs are the primary materials for the manufacturing of REPMs which are essential for electric-vehicle motors, consumer electronic products, renewable-energy generation, and a number of military applications.

RapidSX can process REEs faster and cheaper than existing solvent-extraction-based separation processes used in China. RapidSX offers substantial capital and operating cost savings compared to existing and proposed REE producers. Hexagon and its Canadian partner, Innovation Metals Corp. (IMC), are developing a Commercial Demonstration Plant (CDP) to commercialise the RapidSX REE separation technology. RapidSX was developed and successfully piloted by IMC with more than US\$1.8 million in assistance from the U.S. Department of Defense.

Hexagon's focus is on the downstream processing and transformation of REEs into commercial-grade REOs in North America, with the objective of licensing the RapidSX REE-separation technology to end users around the world. Additionally, Hexagon is developing its US-based downstream graphite-transformation business, focussed on ultra-high-purity battery and advanced-technology applications.

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

AUTHORISATION

This announcement has been authorised by the Managing Director.

FOR FURTHER INFORMATION, please contact:

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Attachment 1

Ucore Announces Technical Services Agreement with Innovation Metals Corp. for RapidSX™ Rare Earth Element Separation Technology Testing

Halifax, Nova Scotia – (February 14, 2020) – Ucore Rare Metals Inc. (TSXV: UCU) (OTCQX: UURAF) (“Ucore” or the “Company”) is pleased to provide the following progress update with respect to the roll-out of its *MINE to METAL to MARKET* plan of strategic actions (the “M³ Plan”) for its Bokan-Dotson Ridge Rare Earth Project (the “Bokan Project” or “Bokan”); further to [the Company’s press release of September 10, 2019](#).

Alaska SMC Separation Technology Testing with RapidSX™

Pursuant to the *Metal* component of the M³ Plan, the Company is pleased to announce the execution of a binding Technical Services Agreement (“TSA”) with Innovation Metals Corp. (“IMC”) to commence a testing program (the “Study”) for the processing of mixed rare-earth element (“REE”) concentrates into separated REE oxides (“REO”) utilizing IMC’s proprietary RapidSX™ REE separation technology. Developed and successfully piloted by IMC, RapidSX is an accelerated solvent-extraction-based REE separation technology for both heavy REE (“HREE”) and light REE (“LREE”) feedstocks with expected significant technical and economic efficiencies for producing commercial-grade REO. Developed by IMC with USD\$1.8 million in assistance from the U.S. Department of Defense’s (“DOD”) [U.S. Army Research Laboratory](#) (“ARL”), RapidSX combines the time-proven chemistry of solvent extraction (“SX”), *the international REE industry’s standard commercial separation technology*, with a new column-based platform, which significantly reduces time to process completion and plant footprint.

Under the terms of the TSA, IMC’s bench-scale test work will be based on a mixed REE concentrate produced from Ucore’s 100%-owned flagship Bokan Project, located at Bokan Mountain in Alaska, USA and/or other commercially available, U.S. allied-sourced, mixed REE concentrate feedstock sources currently under nearer-term consideration by Ucore. The Study will assess yield potential for targeted REE compounds and will include preliminary technical and economic estimates of the separation and purification process, including capital and operating costs. Based on IMC’s prior test programs and subject to the specific results of this Study, the RapidSX™ REE separation technology, a derivative of SX technology, may offer a more efficient technological pathway for utilization in the Company’s planned Alaska Strategic Metals Complex (the “Alaska SMC”) in Southeast Alaska, USA. In this case, upon the conclusion of this preliminary Study, the Company may elect to incorporate this technology into its plans for the Alaska SMC and to conduct a more robust technical and

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economic evaluation of RapidSX™ for incorporation into the expected first phase of the Bokan Project Feasibility Study during 2020/21.



Photo credit: G&W Incorporated (2019)

Figure 1: Innovation Metals Corp's Pilot-Scale RapidSX™ Circuit in Mississauga, Ontario, Canada.

The RapidSX REE Separation Competitive Advantages

(Based on previous pilot-scale test work done by IMC):

- **CAPEX:** Based on previous piloting work undertaken by IMC, IMC estimates a considerably reduced number of separation stages per SX circuit and the resultant smaller physical plant footprint with RapidSX compared to conventional SX facilities, which could potentially result in start-up capital cost savings. These expectations are contingent on the specific feedstock utilized and resulting REE products and purities desired.
- **Rapid Equilibrium:** As a result of the significantly increased kinetics of the RapidSX technology, the time to achieve equilibrium and separation is dramatically accelerated — from weeks (*as is typical in the case with conventional SX*) to hours/days with RapidSX.
- **OPEX:** Based on previous piloting work undertaken by IMC, IMC estimates that the significantly reduced RapidSX separation times, reduced reagent and power

consumption, reduced manpower requirements, and reduced in-process metal inventories, compared to utilization of conventional SX, could potentially result in reduced operating costs, depending on the feedstock and resulting REE products.

- **Feedstock Agnostic:** Due to its modular configuration and reduced number of stages, RapidSX is capable of readily reconfiguring for separating LREE-rich, HREE-rich and/or even blends of mixed REE feedstocks.
- **Commercially Available:** All construction materials for the RapidSX technology — all associated equipment and chemical reagents — are readily commercially available.
- **Scalable and Modular:** The RapidSX technology's process lines are modular and scalable, providing future expected licensees with the opportunity to scale commercial production capacity.

Source: Innovation Metals Corp.

The development of an individual REE separation and purification plant, the Alaska SMC, remains Ucore's targeted first commercial development component of the Bokan Project. In order to meet this critical objective in the shortest timeframe possible, the prospective Alaska SMC will be designed to have the ability to produce REO from other commercially available, U.S. allied-sourced, REE feedstocks. It is planned that the Alaska SMC will be operating at a commercial scale while the Bokan HREE mineral project is still being developed. As such, IMC will also be evaluating other commercial REE feedstock(s) under consideration by Ucore as a part of the TSA.

Ucore Chairman, **Pat Ryan** commented, "We are very excited to be working with IMC and its RapidSX technology and believe there is considerable merit in an evolution of the well-proven conventional SX process, with specific interest in the reduction of CAPEX and required plant footprint, as we simultaneously seek various funding opportunities for our planned Alaska SMC. In early November 2019, Ucore visited the RapidSX pilot plant and laboratory in Mississauga, Ontario.

"During this visit, Ucore COO Mike Schrider, Ucore Director Geoff Clarke and I met extensively with IMC Chairman and CEO Dr. Gareth Hatch, [Hexagon Energy Materials Limited \(ASX:HGX\)](#) Chairman Charles Whitfield, and CEO of Hexagon's US subsidiary, Energy Materials of America, Ty Dinwoodie. Over the following weeks, Ucore, IMC and Hexagon worked collaboratively in developing this opportunity, culminating in this initial agreement. This TSA with IMC further highlights my sentiments that 'our time is now' as Ucore looks forward to the future and strategically advances its M³ Plan of Action with strength and ingenuity."

Chairman and CEO of IMC and co-inventor of RapidSX, **Dr. Gareth Hatch** stated, “The lack of US-based operational REE separation capacity presents a serious vulnerability to U.S. national and economic security and the security of its allies, as REEs are critical for defense technologies, electric vehicles, and U.S. economic growth plans. Without the downstream capacity to separate and purify REEs, the U.S.A. and its allies are vulnerable to potential supply disruptions, price spikes and trade disagreements related to REEs. It is our intention to remedy this situation with the successful commercialization of the RapidSX approach to processing and purifying REEs and IMC is very pleased to work with Ucore in its efforts to establish commercial REE separation capabilities on U.S. soil.”

Ucore COO, **Mike Schrider**, commented, “The successful development of the Alaska SMC involves assuring all stakeholders that the project is founded upon an efficient, yet relatively low risk, REE separation technology. The opportunity to test IMC’s RapidSX technology, a technology which shares the same chemistry and unit operations as traditional SX, on feedstocks we are considering for the Alaska SMC is a key step in establishing this assurance. This work is also expected to provide useful inputs into [IMC’s planned development of its RapidSX Commercial Demonstration Plant](#), which will help to refine IMC’s economic analyses and demonstrate the commercial merit of IMC’s REE technologies.”

About Innovation Metals Corp.

IMC is a private Canada-based company and developer of the proprietary RapidSX™ process for the efficient separation and purification of REEs, 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.

In October 2019, IMC announced the execution of a binding Investment Agreement with Hexagon Energy Materials Limited for the formation of American Innovation Metals, a new joint-venture company focused on the commercialization of IMC’s RapidSX™ technology for the separation of REE concentrates.

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

About Ucore

Ucore Rare Metals is a company focused on rare and critical metals resources, extraction and beneficiation technologies with potential for production, growth, and scalability. The Company has a 100% ownership stake in the Bokan-Dotson Ridge Rare Earth Project.

Ucore’s vision and plan is to transition to become a leading advanced technology company that provides mineral separation products and services to the mining and mineral extraction industry. This vision includes the development of the Alaska SMC in Southeast Alaska and

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the development of the Company's rare earth minerals property located at Bokan Mountain in Alaska.

For further information, please contact Mr. Jim McKenzie, President & CEO of Ucore Rare Metals Inc. at: +1 (902) 482-5214 or visit www.ucore.com.

Qualified Person

Dr. Gareth P. Hatch, CEng, FIMMM, FIET is a Qualified Person, as defined by National Instrument 43-101 ("**NI 43-101**"), and has approved the scientific and technical content of this news release. Dr. Hatch is Chairman and CEO of Innovation Metals Corp. and serves Senior Technical Advisor for Hexagon Energy Materials Limited. He was previously CEO and Executive Director of TSXV-listed Alabama Graphite Corp., and Director of Technology at Dexter Magnetic Technologies Inc. Dr. Hatch holds five U.S. patents and has a BEng (Hons) in materials science & technology and a PhD in metallurgy & materials, both from the University of Birmingham. He is a Fellow of the Institute of Materials, Minerals & Mining, a Fellow of the Institution of Engineering & Technology, and is a Chartered Engineer through the UK Engineering Council. Dr. Hatch is a member of a NATO Science and Technology ("**STO**") organization on REEs, Advisory Board Chair for the Rare Earth Industry Association ("**REIA**") and is a member of the Canadian ISO TC/298 Mirror Committee on standards for REEs.

Cautionary Notes

This press release includes certain statements that may be deemed "forward-looking statements". All statements in this release (other than statements of historical facts) that address future business 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. Regarding Ucore's M3 Plan of Action and the disclosure in the "About Ucore" section above, the Company has assumed that it will be able to procure or retain geometallurgy partners and/or suppliers, including a solvent extraction ("SX") partner or SX supplier 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 NI 43-101 technical report that demonstrates that the Bokan Project is feasible and economically viable for the production of both REE and co-product mineral materials and metals and the then prevailing market prices based upon assumed customer off-take agreements. Ucore has also assumed that sufficient external funding will be found 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: Ucore not being able to procure an SX partner or supplier

for the Alaska SMC; Ucore not being able to raise sufficient funds to fund the specific design and construction of the Alaska SMC; adverse capital market conditions; unexpected due diligence findings; unexpected or adverse outcomes in the currently outstanding litigation matters between Ucore and IBC Advanced Technologies, Inc.; the emergence of alternative superior metallurgy and metal separation technologies; the inability of Ucore to retain its key staff members; unexpected transaction costs or other deal completion setbacks; a change in the legislation in Alaska and/or in the support expressed by 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.

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