Lithium Hydroxide Engineering Study

written by Raj Shah | June 7, 2021

June 7, 2021 (Source) – Critical Elements Lithium Corporation (TSXV:CRE)(OTCQX:CRECF)(FSE:F12) ("**Critical Elements**" or the "**Company**") is pleased to announce it has retained the services of Metso Outotec and WSP in Canada (WSP) to prepare a Phase II engineering study for a chemical plant to produce high quality lithium hydroxide monohydrate for the electric vehicle and energy storage system battery industries.

Phase II Engineering Study for an integrated lithium hydroxide plant

Metso Outotec will design the calcination process of spodumene concentrate (which would include spodumene concentrate from Phase I of its Rose Lithium-Tantalum project but also possibly from other sources), and study the chemical process to produce lithium hydroxide monohydrate from calcined spodumene concentrate. WSP Canada Inc. will design the infrastructure related to the process plant and will act as the integrator for the study. Critical Elements will provide the market study information for the economic analysis.

Metso Outotec is a frontrunner in sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing, metals refining and recycling industries globally. Metso Outotec has global experience on developing lithium extraction technology and has engineered and delivered processing plants for industrial minerals globally for decades. It has engaged its own R&D to both process and equipment development to lithium processes, targeting especially for battery grade lithium hydroxide. Its reference list of studies

and engineering projects of lithium plants as well as its proprietary equipment deliveries keep on growing on projects world-wide.

As one of the world’s leading professional services firms, WSP provides engineering, design, and strategic advisory services in Transportation & Infrastructure, Property & Buildings, Environment, Power & Energy, Resources and Industry sectors. WSP has previously conducted the surface infrastructure feasibility study and environmental impact assessment for the Rose Lithium-Tantalum project.

The end product of the plant would be battery grade lithium hydroxide monohydrate (LMH, >56.5%). It is currently anticipated that the plant capacity would be approximately 27,000 tpa of LMH, as Lithium Carbonate Equivalent (LCE). The plant would also be capable of producing battery grade lithium carbonate. It is further anticipated that the plant would consist of the following main process areas:

- Pressure leaching
- Pressure Leach filtration
- Conversion
- Leach residue filtration
- Ion Exchange
- LiOH*H2O crystallization
- Reagents preparation
- Utilities

Metso Outotec will also continue to perform additional piloting studies to further increase the data set of the hydroxide process contemplated to be used by Critical Elements. The collection of additional data points will provide valuable data for vendor selection and accelerate a smooth start-up phase of the plant. To that effect, spodumene concentrate produced during the pilot plant program conducted at SGS’s Lakefield laboratory

in 2017 is being shipped to Metso Outotec facilities in Europe.

Earlier pilot plant studies by Metso Outotec (see News Release dated October 29, 2018) successfully converted spodumene concentrate from the Rose Lithium-Tantalum Project into battery grade lithium hydroxide using a thermal leaching process. The pilot plant conversion process demonstrated strong results **with extraction rates of 93%.** This extraction rate surpasses the worldwide average of between 70 to 75% in what is accepted as an industry standard. In addition, the pilot plant produced **battery grade lithium hydroxide monohydrate** (LMH, >56.5%).

Based on the results of the earlier Metso Outotec studies, Critical Elements believes that the overall total recovery rate should approximate 80% which compares very favourably to industry standards. This recovery rate estimate is based on the following:

- Concentrator Plant Recovery – 90% as indicated in variability tests
- Decrepitation Kiln Recovery – 96% verified in the pilot plant
- Thermal Leaching Process – 93% as an average verified in the pilot plant
- **Overall yield – potentially over 80%**

Critical Elements looks forward to the results of the integrated Phase II engineering study, economic results of which may be incremental to the economic results of the Phase I feasibility study (see News Release dated September 6, 2017) that focused on the production of spodumene concentrate only. The Phase I feasibility study generated robust results including a 34.9% after tax internal rate of return and $726 million NPV (8%). The Company continues to anticipate the receipt of environmental authorizations, detailed engineering, project financing and a final investment decision for Phase I of the Rose Project before

year-end.

Qualified persons

Paul Bonneville, Eng., is the qualified person that has reviewed and approved the technical contents of this news release on behalf of the Corporation.

About Critical Elements Lithium Corporation

Critical Elements Lithium Corporation aspires to become a large, responsible supplier of lithium to the flourishing electric vehicle and energy storage system industries. To this end, Critical Elements Lithium is advancing the wholly owned, high purity Rose lithium project in Quebec. Rose is our first lithium project to be advanced within a highly prospective land portfolio of over 700 square kilometers. In 2017, the Corporation completed a robust feasibility study on Rose Phase 1 for the production of high quality spodumene concentrate. The internal rate of return for the Project is estimated at 34.9% after tax, with a net present value estimated at C$726 million at an 8% discount rate. Capital parameters were confirmed in 2019 by Primero Group in the context of a Guaranteed Maximum Price under an Early Contractor Involvement agreement, as a prelude to an Engineering, Procurement and Construction process. Detailed engineering for Phase I is expected to conclude this year as we also deliver technical studies for Phase II, the conversion of spodumene concentrate to high quality lithium hydroxide. In our view, Quebec is strategically well-positioned for US and EU markets and boasts exceptional infrastructure including a low-cost, low-carbon power grid featuring 93% hydroelectricity. We have a strong, formalized relationship with the Cree Nation.

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Cautionary statement concerning forward-looking statements

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time such statements are made. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking information.

Although Critical Elements has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking information, there may be other factors that cause results not to be as anticipated, estimated or intended. Factors that may cause actual results to differ materially from expected results described in forward-looking information include, but are not limited to: the Phase II engineering study and additional pilot studies not producing the results anticipated my the Company, Critical Elements' ability to secure sufficient financing to advance and complete the Project, uncertainties associated with the Corporation's resource and reserve estimates, uncertainties regarding global supply and demand for lithium and tantalum and market and sales prices, uncertainties associated with securing off-take agreements and customer contracts, uncertainties with respect to social, community and environmental impacts, uncertainties with respect to optimization opportunities for the Project, as well as those risk factors set out in the Corporation's year-end Management Discussion and Analysis dated August 31, 2020 and other disclosure documents available under the Corporation's SEDAR profile. Forward-looking information contained herein is made as of the date of this news release and Critical Elements disclaims any obligation to update any forward-looking information, whether as a result of new information, future events or results or otherwise, except as required by applicable securities laws.

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