Trevali Begins Pilot Testing of FLSmidth's Rapid Oxidative Leach Technology at Caribou

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VANCOUVER, Aug. 3, 2021 - Trevali Mining Corp. ("Trevali" or the "Company") (TSX: TV) (BVL: TV) (OTCQX: TREVF) (Frankfurt: 4TI) in pleased to announce that a pilot plant testing program using Caribou run-of-mine and milled material at FLSmidth's Rapid Oxidative Leach ("ROL") process testing facility in Salt Lake City, Utah, is underway. The program expands on previous laboratory test work and is aimed at demonstrating the potential to recover zinc, lead, copper, gold, and silver as a precipitate or metal and additional zinc and lead from Caribou ore and mill tailings.

Highlights

- Leach test program targets an improvement to zinc, lead, copper, gold, and silver metal recoveries.
- Potential to produce a precipitate or metal on site replacing the current ore concentrate that is produced at Caribou, which, if implemented, would lead to savings on transport costs and offsite treatment costs.
- Opportunity to process historic mill tailings, which include gold and copper metals, in addition to run of mine ore, increasing revenues and reducing closure liabilities.
- Potential to reduce Trevali's carbon footprint at Caribou.
- Potential to extend Caribou's mine life and treat lower-grade deposits in the Bathurst camp.
- A successful pilot plant test program is expected to support future study work on a Preliminary Economic Assessment and NI-43-101 Technical Report which includes potential processing of the Trevali mill feed and mill tailings and production of metal on site.

If the pilot plant testing program indicates that the ROL technology has the potential to be successfully implemented at Caribou, it may allow Trevali to replace the existing flotation circuit at Caribou with atmospheric leach vessels and potentially an SX/EW train, introducing the possibility of producing base and precious metals on-site and thereby save transport costs and offsite treatment costs. The initiative is consistent with Trevali's strategy to extend the two-year mine plan and investigate further longer-term value-enhancing opportunities in the Bathurst Mining Camp. In addition, the technology has the potential to reduce the Company's carbon footprint and provide other sustainable environmental benefits via the re-treatment and disposal of tailings.

Conceptual objectives of the program include:

- Recovery of metals/minerals that are not recoverable utilizing the current technology at Caribou (precious metals and magnetite)
- Improved payables/selectivity of the traditional flotation process utilizing new and emerging technologies

"FLSmidth's Rapid Oxidative Leach metallurgical technology has the potential to transform the Caribou mine and the wider Bathurst Mining Camp. If viable at Caribou, the technology may increase metallurgical recoveries, produce precipitate or metal on site, including copper and gold, and reduce or eliminate freight costs and treatment charges related to concentrate. This next phase of the testing program is an essential step in evaluating the suitability and economic viability of a processing solution with the potential to enhance the value of the in-situ material and tailings at Caribou as well as the surrounding deposits in the Bathurst region," commented Ricus Grimbeek, President and Chief Executive Officer of Trevali. "The positive results to date support further study and analysis given the potential implications for the Bathurst Mining Camp in general and Trevali in particular."

Beyond quantifying the ability to recover additional metal values, the objective for the pilot plant test program is to determine the various kinetic factors, mass and energy balance, and engineering data to support future engineering on a Preliminary Economic Assessment for potential processing of the Trevali mill feed and mill tailings and produce metal on site. Continuous pilot plant trials commenced in June 2021 (Phase 1) to tune the pilot plant and provide material for precious metal leach tests in late July, followed by a test program at

the Caribou Mine site that is planned for September 2021 (Phase 2). Leach data and results are expected to verify that batch testing results can be achieved in a continuous operation.

Background

A simplified Caribou flowsheet is shown in Figure 1. Depending on the composition of the ore feed, zinc, lead and silver are recovered in the mill to zinc and lead concentrates at a rate of approximately 78% zinc, 62% lead and 25% silver, respectively. The concentrates are then shipped to a smelter to convert to metal. Trevali is responsible for paying treatment charges to third party smelters as well as other associated costs in connection with the transport to, and recovery of metals at, the smelter.

Figure 1: Simplified Caribou Flowsheet Currently In Use

To improve performance and economics, the Company has reviewed several processes that have been conceived and decided to test the ROL Technology. The ROL technology, patent pending by FLSmidth, is a mechano-chemical approach pursuant to which (as described in more detail below) impacting the mineral particle supplies energy to abrade the surface of the leaching particle, increasing the chemical reaction rate as well as removing reaction products from the surface, thus improving the rate of reaction.

Process Description

FLSmidth's patent-pending ROL process utilizes a stirred media reactor to achieve improved metal recoveries under atmospheric conditions within a reasonable amount of time. This mechano-chemical approach overcomes many of the surface passivation problems that have hindered other atmospheric leach processes. The process takes advantage of the enhanced reactivity of transitory, surface-defect structures generated during particle fracture. The process occurs at 80-90 °C and under atmospheric pressure. The use of very low energy, inter-stage attrition/grinding is used to enhance the selective dissolution of valuable minerals.

Rapid Oxidative Leach Benefits

- Avoids the excessive production of sulphuric acid.
- Lowers the carbon footprint by reducing shipping volume.
- The process is scalable.
- Mechano-chemical stirred media reactors (SMRt) perform the mechanical surface activation.

A comparison of alternative processes is summarized in Table 1.

Table 1: Leach Technology Alternatives

	Rapid Oxidative Leach	Atmospheric Leaching	Pressure Leaching
Zinc recovery and leach kinetics	High recovery, good kinetics, modest size reactors	Slightly lower recovery, slower kinetics, larger reactors	High recovery, faster kinetics, smaller reactors
Flexibility and process control	Flexible, suitable for variety of grades and feed rates. Enables Ag and Pb recovery and full control of iron precipitation. No handling of molten sulphur. Simple process control.	Flexible, suitable for variety of grades and feed rates. Enables Ag and Pb recovery and full control of iron precipitation. No handling of molten sulphur.	Complicated process control (temperature, molten sulphur, scaling issues, leaching additives)
Need of maintenance and shutdowns	Low maintenance, reliable, no scale build-up, low corrosion	Low maintenance, reliable, no scale build-up, low corrosion	High maintenance, long shutdowns, scale removal
Investment costs	Low investment cost due to simplicity of tanks and atmospheric operation and good reaction kinetics.	Low investment cost due to simplicity of tanks and atmospheric operation	High investment cost due to complexity, high-tech metals, valves and controls
Operating costs	Higher mixing power, low maintenance, no steam required	Higher mixing power, low maintenance, no steam required	Low mixing power, high maintenance, steam heating

The improvement in leaching kinetics versus conventional atmospheric leaching is due to the addition of the SMRt reactors in the circuit. Figure 2 shows the relative scale of the SMRt reactors versus the atmospheric leach vessels.

Figure 2: Relative Scale of Stirred Media Reactor (SMRt) Versus Leach Vessels in the ROL Process

A simplified version of the conceptual flowsheet in Figure 3 shows how potential metal production on site would be accomplished if the ROL Technology is implemented. There may also be options to produce intermediary products such as metal precipitates, which optionality is part of the studies in the current program.

Figure 3: Possible Caribou Flowsheet Using Rapid Oxidative Leach Technology

A Path Forward

Trevali has a foothold in the Bathurst Mining Camp, which is a valuable and important mining region to New Brunswick and Canada. Infrastructure, mining innovations, economic impact, social effects, and environmental initiatives comprise a few of the reasons for the Camp's continuing importance. Since 2000, mine closure and reclamation have outpaced mine development in the Bathurst Mining Camp. Although at a very early study stage, applying FLSmidth's ROL technology at Caribou may provide an opportunity to begin a reversion of that trend in an environmentally friendly and sustainable manner.

ABOUT TREVALI

Trevali is a global base-metals mining Company headquartered in Vancouver, Canada. The bulk of Trevali's revenue is generated from base-metals mining at its four operational assets: the 90%-owned Perkoa Mine in Burkina Faso, the 90%-owned Rosh Pinah Mine in Namibia, the wholly-owned Caribou Mine in northern New Brunswick, Canada and the wholly-owned Santander Mine in Peru. In addition, Trevali owns the Halfmile and Stratmat Properties and the Restigouche Deposit in New Brunswick, Canada, and the past-producing Ruttan Mine in northern Manitoba, Canada. Trevali also owns an effective 44%- interest in the Gergarub Project in

Namibia, as well as an option to acquire a 100% interest in the Heath Steele deposit located in New Brunswick, Canada.

The shares of Trevali are listed on the TSX (symbol TV), the OTCQX (symbol TREVF), the Lima Stock Exchange (symbol TV), and the Frankfurt Exchange (symbol 4TI). For further details on Trevali, readers are referred to the Company's website (www.trevali.com) and to Canadian regulatory filings on SEDAR at www.sedar.com.

Cautionary Note Regarding Forward-Looking Information and Statements

This news release contains "forward-looking information" within the meaning of Canadian securities legislation and "forward-looking statements" within the meaning of the United States Private Securities Litigation Reform Act of 1995 (collectively, "forward-looking statements"). In certain cases, forward-looking statements can be identified by the use of words such as "plans", "expects", "outlook", "guidance", "budget", "scheduled", "estimates", "forecasts", "intends", "anticipates" or "believes", or variations of such words and phrases or statements that certain actions, events or results "may", "could", "would", "might", "will be taken", "occur" or "be achieved" or the negative of these terms or comparable terminology.

Forward-looking statements relate to future events or future performance and reflect management's expectations or beliefs regarding future events including, but not limited to, statements with respect to the rapid oxidative leaching (ROL) pilot plant testing program using Caribou run-of-mine milled material and the potential outcomes and benefits of same, including but not limited to improvements in zinc, lead, silver, gold and copper recoveries, the potential to produce a precipitate or metal on site in place of the current ore concentrate and any potential savings on transport and offsite treatment costs resulting therefrom, the ability to reduce the Company's carbon footprint at Caribou and provide other sustainable environmental benefits, the opportunity to treat and recover historic mill tailings, including gold and copper values, in addition to run of mine ore, the potential to extend the mine life at Caribou and to treat lower-grade deposits in the Bathurst Mining Camp, and the ability of the pilot plant testing program to generate engineering data to support future study work on a preliminary economic assessment with respect to the use of ROL technology at Caribou; the the ability of Trevali to replace the existing flotation circuit at Caribou with atmospheric leach vessels and potentially an SX/EW train; the potential positive impacts on the Bathurst Mining Camp which may be generated by the ROL technology, including the reversion of the trend of mine closures in the Bathurst Mining Camp; the timing, nature and scope of the planned pilot plant testing program; the potential changes to the existing flowsheet at Caribou to give effect to the implementation of ROL technology at Cariboo; and the Company's growth strategies and planned development activities, including the ongoing study work and any potential implementation of the ROL technology at the Caribou mine. Forward-looking statements are based on the beliefs, expectations, assumptions and opinions of management of the Company as of the date the statements are published, including, with respect to the forward-looking statements in this news release, that the ROL pilot plant testing program will be successfully completed on the timeline currently anticipated; that the ROL technology can be implemented by Trevali at the Caribou mine if the pilot plant testing program is successful; that the ROL technology will generate the expected benefits for Trevali and the Bathurst Mining Camp; that, if the ROL technology is implemented at Caribou, it will be able to be similarly implemented at other locations in the Bathurst Mining Camp and will generate benefits at those locations; and that the changes proposed to the existing flowsheet at Caribou will correspond generally to any actual changes made to the Caribou flowsheet arising from the pilot plant test program. By their very nature, forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of the Company to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements, including, without limitation, risks related to the ROL pilot plant testing program, including that the program may not be successful at achieving some or all of its stated objectives; the risk that even if the pilot plant testing program is successful, it may not be feasible or economic to build a re-designed flowsheet at the Caribou mine incorporating the ROL technology; the risk that the re-designed flowsheet at the Caribou mine incorporating the ROL technology, if implemented, will be different than currently anticipated; the risk that the ROL technology, if implemented at Cariboo, will not generate positive impacts on the Bathurst Mining Camp more generally; the risk that the pilot plant testing program will not proceed as currently anticipated on the timeline currently anticipated, or at all; risks related to changes in project parameters as plans continue to be refined, including with respect to the Caribou life of mine; risks related to dependence on key personnel; risks related to labour pool constraints; risks related to labour disputes; risks related to the availability of infrastructure required for the development of mining projects; risks associated with delays or inability to obtain governmental and regulatory approvals for mining operations or financing or in the completion of development or construction activities; counterparty risks; risks associated with increased operating and capital costs; risks related to foreign currency exchange rate fluctuations; risks associated with compliance with governmental decrees and regulations, including any new or ongoing decrees and regulations issued by

a governmental authority in response to the COVID-19 pandemic; risks related to compliance with environmental laws and regulations; risks associated with land reclamation and mine closure obligations; risks related to challenges to title or ownership interest of our mineral properties; risks related to maintaining the Company's ongoing social license to operate; risks associated with the impact of climatic conditions on the Company's mining operations; risks associated with compliance with debt covenants; risks related to our ability to raise capital; risks related to competition in the mining industry; litigation risks; and other risks of the mining industry including, without limitation, other risks and uncertainties that are more fully described in the Company's annual information form, interim and annual audited consolidated financial statements and management's discussion and analysis of those statements, all of which are filed and available for review under the Company's profile on SEDAR at www.sedar.com. Although the Company has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. Trevali provides no assurance that forward-looking statements will prove to be accurate, as actual results and future events may differ from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements.

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Contact
Investor and Media Relations Contact: Ute Koessler, Investor Relations Manager, Email: ukoessler@trevali.com, Phone: +1 (604) 336-2444