

# McEwen Copper Reports Improved Copper Recovery

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TORONTO, Feb. 22, 2024 - McEwen Copper Inc., 47.7% owned by [McEwen Mining Inc.](#) (NYSE: MUX) (TSX: MUX), is pleased to announce results from the recently completed Phase 1 copper heap leaching metallurgical tests undertaken at SGS Chile Limitada in Santiago, Chile. The test results were produced utilizing conventional bio-heap leaching technology and generated an average copper recovery of 76.0%. This represents an increase of 3.2% over the recovery rate used in the June 2023 Preliminary Economic Assessment (PEA) for Los Azules. These test results were reviewed by Jim Sorensen and Michael McGlynn at Samuel Engineering Inc., who are responsible for the development and oversight of the metallurgical programs.

## Phase 1 Results

Based on the Phase 1 test results available at the time and prior historical column test work, the PEA used an average copper recovery of 72.8% by employing conventional bio-heap leaching technology (see results published June 20<sup>th</sup>, 2023). Final results of Phase 1 show an increase in the average recovery to 76.0% in approximately 230 days of leaching over the planned 27-year life of the project. Average net acid consumption was also reduced by 8.3% relative to the PEA.

The potential impact of the 3.2% increase in average recovery and 8.3% reduction in net acid consumption can be illustrated by selectively adjusting the PEA Base Case financial model, which results in a life of mine copper cathode production increase of 172,000 tonnes and an after-tax NPV(8%) increase of approximately \$262 million. This disclosure should not be taken to modify or update the conclusions of the PEA.

## Deposit Mineralogy

Located in San Juan, Argentina, the Los Azules deposit consists primarily of secondary copper mineralization (supergene zone of predominantly chalcocite), with minimal oxide copper content. Additionally, there is a deeper primary copper (hypogene zone of predominantly chalcopyrite with some zones of significant bornite).

## Metallurgical Testing Phases

Preliminary results from the Phase 1 program along with historical metallurgical testing at Los Azules were used to support the 2023 Preliminary Economic Assessment (PEA), which proposed an environmentally friendly heap leach alternative to a conventional copper concentrator. The testing program is now advancing with two additional phases (2 & 3) currently underway to support the Feasibility Study (FS). Drilling activities related to the current study work started in 2021 and are continuing into 2024. The leach testing protocols are based on conventional bio-leaching methods used extensively in commercial applications for supergene copper mineralization. The current phases, 2 & 3, are being conducted at SGS Chile and Alfred H. Knight (ASMIN Industrial Limitada) laboratories, both located in Santiago, Chile.

The Phase 1 program was initiated using drill core from drilling programs completed prior to 2021, but not older than 2015, for a total of 21 column tests. Started in 2022, Phase 1 has now been completed and final results received. Preliminary results of this work and prior historical leach testing information were used for the PEA metallurgical assumptions.

The Phase 2 program utilizes drill core from the 2022-2023 drilling campaign and focuses on deposit-wide variability testing, leaching protocol optimization and scalability. A total of 34 column tests are in progress,

with results expected in Q2 2024.

The Phase 3 program is also started, utilizing additional drill core material from the ongoing 2023-2024 drilling program. Phase 3 testing is focusing on the material of the initial 5-year mine plan, as delineated in the PEA. A total of 33 additional column tests are planned as part of this final confirmatory testing program, with results anticipated in Q4 2024.

The combined metallurgical programs comprise a total of 88 column tests to be used for the FS metallurgical design basis and geo-metallurgical model.

Copper assaying is conducted using a sequential method to determine the relative amounts of acid soluble (CuAS) and cyanide soluble (CuCN) copper mineralization (oxides and secondary sulfides). When combined, these two partial assay methods are generally considered readily soluble copper (CuSOL), extractable with conventional heap leaching technologies. Copper assayed that does not report to these two partial assay methods is classified as residual copper (CuRES) and is considered copper that requires additional time or is potentially not recoverable with conventional heap leaching technologies.

The finalized results from the Phase 1 metallurgy program for tests completed at minus ½" and ¾" crush sizes confirmed that soluble copper (CuSOL) component recovery is 100% for all leachable resources. The information in Figure 1 below shows the minus ¾" (19 mm) test results. The PEA envisions a minus ¾" crush size for the heap leaching feed in the commercial application.

Figure 1 - Soluble Copper Recovery Kinetics

The recovery results for the residual copper (CuRES) component shown in Figure 2 indicated an average recovery of 25%, an increase of 10% from the 15% preliminary recovery assumption used in the PEA. The additional residual copper recovery when applied to the entire resource increases the overall average recovery from 72.8% to 76.0%.

Figure 2 - Residual Copper Recovery Kinetics

Figure 3 below illustrates the increase in potential copper production throughout the mine life, attributable to the improved recovery, in comparison with the PEA assumptions. The initial two production years do not show additional recovered copper, as the design capacity of the electrowinning plant considered in the PEA is fully utilized.

Figure 3 - Copper Cathode Production (PEA & Revised Model)

The sulfuric acid consumption has also been updated with the Phase 1 final results. The averaged net sulfuric acid consumption reported in the PEA was 18 kilograms per ton of ore processed. The finalized Phase 1 testing now indicates a reduction of 8.3% to 16.5 kilograms per ton. The primary reason for the reduction of acid consumption is minimizing excess acid in the leaching solutions and operating the columns at a pH closer to 2.0 pH than the historic column work at 1.2 pH, which minimizes acid consumption by excess unmineralized gangue material dissolution. This lowered acid requirement may also improve the project economics, both NPV and IRR, by reducing the operating costs for copper produced and increasing revenue from the same tonnes mined.

## Bioleaching Summary

Copper bioleaching has been a commercially applied technology at altitudes similar to the Los Azules site and as much as 1,000 meters higher for several decades, in multiple locations around the world. Testing is conducted in conventional leach test columns by inoculation of the columns with naturally occurring bacterial ferrooxidans and thiooxidans prior to introduction of the leach solution. Bacterial cultures for the inoculum were sourced from the testing laboratories and adapted to the Los Azules leach material. Ferrooxidans convert the ferrous iron in solution to ferric iron, while thiooxidans convert the sulfur produced in the copper sulfide leaching activity to sulfuric acid/sulfate. Ferric iron is the key chemical component necessary for

leaching of copper sulfide material. Bioactivity in the tests is monitored by measurement of the ferrous/ferric ratios and electrochemical oxidation potential in the leaching solutions.

## ABOUT MCEWEN COPPER

McEwen Copper is a well-funded, private company which owns 100% of the large, advanced-stage Los Azules copper project, located in the San Juan province, Argentina. McEwen Copper is a 47.7% owned private subsidiary of McEwen Mining, which is listed on NYSE and TSX under the ticker MUX.

Los Azules is being designed to be distinctly different from conventional copper mines, consuming significantly less water, emitting much lower carbon levels and progressing to be carbon neutral by 2038, being powered by 100% renewable energy once in operation. The project's recently updated Preliminary Economic Assessment (PEA) projects a long life of mine, low production costs per pound, a short payback period, high annual copper production, and an after-tax IRR of 21.1%.

## ABOUT MCEWEN MINING

McEwen Mining is a gold and silver producer with operations in Nevada, Canada, Mexico and Argentina. In addition, it owns approximately 47.7% of McEwen Copper, which owns the large, advanced stage Los Azules copper project in Argentina. The Company's goal is to improve the productivity and life of its assets with the objective of increasing the share price and providing a yield. Rob McEwen, Chairman and Chief Owner, has a personal investment in the company of US\$220 million. His annual salary is US\$1.

## CAUTION CONCERNING FORWARD-LOOKING STATEMENTS

This news release contains certain forward-looking statements and information, including "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. The forward-looking statements and information expressed, as at the date of this news release, [McEwen Mining Inc.](#)'s (the "Company") estimates, forecasts, projections, expectations or beliefs as to future events and results. Forward-looking statements and information are necessarily based upon a number of estimates and assumptions that, while considered reasonable by management, are inherently subject to significant business, economic and competitive uncertainties, risks and contingencies, and there can be no assurance that such statements and information will prove to be accurate. Therefore, actual results and future events could differ materially from those anticipated in such statements and information. Risks and uncertainties that could cause results or future events to differ materially from current expectations expressed or implied by the forward-looking statements and information include, but are not limited to, fluctuations in the market price of precious and base metals, mining industry risks, political, economic, social and security risks associated with foreign operations, the ability of the corporation to receive or receive in a timely manner permits or other approvals required in connection with operations, risks associated with the construction of mining operations and commencement of production and the projected costs thereof, risks related to litigation, the state of the capital markets, environmental risks and hazards, uncertainty as to calculation of mineral resources and reserves, and other risks. Readers should not place undue reliance on forward-looking statements or information included herein, which speak only as of the date hereof. The Company undertakes no obligation to reissue or update forward-looking statements or information as a result of new information or events after the date hereof except as may be required by law. See McEwen Mining's Annual Report on Form 10-K for the fiscal year ended December 31, 2022, and other filings with the Securities and Exchange Commission, under the caption "Risk Factors", for additional information on risks, uncertainties and other factors relating to the forward-looking statements and information regarding the Company. All forward-looking statements and information made in this news release are qualified by this cautionary statement.

*The NYSE and TSX have not reviewed and do not accept responsibility for the adequacy or accuracy of the contents of this news release, which has been prepared by the management of [McEwen Mining Inc.](#)*

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