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THE ATLAS MATERIALS PROCESS FOR LOW CARBON NICKEL

By

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ABSTRACT

Atlas Materials is a climate technology startup with the objective of producing low carbon materials and contributing significantly to atmospheric decarbonization. The Atlas Materials Process treats nickel laterite ore using hydrochloric acid leaching to produce a silica residue for addition to cement making, a mixed hydroxide product containing nickel and cobalt for battery material processing, a small amount of manganese dioxide and magnesium hydroxide for the chemical market and, in the longer term, for carbon sequestration. Natural olivine mineral and sodium hydroxide are used to neutralize and precipitate the various products. Hydrochloric acid and sodium hydroxide are regenerated using the chlor-alkali process.

Atlas Materials has MOUs in place with two mining groups in New Caledonia (Société Minière Georges Montagnat (SMGM) and Société des Mines de la Tontouta (SMT)) for the supply of nickel saprolite ore. This ore will be processed in North America to create a domestic supply of nickel and cobalt for electrification of the transport sector while contributing to decarbonization of cement making and supply of the magnesium chemicals market.

The results of the Atlas Materials Demonstration Pilot Plant program conducted at SGS Canada (Lakefield, Ontario) will be presented and discussed. The program has been conducted in separate campaigns around (1) saprolite milling, (2) hydrochloric acid leaching and olivine neutralization for iron, aluminum and chromium removal, (3) two stage mixed hydroxide recovery and, (4) manganese removal and magnesium hydroxide precipitation. Finally, the entire process has been operated in continuous fashion over an extended period to supply engineering data for the first commercial facility, products for commercial evaluation and all necessary process environmental testing to facilitate permitting.

Keywords: Saprolite, hydrochloric acid, sodium hydroxide, chlor-alkali, supplemental cementitious materials, mixed hydroxide precipitate, manganese dioxide, magnesium hydroxide, decarbonization