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Australian Securities Exchange  
20 Bridge Street  
Sydney NSW 2000

## ASX RELEASE

### Pre-Feasibility Study Commences on Alternative Nickel-Cobalt Laterite Ore Processing

Australian Mines Limited (“Australian Mines” or “the Company”) is pleased to advise it has commenced a Pre-Feasibility Study (“Study” or “Stage 2”)<sup>1</sup> to commercialise an innovative, low-capex, scalable, and environmentally benign (non-HPAL)<sup>2</sup> processing technology targeting the extraction of nickel, cobalt, and scandium from the lateritic ores at its Bell Creek–Minnamoolka (QLD) and Flemington (NSW) Projects.

#### Background

Australian Mines recently completed a Proof-of-Concept Study (“Stage 1”) conducted by UK-based research and development (R&D) partner Descycle<sup>3</sup> investigating the potential to unlock value in both its Bell Creek–Minnamoolka and Flemington Projects using deep eutectic solvents (DES), targeting the extraction of nickel, cobalt, and scandium from lateritic ores.

The Stage 1 Study covered, at a concept level, incorporating a DES leaching technology as a potential alternative to existing treatment and recovery processes (such as HPAL) in the extraction of target metals from nickel and cobalt lateritic ores (see Figure 1 of this report).

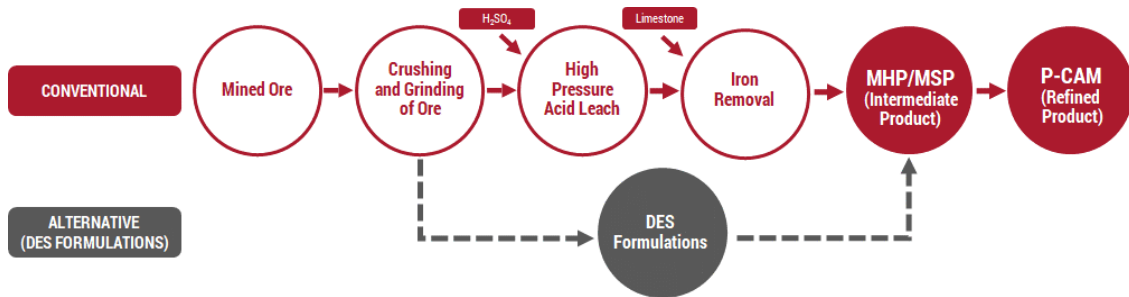
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<sup>1</sup> Descycle, *Investigation of the potential for processing Ni-laterite ore with Deep Eutectic Solvents – Phase 2: Proposal* (10 March 2022).

<sup>2</sup> ‘HPAL’ means high pressure acid leach, a hydrometallurgical process used to extract nickel and cobalt from lateritic ores.

<sup>3</sup> [www.descycle.com](http://www.descycle.com)

## Conventional and Alternative Processing Flowsheets



**Figure 1:** Conventional and Alternative Nickel and Cobalt Processing Flowsheets

The results from the Stage 1 Study highlighted the potential for the economic processing of low-grade oxide nickel laterites and other metal laterites and recovery of by-products, including cobalt and scandium from Sconi and Flemington ores.

In summary, metal recoveries from the Sconi<sup>4</sup> and Flemington<sup>5</sup> ores tested in the Stage 1 Study were seen as high as 100% cobalt, 97% nickel, and 94% scandium.<sup>6</sup>

DES leaching technology is expected to have the following potential benefits, including:

- Significantly lower capital expenditure (compared to other existing process flowsheets, such as HPAL),

<sup>4</sup> The Bell Creek–Minnamoolka deposits are 100% owned by Australian Mines and are located within the Company’s Sconi Project. These nickel-cobalt deposits, however, sit outside the Offtake Agreement with LG Energy Solution, which only concerns the Sconi Project’s Greenvale, Lucknow, and Kokomo deposits.

The Mineral Resource Estimate for the Bell Creek deposit is reported under JORC 2012 Guidelines and was reported by Australian Mines on 29 April 2019. There has been no Material Change or Re-estimation of the Mineral Resource since this 29 April 2019 announcement by Australian Mines.

The Mineral Resource Estimate for the Minnamoolka deposit is reported under JORC 2012 Guidelines and was reported by Australian Mines on 21 October 2019. There has been no Material Change or Re-estimation of the Mineral Resource since this 21 October 2019 announcement by Australian Mines.

<sup>5</sup> The Mineral Resource Estimate for the Flemington Cobalt-Nickel-Scandium Project is reported under JORC 2012 Guidelines and was reported by Australian Mines Limited on 31 October 2017. There has been no Material Change or Re-estimation of the Mineral Resource since this 31 October 2017 announcement by Australian Mines.

<sup>6</sup> Industry standards for HPAL nickel and cobalt recovery rates are typically between 93% and 95%.

- A scalable processing plant, through the modular design and construct approach (with the ability to start small and expand over time),
- Environmental benefits, given DES are environmentally benign, biodegradable, and non-aqueous, with the potential for significantly reduced water usage, and low CO<sub>2</sub> emissions; and
- High recovery rates of nickel, cobalt, and scandium.

### **Pre-Feasibility Study (Stage 2)**

Following the successful Stage 1 Study, Australian Mines has commenced a Stage 2 Study through R&D partner Descycle focussing on metal recovery from the DES formulations and front-end optimisations.

The Study 2 Study testing program over the next 6 months<sup>7</sup> will require 50-100 kilograms of material from Sconi and Flemington ore types (or 100-200 kilograms total material) and comprises five key milestones, including:

- Engineering and process definition,
- Leaching optimisation,
- Solubility of metal products,
- Precipitation of metal products from DES lixiviant, and
- Recovery of DES from solid residue.

Analysis of leaching, solubility, and precipitation tests will be conducted on lixiviants using the inductively coupled plasma mass spectrometry (ICP-MS)<sup>8</sup> facilities at Descycle partner, University of Leicester<sup>9</sup> and solid residue analyses will be conducted by ALS<sup>10</sup> geochemistry laboratory in Galway Ireland, a laboratory accredited to international standard ISO/IEC 17025 for testing laboratories.

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<sup>7</sup> The estimated time to complete Stage 2 Study is approximately six months. Additional time may be required subject to the progress and findings during the Stage 2 Study.

<sup>8</sup> ICP-MS is an analytical technique that can be used to measure elements at trace levels in fluids.

<sup>9</sup> [le.ac.uk](http://le.ac.uk)

<sup>10</sup> [www.alsglobal.com](http://www.alsglobal.com)

Stage 2 Study costings of the commercialisation process have been factored into the current 2022 and 2023 financial year budgets.

The decision to investigate an alternative processing flowsheet for the Bell Creek–Minnamoolka and Flemington Projects does not alter Australian Mines’ commitment to its flagship Sconi Nickel-Cobalt-Scandium Project in North Queensland, nor its offtake agreement with LG Energy Solution<sup>11</sup> (which currently excludes ore from Bell Creek, Minnamoolka, and Flemington).

ENDS

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*Authorised for release by the Board of Directors of Australian Mines Limited*



Australian Mines Limited supports the vision of a world where the mining industry respects the human rights and aspirations of affected communities, provides safe, healthy, and supportive workplaces, minimises harm to the environment, and leaves positive legacies.

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<sup>11</sup> Australian Mines Limited, *Binding offtake agreement with LG Energy Solution for supply of mixed nickel-cobalt hydroxide from the Sconi Project, Queensland* (ASX: 16 August 2021).

## **Appendix 1: Forward Looking Statements**

This announcement contains forward looking statements. Forward looking statements can generally be identified by the use of forward looking words such as, 'expect', 'anticipate', 'likely', 'intend', 'should', 'could', 'may', 'predict', 'plan', 'propose', 'will', 'believe', 'forecast', 'estimate', 'target', 'outlook', 'guidance', 'potential' and other similar expressions within the meaning of securities laws of applicable jurisdictions.

Any forward looking statements in this document relating to the outcomes of the Sconi Project Feasibility Studies and ongoing refinement work as outlined in this report. Actual results and developments of projects and the market development may differ materially from those expressed or implied by these forward looking statements. These, and all other forward looking statements contained in this announcement are subject to uncertainties, risks and contingencies and other factors, including risk factors associated with exploration, mining, and production businesses. It is believed that the expectations represented in the forward looking statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to price fluctuations, actual demand, currency fluctuations, drilling and productions results, resource estimations, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory changes, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

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