

# Jervois

MINING LIMITED

A.B.N. 52 007 626 575

Suite 508, 737 Burwood Road, Hawthorn East, Victoria, 3123, Australia

29 September 2020

ASX/TSX-V: JRV

OTC: JRVMF

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## Jervois to acquire the São Miguel Paulista nickel and cobalt refinery in Brazil

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### HIGHLIGHTS

- Jervois Mining ("Jervois") agrees to acquire 100% of the São Miguel Paulista nickel and cobalt refinery ("SMP Refinery") in São Paulo, Brazil from Companhia Brasileira de Alumínio ("CBA"), a 100%-owned subsidiary of Votorantim SA ("Votorantim"), one of the largest industrial and financial investment holding companies in Latin America.
- SMP Refinery has annual refined production capacity of 25,000 metric tonnes of nickel and 2,000 metric tonnes of cobalt and is currently on care and maintenance.
- Cash purchase price of R\$125 million (US\$22.5 million<sup>1</sup>), payable in tranches, with a R\$15 million (US\$2.7 million<sup>1</sup>) cash deposit paid by end December 2020.
- Timing of balance of purchase price conditional upon permitting, restart Feasibility Study ("FS") outcomes and future production thresholds – payable by June 2023.
- SMP Refinery produced an established nickel and cobalt metal brand, "Tocantins", with an extensive distribution network across the United States, Europe and Japan.
- Jervois to refine concentrate from its Idaho Cobalt Operations ("ICO") and return cobalt metal to the United States. Additional supply contracts to be pursued.
- FS to restart SMP Refinery, including the processing of ICO concentrate, to commence in Q4 2020. Targeted availability to align with first ICO concentrate deliveries from the United States in mid 2022. Subject to permitting and Jervois securing supply contracts for other nickel and cobalt intermediates, accelerated restart to be explored.
- Enables a revised development plan at Jervois' Nico Young nickel-cobalt heap leach development in Australia, to a mixed hydroxide product ("MHP"), suitable for processing based on the existing SMP flowsheet, resulting in estimated capital savings of A\$200 million from the prior Nico Young NI 43-101 Preliminary Economic Assessment.

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<sup>1</sup> US\$ conversion based on today's exchange rate of US\$1: R\$5.55, the transaction values are in R\$ and are not fixed in US\$.

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Jervois Mining Limited (the “Company” or “Jervois”) (ASX: JRV) (TSX-V: JRV) (OTC: JRVMF) is pleased to announce it has agreed to acquire 100% of the São Miguel Paulista nickel and cobalt refinery (“SMP Refinery”) in the Brazilian State of São Paulo from Companhia Brasileira de Alumínio (“CBA”) (an investee company of Votorantim). This transaction will transform Jervois into a vertically integrated producer when ICO commences commercial production, capable of supplying refined nickel and cobalt products to customers across a range of industries including specialty stainless steels, nickel and cobalt superalloys, cathode precursor, lithium ion battery and electric vehicles manufacturers.

## Transaction Structure

Jervois will initially lease SMP Refinery from CBA (“Refinery Lease”), providing Jervois access to undertake a Feasibility Study (“FS”) for the restart. Subject to Jervois’ Early Termination Right up to September 2021, the lease shall continue until closing of Jervois’ acquisition of SMP Refinery (“Closing”) which is subject to the satisfaction of usual condition precedents and is expected to occur by December 2021.

Jervois will acquire 100% of SMP Refinery for R\$125.0 million cash (US\$22.5 million at current exchange rates)<sup>2</sup>, payable in tranches:

- a) R\$15.0 million (US\$2.7 million)<sup>2</sup> cash as a deposit: by 30 December 2020 (“Deposit Payment”). Refinery Lease commences upon receipt by CBA of Deposit Payment. Should Jervois elect to exercise its Early Termination Right, Deposit Payment will be forfeited and no further tranches will be payable. On Closing, Deposit Payment shall be applied to the purchase price for SMP Refinery. Jervois will fund Deposit Payment via cash reserves.
- b) R\$47.5 million (US\$8.5 million)<sup>2</sup>: on Closing.
- c) R\$25.0 million (US\$4.5 million)<sup>2</sup>: on the earlier to occur of:
  - i. SMP Refinery meeting certain production thresholds (average of 125mt per month of contained refined nickel and/or cobalt); and
  - ii. 30 June 2023.
- d) R\$37.5 million (US\$6.75 million)<sup>2</sup>: on 30 June 2023.

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As part of the purchase arrangements and as contained in Refinery Lease, Jervois will pay for existing SMP Refinery care and maintenance (including environmental remediation) of the site from March 2021, via the payment of a monthly lease cost of R\$1.5 million (US\$0.27 million)<sup>2</sup>. Up until Closing, CBA will continue to manage the site. After Closing, 100% ownership will transfer to Jervois as it moves forward to restart the refinery.

## Background

SMP Refinery is a nickel and cobalt electrolytic refinery designed and constructed by Outotec that commenced operations in 1981. The facility is located in an industrial zone in São Paulo, Brazil. It was placed on care and maintenance by CBA in 2016, when CBA also placed its Niquelândia mine and processing plant in Brazil on care and maintenance due to prevailing market conditions at the time. Niquelândia provided the SMP Refinery with nickel carbonate. SMP Refinery's production capacity was 25,000 metric tonnes per annum ("mtpa") of refined nickel cathode and 2,000mtpa refined cobalt cathode.

Figure 1: São Miguel Paulista nickel and cobalt refinery



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## Flowsheet

SMP Refinery utilises a sulphuric acid leach to dissolve nickel and cobalt from delivered intermediate products. The leached nickel and cobalt are subsequently separated using solvent extraction (“SX”) and impurity removal stages to produce final electrowon (“EW”) nickel and cobalt metal. In addition to nickel and cobalt electrolysis, the flowsheet and site encompasses leaching and neutralisation, nickel purification, crystallisation and evaporation, cobalt extraction, utilities, cutting and packing, electrical, maintenance, an industrial waste-water treatment plant and a sodium sulphate crystallisation building.

In parallel to processing nickel carbonate intermediate from Niquelândia, SMP Refinery also successfully processed a range of third party materials including nickel carbonates (from Yabulu in Australia), mixed hydroxide product (“MHP”) (from Ravensthorpe in Australia and Goro in New Caledonia) and cobalt hydroxide (from the Democratic Republic of Congo, or “DRC”). In its last years of operation, approximately 20-30% of metal production was sourced from third party suppliers outside Brazil. Nickel and cobalt recoveries averaged 99% and 96%, respectively, over SMP Refinery’s operating life.

## Nickel and Cobalt Products

SMP Refinery produced electrolytic nickel with 99.9% purity, exceeding the base specification required by the London Metal Exchange (“LME”). This product was historically used in premium applications such as superalloys, specialty stainless steels, electroplating and batteries. SMP Refinery broken cobalt cathodes were also of high quality and historically used in superalloys and batteries. Nickel and cobalt cathodes were sold under the brand “Tocantins” and have an established customer base in key regions of demand today – the United States, Europe and Japan.

CBA has also undertaken a scoping study with a leading international engineering firm specializing in base metal refineries, to assess the potential conversion of the facility to nickel sulphate production, for modest capital expenditure. Nickel sulphate is the current physical form utilized in the preparation of cathode precursor materials by the lithium ion battery supply chain. Jervois has not included this conversion into its current development plans. Off-take and partner negotiations with cathode precursor, lithium ion battery and electric vehicle manufactures under non-disclosure agreements continue.

## SMP Refinery Restart Scenarios

Jervois has assessed in detail three (3) operating scenarios during its due diligence. The scenarios are designed based on filtration and management of waste limitations based on SMP



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Refinery's existing production capacity and flowsheet of 25,000mtpa and 2,000mtpa of refined nickel and cobalt cathode respectively.

- a) Idaho Cobalt Operations ("ICO") concentrate only: 2,000mtpa refined cobalt
- b) ICO concentrate and cobalt hydroxide: 8,000mtpa refined cobalt
- c) ICO concentrate and MHP: 10,000mtpa refined nickel and 2,300mtpa refined cobalt

Restart requirements and costs at SMP Refinery are moderate. Planned works include refurbishment of the electrowinning cells, additional crystallizer(s), a gold recovery circuit, plant corrosion treatments, sealing, filtration upgrades and modifications to materials handling. Expansion of the copper handling capacity will be required if SMP treats a bulk (cobalt and copper) concentrate from ICO.

Jervois' preliminary capital estimates range from R\$75 million (US\$13.5 million)<sup>3</sup> up to R\$150 million (US\$27.0 million)<sup>3</sup> for SMP Refinery to restart across the above three operating scenarios. The operating scenario and the associated capital estimates will be defined as part of the FS Jervois will complete, including supplier contract negotiations to underpin restart economics.

## ICO Concentrate Pre-treatment

During its due diligence, with regard to ICO concentrate, Jervois assessed implications at SMP Refinery both for processing (including impurity removal and physical handling constraints) and also waste generation. Prior to leaching at SMP Refinery, ICO concentrate must be either roasted (to remove sulphur) or processed via a pressure oxidation autoclave, or "POX".

Jervois has undertaken careful assessment in defining both roaster and POX business cases, including feed preparation, materials handling properties, base metal extraction, gold extraction and overall metal recovery, free acid and neutralent required, reagent consumption, thickener and filtration physical properties and impact on SMP product quality.

The ICO Bankable Feasibility Study ("BFS") scope was expanded to include an assessment for a dedicated roaster of cobalt concentrate in Blackfoot, Idaho. This was supported by bench level testwork at SGS Lakefield Oretest ("SGS") in Sudbury. Testwork specific to ICO concentrates also verified the calcining requirements through pilot scale testing of segregated concentrate. Sighter

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testwork completed to date has confirmed satisfactory cobalt extraction in an atmospheric leach, analogous to the existing process flowsheet at SMP Refinery. M3 Engineering (“M3”) based in Tucson, Arizona, prepared capital and operating cost estimates to BFS level of accuracy (+/- 15%). Capital costing for a roaster plant in Idaho processing cobalt concentrate from ICO was US\$17.1 million with operating costs of approximately US\$1.00/lb of contained cobalt.

As part of the refinery restart FS, Jervois will now assess the alternative of situating a roaster in Brazil. Whilst Blackfoot has access to competitive energy costs, skilled labour at competitive rates, gas pipeline, high quality water, existing road and rail infrastructure connected to major sealed roads with access to port facilities – capital and operating costs will be reduced by constructing a roaster adjacent to SMP Refinery in Brazil.

Calcining of a bulk concentrate has been considered and can be developed to a BFS level with an additional pilot test to confirm present assumptions based on bench roasting by Xstrata Process Support (“XPS”), a subsidiary of Glencore, in 2018.

In parallel to the roaster ‘base case’, Jervois developed a POX alternative flowsheet for the integration of sulphide concentrate into SMP. POX has a higher capital cost but has benefits on metal recovery and operating costs. It would also act as an effective debottlenecking initiative, increasing nickel in MHP processing capacity at SMP up to 20,000mtpa from the 10,000mtpa outlined above in operating scenario (c).

The ICO refinery scoping study undertaken by Wood was based on POX technology providing Jervois with the relevant design and costing for a plant in the United States based upon ICO cobalt concentrates, to assist it in same for a plant in Brazil. POX is typically applied to refractory gold ores and base metal sulphide concentrates as an alternative to roasting and/or smelting technology. The technology is robust, well understood and commercially proven. Preliminary POX sighter testwork was progressed at SGS Perth Western Australia with satisfactory results.

The Company expects to make a final decision on whether to utilize a roaster or POX during Q4 2020, following negotiations with third party concentrate suppliers. If the current plan to utilize a roaster is retained, a further decision will be made on the location of the facility.

## Nico Young MHP

Jervois released a NI 43-101 compliant Preliminary Economic Assessment (the “PEA”) on the Nico Young nickel-cobalt deposit in May 2019, associated with its mergers with M2 Cobalt and eCobalt Solutions. The PEA supported the technical and economic viability of heap leaching laterite ore, based on the production of battery grade nickel sulphate hexahydrate crystal and cobalt sulphide

as final, refined products. Within the study scope, Jervois also completed to the equivalent level of engineering, the ability to produce an MHP.

This MHP represents an attractive feed for SMP, with the refinery having processed similar products from other suppliers historically, including from Australia. Were Jervois to modify its development plan at Nico Young to produce an MHP rather than final refined product, Jervois estimates project capital would be reduced by approximately A\$200 million.

### Jervois Due Diligence of SMP Refinery

Due diligence was extensive and encompassed detailed technical and flowsheet assessments, leveraging work undertaken by both Wood and M3. Environmental Resources Management (“ERM”) was engaged for environmental due diligence, which encompassed a review of operating permits (including transportation and logistics), access to and disposal of water, disposal of refinery waste, and an assessment of the adequacy of remediation activities for past contamination. Botelho, Carvalho, Horta, Ibraim, Spagnol Sociedade de Advogados, a São Paulo legal firm were retained for the transaction, as were Brazilian tax advisers.

Jervois has appointed former executives experienced with SMP Refinery in relation to its investment:

- Mr Rogério Cannoni, who was with Votorantim Metais Niquel from 1999 to 2016 in various technical leadership roles. From 2007 to 2016, Mr Cannoni was the head Research and Development Manager at Votorantim, which included SMP where he was based.
- Mr João Bosco Silva, via Cambridge Family Enterprise Group, of which he is a partner. For over a decade, Mr Silva was Chief Executive Officer of Votorantim Metais, which encompassed all the Votorantim group mining and metals assets, including the nickel division and SMP refinery that Jervois is purchasing. After Votorantim, Mr Silva was CEO of Alcan Aluminum Brasil, and then in 2012 founded Bridge Business Advisors, a São Paulo based management consultancy firm. In 2017, Bridge Business Advisors merged with Cambridge Family Enterprise Group. Mr Silva serves as a Board member or Chairman of multiple Brazilian companies in the retail, agribusiness, food, mining, infrastructure and services industries, and he remains President of the Brazilian Aluminum Association.

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## Transaction Summary

The Board and Management of Jervois is genuinely excited to be re-entering nickel and cobalt refining and trading, and to be re-establishing previous supplier and customer relationships. SMP Refinery represents a transformative opportunity for the Company to negotiate refined nickel and cobalt supply directly to end users across multiple industries, including the lithium ion battery supply and customer chain.

Jervois will now progress the funding plan for SMP Refinery transaction and restart in conjunction with the lender negotiations for the completion of ICO construction through first commercial production. The integration of mining and refining of cobalt expands the range of offtake and funding counterparties, together with potential financing structures.

## Investor and Analyst Conference Call Details

Jervois will hold an investor webinar on Tuesday, 29 September at 10:15am AEST to discuss its Bankable Feasibility Study for ICO and acquisition of the São Miguel Paulista nickel and cobalt refinery in Brazil.

The webinar will feature Chief Executive Officer Bryce Crocker, General Counsel Ken Klassen, ICO BFS Project Director Russell Bradford and EGM Technical Services Michael Rodriguez.

Investors are invited to send questions prior to the webinar to:

[nathan.ryan@nwrcommunications.com.au](mailto:nathan.ryan@nwrcommunications.com.au)

Register for the investor webinar at the link below:

[https://us02web.zoom.us/webinar/register/WN\\_nsnyD1v5Q4OWMQ5XUn1BdA](https://us02web.zoom.us/webinar/register/WN_nsnyD1v5Q4OWMQ5XUn1BdA)

After registering, you will receive a confirmation email containing information about joining the webinar.

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For higher quality, dial a number based on your current location:

International numbers available: <https://us02web.zoom.us/j/kvsfa5uem>

A recording will be made available shortly after the conclusion of the webinar at the same link.

On behalf of Jervois Mining Limited,

Bryce Crocker, Chief Executive Officer

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