



## IGO MAXIMISES VALUE OF ITS NOVA CONCENTRATE THROUGH OFFTAKE AGREEMENTS

Independence Group NL (IGO or the Company) (ASX:IGO) is pleased to announce the conclusion of parallel workstreams to maximise value from the high-quality nickel and copper concentrates produced at its Nova Operation (Nova). This includes the completion of a highly competitive concentrate tendering process and conclusion of the Downstream Nickel Sulphate Pre-feasibility Study (the Study).

### Key Highlights

- **Strong demand for Nova concentrate has resulted in materially improved terms than in current offtake agreements.**
- **Nickel concentrate agreements are being finalised with equal volumes to be awarded to Trafigura Pte. Ltd (Trafigura) and BHP Billiton Nickel West Pty Ltd (BHP).**
- **Copper concentrate agreement for 100% of the production awarded to Trafigura.**
- **Completion of pre-feasibility on the IGO downstream nickel sulphate process (The IGO Process™) demonstrating a technologically advanced and cost competitive process for converting nickel sulphide concentrate directly to nickel sulphate.**
- **Decision not to progress to a detailed feasibility study on the IGO downstream nickel sulphate facility given the materially improved commercial terms achieved via new offtake agreements.**
- **Continuing to explore value creation from downstream processing aligned to clean energy via potential partnerships and collaborative industry opportunities leveraging off the technology developed by IGO.**

IGO has progressed parallel workstreams to create strategic options to maximise value from the Nova nickel-cobalt and copper concentrates. The two workstreams have focused on:

1. Generating higher value through the development of a new process to produce battery quality nickel sulphate from nickel sulphide concentrate (The IGO Process™); and
2. Achieving improved commercial terms in new nickel and copper concentrate offtake agreements (which are to replace the existing agreements due to expire in December 2019 and June 2020), through a competitive tender process.

Having completed both workstreams, the Company has determined that maximum value for shareholders is best delivered by entering into traditional concentrate offtake agreements. As a result, IGO will not progress to a feasibility study on the IGO downstream nickel sulphate facility.



Peter Bradford, IGO's Managing Director and CEO, said: *"It is pleasing to have brought these two workstreams to completion, and to have achieved the material improvement in commercial terms for our new offtake agreements. The tightening supply and strong demand forecast for nickel and copper has led to strong competition for Nova concentrate, which is now established as a high quality, highly desirable product for end users. The increased shareholder value captured by these agreements is significant."*

*"The work we have completed as part of the nickel sulphate downstream prefeasibility study has demonstrated that IGO has developed an innovative processing technology to more efficiently produce nickel sulphate for the clean energy and the electric vehicle battery market at a lower cost and in an environmentally sustainable manner. We recognised that this project would have to compete with tightening supply and higher payabilities in the market and as a result of the improved nickel payabilities obtained, the returns on this project are unlikely to meet IGO investment hurdles for construction of such a facility in Western Australia, hence the decision not to advance this project beyond the pre-feasibility study."*

*"We remain committed to our strategy to focus on metals critical to clean energy. We will continue to explore partnering opportunities, leveraging the technology we have developed on downstream processing to create additional value for shareholders."*

## Nickel and Copper Offtake Agreements

IGO has been actively tendering its Nova concentrate in the market, to replace existing nickel concentrate contracts with Glencore International AG and BHP that are due to expire in December 2019 and June 2020 respectively, and its copper concentrate contract with Trafigura which is due to expire in December 2019.

A binding concentrate offtake agreement for a three-year term has been executed with Trafigura for 50% of nickel concentrate and for 100% of copper concentrate produced from Nova. An offtake term sheet with BHP for an additional 50% of the nickel volume for a period of five years has been executed, with the parties agreeing key commercial terms subject to the completion of the formal agreement within one month (which formal agreement will be based on the current offtake agreement with BHP) and all necessary internal approvals of both parties.

While key terms of the agreements are subject to customary confidentiality clauses, the commercial terms agreed are materially better than those they replace and reflect the growing global demand for nickel as a key raw material into the clean energy market.

Under the terms of the agreements, IGO has preserved a right, subject to agreed notification periods and conditions, to redirect the nickel concentrate to enable IGO to take a participating interest in a future downstream processing facility aligned to the production of battery materials.

## Downstream Processing

IGO identified the potential value of downstream processing and, following scoping and proof-of-concept studies, initiated a pre-feasibility study on the technical and financial merits of converting nickel sulphide concentrate from Nova into high quality nickel sulphate via The IGO Process™ (patent pending).

IGO committed to exploring a range of additional study optimisation workstreams in April 2019 (See ASX announcement released 2 April 2019: Downstream Nickel Sulphate Study Update), including process flowsheet refinements, minimising waste streams by maximising by-products, and optimising scale and capital efficiencies.

The Study has successfully demonstrated the technical feasibility of The IGO Process™, a technically advanced process for converting nickel sulphide concentrate directly to battery grade nickel sulphate.

Extensive pilot and continuous plant testwork completed on The IGO Process™ has achieved metal extraction rates of better than 97% for both nickel and cobalt, providing IGO with significant confidence in the potential for The IGO Process™ to become an established flowsheet for the production of nickel sulphate. The IGO Process™ has a smaller carbon and environmental footprint compared with traditional methods<sup>1</sup> for nickel sulphate production due to significantly lower emissions, power consumption and waste generation.

A summary of The IGO Process™ flowsheet is provided in Appendix 1.

As part of the Study, IGO has completed extensive testwork to confirm the application of The IGO Process™ including the production of trial lithium-ion batteries by Queensland University of Technology utilising the raw nickel sulphate generated from The IGO Process™. This has provided greater confidence in The IGO Process™ and its ability to produce battery grade nickel sulphate for the premium energy storage market.

**Figure 1 – Lithium-ion batteries utilising nickel sulphate generated from The IGO Process™**



## Key Study Outcomes

In assessing the financial merits of The IGO Process™, IGO assumed the following as a base case scenario:

- Western Australia based nickel sulphate conversion facility constructed in an industrial centre;
- Nickel sulphide concentrate feed sourced from Nova for an assumed ten-year period;
- Average nickel payability of 70%<sup>2</sup>; and
- Nickel sulphate premium of US\$2,000/tonne<sup>3</sup>.

A summary of key assumptions used to produce the Study outcomes can be found in Appendix 2.

The total capital cost for the downstream process was estimated to be A\$530M, including all direct and indirect costs, as well as owners' costs and a 10% contingency estimate. Operating costs of A\$1.50/pound of payable nickel metal were achieved through the adoption of ammonia as a neutralising agent, which reduces

<sup>1</sup> Compared to existing alternative processes to convert nickel concentrate to nickel sulphate

<sup>2</sup> Assumed historic nickel concentrate payability

<sup>3</sup> US\$2,000/tonne premium is a premium for nickel sulphate to the nickel price based on estimates from Roskill



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conversion costs and generates a significant ammonium sulphate by-product credit. These operating costs place The IGO Process™ in the bottom quartile of the global nickel sulphate production cost curve.

On the base case assumptions, the Study has delivered an internal rate of return (IRR) of 18% and a Net Present Value (NPV)<sup>4</sup> of A\$236M, with a 4.5-year payback period.

However, when applying the average of the payability terms achieved in the recent offtake tender process, instead of the assumed payability of 70%, the IRR for the project reduces to 11% on the assumption that the business case of the downstream opportunity would be on a stand-alone basis (with offtake purchased from Nova on market terms). As a result of the improvement in offtake terms based on current market conditions, the value of the downstream opportunity has been eroded.

Given the reduced project returns implied by the recently improved payabilities for Nova concentrate and the uncertainty of source feed for a ten-year project life, IGO has elected not to progress the project into a detailed feasibility study stage.

IGO remains committed to vertical integration aligned to its strategy and is currently exploring partnership opportunities both domestically and overseas to leverage the technology it has developed.

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## FORWARD-LOOKING STATEMENTS

This document may include forward-looking statements. Forward-looking statements include, but are not limited to, statements concerning Independence Group NL's planned exploration program and other statements that are not historical facts. When used in this document, the words such as "could", "plan", "estimate", "expect", "intend", "may", "potential", "should", and similar expressions are forward-looking statements. Although Independence Group NL believes that its expectations reflected in these forward-looking statements are reasonable, such statements involve risks and uncertainties and no assurance can be given that actual results will be consistent with these forward-looking statements.

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<sup>4</sup> Net Present Value uses a 10% discount rate

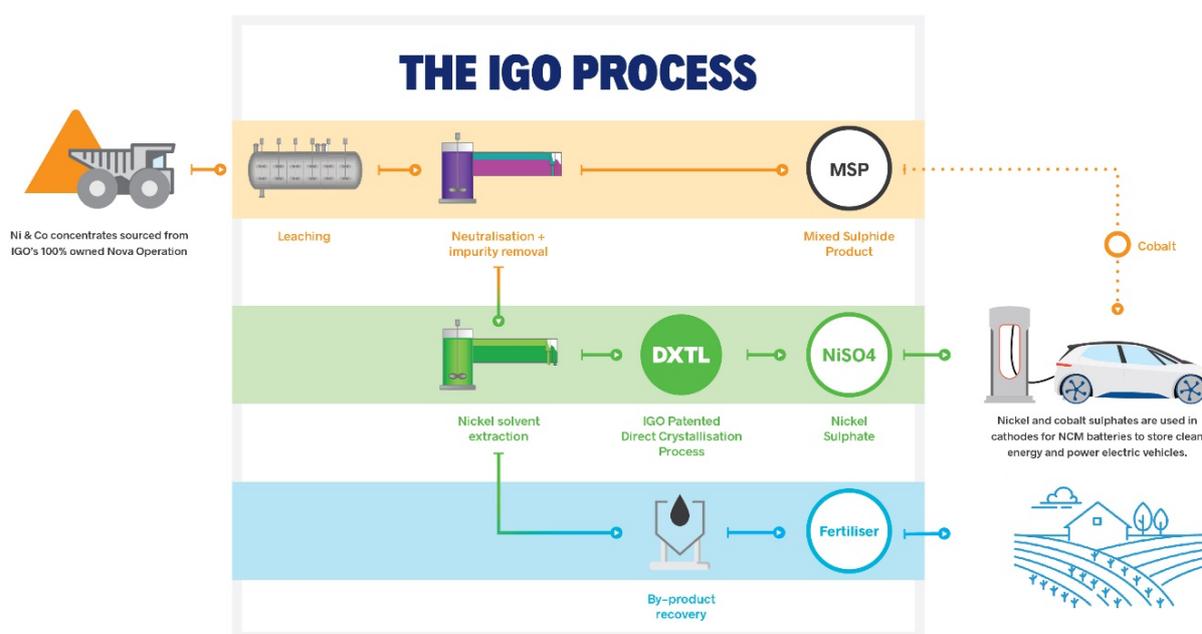
APPENDIX 1

The IGO Process™

IGO has invested heavily in the development of The IGO Process™ and we are proud to have successfully demonstrated its ability to produce a high-quality nickel sulphate product. The IGO Process™ combines several proven technologies in a unique way that has not been previously used in the commercial production of nickel sulphate. It can be simplified into the following four steps:

- **Stage 1 Leaching:** A finely-ground, high-grade nickel sulphide concentrate slurry is pumped into an autoclave, at relatively low temperature and pressure, where oxygen injection is used to partially oxidise the sulphide concentrate into soluble metal sulphate species (nickel, cobalt, copper, iron etc), sulphuric acid and sulphur.
- **Stage 2 Primary & Secondary Neutralisation:** A two-stage neutralisation process for the removal of free acid, iron and other metals to achieve the required feed solution for subsequent solvent extraction.
- **Stage 3 Cobalt and Copper Solvent Extraction and Precipitation:** Cobalt, copper, zinc, manganese and magnesium are removed from solution. The cobalt, copper and zinc are then stripped from the resulting organic solution by sulphuric acid and recovered as a Mixed Sulphide Precipitate (MSP), which is a readily saleable product.
- **Stage 4 Nickel Solvent Extraction and Crystallisation:** Further impurities are removed from solution in the nickel solvent extraction circuit before crystallisation by IGO’s direct crystallisation (DXTL™) process step.

Figure 2 - IGO Process™ Flowsheet



## APPENDIX 2

## Summary of key Study assumptions

Assumption	Units	Value
Project life	years	10
<b>Recoveries</b>		
Nickel	%	97%
Cobalt	%	97%
Copper	%	75%
<b>Production (steady state)</b>		
Nickel in nickel sulphate	t	26,190
Nickel sulphate produced	dmt	117,287
<b>Product payability</b>		
Nickel in nickel sulphate	%	100% + premium
Cobalt in MSP	%	90%
Copper in MSP	%	90%
<b>Commodity prices (average over 10 year project life)</b>		
Nickel	US\$ real / t	15,426
Nickel sulphate premium	US\$ real / t	2,000
Cobalt	US\$ real / t	45,404
Copper	US\$ real / t	6,425
<b>Foreign exchange rate</b>	<b>A\$ / US\$</b>	<b>0.75</b>
<b>Conversion cost</b>	A\$ / lb real	1.50
<b>Capex</b>		
Total directs	A\$ M real	409
Total indirects	A\$ M real	52
Contingency	A\$ M real	46
Total owners cost	A\$ M real	23
Total pre-production capex	A\$ M real	530
<b>Valuation</b>		
Discount rate (post-tax, nominal)	%	10%
<b>Assumed Base Concentrate Payabilities</b>		
Nickel	%	70.0%
Cobalt	%	32.5%
Copper	%	12.5%