



## Julimar – the right metals at the right time in Western Australia

2022 Macquarie Western Australia Forum

28 November 2022



# Forward looking statements and competent person(s) disclosure



This presentation does not include all available Information on Chalice Mining Limited and should not be used in isolation as a guide to investing in the Company. Any potential investor should also refer to Chalice Mining Limited's Annual Reports, ASX/OTCQB releases, and take independent professional advice before considering investing in the Company. For further information about Chalice Mining Limited, visit our website at [chalicemining.com](http://chalicemining.com)

## Forward-Looking Statement

This presentation may contain forward-looking information, including forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 (collectively, forward-looking statements). These forward-looking statements are made as of the date of this report and Chalice Mining Limited (the Company) does not intend, and does not assume any obligation, to update these forward-looking statements. Forward-looking statements relate to future events or future performance and reflect Company management's expectations or beliefs regarding future events and include, but are not limited to: the impact of the discovery on the Julimar Project's capital payback; the Company's strategy and objectives; the realisation of mineral resource estimates; the likelihood of further exploration success; the timing of planned exploration and study activities on the Company's projects; mineral processing strategy; access to sites for planned drilling activities; and the success of future potential mining operations and the timing of the receipt of exploration results and hydrogen establishing a role in long-term energy strategies. In certain cases, forward-looking statements can be identified by the use of words such as, "believe", "continue", "could", "estimate", "expected", "future", "interpreted", "likely", "may", "open", "plan" or "planned", "potential", "targets", "will" or variations of such words and phrases or statements that certain actions, events or results may, could, would, might or will be taken, occur or be achieved or the negative of these terms or comparable terminology. By their very nature forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of the Company to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such factors may include, among others, risks related to actual results of current or planned exploration activities; whether geophysical and geochemical anomalies are related to economic mineralisation or some other feature; whether visually identified mineralisation is confirmed by laboratory assays; obtaining appropriate approvals to undertake exploration activities; metal grades being realised; metallurgical recovery rates being realised; results of planned metallurgical test work including results from other zones not tested yet, scaling up to commercial operations; changes in project parameters as plans continue to be refined; changes in exploration programs and budgets based upon the results of exploration, changes in commodity prices; economic conditions; political and social risks, accidents, labour disputes and other risks of the mining industry; delays or difficulty in obtaining governmental approvals, necessary licences, permits or financing to undertake future mining development activities; changes to the regulatory framework within which Chalice operates or may in the future; movements in the share price of investments and the timing and proceeds realised on future disposals of investments, the impact of the COVID 19 pandemic as well as those factors detailed from time to time in the Company's interim and annual financial statements, all of which are filed and available for review on the ASX at [asx.com.au](http://asx.com.au) and OTC Markets at [otcm Markets.com](http://otcm Markets.com). Although the Company has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements.

## Authorisation

This presentation has been authorised for release by the Disclosure Committee.

## Disclaimer

Whilst care has been exercised in preparing and presenting this presentation, to the maximum extent permitted by law, the Company and its representatives:

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- Accept no responsibility or liability as to the adequacy, accuracy, completeness or reasonableness of this Presentation; and
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## Mineral Resources Reporting Requirements

As an Australian Company with securities quoted on the Australian Securities Exchange (ASX), Chalice is subject to Australian disclosure requirements and standards, including the requirements of the Corporations Act 2001 and the ASX. Investors should note that it is a requirement of the ASX listing rules that the reporting of mineral resources in Australia is in accordance with the JORC Code and that Chalice's mineral resource estimates comply with the JORC Code. The requirements of JORC Code differ in certain material respects from the disclosure requirements of United States securities laws. The terms used in this announcement are as defined in the JORC Code. The definitions of these terms differ from the definitions of such terms for purposes of the disclosure requirements in the United States.

## Competent Persons Statement

The Information in this presentation that relates to exploration results for the Julimar Project is extracted from the following ASX announcements:

- "High-grade nickel-copper-palladium sulphide intersected at Julimar Project in WA", 23 March 2020
- "New Mineralised Zone Intersected at Dampier Target", 7 July 2022
- "Seismic identifies potential 1.6km extension of Gonneville", 6 September 2022
- "Major northern extension of Gonneville Intrusion confirmed", 19 October 2022
- "Outstanding wide high-grade intersections north of Gonneville", 23 November 2022

The information in this presentation that relates to Mineral Resources has been extracted from the ASX announcement titled:

- "Updated Gonneville Mineral Resource", 8 July 2022.

The above announcements are available to view on the Company's website at [chalicemining.com](http://chalicemining.com)

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and, in the case of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the original release continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the relevant original market announcements. Refer to the attached Appendices for further information on the Mineral Resource Estimate and metal equivalents.



A globally recognised name in exploration – a team with a track record of **finding mines and rewarding shareholders**



**High-performance, results driven culture** (mine finding + commercial DNA)



**Our purpose** – to find the metals needed to decarbonise the world



**Our aspiration** – to create a world class, multi-district green metals province



# Julimar

## A major new polymetallic critical minerals project in WA

A remarkable new greenfield discovery in 2020, now a tier-1 scale Resource:

350Mt @ ~0.58% NiEq or ~1.8g/t PdEq<sup>1</sup> (~70% Indicated / ~30% Inferred):



11Moz 3E<sup>2</sup>

560kt Ni

360kt Cu

54kt Co

contained

equivalent to ~2.0Mt NiEq or ~20Moz PdEq

Including a higher-grade (>0.6% NiEq OP + UG) sulphide component which will grow:

82Mt @ ~1.0% NiEq or ~2.9g/t PdEq, extending from 30m to 700m+ (open)



A **strategic, large-scale** Resource with rare mix of critical minerals in sulphide mineralogy



Green metals at Julimar are **essential for decarbonisation** technologies like batteries, electric vehicles and hydrogen



**100% owned by Chalice**, and located in one of the **world's most attractive mining jurisdictions**



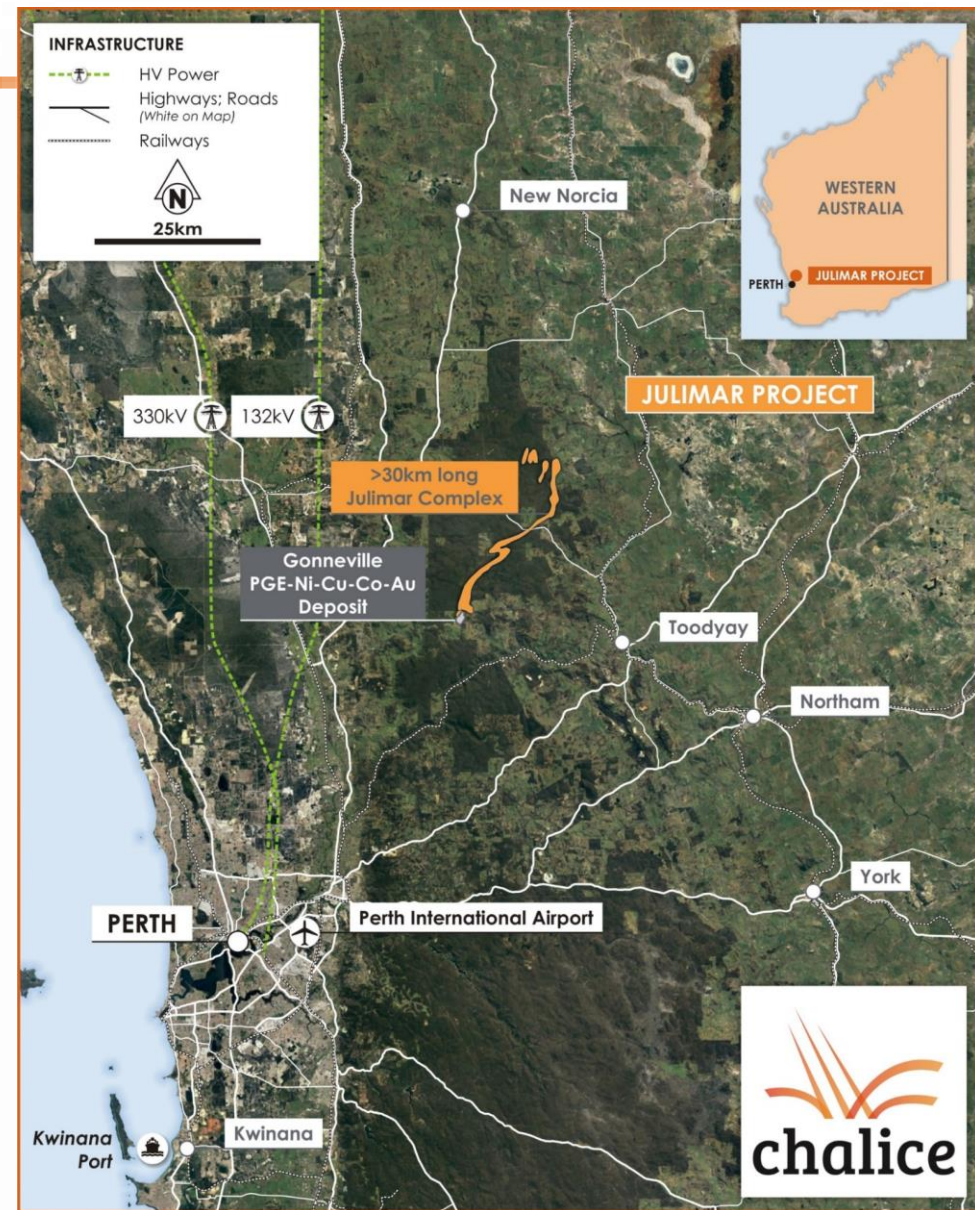
**Strategy** to explore and develop in parallel; strategic minority JV partnerships considered for funding/technical support



Direct access to **major highway, rail, power, port infrastructure** as well as a **large local workforce**



**Exploration upside** – ~2km of new >30km long intrusive Complex drilled-out to date



<sup>1</sup> Refer to full Mineral Resource Statement in Appendix

<sup>2</sup> 3E = Palladium (Pd) + Platinum (Pt) + Gold (Au)

# Julimar is capturing attention as a **strategic asset** for Australia and the western world, given its rare palladium-nickel-cobalt content



Julimar is the **first major PGE discovery in Australia** and one of the few recent large-scale Ni-Cu-PGE discoveries in the western world



**Pd, Pt, Ni and Co** are classified as '**critical minerals**' by most western governments



The western world is **extremely reliant** on **Russian Palladium supply** (~40% of global supply)



Strategically located in one of the **world's most stable mining jurisdictions** and driven by a commitment to sustainable development

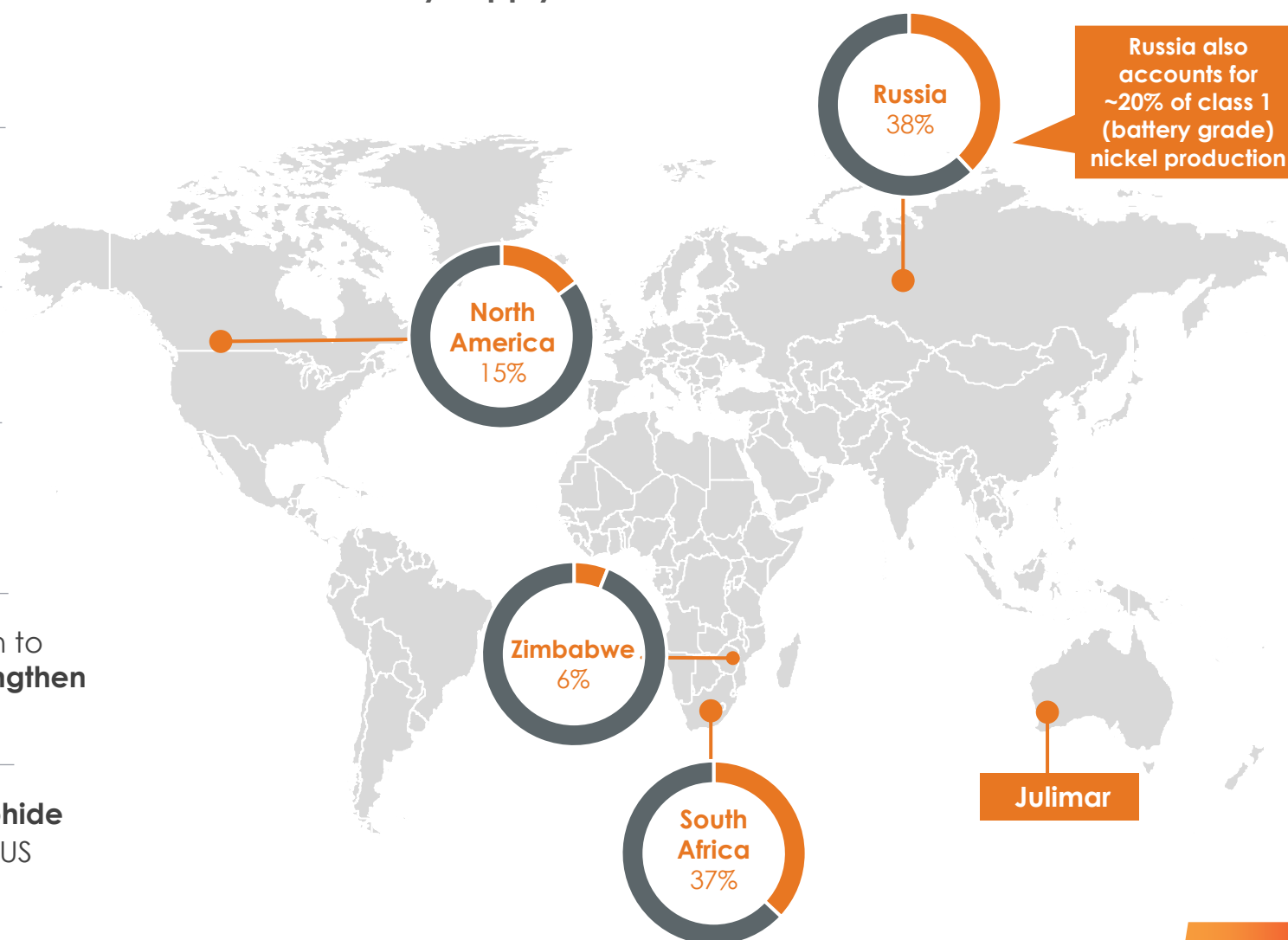


The Australian Government has committed >\$1 billion to **accelerate strategically significant projects** and **strengthen** internal critical mineral **security and supply chains**<sup>(1)</sup>



**Strategic partner** interest in **Julimar's large nickel sulphide endowment** has increased significantly following the US Inflation Reduction Act (IRA)

## Global Palladium Primary Supply Market Share



Source: 'Provision of PGM market intelligence and long-term metal price forecasts' SFA Oxford, March 2021

(1) '2022 Critical Minerals Strategy' Department of Industry, Science, Energy and Resources, Australian Government, March 2022

# The growing battery industry needs new, large scale and sustainable sources of battery-grade nickel – **a unique opportunity for Julimar**



Battery-grade nickel consumers forecast to become heavily reliant on supply sources that **do not meet sustainability standards**, i.e. NPI



With **560kt of contained nickel** and growing, Julimar has the potential to become a globally significant source of class 1 nickel, which has a much lower carbon footprint than other sources

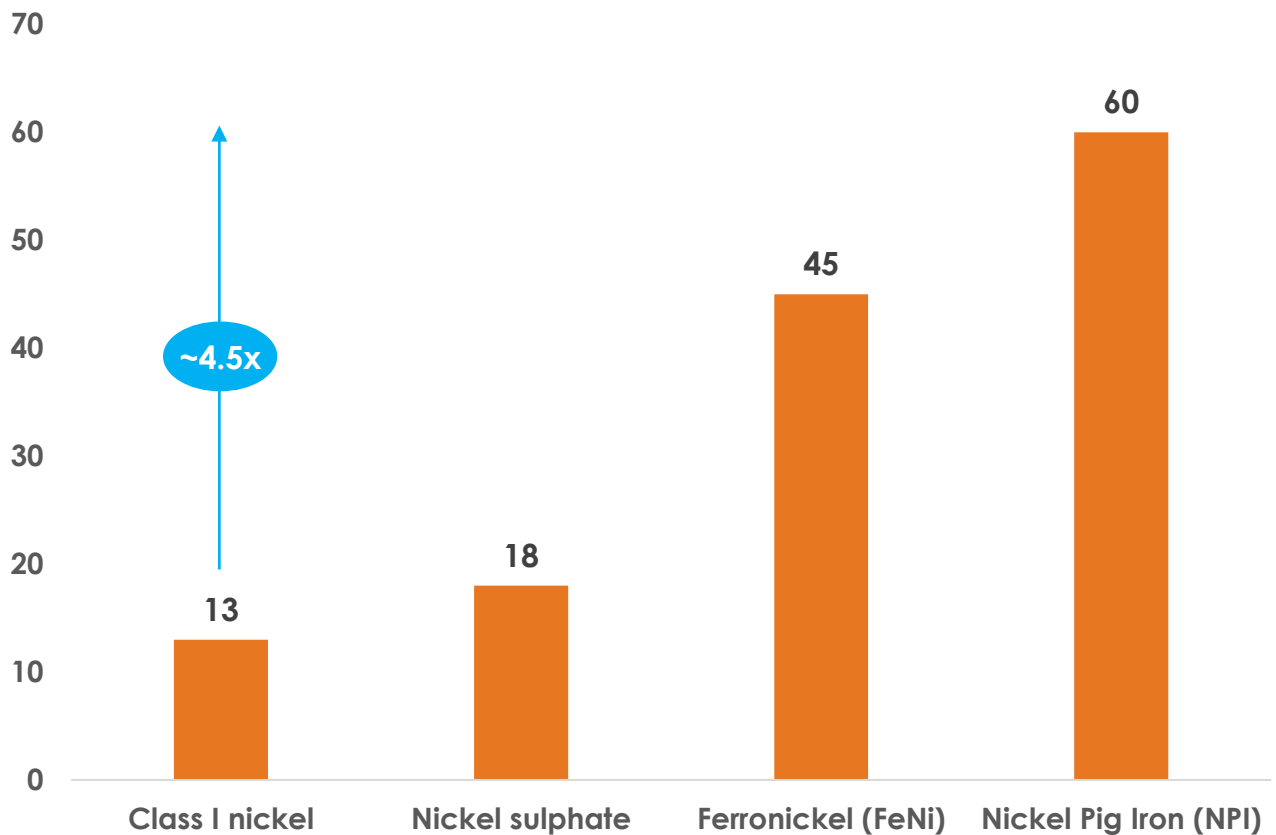


Julimar's proximity to WA's **world class power grid and infrastructure** make it uniquely positioned to deliver low carbon intensity metals



Class 1 nickel sources are likely to **demand a premium**, driven by the need to comply with emissions targets and to satisfy increasing sensitivity to sustainability standards

Estimated avg carbon intensity of nickel sources (kgCO<sub>2</sub> eq. per kg Ni)



Chalice is committed to **strong environmental stewardship** and has a unique opportunity at Julimar to demonstrate this



**Leading practice low-impact exploration**

- Strictly governed by a Conservation Management Plan, according to industry best practice
- Low impact track mounted rigs with a small footprint and no mechanised clearing of vegetation
- Flora, fauna and cultural heritage monitoring is conducted prior to each site mobilisation



**Science-based environmental management**

- Comprehensive baseline environmental surveys across 6,000ha; covering flora, fauna, and dieback
- Baseline water studies underway; Chalice recognises water is a shared resource



**Environmental resilience**

- Effectively managing biodiversity, rehabilitation and closure is part of our commitment to responsible mining and future operations



**Julimar Project Biodiversity Goal**

To ensure science-based **no net loss** of species or habitat diversity as a result of our operations

**Delivering the Biodiversity Strategy**

A detailed implementation plan will be developed over the coming 12 months



**Connectivity**

Establish ecological corridors



**Restoration**

Implement restoration initiatives that address habitat fragmentation



**Regeneration**

Improve carbon sequestration



# The Julimar Project has the potential to deliver **significant benefits** for the local community and wider region



Chalice has **engaged early, actively and transparently** to build respectful and collaborative relationships with stakeholders

Chalice is committed to achieving **lasting social and economic benefits** for the communities in which we operate

Julimar could deliver **jobs, skills and economic diversification** to the Wheatbelt region of WA



**Distribution of information to our host communities** – Regular Community Newsletter, local advertising, information sheets and meetings



**~\$1.2M local procurement and investment contributed by Chalice, plus ~\$1.5M spend by direct contractors** in the local shires surrounding the Julimar Project (FY22)



**Long-term major economic contribution for WA and nationally** direct boost to Australia's GDP, additional revenue through payroll taxation and mineral royalties



**Dedicated Julimar Project Pop-Up Office** – A community hub for questions and information and an opportunity to engage direct with our team



Developing the framework for a future **Community Development Fund**, designed to deliver significant long term benefits to local communities



**Potential to create hundreds of new jobs for the Wheatbelt and outer-Perth**, plus boost adjacent sectors



**Prioritised local employment** with **~22%** of current workforce locally based near Julimar (as at 30-June-22)



A clear pathway for strong stakeholder engagement at every stage through our targeted **Community Engagement Strategy**

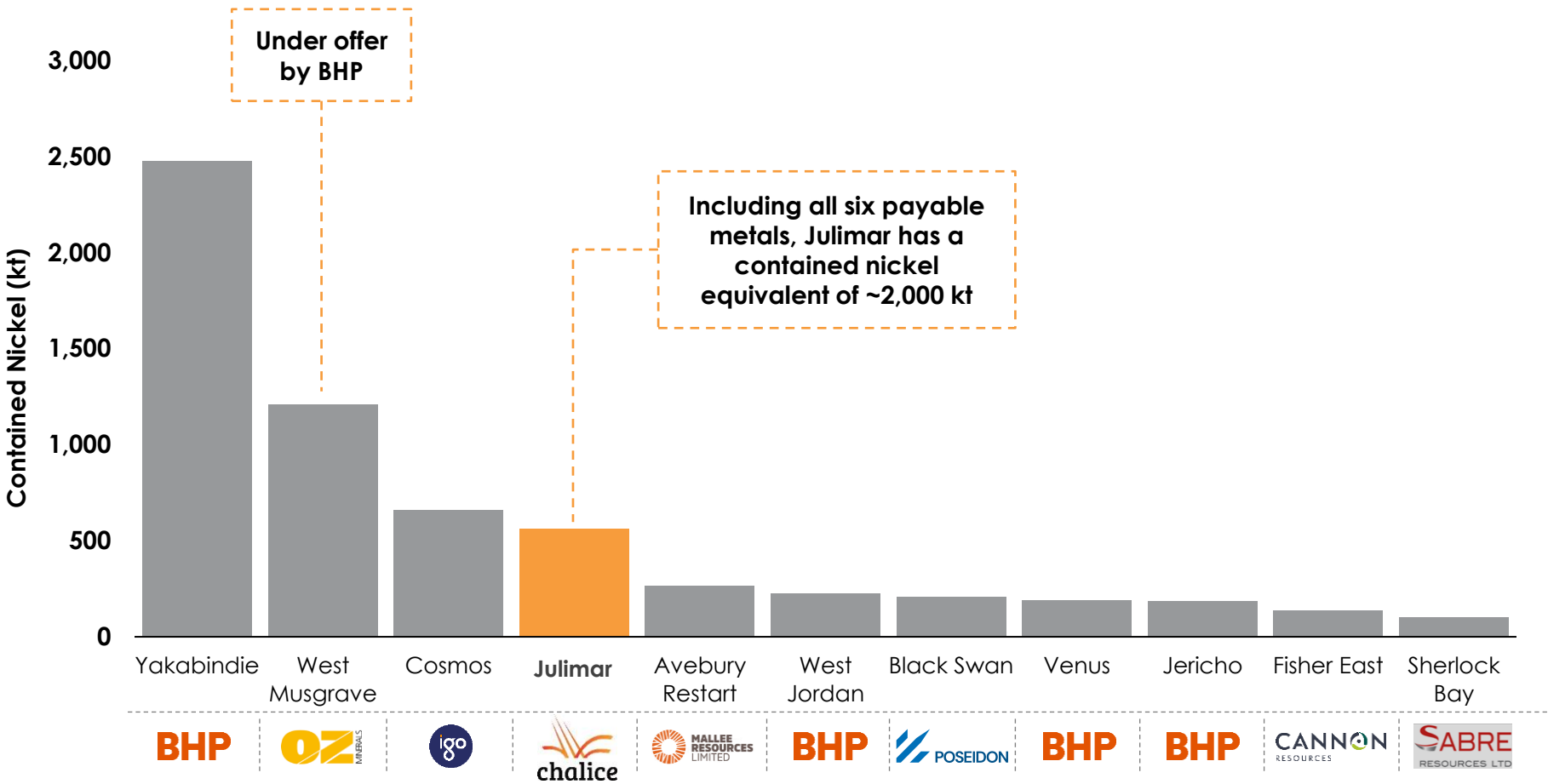


**Attractive semi-rural setting lifestyle or Drive-in-Drive-Out** commute, with increased real wages contributing directly to the regional economy

Julimar has the **fourth largest** undeveloped nickel sulphide resource in Australia and has significant PGE-Cu-Co credits



Australian primary nickel sulphide resources in exploration or development <sup>1</sup>

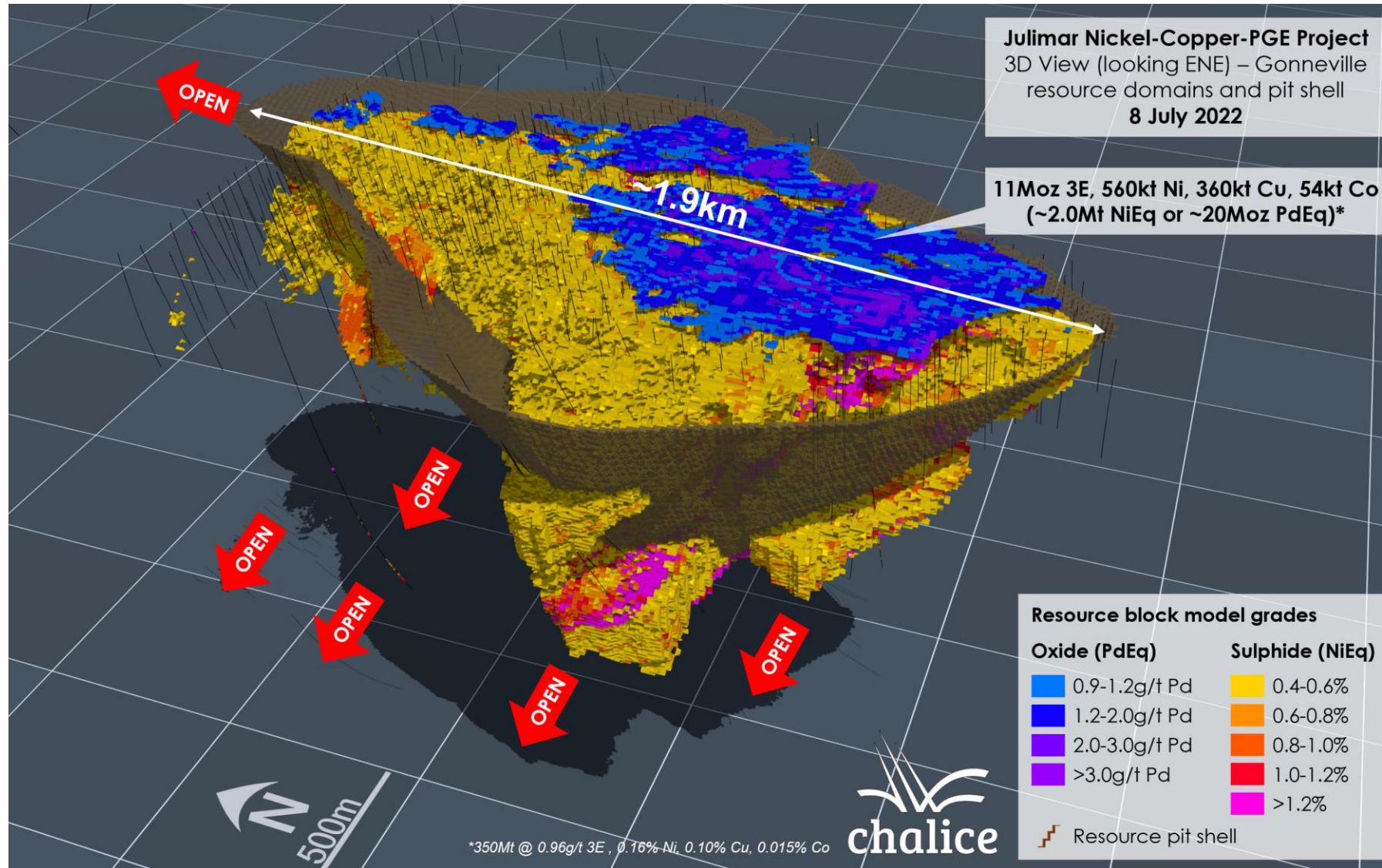


Source: Company filings.  
1: Based on total reported JORC Resource (Measured, Indicated, and Inferred). Includes all exploration and development projects with a contained Ni resource of over 99kt. Please refer to Appendix [Australian Primary Nickel Sulphide Resources slide] for peer comparison information; [Gonneville Mineral Resource Estimate slide] and [Metal equivalent assumptions slide] for the assumptions used for the calculation of metal equivalents.

The **tier-1 scale, near-surface Resource** has high-grade optionality and compelling growth potential



### 3D view (looking ENE) of Gonneville Resource domains and pit shell

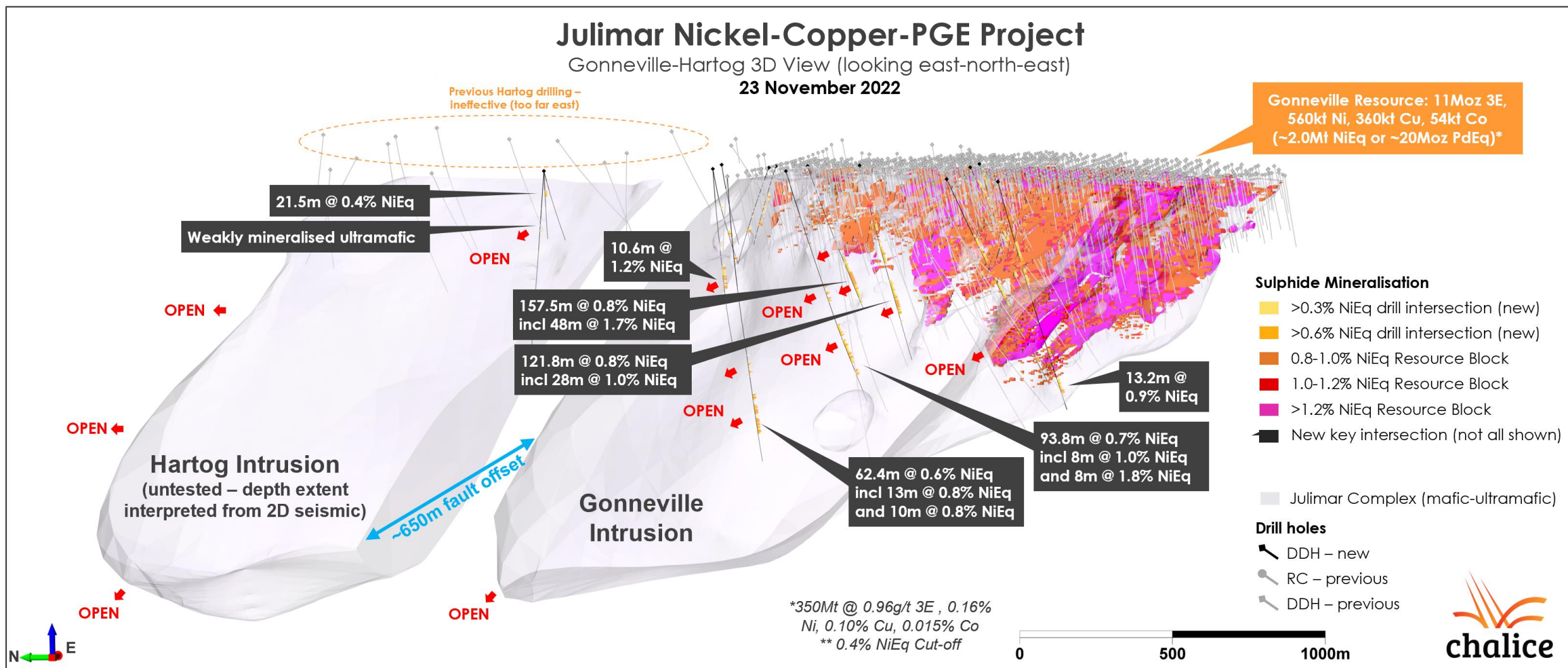


### Updated Indicated and Inferred Mineral Resource Estimate<sup>1</sup>:

- **350Mt** @ 0.96g/t Pd+Pt+Au (3E), 0.16% Ni, 0.10% Cu, 0.015% Co (~**0.58% NiEq** or ~**1.8g/t PdEq**)
- **11Moz 3E, 560kt Ni, 360kt Cu** and **54kt Co** contained
- Equivalent to ~**2.0Mt NiEq** or ~**20Moz PdEq** contained
- Resource is defined to depth of ~700m, open to the north and at depth

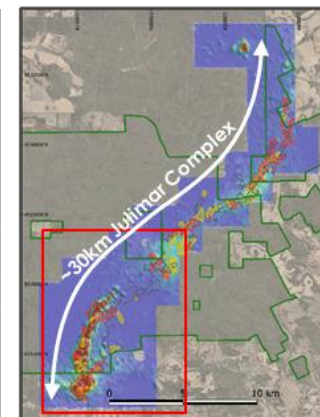
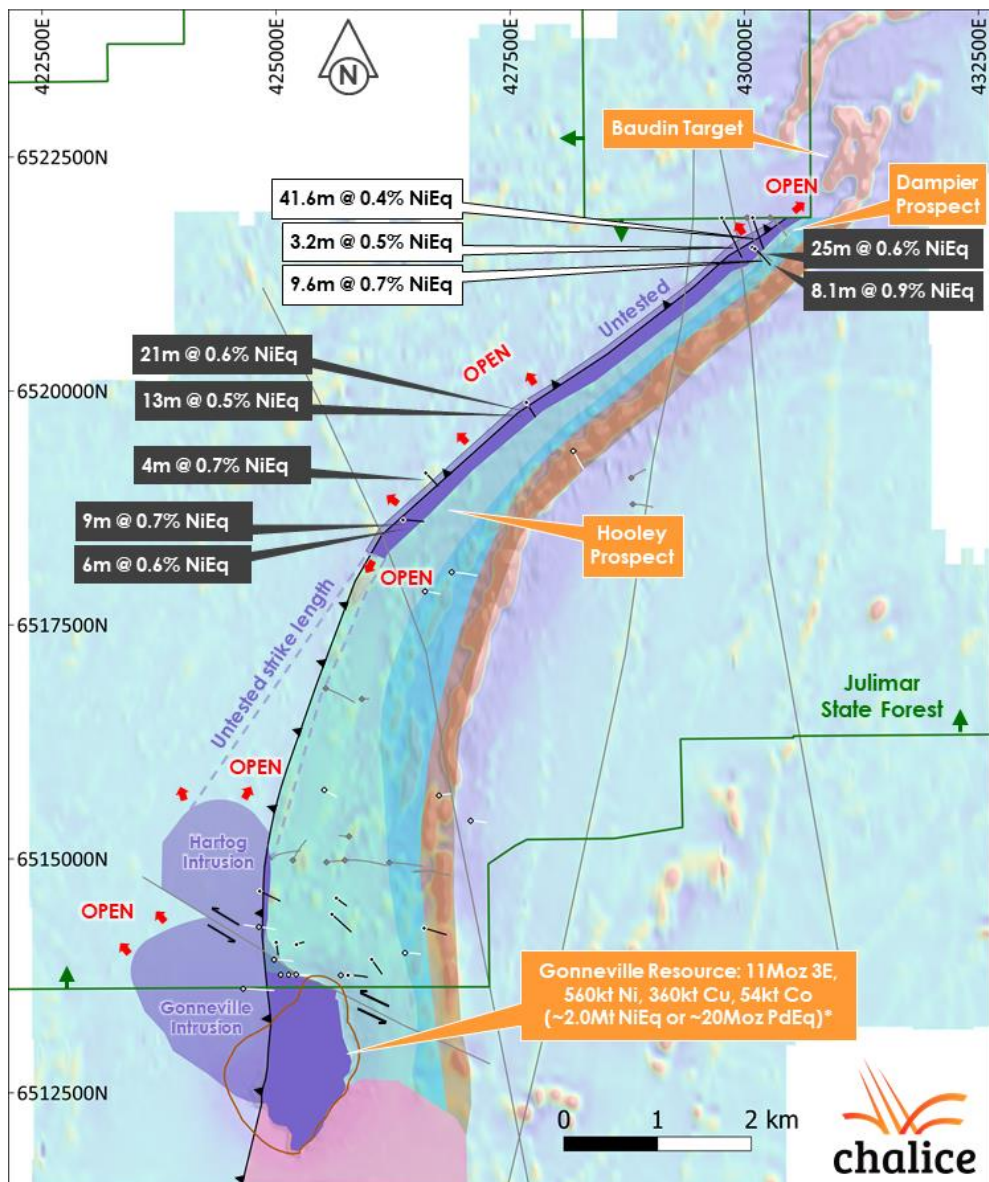
<sup>1</sup> Refer to full Mineral Resource Statement in Appendix

The growth potential at Gonneville was highlighted by recent **outstanding wide, high-grade intersections** at the northern end of the deposit



The initial results at Hartog from restricted drill sites have confirmed **Gonneville-like sulphide mineralisation** in this fault-offset extension of the Julimar Complex – further wide-spaced step-out drilling to commence in the coming weeks

Sulphide mineralisation has been intersected in **every hole drilled** into the Julimar Complex thus far, over a strike length of ~10km



- State Forest boundary
- DDH – New
- DDH – Previous
- DDH – Assays pending
- Gonneville Resource pit crest
- New intersection (excl. Gville)
- Previous intersection

- Geology Interpretation**
- Julimar Complex (at surface)
  - Julimar Complex (at depth)
  - Greenstone Sequence
  - Other Mafic-Ultramafic
  - Banded Iron Formation
  - Granite
  - Hanging Wall Structure
  - Other Structures

\*350Mt @ 0.96g/t 3E, 0.16% Ni, 0.10% Cu, 0.015% Co

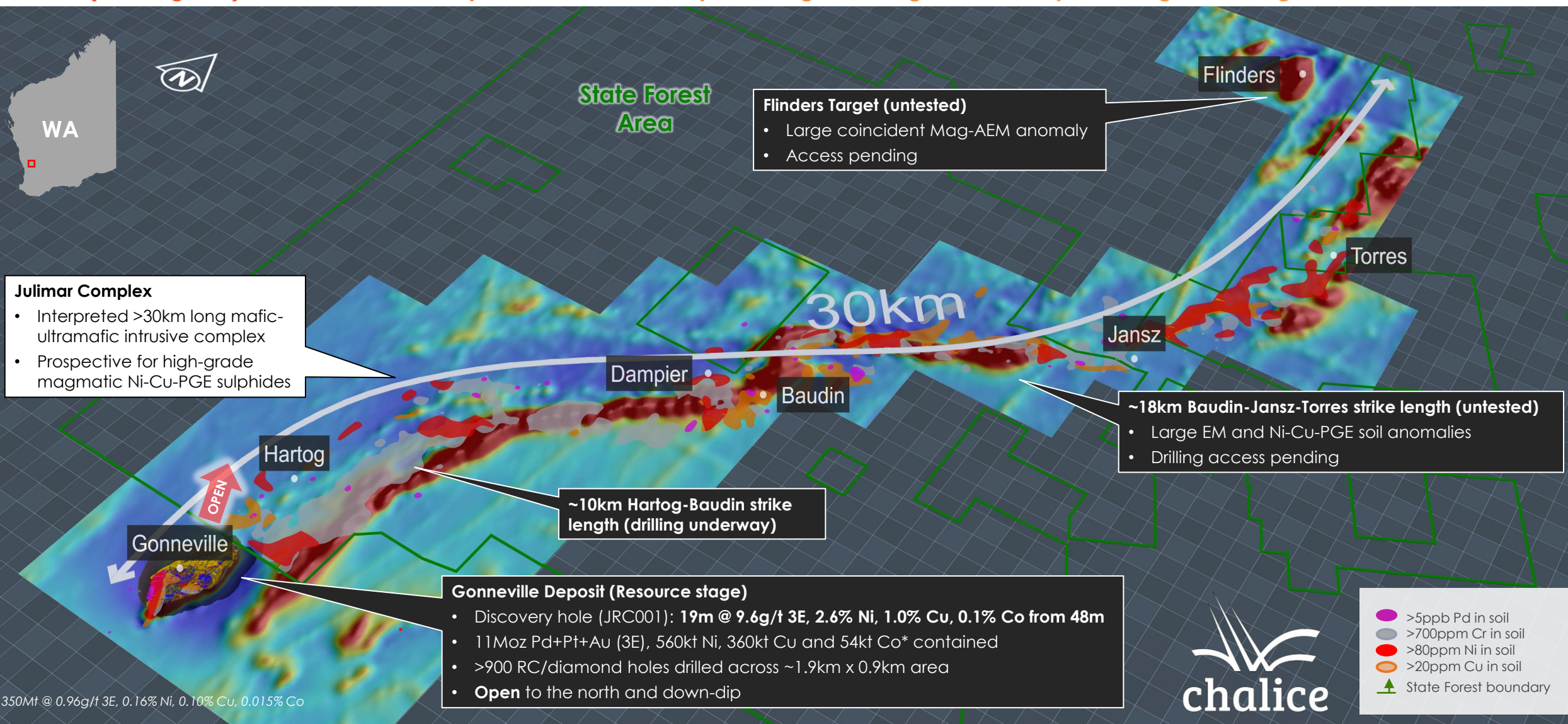
**Julimar Nickel-Copper-PGE Project**  
 South Julimar Complex Plan View – Drill holes, geology, over magnetics (TMI-RTP)  
 19 October 2022

- Drilling **6-10km** further north of Gonneville has intersected a Gonneville-type ultramafic horizon over **~5.5km of strike length**
- All holes to date have intersected highly encouraging evidence of **magmatic sulphides** → Julimar is a very extensive mineral system, potentially **capable of delivering multiple discoveries**
- 2D seismic and drilling to date supports interpretation of Julimar having a rare chonolith-like geometry, similar to other major mineral systems like **Norilsk-Talnakh** (Russia) and **Jinchuan** (China)
- Drilling along the Complex continues with **6 rigs**
- Access discussions underway for next phase of exploration along Hartog-Baudin trend
- Targeted exploration** will continue in parallel to development studies for a potential mine at Gonneville on Chalice-owned farmland

The Resource occupies just ~2km of the **>30km long Julimar Complex** – the upside to the north has the potential to transform the project



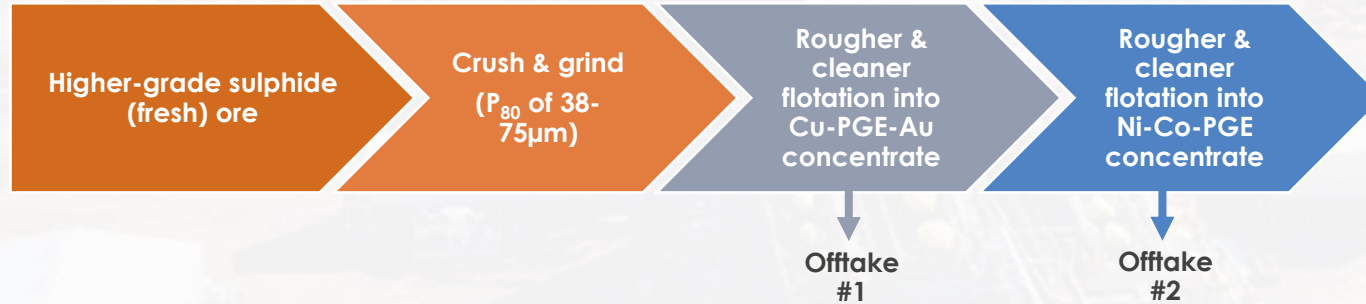
### 3D view (looking NW) of the Julimar Complex, Gonneville Deposit, targets, soil geochemistry over regional magnetics



# Two processing options are under evaluation in the ongoing Scoping Study – selective Cu/Ni flotation or Cu flotation + Ni enrichment

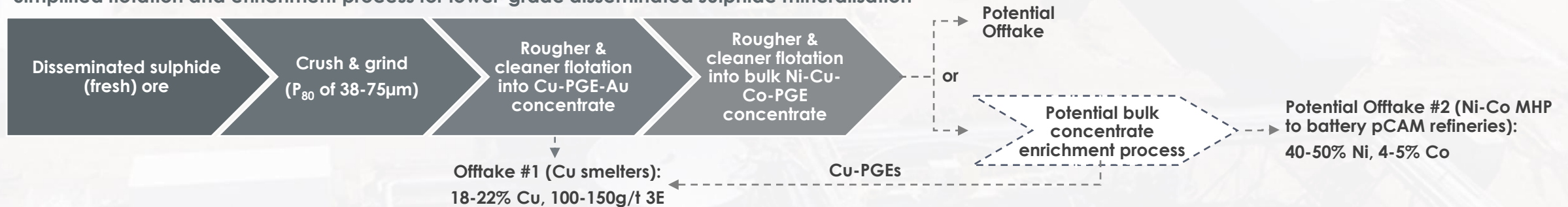


## Simplified sequential flotation process for higher-grade sulphide mineralisation



- Preliminary testwork to date on 15 sulphide composite samples from several geological domains (including higher-grade and lower-grade samples), demonstrates potential to produce **two commercially attractive concentrates** for sale from higher-grade sulphide material, with low levels of potentially deleterious elements
- Variability testwork, mineralogical investigations and flotation optimisation **work continues on the nickel-cobalt-PGE concentrate**

## Simplified flotation and enrichment process for lower-grade disseminated sulphide mineralisation



Metal	Predicted metallurgical recovery range min-avg <sup>1</sup> -max (%)
Palladium (~75%/25% into Cu/Ni conc)	55-67-90
Platinum (~25%/75% into Cu/Ni conc)	55-68-90
Gold (to Cu conc)	30-62-65
Nickel (to Ni conc / MHP)	40-55-80
Copper (to Cu conc)	88-92-95
Cobalt <sup>2</sup> (to Ni conc / MHP)	40-55-80

- Copper and PGE recoveries are robust at lower grades, however more work is underway to optimise flotation recovery of nickel and cobalt (and corresponding PGEs which report to the nickel concentrate)
- Several processing alternatives to enrich bulk Ni-Cu-Co-PGE concentrate being investigated in order to maximise recovery and payability, and potentially sell nickel-cobalt intermediate product direct to battery pCAM manufacturers
- \$2.9M CRC-P grant** from Commonwealth Govt to evaluate these 'midstream' processing options

<sup>1</sup> Average recovery based on average resource grades at >0.6% NiEq cut-off for sulphide (fresh) domain

<sup>2</sup> Cobalt is associated with nickel and hence recoveries reflect the nickel grade

# Initial drilling along the Julimar Complex and the Scoping Study for an potential mine at Gonneville represent **significant upcoming milestones**



Chalice has **consistently delivered** since the Julimar discovery in early 2020

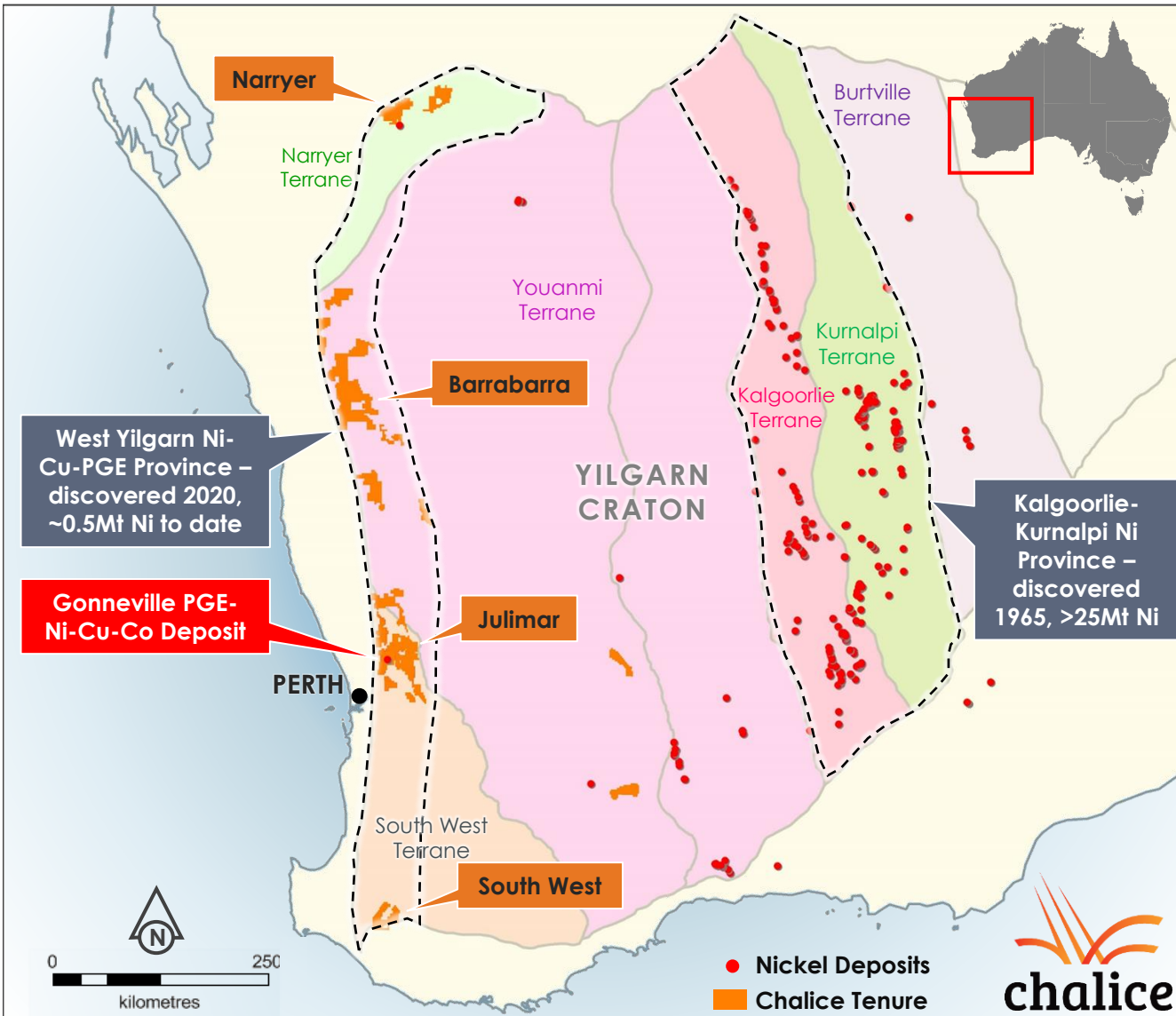
We are rapidly advancing Gonneville **towards mine development...**



... while completing first pass exploration in the new West Yilgarn Province and exploring **strategic partnering options**

<sup>1</sup> Refer to full Mineral Resource Statement in Appendix. Timeline is indicative and subject to exploration and study outcomes.

# The Julimar discovery has kick-started the new West Yilgarn Ni-Cu-PGE Province, which could deliver **more major critical mineral discoveries**



- Many of the **'giant' ortho-magmatic nickel-copper-PGE sulphide** deposits such as Norilsk, Jinchuan, Thompson and Voisey's Bay are located proximal to the margin of cratons
  - In WA, the eastern Yilgarn (Archean craton) hosts several world-class nickel sulphide deposits with over **25Mt of Ni** discovered since 1965
  - ~1,200km long western margin of the Yilgarn presents a **similar geological setting, but is almost entirely unexplored**
  - Chalice made the first major ortho-magmatic Ni-Cu-PGE discovery in the region (Julimar), subsequently staking **>8,000km<sup>2</sup>**
  - Chalice has **'first mover' advantage** in this exciting new province – strong potential to deliver more major Ni-Cu-PGE discoveries
- 
- **Hundreds of potential host intrusions** already identified in our area – **AI assisted screening and prioritisation underway**
  - Rapid, low-cost exploration approach being used – EM, soil/auger sampling and shallow reconnaissance drilling
  - Potential for **highly variable** mineralisation styles (Ni:Cu:PGE metal ratios) across the province
  - **The prize is significant – i.e. Julimar discovery zone massive sulphides grading c. 3.2% Ni, 1.2% Cu, 10g/t 3E**



## Highlights



New world class, **strategic, 'green metals' Resource** in Western Australia – a 'once in a generation' discovery



**Significant exploration upside** at Julimar and in the new West Yilgarn Ni-Cu-PGE Province – targeting more shallow high-grade sulphides



**High performance, well funded team** with an excellent track record





Appendix



## Board of Directors



### **Derek La Ferla, Chairman**

- Highly regarded ASX200 chair and company director with 30+ years experience as a corporate lawyer
- Chair of Poseidon Nickel and formerly Chair of Sandfire Resources



### **Alex Dorsch, Managing Director and Chief Executive Officer**

- Diverse experience in consulting, engineering and corporate advisory in the energy and resources sectors
- Previously a Specialist consultant with McKinsey & Company



### **Morgan Ball, Non-Exec Director**

- Chartered Accountant with 25+ years experience in the resources, logistics and finance industries
- Formerly CFO of Northern Star Resources and Saracen Mineral Holdings



### **Garret Dixon, Non-Exec Director**

- 30+ years experience in resources and mining contracting sectors
- Formerly Executive VP Alcoa & President Bauxite



### **Stephen McIntosh, Non-Exec Director**

- Highly regarded mining executive with 30+ years experience in exploration, major project studies and execution
- Formerly Group Executive and Head of Exploration & Development Projects at Rio Tinto



### **Linda Kenyon, Non-Exec Director**

- Corporate lawyer and senior executive with 30+ years experience
- Formerly Company Secretary and member of Executive Leadership Team at Wesfarmers



### **Jo Gaines, Non-Exec Director**

- Extensive experience in intergovernmental negotiations and stakeholder engagement
- Chair of the Government Employees Superannuation Board (GESB) and a Director of Development WA

## Management



### **Richard Hacker, CFO**

- Chartered Accountant with 20+ years experience in junior company financing, corporate and commercial management
- Company CFO since 2006



### **Dr Kevin Frost, GM Discovery & Growth**

- Co-recipient of AMEC's Prospector of the Year Award in 2009 for the discovery of the Spotted Quoll nickel sulphide deposit in WA (Western Areas)



### **Bruce Kendall, GM Exploration**

- Co-recipient of AMEC's Prospector of the Year Award in 2012 for the discovery of the world-class Tropicana gold deposit in WA (AngloGold Ashanti)



### **Dr Soolim Carney, GM Environment and Community**

- Environment, health and safety, indigenous affairs, govt relations and community specialist with 20+ years experience
- Former Regional Environment Manager for Alcoa Australia



### **Michael Elias, Study Manager – Julimar**

- Study Director with 30+ years experience in mining sector
- Specialist in study management, project development and management consulting



### **Chris MacKinnon, Business Development and Legal Manager**

- 15 years experience as a corporate lawyer and finance advisor in the resources industry

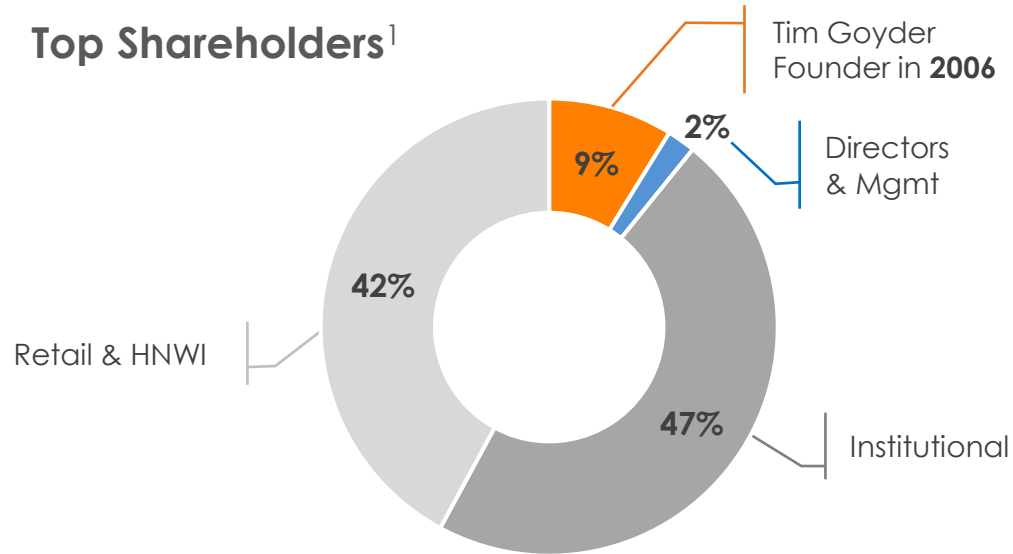


### **Jamie Armes, Company Secretary**

- Chartered Accountant with 20+ years experience within the accounting profession and administration of public listed companies in the mining and exploration industry

# Corporate Snapshot

## Top Shareholders<sup>1</sup>



### Board of Directors

Derek La Ferla (Chairman)  
 Alex Dorsch (MD & CEO)  
 Morgan Ball (NED)  
 Garret Dixon (NED)  
 Stephen McIntosh (NED)  
 Linda Kenyon (NED)  
 Jo Gaines (NED)

### Management

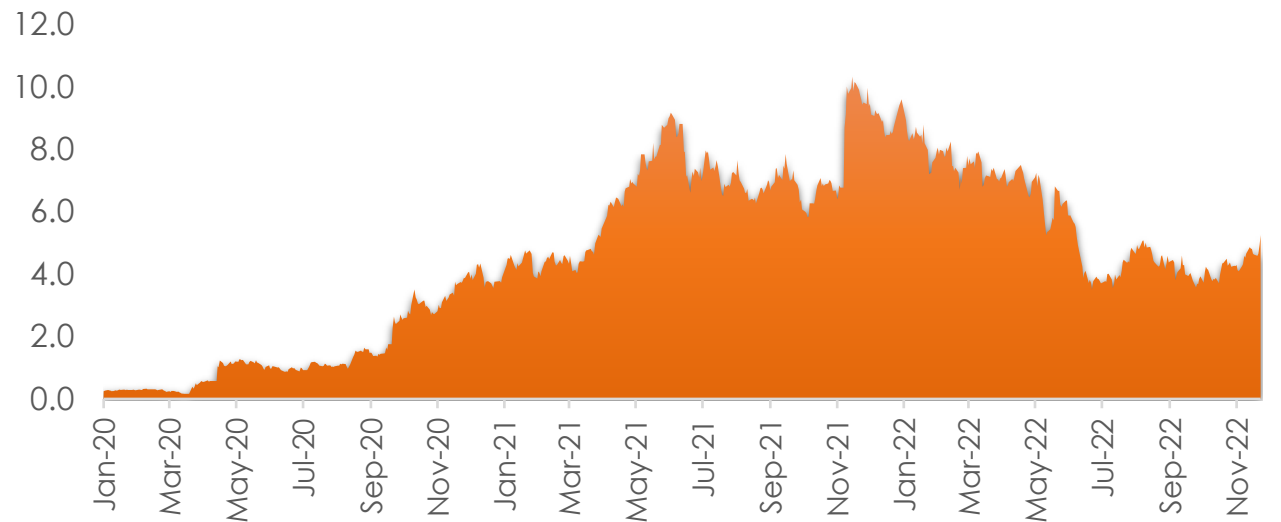
Richard Hacker (CFO)  
 Kevin Frost (GM Discovery & Growth)  
 Bruce Kendall (GM Exploration)  
 Soo Carney (GM Env and Comm)  
 Michael Elias (Study Mgr – Julimar)  
 Chris MacKinnon (BD and Legal Mgr)  
 Jamie Armes (Co Sec)

<sup>1</sup> As of 31 October 2022

## Capital Structure and Financials

<b>Equity listings</b> ASX: CHN OTCQB: CGMLF	Shares out. 376M Shares (F/D) 381M	<b>Market capitalisation</b> ~A\$1.9Bn (@ A\$5.25ps) <sup>3</sup>
<b>Debt</b> nil	<b>Cash<sup>2</sup></b> ~A\$115M	<b>Cash &amp; Investments<sup>2</sup></b> ~A\$120M

## ASX:CHN (A\$/share)

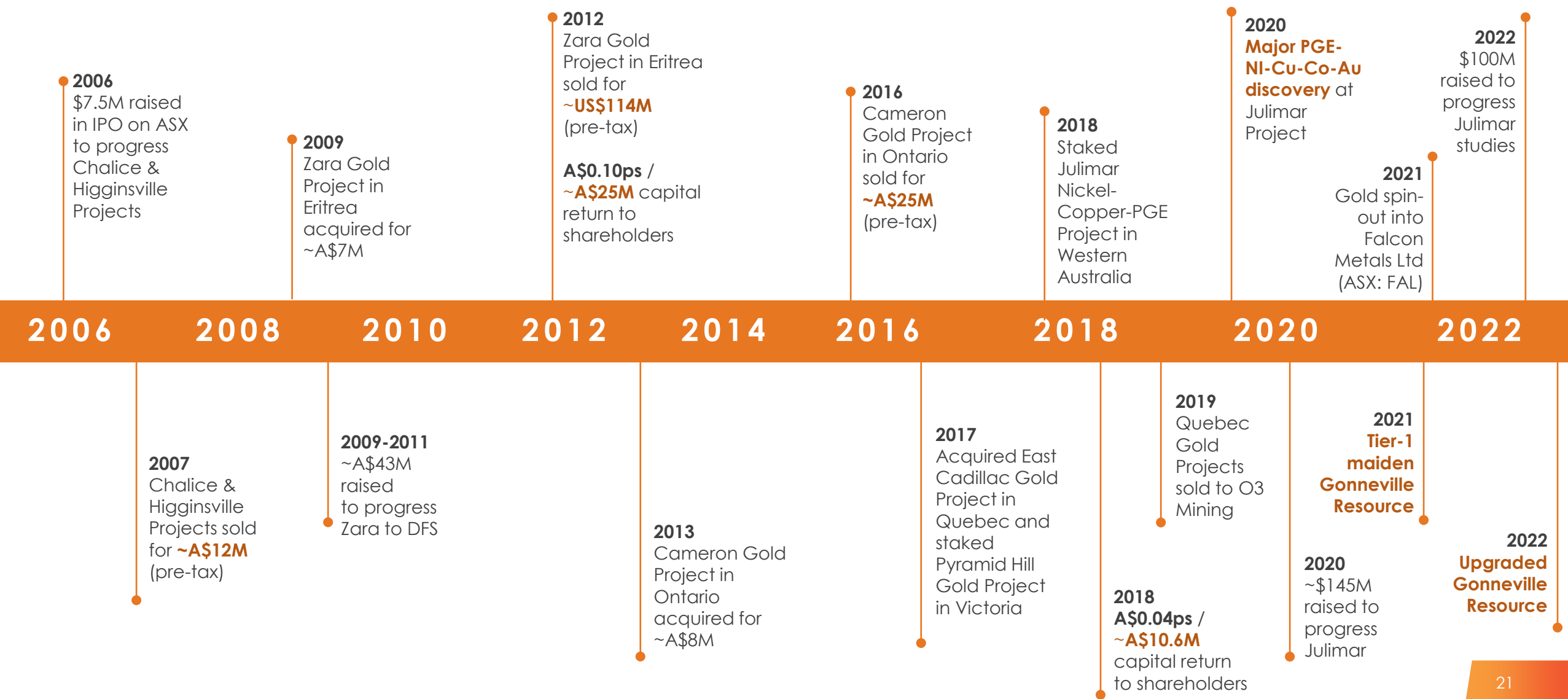


## Research Analyst Coverage

Bell Potter	David Coates
J.P. Morgan	Al Harvey
Jefferies	Mitch Ryan
Macquarie Bank	Hayden Bairstow

<sup>2</sup> As of 30 Sept 2022; <sup>3</sup> As at 24 Nov 2022

Since our 2006 IPO, we have acquired quality assets, advanced projects quickly and generated **exceptional returns**



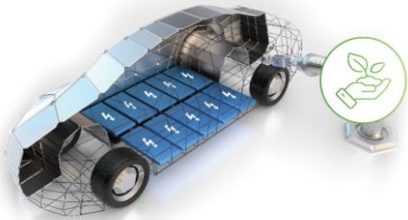
# Chalice is building a world-class 'green metals' portfolio in **Australia**



## Platinum and Palladium

Rare metals used in catalytic converters – a pollution control device which is in every petrol, diesel or hybrid vehicle. Palladium reduces greenhouse gas emissions from exhaust streams, including nitrogen oxides which are 300x more potent than CO<sub>2</sub> as a greenhouse gas. These metals also have a future role to play in green hydrogen technologies.

Palladium market in deficit with supply dominated by Russia. Platinum supply dominated by South Africa.



## Nickel and Cobalt

Both nickel and cobalt are key materials required in batteries for electric vehicles (EV).

EV-driven nickel demand is forecast to increase 19x by 2040, and a lack of new nickel-sulphide discoveries worldwide in recent years has created a significant forecast supply shortage.



## Copper

Used extensively in the green energy industry including solar, hydro, nuclear, and geothermal energy, as well as EV and battery technologies.

The copper market is forecast to remain in deficit until 2026, again with a lack of new large-scale discoveries worldwide.

Source: Johnson Matthey PGM Market Report 2021; IEA "The Role of Critical World Energy Outlook Special Report Minerals in Clean Energy Transitions" March 2022; S&P Global Commodity Quarterly: Copper Q4 2021



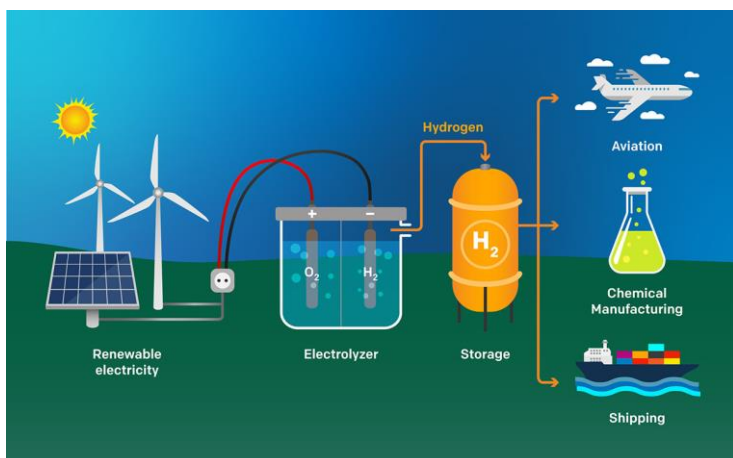
These metals are needed to **decarbonise the global economy and address climate change**

# Platinum and Palladium are essential in every stage of the hydrogen value chain, a critical solution to **achieving net-zero carbon emissions**



## Production

Green hydrogen produced by electrolysis of water using renewable energy (wind, solar, hydro)



**PGEs are essential catalysts in the Proton Exchange Membrane (PEM) Electrolyser**

## Transport and Storage

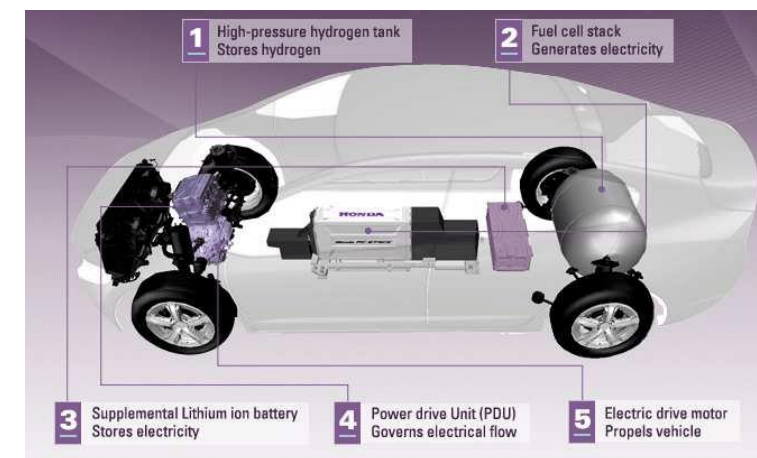
Long-term storage and transport of green hydrogen likely to be achieved using liquified ammonia (NH<sub>3</sub>) as carrier



**Pd is an essential catalyst in hydrogen-ammonia conversion and purification**

## Utilisation

Green hydrogen ideal for use in green steel and Fuel Cell Electric Vehicles (FCEVs), likely to be the dominant technology for heavy transport such as trucks, trains and ships



**PGEs are essential catalysts in most hydrogen fuel cell designs**

# The rapidly growing and increasingly adopted hydrogen economy has the potential to **underpin long term PGE demand**



Current **primary supply of Pt and Pd is ~16Moz p.a.** Pd is in prolonged deficit while Pt in surplus



Our view is that with **conservative hydrogen adoption**, demand for Pt and Pd from hydrogen could be as high as **~8Moz p.a.<sup>(1)</sup>**

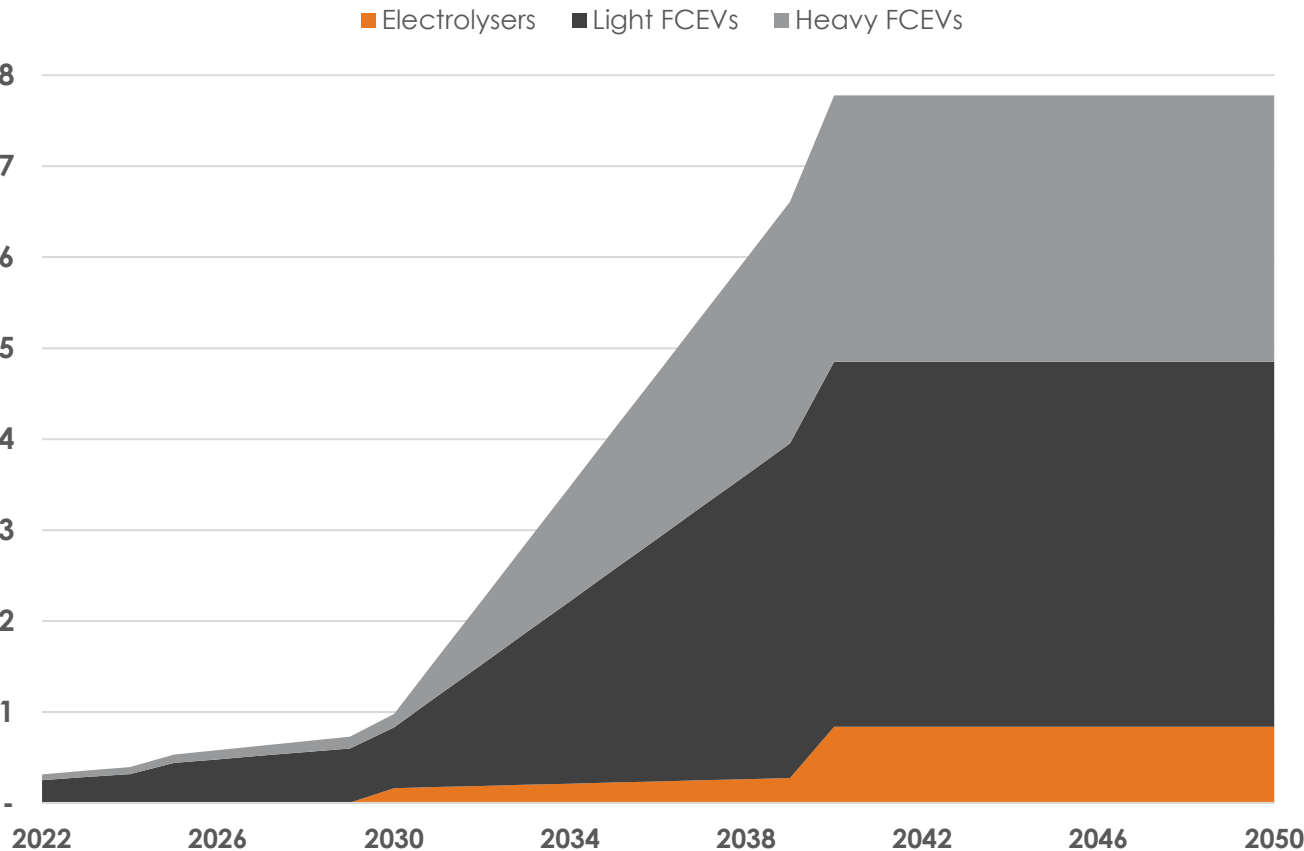


A modest hydrogen adoption scenario includes **~10% share** of light vehicle market, **~40% share** of heavy vehicle market, and **50-70GW** of electrolyser capacity by 2040



Projections do not include PGE usage from hydrogen applications in **shipping, aviation, industrial or steel manufacturing**

Estimated Annual Pt and Pd Demand from Hydrogen (Moz)



**(1) Cautionary statement:** The forward-looking statements have been estimated by Chalice using assumptions that have been informed by third party research. These statements are based on an assessment of economic and operating conditions and on various assumptions regarding future events and actions that, as at the date of this presentation, are considered reasonable by Chalice. Refer to "Long Term PGE Demand Forecast" slide in Appendix for additional information regarding the underlying assumptions and calculation methodology, and Slide 2 for a statement regarding the risks involved in forward-looking statements of this nature. Without limiting these risks, such forward-looking statements are predictive in character, may be affected by incorrect assumptions or by known or unknown risks and uncertainties, and may differ materially in due course. Investors are therefore cautioned against attributing undue certainty to forward-looking statements, including those outlined above.



# Long term PGE demand forecast: supporting assumptions & calculations

The long term PGE demand impact from the Hydrogen economy have been generated by Company analysis using assumptions and forecasts that have been informed by recent third party research. The assumptions used below relate to the year 2040. Note: There is the potential risk that these projections will not be achieved should the adoption of a hydrogen economy be less than expected or if major technological developments reduce the PGE loadings required for electrolyzers and fuel cells.

## Key Model Inputs (2040)

Technology	Input	Unit	Assumption	PGE Demand Calculation
PEM electrolyser	Capacity	GW	70	$70 \times 75\% \times 0.5 / 31.1^{(1)} = \sim 0.8\text{Moz}$
	Market share	%	75	
	PGE loading	g/kW	0.5	
Light Vehicles	Light vehicle market	million per annum	100	$100 \times 12\% \times 80 \times 0.13 / 31.1^{(1)} = \sim 4.0\text{ Moz}$
	Light FCEV market share	%	12	
	Light vehicle rating	kW	80	
	PGE loading	g/kW	0.13	
Heavy Vehicles	Heavy vehicle market	million per annum	7	$7 \times 40\% \times 250 \times 0.13 / 31.1^{(1)} = \sim 2.9\text{ Moz}$
	Heavy FCEV market share	%	40	
	Heavy vehicle rating	kW	250	
	PGE loading	g/kW	0.13	

Source: 'Provision of PGM market intelligence and long-term metal price forecasts', SFA Oxford, April 2020 & 2021

'Strategy Update', AngloAmerican Platinum, 22 February 2021

'Australian and Global Hydrogen Demand Growth Scenario Analysis', Deloitte & COAG Energy Council, November 2019

'Fuelling the Future of Mobility' Deloitte & Ballard, 2020

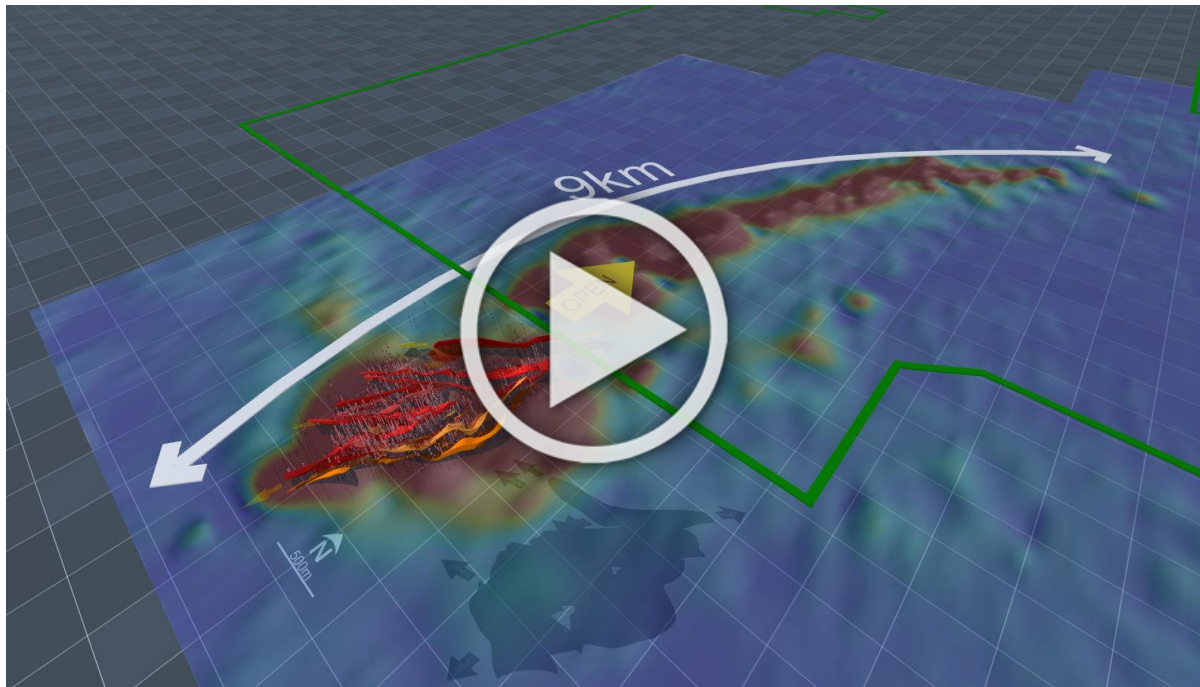
'Committed to producing green metals', Green Metals & Hydrogen Conference, Sibanye Stillwater, 26 Nov 2021

(1) Calculations use a grams to ounce conversion ratio of 31.1.

## Interactive 3D Model & Video: Take a tour of our globally significant Julimar Ni-Cu-PGE Project in Western Australia



Click here to explore Julimar in 3D:  
<https://inventum3d.com/c/chalicemining>



Click here to watch the Julimar Project Video:  
<https://youtu.be/zaparMvbb4g>





# Gonneville Mineral Resource Estimate (JORC Code 2012), 8 July 2022

Domain	Cut-off Grade	Category	Mass	Grade								Contained Metal							
			(Mt)	Pd (g/t)	Pt (g/t)	Au (g/t)	Ni (%)	Cu (%)	Co (%)	NiEq (%)	PdEq (g/t)	Pd (Moz)	Pt (Moz)	Au (Moz)	Ni (kt)	Cu (kt)	Co (kt)	NiEq (kt)	PdEq (Moz)
Oxide	0.9g/t Pd	Indicated	8.6	1.9	-	0.06	-	-	-	-	1.9	0.52	-	0.02	-	-	-	-	0.54
		Inferred	0.4	1.9	-	0.13	-	-	-	-	2.0	0.03	-	0.00	-	-	-	-	0.03
		<b>Subtotal</b>	<b>9.1</b>	<b>1.9</b>	<b>-</b>	<b>0.06</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1.9</b>	<b>0.55</b>	<b>-</b>	<b>0.02</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.57</b>
Sulphide (Transitional)	0.4% NiEq	Indicated	14	0.80	0.19	0.03	0.17	0.12	0.024	0.65	2.0	0.37	0.09	0.01	24	17	3	93	0.90
		Inferred	1.1	0.64	0.17	0.03	0.14	0.11	0.016	0.55	1.6	0.02	0.01	0	2	1	0	6	0.06
		<b>Subtotal</b>	<b>15</b>	<b>0.79</b>	<b>0.19</b>	<b>0.03</b>	<b>0.16</b>	<b>0.12</b>	<b>0.023</b>	<b>0.65</b>	<b>1.9</b>	<b>0.39</b>	<b>0.09</b>	<b>0.01</b>	<b>25</b>	<b>18</b>	<b>4</b>	<b>99</b>	<b>0.96</b>
Sulphide (Fresh)	0.4% NiEq	Indicated	220	0.73	0.16	0.03	0.16	0.10	0.016	0.59	1.8	5.1	1.1	0.20	360	230	34	1,300	12
		Inferred	110	0.71	0.15	0.03	0.16	0.11	0.015	0.58	1.7	2.4	0.52	0.10	170	110	16	610	5.9
		<b>Subtotal</b>	<b>320</b>	<b>0.72</b>	<b>0.16</b>	<b>0.03</b>	<b>0.16</b>	<b>0.11</b>	<b>0.015</b>	<b>0.58</b>	<b>1.8</b>	<b>7.5</b>	<b>1.7</b>	<b>0.30</b>	<b>530</b>	<b>340</b>	<b>50</b>	<b>1,900</b>	<b>18</b>
Underground	MSO	Indicated	0.03	1.7	0.33	0.08	0.16	0.15	0.016	0.99	3.0	0	0	0	0.1	0.1	0.0	0.3	0
		Inferred	2.9	1.8	0.40	0.06	0.27	0.21	0.021	1.2	3.7	0.17	0.04	0.01	7.6	6.0	0.6	35	0.34
		<b>Subtotal</b>	<b>2.9</b>	<b>1.8</b>	<b>0.40</b>	<b>0.06</b>	<b>0.26</b>	<b>0.21</b>	<b>0.021</b>	<b>1.2</b>	<b>3.7</b>	<b>0.17</b>	<b>0.04</b>	<b>0.01</b>	<b>7.6</b>	<b>6.1</b>	<b>0.6</b>	<b>35</b>	<b>0.34</b>
All		Indicated	240	0.78	0.16	0.03	0.16	0.10	0.015	0.57	1.8	6.0	1.2	0.22	380	240	37	1,400	14
		Inferred	110	0.74	0.16	0.03	0.16	0.11	0.015	0.59	1.8	2.6	0.57	0.11	180	120	17	650	6.3
		<b>Total</b>	<b>350</b>	<b>0.77</b>	<b>0.16</b>	<b>0.03</b>	<b>0.16</b>	<b>0.10</b>	<b>0.015</b>	<b>0.58</b>	<b>1.8</b>	<b>8.6</b>	<b>1.8</b>	<b>0.33</b>	<b>560</b>	<b>360</b>	<b>54</b>	<b>2,000</b>	<b>20</b>

Note some numerical differences may occur due to rounding to 2 significant figures.

PdEq oxide (Palladium Equivalent g/t) = Pd (g/t) + 1.27x Au (g/t)

NiEq sulphide (Nickel Equivalent %) = Ni (%) + 0.33x Pd(g/t) + 0.24x Pt(g/t) + 0.29x Au(g/t) + 0.78x Cu(%) + 3.41x Co(%)

PdEq sulphide (Palladium Equivalent g/t) = Pd (g/t) + 0.72x Pt(g/t) + 0.86x Au(g/t) + 2.99x Ni(%) + 2.33x Cu(%) + 10.18x Co(%)

MSO optimisation defined reasonable shapes that could be extracted by underground mining methods.

Includes drill holes drilled up to and including 18 March 2022.

# Higher-grade sulphide component of Gonneville Resource (in pit and underground), 8 July 2022



Domain	Cut-off Grade	Category	Mass	Grade								Contained Metal							
			(Mt)	Pd (g/t)	Pt (g/t)	Au (g/t)	Ni (%)	Cu (%)	Co (%)	NiEq (%)	PdEq (g/t)	Pd (Moz)	Pt (Moz)	Au (Moz)	Ni (kt)	Cu (kt)	Co (kt)	NiEq (kt)	PdEq (Moz)
High-grade Sulphide (Transitional)	0.6% NiEq	Indicated	4.8	1.3	0.31	0.04	0.20	0.18	0.038	0.99	3.0	0.20	0.05	0.01	10	9	2	48	0.46
		Inferred	0.2	1.1	0.26	0.06	0.18	0.18	0.019	0.82	2.4	0.01	0.00	0.00	0	0	0	2	0.02
		<b>Subtotal</b>	<b>5.1</b>	<b>1.3</b>	<b>0.30</b>	<b>0.05</b>	<b>0.20</b>	<b>0.18</b>	<b>0.037</b>	<b>0.98</b>	<b>3.0</b>	<b>0.21</b>	<b>0.05</b>	<b>0.01</b>	<b>10</b>	<b>9</b>	<b>2</b>	<b>50</b>	<b>0.48</b>
High-grade Sulphide (Fresh)	0.6% NiEq	Indicated	52	1.3	0.29	0.06	0.21	0.19	0.019	0.94	2.8	2.2	0.49	0.11	110	99	10	490	4.8
		Inferred	22	1.3	0.29	0.08	0.21	0.23	0.018	0.98	2.9	0.94	0.20	0.05	46	52	4	220	2.1
		<b>Subtotal</b>	<b>74</b>	<b>1.3</b>	<b>0.29</b>	<b>0.07</b>	<b>0.21</b>	<b>0.20</b>	<b>0.019</b>	<b>0.95</b>	<b>2.9</b>	<b>3.1</b>	<b>0.69</b>	<b>0.16</b>	<b>160</b>	<b>150</b>	<b>14</b>	<b>710</b>	<b>6.9</b>
Underground	MSO	Indicated	0.03	1.7	0.33	0.08	0.16	0.15	0.016	0.99	3.0	0	0	0	0.1	0.1	0.0	0.3	0
		Inferred	2.9	1.8	0.40	0.06	0.27	0.21	0.021	1.2	3.7	0.17	0.04	0.01	7.6	6.0	0.6	35	0.34
		<b>Subtotal</b>	<b>2.9</b>	<b>1.8</b>	<b>0.40</b>	<b>0.06</b>	<b>0.26</b>	<b>0.21</b>	<b>0.021</b>	<b>1.2</b>	<b>3.7</b>	<b>0.17</b>	<b>0.04</b>	<b>0.01</b>	<b>7.6</b>	<b>6.1</b>	<b>0.6</b>	<b>35</b>	<b>0.34</b>
All		Indicated	57	1.3	0.29	0.06	0.21	0.19	0.020	0.95	2.9	2.4	0.54	0.11	120	110	12	540	5.2
		Inferred	25	1.4	0.30	0.07	0.21	0.23	0.018	1.00	3.0	1.1	0.24	0.06	54	58	5	250	2.5
		<b>Total</b>	<b>82</b>	<b>1.3</b>	<b>0.29</b>	<b>0.07</b>	<b>0.21</b>	<b>0.20</b>	<b>0.020</b>	<b>0.97</b>	<b>2.9</b>	<b>3.5</b>	<b>0.78</b>	<b>0.17</b>	<b>180</b>	<b>170</b>	<b>16</b>	<b>790</b>	<b>7.7</b>

Note some numerical differences may occur due to rounding to 2 significant figures.

This higher-grade component is contained within the reported global Mineral Resource.

NiEq sulphide (Nickel Equivalent %) = Ni (%) + 0.33x Pd(g/t) + 0.24x Pt(g/t) + 0.29x Au(g/t) + 0.78x Cu(%) + 3.41x Co(%)

PdEq sulphide (Palladium Equivalent g/t) = Pd (g/t) + 0.72x Pt(g/t) + 0.86x Au(g/t) + 2.99x Ni(%) + 2.33x Cu(%) + 10.18x Co(%)

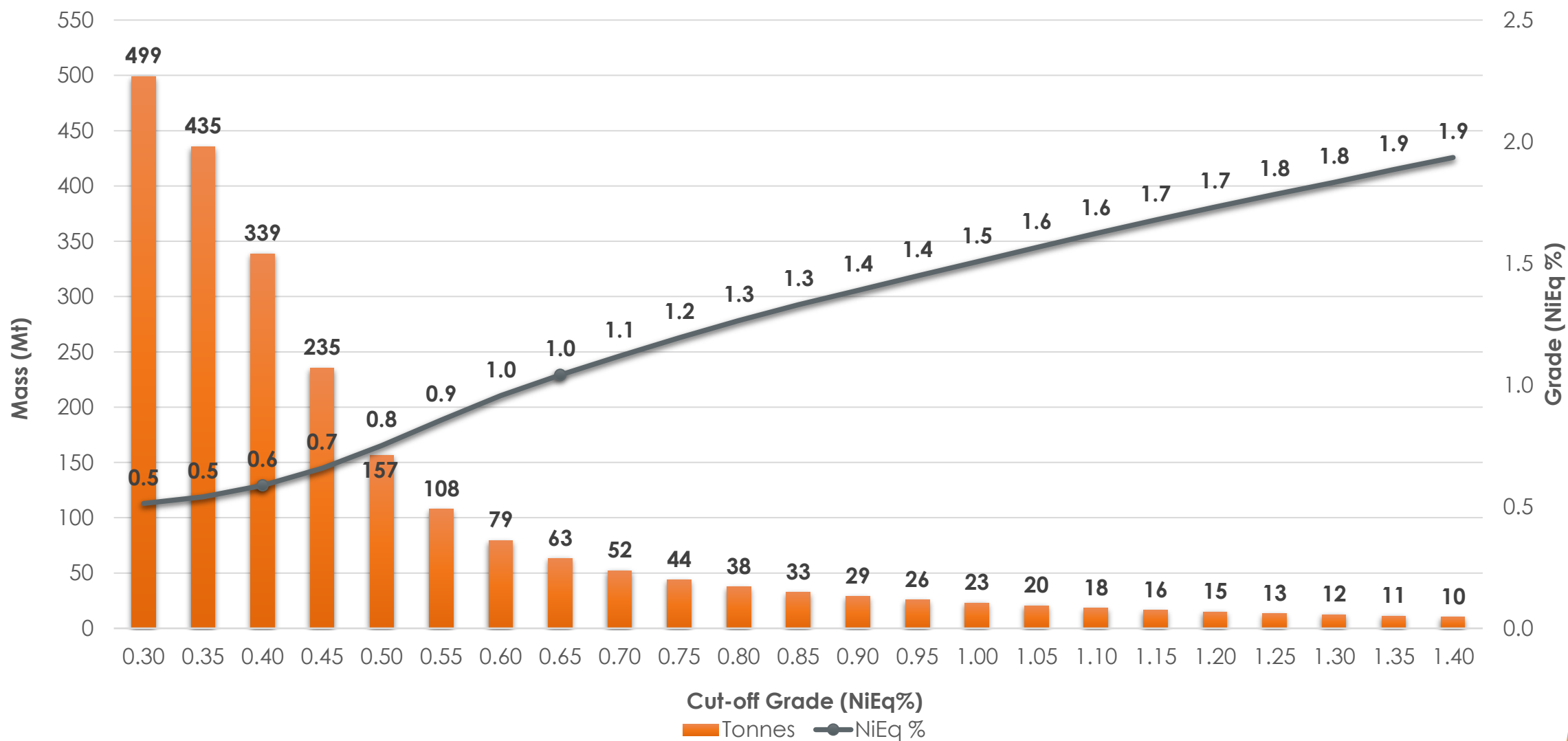
MSO optimisation defined reasonable shapes that could be extracted by underground mining methods.

Includes drill holes drilled up to and including 18 March 2022.

Flat grade-tonnage curve highlights the significant higher-grade component – providing the project with **development optionality**



Nickel Equivalent Grade-Tonnage Curve in-pit (on NiEq cut-off grade basis)





# Metal equivalent assumptions of Gonneville Resource, 8 July 2022

Based on metallurgical testwork completed to date for the sulphide domain, it is the Company's opinion that all the quoted elements included in metal equivalent calculations (palladium, platinum, gold, nickel, copper and cobalt) have a reasonable potential of being recovered and sold.

Only limited samples have been collected from the transitional zone due to its relatively small volume. Therefore, the metallurgical recovery of all metals in this domain are unknown. However, given the relatively small proportion of the transition zone in the Mineral Resource, the impact on the metal equivalent calculation is not considered to be material.

Metal equivalents for the sulphide domains are calculated according to the formula below:

«  $\text{NiEq (\%)} = \text{Ni (\%)} + 0.33 \times \text{Pd (g/t)} + 0.24 \times \text{Pt (g/t)} + 0.29 \times \text{Au (g/t)} + 0.78 \times \text{Cu (\%)} + 3.41 \times \text{Co (\%)};$

«  $\text{PdEq (g/t)} = \text{Pd (g/t)} + 0.72 \times \text{Pt (g/t)} + 0.86 \times \text{Au (g/t)} + 2.99 \times \text{Ni (\%)} + 2.33 \times \text{Cu (\%)} + 10.18 \times \text{Co (\%)};$

Metal recoveries used in the metal equivalent calculations are based on rounded average Resource grades for the higher-grade sulphide domain (>0.6% NiEq cut-off):

« Pd – 70%, Pt – 70%, Au – 60%, Ni – 55%, Cu – 90%, Co – 55%.

Metal prices used are consistent with those used in the Whittle pit optimisation (based on long term consensus analyst estimates):

« US\$1,800/oz Pd, US\$1,300/oz Pt, US\$1,800/oz Au, US\$22,000/t Ni, US\$10,500/t Cu and US\$75,000/t Co.

Initial metallurgical testwork indicates that only palladium and gold are likely to be recovered in the oxide domain, therefore no NiEq grade has been quoted for the oxide. The PdEq grade for the oxide has been calculated using the formula:

«  $\text{PdEq oxide (g/t)} = \text{Pd (g/t)} + 1.27 \times \text{Au (g/t)}.$

Metal recoveries based on limited metallurgical test work completed to date:

« Pd – 75%, Au – 95%.

« Metal prices used are consistent with those used in the pit optimisation:

« US\$1,800/oz Pd, US\$1,800/oz Au

For additional information on the assumptions used in the calculation of metal equivalents, refer to the ASX announcement titled "Updated Gonneville Mineral Resource" dated 8 July 2022.



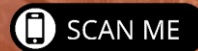
# Australian Primary Nickel Sulphide Resources (4 Oct 2022)

Rank	Asset	Company	Stage	Source Announcement	Date	Total Measured (Meas.), Indicated (Ind.) and Inferred (Inf.) resources								Meas.	Ind.	Inf.
						Tonnage (Mt)	Nickel (kt, %)	Copper (kt, %)	Cobalt (kt, ppm)	Gold (koz, g/t)	Platinum (koz, g/t)	Palladium (koz, g/t)	Silver (koz, g/t)	Tonnage (Mt)	Tonnage (Mt)	Tonnage (Mt)
1	Yakabindie	BHP	Feasibility	Annual Report to Shareholders	06-Sep-22	406	2,474 0.61%	- -	- -	- -	- -	- -	- -	129.6	106	170
2	West Musgrave	OZ Minerals	Feasibility	West Musgrave Mineral Resource and Ore Reserve Statement	23-Sep-22	390	1,200 0.30%	1,300 0.33%	47 120	752 0.06	1,003 0.08	1,129 0.09	10,659 0.85	91	240	59
3	Cosmos	IGO	Development	FY22 Cosmos and Forrestania Resources and Reserves	30-Aug-22	67	656 0.98%	- -	- -	- -	- -	- -	- -	13.6	38.9	14.5
4	Julimar	Chalice	Exploration	Updated Gonneville Mineral Resource	08-Jul-22	350	560 0.16%	360 0.10%	54 154	330 0.03	1,800 0.17	8,600 0.77	- -	-	240	110
5	Avebury Restart	Mallee Resources	Restart	Updated Investor Presentation	07-Jul-22	29	264 0.90%	- -	7 229	- -	- -	- -	- -	-	8.7	20.7
6	Black Swan	Poseidon	Restart	Investor Presentation - Diggers and Dealers Conference	03-Aug-22	30	206 0.69%	7 0.02%	5 178	- -	- -	- -	- -	1.5	10.1	18.3
7	West Jordan	BHP	Exploration	Annual Report to Shareholders	06-Sep-22	43	224 0.52%	- -	- -	- -	- -	- -	- -	-	-	43
8	Venus	BHP	Exploration	Annual Report to Shareholders	06-Sep-22	11	189 1.71%	- -	- -	- -	- -	- -	- -	1.5	7.5	2.1
9	Jericho	BHP	Exploration	Annual Report to Shareholders	06-Sep-22	31	183 0.59%	- -	- -	- -	- -	- -	- -	-	-	31
10	Fisher East	Cannon Resources	Exploration	Fisher East Resource Increased to 134.1kt Contained Nickel	15-Aug-22	8	134 1.79%	- -	- -	- -	- -	- -	- -	-	2.8	4.7
11	Sherlock Bay	Sabre Resources	Exploration	Sherlock Bay Ni Scoping Study Delivers Positive Cashflow	27-Jan-22	25	99 0.40%	22 0.09%	5 220	- -	- -	- -	- -	12.5	6.1	6.1

Note: Values presented in the above table have been rounded and where totals do not add to their components is due to rounding.



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