



Orion Minerals

<sup>29</sup>  
**Cu**  
Copper

<sup>30</sup>  
**Zn**  
Zinc

<sup>28</sup>  
**Ni**  
Nickel

<sup>27</sup>  
**Co**  
Cobalt

**PGE**  
PGE

<sup>79</sup>  
**Au**  
Gold

<sup>47</sup>  
**Ag**  
Silver

# FUTURE METALS FOR A NEW ERA OF DEMAND

Accelerating Towards Production

Errol Smart / Managing Director and CEO  
Presentation / May 2023

ASX: ORN | JSE: ORN  
[www.orionminerals.com.au](http://www.orionminerals.com.au)

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# OUR MISSION

FULLY INTEGRATED FROM EXPLORATION TO MARKET



Orion Minerals

PRODUCING FUTURE FACING METAL  
PRODUCTS – ESG CERTIFIED METALS,  
TRACKED AND CERTIFIED FROM  
EXPLORATION TO SALE



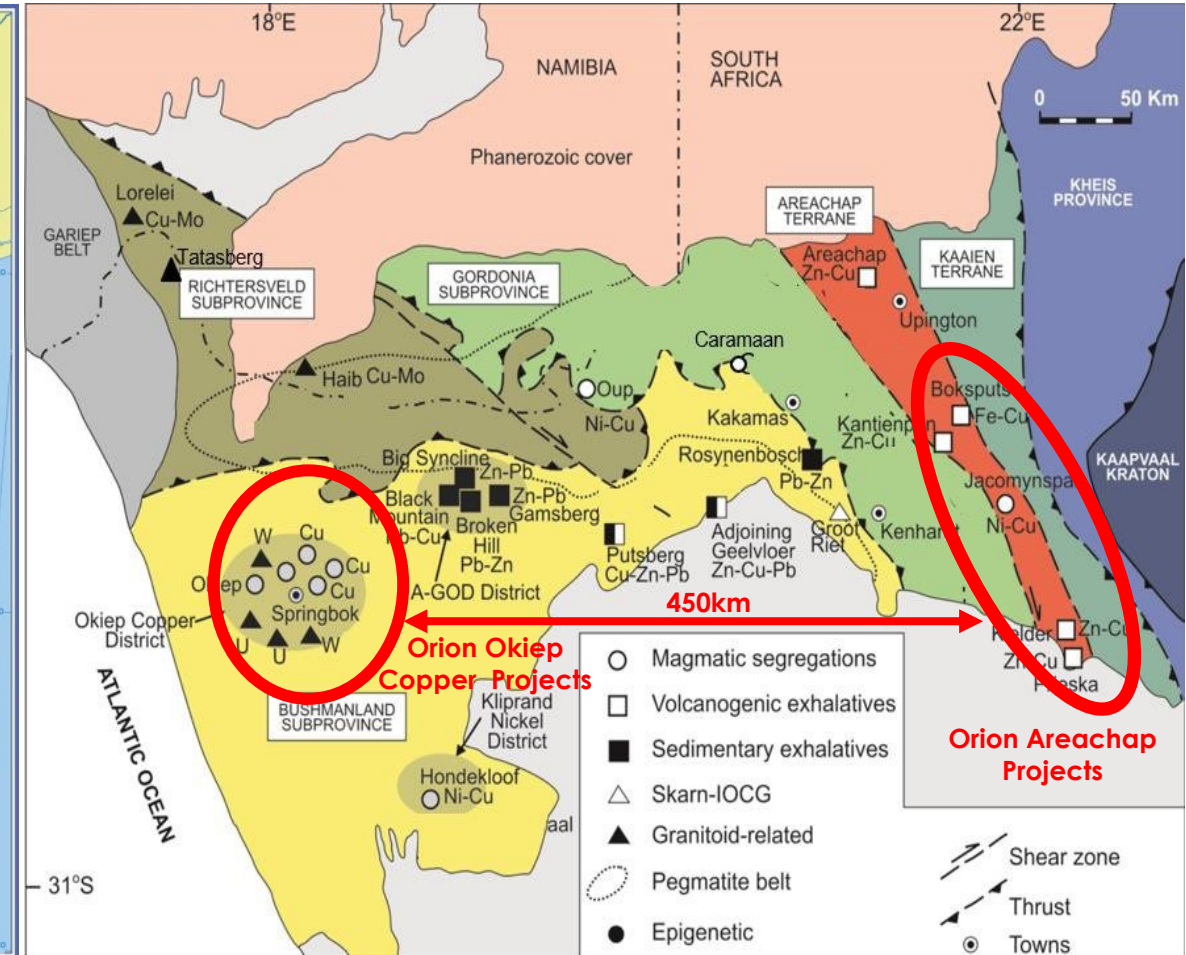


# FOCUS ON TWO HIGHLY PROSPECTIVE SOUTH AFRICAN BASE METAL DISTRICTS

BROWNFIELDS SUCCESS BEING FOLLOWED BY GREENFIELDS EXPLORATION



Orion Minerals



Refer ASX/JSE releases 2 February 2021 and 2 August 2021

# A FUTURE FACING METALS GIANT IN THE MAKING

## FAST-TRACKING TOWARDS DEVELOPMENT AND PRODUCTION

- Two brownfields development assets in South Africa's Northern Cape
- Extensive upside exploration potential, high-quality Mineral Resources
- Mineral Rights include known deposits of Cu, Zn, Ni, Co, PGE, Au, Ag, W, REE, Li.
- Studies underway to accelerate three base metal projects towards first production
- Dewatering preparation well advanced at PCZM
- Substantial exploration upside in under-explored districts
- Strong ESG credentials with available renewable and green hydrogen power
- Financing and strategic partner engagement secured
- Perfectly aligned with new market dynamics for future-facing metals
- Investigating battery precursor metal production potential





# COMPANY SNAPSHOT



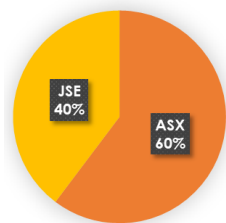
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Capital Structure Summary	Current	Post Capital Raise
Shares on issue <sup>1</sup>	5,466M	5,466M
Options on issue <sup>2</sup>	300M	3.8B
Cash on hand <sup>2</sup>	AUD12.2M	
Placement of Shares – (Tranche 2) – (AUD2.6M) <sup>2</sup>		171M
IDC Shareholder Loan <sup>3</sup>	AUD2.9M	
Tembo Convertible Loan <sup>4</sup>	AUD0.8M	Nil
<b>Market capitalisation (AUD1.8cps) <sup>5</sup></b>	<b>AUD98M</b>	<b>AUD101M</b>

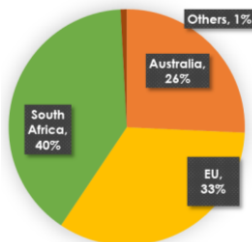
Significant Shareholders	Share Issue % (post capital raise)
Tembo Capital (EU/Netherlands)	19.2
Delphi Group (EU/Germany)	13.4
Clover Alloys (SA) (South Africa)	7.9
Other Orion Directors (South Africa & Australia)	6.4
<b>Total</b>	<b>46.9</b>

Board of Directors	Senior Management
Denis Waddell, Chairman	Peet van Coller, CFO
Errol Smart, MD & CEO	Martin Bouwmeester, Company Secretary
Tom Borman, NED	Marcus Birch, Executive: Sustainability and Business Support
Mark Palmer, NED	Nelson Mosiapoa, Group Corporate Social Responsibility Advisor
Godfrey Gomwe, NED	
Philip Kotze, NED	

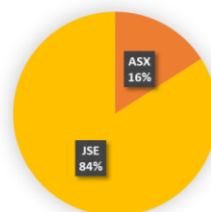
Shares held by  
Stock Exchange



Shares held by  
Jurisdiction



Volume Traded by  
Register



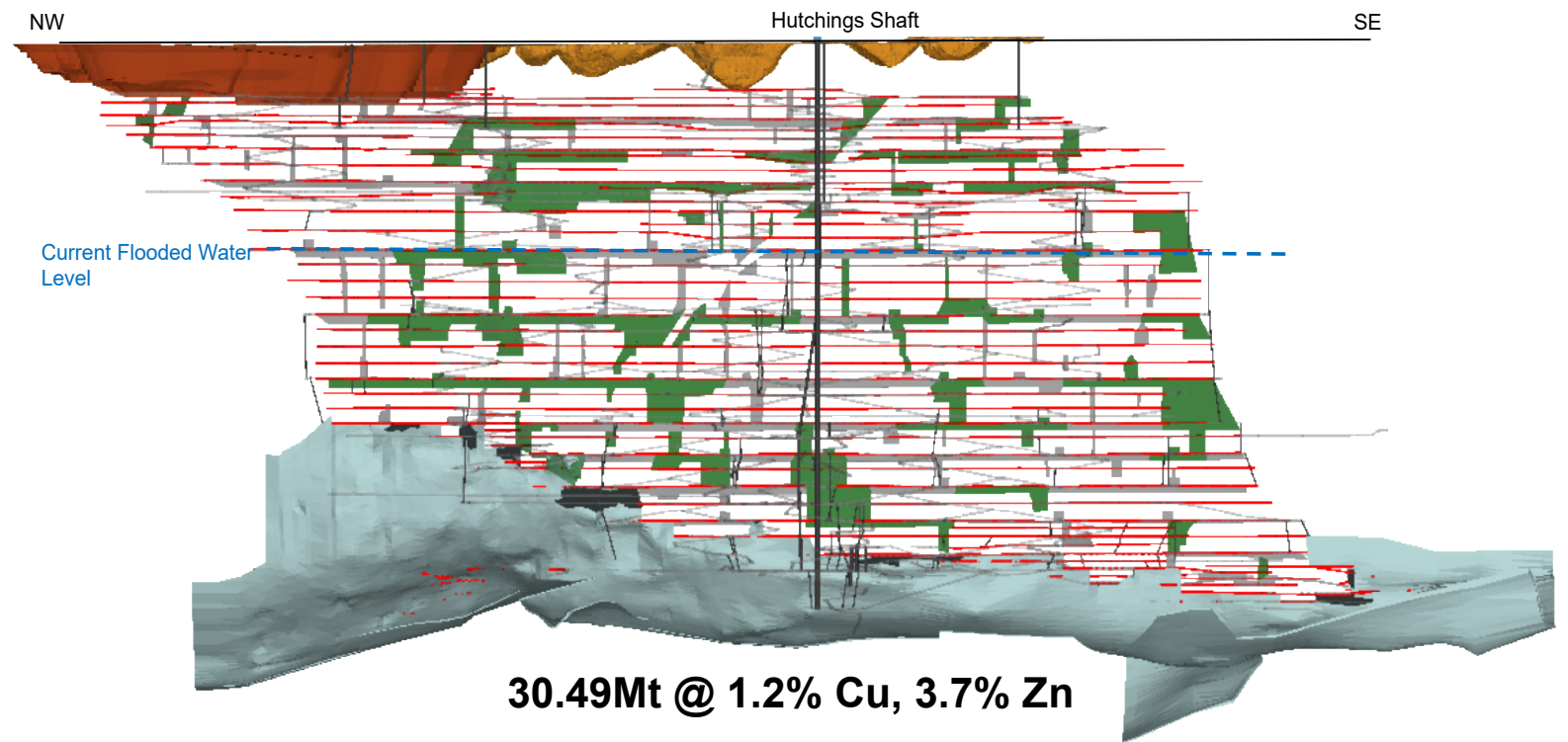
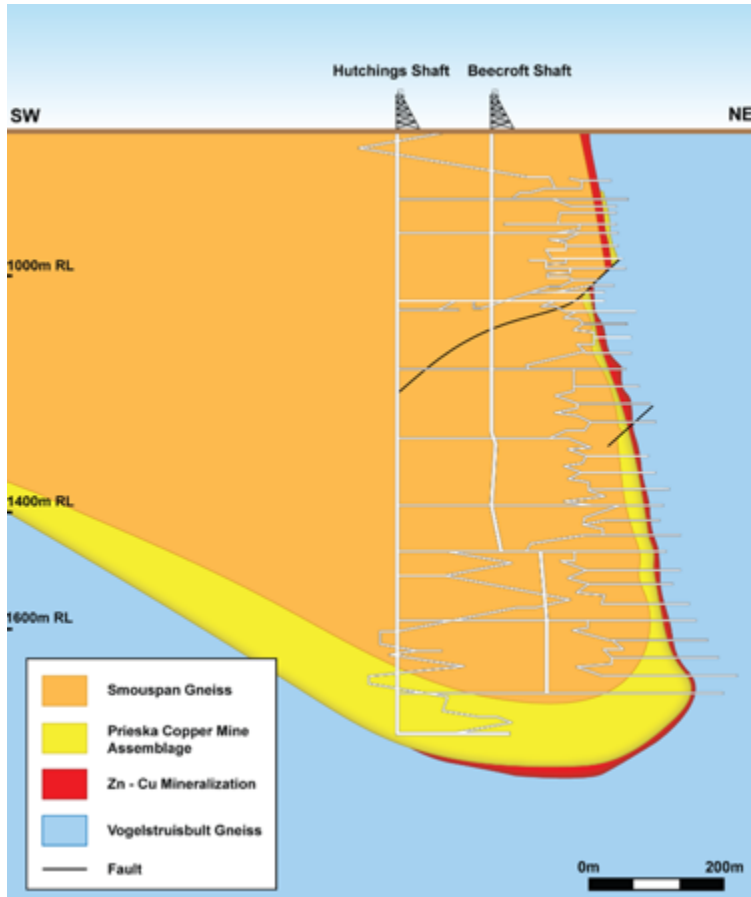
1. Fully paid ordinary Orion shares (**Shares**) on issue at 5 May'23.
2. Cash on hand at 31 Mar'23. On 15 Mar'23 Orion announced that it is conducting a \$13M capital raising via a two-tranche placement at an issue price of AUD1.5cps (ZAR18cps), together with four free attaching options for each Share issued (3.5B options exercisable at AUD1.7cents (ZAR20 cents) and expiring on 30 Nov'23). Tranche 1 – 710M Shares, using the Company's 15% placement capacity under ASX Listing Rule 7.1 to raise \$10.7M and Tranche 2 – 171M Shares to raise \$2.6M (subject to shareholder approval, to be sought at a general meeting of Orion shareholders to be held in May'23 (**General Meeting**)). On 31 Mar'23 Orion announced that Tranche 1 of the capital raising had been completed with \$10.7M having been received in cash from the Tranche 1 Share issue.
3. Refer to Orion's Mar'23 Quarterly Reports for information on the agreement for pre-development funding at the Okiep Copper Project entered into with the Industrial Development Corporation of South Africa Limited (**IDC**). Balance shown at 31 Mar'23.
4. On 3 Jan'23, Orion announced that Tembo Capital continues its strong support of Orion, through an unsecured convertible loan facility of US\$0.5M (**Loan Facility**). Under the terms of the Loan Facility, the amount outstanding of AUD0.77M will be repaid by the issue of Shares at a deemed issue price of AUD1.5cps (subject to receipt of shareholder approval to be sought at the General Meeting and regulatory approvals) (refer ASX/JSE release 15 Mar'23).
5. Volume weighted average price (5 day) at 5 May'23 of ORN Shares trading on the ASX and JSE.



Orion Minerals

# **PRIESKA COPPER ZINC MINE (PCZM)**

# PCZM – CROSS & LONG SECTIONS





# PRIESKA (PCZM) COPPER ZINC PROJECT (70% OWNED)



## The orebody

- Globally significant VMS Resource: 30.49Mt @ 1.2% Cu, 3.7% Zn
- Increased Mineral Reserve: 14.5Mt @ 1.1% Cu and 3.2% Zn

## Foundation phase as per BFS-20 outcomes

- Initial 12-year, 2.4Mtpa operation, targeting 22ktpa Cu and 70ktpa Zn
- Life-of-mine production 226kt Cu and 680kt Zn
- Strong operating margins and financials
- Pre-tax free cash flow AUD1.6bn (post-tax AUD1.2bn)
- Pre-tax NPV8% AUD779m (post-tax AUD552m)
- Payback period of 2.4 years from first production
- All-in sustaining margin of 47%
- Peak Funding requirement AUD413m

## Fully permitted

- Mining Right granted to PCZM in September 2019
- Mining Right granted to Vardocube in August 2020
- Environmental Financial Provision in place fully capitalised
- Environmental approval notices received for both PCZM and Vardocube
- Water Use Licence granted in August 2020

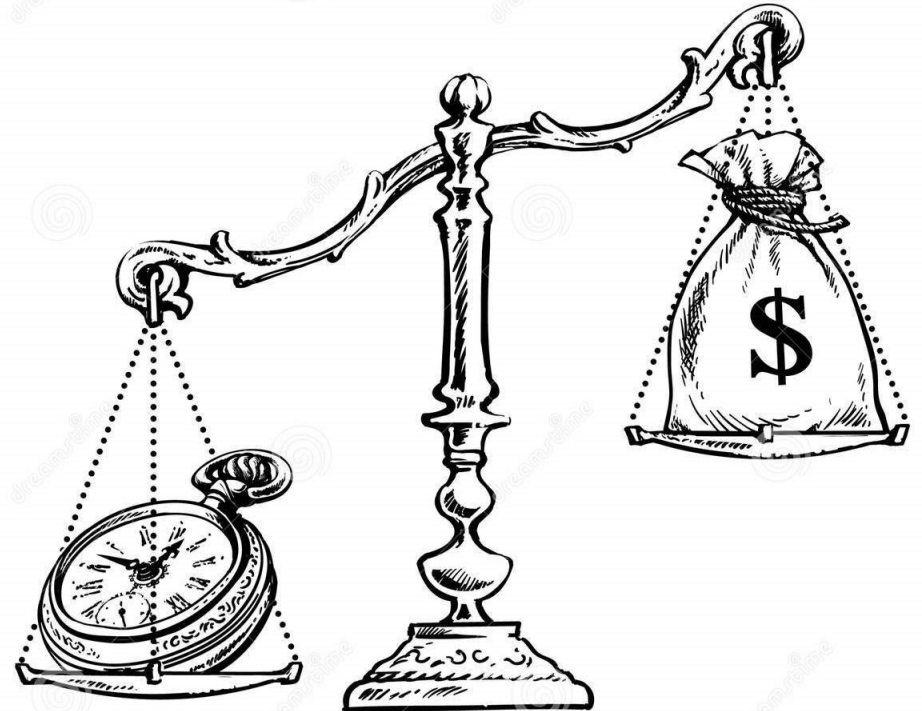


“The completion of the updated BFS marks another huge step towards the development of a modern, state-of-the-art base metals mine at Prieska, which is ideally placed to become the standard bearer for a new generation of world-class mines in South Africa.” – Orion Minerals MD Errol Smart

Refer ASX/JSE releases 8 July 2019, 3 September 2019, 9 March 2020, 26 May 2020, 6 August 2020 and 17 August 2020

# KEY CHALLENGES FOR ORION WITH PCZM BFS-20

- High capital, long lead-time project
  - Can we bring forward production and reduce funding?
- Skills / Development Team?
  - Orion is proven as an explorer and study team – but where are the mining team and experience?
- Dewatering
  - What are alternatives to reduce cost?
- Sources of Finance (for a first-time developer)?



**These pressing questions are now largely answered**



# REVISED PROJECT DEVELOPMENT STRATEGY

## PROJECT '23

- **STRATEGY**

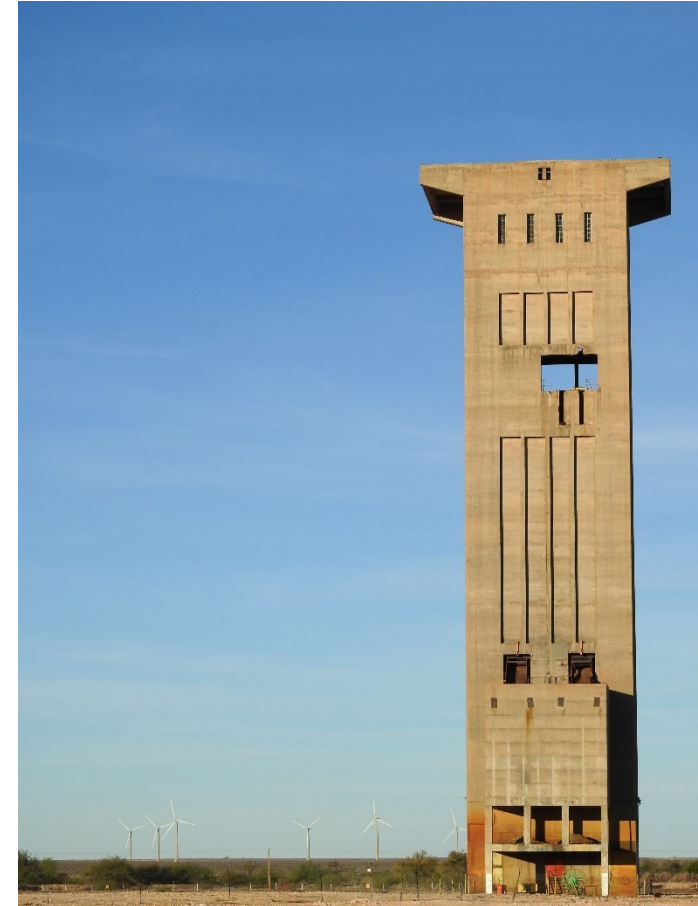
- Address perceived high-risk elements of plan to reduce cost of funding
- Prove up and implement a low peak funding business plan
- Investigate opportunity for early production
- Retain ability to rapidly scale-up to full scale project (subject to funding availability)
- Maintain community, regulatory and stakeholder relations

- **EARLY DEWATERING**

- Immediately start with phased, reduced rate, early dewatering – (before project is fully-funded)

- **EARLY MINING AND CASH FLOWS**

- Prove up early mining concepts by trial mining and processing
- Target ore sources above water level to provide early concentrate production (cash flows)
- Include Remnant (historical) Pillars in mining plans
- Harvest the Deeps deposit (BFS-20 Plan) as an expansion phase

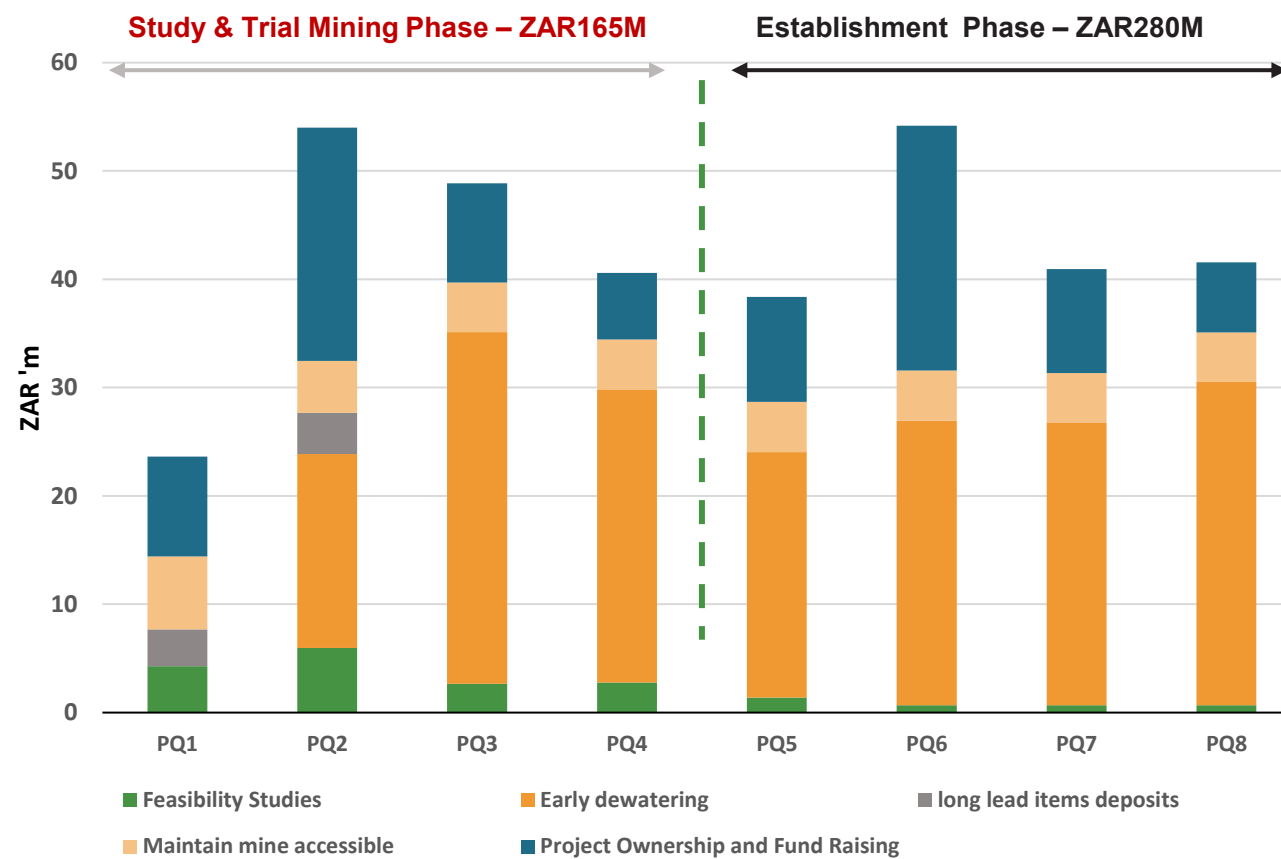


# FUNDING REQUIREMENTS FOR PRE-DEVELOPMENT WORKS ACTIVITIES

- Funding terms agreed:
  - IDC: ZAR250M
    - Definitive agreements signed
    - Draw down of funds expected Q2 CY2023
  - Triple Flag: AUD10M = ZAR120M
    - Definitive agreements signed
    - Draw down of funds expected Q2 CY2023
- Post-study Phase spend of ZAR280M

ACTIVITIES	SPEND (ZAR 'M)
Feasibility Studies	19
Early dewatering	216
Long lead items deposits	7
Prepare mine for ore extraction	68
Project Ownership + Fund Raising	140
<b>Total Forecasted Spend</b>	<b>450</b>

Spend Profile per Quarter to Final Investment Decision





# ACCESS TO SUPPLEMENTAL EQUITY FUNDING



- **Equity funding unlocks early production opportunity.**
  - March 2023 Capital Raise: AUD13.23 million @ AUD0.015 per share
  - Exercise of all attaching options @ AUD0.017 by 30 Nov 2023 could raise an additional AUD59.95 million
  - Ore Production from Trial Mining funded by IDC & Triple Flag may now be monetised with the addition of the first module of a concentrator plant to generate revenue.
  - Potential for early cash flow, unlocks an important staged growth opportunity.
- **Clover Alloys subscribed for ~50% of the capital raising (and attaching options)**
  - Philip Kotze joined the board of Orion in April 2023
  - Clover have specific expertise in successfully building mines incrementally in South Africa, adopting a modular growth strategy

# DEWATERING, TRIAL MINING & REVISED BFS STUDY

## FULLY FUNDED (IDC + TRIPLE FLAG)

Key Project Milestones and Timelines										
ID	Activity	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
<b>1</b>	<b>EARLY MINING PLAN IMPLEMENTATION ROADMAP</b>									
1.1	Trial Mining of Crown & Remnant Pillars			Start	→	Done				
1.2	Early Mining Feasibility Study compilation (+ Financial Model)				Done					
1.3	Ore Reserves Re-statement									
1.4	TMC Independent review finilised					Done				
<b>2</b>	<b>EARLY DEWATERING PLAN IMPLEMENTATION ROADMAP</b>									
2.1	Approval to proceed with Project									
2.2	Installing pumps & pipes		Done							
2.3	Comissioning RO plant			Done						
2.4	Commission dewatering			Done						
2.5	Pumping rate at 500 m <sup>3</sup> /hour					Done				
<b>3</b>	<b>PILOT PLANT TO TREAT EARLY MINED</b>									
3.1	Scoping of pilot plant				Done					
3.2	Contracting Strategy (EPC/EPCM/JV Plant) Inquiry					Done				
3.3	Financial Investment Decision					Done				
3.4	Construct & Commision pilot plant						Start	→	→	Done



# AUD128M\* DEFINITIVE AGREEMENTS SIGNED FOR FUNDING ARRANGEMENT & STREAM FUNDING PACKAGE FOR PCZM

- Definitive agreements signed with Triple Flag for funding package, including stream finance.
  - Triple Flag is a highly respected precious metal royalty and streaming finance provider
- Funding Arrangement to fund:
  - early commencement of dewatering
  - completion of early mining feasibility study
- Stream Finance available to fund mine development following completion of Early Mining Feasibility Study
- Funding Arrangement and Stream Finance provide a significant step on the path to total project funding
  - assists with early mine development



## Early Funding Arrangement:

- AUD10M to be advanced against calculated repayments equal to 0.8% of gross revenue from future mineral sales
- Conditional on Orion securing AUD20M of co-funding as equity/debt/offtake finance – satisfied by ZAR250M IDC convertible loan

## Precious Metal Stream

- US\$80M (AUD118M) to be advanced against delivery of 84% of future Au and Ag by-product production, reducing to 50% of Au and Ag after delivery of 94.3k Oz of Au and 5,710k Oz of Ag
- Orion also receives payments of 10% of the delivered precious metal value at spot Au and Ag at the time of delivery

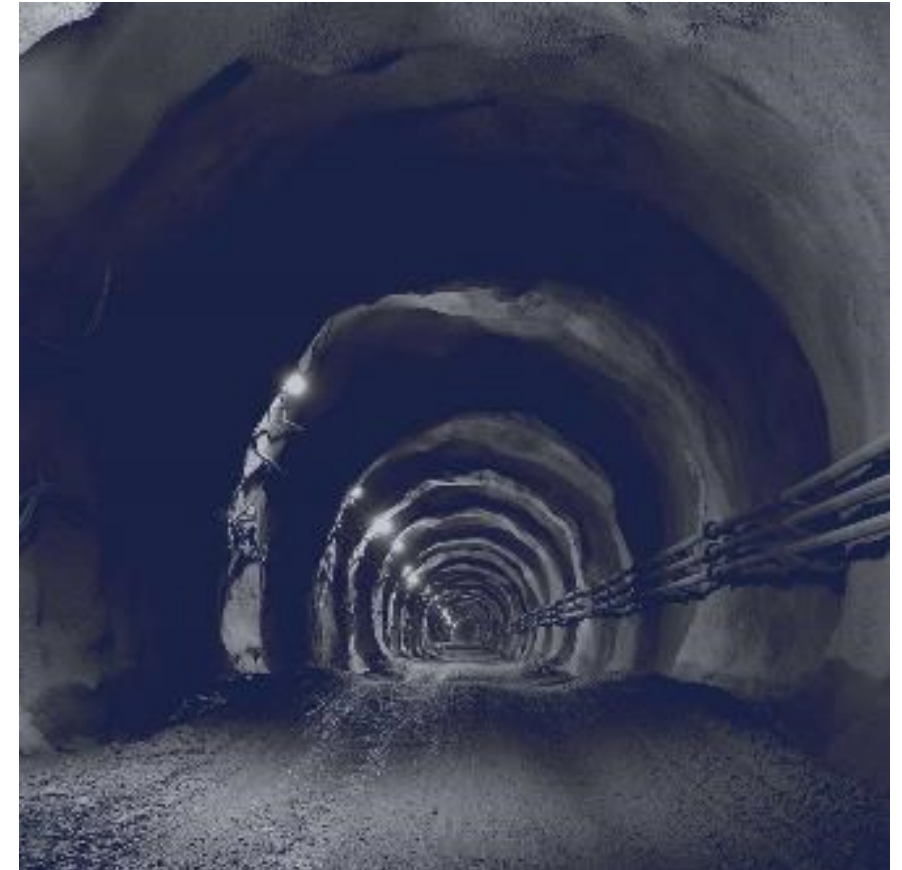
\* FX Source: Oanda.com

Refer ASX/JSE releases 13 December 2022, 9 May 2022 and 13 December 2022

# ZAR250M (AUD21M) PRE-DEVELOPMENT FUNDING FROM IDC



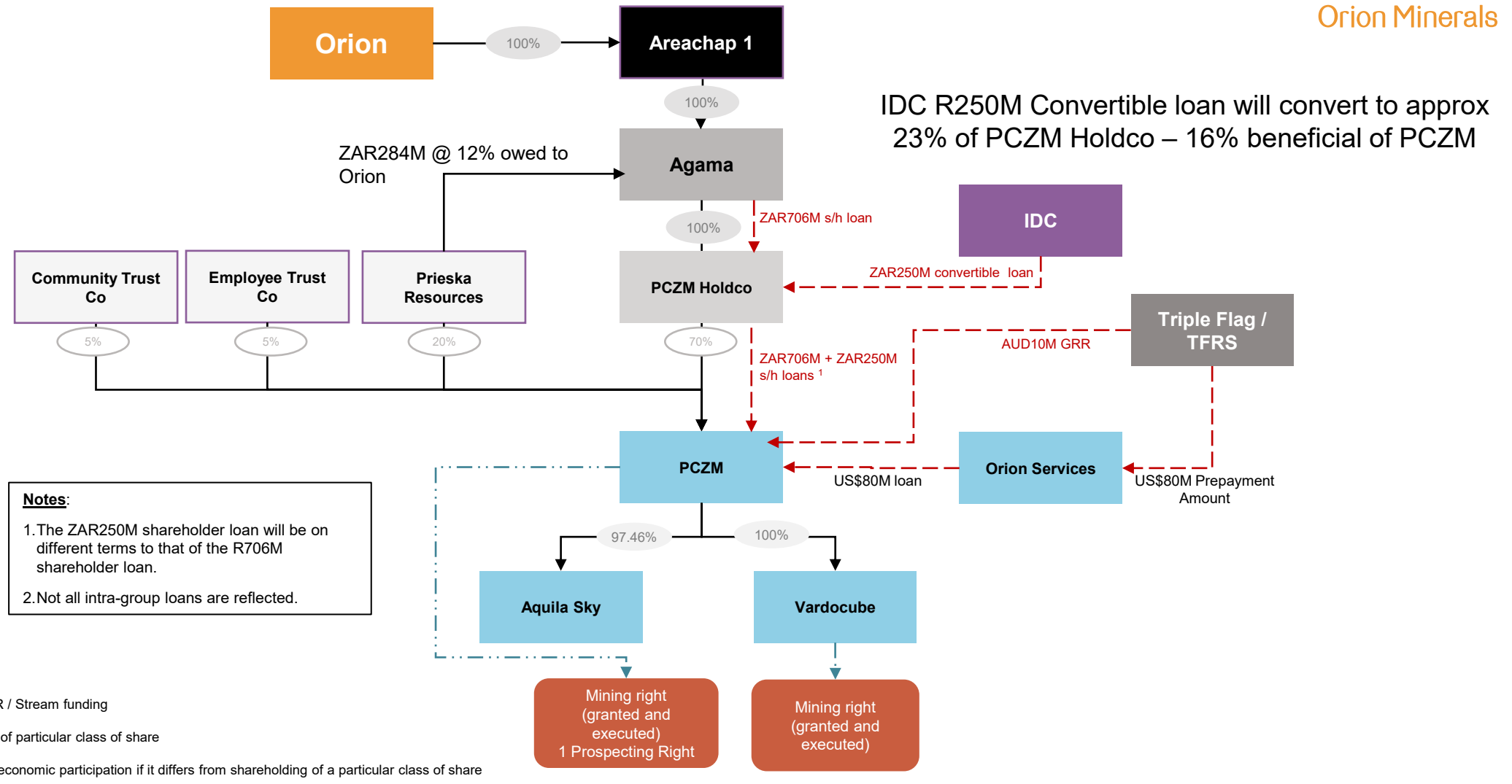
- Definitive agreement signed for ZAR250M pre-development funding
- IDC funding at South African holding company level (HoldCo)
  - Convertible loan
    - Term: 36 months from first draw down (draw down period ends 31 July 2023)
    - Interest: South African Prime Rate plus 3.5%
    - Secured
    - Principal & capitalised interest convertible to shares in HoldCo of PCZM – subject to successful trial mining and revised BFS
- The IDC funding satisfies the condition for release of Triple Flag Early Works Funding



# PCZM FUNDING STRUCTURE AGREED WITH IDC AND TRIPLE FLAG



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# DEWATERING – PROJECT “METSİ KA PELA”

## (STAND-ALONE DEWATERING PROJECT – 3 YEARS)



Pump station at 163 Level to be set up to handle 1,000m<sup>3</sup>/hour

### COSTS TO DEWATER THE MINE

Dewatering Plan	Metsi-ka-Pela	Full-scale BFS
ZAR 'm	550	1,600

@ a steady state pumping rate of 500m<sup>3</sup> hour per hour

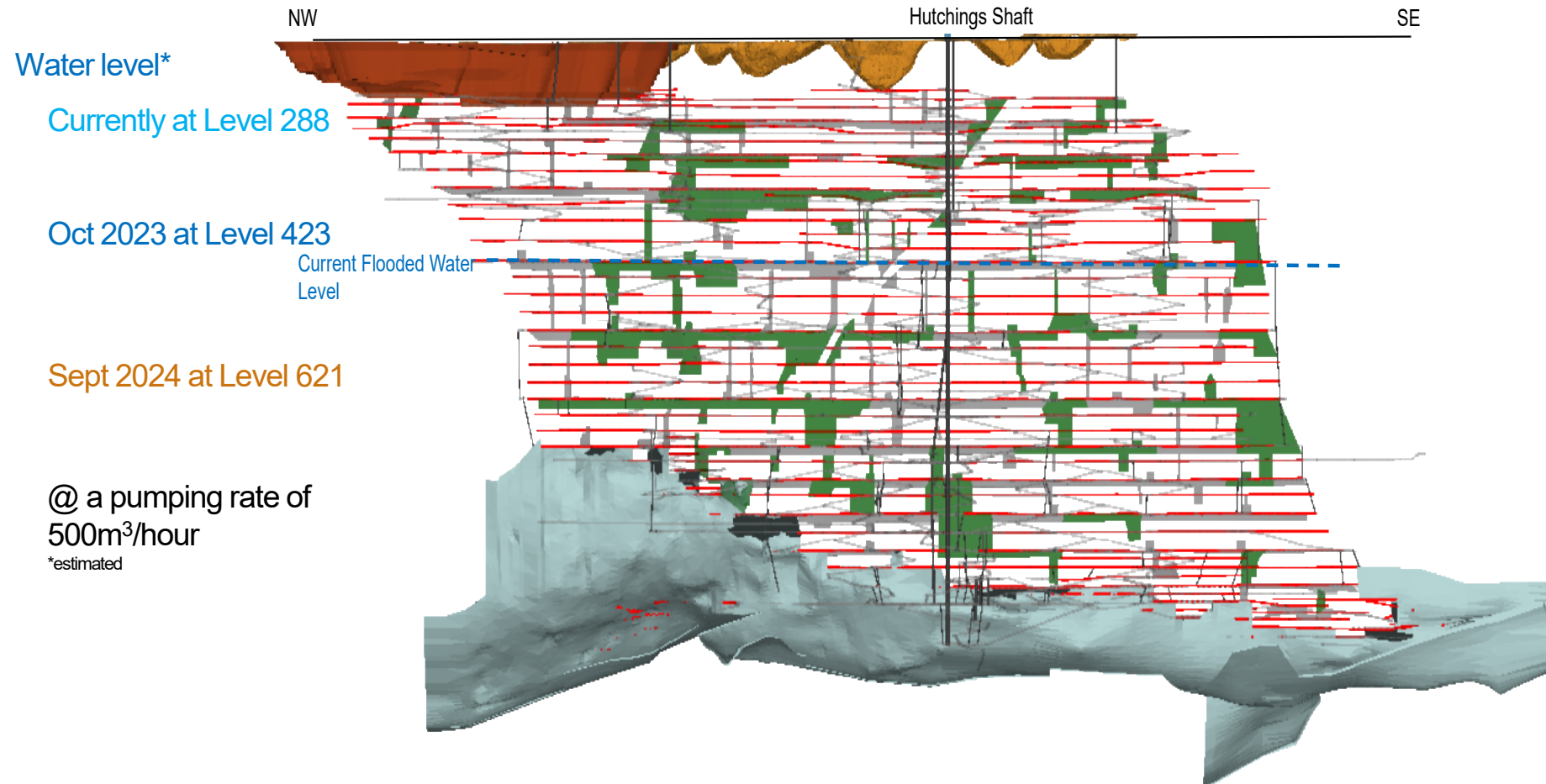
Currently at Level 288 (below surface)

End October 2023 estimated to be at Level 423

End September 2024 estimated on Level 621

	Month 1	Month 2	Month 3	Month 4 – Month 24
Pumping Rate (m <sup>3</sup> /hr)	120	400	400	500

# DEWATERING – PROJECT METSI KA PELA

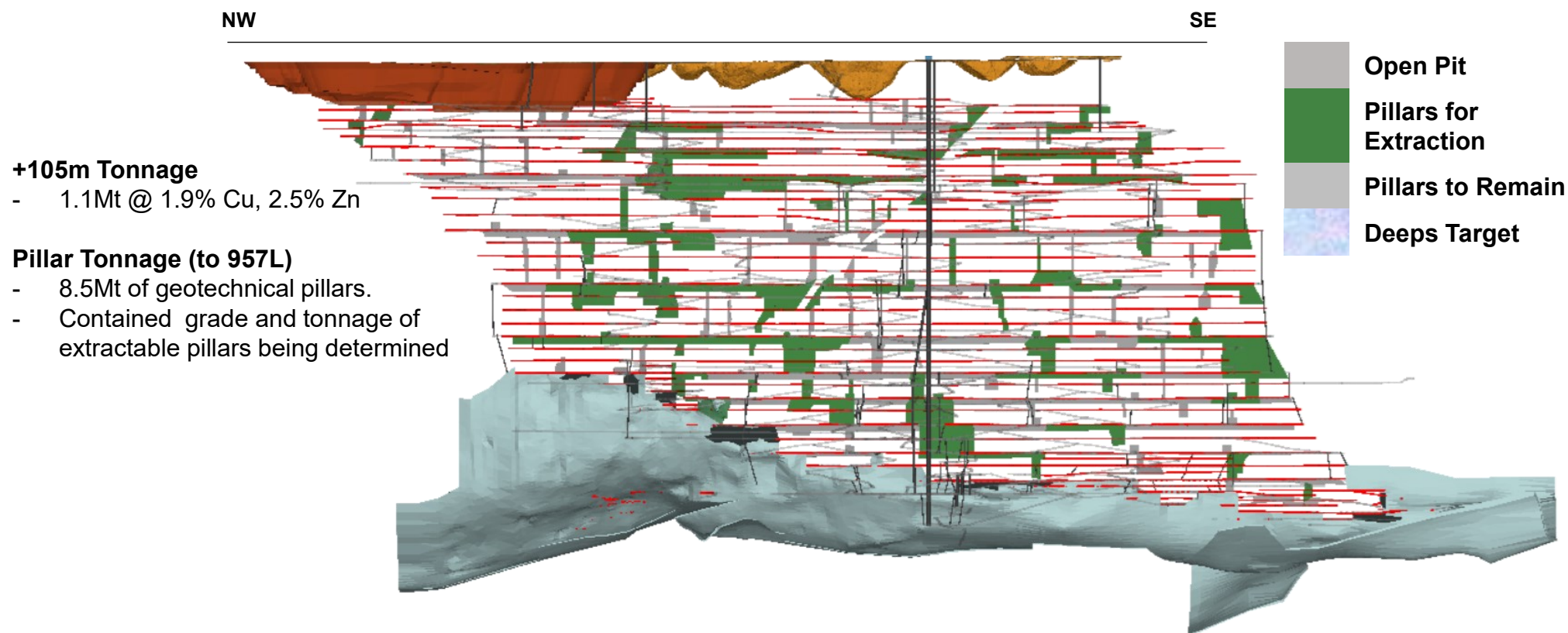


## Dewatering from Current Water Level for the next 3 years

- Water has continued to rise from the natural inflow and is now measured at 288m (310m for BFS-20) below collar level.
- Total water volume of approximately 9.1 million m<sup>3</sup> (8.6 million m<sup>3</sup> for BFS-20) (incl. 10% contingency).
- Plan is to start dewatering now for the next 3 years to lower the water level progressively to safely allow for early revenue production from the upper mine levels

# SHALLOW MINERAL RESOURCES – EARLY MINING TARGETS

- Shallow Mining Plan aims to target mining from the open pit, remnant pillars, while dewatering underway
- Feasibility studies underway to fast-track development
- Stream Finance and early funding advance, provide opportunity fast-track development



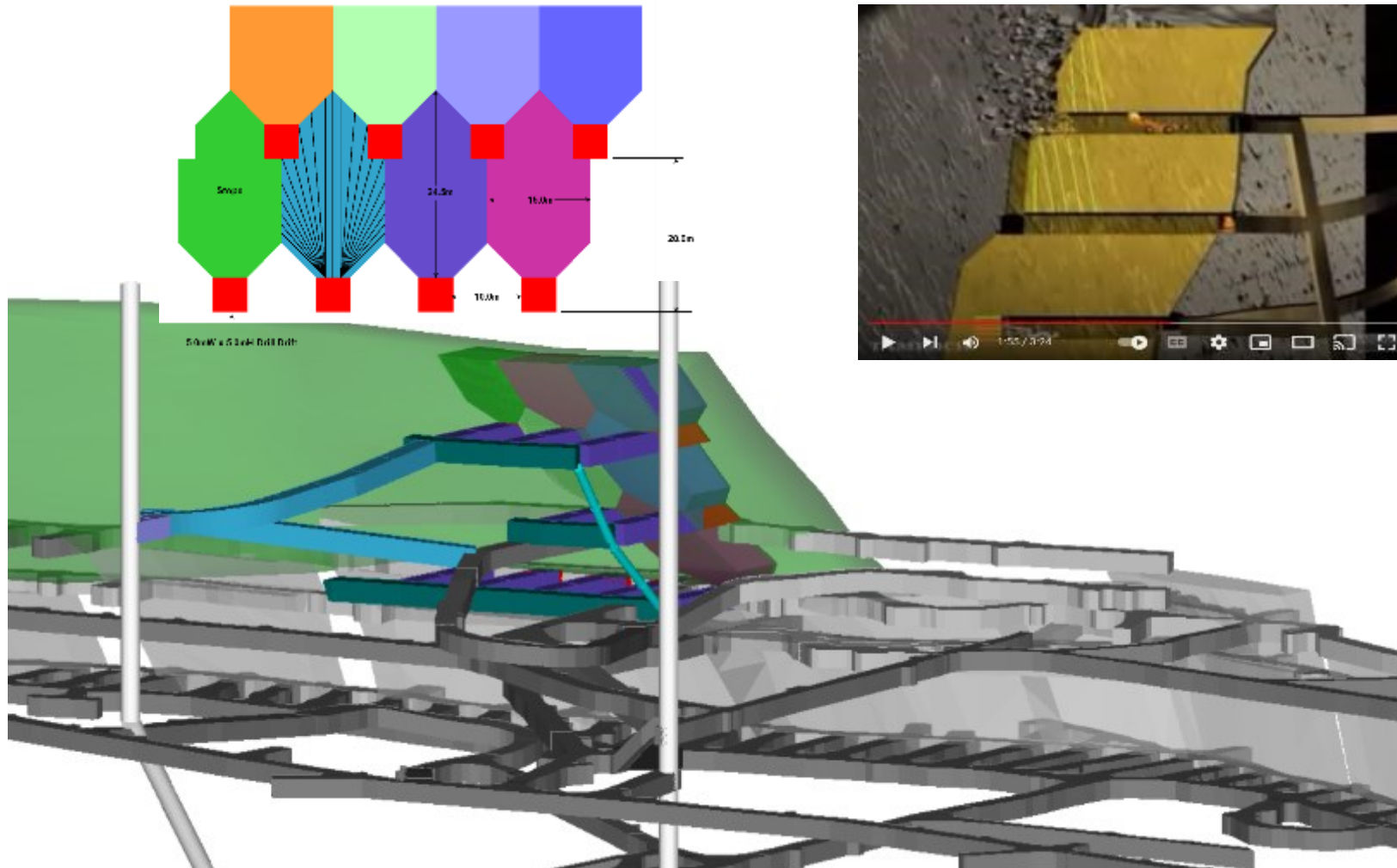


# PCZM +105 RESOURCE – SECTION VIEW LOOKING NORTH-EAST



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SUB-LEVEL CAVING STOPING METHOD TO BE TRIALED REPLACING OPEN PIT





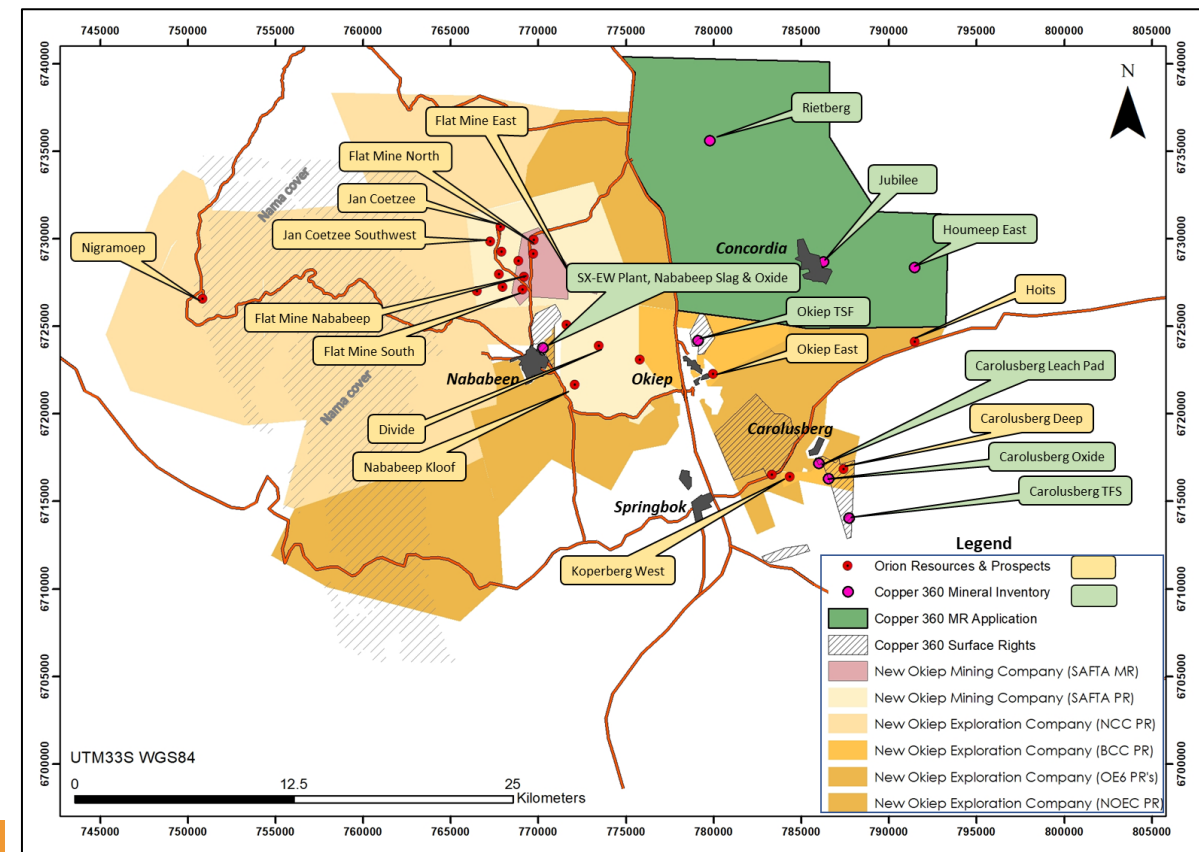
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## OCP Projects



# OKIEP COPPER PROJECT (OCP) (56%-100%)

- **Exercised option** to acquire and applying for additional prospecting rights in the Okiep Copper Complex (OCC):
  - Historical production of +2Mt of copper
  - Non-JORC resource ex-Goldfields of 52Mt @ 1.3%
  - **JORC Mineral Resource of 11.5Mt at 1.4% Cu, containing 159,000 tonnes Cu**
  - Tremendous exploration upside
- Promises outstanding operational synergies with Orion's Prieska Copper-Zinc Project, located 450km east of OCC
- Total acquisition cost, payable in stages in cash and shares, of:
  - Purchase price: ~AUD7.1M (Cash 24% : Shares 76%)
  - Deferred Payment subject to exploration success ~AUD9.1M (100% shares)

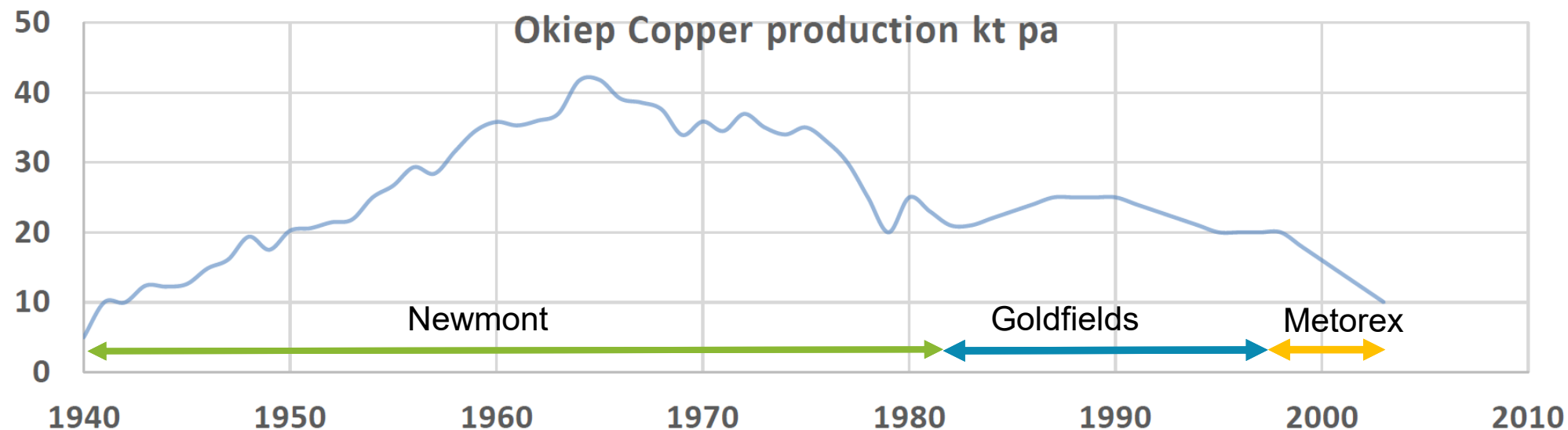


Refer ASX/JSE releases 2 August 2021, September 2021 Quarterly report and Annual Report to Shareholders 2022

**Significant opportunity for Orion to develop a second base metal production hub alongside Prieska**



# OKIEP – HISTORICAL PRODUCTION PROFILE

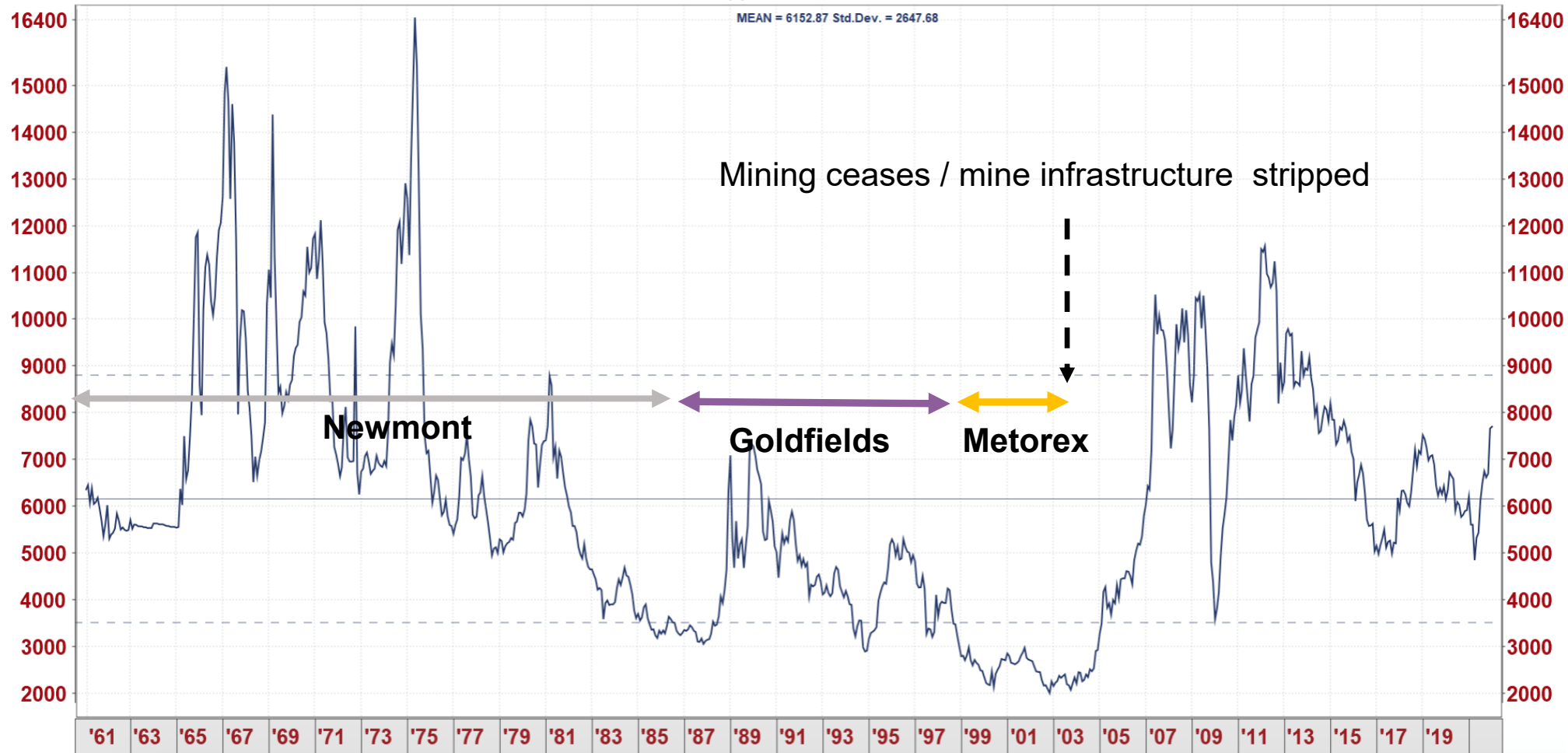


## Produced 2.1Mt Cu from 121Mt ROM @ 1.9% Cu

- Peaked at 2.4Mtpa ROM, mainly from underground mining
- Ore sourced from 42 separate mines within the district (20km radius)
- Consistently achieved >90% plant recoveries to >30% Cu in concentrate

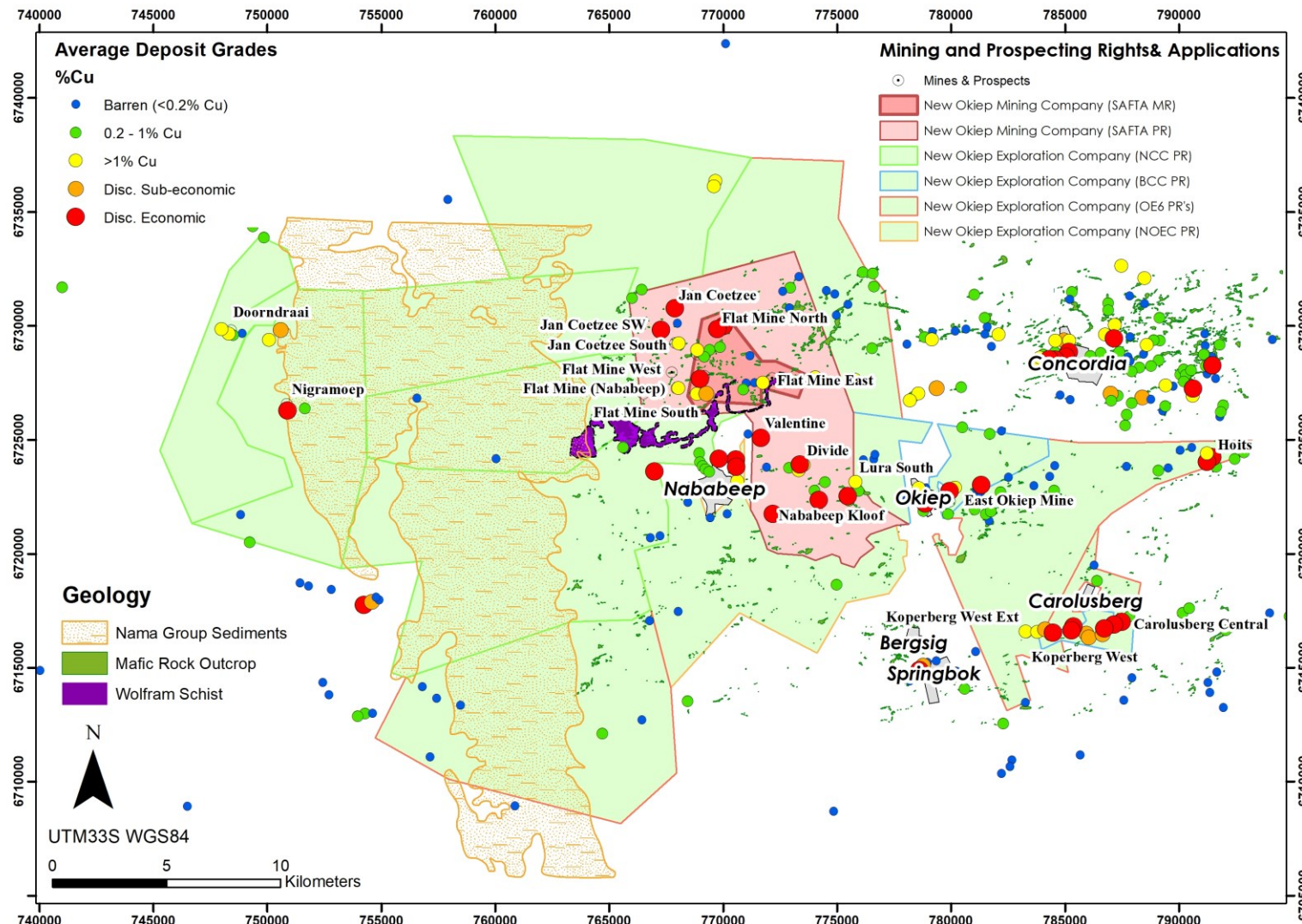


Copper Price \$/ton (real)



Source: Peter Major  
Mergence Capital

# OCP HISTORICAL DISCOVERIES AND MINES



- Mineralised intrusive bodies intrude structures aligned in east-west trending structural corridors
- 25% of mineralised corridors hidden under thin surface cover
- Modern geophysics expected to assist in detecting mineralisation underneath the thin cover
- Orion has now proved the existence of a Ni rich sulphide mineralisation phase, not previously targeted

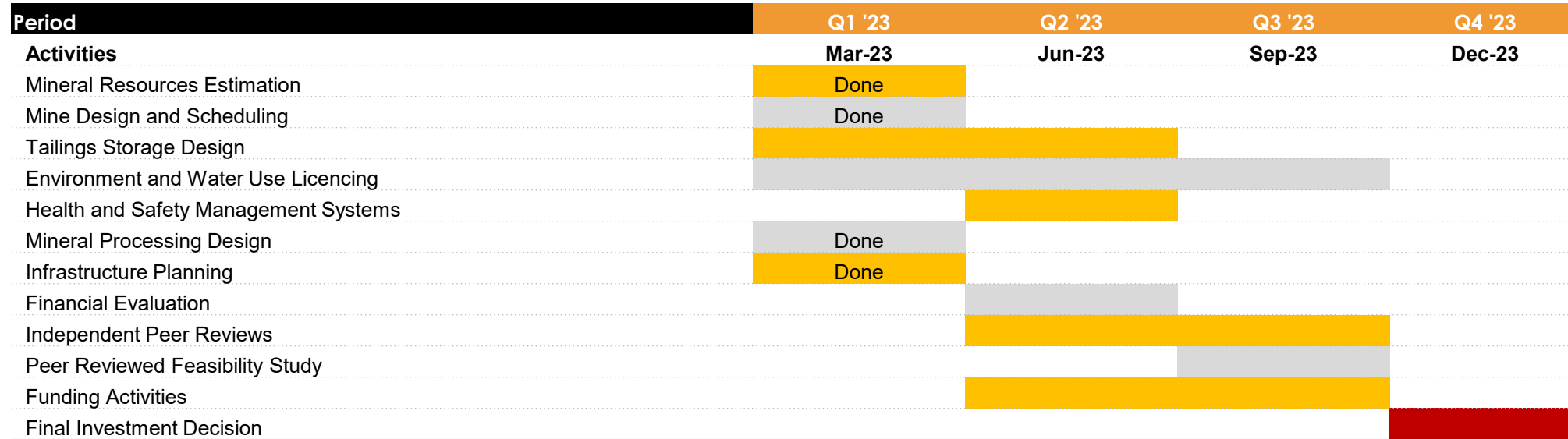


# NOM – FLAT MINES 2021 SCOPING STUDY INDICATED ROBUST ECONOMICS FOR INITIAL “PILOT” MINING

- Industrial Development Corporation (IDC) to be our project partners
- Foundation phase is modelled for 12 years
  - Concurrent exploration targeting mine expansion
- Scoping Study indicates potential for robust pilot-phase mine:
  - Production for the pilot phase of 9Mt at 1.29% Cu producing 102kt of copper in saleable concentrates
  - First production possible within 16 months of the start of construction
- **Capital of AUD58M (including 15% contingency)**
- **All-in-sustaining costs of US\$4,478/t (US\$2.03/lb) of copper sold**
- **NPV<sub>10</sub> (post tax) of AUD114M (at US\$7,593/ton Cu)**
- **All-in-sustaining margin of 40%**
- Average annual undiscounted free cash flows of AUD32M post-tax
- Break-even grade of 0.8% Cu for both un-optimised open pit and underground mining operations



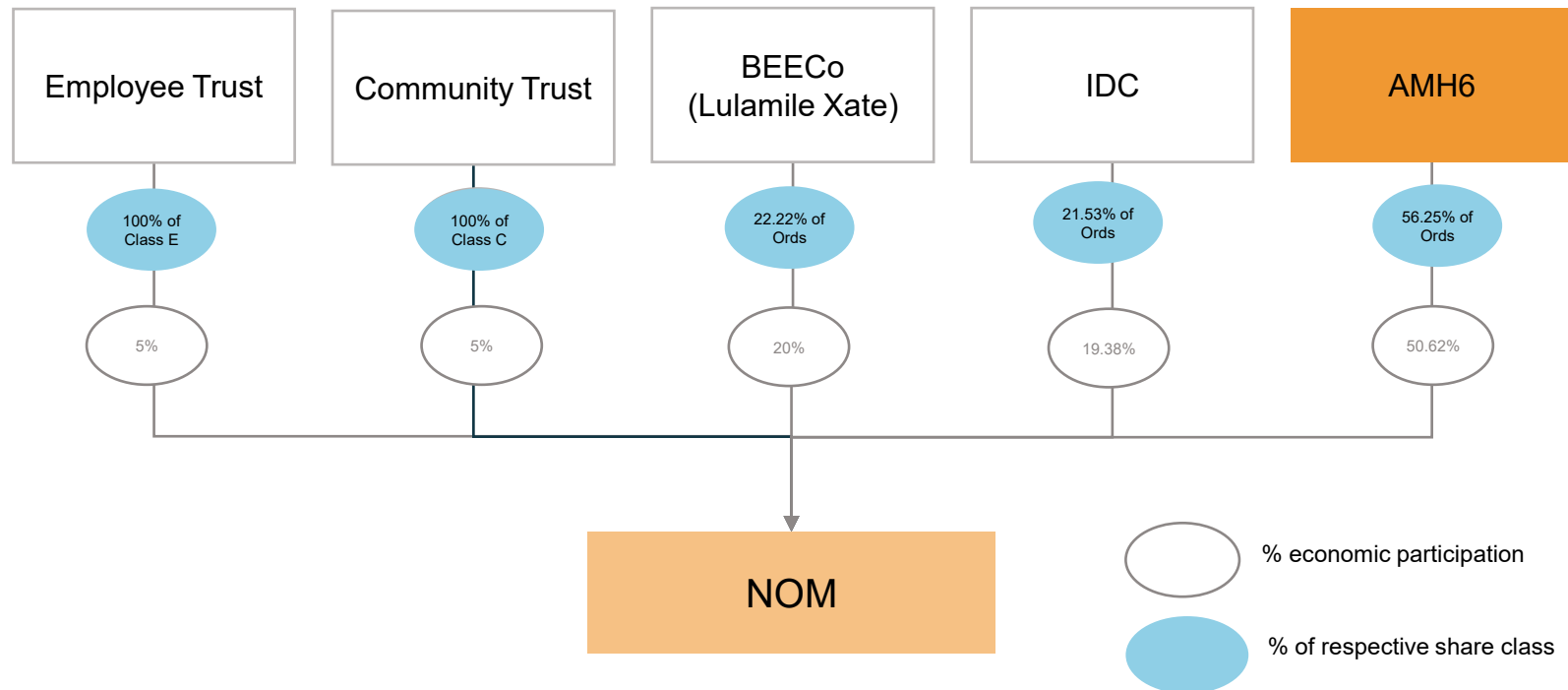
# NOMC TIMELINE: PRE DEVELOPMENT



Company	Role	Detail
Z-Star	Resources estimation	Mineral resources estimation (JORC Code reporting)
Sound Mining	Mining engineers	Mine planning, rock engineering, ore reserves
ABS (Africa)	Environmental consultants	Specialist environmental studies, water use licence
Bluegrey OH&S	Occupational Health and Safety	DMRE returns, occupational health assessments
METC Engineers	Engineering consultants	Processing plant and surface infrastructure design
Epoch	Civil engineers	Tailings storage facility design
BBENERGY	Electrical engineers	10 MVA power supply from NK Municipality
Fraser McGill	Financial analysts	Financial modelling and economic evaluation
Falcon & Hume Inc	Lawyers	Legal advisory and reviews
Orion Minerals Limited	Parent company	Product marketing and funding strategy
TMC	Mining engineers	Independent peer review of feasibility study
Orion Minerals Limited	Parent company	Community and land access matters

# IDC IS NOW 43.75% FUNDING PARTNER IN NOM

IDC Injecting ZAR35M to achieve the following Structure for NOM







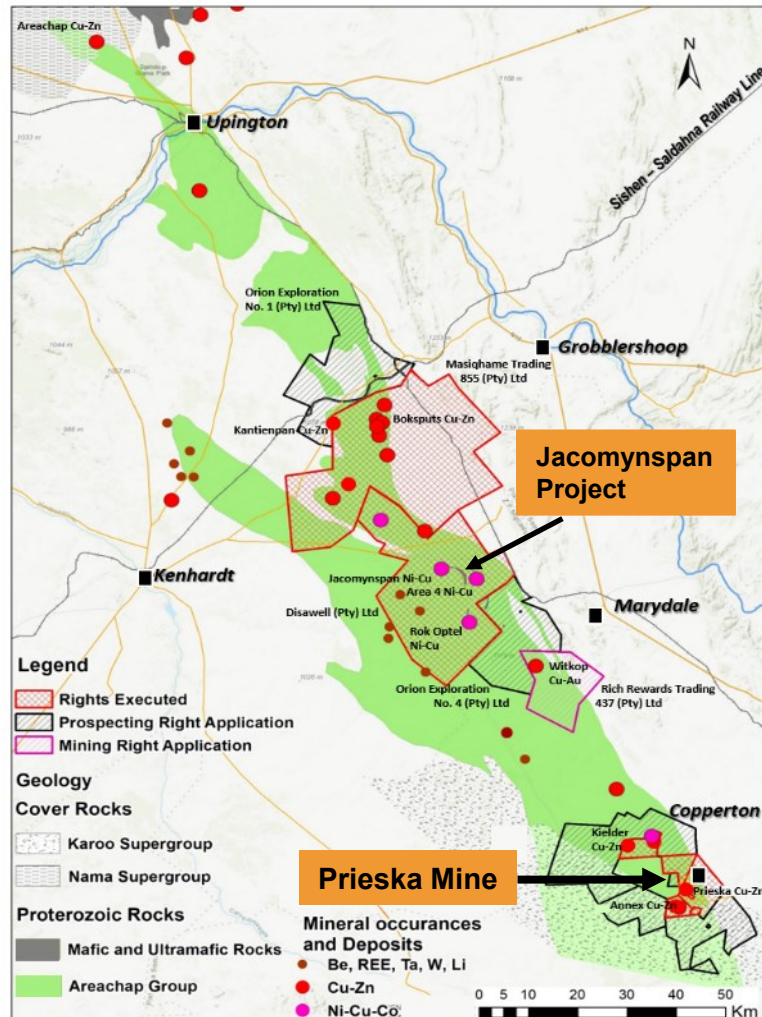
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# JMP Project



# ENORMOUS EXPLORATION UPSIDE

## AREACHAP – AN UNDER-EXPLORED BELT WITH HIGH METAL ENDOWMENT



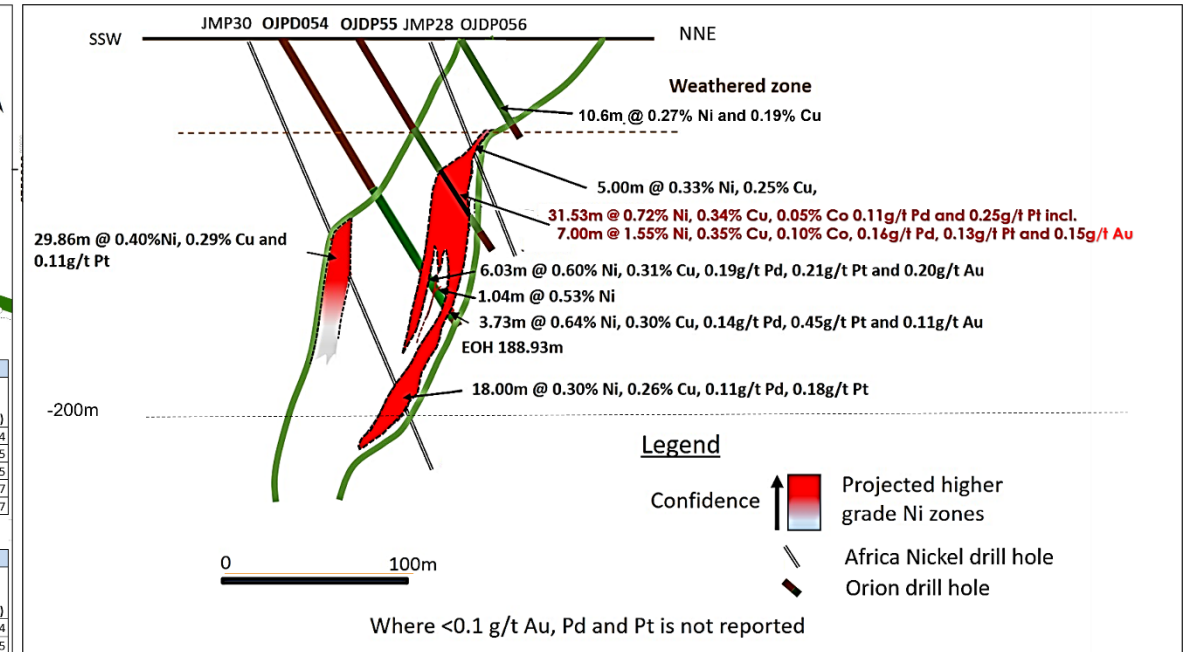
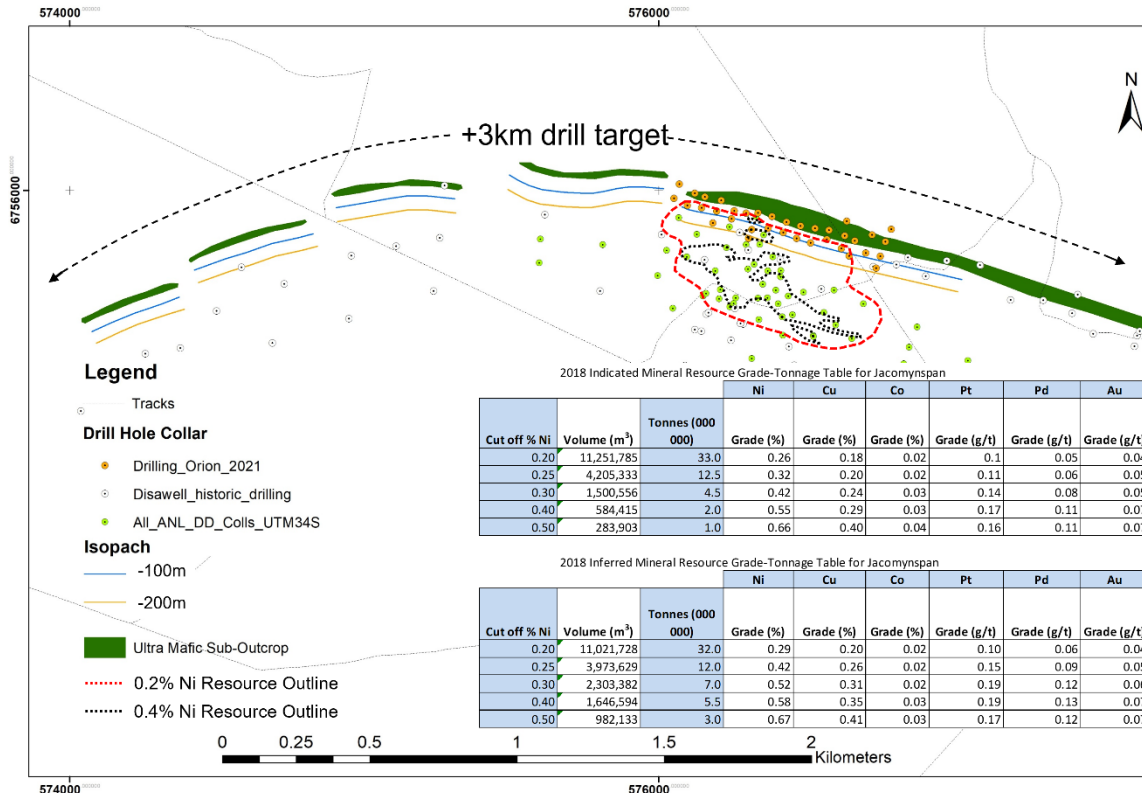
### Multiple Cu-Zn VMS and Ni-Cu-Co intrusive targets within Orion's mineral rights

- Jacomynspan – Mining Right with potential for sulphide Ni-Cu-PGE-Au open pit & shallow underground mining
- Several high grade Cu-Au targets with historical and recent drill intersections
- Several Li, Be, REE occurrences & old diggings to be investigated

# JACOMYNSPAN (50% ORN : 37% AFRICAN NICKEL)

## POTENTIAL TO BE A SIGNIFICANT FUTURE METALS PRODUCER

### Granted Mining Right over Ni-Cu-Co-PGE+Au Intrusive Complex



Investigating innovative proprietary technology to recover Battery Metals and high-value Battery Precursor Products – a value game changer

# BENEFICIATION INVESTIGATIONS

## Potential to unlock value locally, using beneficiation to produce “Future Metal Products”

- Abundant solar and wind renewable energy installed or being developed, with large-scale green hydrogen and ammonia soon to be added
- Combination of low-cost green energy and rapidly-developing clean beneficiation technology coupled with unprecedented demand growth for battery metal salts and specialist powders (Precursor Battery Products) provides unique opportunity
- Specialist Precursor Battery Products trade at large premiums to the contained metal value
- Modern technology and engineering advances have removed the need for roasting and smelting and reduced CAPEX and OPEX
- Low-cost beneficiation with enhanced revenue may reduce mining cut-off grades and increase production from moderate-grade ore sources



## Orion commissioning testwork and scoping feasibility assessments on:

### • **Modified carbonyl and chlorine metal vapour technology**

- MOU and term sheet signed for earn in with Stratega Metals
- Modified derivation of process technology already in use at Sudbury, Norilsk and Jinchuan
- Roasting/smelting steps eliminated with use of metal vapour extraction of sulphide concentrates followed by separation and purification of metals
- Zero emissions, no water used and low energy requirement

Commercial applications of discrete carbonyl nickel powder



### • **Hydrometallurgical Atmospheric Acid Leach Process**

- For application to oxides and mixed oxide - sulphide ore without pre-concentration





Orion Minerals

# Appendices



# ESG – CORE FOCUS OF OUR BUSINESS



- **BEE (30%) Black Empowerment for mining projects of which:**
  - 20% Entrepreneurs
  - 5% Community Trust
  - 5% Employee Trust
- Community focused
- Environmentally conscious

Mining Indaba Award 2022 (Junior Enhanced Labour Standards)  
AAMEG Award 2020 (Junior Mining Leader on ESG)

- MD & CEO Errol Smart
  - Chairman of the Minerals Council South Africa's Junior and Emerging Miners' Leadership Forum

# GREEN POWER – GREEN FOOTPRINT

- Water conservation and recycling – tailings water available for re-use and excess delivered to local community for irrigation
- Tailings – predominantly in ground placement / void filling / carbon sequestration

## Renewable Energy Advantage

- 170MW Solar Power and 200MW Wind Power operational on site at PCZM, feeding into Eskom grid
- Additional dedicated 55MW Hybrid Wind + Solar Renewable Energy facility scoped for PCZM
- Long Term Target for PCZM and OCP to be 100% Renewable Energy Powered
- “Project Carbon Neutral Roadmap”
- The Northern Cape Province – one of the best areas in the world for wind and solar (PV) energy
- PCZM & OCP sites are within South Africa’s “Renewable Energy Corridors”



# NEXT GENERATION WORK PRACTICES

## Fourth Industrial Revolution (4IR) enabled

- Orion will be an industry leader within South Africa, adopting next generation technology and work practices
- Fresh start - no workplace or IR legacy issues
- High tech and mechanised - minimising employee exposure to high-risk environment
- Skilled workforce
- Improved environmental conditions, reduced pollution and contamination

**Winner: Enhanced Labour Standards category  
for Junior ESG Awards, 2022**



Benchmark  
Globally

Implement  
Enablers

Be Fast  
Followers

Always Make  
Commercial  
Sense

# PCZM – A GREEN METAL PRODUCER

Scope 1+2 - Carbon Neutral target

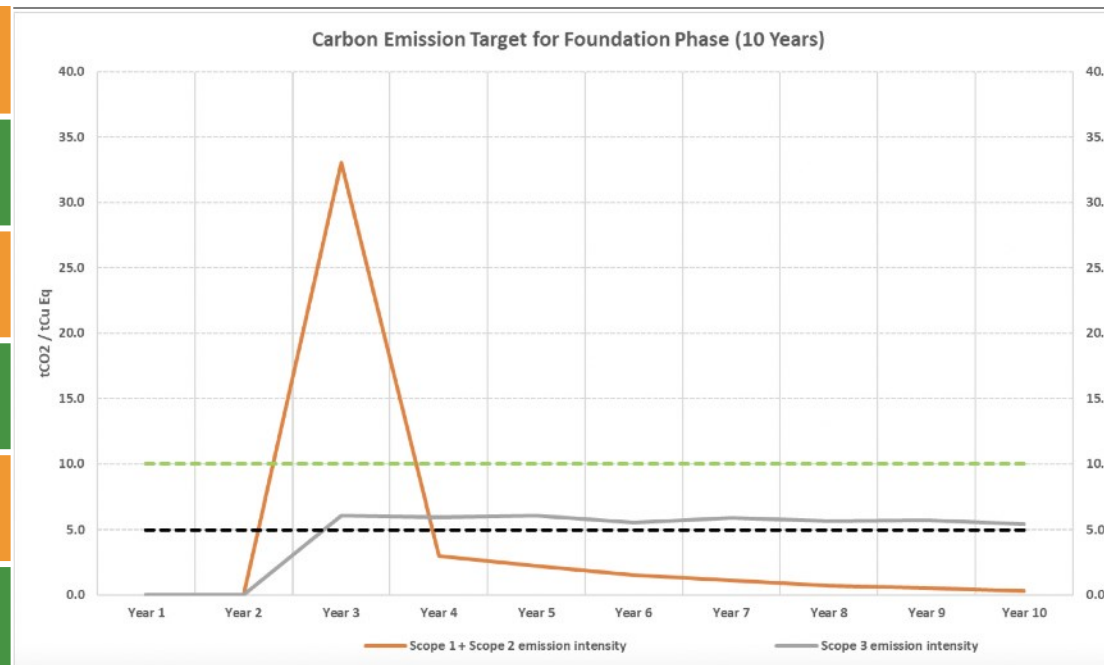
Mine sales – potentially attract “green” premium

Investigating Battery Precursor Production

Desirable for offtake customers

ESG – investment eligibility

Cost savings – carbon credits / low emissions



PARAMETERS		Foundation Phase A					Foundation Phase B				
Description	UoM	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
<b>Total Carbon Emissions</b>	<b>ktCO2</b>	<b>71</b>	<b>64</b>	<b>113</b>	<b>331</b>	<b>419</b>	<b>381</b>	<b>344</b>	<b>316</b>	<b>297</b>	<b>279</b>
Scope 1 - Direct Emissions	ktCO2	22	22	22	20	18	12	8	4	3	0
Scope 2 - Indirect Energy Emissions	ktCO2	49	42	74	91	95	71	47	31	23	14
Scope 3 - Indirect Emissions (Other)	ktCO2	-	-	18	221	306	298	289	281	272	264
<b>Overall emission intensity</b>	<b>tCO2/t Cu Eq</b>	<b>-</b>	<b>-</b>	<b>39.1</b>	<b>8.9</b>	<b>8.4</b>	<b>7.1</b>	<b>7.1</b>	<b>6.4</b>	<b>6.2</b>	<b>5.8</b>
Scope 1 + Scope 2 emission intensity	tCO2/t Cu Eq	-	-	33.0	3.0	2.2	1.5	1.1	0.7	0.5	0.3
Scope 3 emission intensity	tCO2/t Cu Eq	-	-	6.1	6.0	6.1	5.6	5.9	5.7	5.7	5.5



# PORTFOLIO OF FUTURE FACING METALS PROJECTS

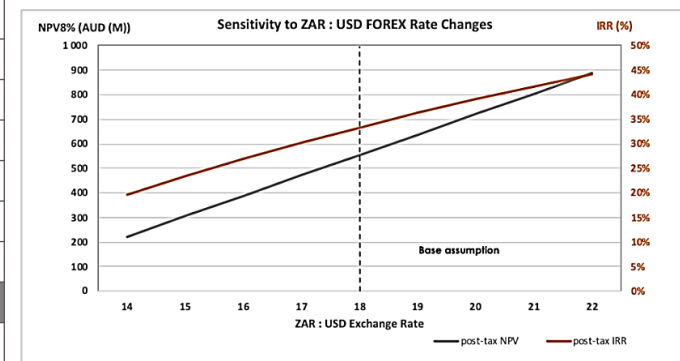


South Africa				Australia
Prieska (PCZM)	Okiep Copper Project (OCP)	Jacomynspan (JMP)	Bokspits	Fraser Range
70% ownership	56-70% ownership	50 ownership	Earning 70% ownership	10-30% free carried to feasibility
Copper-Zinc	Copper-Ni  Tungsten	Nickel-Copper-Cobalt-PGE-Au  Li, Be and REE	Copper-Gold +  Nickel-Copper-Cobalt-PGE-Au	Nickel-Copper
BFS & fully permitted	BFS underway Mining Right Imminent	Scoping Study 2012 being revisited. Granted Mining Right	Exploration	Exploration

# PCZM PROJECT BFS 2020: EXECUTIVE DASHBOARD

Key assumptions and Project Performance Parameters							
Price and FX Assumptions	Unit	Value	Financial Performance	Unit	Value	Unit	Value
Metal price - Cu	USD/t	6,680	NPV (pre-tax) @8% discount rate	ZAR (M)	8,566	AUD (M)	779
Metal price - Zn	USD/t	2,337	NPV (post-tax) @8% discount rate	ZAR (M)	6,069	AUD (M)	552
Exchange rate	ZAR : USD	18 : 1	IRR (pre-tax)	%	39%	%	39%
Exchange rate	ZAR : AUD	11 : 1	IRR (post-tax)	%	33%	%	33%
Exchange rate	AUD : USD	1.64 : 1	Payback from first production	years	2.4	years	2.4
Production metrics	Unit	Value	Undiscounted free cash flow (pre-tax)	ZAR (M)	17,691	AUD (M)	1,619
Life of Mine (Phase 1)	Years	11.5	Peak funding	ZAR (M)	4,542	AUD (M)	413
Treatment plant capacity	Mtpa	2.4	Project Cost Metrics	Unit	Value	Unit	Value
Phase 1 tonnage - ROM	kt	25,250	Average cash operating unit cost (C1)	ZAR/t	807	AUD/t	73
ROM Plant Feed Grade - Cu - U/G (O-Pit)	%	1.0 (1.3)	All-in-sustaining cost per unit ROM t	ZAR/t	972	AUD/t	88
ROM Plant Feed Grade - Zn - U/G (O-Pit)	%	3.3 (2.4)	All-in-sustaining cost per unit Cu eq t sold	USD/t Cu	3,531	AUD/t Cu	5,779
Overall Plant Recovery - Cu	%	83.9%	All-in-sustaining cost per unit Zn eq t sold	USD/t Zn	828	AUD/t Zn	1,355
Overall Plant Recovery - Zn	%	81.9%	Price received (net of NSR) - Cu	USD/t Cu	6,604	AUD/t Cu	10,807
Concentrate tonnage - Cu - U/G (O-Pit)	kt	1,071 (54)	Price received (net of NSR) - Zn	USD/t Zn	1,588	AUD/t Zn	2,599
Concentrate tonnage - Zn - U/G (O-Pit)	kt	1,256 (46)	All-in-sustaining margin	%	47%	%	47%
Concentrate grade UG - Cu - U/G (O-Pit)	%	19.8 (25.5)	Operating breakeven grade (Cu eq)	%	1.0%	%	1.0%
Concentrate grade UG - Zn - U/G (O-Pit)	%	52.9 (35.0)	Project Cash flows	Unit	Value	Unit	Value
NSR as % of metal price - Cu - U/G (O-Pit)	%	99.3 (92.1)	LoM net revenue	ZAR (M)	43,404	AUD (M)	3,946
NSR as % of metal price - Zn - U/G (O-Pit)	%	68.4 (51.3)	LoM operating costs (plus State Royalty)	ZAR (M)	20,082	AUD (M)	1,826
Metal sold (in concentrates) - Cu	tonnes	226,000	Project Start-up Capital Expenditure	ZAR (M)	4,100	AUD (M)	372
Metal sold (in concentrates) - Zn	tonnes	680,000	Sustaining Capital Expenditure	ZAR (M)	1,510	AUD (M)	137
Total Sales as Cu equivalent	tonnes	386,000	Income Tax	ZAR (M)	4,865	AUD (M)	442
Total Sales as Zn equivalent	tonnes	1,644,000	Cash Flow After Tax	ZAR (M)	12,826	AUD (M)	1,166
Level of Accuracy of Financial Model $\pm$ 15%, LoM = Life of Mine, NSR = Net Smelter Return, NPV = Net Present Value, IRR = Internal Rate of Return							
There is a low level of geological confidence associated with Inferred Mineral Resources and therefore there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources so that the Production Target or financial forecast information referred to in this Study will be realised.							

NPV Sensitivity (AUD (M))	% Change	-15%	-10%	-5%	0%	+5%	+10%	+15%	0%
Zn Price USD/lb	0.90	0.95	1.01	1.06	1.11	1.17	1.22	1.06	
Cu Price USD/lb	2.58	2.73	2.88	3.03	3.18	3.33	3.48	3.03	
% Change	ZAR:USD	post-tax NPV (at 8% discount rate)							IRR
-15%	15.30	112	185	257	329	400	471	541	25%
-10%	16.20	176	252	328	403	478	553	629	28%
-5%	17.10	238	319	398	477	557	636	716	31%
0	18.00	301	385	468	552	636	719	804	33%
+5%	18.90	363	451	538	626	714	803	892	36%
+10%	19.80	425	517	609	701	793	887	981	38%
+15%	20.70	487	583	679	775	873	971	1,070	41%



# NOM – FLAT MINES PILOT PROJECT SCOPING STUDY

Executive Dashboard							
Price and Forex Assumptions	Unit	Value	Financial Performance	Unit	Value	Unit	Value
Metal price - Cu	USD/t	7,593	NPV (pre-tax) approximated @10% discount rate	ZAR (M)	1,896	AUD (M)	170
Metal price – Au	USD/oz	1,889	NPV (post-tax) approximated @10% discount rate	ZAR (M)	1,267	AUD (M)	114
Metal price – Ag	USD/oz	24	IRR (pre-tax)	%	44%		
Exchange rate	ZAR : USD	17.2 :1	IRR (post-tax)	%	37%		
Exchange rate	ZAR : AUD	11 .1: 1	Payback from first production	years	3.25 years		
Production Metrics	Unit	Value	Undiscounted free cash flow (pre-tax)	ZAR (M)	4,607	AUD (M)	413
Life of Mine (Proof-of-Concept Phase)	Years	11.8	Peak funding	ZAR (M)	643	AUD (M)	58
Treatment plant capacity	ktpa	780	Project Cost Metrics	Unit	Value	Unit	Value
Proof-of-Concept Phase tonnage - RoM	kt	9,011	Average cash operating unit cost (C1)	ZAR/t	781	AUD/t	70
Proof-of-Concept Phase tonnage – RoM U/G	kt	7,479	All-in-sustaining cost per unit RoM t	ZAR/t	873	AUD/t	78
Proof-of-Concept Phase tonnage – RoM O-Pit	kt	1,531	All-in-sustaining cost per unit Cu t sold	USD/t Cu	4,478	AUD/t Cu	6,904
RoM Plant Feed Grade - Cu - U/G	%	1.29%	Price received (net of NSR) - Cu	USD/t Cu	7,441	AUD/t Cu	11,473
RoM Plant Feed Grade - Cu – O-Pit	%	1.28%	All-in-sustaining margin	%	40%		
RoM Plant Feed Grade – Au	g/t conc	2.2	Operating breakeven grade - Cu	%	0.83%		
RoM Plant Feed Grade – Ag	g/t conc	34	Project Cash Flows	Unit	Value	Unit	Value
Overall Plant Recovery - Cu	%	87.4%	LoM net revenue	ZAR (M)	12,712	AUD (M)	1,142
Concentrate tonnage - Cu	kt	386	LoM operating costs (plus State Royalty)	ZAR (M)	7,320	AUD (M)	657
Concentrate grade - Cu	%	25.8%	Project Start-up Capital Expenditure	ZAR (M)	595	AUD (M)	53
NSR as % of metal price - Cu	%	96.9%	Sustaining Capital Expenditure	ZAR (M)	188	AUD (M)	17
Metal sold (in concentrates) - Cu	Tonnes	102,329	Income Tax	ZAR (M)	1,368	AUD (M)	123
Total Cu Sales	Tonnes	386,787	Cash Flow After Tax	ZAR (M)	3,241	AUD (M)	291

Level of Accuracy of Financial Model  $\pm$  25%, LoM = Life of Mine, NSR = Net Smelter Return, NPV = Net Present Value, IRR = Internal Rate of Return

There is a low level of geological confidence associated with Inferred Mineral Resources and therefore there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the Production Target or financial forecast information referred to in this Study will be realised. Source: *ORN Okiep Financial Model revision 4.0*



# SENIOR MANAGEMENT



**Errol Smart**

*Managing Director &  
Chief Executive Officer*

Geologist, with professional registration for JORC purposes. Errol has more than 30 years' industry experience in exploration, mine development and operations. He is also the Chairman of the Junior and Emerging Miners Forum of the Minerals Council South Africa and serves as a Director on the Board of the Minerals Council of South Africa.



**Peet van Coller**

*Chief Financial Officer*

Chartered accountant who served his Articles of Clerkship at Ernst & Young. Peet has 23 years' experience, predominantly in the mining and manufacturing sectors, including various senior finance and commercial positions at Jubilee Group Metals, Murray & Roberts, Master Drilling, Samancor Chrome, Anglo Platinum and ARM-Norilsk JV, Nkomati Nickel Mines



**Martin Bouwmeester**

*Company Secretary*

Fellow of CPA Australia, highly experienced in exploration, mine development and operations, including more than 20 years' experience as Chief Financial Officer and Company Secretary of ASX listed companies. Key member of the team which evaluated, funded and developed the highly successful Fosterville Gold Mine.



**Nelson Mosiapoa**

*Group Corporate Social  
Responsibility Advisor*

Founder and trustee of the Mosiapoa Family Trust. Policy scholar of science and technology; served on the policy unit of the governing party in South Africa prior to the first democratic elections.



**Marcus Birch**

*Executive: Sustainability  
and Business Support*

Marcus has over 30 years' experience in mining and minerals exploration, initially as a geologist in the South African gold mining sector, and more recently in senior general management positions in the junior exploration sector.

# BOARD OF DIRECTORS



**Denis Waddell**

*Chairman*

Denis is a Chartered Accountant with extensive experience in corporate finance and management of exploration and mining companies.



**Errol Smart**

*Managing Director & Chief Executive Officer*

Errol is a Geologist, with professional registration for JORC purposes. He has more than 30 years' industry experience in exploration, mine development and operations. He is also the Chairman of the Junior and Emerging Miners Forum of the Minerals Council South Africa and serves as a Director on the Board of the Minerals Council of South Africa.



**Philip Kotze**

*Non-Executive Director*

Philip has accumulated significant operational experience over the last 40 years on a number of different mines and has distinguished himself as an expert in finding innovative solutions for complex problems. Philip has served as a senior executive for listed mining companies since 1996. Roles include Operations Director, President and Chief Executive Officer.



**Mark Palmer**

*Non-Executive Director*

Mark is an investment banker with 12 years' experience working with entities in Australia. He has been Investment Director at Tembo Capital since 2015.



**Godfrey Gomwe**

*Non-Executive Director*

Godfrey is the former CEO of Anglo American's Thermal Coal business and he served as Executive Director of Anglo American South Africa until August 2012.



**Tom Borman**

*Non-Executive Director*

Tom is a respected and highly experienced global mining executive who served more than 11 years working for the BHP Billiton Group in various senior managerial roles, including that of Chief Financial Officer of an Australian-listed mining company.





Orion Minerals

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**ASX/JSE: ORN**