



## Orion Minerals

ASX/JSE RELEASE: 31 October 2023

# September 2023 Quarterly Activities Report

## HIGHLIGHTS

- ▶ Orion continued its transition towards becoming a mine developer and operator at the Prieska Copper Zinc Mine (PCZM), with critical path items including recruiting and onboarding of a skilled operating team, preparation of detailed designs together with execution plans for the trial mining program and installation of primary infrastructure upgrades all progressing according to plan.
- ▶ Updated PCZM +105 Mineral Resource reported, increasing the resource to 2.3Mt at 1.7% Cu and 1.6% Zn including an Indicated Resource of 1.9Mt at 1.82% Cu and 1.70% Zn and increases the total PCZM Mineral Resource to 31Mt grading 1.2% Cu and 3.6% Zn.
- ▶ Initial drawdown of project development funding, ~A\$13.8 million was called in July 2023, from facilities totalling ZAR370 million, being the ZAR250 million (~A\$20 million) Industrial Development Corporation of South Africa Limited convertible loan facility and the Triple Flag A\$10 million early Funding Arrangement.
- ▶ Trial Mining Contract awarded to experienced South African contract mining company, Newrak Mining Group. Newrak will operate both with a fleet of conventional load, haul & dump loaders and an innovative continuous loading machine introduced recently to the South African market.
- ▶ Installation of the main 178m rising main dewatering pipe completed, with primary dewatering expected to commence in Q1 2024 following commissioning of the primary 15MW electrical power supply.
- ▶ Updated Feasibility Study on the accelerated development strategy and staged ramp-up at Prieska well advanced and on track for completion by mid-CY2024, once trial mining has been completed.
- ▶ Upgraded Mineral Resources completed for the Flat Mines area at the Okiep Copper Project (OCP), with a revised geological interpretation resulting in improved definition of the mineralised zones, together with an increase in the total Mineral Resource.
- ▶ Mineral Resources at Flat Mine North, East and South now total 9.3Mt at 1.3% Cu for 130,000 tonnes of contained copper, including a Measured and Indicated Resource of 7.4Mt at 1.4% Cu.
- ▶ Mineral Resource for the entire OCP increased to 12Mt at 1.4% Cu for 160,000 tonnes of contained copper.
- ▶ Updated Mineral Resource is incorporated in the Bankable Feasibility Study (BFS) for the OCP, which has been completed and handed to the Independent Technical Adviser for review.
- ▶ Orion received the AAMEG Emerging ESG Leader Award for the Company's pioneering approach to community involvement in its projects, particularly its Community Participation Framework at PCZM.

### **Orion's Managing Director and CEO, Errol Smart, said:**

*"This is a very exciting period for Orion as we make the transition from an exploration company into an operating copper mining company. With our multi-pronged funding strategy implemented last quarter, we were able to push ahead with a range of key activities during the September Quarter which saw our strategy to bring the PCZM back into production, rapidly gaining momentum.*

*"At the core of our strategy is securing an appropriately skilled, local resident operating team comprised of select full time staff supported by skilled contractors. We have been particularly successful in securing the services of the previous mine senior management who bring valuable experience in the mining and metallurgical operations for this specific orebody.*

*"We spent the greater part of the September Quarter completing essential preparations, such as installing underground refuge chambers, upgrading the hoisting capacity of the emergency escapeway to the surface and sourcing and installing key ventilation equipment in preparation for trial mining.*

*"We awarded a six-month trial mining contract to experienced contract mining company Newrak, who will target the near-surface, +105 Level Crown Pillar deposit using both conventional and alternative underground mining methods.*

*"The updated Mineral Resource for the +105 Resource Block which was completed last quarter, outlined a very attractive early mining opportunity focussed on the high-grade supergene sulphide Indicated Resource, with a grade of 2.6% copper. Ore sourced from the trial mining will be used for metallurgical optimisation tests and the detailed design of an initial processing plant at Prieska with all the data and results to feed into the Early Production, Bankable Feasibility Study, which is expected to be completed by mid-2024.*

*"While we are very busy at Prieska, we have not lost sight of the huge opportunity we have at our second emerging production hub, the Okiep Copper Project, also in the Northern Cape. During the Quarter, we delivered an increase in the total Mineral Resource for the Flat Mines area at Okiep following a detailed geological review. This has given us greater confidence in the resource model, with the positive outcome now incorporated into the OCP BFS.*

*"Importantly, our vision for the acquisition and the consolidation of mineral rights of the majority of the most prospective areas of the historic O'okiep Copper Company's mineral holdings, also took a major step forward during the Quarter, with the Department of Mineral Resources and Energy granting Orion prospecting rights over five additional areas in the Okiep Copper District. These grants have increased our tenement holding by about 30,000 hectares and give us access to additional minerals within the Flat Mines Mining Right including tungsten, silver, and gold.*

*"The busy Quarter was topped off by Orion receiving the AAMEG Emerging ESG Leader Award at the 2023 Africa Downunder Conference in Perth for our pioneering approach to community involvement at our projects, particularly our Community Participation Framework which was developed at Prieska. A strong commitment to the environment, communities and ethics have always been at the heart of Orion's operating strategy, and we have worked hard over many years to ensure we deliver genuine, positive, long-term benefits for the regions in which we operate. We are incredibly proud to have received this award, the second time we have done so. This shows what can be achieved in the ESG arena, irrespective of the size of the company."*

### **Orion Overview**

Orion Minerals Ltd (ASX/JSE: ORN) is a diversified international base metals company which is developing three complementary base metal production hubs in South Africa's Northern Cape Province, a richly endowed mineral province and well-established mining jurisdiction.

Orion is prioritising the development of projects capable of meeting the growing demand for key future facing metals – such as copper, zinc and nickel – that have strong market fundamentals because of declining global resource inventories, falling grades at major mines and lack of investment in new mines. The use of these metals in clean energy technologies makes them critical to a low-carbon future.

The Company is fast-tracking the development of its flagship Prieska Copper Zinc Mine (PCZM), with an Early Production Feasibility Study currently in progress targeting a staged ramp-up of operations and production. Key inputs to this study include the upcoming trial mining program and metallurgical test work, with dewatering of the underground mine also commencing in early CY2024. The Feasibility Study is due for completion by mid-CY2024.

Orion is also advancing the development of a second production hub, initially based on the Flat Mines area at the Okiep Copper Project (**OCP**), while also conducting exploration programs to increase the Resource and Reserve base to underpin a larger-scale, longer-term operation. A BFS on Flat Mines has been completed and handed over to the Independent Technical Expert for review. The OCP comprises the core of a premier historical copper district that produced >2Mt of copper over a 150-year period ending in 2006.

Orion's third project, the Jacomynspan Nickel-Copper-Cobalt-PGE sulphide (**JMP**) project will leverage off modern refining technology specifically directed toward production of metal products that are critical to the energy transition. The metal vapour refining technology currently being tested on JMP metal sulphide concentrates presents an exceptional opportunity to maximise metal recovery to high value products with high ESG credentials.

## Operations Report

### Health and Safety, Community Engagement and Environmental Management

#### Health and Safety

One injury was recorded during the September 2023 Quarter and the hours worked for the Quarter and the 2024 financial year to date are shown in the table below:

**Table 1: Hours worked at the Group's Areachap and Okiep Copper Projects (South Africa).**

Category of Work	Hours Worked	
	Quarter	FY2024 YTD Total
Exploration	3,682	3,682
Surface	11,326	11,326
Underground	5,988	5,988
Contractors	8,089	8,089
<b>Total</b>	<b>29,085</b>	<b>29,085</b>

The Lost-Time Injury Frequency Rate (**LTIFR**) per 200,000 hours worked is **0.0** for the September Quarter.

At the end of the Quarter, the team celebrated 1,506 days without a Lost Time Injury (**LTI**) and 333 accident-free days to 27 September 2023. Following Quarter end, a minor accident occurred, whereby a hand injury was sustained, and the Group's accident-free count was reset to zero.

#### Community and Stakeholder Engagement

##### Orion – AAMEG Award for leadership in ESG

In September 2023, Orion received the Australia-Africa Minerals & Energy Group (**AAMEG**) Emerging ESG Leader Award, which recognises Australian companies performing exemplary ESG work on the African Continent. This is the second time Orion has won this prestigious industry award, having also received the inaugural Emerging ESG Leader Award in 2020.

This year's award recognises Orion's pioneering approach to community involvement in its projects, particularly its Community Participation Framework, which was developed at PCZM.

The framework, which has evolved through a year-long series of in-person meetings with representatives from local businesses and resident groups, commits Orion to proactively encourage host community involvement in its operations through targets of 50% of employment, 30% of the procurement of goods and services, and 40% of sub-contracting opportunities.

As the mine begins its transition to the implementation of the Early Production Plan, Orion has already started implementing initiatives that will equip the host community and businesses to meet and beat these targets as the mine develops. Orion anticipates that the framework will create the opportunity for local small enterprises to grow as standalone businesses or via joint ventures with larger established suppliers.

It is also the first of its type among junior mining companies operating in South Africa. The framework is a model for community engagement and participation that can go a long way towards stabilising relationships with those who live close to, and often depend on, mining operations.

Orion's PCZM Community Participation Framework also provides a template that will be implemented in all of Orion's other operational areas as our projects move into development and then production.

Further information about the Community Participation Framework can be accessed via our website, <https://orionminerals.com.au/sustainability/community/>. Orion's entry submission for the AAMEG award can also be viewed via [AAMEG's website](#).

#### Orion continues productive engagements to update on progress

Orion continues to engage productively with its host communities to update them on the recent progress in securing funding and fast-tracking the development plans for its projects.

### **Siyathemba Community**

#### Pixley Ka Seme District Economic Symposium

Orion participated in the Pixley Ka Seme District Economic Symposium, organised by the Department of Economic Development and Tourism in Prieska from 23 to 24 August 2023. Delegates from provincial and district government departments and local businesses convened to discuss economic development in the district and the wider Northern Cape region, funding opportunities and services for small businesses. Orion presented its vision for the region, outlining its investment and plans for the integrated mining and beneficiation of future-facing metals in the province.

#### Local Enterprise Development and Skills Transfer

The first PCZM Social & Labour Plan Human Resource Development program commenced with 20 local candidates participating in Competency B (underground safety) training, which entails, amongst others, skills to identify risks and to install, maintain and remove underground support. Training took place at the Murray & Roberts Training Centre in Carletonville and transportation services were arranged through a local vendor.

#### PCZM promotes mining as a career path

In September, PCZM staff members assisted with a career day event hosted by Copperton Wind Farm. The event was supported by the Kimberley TVET College, Garob Wind Farm, Acciona Energy, the Mulilo Prieska Community Trusts and Orion. Valuable information about subject choices and further study options was shared with matriculants and post-matriculant students.

In addition, PCZM made a financial contribution to the sponsorship of an academic excursion to Cape Town for members of the Moreson Primary School, Prieska, in collaboration with Mulilo Prieska Community Trust. This excursion was made possible through a combination of internal fundraising and parental contributions. This excursion allowed learners to be exposed to historical sites, career path choices and stimulated personal growth.

## **Nama Khoi Community**

### Orion continues productive engagements with stakeholders

Orion continues with its efforts to foster trust and strengthen relationships with various stakeholders. During the quarter a Stakeholder Engagement meeting was convened to share information with the ward councillors. In addition, the partnership with the local radio station, *Radio NFM 98.1*, was renewed. Our research has shown that radio remains an effective way to communicate with stakeholders in Namaqualand. This partnership allows us to use the platform to share information on Orion's latest developments and plans.

### First Social and Labour Plan projects underway

Significant progress was achieved towards the execution of two Flat Mines Social and Labour Plan (**SLP**) projects during the Quarter. These Local Economic Development projects are focused on animal husbandry and agriculture to ensure that communities have a way to sustain their livelihoods beyond mining.

A dedicated project team has identified that the projects' next phase will include training, and Orion has initiated discussions with the Department of Agriculture to define the necessary training structure and requirements. While locating suitable sites for these projects has presented challenges, a solution is anticipated by early next year.

### Facilitating economic growth and regeneration

Orion contributed towards the cost of venue hire for the 7th Karoo Small-Town Regeneration Conference, organised by the South Africa Local Government Association (SALGA).

Hosted in Springbok in September, the conference aims included coordination, integration, and harmonisation of socio-economic infrastructure investments within the region. Addressing spatial transformation strategies with a shared vision and a set of development objectives for the Karoo region, the conference was also aimed at ensuring economic growth and job creation. Orion is proud to support efforts to facilitate economic growth and regeneration in its host communities.

## **Environmental Management**

Making positive contributions to the state of the natural environment, reducing pollution, and ensuring negligible contamination from operational activities are central to Orion's business model and part of our commitment to delivering the highest level of environmental compliance while managing and monitoring the environmental impacts of our activities throughout the mining lifecycle.

There were no environmental incidents recorded during the September 2023 Quarter.

## **Prieska Mine Development and Exploration**

### **Human Resources**

As PCZM moves towards trial mining and continuous operations, the permanent team has transitioned from a rotation shift working arrangement to being permanently site-based, as well as residing in the nearby town of Prieska. The strategy remains to integrate PCZM employees within the Prieska community and local economy. Given that specialist mining skills are currently not available locally, skills transfer remains a high priority while the positive impact of disposable incomes being spent within the local economy benefit the entire host community.

The first group of 20 local community candidates attended underground mining Competency B training at the Murray & Roberts Training Centre in Carletonville during the Quarter. A second group is scheduled for training in Q4 CY2023. The aim is to have a pool of local candidates available to feed into PCZM and contractor mining positions as these become available, and as the mine moves towards full operations.

## Critical Focus Items

During the Quarter, a number of critical items were addressed in preparation for trial mining and dewatering at PCZM. These included:

- The Skyjack hoisting platform installed in the Hutchings Shaft has been upgraded and has been approved by the DMRE as second escape from underground.
- A fixed underground refuge chamber has been built and commissioned on the 163 Level, allowing 30 people at a time to work safely underground.
- A second mobile refuge chamber increases the underground capacity to 50 persons at a time.
- Two engineering companies have been approached for the design, fabrication and installation of ring back ladderways in the Marais Shaft as a further option for second escapeway to surface and back-up to the Skyjack.
- Designs and plans for the self-build of a 15MVA Eskom grid connection sub-station expansion were approved by Eskom.
- Detailed design and scheduling of work for trial mining of selected +105 Level blocks was completed.
- Experienced South African mining contractor P2 Mining (part of Newrak Mining) was appointed for the trial mining program.
- A 30,000 litre sample of underground water was sent to Trailblazer Technologies for pilot plant testing of an ion exchange water purification process, with high value fertiliser as by-products.
- Installation of a 178m rising main dewatering steel pipe was completed in a large-diameter drill-hole from surface to the 178 Level.
- The 7t Telehandler was delivered to site and operator training was completed.

## Dewatering

The water depth is presently approximately 274m below surface. Primary dewatering will commence once electrical power becomes available in Q1 CY2024 and a final decision has been made on the underground water treatment method.

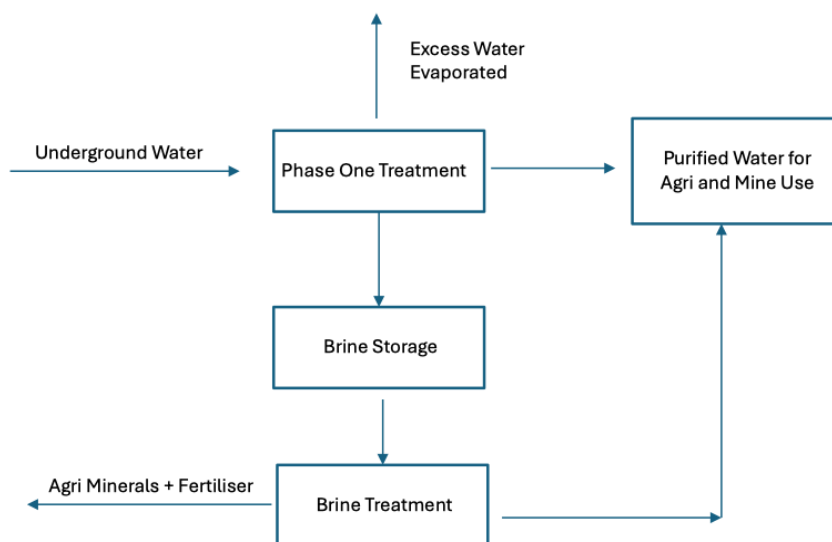
The submersible pumps for installation in the main Hutchings Shaft and the multi-stage pumps to be installed on the 178-Level have been delivered to site and will be installed in Q4 CY2023.

The main dewatering bypass hole has been drilled and fitted with screwed 250mm diameter steel pipe with flanged connections at both surface and the 178 Level. Drilling of the second hole to carry services such as power cables and compressed air from surface to the 178 Level has also been completed.



**Photo 1: Dewatering pumps.**

Water treatment and purification options for the underground water are now being optimised into a two-stage process to reduce capital and opex intensity, while achieving the same technical dewatering solution within the design timeframe. The development of an early mining plan focussed on near to surface material has reduced the need for high-rate early dewatering with the benefit of further cost reductions.



**Diagram 1: Anticipated water treatment and purification process.**

The water treatment is now planned to progress in two phases, with the first phase focussing on volume reduction and yield of water to agricultural standard. This first phase will utilise standard reverse osmosis and evaporation as originally included in our PCZM BFS20. This treatment solution relies on readily available equipment offered on hire for fixed term contracts. The concentrated brine waste will then be temporarily stored in a contained, lined impoundment facility located within the footprint of the future lined tailings dam.

A second phase of water treatment will then follow at a later stage, being less time sensitive and will focus on the future treatment of brine temporarily stored in the lined facilities, to be treated to recover agri-products and fertilisers as part of a potential joint venture with parties specialised on that industry.

The Phase One Reverse Osmosis (**RO**) plant is largely constrained, due to the downside of RO purification producing a residual brine product containing 30% of the water treated and requiring very specific storage in dedicated double-lined evaporation ponds. Orion has done extensive testwork over the past year to identify methods to reduce high cost, permanent brine storage and rather harvesting the minerals to produce agri-minerals and fertiliser and thereby potentially generating a by-product revenue stream to defray water treatment costs.

The Phase Two methods under consideration are electrolysis and ion exchange to harvest the minerals from the brine solution.

A “Rotowinner” electrolysis plant has been proven on trial basis on site, and a proposal has been received from Rotowinner for a full-scale plant which is being commercially evaluated. This method recovers relatively low-value agri-minerals and is less operating cost intensive than the RO option.

The second brine treatment method being considered is the Trailblazer ion-exchange plant. A 30,000-litre sample of underground water has been treated by Trailblazer in their ion-exchange and fertilizer manufacture pilot plant at their premises in Gauteng. The ion-exchange technology works by removing all dissolved solids from the saline mine water and producing high-value fertilizer with clean water

available for agricultural use. There is also an opportunity to generate revenue from the sale of high value potassium nitrate and ammonium sulphate fertilizer to offset infrastructure and treatment costs.

The early dewatering program is on track to complete installation of dewatering pumping at a rate of 100 m<sup>3</sup>/hr initially in Q1 CY2024, building up to 500 m<sup>3</sup>/hr by mid-year. Dewatering will commence with the scheduled 15MVA Eskom power connection in Q1 CY2024 and the availability of a dedicated sub-station to support the preferred water treatment plant.

### Power Reticulation

The engineering design of the 15MVA electricity supply point sub-station extension has been approved by Eskom for construction by Orion. PCZM have partnered with PPE Technologies (Power Plant Electrical Technologies) for electrical specifications and electrical project management. The 15MVA upgrade is scheduled to be completed by early 2024. In the meantime, the surface and underground electrical reticulation is being project managed by PPE in readiness for the delivery of the long-lead items of the 15MVA upgrade.

The interim arrangement to increase the currently available electrical supply to 1MVA has commenced with the delivery of the transformers to PCZM site and PPE managing the 11kV overhead powerline installation and tie-in. The Medium Voltage (11kV) extension to the underground workings powers the mining drills and ventilation fans for trial mining at the 105 Level and draw-point loading at the 143 Level.

### Exploration

A program of shallow in-fill Reverse Circulation holes was completed. The purpose of the program was to increase the amount of drilling data in the oxide Mineral Resource above the +105 Level supergene sulphide Mineral Resource and to provide material for oxide leach test work purposes. This could facilitate the evaluation of the open pit oxide mining concept. Thirty-two holes were drilled, totalling 1,286m (Figures 1 and 3).

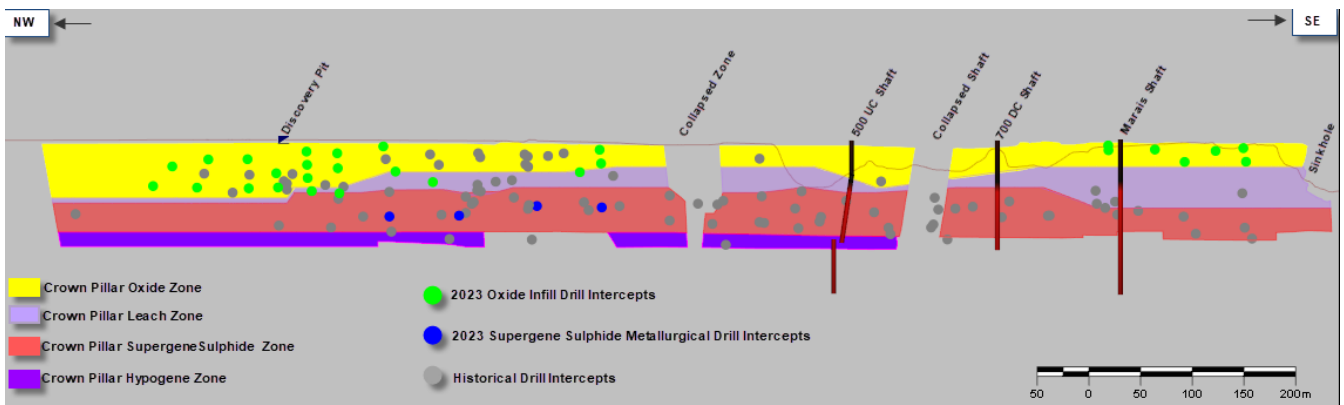


Figure 1: Drill holes – actual oxide hole positions.

### Mineral Resources

An Independent Mineral Resource update for the +105m Level Crown Pillar block was completed during the Quarter by Z Star Mineral Resource Consultants. The updated Mineral Resource Estimate incorporated all 2022 drilling data and an updated geological interpretation (see Table 2 and Figure 1).

The update resulted in a significant increase in the +105 Mineral Resource to 2.3Mt at 1.7% Cu and 1.6% Zn including an Indicated Resource of 1.9Mt at 1.82% Cu and 1.70% Zn (refer ASX/JSE release 25 July 2023). This includes a significant increase in the oxide resource based on new more robust interpretations. The updated Mineral Resource for the +105 block has resulted in an increase in the contained copper and zinc metal by 11,000 and 300 tonnes respectively from the January 2019 Mineral Resource Estimate (refer ASX/JSE release 15 January 2019).

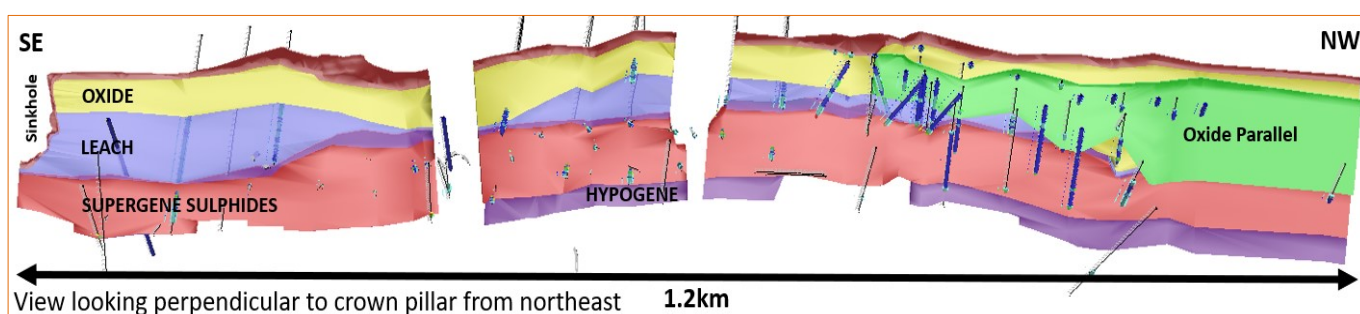


The Prieska total Mineral Resource, reported and classified in accordance with the JORC Code (2012), is now 31Mt grading 1.2% Cu and 3.6% Zn.

**Table 2: Global Indicated and Inferred Mineral Resource Statement for the +105m Level Resource Block of the Prieska Project.<sup>1</sup>**

Classification	Mineralised Zone	Tonnes	Cu (tonnes)	Cu (%)	Zn (tonnes)	Zn (%)
Indicated	HW Oxide	200,000	1,000	0.48	2,000	0.90
	Oxide	490,000	4,000	0.81	4,000	0.73
	Supergene Sulphide	1,100,000	28,000	2.58	22,000	2.06
	Hypogene	120,000	1,000	1.23	4,000	3.78
	<b>Total</b>	<b>1,900,000</b>	<b>34,000</b>	<b>1.82</b>	<b>32,000</b>	<b>1.70</b>
Inferred	HW Oxide	30,000	100	0.4	300	1.0
	Oxide	300,000	3,000	1.0	2,000	0.8
	Supergene Sulphide	60,000	1,000	1.4	300	0.6
	Hypogene	20,000	100	0.8	100	0.4
	<b>Total</b>	<b>400,000</b>	<b>4,000</b>	<b>1.0</b>	<b>3,000</b>	<b>0.8</b>
<b>+105m Level Mineral Resource Total</b>		<b>2,300,000</b>	<b>38,000</b>	<b>1.7</b>	<b>35,000</b>	<b>1.6</b>

**Note:** +105m Level Mineral Resource bottom cut-off = 0.3% Cu. Tonnes are rounded to second significant figure, which may result in rounding errors.



**Figure 2: View showing the +105m Level Mineral Resource with the Supergene Sulphide Zone in red, the Hypogene Sulphide Zone in purple, the main Oxide Zone in yellow and the HW Oxide Zone in green. The area between the main Oxide and Supergene Sulphide zones is a leached (clay) zone (blue) with insignificant Cu and Zn values and is excluded from the Mineral Resource. Brown represents the interpreted overburden.**

Since the previous +105m Level Mineral Resource (refer ASX/JSE release 15 January 2019), 14 holes comprising 918m were successfully drilled to intersect supergene sulphide mineralisation (refer ASX/JSE release 11 July 2022). A further five holes were drilled and abandoned due to poor ground conditions and unacceptable core loss.

Given the changes in the interpretation of mineralised domains, a direct comparison of the updated and previous (2019) resource figures is difficult. The increase in overall tonnes can be largely attributed to the

<sup>1</sup> Mineral Resource reported in ASX release of 25 July 2023: "Prieska Crown Pillar +105 Level Mineral Resource increases to 2.3Mt @ 1.7% Cu and 1.6% Zn ahead of Trial Mining" available to the public on <http://www.orionminerals.com.au/investors/asx-jse-announcements/>. Competent Person Orion's exploration: Mr Paul Matthews. Competent Person: Orion's Mineral Resource: Mr Sean Duggan. Orion confirms it is not aware of any new information or data that materially affects the information included above. For the Mineral Resources, the Company confirms that all material assumptions and technical parameters underpinning the estimates in the ASX release of 25 July 2023 continue to apply and have not materially changed. Orion confirms that the form and context in which the Competent Person's findings are presented here have not been materially modified.

extension of the interpreted crown pillar mineralised zone towards the south-east to where it intersects the sidewall of a sinkhole.

The more comprehensive interpretation of the mineralised zone in the hanging wall to the main crown pillar mineralisation also contributes significantly to this increase in tonnage (and to that of the oxide tonnage). The changes in the geological interpretation of the bottom of the oxide zone (particularly in the north-west) have had a significant positive impact on the oxide tonnage.

The increase in copper can be largely attributed to higher grades in the south-east of the supergene sulphide zone from the 2022 drilling, the extended interpretation of the crown pillar mineralisation to the south-east and the changes in the interpretation of the bottom of the oxides.

### **Trial Mining**

P2 Mining, (part of Newrak Mining – a company with more than 25-years of contractor mining experience) has been appointed as mining contractor for the 6-month trial mining period.

The 6-month trial mining covers the following activities:

- Development of cross-cut ramp in competent footwall formations to access the Crown Pillar Resource. Indicative total development 120m at 4.5m wide x 4.5m high;
- Development of 'reef drive' on strike in the supergene orebody. Indicative total development 300m at 3.0m x 3.0m; and
- Development of 2 x raises up-dip in ore to approximately 36m above reef drive at 2.0m x 2.0m cross-section.

The aim of the trial mining project is to test conventional load-haul-dump and alternative underground mining methods using continuous loaders matched with bi-directional trucks (Photo 2) with learnings and efficiency improvements feeding into the revised mining BFS as well as 143, 201 and 259 Level draw-point sampling exercise to evaluate the quality of broken ore remaining in old stopes in the upper areas of the underground workings.



**Photo 2: Trial mining equipment – at the PCZM project site.**

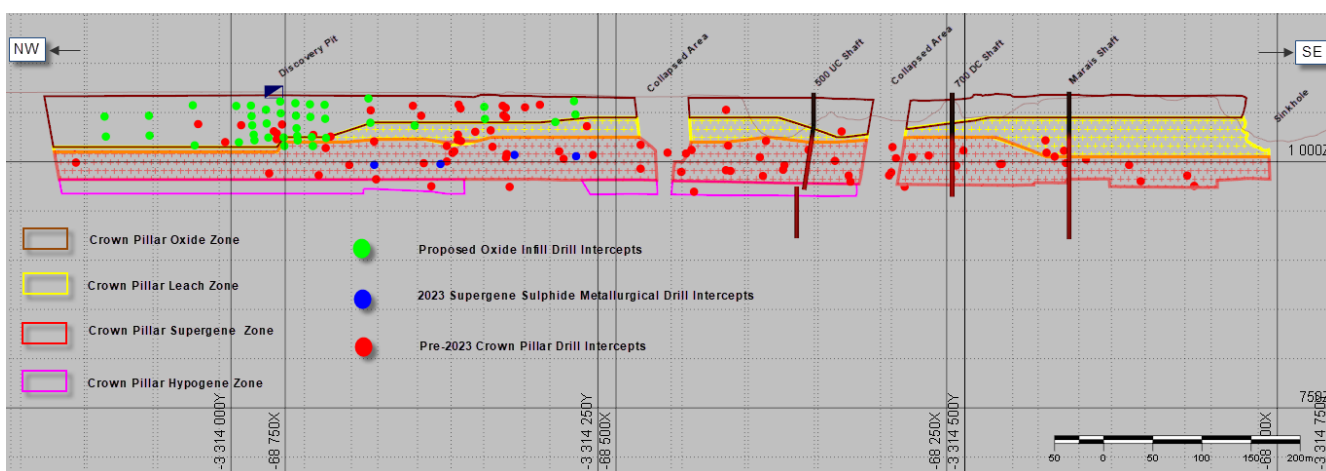
### **Mining Fleet Secured for Trial Mining Phase**

The mining fleet of vehicles and machinery secured for the trial mining phase at PCZM and will be on site for the program is shown in the table below.

Item	Description	Quantity
LHD	Aard 5.t	2
Dump Trucks	14 t low profile Fermel	2
Drill Rig	Sandvik DD321	1
Utility Vehicle	UV120	1
Continuous Loader	ITC120N	1
Bi-directional drive Dump Trucks	20t Paus ITC 10	2

### Metallurgical Process Re-evaluation and Early Concentrator Plant Design

Orion is in the process of engaging with various technical and turnkey process plant service providers for the supply of a 30-60ktpm modular process plant to treat ore from the trial mining phase at PCZM. The test work is being undertaken on supergene material as initial feed into the sulphide process plant being designed.



**Figure 3: Long Section showing supergene metallurgical holes and oxide drill holes.**

Processing routes developed by Mintek in 2018 include hypogene milling, sequential copper (Cu) flotation, zinc (Zn) flotation and ultra-fine grinding. However, opportunities exist to improve on the processing route for the supergene sulphide portions of the deposit (+105 Level Crown Pillar).

Flotation testing of hypogene samples in line with historical recoveries of the mine achieved over 86% recovery for both Cu and Zn, with Cu concentrate grades above 28% and Zn at 53% (refer ASX/JSE release 26 May 2020). Test work is now being progressed to assess the supergene sulphide recoveries from Locked Cycle testing. The results of this test work will be incorporated into the Early Mining Plan and modular process plant design. The plant will be designed to treat the different ore bodies in separated treatment campaigns from surface stockpile material.

Mr Bryan Broekman, the previous Chief Metallurgist for Anglovaal Group – who was directly responsible for most of the metallurgical process plant optimisations at Prieska Copper Mines to treat mixed oxide, supergene sulphide and hypogene sulphide ores from 1988 until mine closure in 1991 – has been contracted to oversee the two sets of supergene flotation test work currently undertaken by Enprotec and MTEC Engineering respectively. The pilot plant tests are being undertaken on 1.5 tonnes of fresh metallurgical samples drilled from four holes in the supergene sulphide zone of the +105 Resource blocks (Figure 3). The test work has already commenced.

Mr Broekman has recommended testing a refined process flow that promises to deliver improved recoveries and produce higher quality concentrates specifically from the ore sources in the upper levels of the mine, above the current water level and targeted in the trial mining exercise.

Orion has also approached two different service providers for XRF and XRT ore sorting technology, to allow for the concentration of ore after waste removal. The target material for ore sorting is the historical surface waste rock dump and the ore from the historic stope drawpoints on 143, 201 and 269 levels.

Documented test work completed on both supergene and hypogene ore indicated both XRF and XRT technologies can differentiate between ore and waste. Five sampling trenches have already been excavated on the waste rock dump and material has been stockpiled for treatment on one of three surface pad areas.

## **Okiep Copper Project Development and Exploration**

### **Feasibility Study Report**

The draft Feasibility Study Report was completed during the Quarter. This followed the finalisation of the TSF engineering design report and updating of the project financial model to include the cost estimates for the TSF construction and operation.

The Feasibility Study Report includes the revised Ore Resource Model, updated Mining Plan and schedule and the completed TSF design. The draft report has been submitted for peer review.

### **Environmental Management**

#### Water Use Licence Application (WULA)

The completion of the TSF design report facilitated the finalisation of the Integrated Water Use Licence Application (IWULA) by ABS (Africa). The application was submitted to the Department of Water and Sanitation (DWS) early in September, and a certificate of acceptance was received. Approval of the WULA by DWS is anticipated in Q1 CY2024.

### **Tailings Storage Facility (TSF)**

As previously reported, the TSF is planned to be located in an area impacted by prior mining operations. The final design of the facility with the accompanying groundwater impact modelling shows that the operation of the facility will have positive short and long-term impacts on the groundwater in the immediate vicinity of the TSF.

In light of the expected improvement of groundwater quality in the vicinity of the TSF, the Project Team expects the DWS will have a favourable view of the WULA.

### **Okiep Project Development**

#### Metallurgical Processing Plant

The conceptual design and costing of the Processing Plant to feasibility level accuracy was completed in the December 2022 Quarter. No further work in this area was undertaken during the Quarter and the metallurgical portion of the Feasibility Study Design report has been finalised.

#### Mineral Resources

A review of the geological interpretation at Flat Mine North, Flat Mine East and Flat Mine South has resulted in an improved definition of the mineralised zones together with an increase in the total Mineral Resources.

At the end of August, Orion announced that Mineral Resources at Flat Mine North, Flat Mine East and Flat Mine South now total 9.3Mt at 1.3% Cu for 130,000 tonnes of contained copper including a Measured and Indicated Resource of 7.4Mt at 1.4% Cu. In addition to the previously announced Mineral Resource of 2.5Mt at 1.4% Cu at Flat Mine (Nababeep), Jan Coetzee Mine and Nababeep Kloof Mine, this brings

the total Mineral Resources within the Flat Mines area of the OCP to 12Mt at 1.4% Cu for 160,000 tonnes of contained copper. Other historical mines and prospects are currently being modelled, with the potential to deliver further growth in the OCP Mineral Resource.

While this initial Resource has been used to support a foundation stage BFS and economic assessment of the Okiep Copper Project, we see outstanding potential to further grow and upgrade the Mineral Resources with in-fill drilling into areas with low drill density as well as drilling potential plunge and strike extensions of the known deposits.

**Table 3: Mineral Resources Statement for the Flat Mine North, Flat Mine East & Flat Mine South.**

Mine / Prospect	Measured			Indicated			Inferred		
	Tonnes	% Cu	† Cu	Tonnes	% Cu	† Cu	Tonnes	% Cu	† Cu
Flat Mine North	440,000	1.13	5,000	940,000	1.42	13,000	200,000	1.5	4,000
Flat Mine East	-	-	-	3,400,000	1.37	47,000	1,000,000	1.0	9,000
Flat Mine South	-	-	-	2,600,000	1.35	35,000	800,000	1.6	13,000
<b>Total*</b>	<b>440,000</b>	<b>1.13</b>	<b>5,000</b>	<b>6,900,000</b>	<b>1.37</b>	<b>95,000</b>	<b>2,000,000</b>	<b>1.3</b>	<b>26,000</b>

\*Numbers may not add up due to rounding in accordance with the JORC code guidance.  
Resources are reported at a 0.7% Cu cut-off grade.

**Table 4: Total Mineral Resources Statement for the Flat Mines area of the OCP.**

Mine / Prospect	Measured			Indicated			Inferred		
	Tonnes	% Cu	† Cu	Tonnes	% Cu	† Cu	Tonnes	% Cu	† Cu
Flat Mine (Nababeep)	-	-	-	-	-	-	1,000,000	1.4	15,000
Jan Coetzee Mine	-	-	-	-	-	-	1,000,000	1.4	14,000
Nababeep Kloof Mine	-	-	-	-	-	-	500,000	1.2	6,000
Flat Mine North	440,000	1.13	5,000	940,000	1.42	13,000	200,000	1.5	4,000
Flat Mine East	-	-	-	3,400,000	1.37	47,000	1,000,000	1.0	9,000
Flat Mine South	-	-	-	2,600,000	1.35	35,000	800,000	1.6	13,000
<b>Total</b>	<b>440,000</b>	<b>1.13</b>	<b>5,000</b>	<b>6,900,000</b>	<b>1.37</b>	<b>95,000</b>	<b>4,500,000</b>	<b>1.3</b>	<b>61,000</b>

\*Numbers may not add up due to rounding in accordance with the JORC code guidance.  
Resources are reported at a 0.7% Cu cut-off grade.

### Mine Planning

Following the Independent review of the Mineral Resources, the mine development layouts and schedule were adjusted to accommodate the minor changes in stope shapes. The mine plans and report were finalised and included in the Bankable Feasibility Report (**BFS**).

### Infrastructure

As reported previously, the plans for the provision of power and water to the Flat Mines operations have been finalised and incorporated in the BFS. No further work in this area is required currently.

Rehabilitation of the Nababeep waste-water-works by the local municipality is in progress, with consultants appointed by the municipality to oversee the work. The refurbishing works required have been put out to tender, and the appointment of contractors is imminent.

Discussions are underway with the Local Authority (**NKM**) technical department to finalise the arrangements for the provision of construction power for the project development phase. This workstream is planned as part of the early works programme to establish the provision of services in advance of the project kick-off.

Communications with the NKM municipality executive team continue to be regular and cordial. The Infrastructure Steering Committee, set up to manage the provision of power and water to the project via the municipal infrastructure, continues to meet on a quarterly basis.

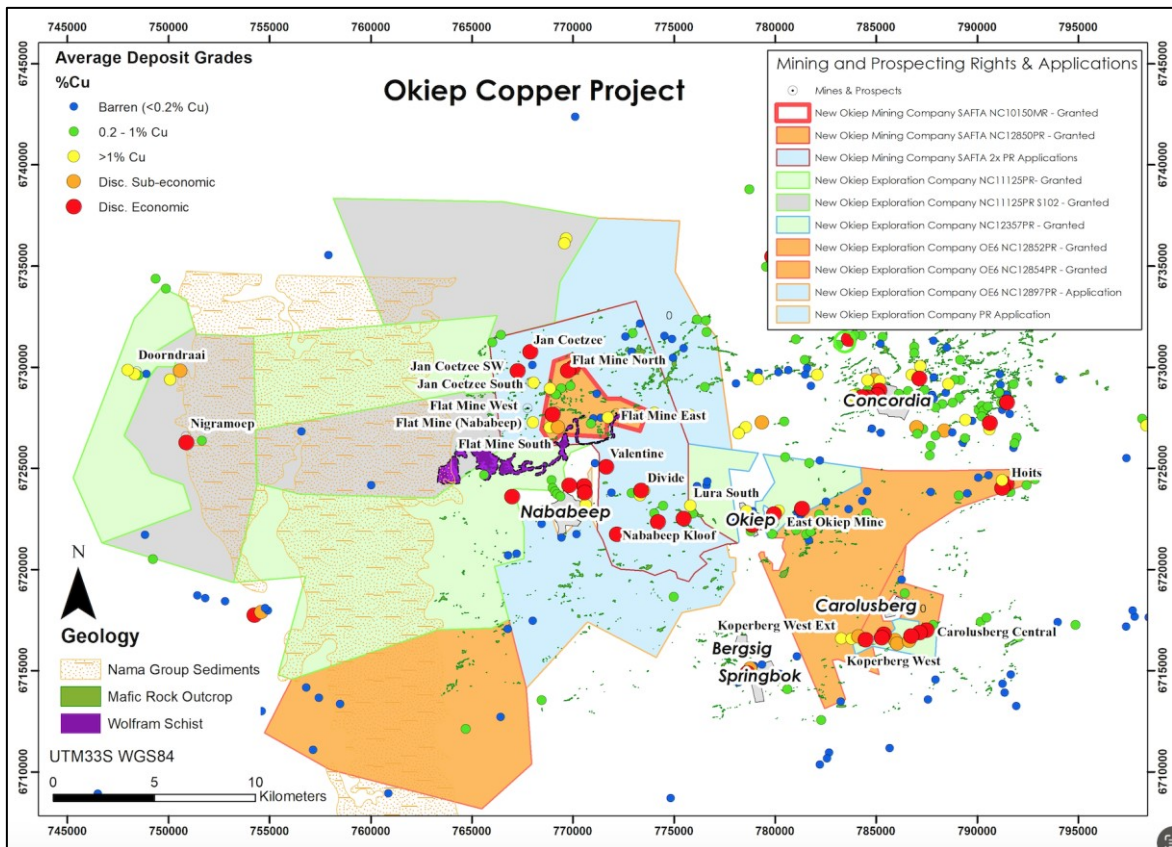
Land Access

As reported previously, access to the land on which the bulk of the surface mining infrastructure will be located has been secured through a lease agreement with the local municipality. The Rezoning Application for Mining Use will be submitted in the Q4CY2023, with the Engineering Services Report now having been received.

The fact that the rezoning application applies to land owned by a NKM means that approval for the rezoning does not require Department of Agriculture approval. The rezoning approval is therefore of relatively short duration.

New Okiep Mining Company Permitting

During the Quarter, Orion received notice from the DMRE for the addition of five new "copper ore" and "tungsten ore" areas to its existing tenement portfolio. This has increased the Company's tenement holding west, south and east of the central Southern African Tantalum Mining (Pty) Ltd (SAFTA) mining right area (red outlined area, Figure 4) by approximately 30,000 hectares (grey and orange shaded areas, Figure 4).



**Figure 4: Grey shaded areas showing three new S102 areas, orange areas showing three newly granted prospecting rights.**

Once executed, the grant of these additional areas opens up a number of exciting opportunities for Orion to explore for potential copper and associated minerals to supplement the Flat Mines Project, which is currently undergoing an Independent Expert's Review of the BFS, while also expanding its control over several high-priority targets including the very important historical Nigramoep Mine.

### Jacomynspan Project

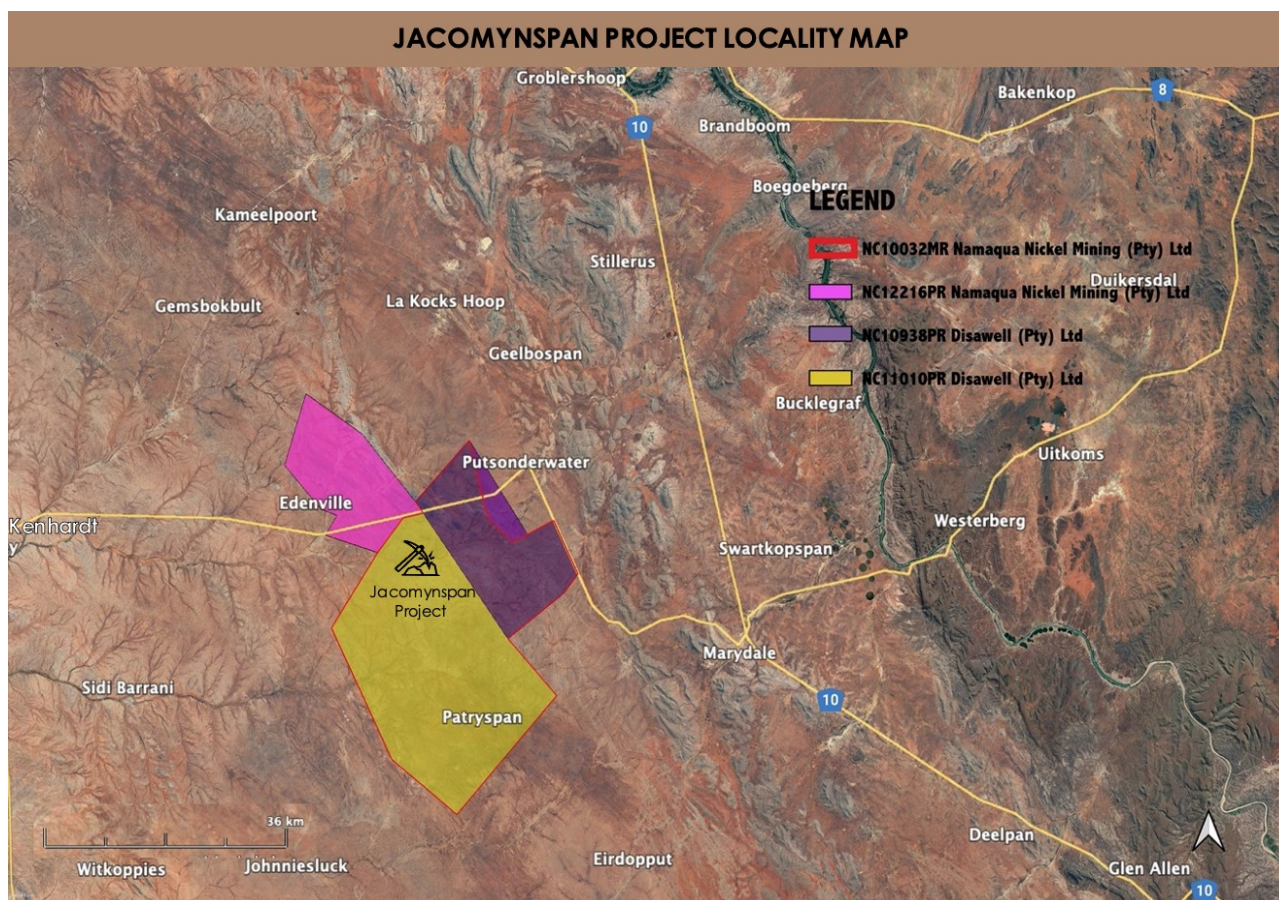


Figure 5: Jacomynspan Project area map in the Northern Cape, South Africa.

The Jacomynspan Project offers the potential for a Class-1 nickel-copper-cobalt-PGE-gold open pit and shallow underground mining project. The Namaqua Nickel Mining Right, which was granted by the DMRE in September 2016, was notarially executed with the DMRE in December 2022. The right has been lodged for registration with the Mineral and Petroleum Titles Registration Office. An Extension Letter of the Mining Rights is under review, prior to submission to the DMRE in mid-November 2023.

Work continues to focus on planning for a trial mining exercise to generate a sufficiently sized representative bulk sample to test innovative metallurgical refining/battery pre-cursor production at a pilot scale. Orion has an exclusivity agreement with Stratega Metals (Pty) Ltd (**Stratega**) to undertake amenability test work on a 250kg sample of Ni-Cu-Co-PGE-Au concentrates from the Jacomynspan Project after the initial laboratory amenability test work on a sample of Jacomynspan concentrate provided promising results.

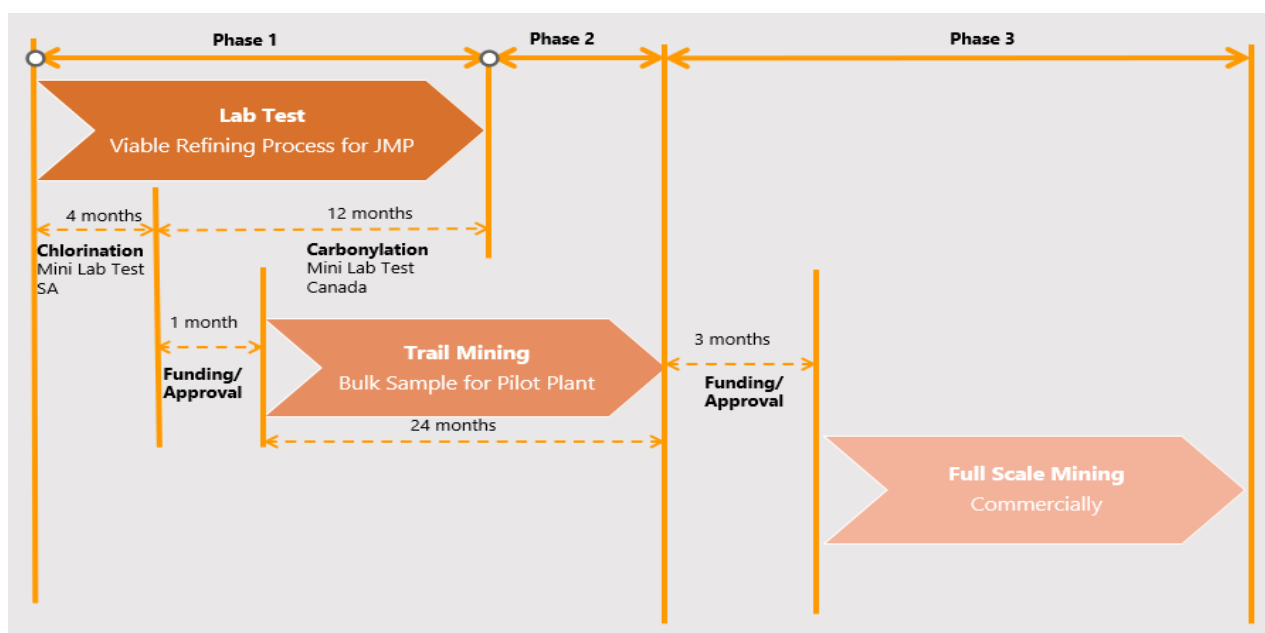
Work during the Quarter has focussed on refining and updating a 2013 feasibility study for the project that forms the basis of the approved mine works plan. Opportunities have been identified for improved water management and inclusion of renewable energy power supply that presents significant upside opportunity for the project.

Work was also progressed on water supply agreements from the Orange River and for related water use licencing.

## Stratega Metals Vapour Refining Project

A series of gram scale laboratory tests on chloro-vapour extraction of sulphur and metals are underway to optimise thermodynamic conditions of the metal vapour process. These tests will determine the thermodynamic and kinetic parameters for selective chlorination and extraction, metal gas transfer, distillation, and carbonylation. The targeted outcome is the optimised refining configuration for production of high value products such as pure elemental sulphur, separated metal products and compounds and metal carbonyl powders.

The review process with an Independent Scientist have commence to evaluate and validate the outcome of the test results. The next phase of the Amenity Test will consist of a larger sample (500g) and will start after the verification of Stage gate 1 test results review.



**Figure 6: High-level timeline for the Stratega Test Work.**

As reported in the June Quarterly Report, Stratega have progressed discussions with electric vehicle (EV) manufacturers which are potential end users of the metal vapour powder products to be produced. One large European EV manufacturer has accepted Stratega onto its accredited supplier listing and has expressed interest in funding a vertically integrated mine and refinery facility to produce its metal product requirements.

## Areachap Exploration

Areachap is an under-explored belt with multiple copper-zinc and nickel-copper-cobalt-PGE-gold intrusive targets within Orion's tenements.

Chief among these are:

- the near-mine open pit and underground targets at Prieska with high-grade copper-zinc intersections;
- several high-grade copper-gold targets with historical and recent drill-hole intersections; and
- lithium, beryllium and Rare Earth Element (REE) opportunities, which are currently being investigated.

No exploration work took place during the Quarter.



## Australian Projects

### Fraser Range – Nickel-Copper Projects (Western Australia)

The Fraser Range Project is a belt-scale project highly prospective for high-value magmatic nickel-copper-cobalt sulphide discoveries. ASX-listed IGO Limited is the dominant landholder in the Fraser Range and owns the Nova Operation, which is mining and processing the Nova-Bollinger Ni-Cu-Co sulphide deposit discovered in 2015.

Orion maintains a sizeable tenement package in the Fraser Range under a joint venture with IGO. In terms of the joint venture, IGO is responsible for the exploration of all the tenements while Orion is free-carried by IGO through to the first Pre-Feasibility Study. This allows Orion to maintain exposure to ongoing exploration and development of the project, without any ongoing financial commitment.

During the September Quarter, IGO completed a rehabilitation across all tenements under the JV agreement. In the coming Quarter, IGO intends to complete additional rehabilitation works on E28/2367 including tracks and collars. Desktop review of the tenements will continue into the coming Quarter.

### Walhalla – Gold and Polymetals Project (Victoria)

While the Walhalla-Woods Point District is best known for gold mining, high-grade copper-nickel and PGE mineralisation also occurs within the belt. Both the gold and copper-nickel-PGE mineralisation within this district are hosted within dykes from the Woods Point Dyke Swarm, a series of ultramafic to felsic dykes occurring over a 75km long north-south belt.

No field or exploration work was carried out on the Walhalla Project during the reporting period.

## Corporate

### Cash and Finance

Cash on hand at the end of the Quarter was \$15.74 million. Payments made to related parties and their associates during the Quarter was \$145k for director fees and consulting fees, as listed in Section 6 of the Company's Quarterly Cash Flow Report (Appendix 5B).

### Project Funding

On 17 July 2023, Orion announced that it had taken another important step in advancing the funding strategy for the PCZM after satisfying numerous substantive conditions required to commence drawdown on project development funding facilities totalling ~ZAR370 million (~\$30 million), being the IDC ZAR250 million (~\$20 million), Convertible Loan and the Triple Flag \$10 million Funding Arrangement.

Drawdown of the IDC Convertible Loan will be in tranches and will be pro rata matched by the drawdown requests that Orion will make under the Triple Flag Funding Arrangement. In August 2023, Orion received ~\$13.8 million in cash from the initial drawdown of the IDC Convertible Loan Facility and the Triple Flag early Funding Arrangement.

Orion's flagship Prieska Copper Zinc Mine (**PCZM**) is transitioning to the mine development and construction phase following the conclusion of the key elements of an overarching strategic funding package.

This funding package allows Orion to progress the development of the PCZM, including the commencement of trial mining and processing of ore, mine dewatering and the completion of feasibility studies for the PCZM Early Production Plan.

The PCZM Early Production Plan, which was first announced in January 2022 (refer ASX/JSE release 20 January 2022), brings forward revenue generation and potentially reduces the upfront external peak funding requirements by phasing the mine build while retaining the option to scale-up to the full-scale project (as outlined in the Bankable Feasibility Study published in 2020, refer ASX/JSE release 26 May 2020)

as sufficient funding becomes available. The BFS for the Early Production Plan for the PCZM is well advanced, with targeted completion in mid-2024.

#### IDC – Convertible Loan

In February 2023, Orion and the Industrial Development Corporation of South Africa Limited (**IDC**) signed definitive agreements for a ZAR250 million (~\$20 million) senior secured loan facility (**IDC Convertible Loan**) to fund early mining works and key pre-development activities at the PCZM. Under the terms of the IDC Convertible Loan, the IDC will provide the ZAR250 million to Agama, or its wholly-owned subsidiary, which will be on-lent to PCZM on similar terms to fund the completion of the Feasibility Study for the previously-articulated Early Production Plan at Prieska (refer ASX/JSE release 20 January 2022), while also allowing the Company to commence dewatering of the existing underground mine – a critical path activity required for the broader long-term development of the project.

A summary of the material terms of the IDC Convertible Loan definitive agreement is provided in Appendix 1 of the 8 February 2023 ASX/JSE release.

#### Triple Flag – Precious Metal Stream and Funding Arrangement

In December 2022, Orion announced that it had signed definitive agreements with Triple Flag Precious Metals Corp. (TSX/NYSE: TFPM) (with its subsidiaries, **Triple Flag**) for a US\$87 million (~\$127 million) secured funding package for PCZM made up of a precious metals stream (**Precious Metal Stream**) and an additional early funding arrangement (**Funding Arrangement**).

The Precious Metal Stream, which comprises US\$80 million (~\$117 million) of funding to be drawn down in tranches, alongside other bank and/or third-party funding during mine development, is conditional on the mine development being fully funded, finalisation of an executable mine plan to Triple Flag's satisfaction, South African regulatory approvals, and fulfilment of drawdown conditions standard for such arrangements.

Triple Flag will also provide an additional \$10 million (~US\$7 million) Funding Arrangement, to complete the Early Production Plan BFS and Dewatering Project.

Under each of the Precious Metal Stream and the Funding Arrangement, PCZM and other obligors will agree to grant a first ranking security in favour of Triple Flag and the IDC over certain assets and claims related directly and indirectly to the Project, with the security in respect of the Precious Metal Stream to be subordinated to Prieska Project financiers on terms to be agreed in an intercreditor arrangement that is consistent with the principles set out in the Precious Metal Stream agreement.

A summary of the material terms of the Triple Flag definitive agreements is provided in Appendix 1 of the 13 December 2022 ASX/JSE release.

#### **Annual General Meeting**

The Annual General Meeting of shareholders of Orion will be held at the offices of Clayton Utz, Level 27, QV1 Building, 250 St Georges Terrace, Perth, Western Australia on Tuesday, 28 November 2023, commencing at 3:00 p.m. (AWST).

## Tenement Table

Tenement	Project	Ownership Interest	Change in Quarter	Joint Venture Partner
<b>South Africa</b>				
NC30/5/1/1/2/11850PR NC30/5/1/1/2/13528PR <sup>1</sup>	Bartotrax	100%	---	---
NC30/5/1/2/2/10138MR	Prieska Copper-Zinc Mine	70%	---	---
NC30/5/1/2/2/10146MR	Prieska Copper-Zinc Mine	70%	---	---
NC30/5/1/1/2/12257PR	Prieska Near Mine-OE5	100%	---	---
NC30/5/1/1/2/12258PR	Prieska Near Mine-OE5	100%	---	---
NC30/5/1/1/2/12287PR	Prieska Near Mine-OE5	100%	---	---
NC30/5/1/1/2/12405PR	Prieska Near Mine-OE5	100%	---	---
NC30/5/1/1/2/11840PR	Doonies Pan	70%	---	---
NC30/5/1/2/2/10032MR	Namaqua-Disawell	25%	---	Namaqua Nickel Mining (Pty) Ltd
NC30/5/1/1/2/12216PR	Namaqua-Disawell	25%	---	Namaqua Nickel Mining (Pty) Ltd
NC30/5/1/1/2/10938PR NC30/5/1/1/2/13397PR <sup>1</sup>	Namaqua-Disawell	25%	---	Disawell (Pty) Ltd
NC30/5/1/1/2/11010PR NC30/5/1/1/2/13398PR <sup>1</sup>	Namaqua-Disawell	25%	---	Disawell (Pty) Ltd
NC30/5/1/1/2/12292PR	Masiqhame	50%	---	Masiqhame 855 (Pty) Ltd
NC30/5/1/1/2/12197PR	Bokspuuts North	70%	---	---
NC30/5/1/1/2/11125PR NC30/5/1/1/2/13395PR <sup>1</sup>	Okiep	100%	---	---
NC30/5/1/1/2/12357PR	Okiep	100%	---	---
NC30/5/1/1/2/12897PR	Okiep	70%	---	---
NC30/5/1/2/2/10150MR	Okiep	56.25%	---	Industrial Development Corporation of South Africa Limited (IDC)
NC30/5/1/1/2/12850PR	Okiep	56.25%	Granted	Industrial Development Corporation of South Africa Limited (IDC)
NC30/5/1/1/2/12852PR	Okiep	100%	Granted	---
NC30/5/1/1/2/12854PR	Okiep	100%	Granted	---
<b>Western Australia</b>				
E28/2367	Fraser Range	30%	---	IGO Limited
E28/2596	Fraser Range	30%	---	IGO Limited
E39/1653	Fraser Range	35%	---	IGO Limited & Geological Resources Pty Ltd
E39/1654	Fraser Range	10%	---	IGO Limited & NBX Pty Ltd
<b>Victoria</b>				
EL6069	Walhalla	100%	---	---
EL5042	Walhalla	100%	---	---

This Quarterly Report is authorised by the Board.