Orion Minerals

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Prieska Zinc-Copper Project Advanced-Stage Metallurgical Tests Achieve Impressive Recoveries to Saleable Product

- **Advanced-stage metallurgical testing of Prieska Project Deep Sulphide material achieves up to 94% zinc and 86% copper recoveries into marketable concentrates.**
- **Results were achieved with locked-cycle metallurgical tests designed to simulate plant operations with the use of modern reagents.**
- **Results demonstrate metallurgical continuity of deep sulphide deposit and achieved parity with historical plant performance.**

Orion Minerals Ltd (**ASX/JSE: ORN**) (**Orion**) is pleased to announce that significant progress has been made in the metallurgical test work program being undertaken as part of the Prieska Zinc-Copper Project (**Prieska Project**) bankable feasibility study (**BFS**).

The first batch of advanced-stage, laboratory-scale, locked-cycle flotation tests, assessing the efficiency of the proposed mineral processing route, have achieved up to 94% zinc and 86% copper recoveries into marketable concentrates, (refer Table 1). The tests are being conducted on the Hypogene Zone (Deep Sulphide Zone) of the deposit. The Deep Sulphide Zone makes up approximately 95% of the delineated Prieska Project Mineral Resources by weight (refer ASX release 9 April 2018) and is being targeted for extraction by underground mining methods.

The latest metallurgical results compare extremely well to the historical performance achieved in past mining operations when Anglovaal processed the up dip section of the deposit over its 20-year operating history. Anglovaal achieved over 85% average metal recoveries for both zinc and copper into differentiated, high-quality concentrates (refer ASX release 15 November 2017).

Locked-cycle testing, which simulates the build-up in concentration of various reagents and other elements during continuous operation, was conducted on a composite sample representing a blended feed comprising of 50% material from the north-western area of the deposit and 50% material from the south-eastern area. The sample tested was composited from recent drill core samples collected from mineralised intersections of the Deep Sulphide Zone. Further variability tests are in progress to confirm the metallurgical response of the full extent of the Prieska Deposit and to finally determine the recoveries and concentrate qualities to be targeted for optimised returns in the ongoing BFS.

When graphically superimposed over the historical plant performance dataset, (refer to Figures 1 and 2 below), the latest locked-cycle tests, (highlighted in red squares in Figures 1 and 2), compare favourably with the historical operational performance. The copper recovery results align with the historical trend line, while the zinc recoveries are above the historical performance. This is an excellent achievement confirming Orion's confidence in the project.

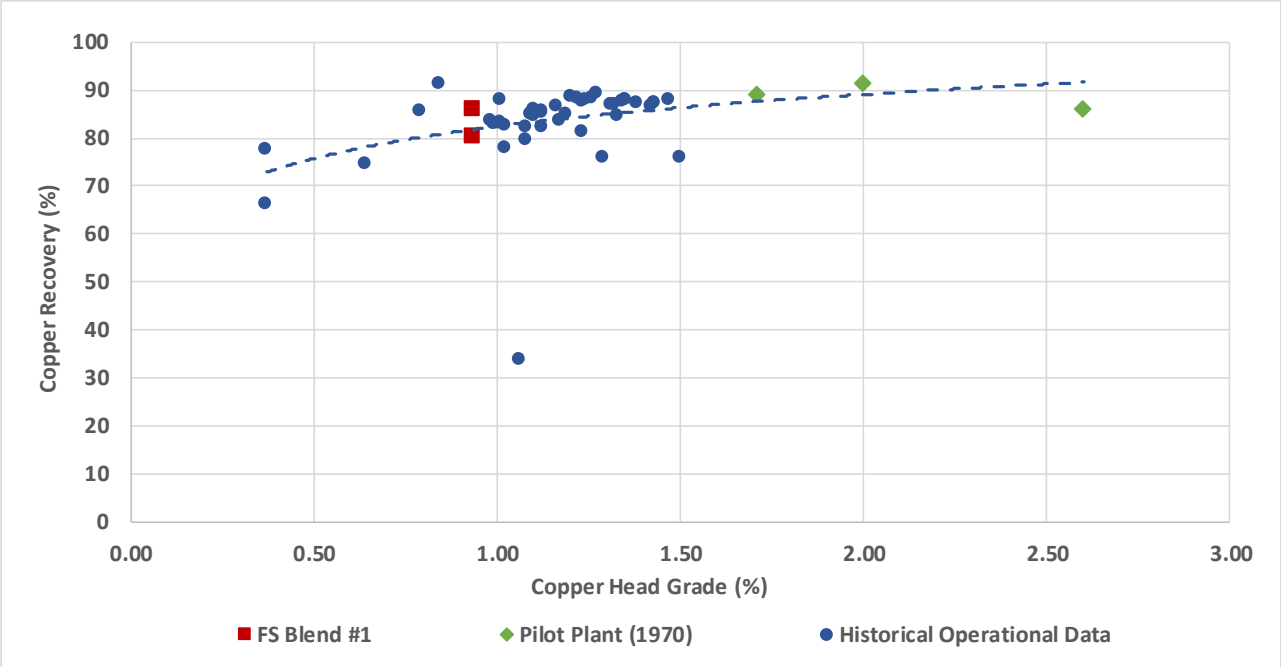


Figure 1: Graph showing the copper recoveries into marketable concentrates achieved for various head grades during historical mining operations ('Historical Operational Data')[1,2], during 1970 Anglovaal pilot plant testing ('Pilot Plant (1970)') and during the latest locked-cycle testing ("FS Blend #1).

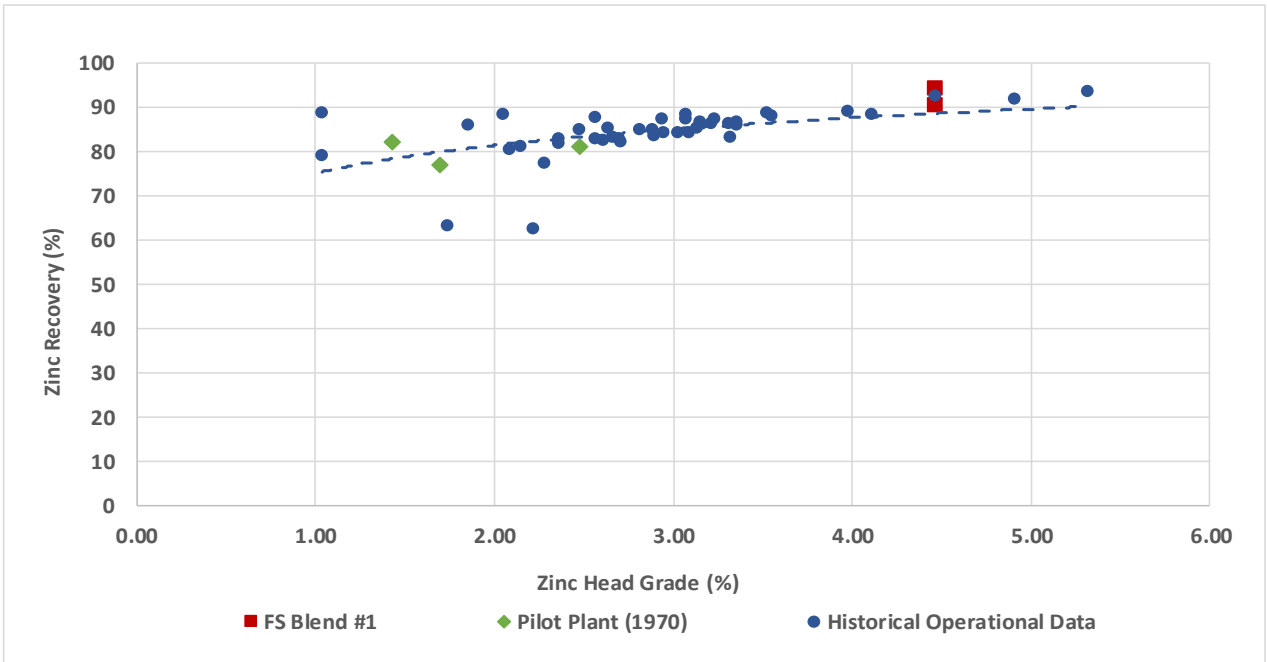


Figure 2: Graph showing the zinc recoveries into marketable concentrates achieved for various head grades during historical mining operations ('Historical Operational Data')[1,3], during 1970 Anglovaal pilot plant testing ('Pilot Plant (1970)') and during the latest locked-cycle testing ("FS Blend #1).

[1] Averaged Monthly Production Data (January 1975 – December 1976), Brian Broekman 1991, The Prieska experience: Flotation developments in copper-zinc separation, J.S. Afr. Inst. Min. Metal., vol. 91, no. 8. Aug. 1991. pp. 257-265.
[2] S.K De Kok 1972, Differential Flotation of Copper-Zinc at Prieska Copper Mines (Pty) Limited: A Pre-Liminary Report, Journal of the South African Institute of Mining and Metallurgy July 1972. pp. 305 – 321.
[3] Averaged Annual Production Data 1973 – 1991 extracted from: Technical Report on the Copperton Project of Repli Trading No. 27 (Pty) LTD, March 2014.

Copper Concentrate	Head Grade (%)		Locked – Cycle Test Results for Deep Sulphide Zone (%)									
	Copper	Zinc	Copper		Zinc		Lead		Iron		Sulphur	
Metal Recovery	0.9	4.5	80.4	86.2	2.4	4.6	2.7	3.4	4.7	5.3	5.7	6.6
Concentrate Grade			23.9	21.3	5.5	3.5	0.6	0.1	24.4	22.9	28.4	27.3

Zinc Concentrate	Head Grade (%)		Locked – Cycle Test Results for Deep Sulphide Zone (%)									
	Copper	Zinc	Copper		Zinc		Lead		Iron		Sulphur	
Metal Recovery	0.9	4.5	6.3	8.1	90.6	94.4	5.3	6.5	4.7	5.9	14.3	17.8
Concentrate Grade			0.8	0.8	53.9	45.5	0.1	0.1	10	6.2	29.8	29.5

Table 1: Summary of locked-cycle metallurgical test results for the Deep Sulphide composite sample.

Laboratory-scale, Locked-Cycle Tests

Earlier metallurgical test work resulted in Orion developing a mineral processing flowsheet to treat all the mineralised zones of the remaining Prieska Deposit using froth flotation and succeeded in producing differentiated zinc and copper concentrates (refer ASX release 1 March 2018). The final processing flowsheet developed will incorporate improvements on the mineral processing technology and reagents to those available to historical operations and will form the basis of process design, equipment selection, equipment sizing once tested for its effectiveness in continuous operation and its applicability to the various geographic regions of the defined deposit.

Locked-cycle testing involves the preparation of samples that are representative composites from sub samples taken from different zones of the deposit and running each composite sample through a laboratory-scale setup of the flowsheet in open circuit. The products of the open circuit test are recycled five times through the same flowsheet setup to simulate the build-up in concentration of various reagents and other elements expected under continuous froth flotation operating conditions. The addition of further repetitive cycles or reagent addition may yet further optimise total recoveries or achieve higher concentrate grades.

Laboratory-scale, locked-cycle metallurgical variability testing on three additional variability composites is now being conducted as part of the advanced stages of the metallurgical testing program. This phase of testing investigates expected performance for a stable reagent suite with the inclusion of recycled scalping and cleaning streams and the performance of the flowsheet for samples obtained from the different geographic locations of the deposit.

Locked-cycle test work results

Locked-cycle testing was conducted on a Deep Sulphide zone composite sample representing a blended feed comprising 50% material from the north-western extent of the Prieska Deposit and 50% material from the south-eastern extent. This testing resulted in the total recovery of 80% to 86% copper and 91% to 94% zinc into marketable concentrates. Copper concentrate grades ranged from 21% to 24%, whilst the zinc concentrate grades ranged from 45% to 54%. Current indications are that zinc recoveries are unlikely to benefit further from additional cycles, while copper recoveries and qualities have further opportunity for optimisation. The amenability of the mineralisation to produce flotation concentrates of varying grades will allow mine-to-market product optimisation to be done at the design and planning stages of the Prieska Project BFS.

Right-sizing planned throughput

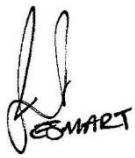
Historical mining operations at the Prieska Project treated 3 million tonnes a year of run-of-mine ore. Some of the mine infrastructure used to support such throughput remains on the project site such as the Hutchings Shaft barrel that was used as the main hoisting shaft, access roads, power supply line and water supply pipeline. With the recent upgrade to the global Mineral Resources to 29.4 million tonnes of Mineral

Resources (refer ASX release 9 April 2018), mining studies are now being advanced, as part of the BFS, to right-size the planned mining operations taking into account how best to fully exploit the defined Mineral Resources and maximise the use of existing infrastructure.

The investigations into right sizing the mine require that higher throughput mining scenarios be considered, as well as ensuring that a significant portion of the defined Mineral Resources are upgraded to Mineral Resources categories that allow them to support a BFS. Infill drilling of the southern extent of the Prieska Deposit has commenced with fourteen rigs now mobilised, in line with the intention to incorporate as much as possible of the defined Mineral Resources into the mine schedule of the BFS. The implications of including more of the Prieska Deposit within the mining studies is that the resource definition drilling will extend into Q4 2018 and the BFS completion is now scheduled for late 2018 or early 2019. This timing coincides with the scheduled time for the issuance of the Mining Right in Q2 2019, which is the required statutory authorisation required before construction, de-watering and mining operations can commence.

Orion's Managing Director and CEO, Errol Smart, commented:

"The locked-cycle metallurgical tests are an important step for Orion to demonstrate minimum design metal recoveries, qualities and concentrate masses to be incorporated in feasibility study work. We are now able to start trade-off assessments in capital and operating costs for optimised returns."



Errol Smart
Managing Director and CEO

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Competent Persons Statement

The information as presented in this report that relates to the results of metallurgical test work at the Prieska Project is not in contravention of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (**JORC Code**) and has been compiled and assessed under the supervision of Mr Errol Smart, Orion's Managing Director. Mr Smart (PrSciNat) is registered with the South African Council for Natural Scientific Professionals, a Recognised Overseas Professional Organisation (ROPO) for JORC purposes and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the JORC Code. Mr Smart consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

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Appendix 1: Test Work Methodology

Laboratory-scale flotation tests were conducted on a 1kg batch samples. The samples were milled using a laboratory rod mill at 50% solids by mass to achieve a target grind of 70-80% passing 75 microns.

The milled slurry was then transferred into a 2.5 litre flotation cell, which was agitated using a Denver D12 flotation machine at an impellor speed of 1200 rpm. Depending on the feed mass, cleaner flotation testing was conducted in either a 1 litre or 2 litre flotation cell which was agitated using a Denver D12 flotation machine at an impellor speed of 1000 -1200 rpm. Concentrates were collected by scraping off the froth at 15 second intervals. A sample of the test product was pulverised and assayed for copper, lead, zinc, iron and sulphur using the Inductively Coupled Plasma (**ICP**) analysis method.

Locked-cycle testing involves repetitive batch flotation testing, whereby the flotation test is repeated five times using recycled intermediate flotation streams. A product sample is collected at the end of each cycle for ICP analysis.

The total copper circuit recoveries as presented in Table 1, reflect the total recovery to the copper re-cleaner concentrate and scavenger cleaner concentrate streams in locked-cycle testing. The total zinc circuit recoveries as presented in Table 1, reflect the total recovery to the high grade cleaner concentrate and low grade re-cleaner concentrate in locked-cycle testing.