Orion Minerals

ASX/JSE RELEASE: 25 JANUARY 2021

Multiple copper sulphide intercepts within large VMS system at Boksputs opens up exciting new discovery opportunity

Deep diamond drill hole still in progress intersects numerous mineralised zones across multiple horizons at southern end of a 3km long mineralised system 125km north-west of the Prieska Copper-Zinc Project

- **Significant zones of copper, zinc and nickel-copper-PGE mineralisation intersected across all key prospects tested as part of the high-impact near-mine and regional drilling program across Orion's tenement holdings in the Northern Cape Province, South Africa.**
- **Results confirm the under-explored nature of the Areachap Province and the substantial opportunity for a major discovery, both in the near-mine environment around the fully-permitted Prieska Copper-Zinc Project, and the broader region.**
- **A key focus will be the greenfields Boksputs Project, located 125km north-west of Prieska, where a deep diamond drill hole has intersected numerous zones of VMS copper mineralisation across multiple horizons, with initial assays including 5m at 1.09% Cu and 0.13g/t Au from 393.00m and 1m at 2.25% Cu and 0.32g/t Au from 498.45m.**
- **The hole is still in progress to test an electro-magnetic (EM) conductor within a large VMS mineralised package with multiple historical intercepts, EM anomalies, outcropping exhalites and mineralisation over an area extending over 3km by 1km.**
- **Intensive follow-up drilling is planned, including to target a strong 3000 Siemens conductor located 3km north of the current drill hole (compared with the current 400S conductor).**
- **Drilling at the Kielder Project, located 15km from Prieska, has intersected high-grade base metal mineralisation close to surface, successfully validating historically reported copper and zinc sulphide mineralisation across two VMS prospects.**
- **Plus, at the Jacomynspan nickel-copper deposit, 68km north-west of Prieska, drilling has intersected three shallow zones of net textured sulphides with a best intercept of 6.03m at 0.60% Ni, 0.31% Cu, 0.19g/t Pd, 0.21g/t Pt and 0.20g/t Au from 145.36m, including 1.10m at 1.23% Ni and 0.69% Cu from 146.35m.**

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

"We could not have asked for a better start to 2021. Against the backdrop of soaring base metal prices and a fantastic outlook for copper, zinc and nickel amidst a stimulus-fuelled global economic recovery, we have been able to deliver some very exciting exploration news from the pre-Christmas drilling across our extensive Areachap tenement holdings in the Northern Cape.

"The strategic significance of all these targets is that they form part of a world-class exploration package that is underpinned by our fully-permitted Prieska Copper-Zinc Project – which remains one of the few advanced base metal assets worldwide ready to move into construction this year. Some of the targets are 'near-mine' opportunities that could quickly develop into satellite ore sources for the Prieska mill. Others sit further afield and have demonstrated strong geological potential to emerge as potential major new VMS discoveries of a similar size to Prieska, or perhaps even bigger."

"The project that has really caught our attention is Boksputs, which fits the latter category. It was originally drilled by Anglo American back in 1973 and yielded some promising copper intercepts, despite patchy information being available. We know that it sits within a large syncline, has outcropping mineralisation, historical intercepts and EM anomalies over a massive area of 3km by 1km, and exhibits all the lithologies and characteristics of a very large VMS system.

"Our first diamond drill hole, targeting a 400 Siemens EM conductor at one end of the syncline, has intersected multiple zones of copper-bearing sulphide mineralisation associated with chloritization and magnetite. The hole is still in progress, but the evidence we are seeing from the drill core is that we are in a very big VMS system – which really excites us.

"Based on the encouraging results so far, we intend to substantially accelerate exploration at Boksputs, including a further deep diamond drill hole to test a strong 3000S EM conductor 3km to the north at the other end of the syncline, along with surface EM and RC drilling across the entire strike length of the structure.

"Elsewhere, drilling at the Kielder Project, located just 15km from Prieska, intersected shallow high-grade base metal mineralisation, validating historical results and elevating this as a priority near-mine opportunity. Meanwhile at Jacomynspan, 68km to the north-west, we have intersected multiple zones of shallow higher grade Ni-Cu-Co-PGE-Au mineralisation that may have importance for open pit mining potential and secured samples for metallurgical test work. This is another promising growth opportunity for the Company.

"We expect the next six months to be a transformational period for Orion as we step-up exploration and secure the financing to start construction at Prieska. This is a project whose time has well and truly come, and we are excited about the opportunity to finally bring it to fruition, for the benefit of our shareholders and the communities in the Northern Cape region. We see this district being a long-term source of high-quality base metal concentrates that will help to support the 'new era' of global economic growth which is widely expected to unfold this decade."

Orion Minerals Limited (**ASX/JSE: ORN**) (**Orion** or the **Company**) is pleased to report highly encouraging results from high-impact exploration drilling programs targeting near-mine and regional volcanogenic massive sulphide (**VMS**) copper-zinc and nickel-copper targets around its flagship Prieska Copper-Zinc Project (**Prieska Project**) in South Africa's Northern Cape.

Drilling was undertaken during the December 2020 Quarter on the Prieska Copper-Zinc Mine (**PCZM**), Namaqua-Disawell and Masiqhame prospecting rights, including the K3 and K6 prospects at the Kielder Project within the Dooniespan Prospecting Right, the Jacomynspan and Area 4 prospects within the Namaqua-Disawell Prospecting Right, the B4 anomaly on the Boksputs Prospect and at the Kantienpan Prospect on the Masiqhame Prospecting Right (Figure 1).

Base metal sulphides were intersected at all five prospects drilled, with the drilling program delivering highly encouraging early results despite being impacted by restrictions associated with the COVID-19 pandemic, a reduction in field staff, slower sampling and assay turnaround and the lack of availability of down-hole geophysical instruments that are currently stranded in Australia due to logistical challenges.

Despite these temporary challenges, Orion intends to substantially expand its exploration activities within the Areachap Province in the coming weeks given the very promising results generated so far and the potential to unlock major new growth opportunities for the Company.

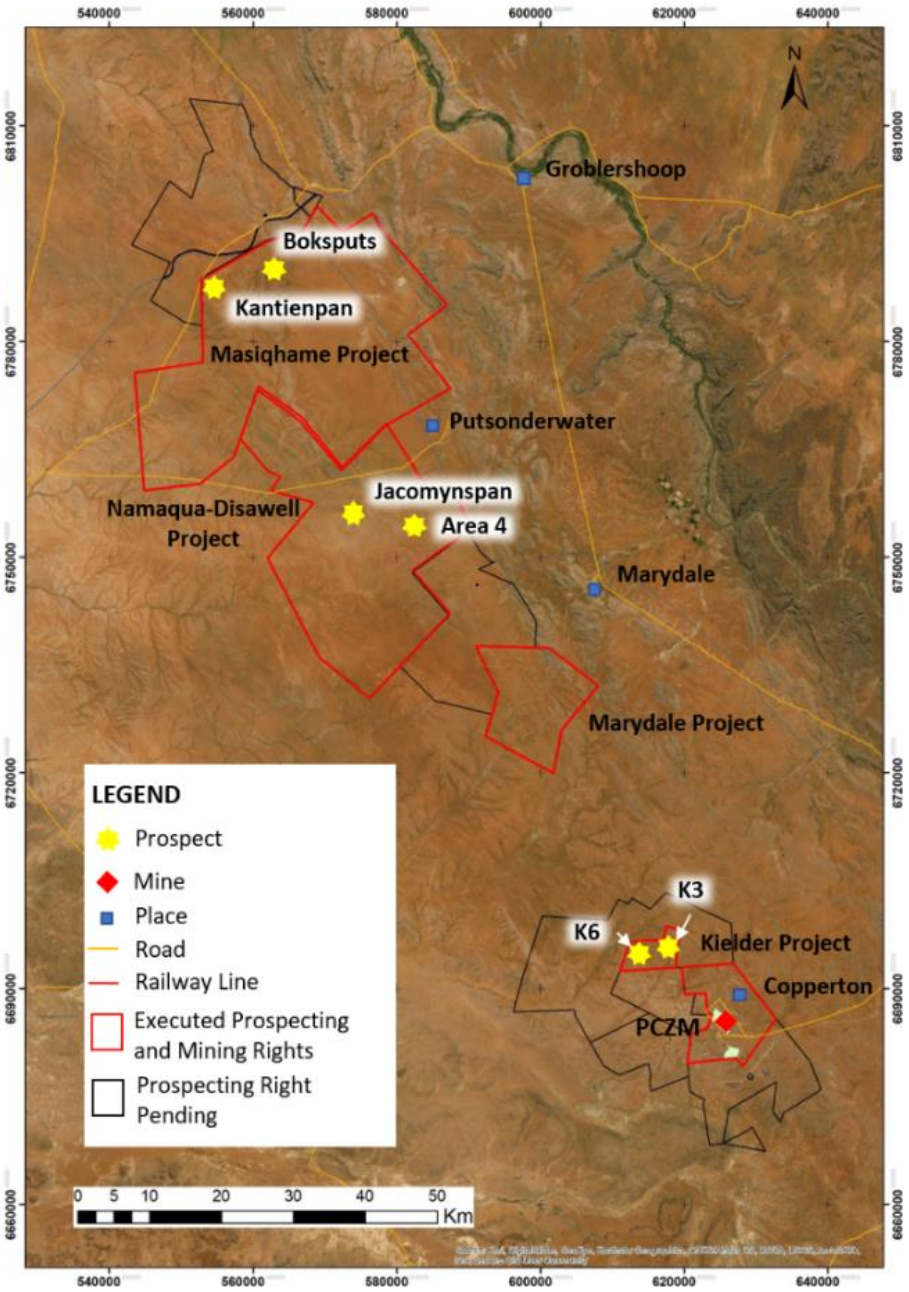


Figure 1: Location map showing the prospects where drilling was undertaken during the 2020 drilling program.

Boksputs Prospect – Masiqhame

Potential for a large-scale greenfields VMS discovery

The Boksputs copper prospect is located close to the northern boundary of the Masiqhame prospecting right, some 125km NNW of the Prieska Project (Figure 1).

Copper mineralisation was discovered by Anglo American Corporation in 1973 following an airborne electro-magnetic (**EM**) survey, ground geophysics and soil geochemistry. The prospect was tested with 12 shallow diamond drill holes.

The **B4 EM anomaly** was detected by Orion using fixed loop time domain electromagnetic (**FLTDEM**) follow-up of previously generated SkyTEM™ anomalies at Boksputs. Modelling of the data revealed a **300m x 1,000m plate** with a conductance of 400 Siemens (refer ASX release 20 October 2020). The plate fits the geology with the B4 conductor developed in the Kraalkop Synform, located stratigraphically below the historical VMS intersections reported in the Anglo American drill holes (Figures 2 and 3).

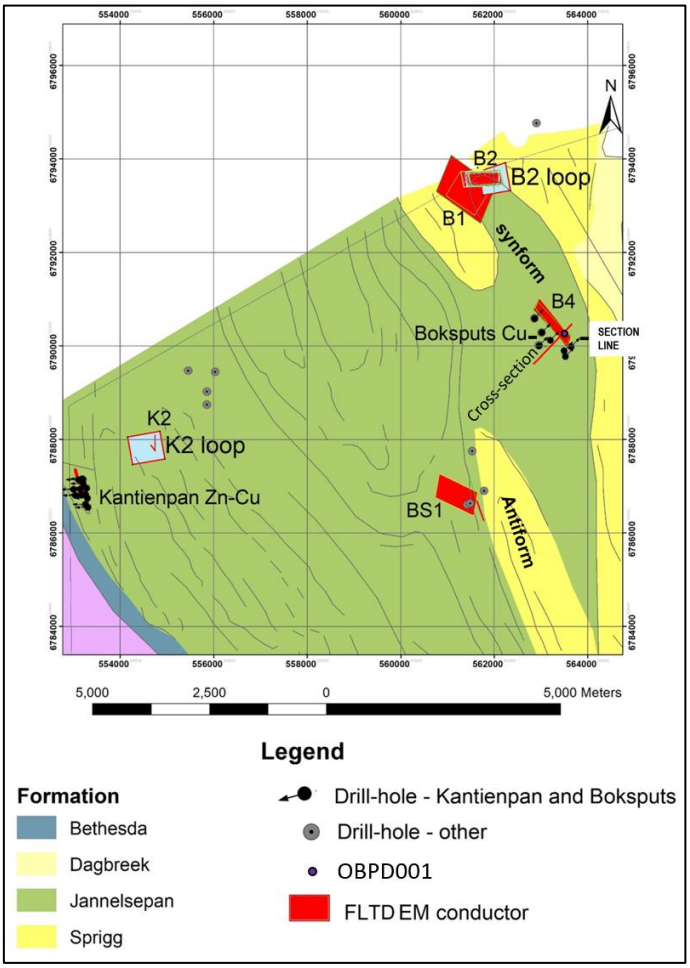


Figure 2: Simplified geological map of the Boksputs Kantienpan Area showing the B4 conductor and Orion hole OBPD001.

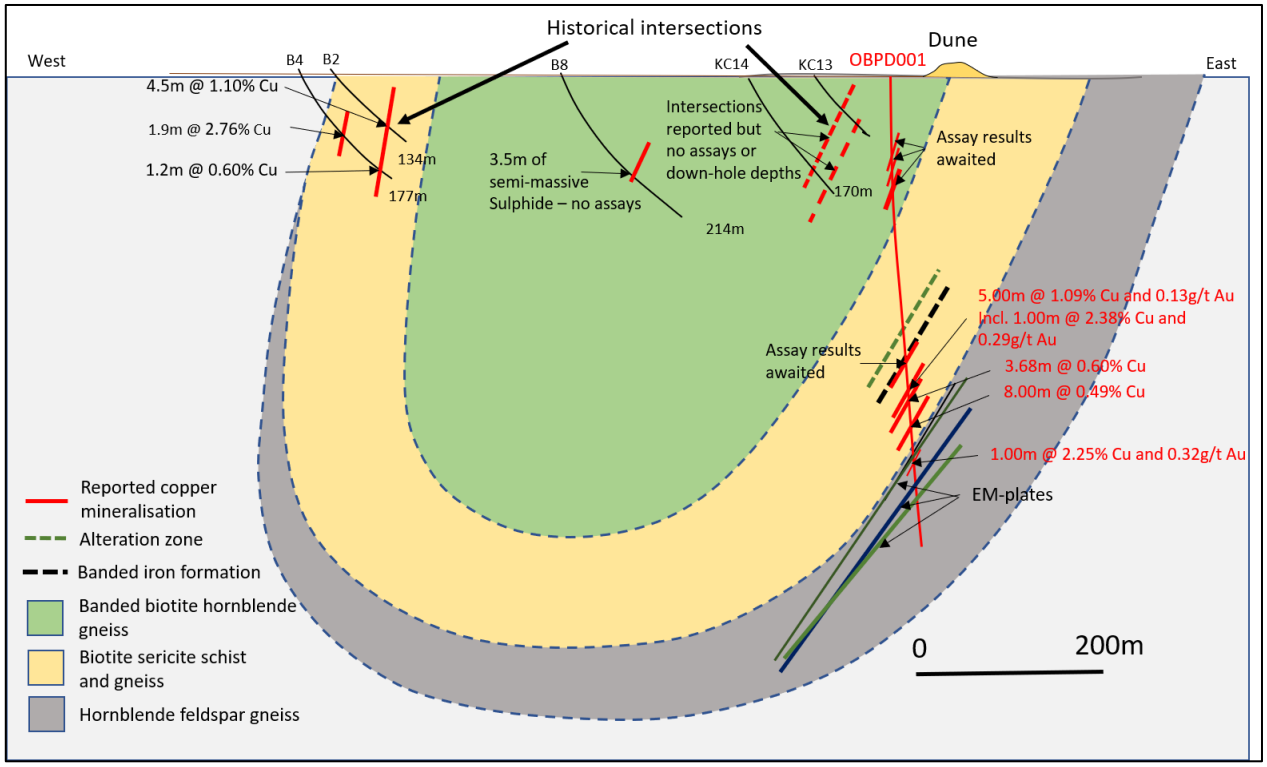


Figure 3: Geological cross-section showing reported historical and recent intersections (historical intersections after Geringer et. al.[1]).

[1] Geringer, G.J., Pretorius, J.J., and Cilliers, F.H., 1987. Strata-bound copper-iron sulfide mineralisation in a Proterozoic front arc setting at Boksputs, Northwest Cape, South Africa – a possible Besshi Type deposit. Mineral Deposita 22, pp. 81 – 89 (1987).

Diamond drill hole OBPD001, which was collared to test the B4 EM plate, is still in progress and has so far intersected numerous zones of copper-bearing sulphide mineralisation associated with chloritization and magnetite. Mineralisation has been intersected in multiple horizons and occurs as remobilised sulphide stringers and disseminated sulphides as well as stratabound primary, massive pyrrhotite-pyrite-chalcopyrite layers with both remobilised and primary sulphides (Figure 4 below).

Significant assay results received to date are set out in Table 1 below:

Hole No	Depth (m) From	Depth (m) To	Intersection Length (m)	Estimated true width (m)	Cu (%)	Au (g/t)
OBPD001	393.00	398.00	5.00	3.00	1.09	0.13
incl.	394.00	395.00	1.00	0.60	2.38	0.29
OBPD001	405.90	409.58	3.68	2.21	0.60	0.18
OBPD001	432.00	440.00	8.00	4.80	0.49	<0.1
incl.	434.00	437.00	3.00	1.80	0.67	<0.1
OBPD001	498.45	499.45	1.00	0.60	2.25	0.32

Table 1: Intersection table for hole OBPD001.

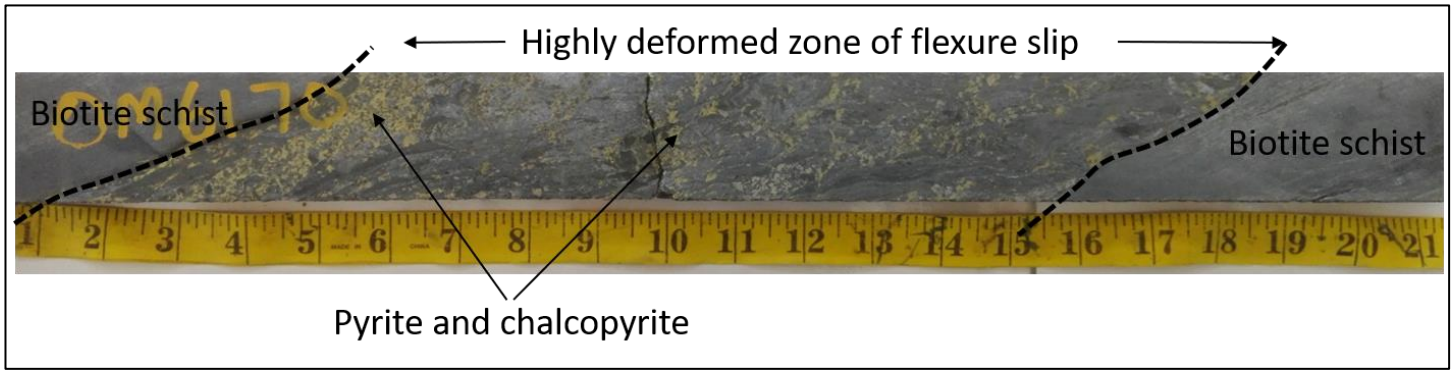


Figure 4: Photo showing a zone of flexure slip with disseminated pyrite and chalcopyrite intersected in OBPD001 at 448.82m. This suggests that remobilisation of sulphides happened during the late folding phase.

Detailed logging of the drill core by experienced members of the Orion exploration team indicates that the hole has intersected strong zones of alteration and signature VMS lithologies similar to those seen at the Prieska Project, confirming Boskputs as a large-scale, high-priority target area for base metal VMS mineralisation.

The mineralised package – with multiple historical intersections and EM anomalies – covers an area of roughly 3km x 1km, with outcropping mineralisation and drill intersections occurring to 550m depth.

Hole OBPD001 is currently being deepened, but assay results from the first four zones of mineralisation provide strong encouragement for follow up down-hole electromagnetic (**DHEM**) surveys and drilling.

The results obtained in OBPD001 also upgrade the exploration potential of the conductors detected on the B1 and B2 anomalies, located 3km to the north of B4 (Figure 2). At B2 the conductance of the modelled plate is up to 3000 Siemens compared to the 400S conductor at B4, suggesting the presence of more coherent and massive mineralisation in the same stratigraphic horizon.

A comprehensive exploration program including moving-loop ground EM and both shallow and deeper drilling is currently being planned.

Kielder Project – PCZM Near Mine

Newmont South Africa (**Newmont**) discovered VMS-style copper-zinc mineralisation at three prospects on the Kielder Project, located 15km from Prieska (Figure 1), in 1976. The shallow depth of the mineralisation offers a significant opportunity for Orion to delineate a shallow, near-mine deposit with the potential to deliver supplemental tonnage for an expanded operation at Prieska.

Six prospects were identified by Newmont with available reports indicating that the K3 and K6 prospects had returned the best results (refer ASX release 20 October 2020).

Drilling at Kielder was designed to verify the historically reported results in historical drill holes KDH3 and KDH15, as well as to provide a platform for modern high-powered DHEM surveys.

Drill holes OKD031 and OKD032 intersected VMS mineralisation and verified the historically reported drill results, with hole details and assay results summarised in Tables 2 and 3 below:

Hole ID	X-coord*	Y-coord*	Inclination	Azimuth	Final Depth
OKD031	618757	6696095	-60	345	227.06
OKD032	612662	6694755	-60	79	155.58
OKD033	618720	6696256	-65	350	149.57

Table 2: Details of the holes drilled at the K3 and K6 prospects on Kielder.

Drill hole		Prospect	Intersection Width (m) and Depth (m)		Cu (%)		Zn (%)		Au (g/t)	
Historic	Twin (Orion)		Historic	Twin (Orion)	Historic	Twin (Orion)	Historic	Twin (Orion)	Historic	Twin (Orion)
KDH3	OKD031	K3	13.08 from 179.21	9.39 from 174.73	0.23	0.14	3.69	3.41	0.19	0.14
KDH15	OKD032	K6	4.20 from 117.30	3.90 from 123.20	0.39	0.30	7.21	7.87	No data	0.16
KDH2	OKD033	K3	6.11 from 117.30	0.70 from 108.80	0.4	0.02	3.01	2.92	0.27	0.3

Table 3: Recent drill results over selected intervals, compared to historically reported intercepts on Kielder.

OKD031 was drilled 10m down-dip from KDH3 and intersected **9.39m at 0.14% Cu, 3.41% Zn and 0.14g/t Au from 174.73m**, including **4.81m at 0.14% Cu and 4.49% Zn from 189.16m** (Table 3).

OKD032, drilled 25m from KDH3, intersected **3.9m at 0.30% Cu, 7.87% Zn, 10g/t Ag and 0.16g/t Au from 123.2m** and **2.21m at 0.70% Cu, 1.70% Zn, 36g/t Ag and 0.20g/t Au from 129.94m**.

OKD033 was drilled 10m from historical hole KDH2 and showed potential high variability in the mineralisation at K3.

The copper and zinc sulphides intersected are shown in the photograph in Figure 5 below and the location of the historical and recently completed holes is shown in Figures 6 - 9.

Figure 5: Massive sulphide intersection in K6 drill hole OKD032 containing copper and zinc sulphides.

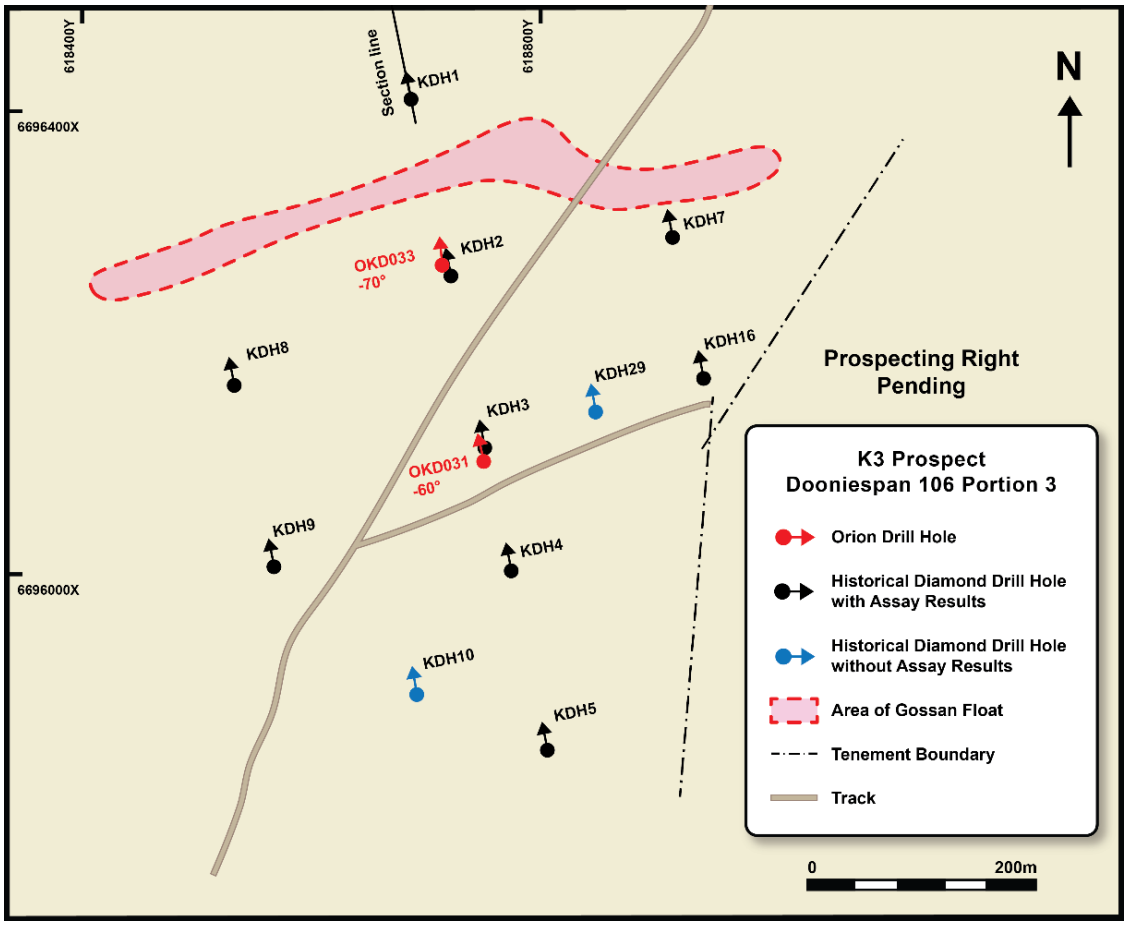


Figure 6: Map showing the historical drilling and recently completed drill holes at K3.

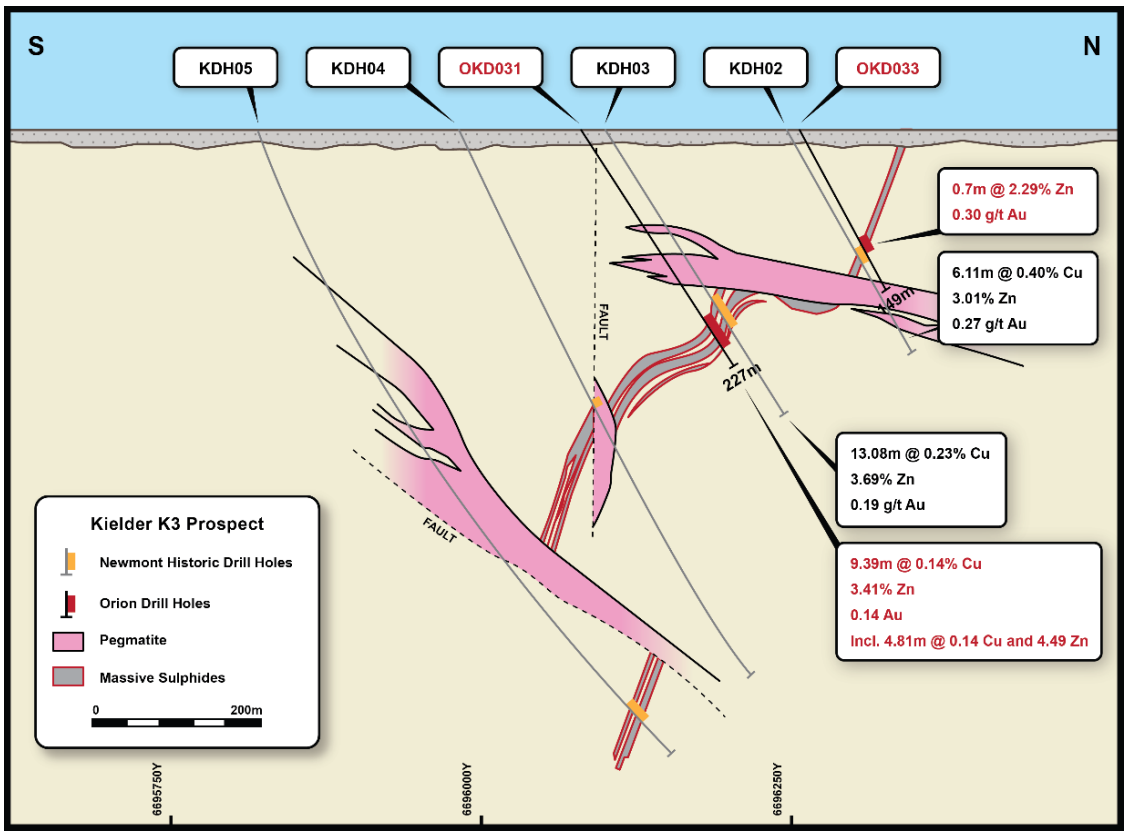


Figure 7: Cross-section showing the mineralisation intersected in drill holes OKD031 and OKD033 at the K3 Prospect.

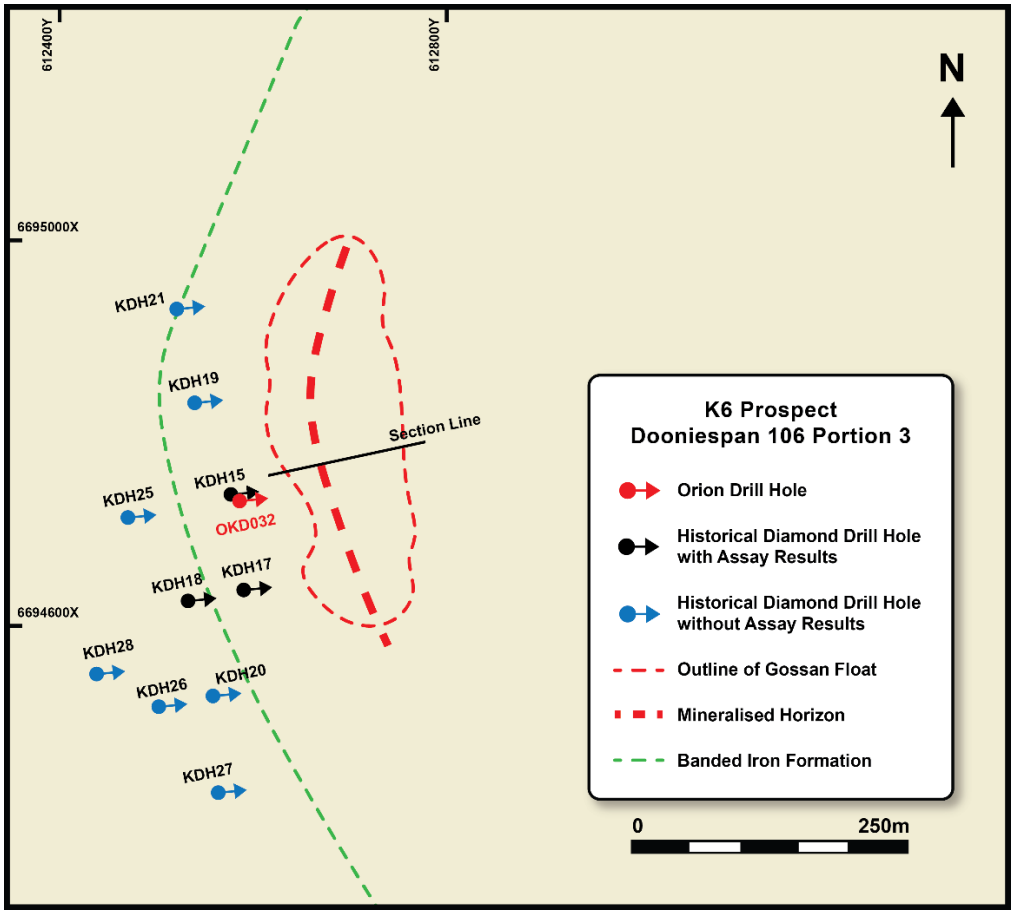


Figure 8: Map of the historical drilling at K6 also showing the planned diamond drill hole.

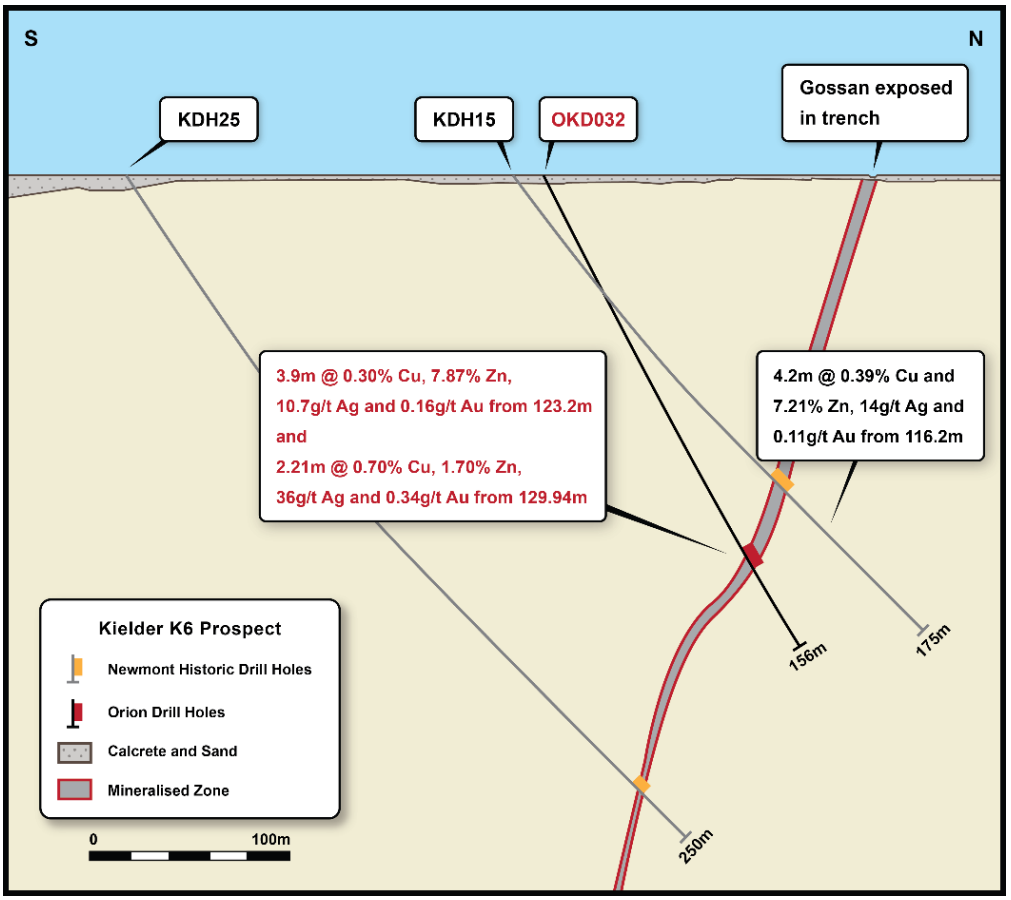


Figure 9: Cross-section through drill holes KDH15 and OKD032 showing the sulphides intersected in drill hole OKD032.

Despite intersecting high-grade massive sulphide mineralisation at K6, Newmont geologists reported that the geophysical techniques available in the 1970s, including electro-magnetic (**EM**) surveys, failed to detect the mineralisation. This rendered geophysical targeting for down-dip and along strike extensions virtually impossible at the time.

This technical challenge contributed to Newmont declining to exercise the option they had to acquire the mineral rights, and exploration on the prospect ceased for nearly 50 years until Orion's recent work.

Orion intends conducting orientation geophysical surveys at K6 using modern geophysical techniques and, if successful, applying these techniques to trace the extensions of K6 and other weaker SkyTEM™ anomalies like K5 and covering the VMS target horizon. DHEM surveys are planned for holes OKD031, 032 and 033 as soon as geophysical instruments currently in Australia can be secured.

The Company's exploration team believes that there is significant potential for a combined approach utilising structural analysis together with high-powered, modern surface and down-hole geophysics as a viable targeting method for the mineralisation, which has demonstrated significant near-surface copper and zinc grades.

Kantienpan Project - Masiqhame

Iscor started drilling on the Kantienpan prospect in 1998. Iscor used an internal laboratory and there are no QA-QC reports available for the 13 diamond drill holes. Quarter core samples from four holes were sent to GoldLab Africa for check-assay (refer ASX release 20 October 2020). GoldLab Africa reported higher zinc grades in all four holes. Should the zinc grades be substantially higher, as indicated by the GoldLab Africa analysis, it may justify progressing to a resource drill-out of the deposit.

Orion selected four holes for twinning (Figure 10). The holes are listed in Table 4. Hole OKND019 twinned hole KD005 and was completed in December 2020 (Figure 11). OKND019 intersected 7.5m at 0.49% Cu, 7.22% Zn and 0.1g/t Au from 81.00m (Figures 11 and 12). Comparison with the Iscor hole KN005 is given in Table 5.

Meaningful conclusion on comparison of the results can only be done after completion of all four twin holes.

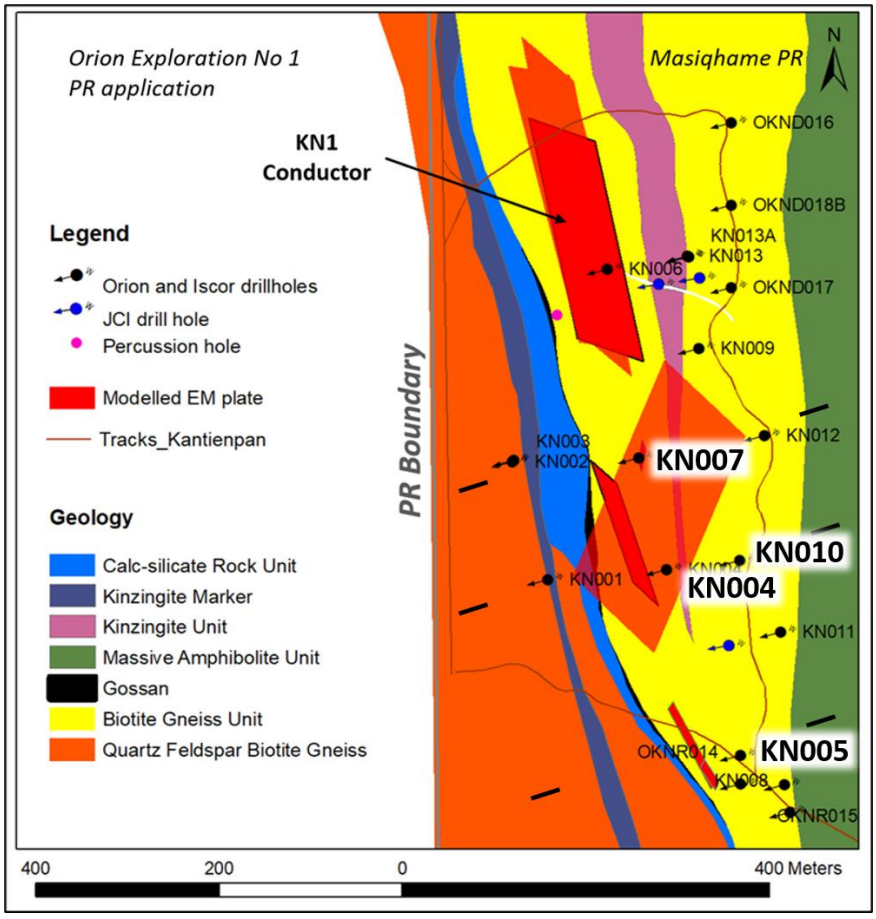


Figure 10: Map showing historical drill holes KN004, 005, 007 and 010 where intersections will be twinned.

Historic drill hole	Top of intersection	Intersection width (m)	Historic intersection		Planned twin hole	Planned meters (m)	Status
			Cu (%)	Zn (%)			
KN004	106	9.00	0.14	1.27	OKND020	125.00	Drilling
KN005	82	8.84	1.02	6.32	OKND019	110.00	Completed
KN007	106	7.00	0.57	3.15	OKND022	120.00	Planned
KN010	190	6.15	0.49	4.74	OKND021	205.00	Planed

Table 4: Planned holes at Kantienpan and status.

Hole No	Company	Laboratory	Depth (m)		Length (m)	Cu %	Zn %
			From	To			
OKND019	Orion	ALS	81	88.5	7.5	0.49	7.22
KD005	Iscor	Iscor	82.05	88.84	6.79	1.02	6.32

Table 5: Copper and zinc assay results from OKND019 and historic hole KD005.

The mineralisation at Kantienpan remains open in depth and along strike to the north.

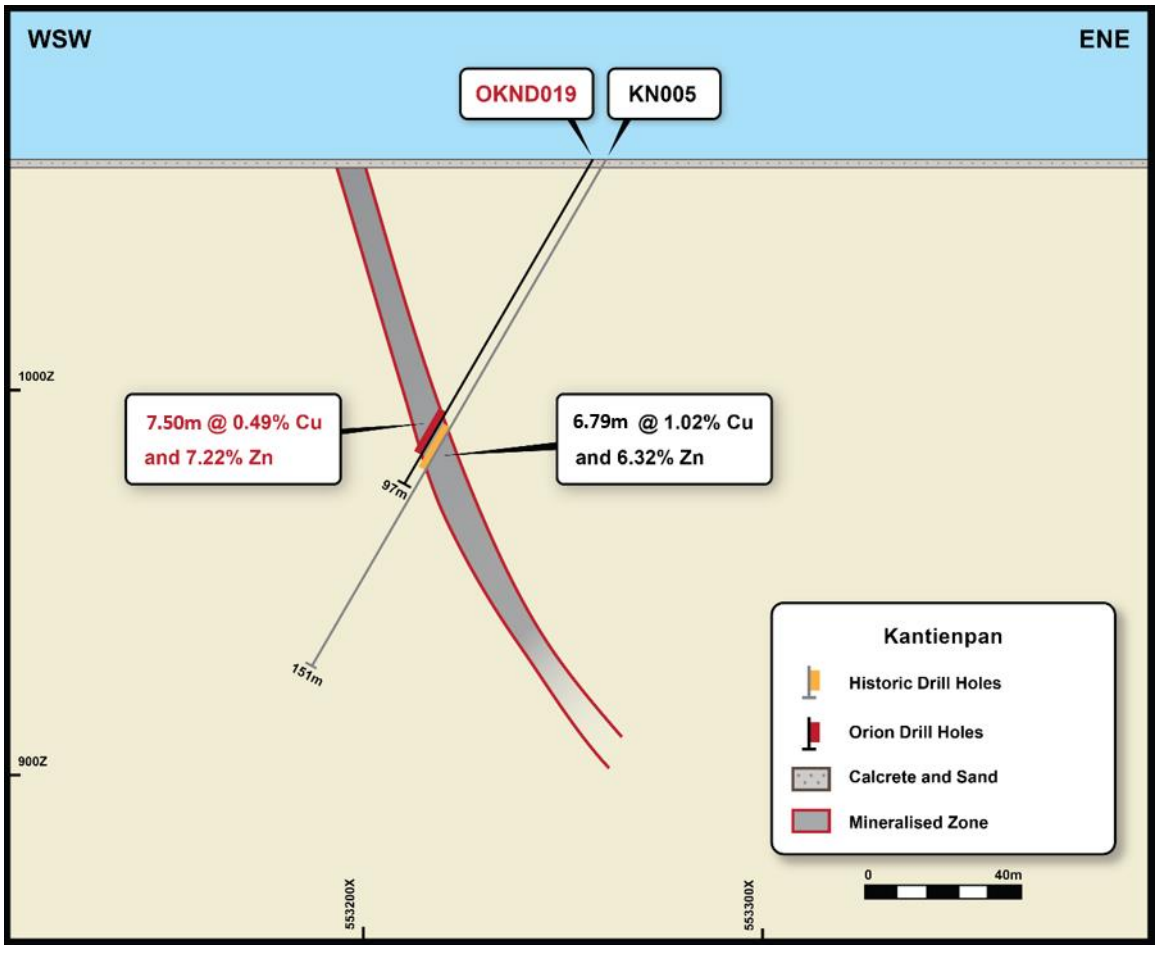


Figure 11: Cross-section through drill holes KN005 and OKND019.

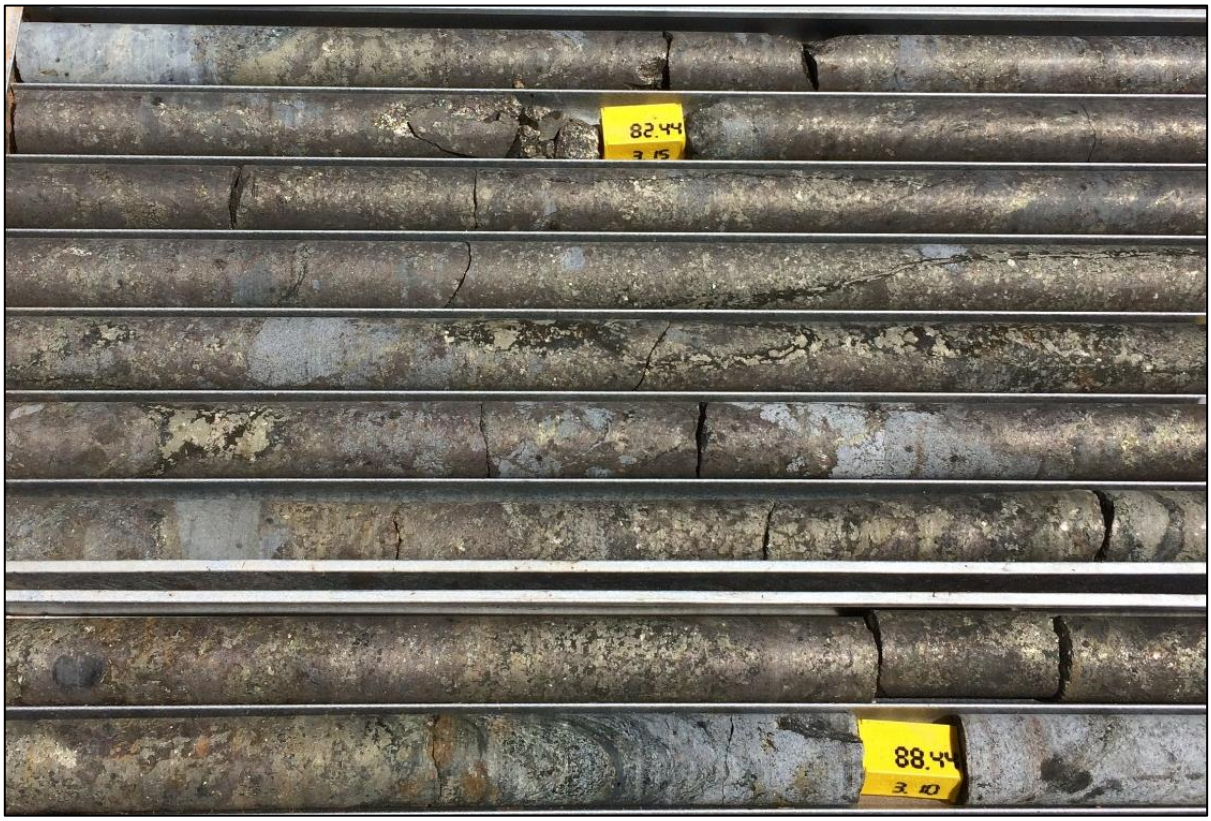


Figure 12: Massive sulphides intersected in drill hole OKND019.

Area 4 Prospect – Namaqua – Disawell Project

Between 1975 and 1983 Anglo American carried out limited exploration at the Area 4 prospect. Two diamond drill holes were drilled, targeting geochemical, magnetic and IP features. Both holes intersected mafic-ultramafic intrusive rocks. Drill hole JAC007 intersected a broad sulphide zone of **62.5m grading 0.26% Ni and 0.17% Cu from 270.30m (refer ASX release 3 July 2018)**. Drilling targeted geochemical, magnetic and IP targets.

Orion carried out FLTDEM surveys over Area 4 using two grids, A4A and A4B. Seven plate models of conductance ranging from 350 – 2000 S, with smaller dimensions characteristic of semi-massive to massive sulphide mineralisation within or on margins of disseminated sulphide mineralisation, have been modelled (Figure 13).

Drill hole OA4D001, completed in November 2020, intersected two zones of mafic-ultramafic rocks separated by 61.70m of metapelitic rocks. The upper zone of 60.90m intersected from 17.00m down-hole consists of pyroxenite that hosts two layers of harzburgite from 21.64m to 23.62m and from 50.47m to 54.45m.

This unit is mineralised with disseminated pyrrhotite and contains nickel and copper concentrations up to 0.28% Ni and 0.15% Cu over 5m from 70m down-hole (Figure 14, Table 6). The lower unit was intersected over 33.92m from 143.30m down-hole and consists of non-conductive gabbro-norite devoid of sulphides. The modelled EM plates with strong conductance are therefore not explained by the drilling intersection.

A down-hole EM survey is planned to detect off-hole EM conductors and assist with modelling of the ground EM data.

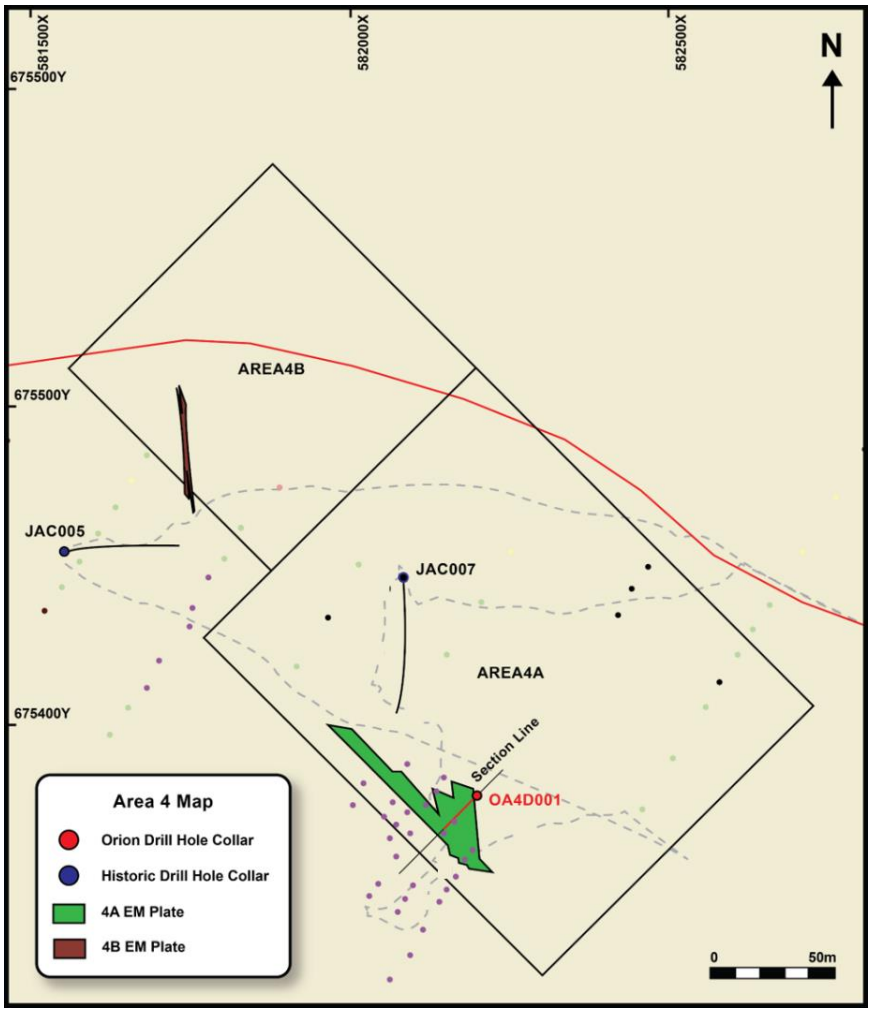


Figure 13: Plan showing EM conductors and drilling on the Area 4 prospect.

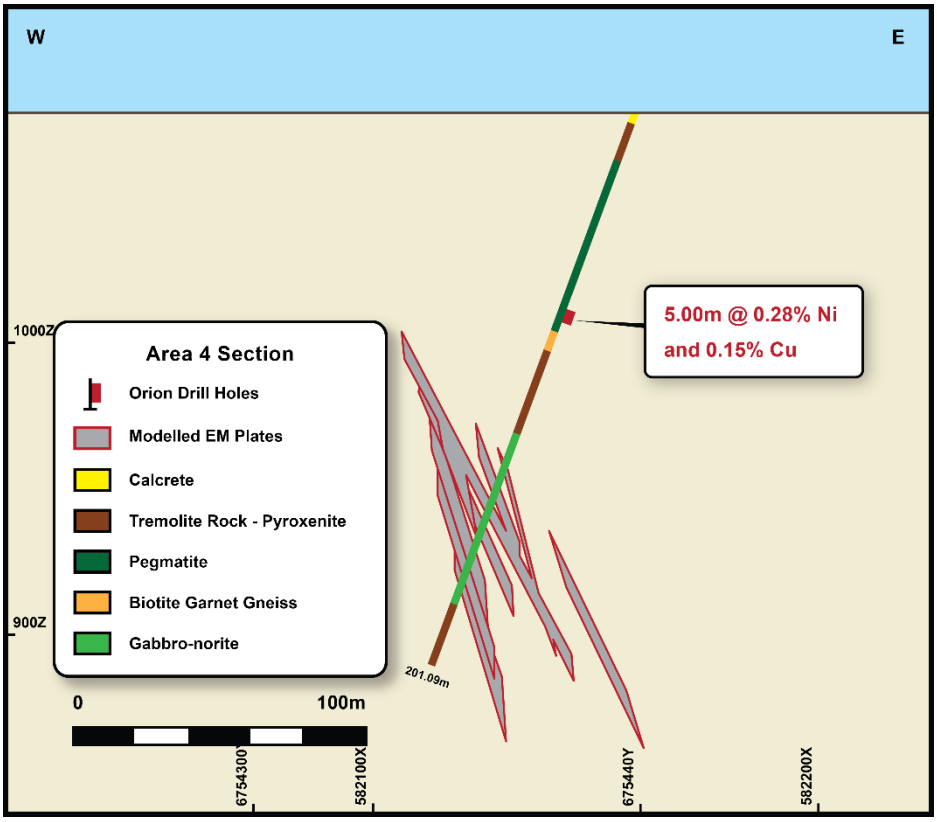


Figure 14: Section showing drill hole OA4D001 with the modelled EM-plates.

Hole No	Depth (m) From	Depth (m) To	Intersection Length (m)	Ni (%)	Cu (%)
OA4D001	70.00	75.00	5.00	0.28	0.15

Table 6: Intersection table for drill hole OA4D001.

Jacomynspan

Drill hole OJPD054 was completed to test the potential of shallow Ni-Cu-Co-PGE- Au mineralisation on the Jacomynspan nickel-copper prospect. Jacomynspan hosts a Mineral Resource of 6.8Mt at 0.57% Ni, 0.33% Cu, 0.03% Co, 0.19g/t Pt, 0.12g/t Pd, 0.07g/t Au[2] (Figure 15) (refer ASX release 20 October 2020).

The deposit has been extensively drilled over the 3km strike length of the intrusive to a depth of 900m; however, the upper 150m of the outcropping deposit that is oxidised to depths of 30m - 60m, remains largely untested and presents an attractive open pit mining prospect.

Historical hole JMP030 intersected higher grade mineralisation of 0.40% Ni and 0.29% Cu over 29.14m at a vertical depth of 120.86m hosted in harzburgite on the hanging wall contact of the ultramafic intrusion (refer ASX release 8 March 2018). OJPD054 was drilled to test for the up-dip continuation of the Harzburgite 25m up-dip of JMP 030 intersection (Table 7).

The hole revealed that the targeted harzburgite does not continue up-dip, however several additional unexpected hartzburgite horizons with higher grade sulphide mineralisation were intersected in the stratigraphic footwall of the target (Table 7, Figure 16). These results show a more complex distribution of mineralisation than previously modelled, including numerous shallow higher grade zones that have merit to evaluate for future selective open pit mining.

Close-spaced, shallow drilling is being planned to test and map out these shallow lenses of mineralisation with attractive Ni-Cu-PGE-Au mineralisation and to collect samples for metallurgical test work.

Hole No	Depth (m) From	Depth (m) To	Length	Ni %	Cu %	Au ppm	Pt ppm	Pd ppm
OJPD054	145.36	151.39	6.03	0.60	0.31	0.20	0.21	0.19
incl.	146.35	147.45	1.10	1.23	0.69	0.05	0.04	0.09
OJPD054	155.13	156.17	1.04	0.53	0.09	0.06	0.23	0.09
OJPD054	167.42	171.15	3.73	0.64	0.30	0.11	0.45	0.14

Table 7: Intersection table for drill hole OJPD054.

[2] Mineral Resource reported in ASX release of 8 March 2018: "Geological Modelling Confirms Compelling Targets Surrounding the Jacomynspan Ni-Cu-Co-PGE Intrusive" available to the public on http://www.orionminerals.com.au/investors/asx-jse-announcements/. Competent Person Mineral Resource: Mr. Jeremy Witley. Orion confirms it is not aware of any new information or data that materially affects the information included in the original market announcement. Orion confirms that all material assumptions and technical parameters underpinning the mineral resource estimates continue to apply and have not materially changed. Orion confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

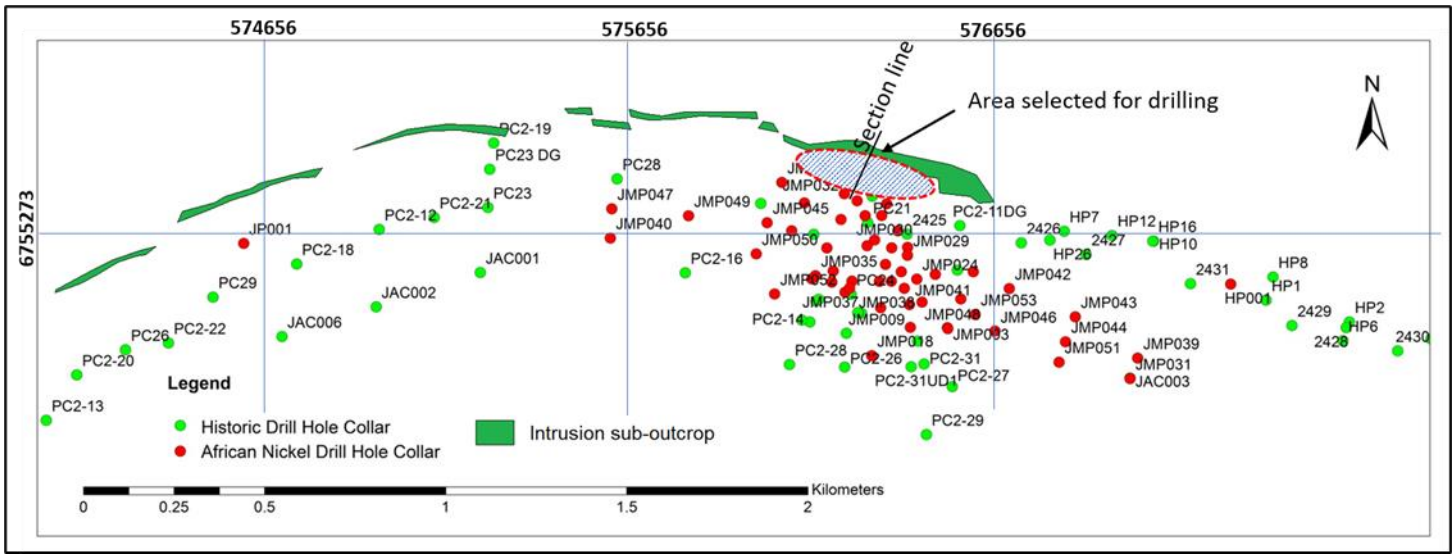


Figure 15: Map of the Jacomynspan Deposit with the current drill area indicated.

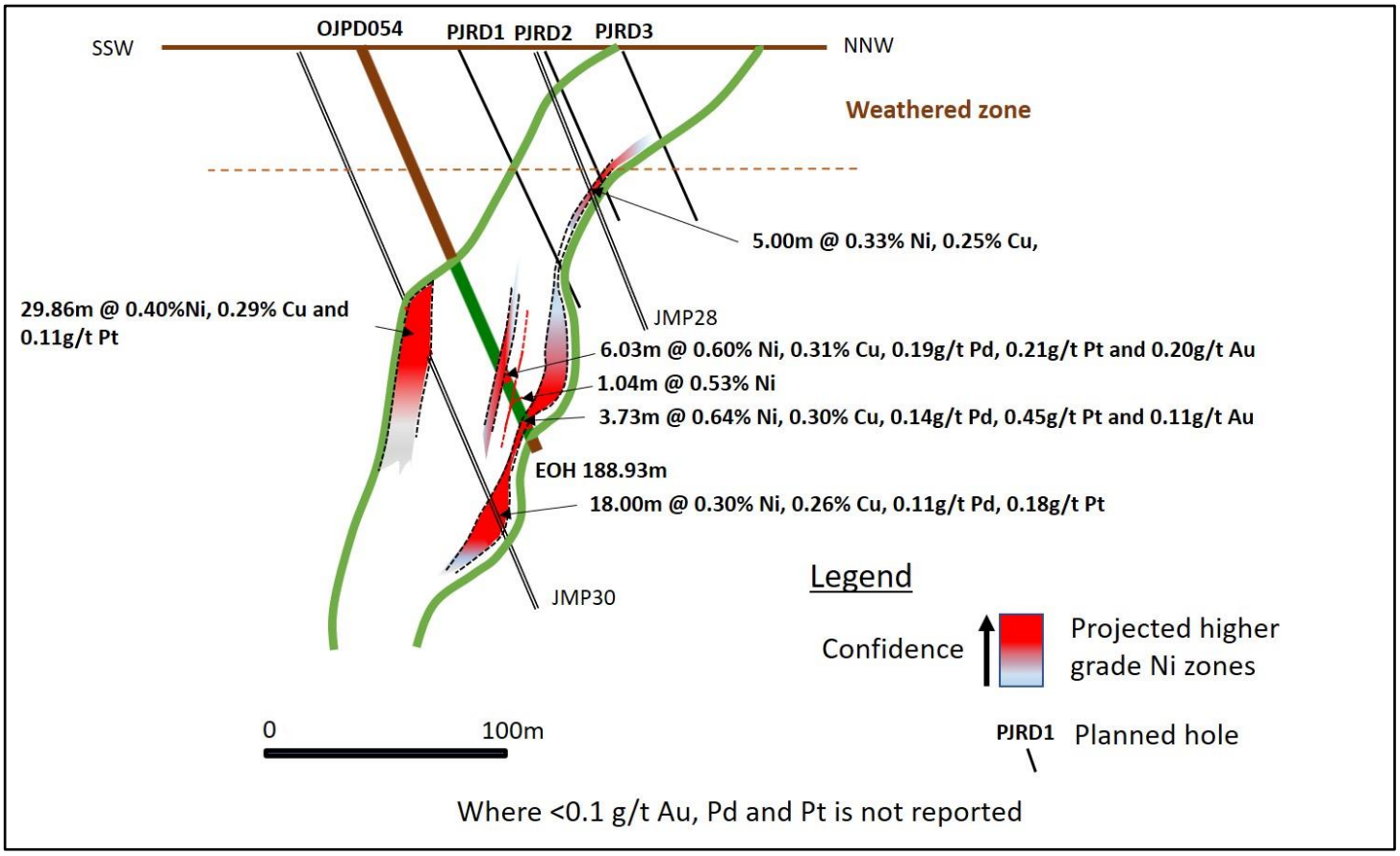
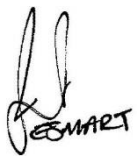


Figure 15: Cross section showing nickel grades in hole OJDP054.

For and on behalf of the Board.



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Competent Person Statement

The information in this report that relates to Exploration Results has been compiled under the supervision of Mr Conrad Louw van Schalkwyk, a Competent Person who is registered with the South African Council for Natural Scientific Professionals, a 'Recognised Professional Organisation (**RPO**). Mr Van Schalkwyk is a full-time employee of Orion in the role of Executive: Exploration. Mr Van Schalkwyk 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 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Van Schalkwyk consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Disclaimer

This release may include forward-looking statements. Such forward-looking statements may include, among other things, statements regarding targets, estimates and assumptions in respect of metal production and prices, operating costs and results, capital expenditures, mineral reserves and mineral resources and anticipated grades and recovery rates, and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions. These forward-looking statements are based on management's expectations and beliefs concerning future events. Forward-looking statements inherently involve subjective judgement and analysis and are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Orion. Actual results and developments may vary materially from those expressed in this release. Given these uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements. Orion makes no undertaking to subsequently update or revise the forward-looking statements made in this release to reflect events or circumstances after the date of this release. All information in respect of Exploration Results and other technical information should be read in conjunction with Competent Person Statements in this release (where applicable). To the maximum extent permitted by law, Orion and any of its related bodies corporate and affiliates and their officers, employees, agents, associates and advisers:

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Appendix 1:

Table 1: Drill hole information and intersections of historical holes drilled on the K3 and K6 prospects Dooniespan 103 portion 6. A 1% Zn cut-off was used with no top cut-off. Where present, internal waste is included in the intersections.

Hole No	Prospect	UTM E	UTM N	Inclination	Bearing	Final Depth	From (m)	Width (m)	Cu wt%	Zn wt%	Au (g/t)	Ag (g/t)
KDH1	K3	618690	6696414	-55	169	66.06	Hole abandoned					
KDH2	K3	618724	6696258	-65	349	199.08	116.32	6.11	0.4	3.01	0.27	3.32
KDH3	K3	618757	6696106	-60	349	274.5	179.21	13.08	0.23	3.69	0.19	4.67
KDH4	K3	618778	6695998	-70	349	491.1	246.95	0.6	0.51	6.84	0.09	3.7
KDH5	K3	618810	6695839	-70	349	596.75	556.4	0.8	0.04	3.59	0.07	2.7
KDH6	K3	619136	6696240	-80	349	405.15	No intersection					
KDH7	K3	618918	6696293	-50	349	178.76	104.8	0.6	0.12	1.16	0.14	4.3
KDH8	K3	618540	6696166	-60	349	175.85	151.45	0.35	0.16	0.01	<0.05	1.1
KDH9	K3	618573	6696009	-60	349	288.7	148	2	0.2	0.01	0.11	0.05
KDH10	K3	618451	6695455	-50	169	138.25	No data available					
KDH11	K3	618495	6695300	-45	349	175.5	No mineralisation					
KDH15	K6	612652	6694766	-55	79	175.7	116	4.8	0.46	6.18	0.1	15.4
KDH16	K6	618945	6696163	-60	349	224.6	No mineralisation					
KDH17	K6	612668	6694671	-55	79	175.7	114.4	0.3	0.26	2.14	5.9	20.2
KDH18	K6	612608	6694656	-65	79	239.9	184.78	3.1	0.34	5.75	0.3	11.62
KDH19	K6	612612	6694857	-45	79	192.25	No data available					
KDH20	K6	612635	6694559	-55	79	274.1	No data available					
KDH21	K6	612595	6694956	-45	79		No data available					
KDH25	K6	612542	6694749	-55	79	249.8	No data available					
KDH26	K6	612576	6694548	-55	79	289	No data available					
KDH27	K6	612629	6694456	-65	79	332.8	No data available					
KDH28	K6	612504	6694583	-65	79	1	No data available					
KDH29	K3	618850	6696138	-60	349	283.35	No data available					
KDH30	K3	618699	6695888	-60	349	405.35	No data available					

Coordinate system: UTM/WGS84 Zone 34J

Table 2: Table of intersections reported in this release.

Hole No	Prospect	UTM E	UTM N	Inclination	Bearing	Final Depth	From	Width	Cu (%)	Ni (%)	Zn (%)	Ag (g/t)	Au (g/t)	Pt (g/t)	Pd (g/t)
OBPD001	B4	563452	6790289	-90	-	557.68	393.00	5.00	1.09				0.13		
incl							394.00	1.00	2.34				0.29		
OBPD001							405.90	3.68	0.66				0.18		
OBPD001							432.00	8.00	0.49						
incl							434.00	3.00	0.67						
OBPD001							498.45	1.00	2.25				0.32		
OKD031	K3	618757	6696095	-60	345	227.06	174.73	9.39	0.14		3.41		0.14		
incl							189.16	4.81	0.14		4.48				
OKD032	K6	612662	6694755	-60	79	155.58	123.20	3.90	0.30		7.97	11	0.16		
OKD032							129.94	2.21	0.70		1.70	36	0.20		
OKD033	K3	618720	6696256	-65	350	149.57	108.80	0.70			2.92		0.30		
OJDP054	Jacomynspan	576307	6755837	-60	23	189.94	145.36	6.03	0.31	0.60			0.19	0.21	0.19
incl							146.35	1.10	0.69	1.22					
OJDP054							155.13	1.04	0.09	0.53				0.23	
OJDP054							167.42	3.73	0.30	0.64			0.10	0.45	0.14
OA4D001	Area 4	582153	6754395	-67	215	201.91	70.00	5.00	0.15	0.28					

Coordinate system: UTM/WGS84 Zone 34J

Appendix 2: The following tables are provided as a requirement under the JORC Code (2012) requirements for the reporting of Exploration Results for the Namaqua-Disawell Project: Hartebeestpan (Area 4) and Rok Optel Prospects.

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	• The core from historic holes were sampled in lengths varying from 0.06m to 2.50m, with a mean of 1.17m. This is appropriate for a reconnaissance-level assessment of volcanogenic massive sulphide deposits. • No additional details are supplied of the sampling techniques of the historical drilling presented in the figures and tables in this report and publicly reported here for this first time. It is assumed that the work was undertaken according to the 'industry standards' of the period. **Current Program** • NQ size cores are cut longitudinally in half and 1 metre sample lengths were taken. These were varied to honour geological / mineralisation boundaries. • Sampling carried out under supervision using procedures outlined below including industry standard QA/QC. • Samples submitted for analysis to ALS is pulverised in its entirety at ALS and split to obtain a 0.2g sample for digestion and analysis. • The samples will be analysed by accredited laboratory ALS Chemex (**ALS**).
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).*	**Historic Data** • The historical drilling is presented in the figures and text in this report and publicly reported here for this first time. • Diamond core drilling was undertaken. • No details of the drilling companies used. • BQ size core were drilled. The core is not available. • Drill holes were drilled at -45° to -65°. • There is no record of orientated core. **Current Program** • Diamond core drilling was undertaken. • HQ and NQ size core was drilled. • Drill holes was drilled at -70 and -60 degrees. • Core was not orientated.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• The drill cores were fitted together and recovered length was measured. • Core recovery was found to be excellent (>98%) within the mineralised zone. • No information is available on core recovery in the historic data.

Criteria	JORC Code explanation	Commentary
Logging	• *Whether core and chip samples have been geologically and geo-technically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.* • *The total length and percentage of the relevant intersections logged.*	• Core of the entire hole length was geologically logged by qualified geologists. • Geological logging was qualitative and was carried out using a standard sheet with a set of standard codes to describe lithology, structure and mineralisation. The logging sheet allows for free-form description to note any unusual features. • Geological logs were captured electronically. • All cores were photographed before and after sampling.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• BQ and NQ core cut at core yard and half core taken as sample. • Samples from percussion pre-collars are collected by spear sampling. • With core samples, the entire sample length is cut and sampled. • Sample preparation is undertaken at ALS Laboratory Johannesburg, an ISO accredited laboratory. ALS utilises industry best practise for sample preparation for analysis involving drying of samples, crushing to <5mm if required and then pulverising so that +85% of the sample passes 75 microns. • CRM's, blanks and replicates are inserted every 30 samples and analysed with each batch. • Lab supplied CRM's, blanks and replicates are analysed with each batch. • Specific gravity measurements are made over the full length of each individual sample on split core where possible. Where not possible due to crushed or broken core, a minimum of 80% of the core sample is used. The specific gravity is determined by measuring and subtracting the wet weight from the dry weight using an electronic density scale. Care is taken to clean and zero the scale between each weighing. • The sample is first weighed in air and the weight recorded. The sample is then weighed, while completely submerged in clean water within a measuring beaker. The mass of beaker and water are deducted for net submerged weight and volume displacement read on measuring beaker. • The sample is then removed and placed back into the core tray in the correct position and orientation. The procedure is repeated for each geological sample interval. • The data is recorded in the Specific Gravity Data Sheet. The specific gravity is calculated for each sample using the formula: $SG = \frac{\text{weight of sample}}{\text{(weight of sample in air minus the weight of the sample in water)}}$.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	• No details are available with respect to laboratory, or quality control on the historic data.

Criteria	JORC Code explanation	Commentary
	• *For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	• Samples from drilling were submitted to ALS Chemex in Johannesburg. Samples were analysed for base metals using a four acid digest and ICP-OES and for gold by fire assay with AAS finish. • External quality assurance of the laboratory assays is monitored by the insertion of blanks, duplicates and certified reference materials (**CRM**) • Three CRMs are alternated through the sample stream and where possible matched to the material being drilled. • Two blanks are used (pulp and chips). • No external laboratory checks have been carried out at this stage.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• No data is available of any verification of the data or storage of the historic data. • Orion's executive geologist is personally supervising the drilling and sampling along with a team of experienced geologists. • The executive geologist have reviewed the raw laboratory data and confirmed the calculation of the significant intersections.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	**Historic data** • The drill holes are indicated on the geological maps. • The collars have been located in the field and surveyed using a handheld Garmin GPS. • The data are recorded using the WGS84 datum, UTM Zone 34S. • Downhole positions were surveyed using a Sperry-Sun instrument. Data was used to plot the holes on available sections. The recorded data is not available. **Current program** • Collar positions of the holes were surveyed using a hand-held Garmin GPS. • The data are recorded using the WGS84 datum, UTM Zone 34S.
Data spacing and distribution	• *Data- spacing for reporting of Exploration Results.* • *Whether the data-spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	**Historic data** • At K3 the drill holes were drilled on sections spaced 200m apart over a strike distance off 400m. Hole spacing were at 160m on the sections and two infill holes were drilled. • At K6 holes were drilled on section lines 100m apart with hole spacing 60m to 120m on the section lines. • Data spacing is insufficient to establish a Mineral Resource. • No sample compositing was done. **Current program** • Not applicable. Drill holes were designed to verify historic results and not aimed at Resource estimations.

Criteria	JORC Code explanation	Commentary
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• At K3 the stratigraphy dips steeply to the south. Drilling was undertaken from the south to intersect at a reasonable angle to dip. • At K6 the stratigraphy dips steeply to the west. Drilling was undertaken from the west to intersect at a reasonable angle to dip. • At Kantienpan the mineralisation dips steeply easterly and drilling was undertaken from the east to intersect at a reasonable ngle to dip. • At Boksputs and Area 4 the drilling was guided by the orientation of the modelled EM plates and drill holes were designed to ensure intersections with the modelled plates. • At Jacomynspan, mineralisation dips steeply south and drilling was carried out from the south to intersect the intrusive body at a reasonable angle.
Sample security	• *The measures taken to ensure sample security.*	• No data is available on the measures taken to ensure sample security for the historic programs. • Chain of custody is managed by the Company. Samples were stored on site in a secure locked building and then freighted directly to the lab.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No audits or reviews is known to have been carried out.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• PCZM, formerly Repli Trading No 27 (Pty) Ltd, holds the prospecting rights, namely NC 30/5/1/2/11840, over Dooniespan 106 Portion 3 for the prospecting of Copper, Zinc, Lead, Gold, Silver, Cobalt, Sulphur in pyrite, Barytes, Limestone, Sulphur and Molybdenum. • No historical or environmental impediments to obtaining an operating licence are known.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• On Dooniespan 206 Portion 3 exploration has been undertaken by Newmont SA during the late 1970's to early 1980's. Only part of the data is available. Twenty-nine diamond drill holes were drilled on four prospects. Geological mapping, IP, gravity and EM surveys were conducted over selected areas. Soil sampling were conducted on a regional grid with follow-up detail surveys over selected areas. Prieska Copper Mines evaluated the Newmont data and did a high level economic appraisal.

Criteria	JORC Code explanation	Commentary
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Kielder mineralisation occurs as stratabound massive sulphide lenses within a folded sequence of granulite grade quartzo-feldspathic gneiss, basic granulite and amphibolite. Three massive sulphide lenses consisting of pyrite pyhrrotite, sphalerite, chalcopyrite, and galena with gangue minerals consisting of baryte, chlorite, phlogopite, apatite, tourmaline and quartz is known to exist on the property. The mineralisation is classified as volcanogenic massive sulphide type deposits.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  o *easting and northing of the drill hole collar*
	  o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  o *dip and azimuth of the hole*
	  o *down hole length and interception depth*
	  o *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• Appendix 1, Table 1 lists all the historical intersections and drilling data available at Kielder.

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• Average was done weighting the samples by sample length. Density values are not available. • A 1% Zn cut-off was applied.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').*	• All drill holes were inclined as to intersect the mineralised horizons as close to 90^0 as possible and the intersection width as close to the true width as possible. • Where down hole lengths are reported it is stated in the report.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Not material for this report. Plans with drill hole collars are provided within the text. Historical results are tabulated in Appendix 1, Table 1.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• In the Competent Person's view, the historic drill results and the geophysical targets are presented in a balanced manner for the purpose of this Public Report.

Criteria	JORC Code explanation	Commentary
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Extensive geology mapping, geochemical sampling, and airborne and ground geophysical programs were undertaken by previous explorers, using the equipment and methods available at that time. These geophysical data are not all available, and mainly comprises plans without the back-up information to verify the data validity. The new geophysical exploration, using modern technology, supersedes all previous geophysics. The geology mapping remains valid and has been digitally captured. The geochemical data have been captured from the original plans and used where appropriate. • In 2018, Orion undertook a regional SkyTEM™ geophysical survey over the area. The results are reported in ASX releases 16 January 2019 and 8 March 2018. Interpretation of the results is ongoing.
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Sampling and assaying of samples will be the next step.