Orion Minerals

ASX/JSE RELEASE: 6 August 2018

Drilling commences on new high conductance target at Rok Optel, Northern Cape, South Africa

- **A fourth Fixed Loop Time-Domain Electro-Magnetic survey has been completed at Rok Optel, detecting the highest conductance measured yet at the northern end of the cluster.**
- **The modelled conductance of 9400S is three times the highest conductance previously detected at Rok Optel.**
- **Drilling has commenced to test this high conductance target.**

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

"Our first intersection at Rok Optel demonstrated that geological conditions exist for accumulation of large intrusive massive sulphide, Ni-Cu bodies. The new ROK 4 conductor, which is three times higher in conductance than the ROK 2 conductor at drill hole OROD001 is very encouraging for the potential to discover a large massive sulphide body."

Orion Minerals Limited (**ASX/JSE: ORN**) (**Orion** or the **Company**) is pleased to provide an update on ongoing exploration at the Rok Optel Ni-Cu target on the Namaqua and Disawell mineral rights (**Disawell**) in the Areachap Belt, South Africa (Figure1). Fixed Loop Time-Domain Electro-Magnetic (**FLTDEM**) surveys and geological mapping over helicopter-borne Electro-Magnetic anomalies at the Disawell Prospects commenced in May 2018 (refer ASX release 1 February 2018). Diamond drilling commenced in July 2018 targeting high grade, magmatic sulphide Ni-Cu-Co-PGE mineralisation.

Drill hole OROD001 (refer ASX release 30 July 2018) intersected a succession of sulphide bearing mafic to ultramafic intrusive rocks, over a down-hole width of 186.86m. Most importantly, the sulphide mineralisation includes syn-magmatic injection veins and stringers of massive sulphide comprising pyrrhotite, chalcopyrite and pentlandite. The hole was completed at 412.06m.

An additional FLTDEM grid (ROK4) has now been completed to the north of grid ROK1 (Figure 2) to test the extension of the conductive zone and better define the anomaly for drilling. Plate models have orientation consistent with the intrusion morphology as currently understood from the available drill hole and surface mapping data. The plate models at ROK 4 (Table 1) have conductance of up to 9400S and are consistently approximately 100m x 300m in area. The intimate associations and consistent plunge of the target indicate that this anomaly is likely to be an extension of the mineralisation drilled in OROD001 (target plate conductances of 1250 to 2900S), with interpreted increasing sulphide content toward the north. A second diamond drill hole, OROD002, was started on 4 August 2018 to test the high conductance target.

In parallel with drilling at OROD002, drill core processing, sampling and analysis of OROD001 is continuing and fieldwork is underway to augment the historic surface mapping. All information is being integrated to enable construction of a three-dimensional intrusion model to enable optimal drill targeting. The Rok Optel intrusion remains open at its northern, southern, and western margins.

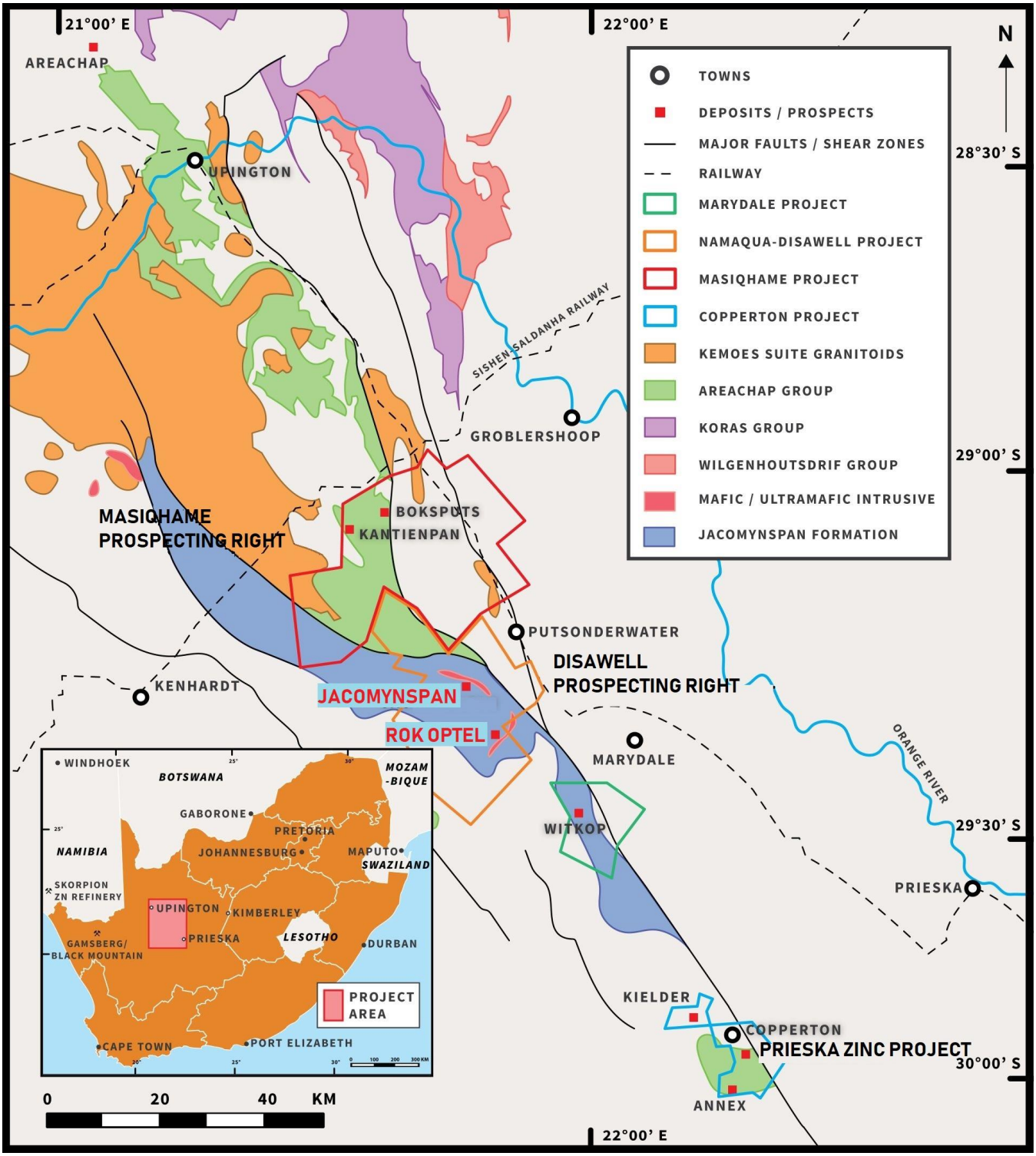

Figure 1: Areachap Project summary geology map showing the Masiqhame and Disawell prospecting right.

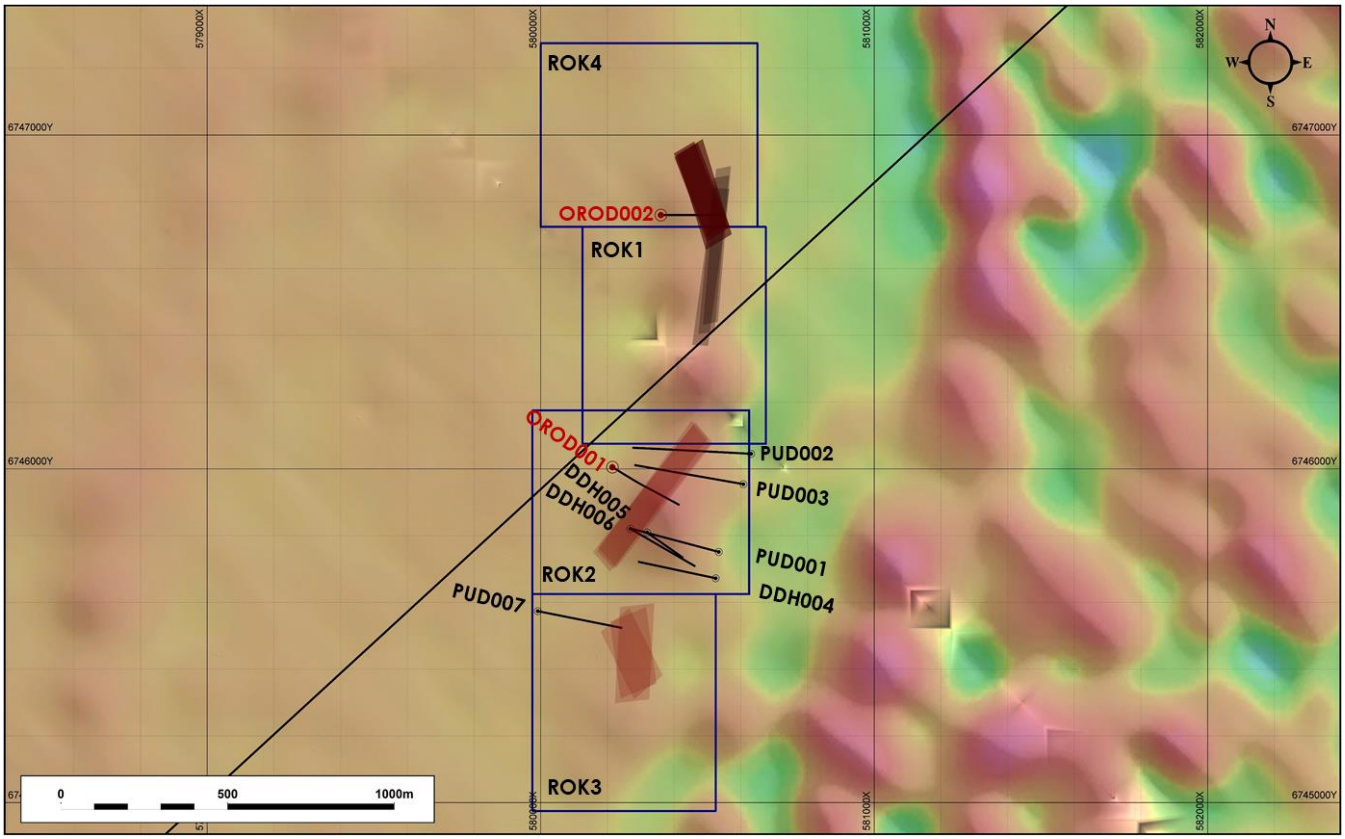

Figure 2: Plan showing the FLTEM grids, conductors, historic drill holes, and new drill holes OROD001 and OROD002 on the Rok Optel prospect overlain on an airborne magnetic map (RTP 1VD).

Target	VMS/NiS	Loop	Conductor Model	Plate Dimensions (m)	Plate Conductance (Siemens)	Approximate Plate Depth (m)
Rok Optel	NiS	ROK1	ROK1_2730	475 x 90	2050	230
			ROK1_2932	475 x 90	2500	250
			ROK1_3133	475 x 85	3600	280
		ROK2	ROK2_2528	475 x 100	1250	200
			ROK2_2729	500 x 95	1700	225
			ROK2_2932	475 x 85	2900	275
		ROK3	ROK3_2325	130 x 300	850	275
			ROK3_2527	135 x 250	950	300
			ROK3_2729	120 x 275	1250	300
		ROK4	ROK4_3335	100 x 330	5250	295
			ROK4_3537	90 x 300	7200	310
			ROK4_3639	80 x 300	9400	320

Table 1: Summary of the plate model dimensions and conductance for the Rok Optel prospect.

Errol Smart
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Competent Person Statement

The information in this report that relates to Exploration Results is based on information compiled by Mr Richard Hornsey (Pr.Sci.Nat.) Registration No: 400071/96, a Competent Person who is a member of the South African Council for Natural Scientific Professionals, a Recognised Overseas Professional Organisation (**ROPO**). Mr Hornsey is a Consultant to Orion. Mr Hornsey 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 Hornsey 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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	X UTM34S	Y UTM34S	Elevation (m)	Initial Depth (m)	Final Depth (m)	Dip (degrees)	Azimuth (degrees)
OROD001	580215.00	6746005.00	1,059.00	0.00	412.06	-60.00	120
OROD002	580360.00	6746760.00	1,559.41	0.00	450.00	-65.00	090

Table 2: Drill hole Information.

Appendix 1: The following tables are provided in accordance with the JORC Code (2012) for the reporting of Exploration Results for the Jacomynspan Project.

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.	• No drill hole core sampling has been undertaken at the date of reporting.
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.).*	• Diamond core drilling was undertaken using HQ core size to drill through the weathered zone (approximately 75m) reducing to NQ core in hard rock. • The OROD001core was not oriented.
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.*	• Core recoveries are assessed on a routine basis using drill rig and core yard standard procedures. • At the drill rig, core stick-ups are measured at the end of each run. The core is fitted together and placed into the core trays with a plastic block at the end of each run recording the hole depth and advance. • At the core yard, the length of core is measured for each run. The measured length of core is subtracted from the run length recorded from the driller's stick-up measurements and recorded as a core gain or loss. • During the logging process, core recoveries are considered, and the cause of loss is quantified and described. The locations of 'bottom breaks' relative to the core run markers are observed. • No information is available yet to determine whether a relationship exists between grade and core recovery.

Criteria	JORC Code explanation	Commentary
Logging	• *Whether core and chip samples have been geologically and geotechnically 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.*	• The drill hole core has been geologically logged by the Competent Person. This process utilises a standard-format logging template designed specifically for this style of mineralisation. • Both quantitative and qualitative logging is undertaken dependent upon the features being described. Qualitative parameters include lithology, colour, grain size, weathering, structural features, alteration, sulphide and oxide mineralisation, secondary mineralisation, and general contextual comments. Quantitative parameters include intensity of the qualitative parameters, mineralisation percentages, and magnetic properties. • The logs are recorded onto pre-designed templates and captured into digital format at the project office. • The drill hole core is photographed according to standard core yard procedure and the photographs are digitally archived.
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.*	• No sampling has been undertaken to date.
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.* • *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.*	• No new analyses have been undertaken to date.
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.*	• No independent peer reviews have been undertaken.

Criteria	JORC Code explanation	Commentary
	• *Discuss any adjustment to assay data.*	
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.*	• The drill hole collar was located using a handheld Garmin GPS. The drill hole azimuth and dip were surveyed using a Brunton compass. • Drill hole downhole surveys are undertaken using a North-seeking Gyro instrument. • 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.*	• OROD001 and OROD002 are the first and second drill holes by Orion Minerals into the Rok Optel prospect. Seven drill holes were drilled by previous explorers.
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.*	• No sampling has yet been undertaken.
Sample security	• *The measures taken to ensure sample security.*	• No sampling has yet been undertaken.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No sampling has yet been undertaken.

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.*	• The farm Rok Optel 261 has overlapping rights (in respect of differing minerals) held by two companies. • Namaqua Nickel Mining (Pty) Ltd holds a mining right NC 10032MR (over Die Plaas No. 387: Whole Farm Hartebeest Pan 175: RE, Portion 5 Jacomyns Pan 176: RE, Portion 1, Rok Optel 261: RE, Portion 1, Portion 2, Portion 3) for the mining of Nickel, Copper, Cobalt, PGM, Gold. This right was granted on 19 September 2016 subject to certain conditions, which include local community participation and financial guarantees, but is not yet executed. • Disawell (Pty) Ltd holds two prospecting rights namely NC 30/5/1/1/2/11010 PR (over Jacomyns Pan 176: RE, Portion 1, Portion 2 Rok Optel 261: RE, Portion 1, Portion 2, Portion 3 Rooi Puts 172: Portion 2, Portion 3, Portion 4) and NC 30/5/1/1/2/10938 PR (over Hartebeest Pan 175: RE, Portion 3, Portion 4, Portion 5 Farm 387: RE), each for the

Criteria	JORC Code explanation	Commentary
		exploration of Zinc, Lead, Sulphur. • Disawell and Namaqua entered into an earn-in agreement with Orion Minerals, in terms of which Orion (through its subsidiary, Area Metals Holdings No. 3 (Pty) Ltd) is granted the right to invest in these companies. • 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 Rok Optel 261, exploration has been undertaken by several parties, although only limited data are available. Hochmetals SWA undertook exploration during the early 1970's and drilled the drill holes previously reported upon by Orion Minerals. Poor quality standardised and summarised geological logs submitted to government are the only information remaining from this period. • Newmont undertook exploration from 1975 to 1977. The Hochmetals core was re-analysed. The existing drill hole PUD001 was deepened by 70m and a new hole (PUD007) drilled to 522.90m. A report (Gresse 1977) with drill plans and sections is available and has been captured into the database.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Rok Optel mineralisation is contained within portions of a metamorphosed mafic to ultramafic intrusion at least 150m thick containing magmatic nickel-copper sulphides. The intrusion is predominantly norite and gabbro, with lenticular bodies of pyroxenite to harzburgite. The intrusion is enclosed within quartz-feldspar-biotite-garnet (sillimanite) gneiss country rocks.
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.	• See Table 2.
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*	• No assays have been undertaken.

Criteria	JORC Code explanation	Commentary
	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.*	
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').*	• No assays have been undertaken.
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.*	• The prospect plan indicates the drilled and planned drill hole localities.
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.*	• The visible nature of the results has been reported in an appropriate manner. No conclusions can be drawn with respect to the grade of the intersected mineralisation until analytical data are received from the laboratory.
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.*	• The Time Domain Electromagnetic Surveys are undertaken using a best-in-class electromagnetic receiver manufactured by Electromagnetic Technologies. The source is a custom-built Time Domain Electromagnetic transmitter, capable of transmitting 140 Amps into a 1 x 1km aluminium wire loop. The source is coupled with military grade fluxgate sensors for shallow exploration and super-sensitive high-temperature Super Conducting Quantum Interference Devices (SQUIDs) manufactured in Germany, which are state of the art for deeper exploration. The SQUID system was employed at the ROK4 grid and can detect moderate to super-conductors to approximately 1,000m below surface. Readings are taken every 50-100m on 200m-spaced grid lines.
Further work	1. The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). 2. Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Drill hole OROD001 intersected the base of the Rok Optel intrusion at 387.82m and was completed at 412.06m. A down-hole electro-magnetic survey will be undertaken. Follow-up work will be dependent upon the survey results. • Drill hole OROD002 will be drilled as indicated in the report to a depth dependent upon the host stratigraphy and mineralisation. The hole will then be surveyed using down-hole electromagnetics.