Date: 26 July 2021

ASX Code: MAN

Capital Structure
Ordinary Shares: 443,924,843
Unlisted Options: 114,575,077 (3c exercise)
Current Share Price: 9.4c
Market Capitalisation: $42M
Cash: $4.7M (Mar 31 2021)
Debt: Nil

Directors

Patrick Burke
Non-Executive Chairman

James Allchurch
Managing Director

Lloyd Flint
Non-Executive Director
Company Secretary

Contact Details
Ground Floor
24 Outram Street
West Perth WA 6005
Australia
Tel: +61 9200 3743
mandrakeresources.com.au

For personal use only

Further Massive Sulphides Intersected at Newleyine

Highlights

- **Diamond hole MNEWDD003 completed – massive sulphides observed coincident with strong DHEM conductor**
- **Down-hole electromagnetic (DHEM) survey at MNEWDD002 has identified a further strong, confined, late-time off-hole conductor plate with ~5,000 Siemens conductance**
- **Sampling underway with ultramafic and sulphide zones to be assayed for base metals and platinum group elements (PGEs) – further follow-up drilling of prospective zones planned**
- **Mandrake fully funded with over $15.5M in cash**

Mandrake Resources Limited (ASX: MAN) (**Mandrake** or **the Company**) advises that diamond drill hole MNEWDD003 has been completed at the Newleyine PGE-nickel-copper prospect.



Figure 1 – Massive sulphides – pyrrhotite and minor chalcopyrite at 321.5m in MNEWDD003

For personal use only

MNEWDD003 tested the very strong, late-time off-hole conductor plate (~7,000 Siemens conductance) identified in the down-hole electromagnetic (DHEM) survey at MNEWDD001.

The primary objective of the drilling programme is to test three discrete, late-time electromagnetic (EM) bedrock anomalies that geophysical interpretation suggests could be the response of massive sulphides consistent with Julimar-style PGE-Ni-Cu mineralisation.

DHEM surveys at completed holes have provided additional conductor plates that have necessitated additional drill testing.

Mandrake Resources Managing Director, James Allchurch, commented:

"The appearance of further massive sulphides in Mandrake's third hole is encouraging and highlights the potential of the Newleyine intrusive to host economic mineralisation. Another compelling off-hole conductor has been identified by down-hole EM at MNEWDD002 and we are yet to test our third and final original conductor at plate C.

We await assay results which will provide an understanding of base metal and PGE concentrations in the three holes drilled to date which will assist with drill planning and interpretation".

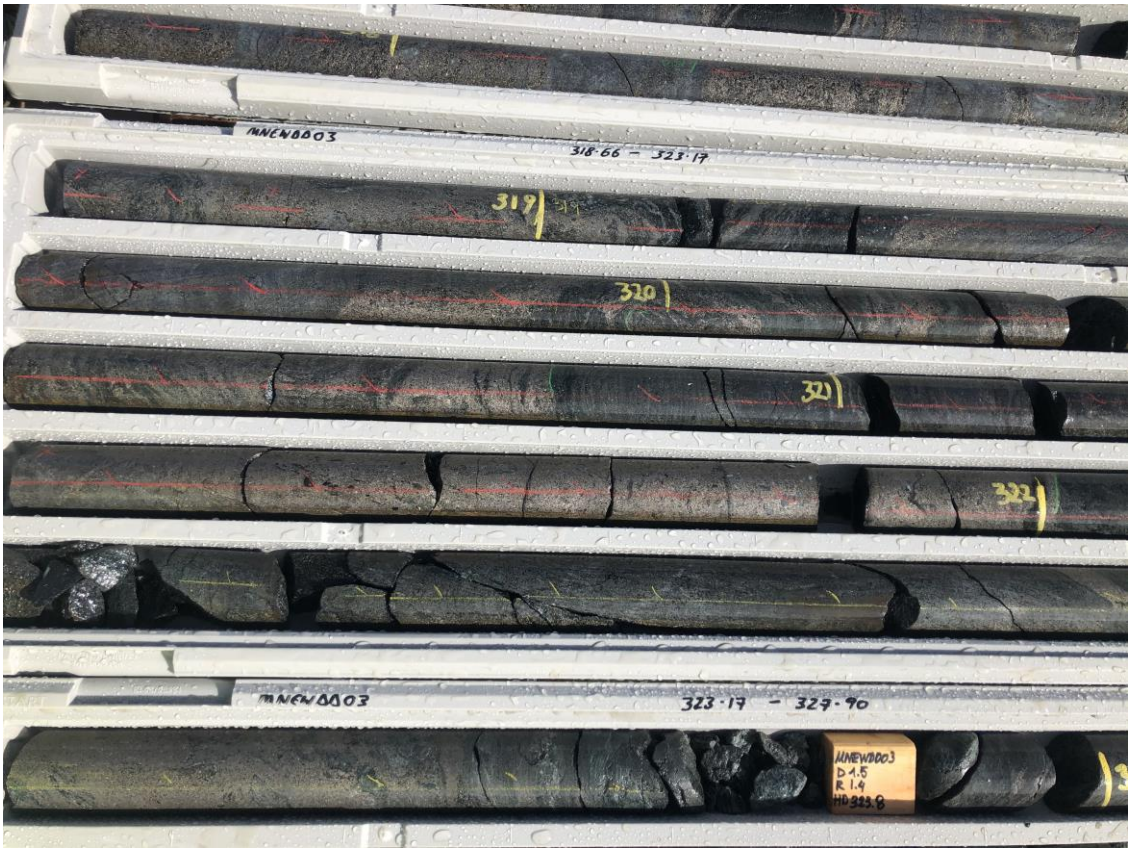


Figure 2 - Sulphide rich zone including massive pyrrhotite with minor chalcopyrite - MNEWDD003 with metre marks shown in yellow

For personal use only

MNEWDD003

In further encouraging signs for the Newleyine prospect, MNEWDD003 has recorded several zones of semi-massive and massive sulphides.

MNEWDD003 primarily comprised mafic-ultramafic rocks serpentinite and amphibolite with zones of disseminated and vein-filled sulphides (primarily pyrite and pyrrhotite) up to 2% sulphides by volume.

Semi massive and massive sulphide zones were observed from 286.2m downhole depth associated primarily with banded iron formation with minor ultramafic rocks and mafic metasediments. The sulphide zones appear proximal to the overlying ultramafic contact (with some ultramafic zones within the sulphidic zone) and are composed primarily of pyrrhotite and minor chalcopyrite. A full lithological summary is provided in Table 1.

Sampling is underway and assay results are awaited for prospective zones within MNEWDD003.

MNEWDD002

MNEWDD002, which targeted fixed loop electromagnetic (FLEM) conductor plate A, and returned zones of semi-massive sulphides with visible chalcopyrite (see ASX release dated 14 July 2021), has been subjected to a down-hole electromagnetic survey (DHEM).

The DHEM survey has identified a very strong, late-time off-hole conductor plate with ~5,000 Siemens conductance. The conductor is strongly confined and measures approximately of 40 x 30m.

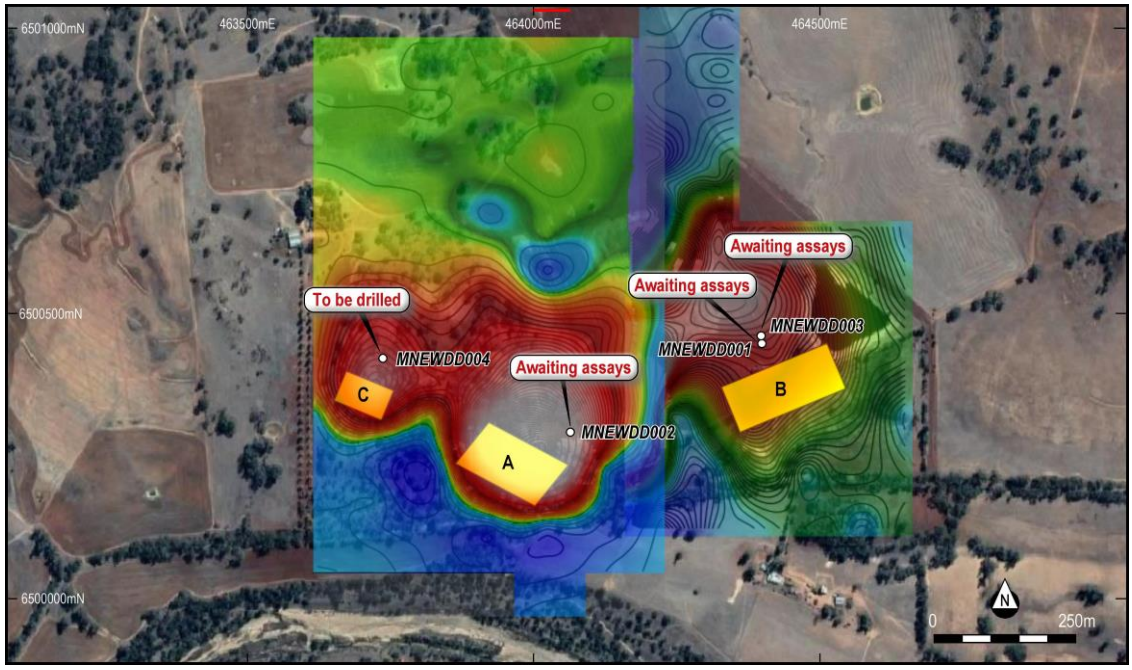


Figure 3 – Newleyine prospect showing FLEM EM conductors (A, B and C) and drill holes

For personal use only

Next Steps

Drilling has ceased at the Newleyine prospect as a function of incessant rain in the Northam area restricting access to drill pads. Drilling will resume as soon as ground conditions permit, with MNEWDD004 (testing conductor plate C) the next hole to be drilled.

Sampling underway with potentially prospective ultramafic and sulphide zones to be assayed for base metals as well as platinum group elements (PGEs). Assay results will inform interpretation and modelling of the Newleyine intrusive where initial drilling has proven the presence of ultramafic host rocks and a relative abundance of sulphide material. Additional work is required to further develop Newleyine.

This announcement has been authorized by the board of directors of Mandrake.

About Mandrake Resources

Mandrake is a junior exploration company established with the purpose of exploring and developing gold, nickel, copper and PGE opportunities. The Company controls 100% of a 140km^2 exploration licence prospective for PGE-Ni-Cu in the exciting Jimperding Metamorphic Belt, 70km NE of Perth.

Mandrake also owns a mineral exploration project located in the prolific Pine Creek Orogen of the Northern Territory prospective for gold, silver and base metals.

For further information visit www.mandrakeresources.com.au

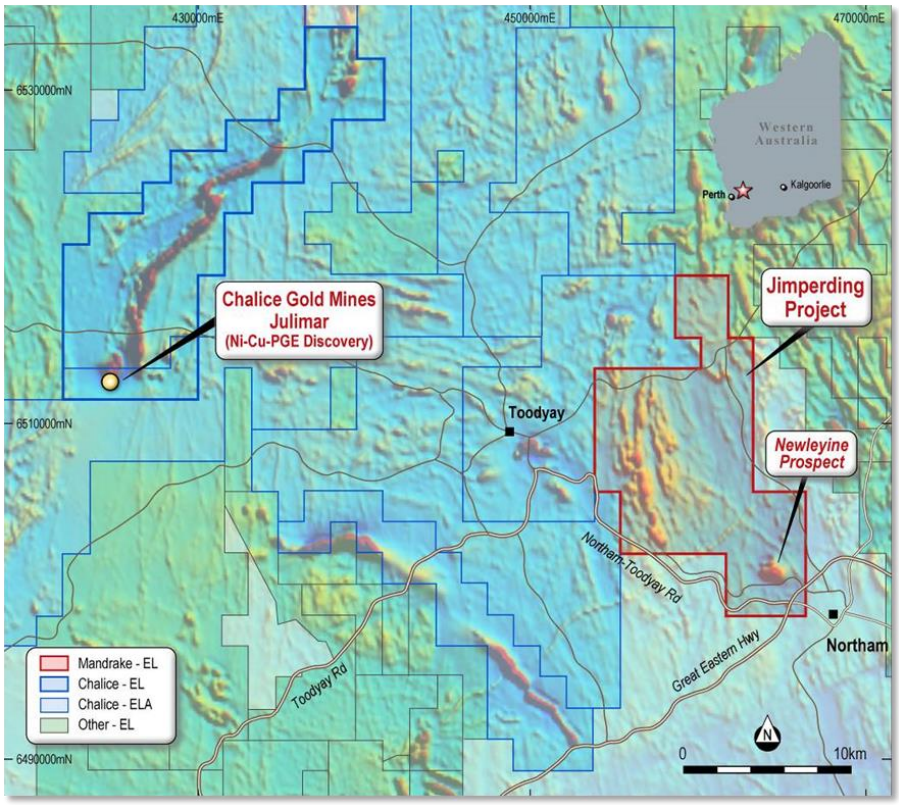


Figure 4 - Regional aeromagnetics – Jimperding Project

Competent Persons Statement

The technical information in this announcement complies with 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 James Allchurch, Managing Director of Mandrake Resources. Mr Allchurch is a Member of the Australian Institute of Geoscientists. He 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 Allchurch consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

For personal use only

Table 1: Drill Hole Details and Observations

Hole ID	Easting*	Northing*	RL	Dip	Azi	Depth (m)	Interval (m)	Description
MNEWDD003	**464395**	**6500464**	**148**	**58**	**164**	**362.9**	0-3	Colluvial ferruginous soils
							3-45.4	Weathered granitic gneiss with occasional serpentinite
							45.4-59.1	Fresh granite with trace disseminated pyrite
							59.1-97.5	Serpentinite with occasional granite/pegmatite dykes
							97.5-109.1	Sheared foliated granite with alternating bands of serpentinite
							109.1-130.6	Serpentinite with minor granite-pegmatite dykes
							130.6-143.9	Serpentinite with granite dykes; tremolite and minor pyrrhotite
							143.9-147.9	Pegmatite granite dyke
							147.9-184.75	Serpentinite with granite-pegmatite dykes tremolite/chlorite veins
							184.75-190.3	Granite - highly fractured and cherty. Trace sulphides
							190.3-209.1	Serpentinite with tremolite and chlorite alteration. Pegmatitie dykes
							209.1-212.8	Amphibolite with minor lamprophyre dykes
							212.8-213.6	Dolerite
							213.6-214.5	Amphibolite with minor lamprophyre dykes
							214.5-215.7	Serpentinite - sheared with minor dolerite dykes
							215.7-252	Serpentinite with granite-pegmatite dykes

For personal use only

	252-255.9	Granite
	255.9-270.3	Serpentinite with amphibolite and trace py/po
	270.3-281.5	Pegmatite granite dyke
	281.5-286.2	Amphibolite with up to 2% disseminated py
	286.2-297.9	Cherty iron formation with 5-10% po/py in bands and disseminated
	297.9-305.5	Banded iron magnetite with chert. Coarsely laminated with minor dolerite dyke and pegmatitic intrusion
	305.5-307.1	Cherty iron formation with 5-10% po/py
	307.1-307.7	Massive sulphide - po and trace cpy
	307.7-308.2	Cherty iron formation with 5-10% po/py ; zone of 40% po and trace cpy
	308.2-310.8	Schistose ultramafic - tremolite, chlorite
	310.8-315.4	Banded iron with 5% po disseminated
	315.4-321.3	Sulphidic banded iron formation with 30-40% po and traces of cpy
	321.3-322	Massive sulphide 90% po, trace cpy
	322-323.4	40% po in metased
	323.4-326.5	Mafic tuffs
	326.5-327	Massive sulphide 60% matrix fill po and trace cpy
	327-327.6	Chert with po bands - 10%
	327.6-328.4	Metasedimentary schist, mafic
	328.4-350.1	Banded iron magnetite with po bands. 25% magnetite
	350.1-350.7	Metasedimentary schist, mafic

For personal use only

	350.7-354.1	Banded iron magnetite with disseminated po
	354.1-362.9	Metasedimentary schist, mafic. Minor po

* Coordinates are in GDA94, MGA Z52
cpy - chalcopyrite
py – pyrite
po - pyrrhotite

For personal use only

JORC Code, 2012 Edition – Table 1 report template

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 (eg 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 (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.*	• Reporting on observations in diamond drill core that at the date of reporting is still to be sampled. • Downhole Electromagnetic (DHEM) surveys were designed and managed by Southern Geoscience Consultants (SGC). DHEM data were acquired by SGC Niche Acquisition with the following survey parameters: • Transmitter loops (x3): 200m x 200-300m • Current: 50-60A • 1 Hz base frequency • Transmitter: DRTX • Receiver: SMARTem24 • Probe: DigiAtlantis 3-component fluxgate • Min. 2 repeatable readings / 32-64 stack
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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 from surface • Un-oriented standard HQ core from surface to 50-100m followed by oriented NQ2 core to end of hole. • Core is orientated by Reflex electronic orientation tool. • Holes were cased with 40mm PVC for DHEM surveying
Drill sample	• *Method of recording and assessing core and chip sample recoveries*	• Recoveries are physically measured by tape measure for each

personal use only

Criteria	JORC Code explanation	Commentary
recovery	*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 run. Core is pieced together for measurement and orientation. • Recoveries averaged over 93%. Most core loss is in the first 60m, with almost 100% recovery in competent un-weathered rock. • During drilling various additives are used to condition the hole to maximize core recoveries. • There is no significant core loss observed in any potentially mineralized zones logged.
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.*	• Each hole was geologically and geotechnically logged over its entire drilled length. Holes were logged for lithology, mineralogy, structure and weathering. • Logging is both qualitative and quantitative, and captured downhole depth, colour, lithology, mineralogy, mineralization, texture and structure. • All core was photographed in core trays after mark-up and orientation.
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*	• Core is marked up for half core sampling which is now underway

personal use only

Criteria	JORC Code explanation	Commentary
	being sampled.	
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 (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Sampling commenced, assays pending.
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.*	• Core was logged by an independent geological contractor. Mandrake management visually verified the main mineralized zones reported. • Geological data was captured in the field in spreadsheets on a notebook computer.
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.*	• Drill collars were located using hand held GPS with accuracy of +-3m. Elevations are estimated with a +-10m accuracy from a DTM generated from airborne survey data. This is considered appropriate for exploration drill-holes. • The grid system used is MGA GDA94 Zone 50 • Diamond holes were downhole surveyed at 5m intervals using a north-seeking Reflex Sprint IQ Gyroscope, with a stated accuracy of +-1 ^{o} in azimuth and +-3^{o} in dip.
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*	• Drillhole spacing is variable, reflecting the targeting of separate conductive bodies.

personal use only

Criteria	JORC Code explanation	Commentary
	Resource and Ore Reserve estimation procedure(s) and classifications applied. • *Whether sample compositing has been applied.*	• Drilling is exploratory in nature. • No sample compositing has been applied • 3-component DHEM data were measured at minimum 10m spacings and infilled to 5m and 2.5m, as required, through conductive features to sufficiently define anomalies of interest. • All DHEM loops were designed to optimally couple with the FLEM and DHEM modelled plates targeted by the drillholes.
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 been carried out as yet. • Drilling is first pass in nature; there is significant uncertainty about the orientation of mineralized structures.
Sample security	• *The measures taken to ensure sample security.*	• Core is stored on private land with restricted access near the drill site.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Geophysical data is managed, quality checked, and processed by Perth geophysical consultants, Southern Geoscience Consultants (SGC). All data collected and interpretations are peer reviewed. • No sampling has been carried out as yet.

• 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*	• The drill-holes are located on E70/5345 which is 100% beneficially held by Mandrake Resources. • The tenement is in good standing with no known impediments.

For personal use only

Criteria	JORC Code explanation	Commentary
	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.*	• Land access and purchase option agreement in place for Newleyine farm.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Nickel-copper mineralization at Newleyine was investigated by Australia Anglo American/North Flinders Mines during 1978. Three diamond core holes were drilled, but no individual assay values were reported. It is unknown if PGE elements were assayed for.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Newleyine is located in the Jimperding Metamorphic belt. • Newleyine is considered prospective for magmatic sulphide Ni-Cu-PGE associated with a pipe like dunitic intrusive body.

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:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *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.*
		• The drill hole collar information is provided in Table 1 of this announcement

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*	• No length weighting or cut-off grades have been applied • No metal equivalent values have been reported.

personal use only

Criteria	JORC Code explanation	Commentary
	• *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.*	
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 (eg 'down hole length, true width not known').*	• Only downhole lengths are reported, true widths are not yet known.
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.*	• Refer to figures in announcement.
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.*	• All significant and relevant intercepts are reported.
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.*	• All meaningful information provided.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions,*	• Diamond drilling and downhole EM are continuing at Newleyine.

personal use only

Criteria	JORC Code explanation	Commentary
	including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	

personal use only