RAMELIUS RESOURCES

ASX RELEASE

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12 September 2019

Vivien Underground Extended to June 2021

The Directors of Ramelius Resources Limited (**ASX: RMS**) are pleased to announce an extension in mine life at the high-grade Vivien underground mine through to at least the end of the 2021 financial year.

The success of the recent drilling has added both Mineral Resources and Ore Reserves below the current mine plan and extended the mine life by around 12 months for a total of almost two years (from 1 July 2019). An extra **200,000 tonnes @ 4.8 g/t Au for 30,000 ounces** has been added to the Ore Reserve below the previous mine plan (within total Ore Reserve below). Drilling at depth remains ongoing with the potential to extend mine life further.

As at 1 July 2019:

Total **Mineral Resource** is estimated to be;

- **660,000 tonnes at 5.7 g/t Au for 120,000 ounces** of gold

Total **Ore Reserve** is estimated to be;

- **420,000 tonnes at 5.5 g/t Au for 74,000 ounces** of gold

The Mineral Resources and Ore Reserves were calculated using A$2,000/oz. Additional JORC 2012 information is provided in Table C appended below.

Managing Director, Mr Mark Zeptner today said:

"It is extremely pleasing to see the mine life of Vivien extend by a further 12 months. Vivien has been a standout asset for Ramelius since its purchase in 2014 for only A$10 million. Once hauled to Mt Magnet, the additional material from Vivien will displace lower grade ore at the plant, leading to a slight increase in gold production for the FY2021 year. A revised group production profile will be released to the market in due course.

Importantly, the drilling remains ongoing at Vivien and we remain hopeful that the results will continue to add to its mine life."

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ISSUED CAPITAL
Ordinary Shares: 658M

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ABOUT RAMELIUS

Ramelius owns and operates the Mt Magnet, Edna May and Vivien gold mines, all in Western Australia (refer Figure 1). Ore from the high-grade Vivien underground mine, located near Leinster, is trucked to the Mt Magnet processing plant where it is blended with ore from both underground and open pit sources. The Edna May operation, purchased from Evolution Mining Limited in October 2017, is currently processing high grade underground ore and low grade stockpiles. Additional ore feed is planned from the adjacent Greenfinch open pit and satellite Marda and Tampia open pit projects.

Figure 1: Ramelius' Operations & Development Project Locations

Ramelius published a one million ounce mine plan in June 2019, across five years from FY20 to FY24, highlighting the longer term potential that exists within the current asset base (see RMS ASX Release "Ramelius Unveils 1 Million Ounce Life of Mine Plan", 17 June 2019). In this plan, Vivien was assumed to only be in production until the end of FY20. The extensions to Vivien, depicted in Figure 2, is indicative only with the positive impact to overall production to be evaluated once the integrated mine plan is updated in due course.

Ore Sources (MMG Mill)	FY 20	FY 21	FY 22	FY 23	FY 24
Milky Way					
Vegas					
Stellar					
Hill 60					
Shannon					
Morning Star					
Boomer					
Brown Hill					
Eridanus					
Vivien[1]					
Saturn					
Low Grade Stocks					
Total Production (oz)	**145,800**	**88,850**	**117,600**	**100,550**	**47,900**

Underground | Open Pit

Figure 2: Ramelius' Mt Magnet production centre feed sources, showing Vivien extension

MINERAL RESOURCES

Table A: Mineral Resources

Deposit	Measured			Indicated			Inferred			Total Resource		
	t	g/t	Oz	t	g/t	Oz	t	g/t	Oz	t	g/t	Oz
Vivien	370,000	5.7	68,000	210,000	5.6	37,000	86,000	5.6	15,000	660,000	5.7	120,000

Figures rounded to 2 significant figures. Rounding errors may occur.

Mineral Resource Commentary

The Vivien deposit is a narrow, high-grade, quartz vein hosted lode deposit. The vein is typically between 1 and 6 metres wide, dips at 70° and is hosted within a dolerite/gabbro unit. It was mined historically as an underground (circa 1910) and open-pit (1997). Ramelius commenced the current underground mine in late 2015 and as of 30 June 2019 had a reconciled gold production of 743,220 t @ 6.42 g/t for 153,461oz.

Above the current base of development (140mRL) the resource is based on drilling and development face sampling. The majority of this resource has been developed and grade controlled and is therefore classed as Measured.

Below the 140mRL level, 48 underground diamond holes for 7,441m were drilled from two hangingwall drives, between March and August 2019. This data was combined with earlier surface and underground drilling. All holes were downhole surveyed using a gyro tool and lode zones sawn and half cored for sampling. Assaying is conducted as 50g fire-assays at a Kalgoorlie commercial laboratory and accompanied by QAQC samples. The quartz lode was interpreted on 12.5m or 25m cross-sections and wireframed with a minimum 1.5m lode width (refer Figure 3). Samples were flagged, top-cut to 50g/t and estimated using an anisotropic, 2-sector, search and ID2. The resource is classified by hole density and geological/grade continuity. All lode within long sectional resource shapes approximating 10-20gram.metres is reported. Above the 130mRL the resource is reported from the mine grade control model and below it is reported from the extension resource model.

Mineral Resource Diagrams

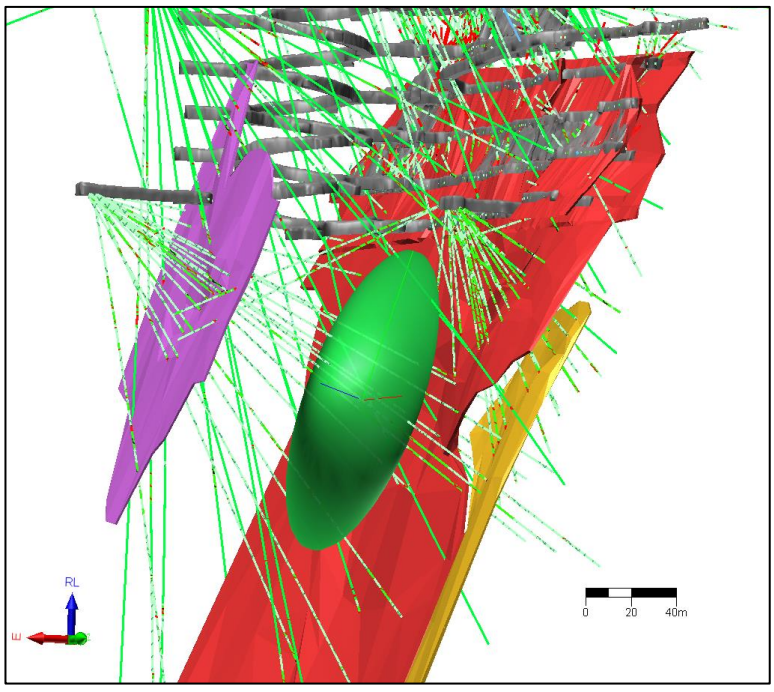

Figure 3: Vivien extension lode wireframes, drilling and search ellipse, looking SW

ORE RESERVES

Table B: Ore Reserves

Deposit	Proven			Probable			Total Reserves		
	t	g/t	Oz	t	g/t	Oz	t	g/t	Oz
Vivien	220,000	6.2	44,000	200,000	4.8	30,000	420,000	5.5	74,000

Figures rounded to 2 significant figures. Rounding errors may occur.

Ore Reserve Commentary

Ore Reserves were based on the resource models referenced above. Reserves above the 140mRL are based on the fully developed mine plan and are all classed as Proven. The Ore Reserve extension below the 140mRL uses well established mine design, geotechnical and scheduling parameters. It utilises a bottom up sequence for each 2 levels and CRF fill of the first of each pair. Minimum stope width is 1.8m, stope dilution is 30% and ore loss 2% (refer Figure 4). Gold price used is A$2,000/oz. All Ore Reserves below the 140mRL is classed as Probable.

Ore Reserve Diagrams

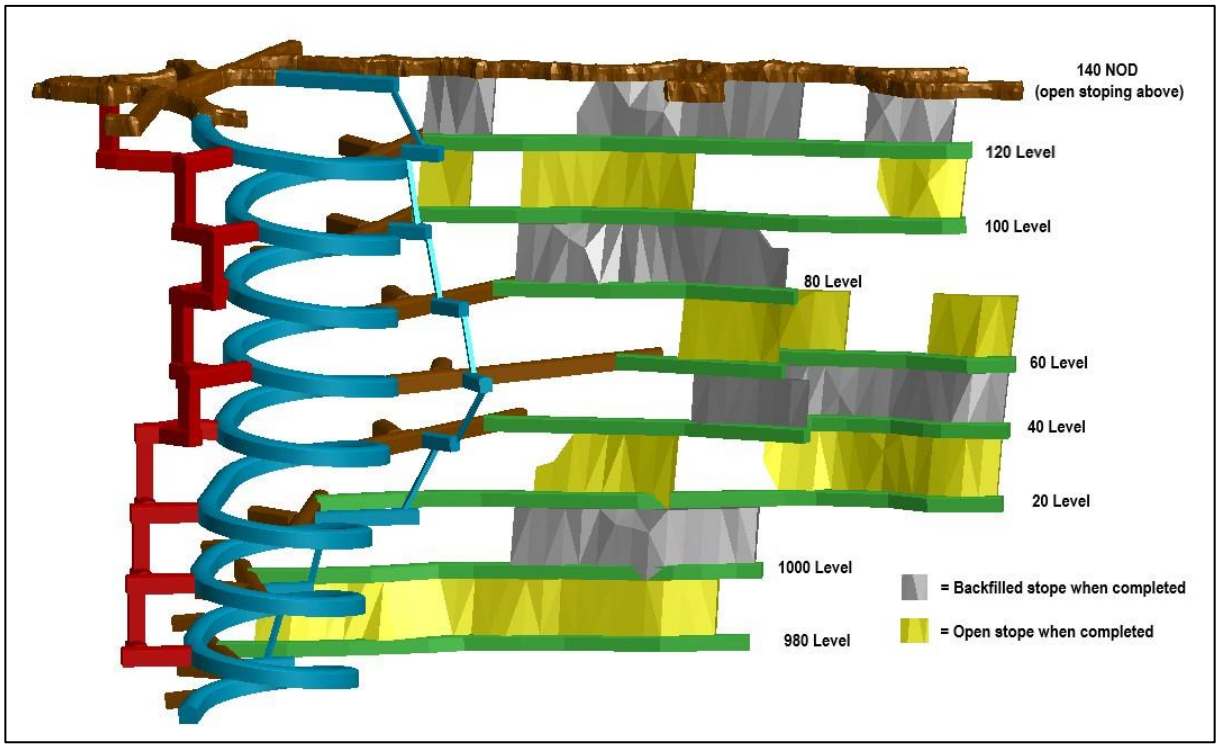

Figure 4: Underground extension design below 140mRL, looking West

FORWARD LOOKING STATEMENTS

This report contains forward looking statements. The forward looking statements are based on current expectations, estimates, assumptions, forecasts and projections and the industry in which it operates as well as other factors that management believes to be relevant and reasonable in the circumstances at the date such statements are made, but which may prove to be incorrect. The forward looking statements relate to future matters and are subject to various inherent risks and uncertainties. Many known and unknown factors could cause actual events or results to differ materially from the estimated or anticipated events or results expressed or implied by any forward looking statements. Such factors include, among others, changes in market conditions, future prices of gold and exchange rate movements, the actual results of production, development and/or exploration activities, variations in grade or recovery rates, plant and/or equipment failure and the possibility of cost overruns. Neither Ramelius, its related bodies corporate nor any of their directors, officers, employees, agents or contractors makes any representation or warranty (either express or implied) as to the accuracy, correctness, completeness, adequacy, reliability or likelihood of fulfilment of any forward looking statement, or any events or results expressed or implied in any forward looking statement, except to the extent required by law.

COMPETENT PERSONS

The information in this report that relates to Mineral Resources and Ore Reserves is based on information compiled by Rob Hutchison (Mineral Resources) and Duncan Coutts (Ore Reserves), who are Competent Persons and Members of The Australasian Institute of Mining and Metallurgy. Rob Hutchison and Duncan Coutts are full-time employees of the company. Rob Hutchison and Duncan Coutts have 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". Rob Hutchison and Duncan Coutts consent to the inclusion in this report of the matters based on their information in the form and context in which it appears.

Table C: JORC 2012 REPORTING CRITERIA

Section 1 Sampling Techniques and Data

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 deposit is sampled using surface Reverse Circulation (RC) and diamond drill holes (DD) on a nominal 25m x 25m grid spacing. Drilling comprises of campaigns by several companies: Asarco Australia Ltd, Wiluna Mines Ltd, Australian Gold Fields, Agnew Gold Mining Company (AGMC) and Ramelius Resources Ltd (RMS). Holes were generally angled towards grid west at varying angles to optimally intersect the mineralised zones. New UG diamond drilling in 2019 below the 140mRL includes 48 holes for 7,441m. • All sampling by conventional gold industry drilling methods or UG face sampling. • Diamond core was NQ size sampled on geological intervals (0.3 m to 1.5 m); cut into half core to give sample weights under 3 kg. Samples were crushed, dried and pulverised (total prep) to produce a sub sample for analysis by 1kg 100µm Screen Fire Assay (SFA) or 50 g Fire Assay (FA) for sample outside the mineralised zone. Previous drilling programmes used FA or SFA analytical techniques. RC drilling was used to obtain 1m samples from which 2-3 kg was pulverised (total prep) to produce a sub sample for assaying by 50 g FA. • Face sampling involved collecting representative chips sample from geologically defined 0.2-2.0m wide intervals across the face, including wallrock zones.
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.).*	• Surface drillholes comprise 70 RC and 170 Diamond holes. Diamond holes are NQ size and normally have RC precollars. • UG drilling completed by Ramelius since 2016 is approximately 100 NQ diamond holes.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximize 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.*	• RMS Diamond core recoveries were recorded during core logging. Diamond drilling is close to 100% • Diamond core is used in preference to test the narrow vein and ensure a true representation of vein width. • No indication of sample bias is evident or has been established
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.*	• All drillholes are geologically logged on site by RMS geologists. Details on the host lithologies, deformation, dominant minerals including sulphide species and alteration minerals plus veining are recorded relationally (separately). • Drillhole logging of RC chips is qualitative on visual recordings of rock forming minerals and estimates of mineral abundance. • The entire length of drillholes are geologically logged • Development faces are mapped and photographed providing an absolute definition of lode width
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*	• RMS DD core was sawn and half core sampled to 1m or geologically determined boundaries (min 0.3m). All earlier DD drilling was by same method. Earlier RC samples and pre-collars were sampled at 1m intervals and riffle split to

Criteria	JORC Code explanation	Commentary
	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 maximize 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.*	3kg. UG DD core samples were whole core sampled or sawn & half core sampled • All samples prepared following industry best practice. Samples were dried then homogenized by pulverisation to 85% passing 75µm before sub-sampling and assay. Sample preparation and assay was carried out by commercial Perth or Kalgoorlie based laboratories. Earlier sampling was conducted using similar techniques which are considered appropriate for the style of mineralisation. • The sample sizes are considered appropriate to represent Vivien mineralisation.
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.*	• Assays have been generated using Fire Assay techniques and in some earlier drilling Screen Fire Assay. The assay method is appropriate and Vivien ore is not especially nuggetty. All jobs are accompanied by regular pulp standards • No field analyses of gold grades are completed. Quantitative analysis of the gold content and trace elements is undertaken in a controlled laboratory environment. • Industry best practice is employed with the inclusion of duplicates and standards as discussed above, and used by Ramelius as well as the laboratory. All Ramelius standards and blanks are interrogated to ensure they lie within acceptable tolerances.
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.*	• Alternative Ramelius personnel have inspected the intersections to verify the correlation of mineralised zones between assay results and lithology, alteration and mineralisation. • All holes are digitally logged in the field and all primary data is forwarded to Ramelius' Database Administrator (DBA) in Perth where it is imported into Datashed. Assay data is electronically merged when received from the laboratory. The responsible project geologist reviews the data in the database to ensure that it is correct and has merged properly and that all the drill data collected in the field has been captured and entered into the database correctly. • The responsible geologist makes the DBA aware of any errors and/or omissions to the database and the corrections (if required) are applied in the database immediately. • No adjustments or calibrations are made to any of the assay data recorded in the database.
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.*	• Hole collars are picked up using accurate DGPS or mine survey control. All downhole surveys are collected using downhole Gyro or digital magnetic surveying techniques provided by the drilling contractors. • All holes are picked up in MGA94 – Zone 51 grid coordinates. • Topographic control is of high quality and adequate accuracy. • UG Face samples are located orthogonal to surveyed UG development drives. The start point of each face is measured from a known survey point.

Criteria	JORC Code explanation	Commentary
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.*	• Drillholes were planned on a nominal 25m (northing) sections and 10 – 30m eastings to adequately cover the core mineralised zones. Drill locations however are partly restricted by the existing pit and UG drill locations • UG face sample traverses are spaced at 3m intervals along 20m vertical development levels • This spacing is considered adequate to define the geological and grade continuity of mineralisation • The UG drilling is fans of holes from available locations. The fans are designed to intercept the vein as orthogonally as possible • No sampling compositing has been applied within key mineralised intervals
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.*	• The drilling is generally drilled orthogonal to the interpreted strike of the target horizon. However, several holes have varied directions. • No drilling orientation and/or sampling bias is evident • Vivien uses MGA94 (Zone 51). Data transformed to local north-south grid for resource modelling. Accuracy of drill hole collars, open-pit and topographic features is +/-1m. A topographic model is available for the site with +/-1m accuracy.
Sample security	• *The measures taken to ensure sample security.*	• All bagged RC / DDH / Face samples are delivered from the field to the assay laboratories in Perth and Kalgoorlie, whereupon the laboratory checks the physically received samples against Ramelius' sample submission/dispatch notes and confirmations sent.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Sampling techniques and procedures are reviewed prior to the commencement of new work programmes to ensure adequate procedures are in place to maximize the sample collection and sample quality on new projects. No external audits have been completed to date.

Section 2 Reporting of Exploration Results

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 results presented in this report are on granted Mining Lease (ML) 36/34 owned 100% by Ramelius Resources Limited. The tenement is located on pastoral/grazing leases. • All the tenements are in good standing. There are no known impediments to obtaining a licence to operate in the area.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Exploration by other parties has been reviewed and is used as a guide to Ramelius' exploration activities. Previous parties have completed shallow RAB, RC drilling and shallow open pit mining at Vivien.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The mineralisation at Vivien is a typical orogenic structurally controlled Archaean gold lode system. It is a steeply dipping narrow quartz vein hosted within a dolerite/gabbro unit. It has strong geological continuity and is well understood from diamond drill core and historic mining and investigation. Mineralisation is related to a secondary phase of quartz veining with associated sulphide mineralisation. Vein width may relate to flexures in

Criteria	JORC Code explanation	Commentary
		the lode and current interpretation is that several higher-grade shoots plunge shallowly to the NE within the overall lode. • The deposit is sub-vertical in geometry, with clear boundaries which define the mineralised domains. Infill drilling has supported and refined the model and the current interpretation is thus considered to be robust. • The position and continuity of the Vivien quartz vein has been used as the primary interpretation factor defined by grade data and geological logs. Variography was used to determine the plunge of the high-grade shoots within the vein mineralisation. • The main factors affecting continuity are the position, shape and thickness of the main quartz vein.
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.*	• All the drill holes reported in recent releases have been included the following information. • All drillholes reported, including those with no significant results. • Easting and northing in MGA94 (Zone 51) coordinates • RL is AHD • Dip is the inclination of the hole from the horizontal. Azimuth is reported in magnetic degrees as the direction the hole is drilled. MGA94 and magnetic degrees vary by ≈1˚ in the project area • Down hole length is the distance measured along the drill hole trace. Intersection length is the thickness of an anomalous gold intersection measured along the drill hole trace. • Hole length is the measured distance along the drill hole trace. • No information is excluded
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.*	• Weighted average techniques are applied to determine the grade of the anomalous interval when geological intervals less than 1m have been sampled. • Gold intersections are generally reported for the width of the geologically defined quartz-lode intercept. This often includes sub-grade material within the lode but defined by the geology • No metal equivalent reporting is used or required.
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').*	• The intersection length is measured down the length of the hole and is not usually the true width • True widths are variable given the varied drill angles. For most intercepts, true widths are around 60-80% of reported intervals.
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*	• Representative maps and sections are shown attached in previous releases

Criteria	JORC Code explanation	Commentary
	limited to a plan view of drill hole collar locations and appropriate sectional views.	
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 drillhole intercepts completed by RMS were reported in previous ASX releases
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.*	• No other exploration data that has been collected is considered meaningful and material to this report
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.*	• Future exploration includes further UG drilling below and along strike of the reported intersections at Vivien to better define the extent of the mineralisation discovered to date. • Ongoing face samples will be collected as development of ore drives progresses.

Section 3 Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Vivien employs a local Access Database system. Several validation checks occur upon data upload to the database. Older data appears to have used similar methods but cannot be fully validated. • The Senior Mine Geologist validates all data.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Person is a full-time employee of Ramelius Resources and has made frequent site visits to Vivien.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• Confidence in the geological interpretation is high and has been confirmed by detailed mapping and exposure in via underground mining • Data used includes drilling assays & logging from broader spaced exploration/resource drilling and high density UG face sampling • No alternate interpretation required • Geology forms a significant component in the Mineral Resource modelling & estimation.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• Narrow vein/lode style. Strike NNE (026°), dip at 70-80° to ESE. Average lode width approximately 2.5 m, mostly ranging between 1- 6m. Established strike length of 600m and down-dip extent of 400m.

Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• The geological interpretation of the lode equates to the estimation domain. A comparison of the resource model wireframes to the block model volume is completed as part of the validation process. • Grade within the domain is estimated by geological software using Inverse Distance Squared and Ordinary Kriging methods within hard bounded domains. Final grade is the topcut OK estimate. The ID² estimate is used to validate the OK grade. • Only gold is estimated • No deleterious elements present • Parent cell of 6.25mN x 5mE x 5mRL with sub-cells to minimum of 3.125mN x 1mE x 1mRL ratio. Parent cell estimation only. The sub-cell size is small to allow for narrow sections of the lode to be defined. • Domains are geostatistically analysed and assigned appropriate search directions, top-cuts and estimation parameters. The search is aligned with the observed geological strike and dip of the lode. The variography study helps determine plunge within the lode. • Samples were composited within ore domains to 1m lengths. • Top cuts were applied to domains after review of grade population characteristics. A cut of between 50 and 70g/t were applied depending on location. No significant bias is observed between the face samples and the drill samples. • Validation includes visual comparison against drillhole grades; swath plots of northing and elevation comparisons; and comparative statistics of composites against block model grades.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages are estimated on a dry basis
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• All lode material within 10 gram.metre long sectional category/grade area is reported including minor internal low-grade zones.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• Resources are reported on the assumption of mining by conventional underground mining methods. Block size and estimation methodology were selected to generate a model appropriate for current underground sub-level open stope mining practices at Vivien. Productivity and economics are dependent on a minimum mining width of around 1.8m (stope) and 4.5m (development).
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of*	• A number of metallurgical tests have been previously carried out and show the deposit is free milling, has high gravity recovery (+50%) and high overall recovery (95%).

	determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	• Attributed mill recovery to date is 96.9%
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• All Mining Approvals and permitting are in place. • Dewatering will be by pipeline to Gold Fields Agnew mill, 8km away.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Gold Fields undertook numerous air/water density measurements from core samples. Density assignment for the 2007 resource by Gold Fields included a variable ore density based on grade, with density ranging from 2.61 to 2.91. This reflects the relationship between higher grade samples containing more sulphides therefore a greater specific gravity. • In the most recent model densities of 2.80 to 3.20 were assigned based on grade ranges to reflect higher sulphide contents and tonnage reconciliations seen in recent mining.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The resource has been classified as Indicated or Inferred category's based on geological continuity, drillhole spacing, search pass and kriging variance. The resource is classified as Measured within the recently mined and face sampled areas. • The resource classification accounts for all relevant factors • The classification reflects the Competent Person's view
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The Ramelius 2014 Vivien Resource was reviewed by Optiro Pty Ltd. No fatal flaws were identified in the technical review of the data quality, interpretation approach and estimation /classification process of the Resource estimate. • The latest models were not audited.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the*	• The accuracy and confidence in the Resource is very high given the deposit style, quality of drilling and sampling, both historic and new and recent mining experience and reconciliations.

	Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• Comparison of recent mining data shows a good reconciliation with the Resource model.

Section 4 Estimation and Reporting of Ore Reserves

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* • *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	• The Ramelius resource models were used to for Ore Reserve generation. The model is a conventional geologically derived, narrow lode, block model, using composited, top-cut drill data, anisotropic ordinary kriging estimation. Economic resource is outlined by a broad long sectional 10 gram.metre envelope. • Mineral Resources are reported inclusive of Ore Reserves
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Person is a full time employee of Ramelius Resources Ltd and has made multiple site visits to Vivien
Study Status	• *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves* • *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered. The effect, if any, of alternative interpretations on Mineral Resource estimation.*	• Operating mine with considerable reconciled production to date. • Above the 140mRL the reserve is taken from the mine plan budget • Below the 140mRL the reserve is calculated with all material aspects were considered, including resource estimation, mine design, costs, ground water, geotechnical and scheduling.
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	• A marginal stoping cut-off grade of 3.4 g/t was calculated. The cut-off grade was used to optimise economic areas within the orebody resource.
Mining factors or assumptions	• *The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of*	• All ore mining will be carried out by underground methods. A 5.5mW x 5.5mH decline is being excavated with associated ore access development and other required capital development (ventilation, dewatering &

	appropriate factors by optimisation or by preliminary or detailed design). • *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.* • *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.* • *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* • *The mining dilution factors used.* • *The mining recovery factors used.* • *Any minimum mining widths used.* • *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* • *The infrastructure requirements of the selected mining methods.*	escapeway development). • Ore drives are excavated at a nominal 4mW x 4.5mH at 20m vertical spacing. • Current Stoping is a bottom up retreat method with small dilution control island pillars and larger CRF sill & rib pillars left (with rock backfill). • Remote bogging will be used for 90% of stope ore production. • Minimum stope width of 1.8m was assumed. Dilution of 30% applied to new depth extension area. Mining recoveries of 98% used for areas that utilise CRF pillars. • The mining method is appropriate for a narrow sub-vertical lode orebody.
Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation* • *Whether the metallurgical process is well-tested technology or novel in nature.* • *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* • *Any assumptions or allowances made for deleterious elements.* • *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.* • *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?*	• Processing by conventional CIL/CIP gold milling at Mt Magnet Checkers Mill • Metallurgical testwork has been previously carried out including gravity recovery, leach recovery, bond work index and concentrate mineralogy studies. Samples were collected as composited diamond half core ore zones and were representative. • The deposit is free milling, has high gravity recovery (+50%) and high overall recovery (+95%).
Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.*	• Environmental studies completed previously and all approvals in place • No significant PAF waste material occurs for the deposit. • Waste has been placed in the existing Vivien pit and used as backfill for UG stope voids.
Infrastructure	• *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided or accessed.*	• Infrastructure requirements comprising of offices, workshop, generators, underground fan, dewatering pumps, pipeline and UG magazine are complete. • Additional high voltage reticulation and pumping infrastructure located underground has been incorporated into the assessment. • Excess water is delivered to the Agnew Gold Mine processing storage system.

		• Milling and accommodation facilities utilise existing Mt Magnet and Leinster based infrastructure.
Costs	• *The derivation of, or assumptions made, regarding projected capital costs in the study.* • *The methodology used to estimate operating costs.* • *Allowances made for the content of deleterious elements.* • *The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.* • *The source of exchange rates used in the study.* • *Derivation of transportation charges.* • *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* • *The allowances made for royalties payable, both Government and private.*	• Capital & Operating Costs have been derived from actual unit rate costs were possible, including mining, haulage, milling, administration and capital costs. • Rates have been applied within an extensive mine design scheduling/costing/production spreadsheet. • Mt Magnet treatment costs based on known current milling costs. • Applicable royalties are included. • No deleterious elements present • Cost models use Australian dollars
Revenue Factors	• *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.* • *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*	• Gold price of $2000/oz used
Market Assessment	• *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.* • *A customer and competitor analysis along with the identification of likely market windows for the product.* • *Price and volume forecasts and the basis for these forecasts.* • *For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.*	• Doré is sold direct to the Perth Mint at spot price • Market window unlikely to change • Price is likely to go up, down or remain same • Not industrial mineral
Economic	• *The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.* • *NPV ranges and sensitivity to variations in the significant assumptions and inputs.*	• Discounted cash flows were carried out to determine relative NPV's, using a 5% annual discount rate.
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	• Agreements are in place with stakeholders
Other	• *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* • *Any identified material naturally occurring risks.* • *The status of material legal agreements and marketing arrangements.*	• No material risks are identified

	• *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.*	
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.* • *Whether the result appropriately reflects the Competent Person's view of the deposit.* • *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any)*	• Ore Reserves are classed as Proven or Probable based on Resource classification and reflect the Competent Person's views •
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• No external reviews were conducted on the Ore Reserve Estimates.
Discussion of relative accuracy/confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.* • *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• Confidence is in line with gold industry standards and the company's aim to provide effective prediction for current and future mining operations • Estimate is global by deposit • The Reserve is most sensitive to a) gold price and b) resource grade prediction • Recent ore production is performing well against resource/reserve estimates