image resources

30 May 2017

ORE RESERVES UPDATE
FOR 100% OWNED ATLAS PROJECT

Image Resources NL (ASX: IMA) ("Image" or "the Company") is pleased to announce an Ore Reserves update on its 100%-owned **Atlas Mineral Sands Project**, located in the North Perth Basin, 80 km north of the Company's Boonanarring project and 170 km north of Perth, Western Australia.

As part of the **bankable feasibility study** (**BFS**) nearing completion on the Company's high-grade Boonanarring and Atlas mineral sands projects, **Optiro Pty Ltd (Optiro)** have completed an update of the estimated Ore Reserves for the Atlas project in accordance with the guidelines of the **JORC Code (2012)**.

When compared to the Ore Reserves reported in the 2013 feasibility study, the total tonnes of Ore Reserves remained relatively constant at 9.5 million tonnes.

A summary of the estimated Ore Reserves for Atlas as at May 2017, reported on the Mineral Resources at a cut-off grade of 2.0% heavy minerals (HM), is presented in Table 1. The Ore Reserves from the 2013 feasibility study, reported on 2011 Mineral Resources at a cut-off grade of 2.5% HM, is shown in Table 2.

Table 1. 2017 Atlas Ore Reserves Summary[1-5]

Classification	Million tonnes	HM %	Slimes %	Oversize %	% of total heavy mineral			
					Zircon	Rutile	Leucoxene	Ilmenite
Probable	9.5	8.1	15.5	5.2	10.6	7.5	4.5	50.7
Total	**9.5**	**8.1**	**15.5**	**5.2**	**10.6**	**7.5**	**4.5**	**50.7**

Table 2. 2013 Feasibility Study Atlas Ore Reserves Summary[6]

Classification	Million tonnes	HM %	Slimes %	Oversize %	% of total heavy mineral	
					Zircon	VHM
Probable	9.6	8.1	15.5	-	11	74
Total	**9.6**	**8.1**	**15.5**	**-**	**11**	**74**

Table notes:

1. *Ore Reserves are based upon a cut-off grade of 2% total heavy minerals (THM).*
2. *The Ore Reserves are based upon an FX rate US$0.73:A$1.00; and the following commodity prices: ilmenite - $US171, leucoxene - $US522, rutile - $US936 and zircon - $US1,126.*
3. *Mineral Resources have been reported as inclusive of Ore Reserves.*
4. *The mineral assemblage is reported as a percentage of in-situ THM content.*
5. *Tonnes and grade data have been rounded to one significant figure. Discrepancies in summations may occur due to rounding.*
6. *Based on Mineral Resources at 2.5% HM cut-off grade.*

Image Resources NL ABN 57 063 977 579
Ground Floor, 23 Ventnor Ave West Perth WA 6005 | PO Box 469 West Perth WA 6872
T: 08 9485 2410 | F: 08 9486 8312
www.imageres.com.au

The following are key items addressed in the 2017 Ore Reserve estimate:

- Estimate in accordance with the guidelines for the reporting of Mineral Resources and Ore Reserves JORC Code (2012);
- The bulk density formula was adjusted using data from Image's Boonanarring deposit (located within the Perth Basin and to the south of the Atlas deposit). The formula was adjusted by applying a 6% reduction to the calculated density for material with <28% slimes and assigned density of 1.8 t/m^3 for material with slimes contents of 28% to 50% and 1.54 t/m^3 for material with slimes of >50%;
- Exclusion zones have been applied to the high voltage powerlines and Wongonderrah Road, which both cross the Atlas Mineral Resource.

The Executive Summary from the Ore Reserves estimate by Optiro is attached.

The Atlas 2017 Ore Reserves have been incorporated into the overall Project BFS. Further review of capital cost estimates and economic modelling is ongoing and BFS reporting is underway and anticipated to be completed during May 2017.

For further information, please contact:

Patrick Mutz
Managing Director
+61 8 9485 2410
info@imageres.com.au www.imageres.com.au

COMPLIANCE STATEMENT

The information in this report that relates to the estimation of Mineral Resources is based on information compiled by Mrs Christine Standing, who is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM) and the Australian Institute of Geoscientists (AIG). Mrs Standing is a full-time employee of Optiro Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she is undertaking 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'. Mrs Standing consents to the inclusion in this report of the matters based on her information in the form and context in which it appears.

The Ore Reserves statement has been compiled in accordance with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code – 2012 Edition). The Ore Reserves have been compiled by Jarrod Pye, Mining Engineer and full-time employee of Image Resources, under the direction of Andrew Law of Optiro, who is a Fellow of the Australasian Institute of Mining and Metallurgy. Mr Law has sufficient experience in Ore Reserves estimation relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves". Mr Law consents to the inclusion in the report of the matters compiled by him in the form and context in which it appears.

Extract from Image Resources NL
Atlas Mineral Sands Deposit
Ore Reserves Report - May 2017

EXECUTIVE SUMMARY

Optiro Pty Ltd (Optiro) was commissioned by Image Resources Limited (Image) to oversee the Ore Reserve estimation process for the Atlas Project as at 1 May 2017. The Atlas project is located approximately 170 km north of Perth and 18 km east of the coastal town of Cervantes. The orebody lies 1.4 km east of the Nambung National Park, (better known for "the Pinnacles"), approximately 90 km from Images Boonanarring Minerals Sands project.

The Ore Reserve estimate followed the creation of an open pit Mineral Resource estimate in May 2017 as part of the Mineral Resource update for the Atlas mineral sands project. The Mineral Resources work was carried out by Christine Standing (Principal Consultant, Optiro) a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (the JORC Code).

All material was subjected to an economic evaluation, wherein all costs have been based on a mining rate of 3.3 Mtpa, a wet concentrator plant throughput rate of 3.3 Mtpa and process recoveries of 92% for ilmenite, 74% for leucoxene, 92% for rutile and 93% for zircon. Further dry plant processing is to be undertaken (by others) with a projected average throughput of 240,000 tonnes heavy mineral concentrate (HMC) per annum with recoveries of 94% ilmenite, 75% leucoxene, 94% rutile and 88% zircon.

The Atlas Project is to be operated using conventional heavy mineral sands open pit mining methods (excavators, trucks, scrapers, mobile hoppers, dozers and grader) by a mining contractor on a schedule of rates style contract. Dilution and recovery of the ore zones were estimated at 2% and 100% respectively. These parameters were agreed to in consultation with Image.

Revenue was based on an AUD:USD exchange rate of 0.73; an ilmenite price of $171 per tonne, leucoxene price of $522 per tonne, rutile price of $936 per tonne and a zircon price of $1,126 per tonne. All prices are in $US.

To the best of Optiro's knowledge, Image is currently compliant with all legal and regulatory requirements. A gap analysis has been undertaken to quantify what needs to be completed for government permits, licenses and statutory approvals. All approvals for the Atlas project are expected to be obtained within 2-3 years of formally commencing the environmental approval process. No risk factors have been applied to the mining rates.

Measured and Indicated Mineral Resources were converted to Probable Ore Reserves, subject to the mine design, physical modifying factors and an economic evaluation. Measured Mineral Resources were converted to probable due to the requirement of more test work to be completed on the density component of the ore body. The following Ore Reserve statement outlines the Ore Reserves for the Atlas Project as at May 2017.

Material was excised (~8.6 Mt) from the Mineral Resource model used to generate the Ore Reserve model. This material was excluded from the following areas:

1. Inferred material.
2. Standoff from roads (50 m, Wongonderrah Road) a total of 1.5 Ha of land and 42,000 t of ore.
3. Standoff from HV powerlines (50 m) a total of 1.2 Ha of land and 70,000 t of ore.

Table 3 contains a summary of the Atlas Ore Reserves as at May 2017.

Table 3 Atlas Project – Ore Reserve Statement as at May 2017.

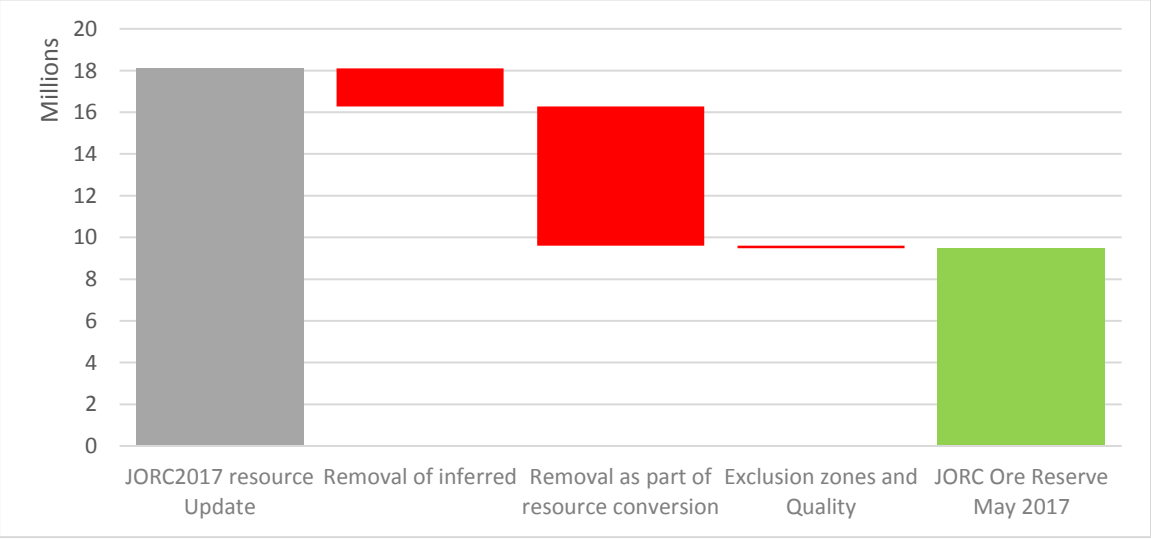
Classification	Million tonnes	HM %	Slimes %	Oversize %	% of total heavy mineral			
					Zircon	Rutile	Leucoxene	Ilmenite
Probable	9.5	8.1	15.5	5.2	10.6	7.5	4.5	50.7
Total	**9.5**	**8.1**	**15.5**	**5.2**	**10.6**	**7.5**	**4.5**	**50.7**

Notes accompanying the Ore Reserve statement:

1. *Ore Reserves are based upon a cut-off grade of 2% total heavy minerals (THM)*
2. *The Ore Reserves are based upon an FX rate US$:A$ $0.73 and an ilmenite price of $US171, leucoxene price of $US522, rutile price of $US936 and a zircon price of $US1,126.*
3. *Mineral Resources have been reported as inclusive of Ore Reserves.*
4. *The mineral assemblage is reported as a percentage of in-situ THM content.*
5. *Tonnes and grade data have been rounded to one significant figure. Discrepancies in summations may occur due to rounding.*
6. *This Ore Reserve statement has been compiled in accordance with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code – 2012 Edition).*
7. *The Ore Reserves have been compiled by Jarrod Pye, Mining Engineer, of Image, under the direction of Andrew Law of Optiro, who is a Fellow of the Australasian Institute of Mining and Metallurgy. Mr Law has sufficient experience in Ore Reserve estimation relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves".*
8. *Mr Law consents to the inclusion in the report of the matters compiled by him in the form and context in which it appears.*

Figure 1 illustrates how the Ore Reserves have been calculated from the Mineral Resources.

Figure 1 Waterfall graph 2017 Mineral Resources to 2017 Ore Reserves



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APPENDIX A. JORC CODE TABLE 1 CRITERIA

The table below summaries the assessment and reporting criteria used for the Atlas Project Mineral Resource and Ore Reserve estimates and reflects the guidelines in Table 1 of *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves* (the JORC Code, 2012).

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. 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.*	• Sampling of the deposit has been by vertical reverse-circulation air-core method (RCAC). This is a mineral sands industry-standard drilling technique. • Samples are from intervals of 1 m, 1.5 m and 2 m. Single isolated intervals of 0.2 to 0.5 m have been used. 74% of the samples are from 1 m, 6% are from 1.5 m and 20% are from 2 m intervals.
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).*	• All Image RCAC drillholes are drilled vertically using an NQ-sized (76 mm diameter) drill bit. • All Iluka RCAC drillholes are vertical and were drilled using a BQ-sized drill bit (60 mm diameter). • Water injection is used to convert the sample to a slurry so it can be incrementally sampled by a rotary splitter.
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.*	• At the drill site, Image's geologist estimates sample recovery qualitatively (as good, moderate or poor) for each 1 m or 2 m down hole sampling interval. Specifically, the supervising geologist visually estimates the volume recovered to sample and reject bags based on prior experience as to what constitutes good recovery. • Image has recorded that over 90% of the samples have good recovery and that less than 5% have moderate recovery and less than 5% have poor recovery. • Image also monitors recovery through the mass of the laboratory sample, which is recorded prior to despatch and again on delivery to the laboratory. The mass variation in the laboratory samples can then be correlated back to the original total sample.
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.*	• Image's supervising geologist logs the sample reject material at the rig and pans a small sub-sample of the reject, to visually estimate the proportions of sands, heavy mineral sands, 'slimes' (clays), and oversize (rock chips) in each sample, in a semi-quantitative manner. • The geologist also logs colour, grainsize, an estimate of induration (a hardness estimate) and sample 'washability' (ease of separation of slimes from sands by manual attrition). • To preclude data entry and transcription errors, the logging data is captured into a digital data logger at the rig, which contains pre-set logging codes. No photographs of samples are taken. • The digital logs are downloaded daily and emailed to Image's head office for data security and compilation into the main database server. • Samples visually estimated by the geologist to contain more than 0.5% total HM (by weight) are despatched for analysis along with the intervals above and below the mineralised interval. • The level and detail of logging is of sufficient quality to support Mineral Resource estimates (MRE). • All (100%) of the drilling is logged.
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*	• Approximately 60% of samples were analysed for total heavy minerals (HM), slimes and oversize. • The sample from the internal RC rods is directed to a cyclone and then through a 'rotating-chute' custom-built splitting device. This device

	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.*	allows different fraction splits from the cyclone sample stream to be directed to two 25 cm by 35 cm calico bags (as the laboratory despatch and reject samples. The rotary splitter directs ≈10 increments from the stream to the laboratory despatch samples, for a specified sampling interval. • For resource definition drilling, two (replicate) 1/8 mass splits (each ≈ 1.25 kg) are collected from the rotary splitter into two pre-numbered calico bags for each down hole interval. A selection of the replicate samples are later collected and analysed to quantify field sampling precision, or as samples contributing to potential future metallurgical composites. • Iluka is understood to have used a similar procedure albeit no records are available to support this assertion. • To monitor sample representation and sample number correctness, Image weighs the laboratory despatch samples prior to despatch. The laboratory then weighs the received sample and reports the mass to Image. This quality control ensures no mix up of sample numbers and is also a proxy for sample recovery. • Image considers the nature, quality and size of the sub samples collected are consistent with best industry practices of mineral sands explorers in the Perth Basin region.
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.*	• Image and Iluka used industry standard approaches to estimating the contents of HM, slimes and oversize involving washing slimes from samples, then extracting the heavy minerals from the residual sands using heavy media. • Image engaged two laboratories (Western GeoLabs and Diamantina Laboratory). • Image inserted CRMs for assaying undertaken in 2016. • Both Iluka and Image collected duplicate samples including field-duplicates of the primary sample and laboratory duplicates at the laboratory sub sampling stage (post de-sliming). • Analysis of QAQC data for the drilling programs indicates that it is of moderate to high quality and supports resource estimation. • Three sets of mineral assemblage data (two sets of QEMSCAN data and grain counting data) have been used to estimate the ilmenite, leucoxene, rutile and zircon concentrations within the total HM.
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.*	• Image collected primary data on hard copy logs and also using a data logger. Data from laboratories was provided in digital form and compiled in Microsoft Access databases and spreadsheets. • Approximately 97% of the assayed intervals have been analysed using a 63 µm sieve and almost 3% of the data having been analysed using a 53 µm sieve. • In 2017, 28 samples of -2mm+53µm HMC were screened at 63 µm to assess the total HM in the -63µm fraction. This data was used to determine an adjustment factor to derive estimates of the % total HM within the -63µm fraction from the % total HM within the -53µm fraction for samples where the % total HM from the -63µm fraction was not available.
Location of data points	• *Accuracy and quality of surveys used to locate drillholes (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.*	• Drillhole collars at Atlas have been surveyed using hand-held, DGPS and RTK DGPS methods, with the latter method deemed most accurate. • The collar coordinates and survey ground controls have been tied to the Landgate GOLA database by a registered surveyor. • All collars for the MRE have been adjusted to a LiDAR topographic model described below. • Data for Atlas has been surveyed in MGA Zone 50 GDA94. The mineral resource has been estimated in the same coordinate system due to the north-south trending nature of Atlas. The topographic model for Atlas is based on LiDAR survey. A review of this survey by Image did not produce any significant variation of the resource.
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*	• The drillhole spacing is generally 20 m to 40 m across strike on section lines spaced at 100 m or 200 m along strike. Some areas have been drilled at a wider spacing of up to 80 m by 400 m. • The drill database used in the resource estimate comprises 2,307 drillholes for a total 32,300.35 m drilled by Image, TiWest, RGC; and Iluka between 1989 and 2012. • Samples for HM assemblage determination were composited on

	applied. • *Whether sample compositing has been applied.*	intervals according to a combination of grade and geology appropriate to reflect resource estimation domains. • 65 composites from 326 drillholes totalling 1,168 m were used in the resource estimate. • The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation procedure and classification applied.
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.*	• All drillholes are vertical and intersect sub-horizontal strata. This is appropriate for the orientation of the mineralisation and will not have introduced a bias.
Sample security	• *The measures taken to ensure sample security.*	• All samples are collected from site by Image's staff as soon as practicable once drilling is completed and then delivered to Image's locked storage sheds. • Image's staff deliver samples to the laboratory and collect heavy mineral floats from the laboratory, which are also stored in Image's locked storage. • Image considers there is negligible risk of deliberate or accidental contamination of samples. Occasional sample mix-ups are corrected using Images checking and quality control procedures.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• The results and logging have been reviewed internally by Image's senior exploration personnel including checking of masses despatched and delivered, checking of CRM results, and verification logging of significant intercepts.

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 Atlas deposit is within pending mining lease M70/1305 (application 17/01/2012; exploration licences E70/2636 (expiry 19/02/2018), E70/2898 (expiry 13/11/2017), E70/3997 (expiry 10/10/2017) and prospecting licence P70/1516 (expiry 27/05/2017). Image has a 100% interest in each of these licences.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The Atlas deposit was discovered by RGC, who drilled out the deposit to an Inferred Resource Status. The work is well documented in reports from Iluka, and prior mineral resource estimator Widenbar and Associates (2011).
Geology	• *Deposit type, geological setting and style of mineralisation.*	• Atlas is hosted in the Perth Basin, in surficial marine sediments eroded into Cretaceous basal sediments during the Pleistocene marine transgressions. • The host sediments consist of unconsolidated well sorted sands and clayey sands, sitting over basal sediments of very fine to granular or pebbly, poorly sorted sands and clayey sands. • Atlas has one major strandline of heavy minerals, with 7 minor strandlines interpreted to the north, east and west. • The basement to the strandline mineralisation is identified by the decrease in mineralisation.
Drillhole information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drillholes:* • *easting and northing of the drillhole collar* • *elevation or RL (Reduced Level – elevation*	• Not relevant – Mineral Resource defined. Exploration results are not being reported for the Mineral Resource area.

	above sea level in metres) of the drillhole collar • *dip and azimuth of the hole* • *down hole length and interception depth* • *hole length.*	
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.* • *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.*	• Not relevant – Mineral Resource defined. Exploration results are not being reported for the Mineral Resource area. • There are no metal equivalent values assumptions applied in the Mineral Resource reporting.
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 drillhole angle is known, its nature should be reported.* •	• The geometry of the Atlas mineralisation is effectively horizontal and the vertical drillholes used to define the Mineral Resource give the approximate true thicknesses of mineralisation
Diagrams	• *Appropriate maps and sections and tabulations of intercepts should be included for any significant discovery being reported*	• Not relevant – Mineral Resource defined. Exploration results are not being reported for the Mineral Resource area.
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.*	• Not relevant – Mineral Resource defined. Exploration results are not being reported for the Mineral Resource area.
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.*	• Slimes and HM grain size analysis reported under "Verification of sampling and assaying".
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.*	• Image is planning infill drilling to allow a likely upgrade of the northern Indicated part of the resource to Measured. Image is also planning an extensional exploration programme to the north of Atlas.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

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.*	• The drillhole database is managed by Image. Maintenance of the database includes internal data validation protocols by Image. • For the Mineral Resource estimate the drillhole data was extracted directly from Image's Micromine database. • Data was further verified and validated by Optiro using mining software (Datamine) validation protocols, and visually in plan and section views.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	• Mrs Christine Standing (CP for the Mineral Resource estimate) has not visited the Atlas deposit. She has visited other mineral sands deposits and operations within the North Perth Basin.
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.*	• The Yoganup Formations was defined using a combination of slimes and oversize data and drillhole lithological logs. • For the purposes of resource estimation, this unit was used in combination with grade criteria (nominal cut-off grade of 2% total HM) to define a main strandline and seven additional strandlines to the north, west and east of the main strandline. • There is good confidence in the geological interpretation of the main strandline. Confidence in the other strandlines is lower, as reflected by the classification.
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.*	• The main strandline mineralisation has been shown from drilling to extend for approximately 6.5 km north/south and has an across strike width of up to 500 m. The strandline mineralisation extends from surface to 16 m depth. • Seven additional zones of strandline mineralisation have been interpreted to the north, east and west of the main strandline. Strike lengths range from 0.5 km to 2.5 km and they extend from surface to depth of 22 m.
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 drillhole data, and use of reconciliation data if available.*	• Datamine resource estimation software was used to create a geological model and define the mineralisation envelopes. A series of mineralised domains was used to constrain the Mineral Resource estimate. • Wireframe interpretations of mineralisation were made by Optiro based on geological logging and HM content, using a threshold of ~ 2% HM to define the strandline mineralisation. • Optiro assessed the robustness of these domains by critically examining the geological interpretation and by using a variety of measures, including statistical and geostatistical analysis. The domains are considered geologically robust in the context of the resource classification applied to the estimate. • Drillhole sample data was flagged from the three dimensional interpretation of the mineralised horizons. • Samples are from intervals of 0.2 m, 0.25 m, 0.3 m, 0.5 m 1 m, 1.5 m and 2 m. As the majority of samples within the interpreted mineralisation (82%) are from intervals of 1 m the data was composited to 1 m downhole intervals for resource estimation. • Extrapolation of up to 50 m along strike and approximately half the drill spacing across strike was used for the interpretation. • Total HM, slimes and oversize quantities were estimated using ordinary kriging (OK) into blocks of 10 mE by 50 mN by 1 mRL. • Zircon, leucoxene, rutile and ilmenite (VHM components) percentages within the HM fraction were estimated using inverse distance (ID) into the parent blocks. • Block dimensions were selected from kriging neighbourhood analysis and reflect the variability of the deposit and the model's practicality for future mine planning. Sub-cells to a minimum dimension of 2.5 mE by 12.5 mN by 0.5 mRL were used to represent volume of the strandlines and sub-cells to minimum dimension of 1.25 mE by 6.25 mN by 0.25 mRL were used for definition of the 0.5 m soil horizon. • The drillhole spacing is generally 20 m to 40 m across strike on section lines spaced at 100 m or 200 m along strike. Some areas have been drilled at a wider spacing of up to 80 m by 400 m. • Data analysis and estimation was undertaken using Snowden Supervisor and Datamine software. • All variables were estimated separately and independently. • Hard boundaries were applied to the estimation of HM, slimes and

		oversize and the VHM components within the mineralisation domains. • Grade capping was applied to HM%, slimes% and oversize%. The top cut levels were determined using a combination of top cut analysis tools, including grade histograms, log probability plots and the coefficient of variation. • Variogram analysis was undertaken to determine the kriging estimation parameters used for OK estimation of HM, slimes and oversize and the search dimensions used for ID estimation of the VHM components. • HM mineralisation continuity was interpreted from variogram analyses to have an along strike range of 390 m and an across strike range of 40 m within the main strandline. Within the other mineralised strandlines HM mineralisation has an along strike range of 485 m and an across strike ranges of 40 m. • The VHM continuity was interpreted from variogram analyses to have an along strike range of 1,280 m and an across strike range of 240 m. • Kriging neighbourhood analysis was performed in order to determine the block size, sample numbers and discretisation levels. • Three estimation passes were used for HM; the first search was based upon the variogram ranges; the second search was two times the initial search and the third search was up to five times the initial search with reduced sample numbers. The majority of blocks (76%) were estimated in the first pass, 23% in the second pass and 1.4% in the third pass. • The HM, slimes and oversize estimated block model grades were visually validated against the input drillhole data and comparisons were carried out against the declustered drillhole data and by northing, easting and elevation slices. • The VHM estimated block model grades were visually validated against the input drillhole data and comparisons were carried out against the drillhole data and by northing and easting slices.
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.*	• The Mineral Resource estimate for the Atlas deposit has been reported at a 2.0% total HM cut-off. This cut-off grade was selected by Image based on technical and economic assessment carried out during Feasibility Studies.
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.*	• Open pit mining methods will be used, similar to those commonly and currently in use in HM mining operations both in Australia and globally. • Image has assumed mining by conventional truck and shovels, with dozers used to improve vertical selectivity.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of 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.*	• Mineral assemblage data within the Mineral Resource estimate has been sourced from three different assemblage programmes: – Grain counting data (1 composite) – QEMSCAN data from Bureau Veritas (47 composites) – QEMSCAN data from SGS (17 composites). • The QEMSCAN rules for the titanium mineral determination are as follows: – Ilmenite: 50-70% TiO_2 – Leucoxene: 70-95% TiO_2 – Rutile: >95% TiO_2 • Image considers there are no metallurgical factors which are likely to affect the assumption that the deposit has reasonable prospects for eventual economic extraction.
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*	• Image is intending to complete environmental studies at Atlas. At present Image considers there are no environmental factors which are likely to affect the assumption that the deposit has reasonable prospects for eventual economic extraction.

	eventual economic extraction to consider the potential environmental impacts of the mining and processing operation.	
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.*	• Previous resource estimates (2008, 2009 and 2011) used bulk density values predicted from an industry-standard formula which accounts for the total HM and slimes content of heavy mineral sand deposits. • Bulk density testwork at Image's Boonanarring deposit found that this formula overstated the bulk density. The formula was calibrated with the 2016 data at Boonanarring and the updated formula was used for estimation of the bulk density for the 2017 Atlas Mineral Resource estimate.
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 estimate has been classified according to the guidelines of the JORC Code (2012), into Measured, Indicated and Inferred Resources taking into account data quality, data density, geological continuity, grade continuity and confidence in estimation of heavy mineral content and mineral assemblage. In plan, polygons were used to define zones of different classification within each of the mineralised domains. – Measured Resources are defined within the main strandline where drilling is at 10 m to 20 m on 100 m to 150 m spaced section lines and mineral assemblage data is from QEMSCAN analysis. – Indicated Resources are defined within the main strandline where the mineral assemblage has been estimated from grain counting data ,and within the additional strandlines where drilling is generally at 20 m to 40 m by 200 m and where there is mineral assemblage data. – Inferred Resources are defined where there is limited or no mineral assemblage data.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The Mineral Resource has been reviewed internally as part of normal validation processes by Optiro. • No external audit or review of the current Mineral Resource has been conducted.
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 Competent Person.* • *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.*	• The assigned classification of Measured, Indicated and Inferred reflects the Competent Persons' assessment of the accuracy and confidence levels in the Mineral Resource estimate. • The confidence levels reflect production volumes on a monthly basis. • No production has occurred from the deposit.

SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to	• *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*	• The Mineral Resource estimate used is classified as JORC 2012 Mineral Resource statement as per Image Resources Ltd, the Atlas Project Mineral Resource estimate was completed by Christine Standing of Optiro Pty Ltd. • The Mineral Resources are reported inclusive of the Ore Reserves.

Criteria	JORC Code explanation	Commentary
Ore Reserves	*inclusive of, the 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.*	• Site visit undertaken by Jarrod Pye with the purpose of the visit being to assess requirements for evaluating the updated reserve. • Andrew Law has not yet visited the site, however knows the area well and has visited Image's Boonanarring site.
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.*	• Image completed a Pre-feasibility study in 2013
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	• The cut-off grade in the case of Atlas has been calculated using spreadsheets and an individual cut-off grade applied to each block within the model. The calculations consider, among other considerations, individual mineral and product values, operating costs and other practical considerations (including ore and overburden variabilities) and HM and product recoveries.
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 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.*	• The truck, shovel and scrapers method has been chosen for the mining of the Atlas Project. The truck, shovel and scraper method is used in similar operations in Australia. Appropriate factors have been applied to the Mineral Resource by optimisation and design to derive the Ore Reserves. • The choice of the truck, shovel and scraper method was deemed appropriate due to the ore thickness, access, and nature of the geology. Similar mining methods were also used in the geographical area, such as Iluka's Gingin deposit • A preliminary study by Golder Associates was undertaken in 2010, however this was only one drill hole. Recommendations were made for 35 degrees. Further testwork will be conducted • Mining dilution (2%) and recovery factors (100%) are assumptions made for similar mining operations and mining techniques. Reconciliations from previous operations to date have supported these assumptions. • Grade control will be conducted by a geologist in pit using panning to establish ore contacts, in conjunction with Survey who also be used to stake our ore surfaces. • Inferred resources were not used in the Ore Reserve output. However will be used in an operations schedule for internal production purposes. • Infrastructure required will be office blocks, mining contractor workshop and associated facilities.
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*	• The ore is processed through a wet concentration plant (WCP) to produce a Heavy Mineral Concentrate (HMC) which is further processed at an offsite Mineral Separation Plant (MSP) to generate final products. The WCP and MSP use traditional mineral sands separation techniques. The metallurgical process and appropriateness of the process is outlined in a process map by Image and is detailed in the Ore Reserve document. The process has been widely utilised in similar operations. • The metallurgical process is well tested and commonly used in similar operations worldwide. • Deleterious materials include oversize material and clay fines which will be managed as part of Image's rehabilitation management plan and mildly radioactive material, which will be returned into the pit as backfill and capped. • The Ore Reserve estimation has been based on the recoveries and processes outlined above which are well tested, and established as

Criteria	JORC Code explanation	Commentary
	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?*	being appropriate for similar metallurgical specifications. • Yes, mine planning filters and metallurgical recovery through to final the products.
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.*	• Preliminary studies conducted have been flora and fauna and Hydrogeological and hydrological scoping studies have been completed by URS. • Mining lease M70/1305 has been applied for and is pending. • A gap analysis has been conducted to establish what is needed for further approvals, such as, Part IV Environmental protection act – PER, EPBC Act, Land owner agreements and groundwater abstraction license.
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.*	• Image will need additional power and accommodation due to the location of Atlas • Image owns a WCP, Slurry mining unit (SMU), pipes, pumps and power infrastructure for mining at Atlas • Labour is likely to be acquired from the local area and surrounds.
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 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.*	• Projected capital costs relate to sustaining capital only and are considered appropriate. • Operating history (Murray Zircon's Mindarie project) and Pre-Feasibility Study in combination with offtake agreements in place for sale of various commodities produced at Boonanarring, at varied proportions of product volume provide adequate coverage for the estimation of operating costs at Atlas. For the purpose of the Reserve financial calculations, the contract prices are commercially sensitive. • Product specifications deals with deleterious elements. • Long term exchange rates of A$0.73 were sourced from consensus pricing • Transportation charges reflect contract quotes with service providers. The transportation charges are included in the selling costs. The selling costs include provision for bagging, handling, transport to port, and port costs. All product prices have been derived on an FOB basis and as such shipping prices have not been included. • Third party processing costs reflect contracted rates • Allowances made for royalties include a 5.0% revenue royalty in the financial model. • Land owner contracts are still being negotiated with the native title land owners the Yued's.
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.*	• Consensus pricing has provided a pricing range for each of the products which Image have used. • Product revenue for the zircon concentrate product is calculated using consensus long term prices adjusted for zircon quality and other factors contained in the Boonanarring offtake agreement for this product. • Product revenue for all other products is calculated using consensus long term prices adjusted for content, product quality and other factors, as well as the company's expectations.
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.*	• Market analysis is based on independent reports and Image marketing activities, with demand for mineral sands typically following global GDP. • Image produces zircon and TiO_2 products which are forecast to be in relative short supply in the medium term. • At current production rates, final products of zircon expected to average – 20 ktpa (dry). Ilmenite – 110 ktpa (dry) • Offtake agreement for 90% of zircon at market price. • Other products still to be marketed
Economic	• *The inputs to the economic analysis to produce the net present value (NPV) in the*	• To demonstrate the Ore Reserve is economic it has been evaluated through a high level financial model. This process has demonstrated the

Criteria	JORC Code explanation	Commentary
	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.*	Ore Reserve generates positive cash flows above the cut-off grade. • Economic assumptions with respect to product pricing and operating costs are described above. • Sensitivity ranges of +/-10% were run on the revenue, operating costs, and capital costs for the project and the project is positive based on each of these scenarios.
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	• Agreements are in place with all current relevant stakeholders and negotiations are well advanced with those identified as high probability of needing agreements to be in place. Image has a comprehensive community engagement program.
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.* • *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.*	• No identifiable naturally occurring risks have been identified to impact the Ore Reserves. • A 90% zircon offtake agreement is in place • Mining Lease application is pending • A gap analysis has been completed for environmental studies • There is no reason why Government approvals will not be granted by the time mining commences in approximately 5 years • Measured material has been downgraded to probable due to Image taking a conservative approach on the density calculation. More test work will be undertaken on the ore to validate the density formula used.
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).*	• Mineral Resources converted to Ore Reserves as per JORC 2012 guidelines • Measured material has been downgraded to probable pending more test work to confirm the density calculation. • Indicated material has been converted to probable • No Inferred category material used or reported. • The result reflects the Competent Person's view of the deposit. • There is 7.4 Mt of "probable" Ore reserves derived from Measured Mineral Resources.
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• The Ore Reserve has been calculated by Image with Independent consultants Optiro Pty Ltd providing the relevant direction and providing CP signing off on the Ore Reserve.
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*	• The level of accuracy for the Ore Reserve is determined largely by the Mineral Resources model, the metallurgical assumptions as well as long term revenue and cost assumptions. • Atlas is a new operation and as such insufficient production data exists to enable a full statistical reconciliation at this stage.

Criteria	JORC Code explanation	Commentary
	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.*	