



## Corporate Details

27 August 2018

**Ordinary Shares:**  
791,970,324

**Market Capitalisation:**  
~\$150 million

**Cash and bullion at 30 June 2018:**  
~\$13.6 million

**Debt at 30 June 2018:**  
NIL

**ASX Code:** MOY

## Board of Directors

**Greg Bittar**  
Non-Executive Chairman

**Bruno Lorenzon**  
Non-Executive Director

**Tim Kennedy**  
Non-Executive Director

**Peter Lester**  
Non-Executive Director

## Management

**Peter Cash**  
Chief Executive Officer

**Dean Will**  
Chief Operating Officer

**Ray Parry**  
Chief Financial Officer and  
Company Secretary

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# Millennium makes key exploration breakthrough at Nullagine

## New exploration targeting methodology delivers significant new target south-west of the key Golden Eagle deposit

- **Large new greenfields exploration target identified 1.8km south-west of the flagship Golden Eagle deposit, the largest gold deposit defined at the Nullagine Project to date (current Resource: 320,000oz).**
- **Reconnaissance drilling has returned a significant 12 metre intercept comprising a broad zone highly anomalous mineralisation with a similar alteration to Golden Eagle including narrow zone of high-grade gold. Assay results include:**
  - ***12m @ 0.87g/t gold from 184m, including 1m @ 3.13g/t gold from 191m (GEX391)***
- **The new target has been identified through a combination of 3D magnetic inversion, structural analysis and soil geochemistry.**
- **The 3D magnetic inversion models outline an alteration zone measuring 400m in strike which represents an outstanding target for follow-up drilling.**
- **The targeting methodology, based on a reinterpretation of the Company's extensive high-quality exploration datasets, represents a new approach for Millennium and marks an important technical breakthrough in close proximity to one of Nullagine's largest gold deposits.**
- **The new targeting approach will now be applied across all of Millennium's tenements in the Mosquito Creek Basin.**
- **Follow-up exploration to commence shortly, comprising a gravity survey and additional drilling.**
- **The Company remains committed to its successful near-surface exploration approach at Nullagine, which continues to deliver important exploration breakthroughs.**

Millennium Minerals Limited (ASX: MOY) ("**Millennium**" or the "**Company**") is pleased to advise that it has identified a major new greenfields exploration target in close proximity to the large-scale Golden Eagle deposit at its 100%-owned Nullagine Gold Project in WA's East Pilbara.

The new area, located 1.8km south-west of Golden Eagle (see Figure 1) and named "Golden Eagle South West", has been identified by employing a new exploration targeting methodology based on a reinterpretation of the Company's extensive high-quality exploration datasets, which include spectral, magnetic, surface geochemistry and radiometric survey data.

Golden Eagle South West is situated in an area of increased variation in the magnetic signature, which is interpreted to be associated with gold mineralisation at depth, in conjunction with a zone of structural complexity.

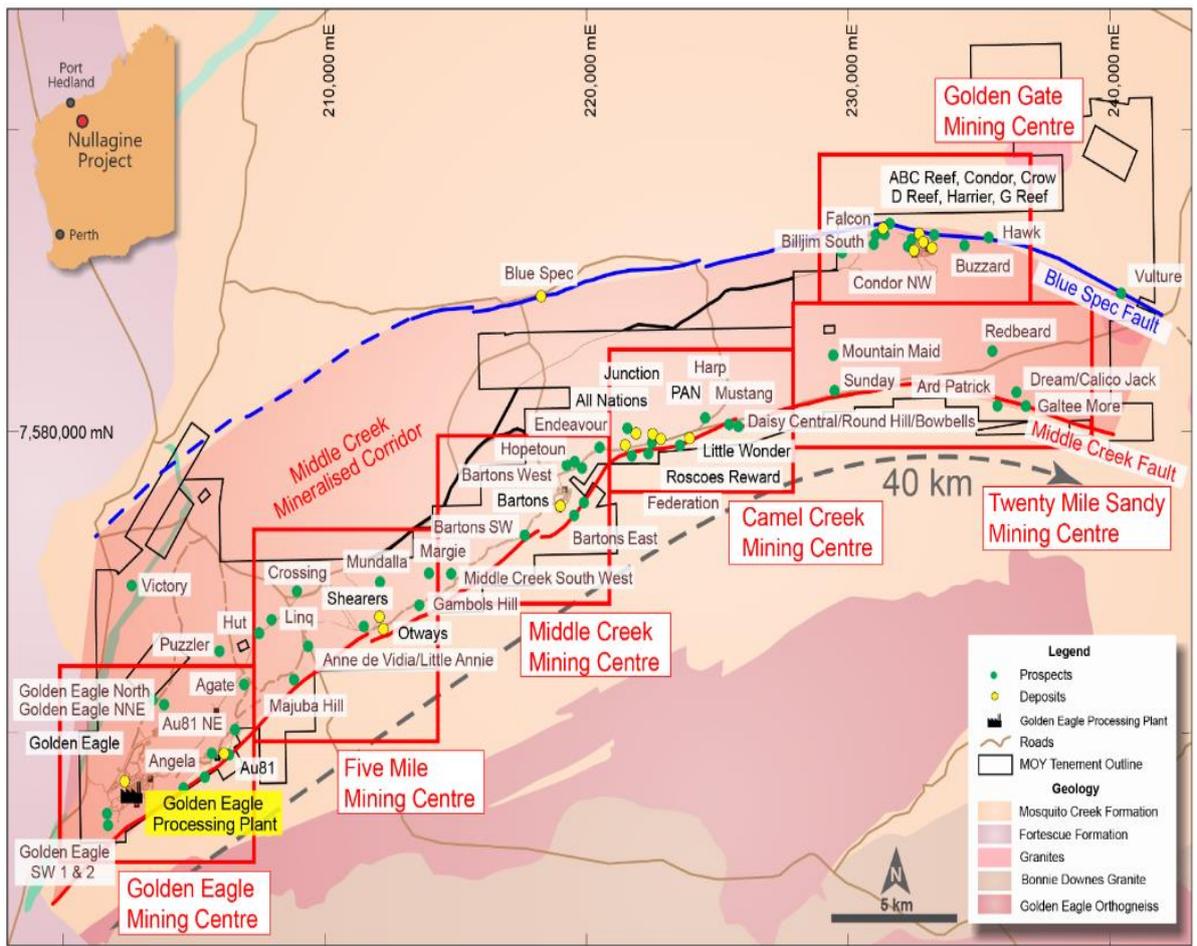


Figure 1: Nullagine Project Location Plan over regional geology

Two reconnaissance drill holes were drilled with the results from the first hole containing a highly anomalous broad mineralised intercept of 12m grading 0.87 g/t gold from 184m, including a high grade zone of 1m grading 3.13 g/t Au from 191m (GEX391). Assays for a second hole are pending.

The results from GEX931 are considered to be highly significant as they confirm that the magnetic signature is associated with gold mineralisation and validate the use of 3D magnetic inversions to identify the presence of gold mineralisation at Nullagine (see Figures 2 to 4 and Table 1).

Importantly, the mineralisation observed in GEX391 has similar alteration to the nearby Golden Eagle deposit, which is the largest gold deposit identified at Nullagine to date with a current Mineral Resource inventory of over 320,000oz of gold.

3D magnetic inversion data at Golden Eagle South West has highlighted an alteration zone measuring 400m in strike.

Based on the encouraging results from GEX391, the strength and size of the magnetic anomaly, and the position of Golden Eagle South West in a structurally significant area, Millennium considers this to be a priority greenfields exploration target with outstanding potential for a new discovery outside of existing mining areas.

A gravity survey will commence in the coming weeks to assist with developing the 3D interpretation of the geology, alteration and structures associated with the gold mineralisation, with follow-up drilling also planned.

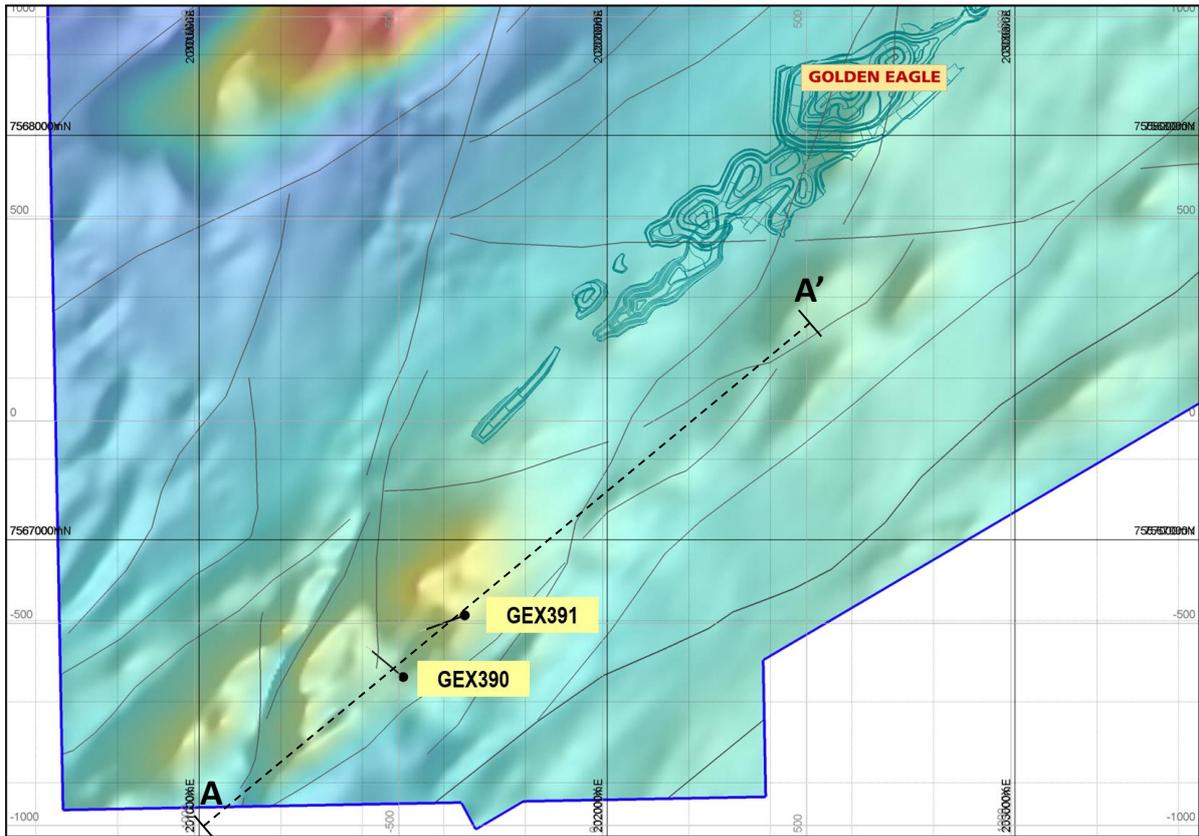


Figure 2: Total magnetic intensity data showing location of Golden Eagle South West anomaly, drill holes and cross-section shown in Figure 4

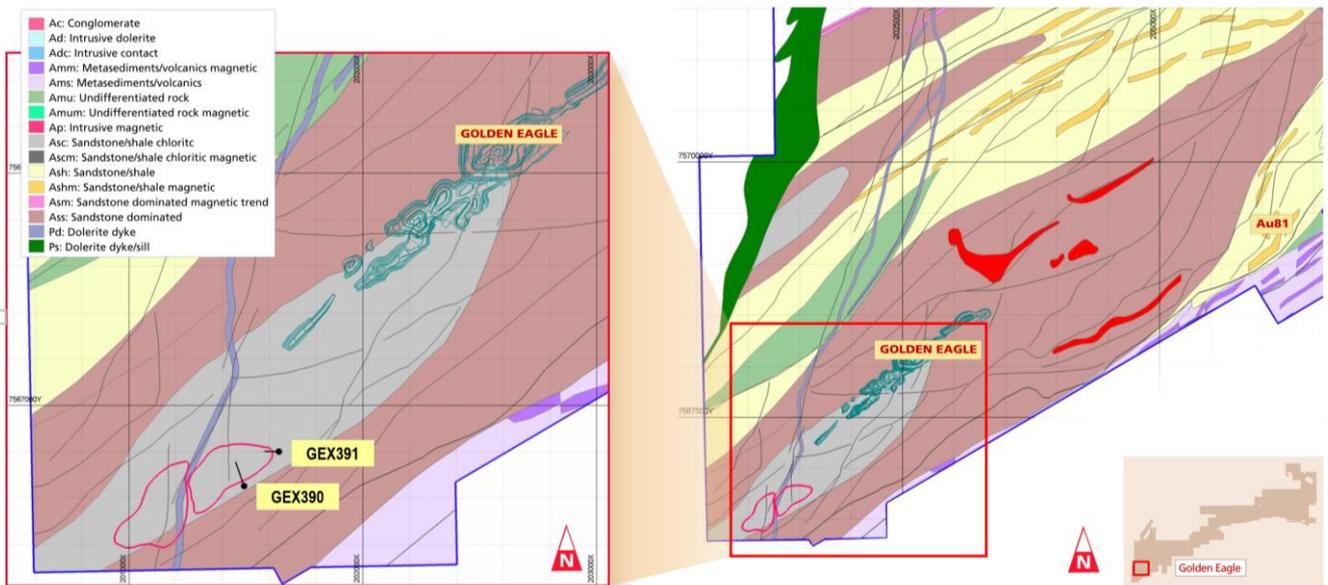
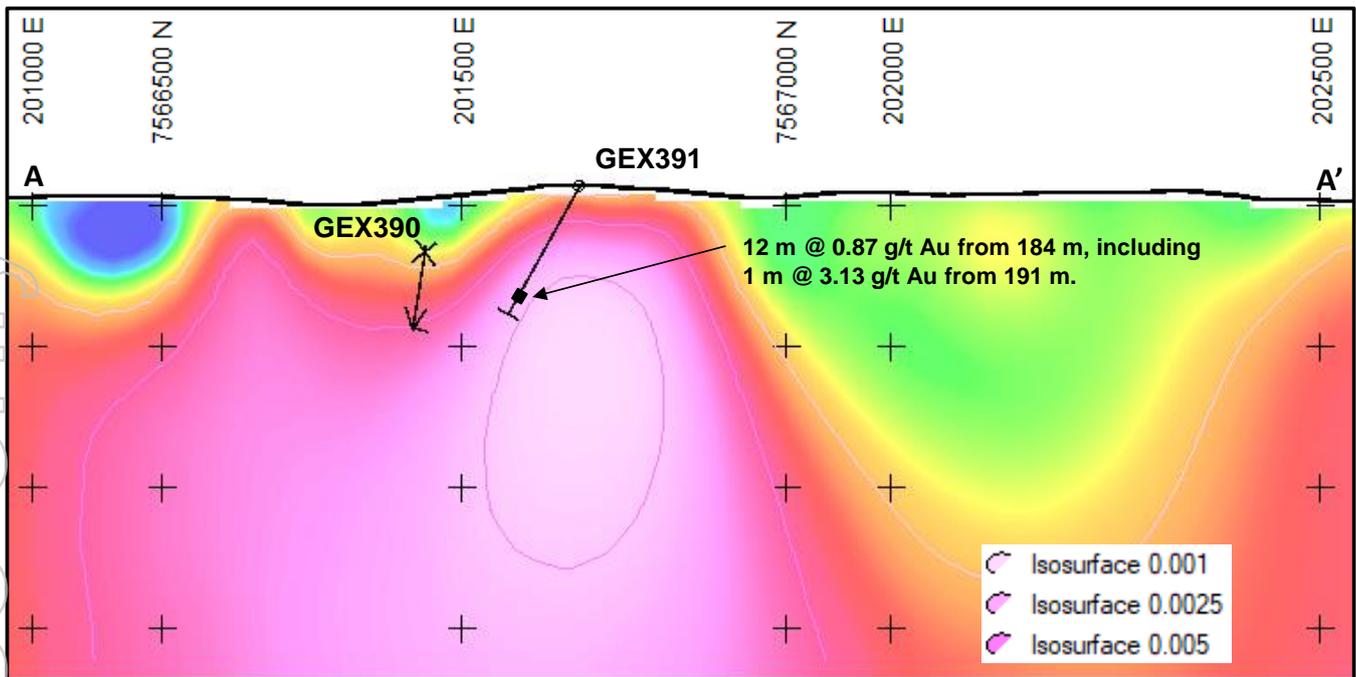


Figure 3: Golden Eagle South West magnetic anomaly over regional geology, showing location of reconnaissance drill holes



**Figure 4: Cross-section showing 3D magnetic inversion, magnetic isosurfaces and the location of anomalous results within the zone of magnetic variability from drill hole GEX391**

Millennium Chief Executive Peter Cash said the confirmation of gold mineralisation in a previously untested area at Golden Eagle South West represented a major breakthrough for the Company.

"This is an outstanding result, demonstrating that our new exploration targeting approach is capable of identifying new, high-quality exploration opportunities at depth.

"While most of our exploration at Nullagine has historically been directed towards outcropping geochemical targets – which have been very successful in delivering ongoing increases in Resources and Reserves – we believe that an integrated targeting methodology based on a mineralised system approach has the potential to unlock major new discoveries.

"Millennium has a series of high-quality exploration datasets that have recently been reprocessed and reinterpreted by our exploration team with support from a team of advisory experts that includes renowned geologists Brett Keillor, who has twice received the AMEC Prospector of the Year Award for the Plutonic and Tropicana discoveries, and Barry Bourne, who has been part of several successful exploration teams that have made significant discoveries globally.

"Their analysis of the integrated exploration dataset identified Golden Eagle South West as a compelling greenfields exploration target, prompting us to undertake reconnaissance drilling in this completely new and untested area 1.8km south-west of Golden Eagle.

"3D magnetic inversion data has never previously been used to identify gold mineralisation at Nullagine, and we are really excited to now have confirmation that this technology can successfully define new gold targets in the Mosquito Creek Basin. This represents an enormously important technical breakthrough for the area and Millennium.

"In addition to undertaking immediate follow-up work at Golden Eagle South West, Millennium will now prioritise and pursue a series of additional magnetic targets identified by our technical team," he said. "We remain committed to our successful near-surface exploration approach at Nullagine, which has already delivered significant value for the Company by growing our oxide Resource and Reserve inventory."

**ENDS**

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### **Competent Persons Statements – Exploration Results**

*The information in this report that relates to Exploration Results is based on information compiled by Mr James Farrell (MAusIMM(CP), MAIG), a geologist employed full-time by Millennium Minerals Limited. Mr Farrell is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to this style of mineralisation and type of deposit under consideration and to the activity that is being reported on to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Farrell consents to the inclusion in the report of the matters in the form and context in which it appears.*



Section 1 Sampling Techniques and Data

Criteria	JORC Code Explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Include reference to measures taken to ensure sample representatively and the appropriate calibration of any measurement tools or systems used.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Samples were collected using Reverse circulation (RC) drilling.</li> <li>Weighing of the second sample split is undertaken to ensure that the sample splitter on the RC drill rig is set up appropriately.</li> <li>Standard samples were inserted to the RC sampling stream at a ratio of 1:50.</li> <li>RC drilling was carried out with a 5.5-inch face-sampling bit, 1m samples collected through a cyclone and cone splitter to form a 2-3 kg sub-sample. All sub-samples were fully pulverised at the laboratory to &gt;85% passing 75 µm, to produce a 50 g charge for Fire Assay with AAS finish.</li> <li>Rock chip samples were taken from outcrop that appeared to be mineralised. Samples were comprised of chips taken across the outcrop of interest to comprise a sample weighing between 1.5 and 3.5 kg. These were crushed to &gt;85% &lt;10 mm in a Jaw Crusher before being pulverised to &gt;85% passing 75 µm. A 25 g sub-sample was digested in an aqua regia solution with Au determined via AAS machine.</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>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).</li> </ul>	<ul style="list-style-type: none"> <li>RC drilling was carried out with a 5.5-inch face-sampling bit.</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>A record of the RC sample recovery and moisture content was recorded by the rig geologists. Overall sample weight and quality were good to very good (2 to 3.5 kg).</li> <li>ALS records sample weights on receipt of samples. This was used to help track sample recovery.</li> <li>There is no correlation between sample recovery and gold grade.</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<ul style="list-style-type: none"> <li>All of the RC drilling has been captured in chip trays for reference.</li> <li>Geological logging is both qualitative and quantitative in nature. Logging is carried out for lithology, colour, grain size, regolith, alteration, weathering, veining and mineralisation. Sulphide and vein content were logged as a percentage of the interval.</li> <li>RC chip trays are retained at site.</li> <li>All of the intersections were logged.</li> </ul>

Criteria	JORC Code Explanation	Commentary
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>• If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>• If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</li> <li>• For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>• Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>• 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.</li> <li>• Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul style="list-style-type: none"> <li>• One metre RC samples were split using a rig mounted cone splitter. The vast majority of the samples were dry with the moist and wet samples were recorded.</li> <li>• The sample sizes are industry-standard and considered to be appropriate to correctly represent mineralisation at the deposits based on: the style of mineralisation, the thickness and consistency of the intersections, the sampling methodology and assay ranges for gold.</li> <li>• Field duplicates were taken from the second aperture of the cone splitter at a rate of 1 in 50.</li> </ul>
<b>Quality of assay data and laboratory tests</b>	<ul style="list-style-type: none"> <li>• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>• 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.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• The industry best practice standard assay method of 50 g charge Fire Assay with AAS finish was used to determine total Au content of the RC samples.</li> <li>• Commercially prepared, predominantly matrix-matched low, medium &amp; high value certified reference QAQC standards were inserted at a rate of 1:50 into the RC sample stream.</li> <li>• The QAQC results from this protocol were considered to be acceptable.</li> <li>• No geophysical tools were used to determine any element concentrations used for these results.</li> <li>• Sample preparation checks for fineness were carried out by the laboratory as part of their internal procedures to ensure the grind size of 85% passing 75 <math>\mu\text{m}</math> was being attained. Laboratory QAQC involves the use of internal lab standards using certified reference material, blanks, splits and replicates as part of the in-house procedures.</li> <li>• Results highlight that sample assay values are accurate.</li> </ul>
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li>• The verification of significant intersections by either independent or alternative company personnel.</li> <li>• The use of twinned holes.</li> <li>• Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>• Discuss any adjustment to assay data.</li> </ul>	<ul style="list-style-type: none"> <li>• Intersections were checked by alternative company personnel to check they were reported correctly.</li> <li>• No twin holes were drilled in the programme. Previous significant intersections were verified with close spaced drilling.</li> <li>• Sampling is directly uploaded to the LogChief software and it is synchronised to the database.</li> <li>• Assay results were not adjusted.</li> </ul>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Post completion of the drilling the RC collars were surveyed with a Real Time Kinematic (RTK) DGPS to a <math>\pm 10</math> mm positional precision. All collars were then validated against planned positions as a cross check. Surveyed collar co-ordinates</li> </ul>

Criteria	JORC Code Explanation	Commentary
	<ul style="list-style-type: none"> <li>• <i>Specification of the grid system used.</i></li> <li>• <i>Quality and adequacy of topographic control.</i></li> </ul>	<p><i>are uploaded into the Company SQL database.</i></p> <ul style="list-style-type: none"> <li>• <i>Grid datum is GDA94 51K (East Pilbara).</i></li> <li>• <i>Downhole surveys were completed using a using a gyroscope and are considered to be accurate.</i></li> </ul>
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>• <i>Data spacing for reporting of Exploration Results.</i></li> <li>• <i>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.</i></li> <li>• <i>Whether sample compositing has been applied.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>The two drill holes collars were 215 m apart and were designed to test a zone of variable magnetism associated with NE-trending structures.</i></li> <li>• <i>None of the reported sample intervals were composited. Data aggregation for reporting is described in this table.</i></li> </ul>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>• <i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i></li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Drilling was designed perpendicular to targets associated with interpreted NE-trending structures. However, there is currently insufficient information to confirm the orientation of the reported mineralisation.</i></li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>• <i>The measures taken to ensure sample security.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Samples were given a unique identification number, cross checked by field personnel that they corresponded to the assigned interval. Samples were collected on completion of each hole and delivered to the onsite assay laboratory for dispatch to Perth. Monitoring of sample dispatch is undertaken for samples sent from site and to confirm that samples have arrived in their entirety and intact at their destination.</i></li> <li>• <i>Sample security is managed with dispatch dates noted for each samples by the technician, this is checked and confirmed at the Perth laboratory on receipt of samples and discrepancies are corrected via telephone link up with the on-site and Perth laboratories.</i></li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>• <i>The results of any audits or reviews of sampling techniques and data reviews.</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Internal lab audits conducted by Millennium have shown no material issues.</i></li> </ul>

## Section 2 Reporting of Exploration Results

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

Criteria	JORC Code Explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>The Nullagine Gold Project prospects and deposits lie within fully granted Mining Leases within the Pilbara Gold Field (46), as detailed below. All the tenements are in good standing with no known impediments.</li> <li>M46/186 (100% MML);</li> <li>M46/267 (100% MML);</li> <li>M46/300 (100% MML);</li> <li>These tenements are located within the Palyku title claim (WC99/16) and there is a \$10/oz royalty payable to Tyson Resources Pty Ltd.</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	<ul style="list-style-type: none"> <li>Millennium has reviewed exploration undertaken by other parties at Nullagine. Previous work has not assessed exploration targets similar to those described in this announcement.</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>Deposit type, geological setting and style of mineralisation.</li> </ul>	<ul style="list-style-type: none"> <li>The Nullagine Gold Project deposits are structurally controlled, sediment-hosted, lode gold style deposits. They are all situated in the Mosquito Creek Basin that consists predominantly of Archean aged, turbidite sequences of sandstone, siltstone, shale and minor conglomerate units.</li> </ul>
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>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: <ul style="list-style-type: none"> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> </ul> </li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>A summary of the reported drilling is provided in a table and includes: hole co-ordinates, RL, dip, azimuth, end of hole depth, downhole length and interception depths.</li> <li>All of the current drilling with results returned has been reported.</li> </ul>

Criteria	JORC Code Explanation	Commentary
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	<ul style="list-style-type: none"> <li>All of the exploration prospects have their significant intersections reported with a lower cut-off grade of 0.5 g/t Au and maximum of two consecutive metres of internal dilution. Higher grade intersections use a lower cut-off grade of 3 g/t Au and maximum of two consecutive metres internal dilution.</li> <li>All RC samples reported were one metre in length.</li> <li>No metal equivalents were used.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>These relationships are particularly important in the reporting of Exploration Results.</li> <li>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>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').</li> </ul>	<ul style="list-style-type: none"> <li>The drilling was planned perpendicular to the strike of interpreted mineralised structures; however, in early exploration the dip direction is sometimes uncertain. It is not known whether the reported drilling is unbiased or drilled sub-parallel to the mineralisation which would result in longer and higher-grade intersection than the true intercept.</li> <li>Quoted widths are downhole widths.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</li> </ul>	<ul style="list-style-type: none"> <li>Significant exploration results are tabulated in the release with drill hole plans to show them in context.</li> <li>Representative maps have been included in the report along with documentation.</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>All of the current drill results have been reported for the project.</li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Outcrops of quartz veins have been previously mapped at Golden Eagle. Mineralisation is primarily associated with a combination of quartz veining, shearing, strong sericite alteration and strong limonite staining or pyrite-arsenopyrite content.</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	<ul style="list-style-type: none"> <li>Further drilling is proposed to follow up on the intersected mineralisation.</li> <li>A gravity survey will commence in the coming weeks. This survey will support the interpretation of geology, alteration and structures associated with the mineralisation in three dimensions.</li> </ul>