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The Manager Companies  
ASX Limited  
20 Bridge Street  
Sydney NSW 2000

(10 pages by email)

**SUCCESSFUL SOLVENT EXTRACTION OF NICKEL, COBALT AND MANGANESE  
FROM ALUMINIUM-DEPLETED PLS  
(ASX: CLL)**

**HIGHLIGHTS**

- Preliminary solvent extraction tests achieve **greater than 98% nickel** and **97% cobalt recovery**, with **80% manganese recovery**. Optimisation testwork is expected to further improve upon these initial results.
- Impurity removal tests demonstrate **greater than 99.8% nickel purity** is achievable as required for **LME grade nickel** and other high purity nickel products.
- Further testwork planned to produce a **nickel, cobalt and manganese pre-cursor** suitable for the electric vehicle **lithium Ion battery market (Li-B)**.

The Directors of Collerina Cobalt Limited ('Collerina Cobalt' or 'the Company') are pleased to announce the results of preliminary solvent extraction testwork using proprietary technology to on precipitate nickel, cobalt and manganese from an aluminium-depleted pregnant leach solution (PLS).

**Solvent Extraction Tests**

Having previously applied proprietary processes to extract aluminium from the PLS to produce High Purity Alumina (HPA), a further series of batch solvent extraction tests were performed on the aluminium-depleted PLS using a suitable organic extractant to demonstrate nickel, cobalt and manganese extraction. These tests were performed at various organic to aqueous volumetric ratios and indicate that approximately four counter-current extraction stages will be required to achieve greater than 99% nickel and cobalt recovery, and up to ~80% manganese recovery of which can be adjusted to between 25% and 80% as driven by market demand.

Two impurity removal tests employing proprietary patented technology demonstrated that greater than 99.8% nickel purity required to meet LME grade was reproducibly achievable.

Commenting on the nickel, cobalt and manganese extraction testwork results, Managing Director Justin Werner noted:

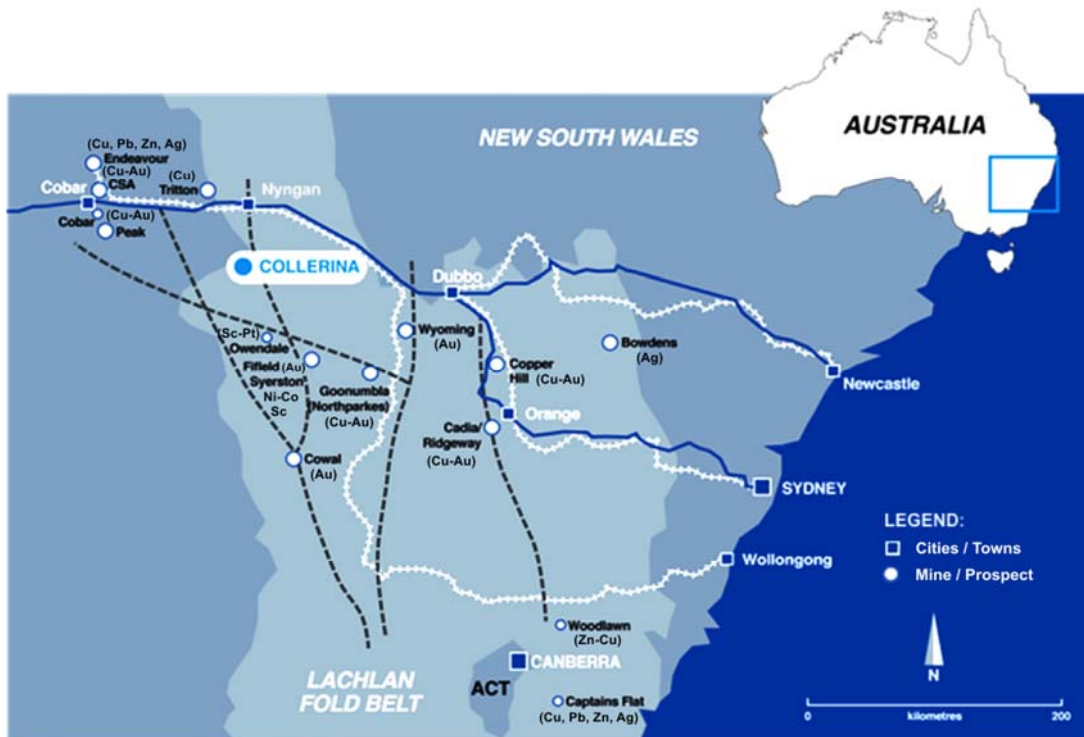
*“Whilst the primary focus of the Collerina project testwork is producing HPA, the opportunity to capture very valuable co-product credits such as nickel, cobalt and manganese significantly enhances the project economics as demonstrated by this testwork where we were able to successfully extract nickel, cobalt and manganese, with impurity removal meeting the requirements for LME grade nickel.”*

*“The Company intends to optimise this initial testwork to explore the option to produce a nickel, cobalt and manganese battery precursor, which currently commands a significant premium to current LME prices, and has begun discussions with experts in this field.”*

### **Collerina Project**

The Collerina project lies about 40 kilometres south of Nyngan in the central and western region of NSW within the Lachlan Fold Belt which hosts a number of world class copper-gold mines including the Cadia, Ridgeway and Northparkes operations. The district also hosts the globally significant Syerston (Sunrise) cobalt-nickel deposit owned by Clean Teq Holdings Limited (ASX: CLQ) which contains a reported 109 million tonnes of 0.10% cobalt and 0.65% nickel. The deposit is currently under definitive feasibility study.

The mineralisation identified by the Company’s current drilling program is spatially associated with the previously announced JORC compliant high grade cobalt and nickel resource of 16.3 million tonnes of 3.1% aluminium, 0.93% nickel and 0.05% cobalt at a 0.7% nickel cut-off grade for 505,300 tonnes of aluminium, 151,000 tonnes of nickel and 8,100 tonnes of cobalt, which increases significantly to 27.2 million tonnes at 3.2% aluminium, 0.80% nickel and 0.05% cobalt for 870,400 tonnes of aluminium, 217,600 tonnes of nickel and 13,600 tonnes of cobalt at cut-off 0.5% nickel.



For further information, please contact Peter Nightingale on +61 2 9300 3310.

Yours sincerely

**Peter J. Nightingale**

**Director**

pjn9174

### Statement of Compliance

Information regarding the Mineral Resource at the Collierina project was prepared and first disclosed under the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. See ASX announcement dated 23 June 2011. It has not been updated since to comply with the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' on the basis that the Company is not aware of any new information or data that materially affects the information and, in the case of the resource estimate, all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed.

The information in this report that relates to Mineral Resources is based on information compiled by Collierina Cobalt staff and contractors and approved by Mr Michael Corey, PGeo., who is a Member of the Association of Professional Geoscientists of Ontario (APGO) in Canada. Mr Corey is employed by the Company and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he 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'. Mr Corey has consented to the inclusion in this report of the matters based on his information in the form and context in which they appear.

Information in this announcement relating to the process development testwork is based on test work results compiled by Mr Boyd Willis, an Independent Consultant trading as Boyd Willis Hydromet Consulting. See ASX announcement dated 24 November 2017. The Company is not aware of any new information or data that materially affects the information and all material assumptions and technical parameters underpinning the process development testwork continue to apply and have not materially changed. Mr Willis is a Fellow and Chartered Professional of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Willis has sufficient experience which is relevant to metal recovery from the style of mineralisation and type of deposits under consideration and to the activity which he is undertaking to qualify as a Competent Person under the 2012 Edition of the 'Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves'. This includes over 21 years of experience in metal recovery from Laterite ore. Mr Willis consents to the inclusion of the technical data in the form and context in which it appears.

# JORC Code, 2012 Edition – Table 1

## 1. *Section 1 Sampling Techniques and Data*

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul style="list-style-type: none"> <li>• <i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.</i></li> <li>• <i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></li> <li>• <i>Aspects of the determination of mineralisation that are Material to the Public Report.</i> <i>In cases where ‘industry standard’ work has been done this would be relatively simple (eg ‘reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay’). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</i></li> </ul>	<ul style="list-style-type: none"> <li>• RC /air core drill samples were collected from the rig cyclone every 1 metre of drilling. Samples were collected into a plastic bag which was retained on site. Individual samples were not weighed on site.</li> <li>• Material was composited on a 2 metre basis from 1 metre sample bags. Due to the damp nature of the laterite material use of a splitter was not practical. As such composite samples were collected using a standard polystyrene 32oz scoop collecting approximately 1kg per scoop for a total of 5kg collected per each 2m composite sample. Samples were submitted to ALS Minerals in Orange, NSW for sample preparation and forwarded by ALS to Brisbane lab for assay by XRF fusion technique.</li> </ul>
Drilling techniques	<ul style="list-style-type: none"> <li>• <i>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).</i></li> </ul>	<ul style="list-style-type: none"> <li>• Drilling was completed using a standard reverse circulation, air core drilling technique. Disaggregated sample material was collected from the rig-attached cyclone into plastics bags every 1 meter of drilling.</li> </ul>

<p><i>Drillsample recovery</i></p>	<ul style="list-style-type: none"> <li>• <i>Method of recording and assessing core and chip sample recoveries and results assessed.</i></li> <li>• <i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i></li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Samples were collected at 1m intervals during drilling and composited on 2 metre basis for assay. In cases where the samples were very wet with poor recovery a best effort sampling using the scoop was conducted to ensure that the composites were representative.</li> </ul>
<p><i>Logging</i></p>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i></li> <li>• <i>The total length and percentage of the relevant intersections logged.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Pertinent details of the lithology drilled and any observations in regards to types and % concentration of individual mineral present were recorded.</li> <li>• Representative sieved rock chip were collected from each sample and collected in standard plastic chip trays for future reference.</li> <li>• Upon hole completion each tray was also photographed.</li> </ul>
<p><i>Sub-sampling techniques and sample preparation</i></p>	<ul style="list-style-type: none"> <li>• <i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></li> <li>• <i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></li> <li>• <i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></li> <li>• <i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i></li> <li>• <i>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.</i></li> <li>• <i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></li> </ul>	<ul style="list-style-type: none"> <li>• 2 m composite samples were collected for assay using a scoop collecting approximately 2.5kg from each 1 metre sample.</li> <li>• Composite samples were bagged and tagged with unique assay number for analysis.</li> <li>• Due to the damp nature of the sample material no intermediary riffle splitter was used to sub-sample.</li> <li>• Subsequent metallurgical test samples were prepared from pulverized and coarse reject sample material remaining after initial sample preparation and assaying completed by ALS laboratories in Orange, NSW and Brisbane, QLD.</li> </ul>

<p><i>Quality of assay data and laboratory tests</i></p>	<ul style="list-style-type: none"> <li>• <i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></li> <li>• <i>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.</i></li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Each 2m composite sample was either delivered by Company representatives to ALS Laboratory in Orange NSW or shipped directly to the lab using a commercial carrier from Dubbo, NSW.</li> <li>• Samples were then sub-split into 3kg samples if required and dried and crushed to 70% passing 2mm followed by pulverizing to 85% passing 75 micron (200 mesh).</li> <li>• The homogenized and pulverized samples were then sent by ALS to their lab in Brisbane for major oxide and select element analysis according to their published nickel ore package using fused disk XRF (ME-XRF12n) method.</li> <li>• A certified standard pulp and field duplicate and blank sample were inserted at the rate of 1 each per every 30 samples.</li> <li>• ALS also has an in-house QA-QC protocol.</li> </ul>
<p><i>Verification of sampling and assaying</i></p>	<ul style="list-style-type: none"> <li>• <i>The verification of significant intersections by either independent or alternative company personnel.</i></li> <li>• <i>The use of twinned holes.</i></li> <li>• <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></li> <li>• <i>Discuss any adjustment to assay data.</i></li> </ul>	<ul style="list-style-type: none"> <li>• All assay data was delivered in both csv and pdf format from ALS.</li> <li>• Data was manually checked, and all QA/QC samples assessed for analytical precision and variance. The data was then entered into excel spreadsheets by Collerina Cobalt geologists, then validated and loaded into an Access database.</li> <li>• Electronic sample results were uploaded into a Dropbox project folder that can be accessed by permitted Company personnel.</li> <li>• Data is exported from Excel and Access into MapInfo &amp; GeoReka software for map-making and 3D modeling.</li> <li>• All electronic data is routinely backed up. No hard copy is retained.</li> </ul>
<p><i>Location of data points</i></p>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>Specification of the grid system used.</i></li> <li>• <i>Quality and adequacy of topographic control.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Individual drill hole collar locations were picked up by handheld Garmin GPSmap 64s, deemed accurate to within 5m.</li> <li>• The co-ordinates datum system used was GDA 94 for GIS purposes.</li> <li>• Topographic control was from Garmin GPSmap 64s. This is adequate for current requirements.</li> </ul>

<p><i>Dataspacing and distribution</i></p>	<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>• Drill holes spacing varied from 50m to 100m spacing.</li> <li>• Sample for assay were obtained from 2 meter composites of individual 1 metre samples.</li> </ul>
<p><i>Orientation of data in relation to geological structure</i></p>	<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>• There was no consideration given to sample collection relative to defined or inferred geological structures such as faults or lithological contacts. Sample collection was determined by vertical drilling of each 1 metre drilled.</li> <li>• Given that the material being sampled was laterite which predominately developed horizontally from the surface downward a vertical drilling orientation was deemed appropriate.</li> </ul>
<p><i>Sample security</i></p>	<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>• Rock chip samples were temporally stored at near site accommodation at then delivered by the company geologists to ALS Minerals Laboratory in Orange.</li> </ul>
<p><i>Audits or reviews</i></p>	<ul style="list-style-type: none"> <li>• <i>The results of any audits or reviews of sampling techniques and data.</i></li> </ul>	<ul style="list-style-type: none"> <li>• No reviews or audits have been conducted to this point.</li> </ul>

## 2. **Section 2 Reporting of Exploration Results**

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

Criteria	JORC Code explanation	Commentary
<i>Mineral tenement and landtenure status</i>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The Collerina mineral licence (~133 km<sup>2</sup>) is located approximately 40 kilometres south of Nyngan, NSW.</li> <li>• The tenement EL 6336 is held 100% by Collerina Cobalt Limited.</li> <li>• There is no known impediment to the company completing planned exploration within the tenement.</li> </ul>
<i>Exploration done by other parties</i>	<ul style="list-style-type: none"> <li>• <i>Acknowledgment and appraisal of exploration by other parties.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Collerina Cobalt Limited completed 2 previous drill programs to test for laterite-hosted Ni mineralisation.</li> <li>• This work culminated in the completion of a JORC compliant resource estimate in 2014.</li> </ul>
<i>Geology</i>	<ul style="list-style-type: none"> <li>• <i>Deposit type, geological setting and style of mineralisation.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Mineralisation targeted is hosted within lateritic serpentinite which to date is confined to linear, structurally-controlled belts characterised by a high-magnetic signature.</li> <li>• The Co-Ni mineralisation identified to date is contained within limonite and saprolite facies laterite.</li> <li>• Such mineralisation is typical of other laterite deposits within NSW.</li> </ul>
<i>Drill hole Information</i>	<ul style="list-style-type: none"> <li>• <i>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:</i> <ul style="list-style-type: none"> <li>• <i>easting and northing of the drill hole collar</i></li> <li>• <i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i></li> <li>• <i>dip and azimuth of the hole</i></li> <li>• <i>down hole length and interception depth</i></li> <li>• <i>hole length.</i></li> </ul> </li> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Drill collar coordinates for holes mentioned in this release are provided.</li> </ul>



<i>Data aggregation</i>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> <li>• <i>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.</i></li> <li>• <i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></li> </ul>	<ul style="list-style-type: none"> <li>• No cutting of reported Al, Co, Ni assays have been employed at this stage of exploration.</li> <li>• Reporting of significant assay intervals were determined utilising assay cut-offs of <math>\geq 5\%</math> Al, <math>\geq 0.05\%</math> Co and <math>\geq 0.5\%</math> Ni.</li> <li>• The use of these cut-offs is based on requirements for metallurgical testwork.</li> </ul>
<i>Mineralisation widths and intercept lengths</i>	<ul style="list-style-type: none"> <li>• <i>These relationships are particularly important in the reporting of Exploration Results.</i></li> <li>• <i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></li> <li>• <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</i></li> </ul>	<ul style="list-style-type: none"> <li>• The mineralisation is hosted within laterite facies host rock which is largely horizontal in nature. The Al-Co-Ni mineralisation appears to be confined to the same facies and is essentially stratabound in distribution.</li> <li>• No specific determination of 'true' thickness has been done.</li> </ul>
<i>Diagrams</i>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Plan maps and 3D models showing drill hole locations relative to interpreted geology and geophysics have been prepared. These are deemed sufficient to show areas of interest for exploration planning.</li> </ul>
<i>Balanced reporting</i>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Significant assay intervals using appropriate grade cut-offs have been reported.</li> <li>• Some attention was also given to the amount of internal waste (low-grade material between significant assays) however the nature of mining laterite and the requirement for blending to attain a desired bulk grade for processing makes a definite determination of waste very difficult at this point in the program.</li> </ul>

<p><i>Other substantive exploration data</i></p>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Metallurgical testwork was completed on an approximate 45kg sample of laterite. This sample was prepared from crushed and pulverised sample material that remained after initial sample assay preparation.</li> <li>• The metallurgical sample represented a composite of individual samples selected to meet leach test criteria. The chemical composition of the metallurgical sample was considered to be representative of the current JORC compliant resource.</li> <li>• Metallurgical testwork on one composite ore sample from Homeville demonstrated excellent extractions of cobalt (94%), nickel (90%) and aluminium (66%) via CCAL (counter-current atmospheric leaching).</li> </ul>
<p><i>Further work</i></p>	<ul style="list-style-type: none"> <li>• <i>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</i></li> <li>• <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Planned exploration by the Company includes additional exploration and resource delineation drilling.</li> <li>• Additional ground geophysics consisting of ground penetrating radar and EM surveys will be considered to define drill targets.</li> </ul>

Section 3 does not apply as resource estimates are not being disclosed at this time.

Section 4 does not apply as reserve estimates are not being disclosed at this time.

Section 5 does not apply as this section relates to the reporting of diamonds and other gemstones.