ABN 46 006 045 790

www.cullenresources.com.au

ASX Symbol: CUL 4 September 2014

# **EXPLORATION UPDATE**

#### **SUMMARY**

- Heritage survey completed over AK47 nickel sulphide prospect in preparation for new ground EM survey
- Compilation of geological and geophysical data highlights Central Ultramafic Package and its basal contact as the high priority target stratigraphy for nickel sulphide deposits
- Cullen's interpretation suggests AK47 prospect and Camelwood-Musket-Cannonball mineralisation, of Rox Resources Limited, are at similar stratigraphic positions some 25km apart
- Three ground EM surveys and downhole surveying is planned

# Mt Eureka Project

## 1. "AK47" - nickel sulphide prospect

## **Background**

Cullen Resources Limited (Cullen) has completed a review of all geological and geophysical data available for the "AK47" nickel sulphide prospect where drilling in 2002-2003 by the WMC - Cullen joint venture, intersected 0.2m of massive sulphide with 1.93% Ni, with 0.42% Cu and 0.7g/t Pt+Pd (GBD2). Re-interpretation of the prospect geology and geophysical data shows that previous drill testing may not have been conclusive and that significant potential remains for the presence of massive, primary nickel sulphide mineralisation down dip and along strike from the drilled nickel intersections. A ground EM survey has been designed over an area of 2x1km at the AK47 prospect, and further drilling, subject to all statutory approvals, will test any modeled conductors.

## **Geophysics Data**

Southern Geoscience Consultants (SGC) has reviewed all VTEM (airborne), MLTEM (moving loop) and DHTEM (down-hole) data for the AK47 prospect and has made the following observations and recommendations:

• The AK47 target was identified from MLTEM surveys completed in 2003. In-loop and slingram configuration data were acquired over lines 7058730mN, 7058830mN and 7058930mN. Modelling of the MLTEM data shows a narrow, east-dipping conductive zone.

**REGISTERED OFFICE**: Unit 4, 7 Hardy Street, South Perth WA 6151 **Telephone**: 089 474 5511; **FAX**: 089 474 5588

Contact: Dr Chris Ringrose, Managing Director; email: cringrose@cullenresources.com.au

- The conductor was drill tested in a series of 'fences' spaced 100m apart, namely: diamond drill holes GBD2 and GBD3 drilled on the central line, GBD4 and 5 to the south and GBD6 and 7 to the north.
- the (follow-up) 2005 MLTEM data is of poor quality and is not considered reliable for testing the mineralised structure/horizon at deeper levels.
- The 2003 Fugro data detected a low-level conductive response on the eastern end of the line 7057400mN (353800mE to 353900mE) that cannot be seen in the 2005 data. This anomaly is of significance because it is located along the same horizon as AK47 and within the interpreted ultramafic sequence. It is possible that it represents an off-line response from the edge of a conductor and should be followed up.
- The DHTEM surveying completed in GBD 2 to 7 is only suitable for testing for conductors that are reasonably close to the drill hole. There is no effective reconnaissance DHTEM surveying down dip/plunge or along strike.
- A new ground EM survey is recommended which will extend coverage to the east to test for deeper mineralisation down dip/plunge from AK47(see Figure below). The effective penetration of modern day survey equipment is greater than that of the older systems due to higher signal levels, more sensitive sensors and higher resolution receivers. The higher power transmitters result in greater depth of penetration of the primary field (because of the stronger EM signal) and an increased signal to noise ratio (environmental noise being independent of the transmitter power) which effectively increases the depth of investigation. The high resolution receivers are better able to sample the analogue signal at very low signal levels (this accommodates the low noise levels in the sensors). The net effect of more power and less noise is deeper penetration.

# 2. "A3" - nickel sulphide target area

#### Compilation and review of geophysical data(SGC)

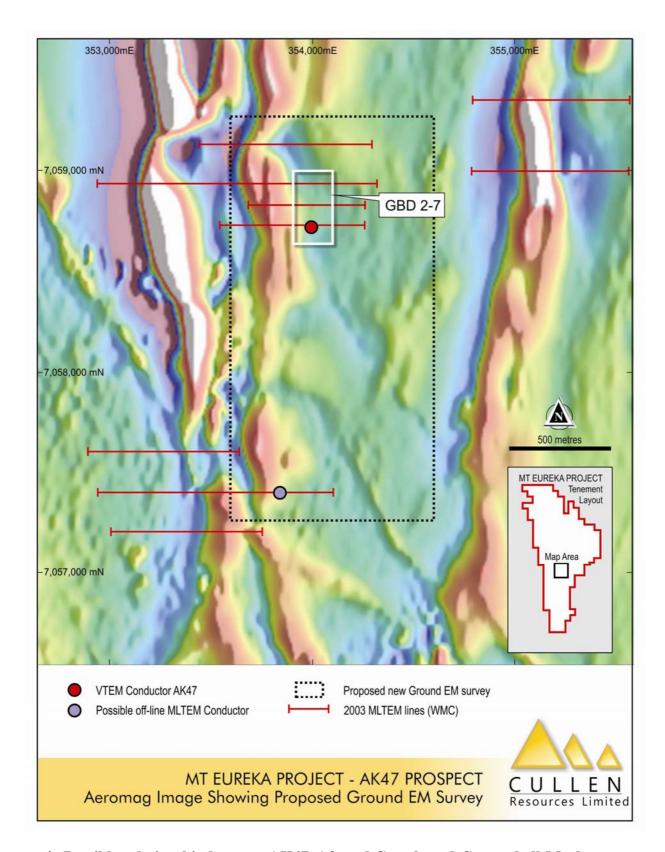
The EM data for line 7051680mN, from a FUGRO 2003 MLTEM survey undertaken by WMC – Cullen JV, shows an east dipping conductor centred on 354550mE. The response is from a genuine bedrock conductor which has not been closed off along strike or drill tested. It is possible that the "A3" anomaly is associated with a discrete sulphide body and follow-up is recommended.

A comparison with the VTEM data shows that the A3 anomaly is offset to the east from a stratigraphic conductor. The A3 anomaly however is not detected by the VTEM data (it could be too deep for the VTEM system to detect).

A ground EM survey is proposed for the A3 prospect area.

## 3. Irwin Well - nickel sulphide target area

The Central Ultramafic Packge in Cullen's ground near the southern boundary of the Mt Eureka project, has aslo been selected for further ground EM surveying. The base of the ultramafics in this area is in contact with thin BIFs and on strike from a set of VTEM and ground EM anomalies (from previous surveying). An extension of previous ground EM surveying, to the north is planned.



## 4. Possible relationship between AK47, A3, and Camelwood-Cannonball-Musket

Cullen's interpretation of available geological maps and geophysical data for the Mt Eureka greenstone belt, including the Camelwood-Cannonball-Musket area, suggests that the Central Ultramafic Package, as named by Cullen for part of the stratigraphy in its project area, is the prime setting for nickel sulphide deposits in the belt.

This interpretation suggests that a number of the belt's known nickel sulphide prospects and deposits, including AK47 and Camelwood-Cannonball-Musket, occur at the base of this ultramafic package. The interpretation advocates the presence of north west-south east faulting, just north west of Camelwood, and strike-persistent, north-south trending faults/shears, which truncate a section of lowermost greenstone belt stratigraphy, seen only in Cullen's project area, immediately north of Camelwood. Cullen's lowermost greenstone belt stratigraphy is characterised by a very thick, highly magnetic basal BIF unit, which is quite distinct from the magnetic response of the thinner BIF's that occur around Camelwood. It is possible that the Camelwood ultramafic has thermally eroded into a relatively thin footwall BIF.

Using this model, Cullen will focus further exploration on the Central Ultramafic Package, especially the base and where BIF is missing or eroded. Due to lack of outcrop, mapping of such windows is difficult, and EM conductors detected by ground surveying the Central Ultramafic package offer the best vectors to possible nickel sulphide mineralisation.

Three areas have been selected for ground EM survey - AK47, A3 and Irwin Well (see following Figure).

## 5. Results of July RC drilling programme

Cullen reported the visual results of samples from an RC drilling programme ( 9 holes for 1502m, MERC 126-134, and deppening of MERC 121) in its Quarterly Report of 30 July 2014.

All assays for 5-m composite samples from this reported drilling have now been received. The results show low Ni and Cu concentrations (maxima 2334ppm and 637ppm respectively), confirming visual characterisation of sulphides as pyrite and pyrrhotite. Elevated Cu concentrations are associated with mafic lithology whilst ultramafic units with elevated Ni show low or very low Cu (less than 100ppb).

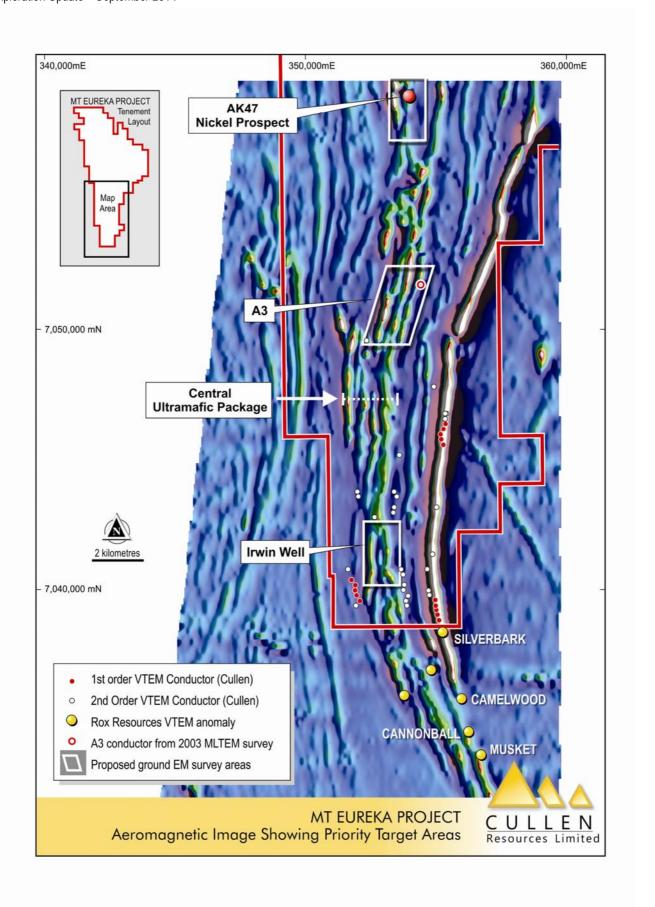
The maximum gold result is 310ppb in meta-sediment in a 5m composite sample in MERC129 (105-110m).

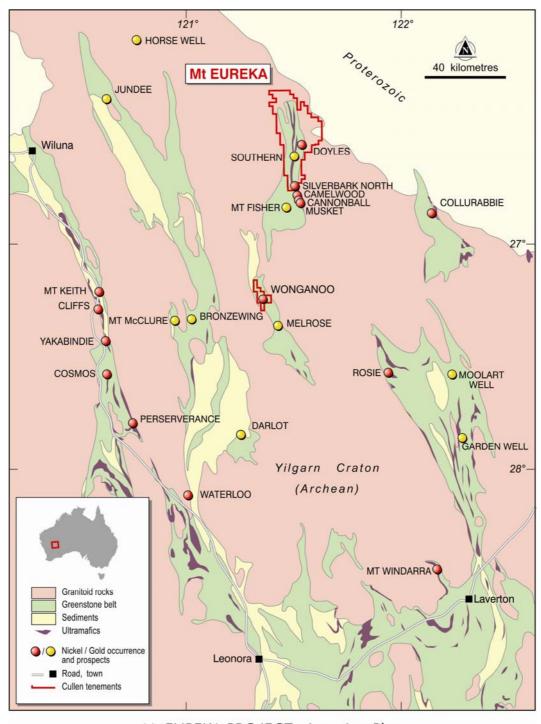
Downhole surveying planned for holes: MERC 128,126,124 and 103.

# Minter tungsten prospect, E6572, N.S.W.

Cullen has been successful in its application to the NSW Trade and Investment, Regional Infrastructure and Services Department , for a grant of funds under the New Frontiers Cooperation Drilling Program.

Cullen has been awarded \$36,250 towards a diamond and RC drilling program it has proposed to test its Doyenwae and Orr Trigg prospects at Minter.





Mt EUREKA PROJECT - Location Plan

#### **Competent Person Statement**

The information in this report that relates to exploration activities and results is based on information compiled by Dr Chris Ringrose, Managing Director, Cullen Resources Limited who is a Member of the Australasian Institute of Mining and Metallurgy. Dr. Ringrose is a full-time employee of Cullen Resources Limited. He has sufficient experience which is relevant to the style of mineralisation and types of deposits under consideration, and to the activity which has been undertaken, to qualify as a Competent Person as defined by the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Dr. Ringrose consents to the report being issued in the form and context in which it appears.

**REGISTERED OFFICE**: Unit 4, 7 Hardy Street, South Perth WA 6151 **Telephone**: 089 474 5511; **FAX**: 089 474 5588

Contact: Dr Chris Ringrose, Managing Director; email: cringrose@cullenresources.com.au

<sup>\*</sup> Mt Eureka Project – ELs 53/1299, 1300, 1209, 1630,1635,1637,1611 - Cullen 100%

# Data description as required by the 2012 JORC Code - Section 1 and Section 2 of Table 1 $\,$

Section 1 Sampling techniques and data			
Criteria	JORC Code explanation	Comments re RC drilling programme	
Sampling technique	Nature and quality of sampling (egg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was by reverse circulation (RC) drilling testing individual EM conductors and geological targets. Nine RC holes were drilled and one previously drilled hole was deepened for a total of 1502m.	
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used	The collar positions were located using a handheld GPS with an approximate accuracy of ±3m; down-hole surveys were completed.	
	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 1m samples from which 3kg was pulverised to produce a 30g 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.	RC drilling was used to obtain one metre samples from which a 3-4kg sub-sample was taken using a cone splitter. The sub-sample together with the remainder of the 1-m sample was placed on the ground. From each drill spoil pile, a c. 400g sample was then collected using a scoop; five of such 1-m samples were combined into one composite sample. The composite samples (2-3kg) were sent to an accredited Perth laboratory for analysis.	
Drilling technique	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.).	Drilling was by reverse circulation using a 140mm diameter face-sampling hammer bit.	
Drill Sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed	Sample recovery was assessed visually and the recovery recorded. The samples were generally dry or damp, and showed little (<10%) variation in volume.	
	Measurements taken to maximise sample recovery and ensure representative nature of the samples.	The samples were visually checked for recovery, contamination and water content; the results were recorded on spread sheets. Cyclone, splitter and buckets were cleaned regularly and thoroughly (between rod changes and after completion of each drill hole) to avoid cross contamination.	
	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.	The holes were kept dry and within the targeted zones, there was no significant loss/gain of material introducing a sample bias.	

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.	All samples were logged by a geologist in order to provide a geological framework for the interpretation of the analytical data.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel etc.) photography.	Logging of rock chips was qualitative (lithology, type of mineralization) and semi-quantitative (visual estimation of sulphide content, quartz veining, alteration etc.).
	The total length and percentage of the relevant intersections logged	All drill holes were logged in full.
Sub- sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Not applicable - no core taken
	If non-core, whether riffles, tube sampled, rotary split, etc. and whether sampled wet or dry.	One-metre samples were split dry using a cone splitter attached to the drill rig. Composite samples were taken using a sampling scoop.
	For all sample types, quality and appropriateness of the sample preparation technique.	All samples are pulverised using Essa LM1, LM2 or LM5 grinding mills determined by the size of the sample. Dry crushed or fine samples are pulverized to produce a homogenous and representative sub-sample for analysis. A grind quality target of 85% passing 75µm is established and is relative to sample size, type and hardness. However the nature (hardness) of some samples is such that this may not always be achievable using standard preparation protocols. In such case an additional 2nd stage grinding is applied where a sub split is taken and further ground to ensure the assay pulp passes QC. In extreme cases, 85% passing 75 micron may not be achievable and thus cannot be guaranteed for all samples. Low chrome steel bowls are used for pulverising which could impart trace levels of contaminants such as Cr, Fe and Mo.
	all sub-sampling stages to maximise representivity of samples.	inserted by the laboratory and reported in the final assay report.
	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.	For quality control of the field sampling, duplicate samples of the 5-m composites are taken at the rate of 1 per 20.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The sample size is considered appropriate for the purpose of this drilling programme, which is exploratory and primarily aimed at establishing the presence of mineralisation.
	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	For all 5-m composite samples, a 10g aliquot is digested using aqua regia. Analysis for gold is by AAS; Cu and Ni are analysed using ICP-OES. The aqua regia digestion is considered partial depending on the host of the elements analyzed, but does provide an acceptable level of accuracy for an initial assessment of the contained target elements.

	For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the	Not applicable, no geophysical parameters reported.
	analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	
Quality of assay data and laboratory tests	Nature of quality control procedures adopted (egg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	International standards, blanks and duplicates are inserted by the laboratory.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Cullen staff has visually inspected the samples and sampling procedures.
	The use of twinned holes	No twinned holes drilled to date
	Documentation of primary data, data entry procedures, data verification, data storage (physically and electronic) protocols.	All primary geological data are recorded manually on log sheets and transferred into digital format.
	Discuss any adjustment to assay data.	No adjustments are made to assay data other than the replacement of 'less than detection limit' with a value of half of the respective detection limit.
Location of data points	Accuracy and quality of surveys used to locate drill holes (collar and downhole surveys), trenches, mine workings and other locations used in Mineral Resources estimation.	All drill collar surveys are by handheld GPS. Several measurements (2-3) at different times are averaged; the estimated error is $\pm 3$ m.
	Specification of the grid system used.	The grid coordinates for the Silverbark North and Doyle's targets are in GDA94, Zone 51
_	Quality and adequacy of topographic control.	There is currently no topographic control and the RL is a nominal 500m for all drill holes.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	The drilling tested geological and geophysical targets, several kilometers apart. Some of the targets were tested by a single hole others were drilled along a traverse with holes spaced 20-80m apart.
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Reserve and Ore Re4serve estimation procedure(s) and classifications applied.	The drilling was exploratory and not designed to satisfy requirements for mineral reserve estimations.
	Whether sample compositing has been applied.	The drill spoil generated by the RC drilling was composited into one metre intervals.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The drilling is exploratory only and designed to test geophysical and geological targets for the presence of nickel mineralisation at depth. The drill orientation was generally to the west (257 or 270 degrees) and at an angle of -60 degrees with the exception of MERC133 which targeted a magnetic high east of Doyles at a dip of -90 degrees. No visible Ni sulphide mineralisation was encountered and hence it is unclear whether the sampling is unbiased or not.

	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	The exact dip of the mineralization related to geophysical modeling has not been established yet (single holes only) but based on the geophysical modeled plates it is likely that the drilled intersections overestimate the true thickness of any intersected geological unit and related mineralization.
Sample security	The measures taken to ensure sample security.	All samples are handled, transported and delivered to the laboratory by Cullen staff or Cullen contractors. All samples were accounted for.
Audits or reviews	The results of and audits or reviews of sampling techniques and data.	No audits or reviews of sampling techniques and data have been conducted to date.
Teviews		of exploration results
Mineral tenements and land tenure status	Type, reference name/number, locat and ownership including agreements material issues with third parties such joint ventures, partnerships, overrid royalties, native title interest, historisites, wilderness or national park a environmental settings.  The security of the tenure held at the tit of reporting along with any kno	or & 4), E53/1299 (Doyles) and E53/1637 (Silverbark North Targets 2 & 3)) which are all 100% owned by Cullen Resources Limited. Cullen has signed an agreement with Central Desert on behalf of the Wiluna traditional owners who have native title over the respective areas. All drill sites and access tracks were cleared by the traditional owners prior to commencement of ground-disturbing activities. There are no particular environmental settings.
Exploration done by other parties	impediments to obtaining a licence operate in the area.  Acknowledgement and appraisal	
Geology	Deposit type, geological settings and st of mineralisation.	
Drill hole information	A summary of all information mate for the understanding of the explorat results including a tabulation of following information for all Mate drill holes:	rial on the
	Easting and northing of the drill h collar      Elevation or RL (Reduced levelustion above sea level in metres) at the drill hole collar      Dip and azimuth of the hole	ending 30 June 2014
	· Down hole length and intercept depth	ion
	Hole length  If the exclusion of this information justified on the basis that the informat is not Material and this exclusion does detract from the understanding of report, the Competent Person sho clearly explain why this is the case.	ending 30 June 2014

Data aggregation methods	In reporting Exploration results, weighing 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.	No averaging or weighing, or grade truncations applied.
	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.	No aggregate intercepts reported.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents used.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results.	Drilling was at 60-90 degree angles to test geophysical target plates derived from EM ground surveys and prospective geological settings. The stratigraphy encountered in drilling is variably dipping to the east and any mineralisation intercepts are likely to overstate the true width of mineralisation.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	The exact geometry of the mineralisation is not known yet.
	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')	Not applicable - no mineralized intervals reported.
Diagrams	Appropriate maps and sections (with scales) and tabulations of intercepts would 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	See maps and table attached to Quarterly Report for period ending 30 June 2014
Balanced reporting		Not applicable – no specific exploration results reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations, geophysical survey results, geochemical survey results, bulk samples — size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or containing substances.	There are currently no other exploration data that appear meaningful in the context of the reported results.
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).	Further work, including RC drilling, and ground and down-hole geophysical surveys, is planned.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, providing this information is not commercially sensitive.	See figures attached to Quarterly Report for period ending 30 June 2014