RESOURCE UPDATE POINTS TO NEW EARAHEEDY MANGANESE RESOURCE EXTENSION TARGETS

Zenith Minerals Limited
ABN 96 119 397 938

September 9th, 2014

HIGHLIGHTS

- **Updated mineral resource for Red Lake Manganese Prospect**
  - Additional drilling, revised geological interpretation and new density data leads to greater tonnes and higher manganese grades in high-grade core of the deposit.
  - 50% more tonnes and 10% higher manganese grade at a 25%Mn cut-off.

- **Resource Extension Targets**
  - Newly identified fault zone coincident with higher-grade manganese zone (500k tonnes @ 25.1% Mn).
  - Fault zone identified in detailed aeromagnetic survey data.
  - Higher-grade manganese zone open to northwest and southeast is now a priority drill target.

The Company is pleased to report an updated resource for its 100% owned Red Lake manganese deposit, one of 7 manganese ("Mn") prospects within its extensive Earaheedy Project landholdings, in Western Australia.

The resource was updated for compliance with the 2012 JORC Code, and to incorporate: results from the November 2013 aircore drilling program, new density data and the Company's new geological interpretation.

The new geological model includes a north-west trending fault zone that is interpreted to control the thicker and higher grade portions of the Red Lake manganese deposit. The recognition of this fault as an important control on Mn mineralisation is a major breakthrough in the geological understanding of the Red Lake deposit and opens up a high potential resource extension target. The fault is coincident with an aeromagnetic low that extends well beyond the current limit of drilling - this area is now a priority target for follow-up.

Planning is underway for drill testing of the Red Lake resource extension target, as well as the newly discovered Bluegrass and Blue Elbow manganese prospects located approximately 50km to the north of Red Lake. Recent rock chip sampling at Bluegrass returned up to 48.1% Mn (ASX Release dated 12th August 2014).

Activities

Exploration/Development

- Earaheedy Manganese
- Kavaklitepe Gold
- Develin Creek Copper-Zinc
- My Minnie Gold
- Mt Alexander Magnetite Iron

Details as at June 2014

Issued Shares	113.1 m
Unlisted options	1.1 m
Mkt. Cap. ($0.10)	A$ 11m
Cash Jun 14	A$1.1m
Debt	Nil

Directors

Michael Clifford:
Managing Director
Mike Joyce:
Non Exec Chairman
Stan Macdonald:
Non Exec Director
Julian Goldsworthy:
Non Exec Director

Major Shareholders

HSBC Custod. Nom	9.3 %
Giralia (Atlas Iron)	9.1%
Miquilini	5.3%
Tilbrook/Grey Willow	5.3%
Nada Granich	4.8%
Yandal Inv. PL	3.0%

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Resource Extension Targets

Re-interpretation of the geology of the Red Lake Manganese Deposit has resulted in identification of a new fault that controls the location of the high-grade manganese zones. The recognition of this fault as an important control on high-grade manganese mineralisation opens up a high potential resource extension target to the northwest and southeast of the existing Red Lake resource (Figure 1). The newly identified zone is now a priority target for follow-up (Figure 2).

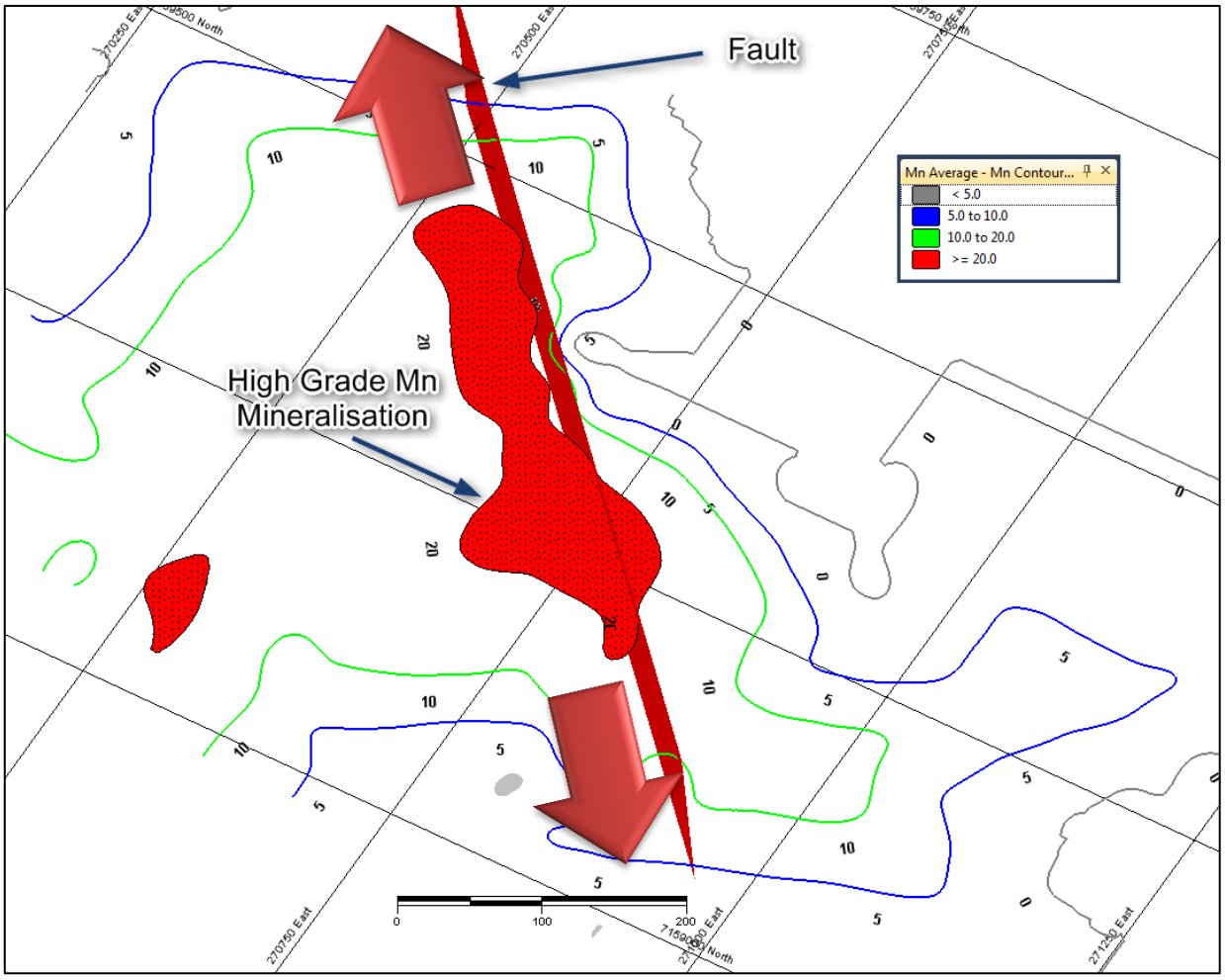

Figure 1: Red Lake Manganese Deposit with Resource Extension Targets (red arrows) - 3D view looking north, (red, green and blue contours show average Mn grades of >20%, >10% and >5% respectively)

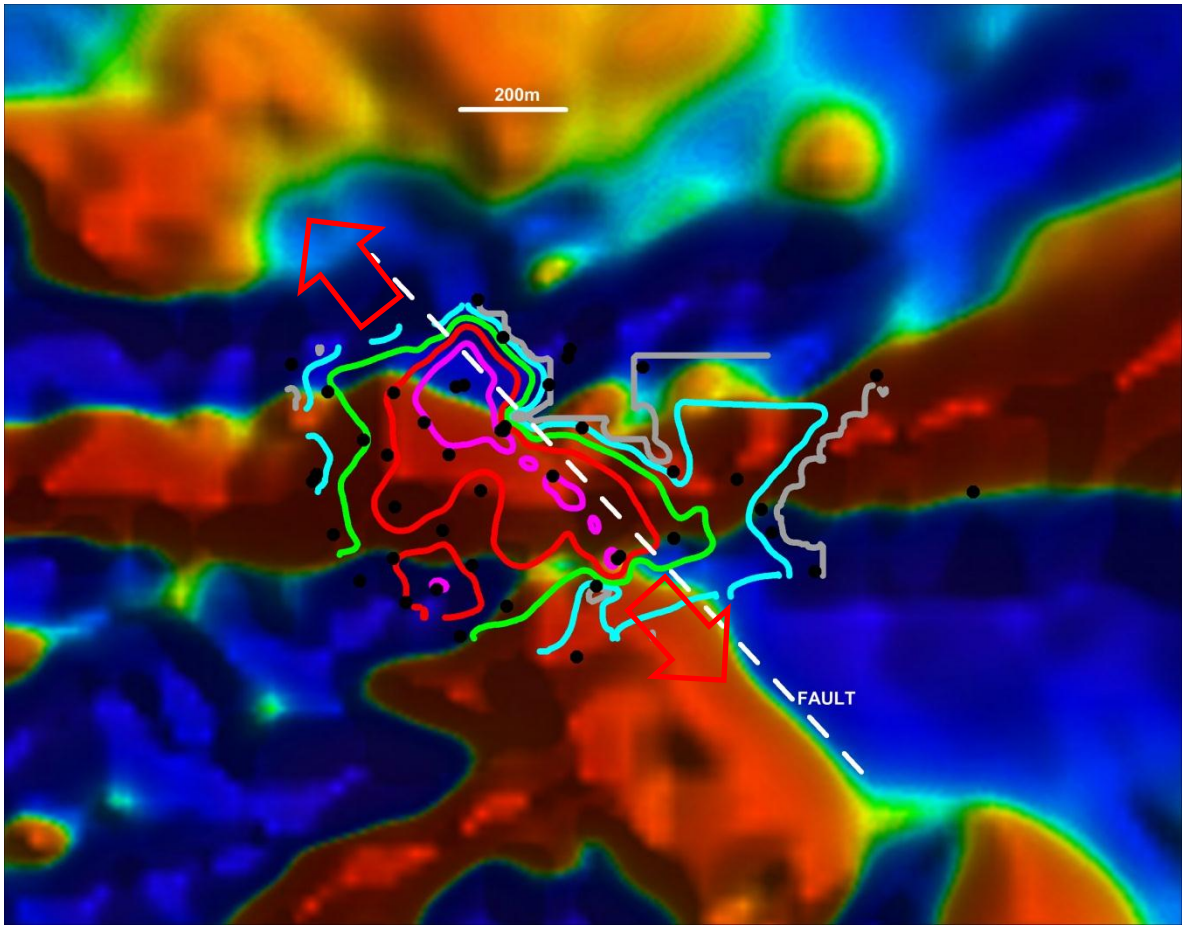

Figure 2: Red Lake Manganese Deposit Mn Metal Contours (Purple >100m%Mn, Red > 50m%Mn, Green >20m%Mn and Blue >5m%Mn) with Resource Extension Targets (red arrows) – Overlying Aeromagnetic Image

Resource Update

The updated mineral resource estimate for the Red Lake prospect is: 1.4Mt @ 19.0%Mn at a 10% Mn cut-off grade with a higher grade component of 0.2Mt @ 30.0% Mn at a 25% Mn cut-off grade as presented in Table 1.

The resource is classified under the JORC Code 2012 as Inferred, based on confidence in, and continuity of, the results from the drilling campaigns, and surface mapping. Details of the estimate are included in the attached JORC Code Reporting Criteria Tables 1 - 3.

Table 1: Mineral Resource estimate results for Red Lake Prospect.

Red Lake Mn Mineral Resource estimate as at August 2014									
Classification	**Reporting Cut-off Grade**	**Tonnes (Mt)**	**Mn %**	**Fe %**	**Si %**	**Al_2O_3 %**	**P %**	**S %**	**LOI %**
Inferred	25% Mn	0.2	30.0	14.1	13.85	7.9	0.24	0.03	12.1
	20% Mn	0.5	25.1	16.1	17.0	8.9	0.25	0.06	11.9
	15% Mn	1.1	20.8	17.7	20.5	9.3	0.24	0.17	11.5
	10% Mn	1.4	19.0	19.1	20.8	9.6	0.26	0.19	11.4

Note: The CSA Mineral Resource was estimated within constraining wireframe solids based on the specified nominal lower cut-off grade for Mn. The Mineral Resource is quoted from all blocks above the specified Mn cut-off grade %. Differences may occur due to rounding.

Figure 3 below shows the Red Lake manganese resource adjacent to the newly recognised fault zone, whilst Figure 4 highlights the flat lying, near surface, continuous nature of the Red Lake manganese mineralisation.

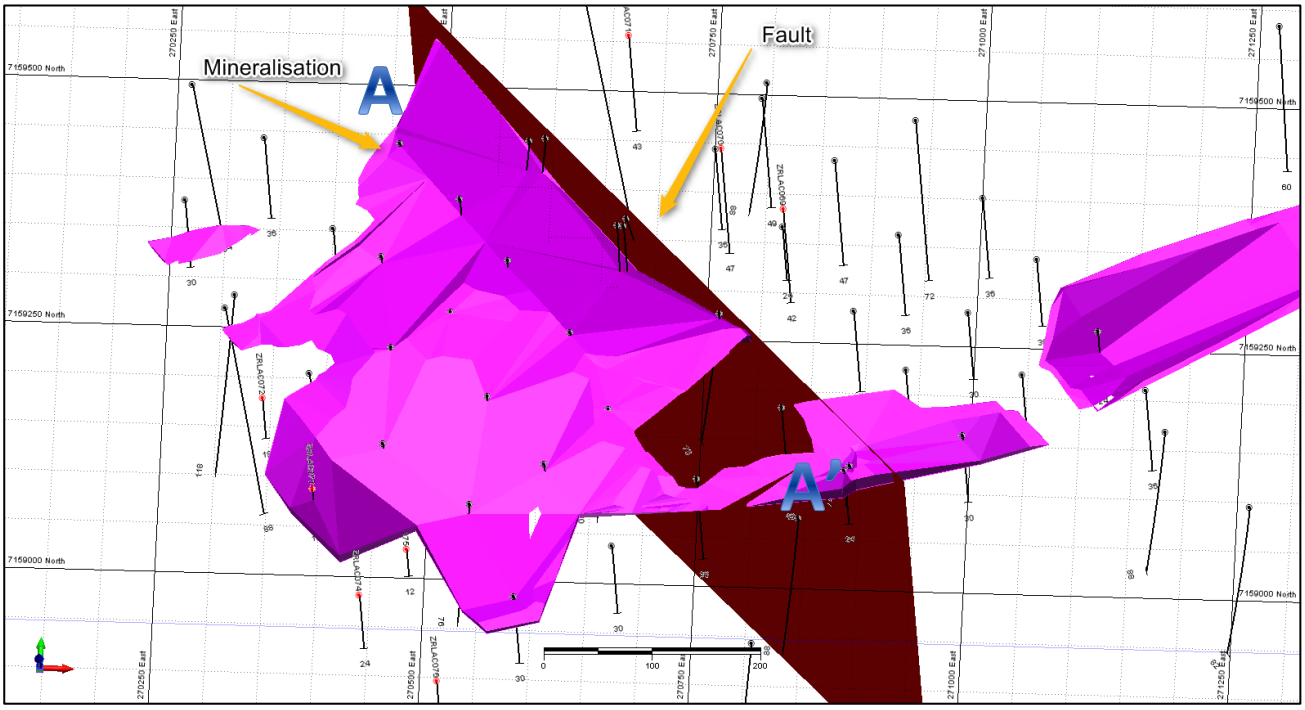

Figure 3: Red Lake Resource 3D Wireframes (purple), Fault (maroon-red) and drill traces (black)

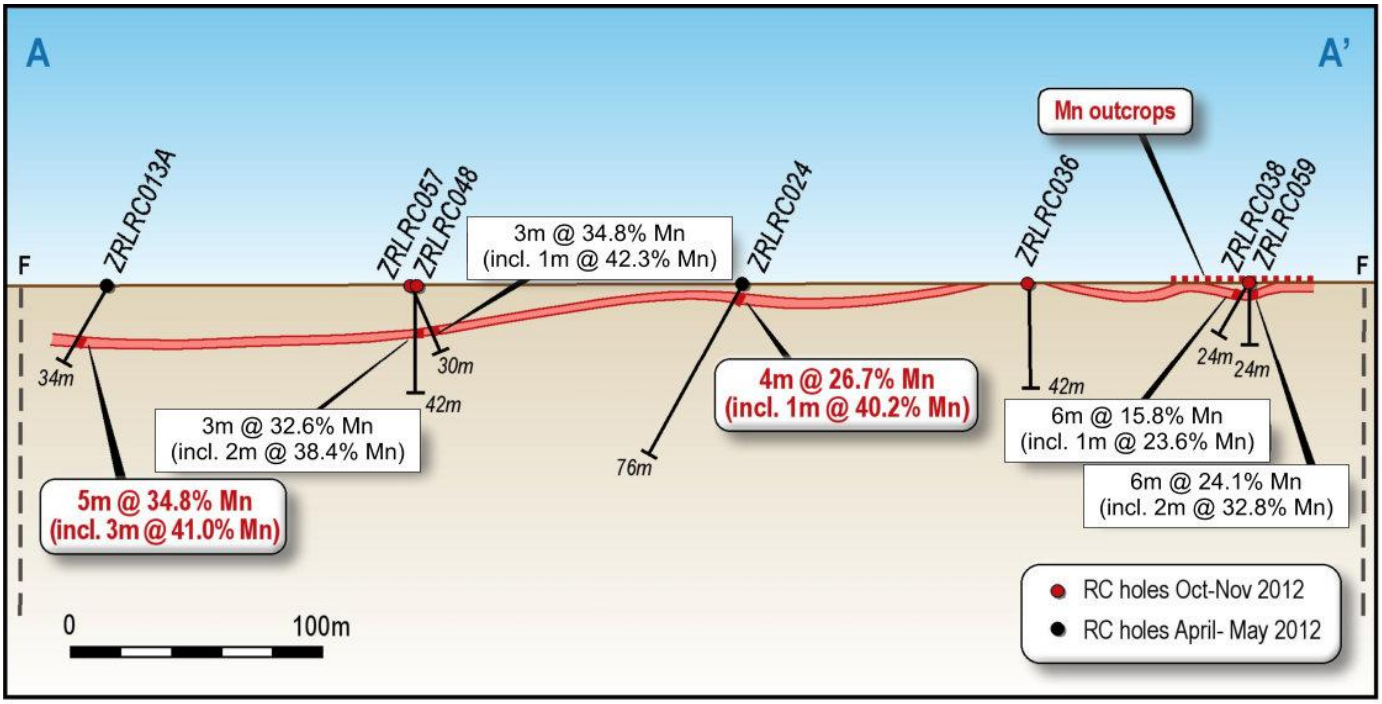

Figure 4: Red Lake Resource Cross Section (annotated with significant Mn intercepts)

Forward Program

The Company is planning for drill testing of the Red Lake resource extension target as well as the newly discovered Bluegrass and Blue Elbow manganese prospects, located approximately 50km to the north.

A detailed review of airborne electromagnetic (VTEM) survey data that was acquired as part of the acquisition of Rio Tinto's licences is also underway by the Company's geophysical consultants. Preliminary indications are that there appear to be EM responses coincident with the known manganese prospects and that the VTEM system, which is significantly more powerful than the airborne EM system previously flown over Zenith's Lockeridge manganese prospect, may provide a direct detection technique that Zenith can use to assist in targeting manganese within its extensive highly prospective landholdings. Further details will be provided once the geophysical review has been completed.

BACKGROUND

Zenith was the first mover for manganese in the Proterozoic aged Earaheedy Basin in Western Australia, and has discovered and drill tested several zones of near surface manganese oxide. In 2012 the Company reported the first potential direct shipping ore ("DSO") grade manganese drill intersections in the Earaheedy Basin and in April 2013 completed a maiden JORC Inferred Resource at the Red Lake deposit, as well as preliminary metallurgical work.

The Proterozoic aged Earaheedy Basin north of Wiluna in WA is a potential new manganese province with similarities to the giant Kalahari manganese field in South Africa. As first mover Zenith established a strong land position with tenements covering ~75 strike km of prospective stratigraphy, subsequently extended to ~130km with the recently acquisition of Rio Tinto's Earaheedy tenements (Figure **5**), where recent initial reconnaissance surveying and rock chip sampling identified two new manganese prospects Bluegrass and Blue Elbow with assays up to 48.1%Mn. Zenith's priority target is high-grade (>40% Mn) manganese oxide formed by weathering or supergene upgrade of primary carbonate manganese.

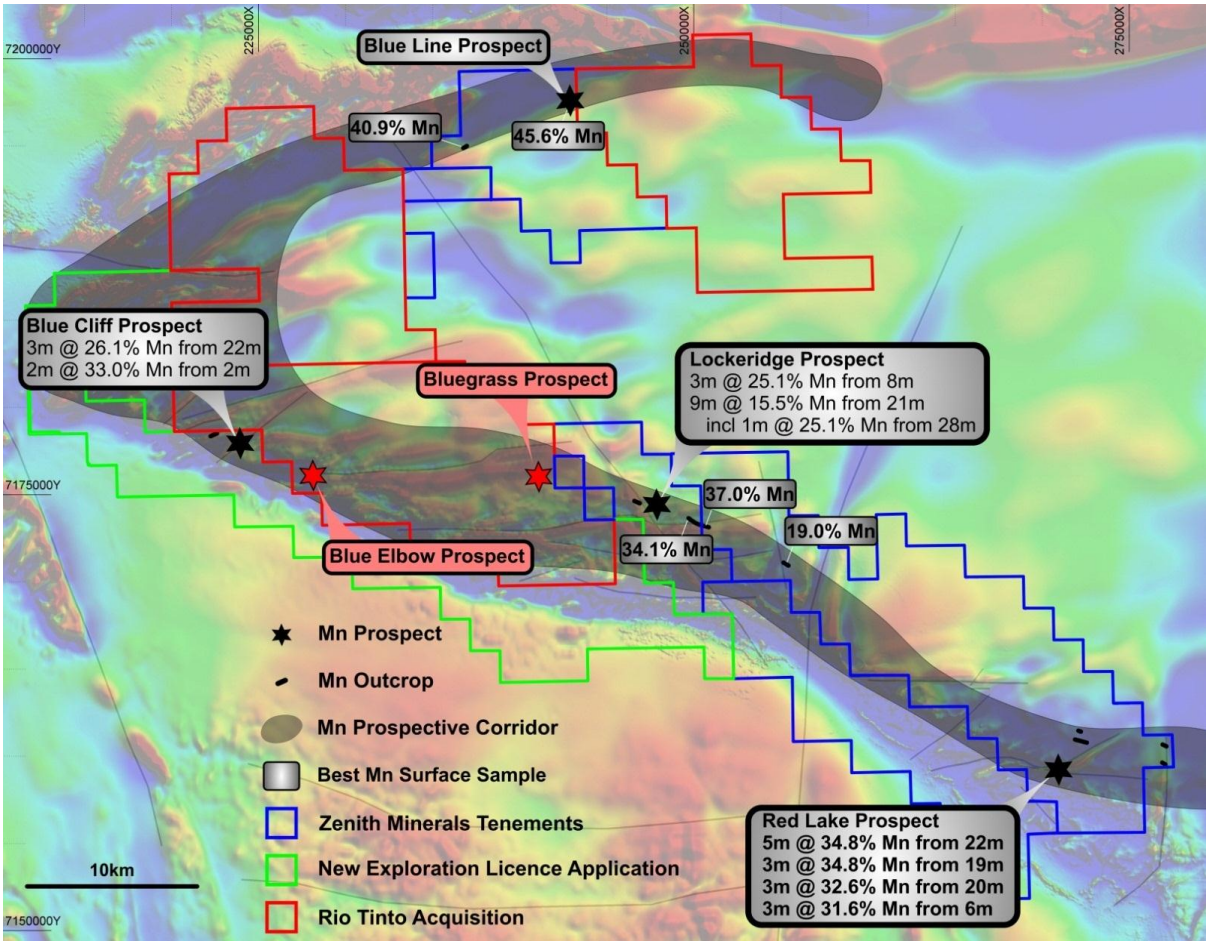

Figure 5: Earaheedy Project – Tenure and Prospects

Zenith completed the first ever drilling for manganese in the western Earaheedy in late 2010 at the Lockeridge prospect, intersecting a shallow dipping bed of manganese mineralisation extending from surface to 1.2km down dip. Better results from Lockeridge include 12m @ 11.1% Mn from 28m depth, and 3m @ 18.0% Mn from 37m depth. Subsequent drilling returned thick zones of manganese oxide at the Black and Blue prospect; 31m @ 7.9% Mn from surface, incl. 2m @ 17.1 %Mn, 1m @ 22% & 3m @ 14.3 %Mn.

The first DSO grade Mn drill intersections recorded in the Earaheedy Basin were reported by Zenith in 2012 at the Red Lake prospect. Drilling results include; 3m @ 41% Mn (within 5m @ 34.8% Mn from 22m depth), and **3 metres @ 34.8% Mn from 19 metres (ZLRC057), including 1m @ 42.3% Mn.**

A maiden resource estimate for the Red Lake prospect was first reported to the ASX on 9 April 2013. This resource has now been updated based on a revised geological interpretation and is now reported under the JORC Code 2012 as per the Resources sections in this ASX release.

Zenith's priority target in the Earaheedy Basin is high-grade near surface direct shipping (DSO) manganese. In addition to the high-grade DSO manganese intersected in Zenith drilling to date, screening and metallurgical testwork by Zenith shows potential to significantly upgrade the lower grade manganese horizons and further testwork is planned on coarser sample sizes that will better represent manganese material that may be mined.

The Earaheedy project also includes a 30 km long zone of carbonate-hosted zinc (Zn) and lead (Pb) mineralisation in the Yelma Formation at the base of the Earaheedy Basin stratigraphy. Broadly spaced drilling by RGC Exploration from 1992 to 1996 defined several prospects containing drill intersections of oxidised and primary Zn-Pb mineralisation, including;

- Navajoh: 7.3 m @ 6.1 % Zn, 0.77% Pb (incl. 3.3 m @ 11.2% Zn, and 0.93% Pb)
- Magazine: 5 m @ 5.6% Zn +Pb (incl. 2 m @ 8.2% Zn, 2.8% Pb)
- Chinook: 6 metres @ 3.63% Pb +Zn.

The information in this report that relates to Exploration Results is based on information compiled by Mr Michael Clifford, who is a Member of the Australian Institute of Geoscientists Mr Clifford 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 Clifford consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. The information relating to the Cazaly Resources Blue Cliffs drilling results was prepared and first disclosed to ASX on 27 July 2012 under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported. The Company has advised that it is not aware of any new information or data that materially affects the information included in the 27 July 2012 market announcement, and that all material assumptions and technical parameters underpinning the Exploration results in the 27 July 2012 market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in this report that relates to Mineral Resources is based on information compiled by Mr Dmitry Pertel, a Competent Person who is a fulltime employee of CSA Global Pty Ltd and a member of the Australian Institute of Geoscientists (AIG). Mr Pertel has sufficient experience 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 Mineral Resources and Ore Reserves". Mr Pertel consents to the inclusion of such information in this report in the form and context in which it appears.

About Zenith

Zenith is advancing its project portfolio of high-quality, gold, base metal and manganese projects whilst building a superior project base of high-quality advanced exploration assets:

Kavaklitepe Gold Project, Turkey (ZNC earning 70%)

- Recent (2013) grass roots gold discovery in Tethyan Belt – ("elephant" terrain)
- Large, virtually drill-ready, high order gold soil / IP anomaly >1km strike
    - Trenching and drilling (permitting in progress)

Develin Creek Copper-Zinc-Silver-Gold, QLD (ZNC initial 51%, option for 100%)

- 3 known VHMS massive sulphide deposits with JORC resources, 50km of strike of host volcanics
- 2011 drilling outside resource; 13.5 metres @ 3.3% copper, 4.0% zinc, 30g/t silver and 0.4g/t gold
    - Drilling to extend known deposits, geophysics, geochemistry to detect new targets

Mt Minnie Gold Project, WA (ZNC 100%)

- 75km strike of major regional fault. Alteration, geochemistry, rock samples 64.2 and 21.5 g/t Au
    - Initial field assessment to follow-up and extend known prospects

Earaheedy Manganese (and Pb,Zn) Project, WA (ZNC 100%)

- New manganese province discovered by ZNC, potential DSO drill intersections (+40%Mn)
- Target area doubled with new acquisitions (RIO tenements, Blue Cliffs).
    - Mapping, sampling, drilling new ground, beneficiation tests, assess geophysical techniques

Mt Alexander Iron Ore, WA (ZNC 100%)

- JORC magnetite Resource 535 Mt @ 30.0% Fe close to West Pilbara coast, 50% of target untested.
    - Seeking development partner/ buyer for project

Other

- Divesting Indonesian coal project – Conditional offer received, US$500K +royalty US$1/t
- Evaluating new project opportunities (acquire at bottom of the cycle)

Zenith Minerals Limited

9th September 2014

For further information contact;

Directors Michael Clifford or Mike Joyce

Phone 08 9226 1110

JORC Code Reporting Criteria (Table 1)

1.1 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 (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.*	*The deposit was sampled using Reverse Circulation (RC) drill holes over two drilling campaigns and aircore during one campaign with a nominal 100m x 100m grid spacing over the Mn mineralised zone of interest. 70 RC and 10 aircore holes were drilled for a total of 4,470m (4,092m RC, 378m aircore) in the prospect area. 7 of the RC holes for 750m were drilled to test for potential Fe mineralisation to the west of the Mn mineralised area, whereas 2 aircore holes were drilled form Mn to the west of the mineralised area. The majority of the holes were drilled vertically, with the remainder drilled dipping at approximately 60^{o} mostly towards the north west or south east.*
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	*RC samples were collected by means of a cone or riffle splitter. Aircore samples were speared from piles on the ground. Appropriate QAQC protocols were followed, including submission of field duplicates and insertion of commercial standards.*
	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 (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.	*The RC samples collected averaged about 3kg after passing through a riffle or rotary cone splitter at 1m intervals, whereas aircore samples were collected with a spear and averaged about 2-3kg. Mineralised samples were kept as 1m samples, whereas non-mineralised samples were made into 2 or 4 m composites using a spear. Samples were dispatched to SGS Laboratories (Perth) where they were dried and pulverised to a nominal 75µm and assayed by means of X-Ray Fluorescence (XRF)*
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).*	*RC drilling used 5 ½ inch diameter face sampling hammer with hole depths ranging from 10m to 148m. Aircore drilling used aircore blade, as well as aircore and RC face sampling hammer with hole depth ranging from 12 to 47m.*
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	*Sample recovery was visually assessed and was considered to be acceptable within the mineralised zones.*
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	*During the first drill programme, water injection was used in the transition between weathered clays and more competent rock near the standing water table (typically 25-35m depth) for the purpose of maximising sample recovery in that interval. A cyclone and splitter were used to provide a uniform sample and these were routinely cleaned. Aircore cyclone was routinely cleaned.*
	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.	*This will need to be assessed once additional work is done by means of diamond core twin drilling, but at this stage no significant bias is expected, and is not considered material at this stage of resource development.*

Criteria	JORC-Code Explanation	Commentary
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.*	*Detailed logging of drill chips was undertaken through the entire hole at 1m intervals, with record kept of colour, lithology, degree of oxidation, water table etc. The drill holes were relogged at a later date to ensure consistency between geologists and drill programmes. Chip trays have been stored in Perth for future reference.*
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	*The RC chip logging included records of lithology, oxidation state, colour, mineralisation, alteration and veins.*
	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.*	*No core drilling to date*
	If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	*RC samples were rotary and riffle split, aircore samples were collect with a spear. Most samples were dry to damp (near water table). Deeper samples outside the mineralisation zone were in places wet.*
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	*Sample prep was by drying, then pulverizing to 90% passing 75µm using a Labtech Essa LM5 pulveriser.*
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	*Field QAQC procedures included the insertion of field duplicates at the rate of roughly 2 duplicates per hole (about 1 every 26 samples), and commercial standards at a rate of roughly 1 standard per hole (about 1 per 29 samples) for RC. For aircore, one QAQC sample (alternatively field duplicate or standard) was introduced every 10 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.	*2 RC duplicate holes were drilled to test close range continuity of mineralisation and stratigraphy, and were drilled from the same pad as a vertical hole but dipping 60^{o} toward the north west and the south. The hole dipping to the south did demonstrate continuity but the hole dipping toward the north west failed to encounter any Mn oxides. Water injection was used in a hole to facilitate drilling through a clayey Mn zone and a duplicate hole was drilled off the same pad without water injection to ensure water injection would not be up or down grading the mineralisation. The results suggest that the geological variability outweighs any bias that may arise from the use of water injection.*
	Whether sample sizes are appropriate to the grain size of the material being sampled.	*Sample sizes are considered to be appropriate to accurately represent the Mn oxide mineralisation at Red Lake based on the thickness and consistency of the intersections, the sampling methodology and the percent value assay ranges for the primary elements.*
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.*	*The analytical technique used X-Ray fluorescence. Results provide the total contained amount of each element in the suite.*
	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.	*No geophysical tools were used to determine any element concentrations used in this resource estimate.*

Criteria	JORC-Code Explanation	Commentary
	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.	*Field QAQC procedures included the insertion of field duplicates at the rate of roughly 1 duplicate per 26 samples, and commercial standards at a rate of roughly 1 standard per 29 samples for RC and about 1 field duplicate or standard every 10 samples for aircore. Assay results from field duplicates, and standards have been satisfactory demonstrating acceptable levels of accuracy and precision. Pulp samples have been sent for umpire assay and returned satisfactory results. Internal laboratory duplicates, repeats and standards show acceptable repeatability and precision.*
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	*A CSA Global geologist was responsible for managing the infill drilling program under taken in late 2012. Duties included chip logging and management of sampling.*
	The use of twinned holes.	*2 RC duplicate holes were drilled to test close range continuity of mineralisation and stratigraphy, and were drilled from the same pad as a vertical hole but dipping 60^o toward the north west and the south. The hole dipping to the south did demonstrate continuity but the hole dipping toward the north west failed to encounter any Mn oxides. Water injection was used in a few holes to facilitate drilling through clay zones and a duplicate hole was drilled a few metres away from one of these holes without water injection to ensure water injection would not be up or down grading the mineralisation.*
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	*Field data were all recorded on hardcopies (geological logging, sampling intervals, using a set of standard Excel templates, then manually entered into excel spreadsheets. Data were then sent to Maxwell Geoservices for storage into a relational database. Assay files were sent to Maxwell Geoservices upon receival from the laboratories. Validation of data was performed by Maxwell Geoservices.*
	Discuss any adjustment to assay data.	*No adjustments were made, other than for values below the assay detection limit which have been entered as the negative of the detection limit*
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	*Drillhole collars were surveyed by handheld GPS with horizontal accuracies of about 5m.At the time of modelling the majority of the angled RC drill holes had a downhole survey point at the end of hole taken by means of a single shot Eastman camera tool by the drilling contractor. None of the vertical holes have had a downhole survey completed. Due to the shallow depth of the vertical drilling and the Mn mineralised zone of interest, no material effect on the interpreted mineralisation volume is expected by any possible deviation.*
	Specification of the grid system used.	*The grid system is MGA_GDA94 Zone 51*
	Quality and adequacy of topographic control.	*The topographic surface has been generated from 5m topographic contours obtained during an aeromagnetic survey completed in 2007 by Fugro. All collar locations have been picked up by means of hand held GPS with elevations corrected to the topographic surface. No material effect on total mineralised volume is expected due to the relatively flat lying mineralisation and topography over the zone of interest.*

Criteria	JORC-Code Explanation	Commentary
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	*The nominal drill spacing is 100m x 100m over the infill drilled resource area, extending to a nominal 200m x 200m over the broader exploration drilling area.*
	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.	*The data spacing and distribution is sufficient to demonstrate spatial and grade continuity of the mineralised horizon to support the definition of Inferred Mineral Resources under the 2012 JORC code.*
	Whether sample compositing has been applied.	*No sample compositing has been applied in the estimation stage as all samples within the mineralised zone were taken at 1m 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.*	*Drilling sections are orientated North West to South East with respect to grid north. This orientation is roughly perpendicular to the interpreted open anticlinal structure forming the mineralised area. The majority of the drilling is vertical, appropriate for testing the relatively flat lying mineralised zone. No diamond drilling has yet been completed so no structural logging has been done.*
	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.	*No drilling orientation related sampling bias has been identified in the data to this point: the subhorizontal mineralisation tested by 60 degree holes is not expected to show significant bias*
Sample security	*The measures taken to ensure sample security.*	*Chain of Custody is managed by Zenith. Samples are stored on site and delivered to the assay laboratory in Perth by Toll Ipec. Samples submission sheets are in place to track the progress of every batch of samples.*
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	*Sampling techniques are consistent with industry standards. Consistency of data was validated by Maxwell Geoservices while loading into the database (Depth from < Depth to; interval is within hole depth, check for overlapping samples or intervals, etc.). Any data which fails the database constraints and cannot be loaded is returned to Zenith for validation, etc.). Global consistency was also checked later on by plotting sections using the database and reconciling assays against geology.*

1.2 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 deposit is located within the 100% Zenith owned exploration licence E69/2733. Zenith has signed heritage agreement with the Wiluna People whose Native Title claim WAD6164/98 covers this tenement. The prospect is located within the Cunyu Pastoral Lease.*
	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 tenement is in good standing with no known impediment to future granting of a mining lease*
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	*The tenement has not been explored for Mn in the past, although anomalous Mn values were returned in RC drilling during base metal exploration by RGC.*
Geology	*Deposit type, geological setting and style of mineralisation.*	*The deposit comprises stratiform manganese oxide derived from weathering of a manganiferous carbonate sediment in a sabkha environment, or from replacement/infill of a permeable sediment during a hydrothermal event, or possibly a combination of both. There appears to be a structural influence on the location of the deposit.*
Drill hole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*	*In the company's opinion this material has been adequately reported in previous announcements and the detail is not relevant for reporting of Mineral Resources*
	• *easting and northing of the drill hole collar*	
	• *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*	
	• *dip and azimuth of the hole*	
	• *down hole length and interception depth*	
	• *hole length.*	
	If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	
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.*	*No weight averaging was required as all relevant intercepts are 1m composite samples. Cut-off grade are discussed in the relevant part of section 3 of this table.*
	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.	*Not applicable*
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	*Not applicable*

Criteria	JORC-Code Explanation	Commentary
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.*	*The mineralised horizon is generally flat lying to shallow dipping. The majority of holes are drilled vertically with the remainder generally at a 60° dip. The mineralisation intercept widths in the drill holes are approximately true width.*
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	*The majority of the holes were drilled vertically, with the remainder drilled dipping at approximately 60° mostly towards the north west or south east., and interpreted dip of the host rocks and mineralisation proven to be flat or shallow dipping, mineralised intersections are interpreted as being close approximations to true width.*
	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').	
Diagrams	*Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	*Refer to diagrams in body of text*
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 to reporting of Mineral Resources*
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.*	*Surface sampling and mapping were completed over different field campaigns by Zenith Minerals. Manganese oxide outcrops were the starting point to drilling at Red Lake. A regional aeromagnetic survey was completed in 2007. Faults surrounding the Red Lake Prospect were interpreted from this survey. Basic dry screening sighter tests were completed at Red Lake and suggest a good potential for upgrading of Mn mineralisation. Some lead values close to the detection limit of XRF analysis were obtained. Metallurgical characterisation of Red Lake samples is underway to define if these could be an issue.*
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*	*Metallurgical characterization of the Mn ore is planned. Collection of bulk samples is proposed for further metallurgical tests. Drilling of prospective areas in the region is proposed to increase resource tonnage. Consolidation of tenement holdings is planned.*
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	*Refer to diagrams in body of text*

1.3 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 used in the Mineral Resource estimate is sourced from a data base dump, provided in the form of an MS Access database, from the Datashed relational database hosted by Maxwell Geoservices. Relevant tables from the export converted to MS Excel format and converted to csv format for import into Micromine software for use in the Mineral Resource estimate. Validation protocols for the data entered to the Datashed database are described in Section 1*
	Data validation procedures used.	*Validation of the data import include checks for overlapping intervals, missing survey data, missing assay data, missing lithological data, and missing collars. The desurveyed drill holes were then also verified against the provided paper sections containing the lithological interpretation for consistency.*
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	*No site visit was undertaken by the Competent Person*
	If no site visits have been undertaken indicate why this is the case.	*A site visit was not undertaken by the Competent Person as a CSA Global staff member was responsible for the drilling program as described in Section 1 and could provide independent verification of the location and extents of the deposit.*
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	*There is a reasonable level of confidence in the geological interpretation of stratiform manganese oxide enrichment concentrated in a specific lithological horizon traceable over numerous drill holes and drill sections and in surface mapping.*
	Nature of the data used and of any assumptions made.	*Surface mapping of mineralised outcrop and drillhole intercepts have formed the basis for the lithological interpretation.*
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	*The precise extent limits of the mineralised horizon cannot be absolutely defined due to the drill spacing. Further work is required to determine the exact limits, but no major changes to the interpreted mineralised volume are expected.*
	The use of geology in guiding and controlling Mineral Resource estimation.	*The lithological interpretation forms the basis for the modelling. A lithological envelope defining the prospective horizon which has elevated Mn levels and is traceable over numerous drillhole intercepts and in surface mapping. Within the lithological envelope grade cut-off envelope of 10% Mn has been defined within which the Mineral Resource estimate is completed.*

Criteria	JORC-Code Explanation	Commentary
	The factors affecting continuity both of grade and geology.	*The lithological interpretation is fault bounded to the north and south. These parallel bounding structures which are interpreted to be vertical and strike towards 070°, are not yet precisely defined in space and small changes to the interpreted extents can be expected once they are. In the north east where one of the angled duplicate holes did not encounter the expected mineralised horizon further infill drilling is required to clarify the reason for this and refine the geometry of the interpretation.*
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 bulk of the deposit consisting of the northern most 2 thirds as measured towards 070° is approximately 400m, while on the southern side drilling and surface mapping demonstrate a longer extent up to approximately 900m. The mineralised zone is roughly between 1.3 and 7 m thick with outcrops over parts of the deposit area in the west and south, and is generally flat lying to gently rolling, with a portion in the north east of the deposit steepening to dip at 10° towards 045°. Maximal depth here is approximately 24m below surface.*
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.*	*CSA made a decision that the model and sample composite files should be unfolded before grade interpolation. Without unfolding the deposit would have to be domained according to the general dipping of different parts of the structures. In that case every structural domain would have to be estimated separately, and that would downgrade the reliability of the estimate.* *Grade estimation was by Inverse Distance to the power of 2 (IDW) completed using Micromine software in the extended precision environment for Mn, Fe, SiO2, Al2O3, P S and LOI. IDW was chosen as there was insufficient data from within the mineralisation domains to generate sufficiently robust variograms to allow estimation by means of Ordinary Kriging (OK).* *The interpretation was extended perpendicular to the corresponding first and last interpreted cross-section to the distance equal to a half distance between the adjacent exploration lines;* *If a mineralised envelope did not extend to the adjacent drillhole section, it was projected half way to the next section and terminated. The general direction and dip of the envelopes was maintained.* *The mineralisation zone interpretation is extrapolated approximately 50m westwards from the last line of drilling in the west and in the southern third of the deposit approximately 250m eastwards from the infill drilling area toward the next line of exploration drilling that did not encounter above cut-off grade*
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	*No previous estimates have been completed for this deposit, and no mining has taken place.*
	The assumptions made regarding recovery of by-products.	*No assumptions have been made*
	Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).	*Fe, SiO2, Al2O3, P and S were also modelled.*

Criteria	JORC-Code Explanation	Commentary
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	*The block model was constructed using a 40mE x 40mN x 1mRL parent block size, with subcelling to 4mE x 4mN x 0.20mRL for domain volume resolution. The parent cell size was chosen on the basis of the general morphology of mineralised bodies and in order to avoid the generation of too large block models. The subcelling size was chosen to maintain the resolution of the mineralised bodies. The subcells were optimised in the models where possible to form larger cells.* *Search ellipse orientations were defined based on the spatial distribution of the Mn grades. The majority of the mineralisation is roughly flat lying to gently rolling and a search ellipse orientated towards 135^{o} was defined, with search radii of 200m x 50m x 1m.* *The first search radii for all mineralised envelopes were selected to be equal to two thirds of the all distances. Model cells that did not receive a grade estimate from the first interpolation run were used in the next interpolation with greater search radii equal to the full distances in all directions. The model cells that did not receive grades from the first two runs were then estimated using radii incremented by the full distances. For the first two search passes in the 10% cut-off zone, a minimum of 3 samples and a maximum of 20 samples were used to estimate the sample grades into each block. For the subsequent passes the minimum was reduced to 1.*
	Any assumptions behind modelling of selective mining units.	*No selective mining units were assumed in this estimate*
Estimation and modelling techniques (continued)	*Any assumptions about correlation between variables.*	*No strong correlations were found between the grade variables, most likely due to the limited number of drillhole samples.*
	Description of how the geological interpretation was used to control the resource estimates.	*The 10% Mn grade envelopes were defined. Hard boundaries between the grade envelopes used to select sample populations for grade estimation.*
	Discussion of basis for using or not using grade cutting or capping.	*No grade cutting was applied*
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	*Validation of the block model consisted of comparison of the block model volume to the wireframe volume. Grade estimates were validated by statistical comparison with the drill data, visual comparison of grade trends in the model with the drill data trends. No reconciliation data is available at this early stage of the project.*
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	*The tonnages are estimated on a dry basis*

Criteria	JORC-Code Explanation	Commentary
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	*Statistical analysis showed natural breaks in the Mn grade population distribution at approximately 5% and 10%, which formed the basis for the decision regarding determination of mineralisation envelope cut off grades. The Mineral Resource is quoted from estimated blocks above these cut off grades.*
Mining factors or assumptions	*Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	*Mining would be by open pit methods as the deposit is at or close to the surface.*
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. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	*A selection of RC drill samples with head assays ranging from 20% to 40% were dry screened to various size fractions. The results show a clear potential for significant grade improvement through a simple dry screening process, with the combined coarser (+1.6 mm) fraction of all the 11 test samples averaging 38.1 % Mn from a combined average head grade of 26.9% Mn, with an average mass recovery of 32.5% for this coarse fraction.*
Environmental factors or assumptions	*Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	*No detailed assumptions have been made and this aspect will be fully considered in any future scoping studies. The broader assumption made is that mining of Mn oxide deposits of this type should not require any special environment permitting that might add significant costs to a project.*
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.*	*28 rock samples were collected from Red Lake and other Mn prospects in the Earaheedy Project, amongst which 16 samples (Mn-rich, Fe-Rich, Mn+Fe-Rich) were assayed by XRF and their specific gravity (SG) tested using pycnometre techniques. Due to a lab error, out of these 16 samples, 13 were re-assayed and re-measured for SG using both immersion and pycnometre techniques. Two other samples were used which had previously been tested for petrophysical characteristic at Systems Exploration (NSW) Pty Ltd. In the end, a total of 15 samples were assayed and SG-tested using both techniques.* *Additionally, 55 previously dry screened samples (11 samples with 5 sub-samples each) were tested for SG by pycnometre (from pulps) to look for similar correlation and to assess if density – mineralogical variations existed in differing size fractions that may bias RC 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.	*Some porosity can be expected however the bulk density assigned is considered to be reasonable.*

Criteria	JORC-Code Explanation	Commentary
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	*A number of regression formulas were derived for the calculations of the bulk density. These formulas are based on the elements' grades. The more detailed information how these formulas were derived is presented in MRE.*
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.*	*The Inferred Mineral Resource classification is based on the available RC and Aircore drill sampling and surface mapping. This evidence is sufficient to imply but not verify geological and grade continuity.*
	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).	*The Inferred classification has taken into account all available geological and sampling information, and the classification level is considered appropriate for the current stage of this project.*
	Whether the result appropriately reflects the Competent Person's view of the deposit.	*The Mineral Resource estimate appropriately reflects the view of the Competent Persons*
Audits or reviews.	*The results of any audits or reviews of Mineral Resource estimates.*	*No audits of the Mineral Resource estimate have been undertaken at this time*
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. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*	*The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource to an Inferred classification as per the guidelines of the 2012 JORC Code*
	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.	*The statement refers to global estimation of tonnes and grade*
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	*No production data is available.*