

# EASTERN PILBARA GEOPHYSICAL SURVEY OUTLINES NEW DRILL TARGETS

## **KEY POINTS**

- Follow-up IP survey and surface sampling at the Western Star prospect in the Eastern Pilbara identifies multiple drill targets
- High-grade copper (Cu), manganese (Mn) and cobalt (Co) rock chip anomalies coincident with significant geophysical anomalies, including:
  - Outcropping copper mineralisation up to 43.7% Cu in rock chip samples coincident with IP anomalism over 400m strike
  - Surface cobalt up to 0.11% Co and manganese up to 50% Mn in rock chip samples coincident with strong IP anomalism over 300m strike and extending beyond 150m depth
  - $\circ$  Surface manganese up to 53.8% Mn in rock chip samples coincident with IP anomalism over 500m strike
- Drill testing scheduled for September 2018

Minerals explorer **Carawine Resources Limited ("Carawine"** or **"the Company") (ASX:CWX)** is pleased to announce positive results from a follow-up IP survey and rock chip sampling program at the Western Star Cu-Co-Mn prospect at its Oakover project in Western Australia's Eastern Pilbara region.

The recent dipole-dipole induced polarisation ("IP") survey comprising an additional 10 line-km builds on the IP survey completed in Q4 2017. The results of the latest survey have increased the potential for high-grade copper, cobalt and manganese mineralisation to extend at depth, and together with results of rock chip sampling and geological mapping have identified six high-priority targets that warrant immediate drill testing.

Four of these targets are characterised by outcrop or historic workings with rock chip assay values of up to 43.7% Cu, coincident with IP anomalies of strike lengths between 200m and 400m. One target comprises a high-grade manganese rock chip sample of 53.8% Mn within a 500m long by 150m wide IP anomaly which extends below 150m depth, and another target comprises rock chip samples from outcrop with assay values of 49.8% to 50.0% Mn and 0.11% Co, directly coincident with a 300m long by 100m wide IP anomaly which also extends below 150m depth (Figures 1 and 2, Table 1, Appendix 1; see ASX announcement dated 19 December 2017 for further details).

The results follow Carawine's extremely successful drilling campaign at its Jamieson gold project in Victoria and highlight the Company's excellent near-term exploration opportunities.

Carawine Managing Director David Boyd said the Company was entering another exciting period as preparations begin for its first drilling program at the Oakover project.

"The results from Western Star significantly increase the potential for the high-grade copper mineralisation mapped in outcrop and historic workings to extend at depth. There are also two additional manganese targets to test, one of which is associated with high-grade cobalt mineralisation – an emerging key mineralisation style within our Eastern Pilbara tenements.

"We are set for a busy six months ahead, with drilling at Western Star due to commence in September and regional exploration programs underway on our Eastern Pilbara projects, while preparing for the next phase of exploration at Jamieson which is due to commence in Q4 2018."







Figure 1: Western Star prospect plan showing drill targets, modelled IP anomalies, outcrop geology and summary of rock chip assay results.



28 August 2018



Figure 2: Western Star prospect modelled IP chargeability sections (mV/V; 3D isometric view looking from above towards the northeast).

The high-grade copper mineralisation sampled from historic workings and outcrop at Western Star displays typical oxide zone mineralogy associated with weathering and oxidation of primary copper sulphide mineralisation (Figure 3). The moderate strength anomalies outlined from the IP survey data, especially those with coincident surface copper mineralisation, therefore have the potential to be associated with copper sulphide mineralisation at depth, representing excellent targets for drill testing.



Figure 3: Copper-rich hand specimen samples from Western Star.

Manganese mineralisation is typically strongly chargeable, with IP considered a primary ground geophysical survey exploration method. The strong IP responses coincident with manganese outcrops at Western Star are therefore highly encouraging, increasing the potential for the mineralisation to extend below surface.







Figure 4: High-grade manganese outcrop at Western Star (sample SA062474: 50% Mn, 0.11% Co).

Recent field work also included the collection of fifteen additional rock chip samples from Carawine Dolomite outcrop to the east of the area of main workings. Four rock chip samples collected previously were re-submitted for cobalt analysis, resulting in two samples from outcropping manganese mineralisation to the north of the main area returning very high cobalt assay values of 1,122ppm (0.11% Co) and 1,068ppm (0.11% Co), and high-grade manganese assay values of 50.0% and 49.8% Mn, respectively (Figures 1 and 4, Table 1, Appendix 1). The cobalt-manganese rich outcrops are 100m apart and have strong IP responses, representing another excellent target for drill testing.

The latest IP survey was conducted by Vortex Geophysics along nine east-west lines nominally 100m apart, with data quality and processing managed by Southern Geoscience Consultants. An additional 10 line-km was surveyed, comprising both infill and extension lines. Survey data was deemed to be of high quality with good signal strength and robust repeatability. Data acquired during the previous survey at Western Star in 2017 was merged with the latest survey data for processing, with good agreement between the two surveys. Further survey details are included in Appendix 1.

The style of copper and manganese mineralisation targeted at Western Star is expected to provide moderate to strong IP responses below the ground surface and is therefore considered an excellent exploration technique.



## About Western Star

The Western Star prospect is part of Carawine's Oakover project, located about 160km northeast of Newman in the Eastern Pilbara region of WA (Figure 5). The prospect comprises an area of about 2km x 1km of Carawine Dolomite, Pinjian Chert Breccia and Manganese Group sediments which host a number of historic copper workings and exploration costeans. Historic copper production from the area is reported at 179t of ore grading 20% Cu<sup>1</sup>.

Detailed geological mapping and rock chip sampling by the Company's geologists has identified several mineralised trends of high-grade copper mineralisation in breccia and vein stockworks in dolomite (Figures 1 and 3). Rock chip samples of dolomite, altered wall rock and mineralisation exposed in outcrop and in historic workings have returned assay values ranging from 0.03% up to 43.7% Cu, and 7.8ppm up to 1,436ppm (0.14%) Co (Figure 1). Petrological examination of the samples identified copper mineralisation typical of that associated with weathering of copper-sulphides at depth in carbonate-rich host rocks (see ASX announcement dated 19 December 2017 for further details).

Mapping has also identified a number of manganese outcrops away from the main area of historic copper workings. These have returned assay values ranging from <0.1% to 53.8% Mn, with cobalt values ranging from 244ppm up to 1,122ppm (0.11%) Co (associated with manganese assay values above 25% Mn). The Company considers cobalt-manganese mineralisation such as that identified at Western Star, and elsewhere within the Oakover Project (e.g. Xmas region - see Figure 5 and ASX announcement dated 26 March 2018) as a potentially significant new source of cobalt and manganese, both important feedstocks for the growing global battery market.

The results of the IP survey described in this announcement have identified several anomalies either coincident with, or along strike from surface mineralisation, indicating the potential for the mineralisation to extend below surface and defining targets for drill testing, currently scheduled to begin in September 2018.

## Paterson Project Update

The Company's Paterson Project, situated in the Paterson Province at the eastern edge of the Pilbara Craton, is dominated by Proterozoic age rocks of the Rudall Metamorphic Complex and the overlying Yeneena Supergroup. The Paterson area is host to the Telfer Au-Cu deposit, the Nifty Cu deposit and the Maroochydore Cu-Co deposits, and has seen a recent increase in exploration activity (Figure 5).

Two exploration licences have recently been granted within the Paterson Project at Trotman South and Baton. The Company has also recently made a successful application for vacant ground adjacent to its Lamil Hills tenement (Figure 5). This brings Carawine's total landholding in the Paterson region to over 1,137 km<sup>2</sup>.

Reconnaissance geological field work has commenced on these tenements.

<sup>&</sup>lt;sup>1</sup> Marston, R., J., 1979. Mineral Resources Bulletin 13, Geol. Survey of WA.



28 August 2018



Figure 5: Oakover and Paterson Project tenement location plan.

## ENDS

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28 August 2018

## Table 1: Western Star Prospect recent rock chip sample assay results.

Comple	Faat	aat Narth	Cu	Со	Au	Ag	Pd	Pt	Fe	Mn	Description
Sample	East	norun	(%)	(ppm)	(ppb)	(ppm)	(ppb)	(ppb)	(%)	(%)	Description
SA062474*	274353	7531134	0.01	1122	4	<0.05	5.6	2.2	5.6	50.0	Massive manganese oxide (braunite) outcrop, 10m wide
SA062475*	274318	7531009	0.04	1068	3	<0.05	0.8	<0.5	6.4	49.8	Massive manganese & strong Mn staining, outcrop over 20m x 40m.
SA062478*	274573	7530271	<0.01	8	1	<0.05	0.6	0.9	58.7	<0.1	20m x 20m pod of massive hematite at chert-dolomite contact
SS08327*	274491	7530254	0.01	693	1	<0.05	<0.5	<0.5	2.0	53.8	Mn alteration dolomite/chert breccia contact. Massive vuggy and powdery Mn.
SA079074	275034	7530386	36.2	24	25	21.5	2.0	14.6	6.2	0.3	Small anastomosing malachite veins to 5mm wide in grey dolomite with sparry dolomite veins
SA079075	275016	7530496	0.17	50	2	0.10	0.8	1.2	19.4	0.3	Coarse >1cm ex-pyrite crystals in steeply dipping N-S striking dolomite veins to 5cm wide
SA079076	275000	7530510	3.24	112	<1	1.37	0.6	<0.5	0.8	1.0	Zone of numerous 1-5mm malachite veinlets mostly N-S striking steeply dipping
SA079077	275024	7530383	6.35	16	<1	1.60	<0.5	<0.5	2.9	0.3	Zone of anastomosing malachite veinlets both N-S & E-W striking
SA079078	274951	7530618	0.02	7	<1	<0.05	<0.5	<0.5	18.6	0.3	Small clusters of ex-pyrite crystals in joints and veins in dolomite
SA079079	274976	7530631	0.14	13	<1	0.08	0.9	0.8	2.9	2.4	Black manganiferous recrystallised dolomite. Stratiform zone over 0.5m thick striking E-W and dipping gently to S
SA079080	274990	7530626	0.16	5	1	<0.05	1.4	0.7	1.5	2.0	Stratiform zone of black recrystallised manganiferous dolomite with carbonate veins
SA079081	275013	7530615	0.02	4	<1	<0.05	1.0	<0.5	1.6	1.7	Stratiform zone of black recrystallised manganiferous dolomite with calcite veins
SA079082	275013	7530615	0.01	3	<1	<0.05	<0.5	<0.5	0.7	0.5	5cm thick chert selvage at upper contact of stratiform alteration zone
SA079083	274964	7530638	0.03	20	<1	<0.05	1.8	0.7	6.1	1.6	Altered dolomite with hematite and euhedral quartz crystals and ex-pyrite
SA079084	274939	7530690	0.04	137	<1	0.10	1.2	1.0	4.7	3.3	Altered manganiferous dolomite
SA079085	274865	7530712	0.02	65	<1	<0.05	1.0	1.1	3.6	4.1	Manganiferous dolomite beneath chert talus
SA079087	274907	7530684	0.01	81	<1	<0.05	1.2	0.7	3.8	4.4	Altered manganiferous dolomite with calcite veins
SA079088	274937	7530674	0.05	24	<1	0.09	<0.5	0.9	10.0	2.6	Altered manganiferous dolomite with calcite veins and coarse euhedral ex-pyrite
SA079089	275051	7530580	0.02	47	2	<0.05	1.2	0.8	7.0	14.7	Manganiferous laminated dolomitic siltstone clasts to 15cm in talus slope

\* Previously reported results, re-assayed for cobalt, for details of previously reported assay results refer to the Company's ASX announcement dated 19 December 2017.



#### COMPLIANCE STATEMENTS

#### **REPORTING OF EXPLORATION RESULTS**

The information in this announcement that relates to Exploration Results is based on information compiled by Mr David Boyd, a Competent Person who is a Member of the Australian Institute of Geoscientists (AIG). Mr Boyd is a full-time employee of Carawine Resources Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activities being undertaken 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' (the "JORC Code (2012)"). Mr Boyd consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

#### **PREVIOUSLY REPORTED INFORMATION**

This announcement includes information that relates to Exploration Results prepared and first disclosed under the JORC Code (2012). The information was extracted from the Company's previous ASX Announcements as follows:

- Jamieson Project: "Strong Finish to Maiden Drilling Program at Hill 800" 20 August 2018
- Eastern Pilbara Projects: "Quarterly Activities Report for the Period Ended 30 June 2018" 25 July 2018
- Xmas region: "New Cobalt Targets Identified in Eastern Pilbara" 26 March 2018
- Xmas prospect: "Significant Outcropping Cobalt-Manganese Anomaly Identified" 21 December 2017
- Western Star prospect: "Significant IP Anomaly Identified Beneath Surface Copper Cobalt Mineralisation" 19 December 2017

Copies of these are available from the ASX Announcements page of the Company's website: <u>www.carawine.com.au</u>

The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements. The Company confirms that the form and context in which the competent person's findings are presented have not been materially modified from the relevant original market announcements.

#### FORWARD LOOKING AND CAUTIONARY STATEMENTS

Some statements in this announcement regarding estimates or future events are forward-looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Forward-looking statements include, but are not limited to, statements preceded by words such as "planned", "expected", "projected", "estimated", "may", "scheduled", "intends", "anticipates", "believes", "potential", "predict", "foresee", "proposed", "aim", "target", "opportunity", "could", "nominal", "conceptual" and similar expressions. Forward-looking statements, opinions and estimates included in this report are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Forward-looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. Forward-looking statements may be affected by a range of variables that could cause actual results to differ from estimated results and may cause the Company's actual performance and financial results in future periods to materially differ from any projections of future performance or results expressed or implied by such forward-looking statements. So, there can be no assurance that actual outcomes will not materially differ from these forward-looking statements.



## **ABOUT CARAWINE RESOURCES**

Carawine Resources Limited is an exploration company whose primary focus is to explore for, and ultimately develop, economic gold, copper and base metal deposits within Australia. The Company has four gold, copper, cobalt and base metal projects, each targeting high-grade deposits in well-established mineralised provinces throughout Australia.

## JAMIESON PROJECT (Au-Cu, Zn-Au-Ag)

The Jamieson Project is located near the township of Jamieson in the northeastern Victorian Goldfields and comprises granted EL5523, covering an area of 34 km<sup>2</sup> and containing the Hill 800 gold and Rhyolite Creek zinc-gold-silver prospects.

Hill 800 was discovered by New Holland Mining NL (New Holland) in 1994, following sampling of outcropping gold-rich gossans, with drilling returning results with significant widths and high gold grades. The deposit is a volcanic-hosted massive sulphide (VHMS) gold-copper system with similar host rock, age and mineralisation style to the 1.5Moz Henty gold deposit in Western Tasmania. The Rhyolite Creek Prospect, located about 5km south of Hill 800, was discovered in 2008, with diamond drilling intersecting a zone of strong alteration and sulphide mineralisation returning high grade zinc, gold and silver from an interpreted seafloor VHMS system.

## OAKOVER PROJECT (Cu-Co)

Located in the highly prospective Eastern Pilbara region of Western Australia, the Oakover Project comprises nine granted exploration licences and six exploration licence applications with a total area of about 3,270km<sup>2</sup>, held 100% by the Company. The Oakover Project is centred on the Proterozoic Oakover Basin and is prospective for copper, cobalt, manganese and iron.

## PATERSON PROJECT (Au-Cu, Cu-Co)

The Paterson Project, situated in the Paterson Province at the eastern edge of the Pilbara Craton, is dominated by Proterozoic age rocks of the Rudall Metamorphic Complex and the overlying Yeneena Supergroup. The Paterson area is host to the Telfer Au-Cu deposit, and the Nifty and Maroochydore stratabound Cu-(Co) deposits. Carawine's Paterson Project comprises two granted exploration licences and four exploration licence applications over an area of about 1,137km<sup>2</sup> across five regions: Lamil Hills, Trotman South, Red Dog, Baton and Sunday.

## FRASER RANGE PROJECT (Ni-Cu-Co)

The Fraser Range Project includes 5 granted exploration licences in four areas: Red Bull, Bindii, Big Bullocks and Similkameen; and one exploration licence application Big Bang, in the Fraser Range region of Western Australia. The Project is considered prospective for magmatic nickel-sulphide deposits such as that at the Nova nickel-copper-cobalt operation. Carawine has a joint venture with Independence Group NL (IGO) for the five granted tenements (the Fraser Range Joint Venture). IGO currently hold a 51% interest and can earn an additional 19% interest in the tenements by spending \$5 million by the end of 2021.

ASX Code:	CWX	Market Capitalisation:	A\$14 million
Issued shares:	55.8 million	Cash (at 30 June, 2018):	A\$5.0 million



28 August 2018

# Appendix 1: JORC (2012) Table 1 Report

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. Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. Aspects of the determination of mineralisation that are Material to the Public Report. 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	<ul> <li>Point surface samples consisting of rock chips of outcropping bedrock, to a nominal 0.5- 2kg weight.</li> <li>Each sample was described at the site and time of collection to ensure accurate records of sampled material. Samples were selected based on mineralisation / alteration zones, or to distinguish low level alteration indicating potential mineralisation at depth.</li> </ul>
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).	Not Applicable
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed. Measures taken to maximise sample recovery and ensure	Not Applicable





Criteria	JORC Code explanation	Commentary
Logging	representative nature of the samples. Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material. Whether core and chip samples have been geologically and	<ul> <li>All samples have been logged at the time and location of collection,</li> </ul>
	geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. The total length and percentage of the relevant intersections logged.	<ul><li>enabling them to be placed in geological context.</li><li>All surface samples have been logged to high detail.</li></ul>
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique. Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. Whether sample sizes are appropriate to the grain size of the material being sampled.	<ul> <li>Samples were collected dry and consisted of multiple chips dislodged and fractured by a geological pick.</li> <li>Samples were between a nominal 0.5-2kg weight and placed directly in to numbered calico bags at the collection point.</li> <li>Appropriate assay techniques were designated at the point of collection based on the perspective commodity.</li> <li>Single point samples.</li> </ul>
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times,	<ul> <li>Assays were carried out by Intertek Genalysis Laboratories of Maddington, Western Australia.</li> <li>Samples were assayed by Au 25g fire assay ICP-MS (Au, Pt, Pd); 4-acid digest ICP-OES (Al, Ca, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, S, Sc, Ti, V, Zn);); 4-acid digest ICP-MS (Ag, As, Ba, Be, Bi, Cd, Ce, Co, Cs, Ga, Ge, Hf, In, La, Li, Mo, Nb, Pb, RB, Re, Sb, Se, Sn, Sr, Ta, Te, Th, Tl, U, W, Y, Zr).</li> </ul>



28 August	2018
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Criteria	JORC Code explanation	Commentary
	calibrations factors applied and their derivation, etc. Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	<ul> <li>Internal laboratory standards were used for each job to ensure correct calibration of elements.</li> <li>Only relevant and material element results are reported.</li> <li>Standard industry practices have been employed in the collection and assaying of samples from Western Star. Internal laboratory standards and checks have passed control thresholds. The assay data has sufficient quality for the reporting of Exploration Results.</li> </ul>
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel. The use of twinned holes. Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. Discuss any adjustment to assay data.	<ul> <li>Assay results summarised in the context of this report have been rounded appropriately.</li> <li>No assay data have been adjusted.</li> </ul>
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. Specification of the grid system used. Quality and adequacy of topographic control.	<ul> <li>Sample locations were surveyed by a hand-held GPS +/-5m, at the time of sample collection.</li> <li>RL was not recorded and is not relevant to surface point samples.</li> <li>Coordinates reported are MGA Zone 51.</li> <li>Location data is considered to be of sufficient quality for reporting of exploration results.</li> </ul>
Data spacing and distribution	Data spacing for reporting of Exploration Results. Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. Whether sample compositing has been applied.	<ul> <li>Selective sampling based on field observation and outcrops identified as hosting potential for mineralisation.</li> <li>Should not be considered representative of the rock mass as a whole.</li> <li>See figures in body of the report for locations.</li> </ul>
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and	<ul> <li>Samples are representative only of the material sampled and should not be considered representative of the rock mass as a whole.</li> </ul>



Criteria	JORC Code explanation	Commentary
	reported if material.	
Sample security	The measures taken to ensure sample security.	• No measures taken regarding sample security have been reported however this is not considered a high risk given the Project location.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	• NA

Section 2 Reporting of Exploration Results

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

Criteria	Statement	mmentary	
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	Western Star is within Exploration Licence E46/1 northeast of Newman within the pastoral lease of Australia. It was granted to Sheffield Resources 2016. Subsequently it has been transferred to 0 The tenement is due to expire on the 10 Novemb There are no known impediments to obtaining a the area.	L069 situated 160km of Mt Divide, Western Ltd on 11 November Carawine Resources. per 2021. licence to operate in
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Previous work was carried out by Pickland ar although the location of activities is not stated in or visible in the field. Golden Reef Enterprises samples for copper at the prospect as did CRA. Pi Ltd a subsidiary of Consolidated Minerals Ltd project area, although concentrated on their con manganese.	nd Mather in 1969, their statutory report s sampled rock chip ilbara Manganese Pty previously held the ore target commodity;
Geology	Deposit type, geological setting and style of mineralisation.	The Project is hosted in gently dipping Carawine d thin veneer of recent colluvium, talus, scree and ir of Pinjian chert breccia. The exposure of the host Carawine Dolomite approximately 600m by 400m partially covered chert breccia and more recent cover. Coppe associated with discontinuous at surface brecc	dolomite covered by a ntermittent remnants at Western Star is by overlying Pinjian per mineralisation is ciated fracture zones



Criteria	Statement	Commentary
		<ul> <li>that have undergone malachite and chalcocite enrichment by metasomatic fluids injected along the lines of a Kennecott style copper deposit model. Sinuous copper veinlets are peripheral to these fracture zones which cross-cut strata or are associated with bedding planes. Mineralisation has also been observed to be associated with a fold axis, channelling metasomatic fluids in a similar manner to the bedding planes.</li> <li>Two main zones of copper mineralisation are evident at surface. A central north-south zone of discontinuous brecciated fractures with bedded veinlets spanning 400m length. To the northeast is a zone associated with a dissolution 'sink hole' structure, with peripheral cross-cutting veinlets spanning approximately 350m in length and orientated northwest-southeast.</li> <li>Mineralisation is co-incidental with a gravity high and fault bound. These faults may not necessarily limit the mineralisation to Western Star as the gravity high extends beyond these structures.</li> <li>Hematite alteration occurs peripheral to the copper mineralisation, often accompanied by more distal silica alteration. Sparry dolomite veining can exist in the outer aureole.</li> <li>Manganese mineralisation occurs at surface as poddy outcrop within Carawine Dolomite, Pinjian Chert Breccia and Manganese Group sediments.</li> </ul>
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: 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	• NA
	down drill hole length and interception depth	





Criteria	Statement	Commentary
	drill 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	In reporting Exploration Results, weighting averaging	• All sample results are listed. Those considered significant in terms of
methods	techniques, maximum and/or minimum grade truncations (eg	grade and potential to indicate potential mineralisation are highlighted.
	cutting of high grades) and cut-off grades are usually Material	
	and should be stated.	
	Where aggregate intercepts incorporate short lengths of high	
	grade results and longer lengths of low grade results, the	
	procedure used for such aggregation should be stated and some	
	typical examples of such aggregations should be shown in detail.	
	The assumptions used for any reporting of metal equivalent	
	values should be clearly stated.	
Relationship	These relationships are particularly important in the reporting of	• Mineralisation is associated within discontinuous brecciated fracture
between	Exploration Results.	zones and veinlets.
mineralisation	If the geometry of the mineralisation with respect to the drill hole	<ul> <li>Depth and continuity of these fracture zones is unknown.</li> </ul>
widths and intercept	angle is known, its nature should be reported.	
lengths	If it is not known and only the down drill hole lengths are	
	reported, there should be a clear statement to this effect (eg	
	'down drill hole length, true width not known').	
Diagrams	Appropriate maps and sections (with scales) and tabulations of	• See body of the report for plan and interpretative section view and
	intercepts should be included for any significant discovery being	tabulation of surface sample assays.
	reported These should include, but not be limited to a plan view	
	of drill hole collar locations and appropriate sectional views.	
Balanced reporting	Where comprehensive reporting of all Exploration Results is not	• All information considered material to the reader's understanding of
	practicable, representative reporting of both low and high grades	the Exploration Results has been reported.
	and/or widths should be practiced to avoid misleading reporting	
	of Exploration Results.	
Other substantive	Other exploration data, if meaningful and material, should be	• The dipole-dipole induced polarisation (DDIP) survey was performed
exploration data	reported including (but not limited to): geological observations;	



	28	August	2018
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Criteria	Statement	Commentary
	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.	<ul> <li>along nine east-west survey lines nominally 100m apart with survey parameters as follows. Dipole length of 75 m; dipole separation (N level) 1 to 12; using a ZT-30 transmitter with a base frequency of 0.125 Hz (2s on, 2s off) and a SmartEM 24 receiver and porous pots as receiver electrodes. Locations of the completed survey lines are shown in diagrams in the report.</li> <li>Measured chargeability/IP and apparent resistivity pseudosections and 2-D inversion model sections were completed for each survey line. All 2D inversion models were produced using the finite element routine RES2DINV produced by Geotomo Software Pty. Ltd.</li> <li>All information considered material to the reader's understanding of the Exploration Results has been reported.</li> </ul>
Further work	The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Further work is detailed in the body of the announcement.