

#### **ASX: ADC**

ACN 654 049 699

**CAPITAL STRUCTURE** 

Share Price: A\$0.074\*
Cash: A\$5.8 M\*
Debt: Nil
Ordinary Shares: 72.3M
Market Cap: A\$5.35M\*
Enterprise Value: A\$-0.45M
Options: 47.7M
\*as of 22 Aug 2023

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# Maiden REE Results Demonstrate High Value Magnet Metals at Goschen Central

### **Key Highlights**

- Maiden high value rare earth element (REE) assays from Goschen Central grading up to 3.1% total rare earth oxide (TREO) within the heavy mineral fraction.
- 8 composite samples taken from over 8.5 x 4 km area and 10-15 thick zone, demonstrating wide-spread and consistent mineralisation and potential for a high quality resource of scale at Goschen Central.
- Mineralogy and process testwork show that a very large portion of the REE's are present in monazite. ACDC Metals holds an exclusive licence to technology for the efficient extraction of REE from monazite.
- Assays show a high portion of key magnetic rare earth oxides (MREO) which are the highly priced and critical REE sought for magnets.
- Magnet REOs average ~26% of the sample material but ~90% of REE value.
- Maiden resource on track for Q3 release, with scoping study for the Goschen Central Project scheduled for Q4.

ACDC Metals Limited (ASX: ADC) ("ACDC Metals" or the "Company") is pleased to announce assay results from heavy mineral concentrates prepared from the Goschen Central heavy mineral sand (HMS) and rare earth element (REE) project, located in western Victoria. The results (see Table 1) indicate an attractive and high-value distribution of REE, with a high contribution of magnetic metals.

These results, developed from heavy mineral composite samples from the Company's recent aircore drilling program, provide strong support for ACDC Metals' business strategy to pair heavy mineral sand mining with downstream extraction of REE carbonate from monazite within eastern Australia. The value and marketability of a rare earth carbonate is determined by the REE distribution, with a high relative abundance of magnet metals neodymium, praseodymium, dysprosium and terbium presenting an attractive offering.

#### **ACDC Metals CEO Tom Davidson commented:**

"Through these results, we see strong support for a high basket price for the Goschen Central heavy mineral sand and REE products. In particular, it shows that our REE bearing mineral monazite is extremely rich in the most valuable magnet rare earths. It complements our strategy to maximise value capture of strategic metals through downstream processing of monazite into REE carbonates and beyond. We have a big end-of-year ahead, with infill results, a maiden resource and maiden scoping study on Goschen Central all to be released before year end. A fantastic achievement by the team in less than 1 year from IPO"



Table 1 Summo	arv of Maan	etic Rare ed	arth oxides

Composite	TREO	Nd <sub>2</sub> O <sub>3</sub>	Pr6O11	Tb4O7	Dy2O3	MREO	MREO/ TREO
Units	%	%	%	ppm	ppm	%	%
1	2.56	0.46	0.13	123	821	0.68	26.6%
2	2.18	0.38	0.11	107	727	0.58	26.4%
3	2.97	0.54	0.15	136	912	0.80	26.9%
4	3.09	0.57	0.16	137	902	0.83	26.9%
5	1.81	0.32	0.09	87	589	0.48	26.3%
6	2.17	0.38	0.11	105	701	0.57	26.2%
7	1.83	0.32	0.09	81	528	0.47	26.0%
8	2.04	0.35	0.10	93	623	0.53	26.0%

### **Work Completed**

Eight (8) composite samples were selected from the Phase 1 aircore drilling at the Goschen Central project undertaken during 2023. The samples were selected and aggregated based on their geographical location within the Goschen Central project. Composites were created using heavy mineral sachets across over an 8.5km x 4km x 10-15m thick zone of EL005278 that is interpreted by ACDC Metals geologists as the highest grade section of the Goschen Central project. Refer to Figure 1.

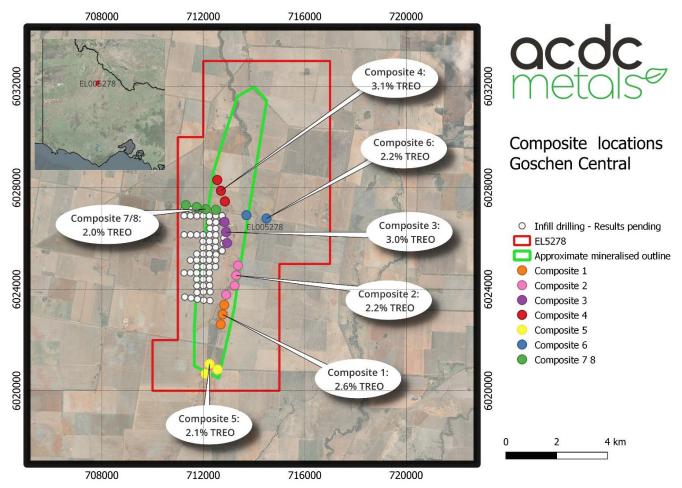


Figure 11 - Location of the composite samples labelled with the total rare earth oxide (TREO) number for each composite.



The samples were assayed by Bureau Veritas in Adelaide using a 4-acid digest followed by induction coupled plasma mass spectrometry (ICP-MS). The composites were made in groups of 2-4 drill holes to reflect different domains within the upcoming resource estimate.

Further assays are awaited from the Goschen Central infill drilling. A full table of all samples aggregated in each composite are shown in Appendix 2. A full breakdown of ICP-MS assay values for the rare earth element suite on the 8 composite samples are provided in Appendix 1.

The analyses by Bureau Veritas demonstrate that the magnetic REE content is greater than 26% of the TREO assemblage by weight. Through a partnership with Canadian company Medallion Resources Ltd, ACDC Metals holds an exclusive licence to a process technology specifically designed for efficient monazite processing. This process includes the low-cost removal of cerium (a low value REE) resulting in an effective magnetic REE distribution at REE carbonate stage of approximately 49%.

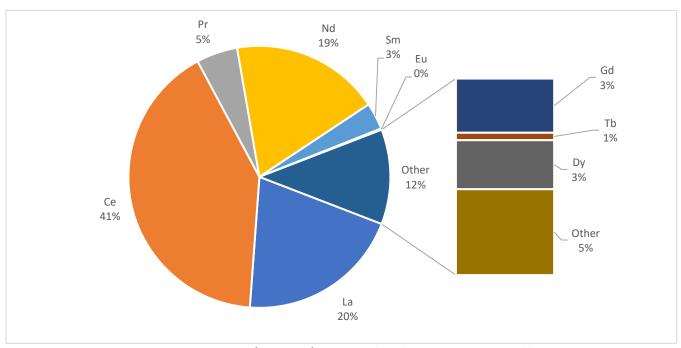


Figure 2 2 Composite #4 (TREO 3.1%) ICP-MS analysis demonstrates REE assemblage.

Based on July 2023 pricing from Rare Earth Industry Association (REIA), magnetic REEs equate to 90% of REE value within Goschen Central monazite, a highly favourable distribution. This demonstrates that the Goschen Central project may provide a very attractive rare earth carbonate for REE permanent magnet production.



With reference to table 2, the Goschen Central project compares well to advanced peer projects in the Murray Basin.

Table 2 - % of Rare Earth distribution

%	Definition	La	Се	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Other	MREO
ACDC Metals Ltd	Average of 8 composites	20.1	41.0	5.1	17.8	3.3	0.2	3.3	0.5	3.1	5.6	26.5
VHM <sup>1</sup>	Resource	16.9	36.0	4.0	14.7	2.7	0.0	2.2	0.4	2.2	20.9	21.3
Astron <sup>2</sup>	Resource	19.1	40.0	4.6	16.4	3.1	0.1	2.3	0.3	1.8	12.4	23.1

Powerful REE permanent magnets (also known as NdFeB magnets) are critical components of energy transition products including electric vehicles and wind turbines, as well as other essential communication, robotic and military technologies. More than 90% of the value of the REE industry is derived from the metals essential to the production of these magnets.

A typical NdFeB magnet contains about one-third neodymium (Nd) which can be substituted by praseodymium (Pr). To enable effective operation at elevated temperatures, Dy and Tb are both included in minor amounts within NdFeB magnets.

### **About ACDC Metals**

ACDC Metals is a heavy mineral sand and rare earth element explorer and developer focussed on projects in the Murray Basin of western Victoria, Australia. ACDC Metals also holds the exclusive licence for Eastern Australia for the 'Medallion Monazite Process', a well advanced process technology to efficiently extract rare earth elements from monazite, developed by TSX listed Medallion Resources (TSX:MDL). Goschen Central is the ACDC Metals' flagship project, a maiden mineral resource is due for release in Q3 2023.

We refer shareholders and interested parties to the website <u>www.acdcmetals.com.au</u> where they can access the most recent corporate presentation, video interviews and other information.

Announcement has been authorised for release by the Board.

#### For Further Information

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<sup>&</sup>lt;sup>1</sup> Company Mineral Resource,, 629Mt Mineral Resource Estimate, ASX Announcement March 2023. Goschen Project DFS Refresh - Phases 1 and 1A.

<sup>&</sup>lt;sup>2</sup> Investor presentation May 2023.



### **Competent Persons Statement**

The information in this document that relates to exploration results is based on information reviewed by Mr Kent Balas, a Competent Person who is a member of the Australian Institute of Geoscientists (AIG, member no 8652)

Mr Balas is an employee of Langdon Warner Pty Ltd and provides consulting services to ACDC Metals.

Mr Balas 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 in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code).

Mr Balas 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 in this document that relates mineralogy results is based on information reviewed by Mr. Mark Saxon, the Company's Executive Director, a Fellow of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists, has reviewed and approved the contents of this release.



# JORC Code, 2012 Edition – Table 1 report template

# **Section 1 Sampling Techniques and Data**

Criteria	is section apply to all succeeding sections.)	Commontoni
Sampling techniques	<ul> <li>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.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>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.</li> </ul>	<ul> <li>Aircore drilling was used to obtain samples at 1.5m intervals.</li> <li>The following information covers the sampling process:</li> <li>each 1.5m sample was homogenized within the bag by manually rotating the sample bag;</li> <li>a sample of sand, approx. 20 g, is scooped from the sample bag for visual THM% and SLIMES% estimation and logging. The same sample mass is used for every pan sample for visual THM% and SLIMES% estimation. Estimates are also made of induration hardness, induration type, grain size, sorting and heavy mineral assemblage.</li> <li>the standard sized sample is to ensure calibration is maintained for consistency in visual estimation;</li> <li>a sample ledger is kept at the drill rig for recording sample intervals;</li> <li>A rotary splitter is used to take a 25% split of the drill sample of each 1.5m interval.</li> <li>ACDC cannot confirm the sampling techniques of previous explorers.</li> </ul>
Drilling techniques	<ul> <li>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).</li> </ul>	<ul> <li>Wallis Drilling was the contractor used for the drilling program</li> <li>Aircore drilling with inner tubes for sample return was used.</li> <li>Aircore is considered a standard industry technique for heavy mineral sand exploration. Aircore drilling is a form of reverse circulation drilling where the sample is collected at the face and returned inside the inner tube.</li> <li>Aircore drill rods used were 3 m long.</li> <li>NQ diameter (76 mm) drill bits and rods were used.</li> <li>All drill holes were vertical.</li> </ul>



		<ul> <li>ACDC cannot confirm the drilling techniques of previous explorers.</li> </ul>						
Drill sample recovery	<ul> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> </ul>	<ul> <li>Drill sample recovery is monitored by recording sample condition from 'dry good' to 'wet poor'.</li> </ul>						
	<ul> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>Whether a relationship exists between sample recovery and grade and</li> </ul>	<ul> <li>While initially collaring the hole, limited sample recovery can occur in the initial to 1.5 m sample interval owing to sample and air loss into the surrounding loos soil.</li> </ul>						
	whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	<ul> <li>The initial 0 m to 1.5 m sample interval is drilled very slowly in order to achieve optimum sample recovery.</li> </ul>						
		<ul> <li>Samples are collected at 1.5m intervals into a standard numbered calico sample bags via a rotary splitter taking a 25% split of the total 1.5m interval.</li> </ul>						
		<ul> <li>At the end of each drill rod, the drill string is cleaned by blowing down with air to remove any clay and silt potentially built up in the sample tubes.</li> </ul>						
		<ul> <li>The twin-tube aircore drilling technique is known to provide high quality samples from the face of the drill hole (in ideal conditions).</li> </ul>						
		<ul> <li>ACDC cannot confirm sample recovery of previous explorers.</li> </ul>						
Logging	<ul> <li>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource</li> </ul>	<ul> <li>The 1.5 m aircore samples were each qualitatively logged via digital entry into a Microsoft Excel spreadsheet, and later uploaded to the Micromine database.</li> </ul>						
	<ul> <li>estimation, mining studies and metallurgical studies.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> </ul>	<ul> <li>The aircore samples were logged for lithology, colour, grainsize, sorting, hardness, sample condition, washability, estimated THM%, estimated SLIMES% and any relevant comments such as slope, vegetation, or cultural activity.</li> </ul>						
	<ul> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	Every drill hole was logged in full.						
		<ul> <li>Logging is undertaken with reference to a Drilling Guideline with codes prescribed and guidance on description to ensure consistent and systematic data collection.</li> </ul>						
Sub-sampling techniques	<ul> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc and whether</li> </ul>	<ul> <li>The 1.5 m sample interval is rotary split at the drill rig, collected and stored at the ACDC metals storage facility.</li> </ul>						
and sample	sampled wet or dry.	The water table depth was noted in all geological logs if intersected whereby sample						
preparation	<ul> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> </ul>	<ul><li>condition was specified as 'wet poor'.</li><li>Hole twinning, lab standards and duplicates are used to ensure samples are</li></ul>						
	<ul> <li>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> </ul>							



	<ul> <li>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/secondhalf sampling.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>					
Quality of assay data and laboratory tests	<ul> <li>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</li> <li>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</li> </ul>		erted in the lab re conducted of meshes are u	oximate conce oratory every 4 every 25 sample	ntrations of TH -0 samples. es to ensure sa	
Verification of sampling and assaying	<ul> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	ensure they are w laboratory data ha for this stage in th overlapping sampl 'Survey' files, dupl  Twin holes are dril assay.	at consulting Rece Material sandithin tolerance is been update e program. Date intervals, encicate sample nulled periodicallien received from and have robusted analysis	esource Geologenple results are (<2SD) and that dinto a master ta validation crid of hole match umbers and otly to test variation Bureau Veriust QAQC proces (REE) to stoich	ist checked from it there is no bi spreadsheet v iteria are includ between 'Lith her common er on in terms of tas who insert esses.	each sample batch to ias. The field and which is appropriate ded to check for iology', 'Sample', rrors. sample collection and
			(ppm) La	n Factor 1.1728	Form La <sub>2</sub> O <sub>3</sub>	



Ce	1.2284	CeO <sub>2</sub>
Pr	1.1703	Pr6O <sub>11</sub>
Nd	1.1664	Nd <sub>2</sub> O <sub>3</sub>
Sm	1.1596	Sm <sub>2</sub> O <sub>3</sub>
Eu	1.1579	Eu <sub>2</sub> O <sub>3</sub>
Gd	1.1526	Gd <sub>2</sub> O <sub>3</sub>
Tb	1.151	Tb4O7
Dy	1.1477	Dy <sub>2</sub> O <sub>3</sub>
Но	1.1455	Ho <sub>2</sub> O <sub>3</sub>
Er	1.1435	Er <sub>2</sub> O <sub>3</sub>
Tm	1.1542	Tm <sub>2</sub> O <sub>3</sub>
Yb	1.1387	Yb2O3
Lu	1.1371	Lu <sub>2</sub> O <sub>3</sub>

Rare earth oxide is the industry accepted form for reporting rare earths. The following calculations are used for compiling REO into their reporting and evaluation groups:

- Note that Y<sub>2</sub>O<sub>3</sub> is included in the TREO calculation.
- TREO (Total Rare Earth Oxide) =  $La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3 + Sm_2O_3 +$  $Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3 + Y_2O_3 + Lu_2O_3$ .
- HREO (Heavy Rare Earth Oxide) =  $Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3, + Y_2O_3 + Lu_2O_3$
- LREO (Light Rare Earth Oxide) = La<sub>2</sub>O<sub>3</sub> + CeO<sub>2</sub> + Pr<sub>6</sub>O<sub>11</sub>+ Nd<sub>2</sub>O<sub>3</sub>
- SEG = Sm2O3 + Eu2O3 + Gd2O3
- TbDy = Tb4O7 + Dy2O3
- $NdPrO\% = Nd_2O_3 + Pr_6O_{11}$
- NdPrO% of TREO= NdPrO%/TREO x 100

# 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 Resource estimation.

- Drill hole collar locations are collected using a Garmin hand held GPS with an accuracy of +-3m.
- The datum used is GDA 94 and coordinates are projected as MGA zone 54.



	Specification of the grid system used.	
	Quality and adequacy of topographic control.	
Data spacing and distribution	<ul> <li>Data spacing for reporting of Exploration Results.</li> <li>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.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul> <li>Drill holes were spaced at between 100 and 800 meters for the initial drill program.</li> <li>This data spacing is considered appropriate for possible later inclusion in a Mineral resource or Ore reserve estimate.</li> <li>Sample compositing has not been applied.</li> </ul>
Orientation of data in relation to geological structure	<ul> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>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.</li> </ul>	<ul> <li>mineralization defined by previous drill data information.</li> <li>The strike of the mineralization is approximately north-south.</li> <li>All drill holes were vertical, and the orientation of the mineralization is horizontal.</li> </ul>
Sample security	The measures taken to ensure sample security.	<ul> <li>Air core samples were stored at the ACDC Bendigo Warehouse facility.</li> <li>The samples were then dispatched by freight agent to Diamantina laboratories Perth facility for assay and reporting.</li> <li>Metallurgical samples were utilized from previous drilling completed by previous vendor:         <ul> <li>Samples were stored by previous vendor Providence &amp; Gold Minerals.</li> <li>Samples were collected and dispatched to Mineral Technologies Queensland facility, using freight agents from Bendigo and delivered to the Mineral Technologies laboratory.</li> <li>The laboratory inspected the packages and did not report tampering of the samples.</li> <li>Mineral Technologies metallurgical manager inspected the packages and prepared a sample inventory which will be reconciled with the sample dispatch information and sample database.</li> </ul> </li> </ul>
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	<ul> <li>Internal reviews were undertaken during the geological interpretation and throughout the modelling process.</li> </ul>

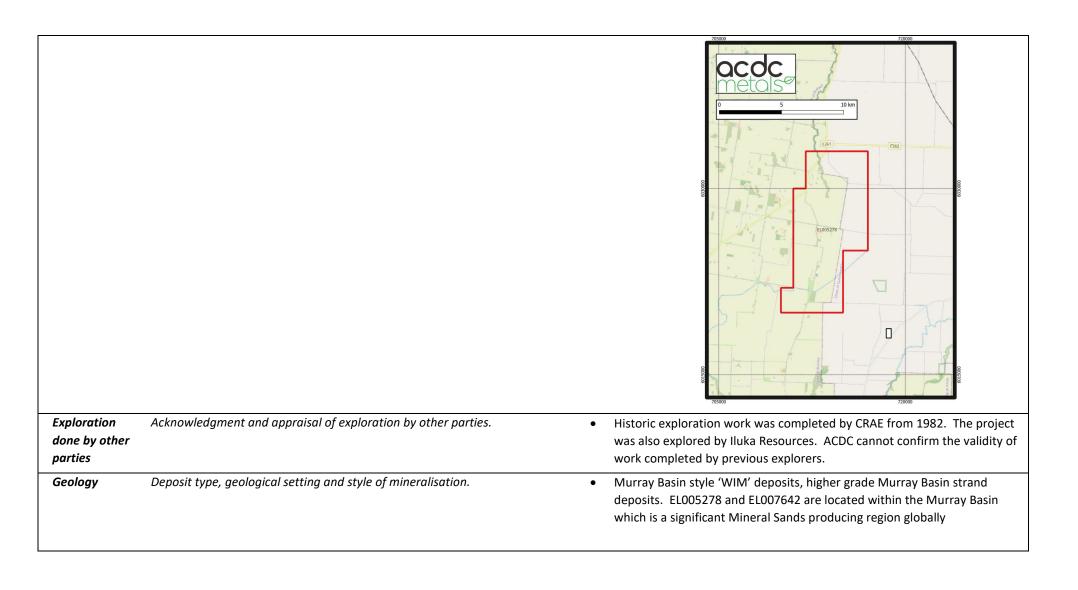


# **Section 2 Reporting of Exploration Results**

(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 security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.	The exploration work was completed on EL005278 that is 80% owned by ACDC Metals Ltd, and 20% Providence & Gold Minerals.







Drill hole	A summary of all information material to the understanding of the	No new drill hole information is reported
Information	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 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.  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.	Samples have been composited from heavy mineral sachets then split by Bureau Veritas and their laboratory facility. The results reported come directly from the Bureau Veritas assay report.
Relationship between mineralisation	These relationships are particularly important in the reporting of Exploration Results.  If the geometry of the mineralisation with respect to the drill hole angle is	The nature of the mineralisation is broadly horizontal, thus vertical aircore holes are thought to represent close to true thicknesses of the mineralisation:
widths and intercept lengths	known, its nature should be reported.  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').	<ul> <li>Reported widths are the true widths due to the horizontal nature of the deposit.</li> </ul>
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.	<ul> <li>Figures and plans are displayed in the main text of the release. All plans and sections are clearly labelled and are shown in GDA94/UTMZ54 coordinates.</li> </ul>



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 practised to avoid misleading reporting of Exploration Results.	• Both low and high grade intervals have been reported. Al intervals of > 1% THM are shown in Appendix 1.
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.	<ul> <li>Diamantina laboratories have analysed a heavy mineral sample of ~2g taken from drilling intervals. The samples are subject to a magnetic separation and then a experienced professional mineralogist completes a count and categorization of all of the present minerals. These results are presented in their entirety in Appendix 1.</li> <li>This release is not a full characterization of the Goschen Central deposit, work is ongoing and will be released with the MRE in Q3.</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.	<ul> <li>Advanced metallurgical test work during Q2.</li> <li>Mineralogical analysis is ongoing.</li> </ul>



## Appendix 1: ICP-MS assay values for the rare earth suite on the 8 composite samples

IDENT	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Но	Er	Tm	Yb	Lu	Stoichiometrically Calculated TREO %
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
SCHEME	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	IC4M	
DETECTION LIMIT	1	0.5	1	0.5	0.5	0.5	1	0.5	0.5	1	1	1	1	0.5	
AN0655-1	4340	8910	1110	3890	734	38.5	734	105	700	151	472	72	502	79	2.6
AN0655-2	3710	7540	937	3260	627	32	629	91.5	620	135	427	64	454	72.5	2.2
AN0655-3	5100	10300	1270	4630	832	43	830	116	778	167	521	79	539	86	3.0
AN0655-4	5350	10800	1340	4850	869	42.5	850	117	769	164	501	76	524	82.5	3.1
AN0655-5	3110	6240	778	2710	517	28	515	74.5	502	109	349	54	380	60.5	1.8
AN0655-6	3710	7540	929	3220	622	31	627	89.5	598	132	416	64	437	69.5	2.2
AN0655-7	3140	6570	799	2730	510	25.5	492	69	450	95	297	44	308	49.5	1.9
AN0655-8	3530	7200	887	3020	579	30.5	575	79.5	531	113	348	52	366	58.5	2.1



**Appendix 2: Table of Composite sample locations** 

Composite 1			
SAMPLE ID	HOLEID	FROM	ТО
GAC0889	23AC043	24	25.5
GAC0890	23AC043	25.5	27
GAC0892	23AC043	27	28.5
GAC0893	23AC043	28.5	30
GAC0894	23AC043	30	31.5
GAC0896	23AC043	31.5	33
GAC0897	23AC043	33	34.5
GAC0926	23AC044	19.5	21
GAC0927	23AC044	21	22.5
GAC0928	23AC044	22.5	24
GAC0929	23AC044	24	25.5
GAC0930	23AC044	25.5	27
GAC0932	23AC044	28.5	30
GAC0933	23AC044	30	31.5
GAC0934	23AC044	31.5	33
GAC0935	23AC044	33	34.5
GAC0970	23AC045	25.5	27
GAC0971	23AC045	27	28.5
GAC0972	23AC045	28.5	30
GAC0973	23AC045	30	31.5
GAC0974	23AC045	31.5	33
GAC0975	23AC045	33	34.5
Composite 2			
SAMPLE ID	HOLEID	FROM	ТО
GAC1006	23AC046	19.5	21
GAC1007	23AC046	21	22.5
GAC1008	23AC046	22.5	24
GAC1009	23AC046	24	25.5
GAC1010	23AC046	25.5	27
GAC1011	23AC046	27	28.5
GAC1012	23AC046	28.5	30
GAC1013	23AC046	30	31.5
GAC1013	23AC046	31.5	33
GAC1014 GAC1015	23AC046	33	34.5
GAC1016	23AC046	34.5	36
GAC1017	23AC046	36	37.5
GAC1018	23AC046	37.5	39
GAC1047	23AC047	21	22.5
GAC1048	23AC047	22.5	24
GAC1049	23AC047	24	25.5
GAC1050	23AC047	25.5	27
GAC1051	23AC047	27	28.5
GAC1052	23AC047	28.5	30



GAC1053	23AC047	30	31.5
GAC1054	23AC047	31.5	33
GAC1055	23AC047	33	34.5
GAC1056	23AC047	34.5	36
GAC1057	23AC047	36	37.5
GAC1082	23AC048	22.5	24
GAC1083	23AC048	24	25.5
GAC1084	23AC048	25.5	27
GAC1085	23AC048	27	28.5
GAC1086	23AC048	28.5	30
GAC1087	23AC048	30	31.5
GAC1088	23AC048	31.5	33
GAC1089	23AC048	33	34.5
GAC1090	23AC048	34.5	36
GAC1091	23AC048	36	37.5
GAC1119	23AC049	24	25.5
GAC1120	23AC049	25.5	27
GAC1121	23AC049	27	28.5
GAC1122	23AC049	28.5	30
GAC1123	23AC049	30	31.5
GAC1124	23AC049	31.5	33
GAC1125	23AC049	33	34.5
GAC1126	23AC049	34.5	36
GAC1127	23AC049	36	37.5
	237 (00 13	30	37.3
Composite 3	25710015	30	37.3
	HOLEID	FROM	TO
Composite 3			
Composite 3 SAMPLE_ID	HOLEID	FROM	ТО
Composite 3 SAMPLE_ID GAC1155	HOLEID 23AC050	FROM 25.5	TO 27
Composite 3 SAMPLE_ID GAC1155 GAC1156	HOLEID 23AC050 23AC050	FROM 25.5 27	TO 27 28.5
Composite 3 SAMPLE_ID GAC1155 GAC1156 GAC1157	HOLEID 23AC050 23AC050 23AC050	FROM 25.5 27 28.5	TO 27 28.5 30
Composite 3 SAMPLE_ID GAC1155 GAC1156 GAC1157 GAC1158	HOLEID 23AC050 23AC050 23AC050 23AC050	FROM 25.5 27 28.5 30	TO 27 28.5 30 31.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159	HOLEID 23AC050 23AC050 23AC050 23AC050 23AC050	FROM 25.5 27 28.5 30 31.5	TO 27 28.5 30 31.5 33
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160	HOLEID 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050	FROM 25.5 27 28.5 30 31.5 33	TO 27 28.5 30 31.5 33 34.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161	HOLEID 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050	FROM 25.5 27 28.5 30 31.5 33 34.5	TO 27 28.5 30 31.5 33 34.5 36
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162	HOLEID 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050	FROM 25.5 27 28.5 30 31.5 33 34.5 36	TO 27 28.5 30 31.5 33 34.5 36 37.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163	HOLEID 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050	FROM 25.5 27 28.5 30 31.5 33 34.5 36 37.5	TO 27 28.5 30 31.5 33 34.5 36 37.5 39
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164	HOLEID 23AC050	FROM 25.5 27 28.5 30 31.5 33 34.5 36 37.5 39	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188	HOLEID 23AC050	FROM 25.5 27 28.5 30 31.5 33 34.5 36 37.5 39	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1189	HOLEID 23AC050 23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  39  24  25.5	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1188  GAC1189  GAC1190	HOLEID  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC051  23AC051	FROM 25.5 27 28.5 30 31.5 33 34.5 36 37.5 39 24 25.5 27	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5 27 28.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1189  GAC1190  GAC1191	HOLEID 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC050 23AC051 23AC051 23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  39  24  25.5  27  28.5	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5 27 28.5 30
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1188  GAC1190  GAC1191  GAC1191	HOLEID  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC051  23AC051  23AC051  23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  39  24  25.5  27  28.5  30	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5 27 28.5 30 31.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1189  GAC1190  GAC1191  GAC1192  GAC1193	HOLEID  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC051  23AC051  23AC051  23AC051  23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  39  24  25.5  27  28.5  30  31.5	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5 27 28.5 30 31.5 33
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1189  GAC1190  GAC1191  GAC1191  GAC1192  GAC1193  GAC1194	HOLEID  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  39  24  25.5  27  28.5  30  31.5  33	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5 27 28.5 30 31.5 33 34.5 36
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1189  GAC1190  GAC1191  GAC1191  GAC1192  GAC1193  GAC1194  GAC1195  GAC1196	HOLEID  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  27  28.5  27  28.5  30  31.5  33  34.5  36  37.5  39	TO 27 28.5 30 31.5 33 34.5 36 37.5 27 28.5 27 28.5 30 31.5 33 34.5 36 37.5
Composite 3  SAMPLE_ID  GAC1155  GAC1156  GAC1157  GAC1158  GAC1159  GAC1160  GAC1161  GAC1162  GAC1163  GAC1164  GAC1188  GAC1189  GAC1190  GAC1191  GAC1191  GAC1192  GAC1193  GAC1194  GAC1195	HOLEID  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC050  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051  23AC051	FROM  25.5  27  28.5  30  31.5  33  34.5  36  37.5  39  24  25.5  27  28.5  30  31.5  33  34.5	TO 27 28.5 30 31.5 33 34.5 36 37.5 39 40.5 25.5 27 28.5 30 31.5 33 34.5 36



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GAC1227	23AC052	31.5	33
GAC1228	23AC052	33	34.5
GAC1229	23AC052	34.5	36
GAC1230	23AC052	36	37.5
GAC1231	23AC052	37.5	39
GAC1232	23AC052	39	40.5
Composite 4			
SAMPLE_ID	HOLEID	FROM	ТО
GAC1258	23AC053	27	28.5
GAC1259	23AC053	28.5	30
GAC1260	23AC053	30	31.5
GAC1261	23AC053	31.5	33
GAC1262	23AC053	33	34.5
GAC1263	23AC053	34.5	36
GAC1264	23AC053	36	37.5
GAC1265	23AC053	37.5	39
GAC1290	23AC054	24	25.5
GAC1291	23AC054	25.5	27
GAC1292	23AC054	27	28.5
GAC1293	23AC054	28.5	30
GAC1294	23AC054	30	31.5
GAC1295	23AC054	31.5	33
GAC1296	23AC054	33	34.5
GAC1297	23AC054	34.5	36
GAC1298	23AC054	36	37.5
GAC1299	23AC054	37.5	39
GAC1300	23AC054	39	40.5
GAC1326	23AC055	27	28.5
GAC1327	23AC055	28.5	30
GAC1328	23AC055	30	31.5
GAC1329	23AC055	31.5	33
GAC1330	23AC055	33	34.5
GAC1331	23AC055	34.5	36
GAC1332	23AC055	36	37.5
GAC1333	23AC055	37.5	39
GAC1334	23AC055	39	40.5
Composite 5			
SAMPLE_ID	HOLEID	FROM	ТО
GAC0641	23AC037	24	25.5
GAC0642	23AC037	25.5	27
GAC0643	23AC037	27	28.5
GAC0644	23AC037	28.5	30
GAC0645	23AC037	30	31.5
GAC0646	23AC037	31.5	33
GAC0647	23AC037	33	34.5
GAC0648	23AC037	34.5	36
GAC0649	23AC037	36	37.5
L	t	t	t



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GAC0727	23AC039	27	28.5
GAC0728	23AC039	28.5	30
GAC0729	23AC039	30	31.5
GAC0730	23AC039	31.5	33
GAC0731	23AC039	33	34.5
GAC0732	23AC039	34.5	36
GAC0733	23AC039	36	37.5
GAC0764	23AC040	22.5	24
GAC0765	23AC040	24	25.5
GAC0766	23AC040	25.5	27
GAC0767	23AC040	27	28.5
GAC0768	23AC040	28.5	30
GAC0769	23AC040	30	31.5
GAC0771	23AC040	33	34.5
GAC0772	23AC040	34.5	36
GAC0773	23AC040	36	37.5
GAC0774	23AC040	37.5	39
GAC0775	23AC040	39	40.5
Composite 6			
SAMPLE_ID	HOLEID	FROM	TO
GAC1530	23AC061	24	25.5
GAC1531	23AC061	25.5	27
GAC1532	23AC061	27	28.5
GAC1533	23AC061	28.5	30
GAC1534	23AC061	30	31.5
GAC1535	23AC061	31.5	33
GAC1536	23AC061	33	34.5
GAC1537	23AC061	34.5	36
GAC1538	23AC061	36	37.5
GAC1596	23AC063	15	16.5
GAC1597	23AC063	16.5	18
GAC1598	23AC063	18	19.5
GAC1599	23AC063	19.5	21
GAC1600	23AC063	21	22.5
GAC1601	23AC063	22.5	24
GAC1602	23AC063	24	25.5
GAC1603	23AC063	25.5	27
GAC1604	23AC063	27	28.5
GAC1605	23AC063	28.5	30
GAC1606	23AC063	30	31.5
GAC1607	23AC063	31.5	33
Composite 7			
22GC002-005			
20-30m			
Composite 8	•	i .	l
22GC002-005			

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