

30 January 2023

Level 1  
10 Outram Street  
West Perth WA 6005

# Assays Identify Widespread Surface Manganese Mineralisation

## Weelarrana Manganese Project Update

### HIGHLIGHTS

- **Assay results for 31 rock chip samples from newly granted tenement E 52/4071 received**
- **23 out of 31 rock chip samples returned manganese ("Mn") grades >10% Mn - average grade of 25.1% Mn**
- **Maximum Mn grade of 39.8% Mn from sample BR025Mn**
- **Outcropping to subcropping manganese mineralisation occurs over a coherent area of 5km x 3km within the Balfour Formation - a known manganese host within the area**
- **The identified manganese mineralisation is 5.5km south-east of Firebirds Metals Hill (ASX:FRB) 616 Manganese deposit (57.5 Mt @ 12.2% Mn)<sup>1</sup>**
- **Reverse circulation program to be planned for second half of CY2023**

### Pantera CEO, Matt Hansen, commented:

*"We are delighted to have received assay results confirming a further manganese mineralisation area within the Weelarrana project area. The identification of an additional area of mineralisation adds to potential for the discovery of high-grade manganese mineralisation. We will now undertake the approval process allowing for a first pass RC drilling program."*

*"We look forward to addressing the market with further updates over the coming weeks."*

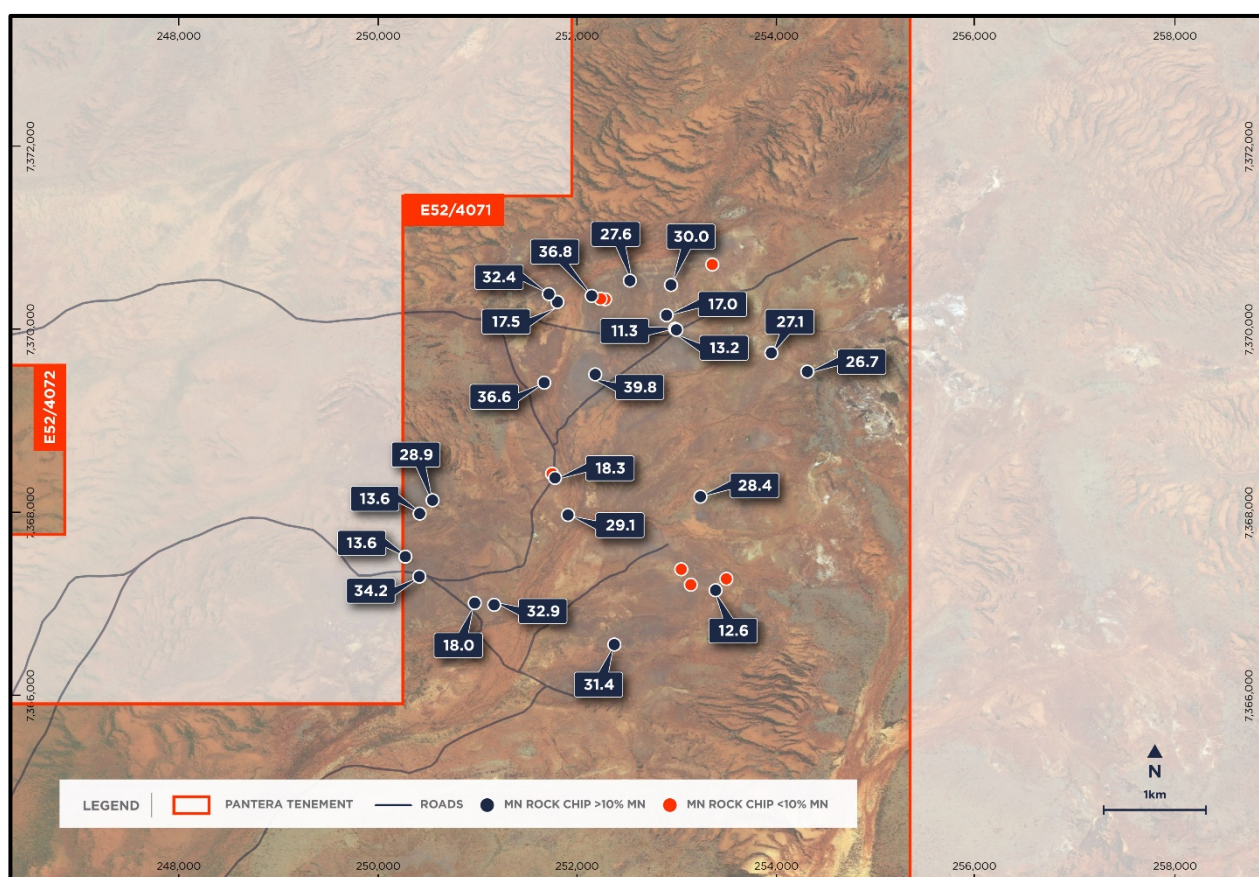
Pantera Minerals Limited (ASX:**PFE**) ("**Pantera**" or the "**Company**") is pleased to announce that the Company has received manganese rock chip results from newly granted tenement E 52/4071, with Pantera identifying a large coherent manganese target within the tenement at Weelarrana, located 70km south of Newman in West Australia's Pilbara region.

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<sup>1</sup> See ASX FRB Announcement 'Hill 616 Maiden Inferred Resource Increases Manganese Inventory by 90%' dated 21 April 2021

## ROCK CHIP RESULTS

- 31 rock chip samples taken in mid-December 2022 have been returned
- 23 out of 31 of the rock chip samples returned manganese grades >10% Mn with an average returned manganese grade of **25.1% Mn**. Figure 1 shows the location of all samples taken and the 23 samples >10% Mn and Table 1 shows all the rock chip assay results and location
- Manganese grades ranged from **11.3% Mn** to **39.8% Mn** and cover an area of 5km x 3km of outcropping to subcropping Balfour Formation
- The Balfour Formation hosts the Firebirds Metals Hill (ASX:FRB), 616 manganese deposit (57.5 Mt @ 12.2% Mn) which is 5.5 km to the north-west of E 52/4071. The Balfour Formation is a manganiferous shale formation. Figure 2 shows examples of the outcropping manganese mineralisation encountered within the Balfour Formation in E 52/4071



**Figure 1- Weelarrana Manganese Project E 52/4071 showing location of outcropping manganese mineralisation and rock sample locations**



**Figure 2 - Manganiferous shale samples within the Balfour Formation BR003 - 36.8% Mn (left) and BR008 - 28.9% Mn (right) from E52/4071**

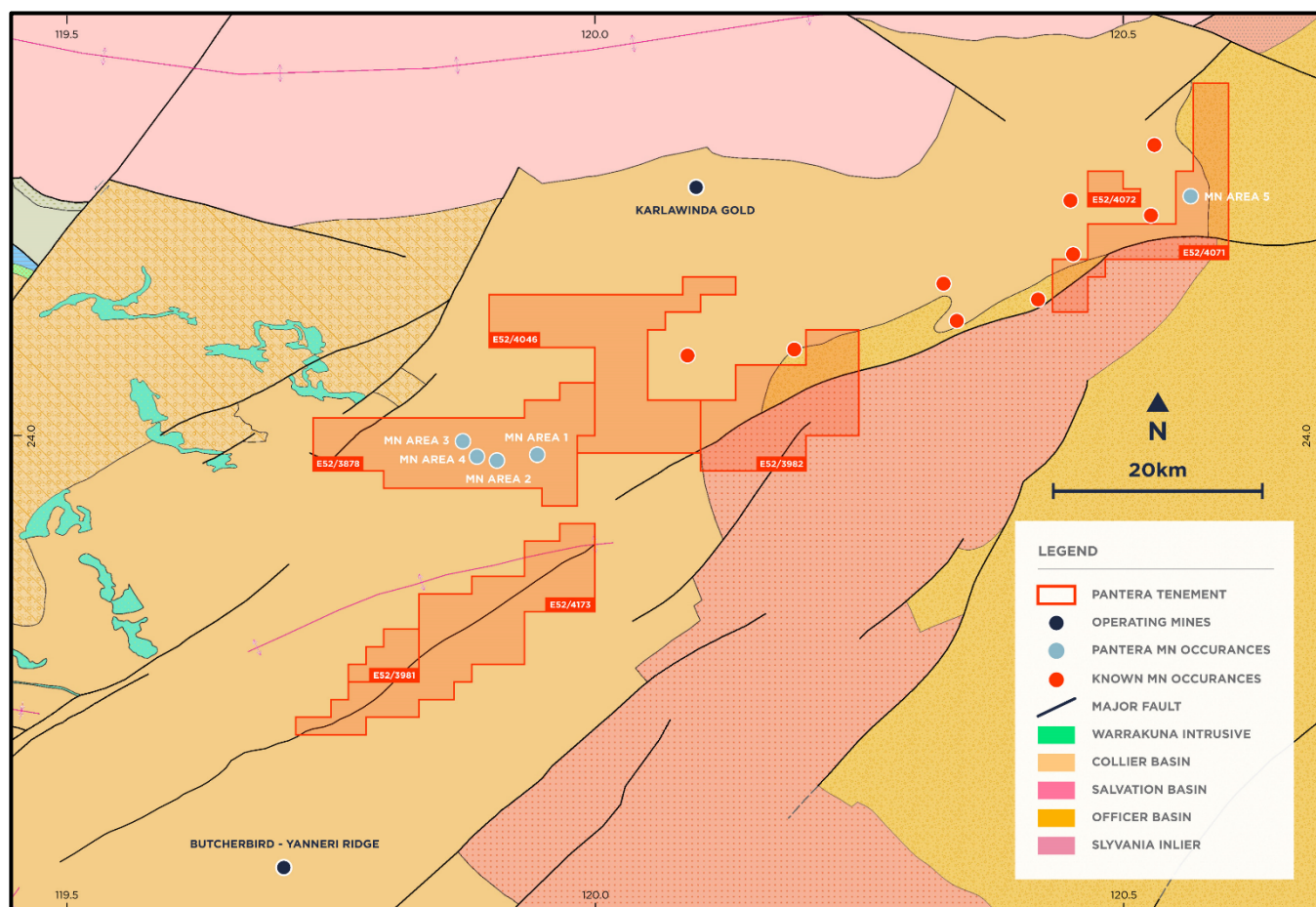
## NEXT STEPS

- Further rock chip sampling and mapping to define the extents of outcropping mineralisation
- First pass RC drill program to be planned
- Cultural and heritage survey to be arranged to allow for first pass RC drilling
- RC drilling planned for the second half of 2023

## WELLARANA PROJECT BACKGROUND

Located within the Proterozoic Collier Basin some 80 km south of Newman, Western Australia, the Weelarrana Project covers 958 km<sup>2</sup> of tenure considered prospective for manganese and precious metal mineralisation. All tenements cover either Ilgarari Formation manganiferous shales, Backdoor Formation or Balfour Formation manganiferous shales which are known to host economic manganese mineralisation at Element 25's Butcherbird Deposit (ASX:E25) and Firebird Metals Hill 616 Deposit (ASX: FRB).

Despite the presence of two significant manganese deposits the area covered by Pantera tenements has been under explored for manganese. Pantera aims to systematically explore for manganese within the two known stratigraphic hosts as well as assess and explore the tenure for structural hosted precious metal mineralisation.



**Figure 3 - Weelarrana Project tenement location plan showing location of Pantera manganese occurrences**

- END -

This release is authorised by the Board of Directors of Pantera Minerals Limited.

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## **Competent Person's Statement**

*The information in this announcement that relates to geology and exploration results and planning was compiled by Mr. Nick Payne, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and is Head of Exploration for Pantera. Mr Payne has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr Payne consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

*All parties have consented to the inclusion of their work for the purposes of this announcement. The interpretations and conclusions reached in this announcement are based on current geological theory and the best evidence available to the author at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however might be, they make no claim for absolute certainty. Any economic decisions which might be taken on the basis of interpretations or conclusions contained in this presentation will therefore carry an element of risk.*

Sample ID	Easting	Northing	Mn %	Fe %	Al <sub>2</sub> O <sub>3</sub> %	P %
BR001Mn	252330	7370210	0.12	48.10	4.52	1.35
BR002Mn	252285	7370214	0.15	52.94	2.24	1.28
BR003Mn	252195	7370245	<b>36.8</b>	11.63	3.18	0.66
BR004Mn	253039	7369900	<b>11.29</b>	29.07	6.20	0.70
BR005Mn	251077	7366874	<b>18.04</b>	26.51	4.97	0.93
BR006Mn	250515	7367153	<b>34.18</b>	9.32	4.38	0.34
BR007Mn	250371	7367368	<b>13.57</b>	19.40	11.01	0.20
BR008Mn	250634	7367988	<b>28.86</b>	11.38	5.83	0.15
BR009Mn	251998	7367851	<b>29.05</b>	13.99	6.44	0.99
BR010Mn	251860	7368253	<b>18.27</b>	23.70	7.10	0.60
BR011Mn	238762	7359896	6.45	39.27	4.68	0.84
BR012Mn	252487	7366445	<b>31.41</b>	10.08	4.85	0.20
BR013Mn	251272	7366858	<b>32.92</b>	9.69	4.91	0.31
BR014Mn	250507	7367840	<b>13.62</b>	10.97	9.91	0.11
BR015Mn	253146	7367278	1.83	48.68	4.5	0.90
BR016Mn	253245	7367111	0.22	42.82	6.34	0.27
BR017Mn	253495	7367055	<b>12.58</b>	9.48	5.63	0.12
BR018Mn	253601	7367181	0.09	50.62	4.99	1.39
BR019Mn	253325	7368073	<b>28.42</b>	14.19	4.93	0.51
BR020Mn	254011	7369653	<b>27.15</b>	10.02	7.37	0.24
BR021Mn	253053	7369889	<b>13.23</b>	27.09	5.85	0.78
BR022Mn	251734	7369290	<b>36.61</b>	8.17	5.9	0.62
BR023Mn	251851	7370172	<b>17.49</b>	29.9	3.94	0.91
BR024Mn	251764	7370257	<b>32.35</b>	12.51	4.67	0.41
BR025Mn	252245	7369389	<b>39.8</b>	8.02	4.36	0.26
BR026Mn	252576	7370417	<b>27.58</b>	20.01	3.71	0.97
BR027Mn	252990	7370377	<b>30.02</b>	23	3.42	0.15
BR028Mn	253401	7370607	3.17	55.21	1.82	0.11
BR029Mn	252951	7370046	<b>16.98</b>	22.28	5.73	0.46
BR030Mn	254376	7369455	<b>26.67</b>	20.92	3.49	0.82
BR031Mn	251830	7368298	8.19	37.87	4.85	0.57

**Table 1- Mn Rock chip sample location from E52/4071 and laboratory assay results (GDA94 MGAz51)**

## JORC Code Table 1 – Pantera Minerals Exploration Update

### Section 1 Sampling Techniques and Data

Criteria in this section apply to all succeeding sections

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<i>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down-hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.</i>	<ul style="list-style-type: none"> <li>All rock chip samples were collected from in-situ outcropping material.</li> <li>Rock chip sample sizes varied from 0.5 kg and 2kg.</li> </ul>
	<i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i>	<ul style="list-style-type: none"> <li>The samples taken are considered to appropriately represent the surface manganese mineralisation .</li> </ul>
	<i>Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 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 (e.g. submarine nodules) may warrant disclosure of detailed information.</i>	<ul style="list-style-type: none"> <li>The Mn rock chip samples were whole crushed and then pulped. The pulped samples were then submitted for standard 18 element XRF analysis for Mn at Intertek in Perth.</li> <li>Elements assayed for are: Al<sub>2</sub>O<sub>3</sub>, BaO, CaO, Cr<sub>2</sub>O<sub>3</sub>, Cu, Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, MgO, Mn, Na<sub>2</sub>O, P<sub>2</sub>O<sub>5</sub>, Pb, SO<sub>3</sub>, TiO<sub>2</sub>, V<sub>2</sub>O<sub>5</sub>, Zn and LOI.</li> </ul>
<b>Drilling techniques</b>	<i>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).</i>	<ul style="list-style-type: none"> <li>No drilling was performed.</li> </ul>
<b>Drill sample recovery</b>	<i>Method of recording and assessing core and chip sample recoveries and results assessed.</i>	<ul style="list-style-type: none"> <li>No drilling was performed.</li> </ul>
	<i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i>	<ul style="list-style-type: none"> <li>No drilling was performed.</li> </ul>
	<i>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</i>	<ul style="list-style-type: none"> <li>No drilling was performed.</li> </ul>
<b>Logging</b>	<i>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</i>	<ul style="list-style-type: none"> <li>Each rock chip sample was geologically described and recorded in a digital Rock Chip Register.</li> </ul>

Criteria	JORC Code explanation	Commentary
	<i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.</i>	<ul style="list-style-type: none"> <li>Logging of rock chip samples is both qualitative and quantitative.</li> </ul>
	<i>The total length and percentage of the relevant intersections logged.</i>	<ul style="list-style-type: none"> <li>No drilling intersections are reported.</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<i>If core, whether cut or sawn and whether quarter, half or all core taken.</i>	<ul style="list-style-type: none"> <li>No drillcore was taken.</li> </ul>
	<i>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.</i>	<ul style="list-style-type: none"> <li>Each sample was whole crushed and pulverised with approx. 100g submitted for standard XRF analysis .</li> </ul>
	<i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i>	<ul style="list-style-type: none"> <li>The sampling preparation technique of homogenising the entire rock chip sample is considered appropriate for the reporting of exploration results.</li> </ul>
	<i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i>	<ul style="list-style-type: none"> <li>The entire rock chip sample was crushed, split then pulverised. The pulverised material was split and sub-sampled to produce a 100g sample for XRF assay.</li> </ul>
	<i>Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.</i>	<ul style="list-style-type: none"> <li>Every 10<sup>th</sup> sample was split twice to produce a duplicate for assay.</li> </ul>
	<i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i>	<ul style="list-style-type: none"> <li>Sample size is considered appropriate to the grain size of the manganese mineralisation.</li> </ul>
<b>Quality of assay data and laboratory tests</b>	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i>	<ul style="list-style-type: none"> <li>The assaying method and laboratory procedures are considered appropriate for the reporting of manganese rock chip results.</li> <li>The assay method is considered a total method given the sample was whole crushed and pulverised.</li> </ul>
	<i>For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i>	<ul style="list-style-type: none"> <li>No geophysical or handheld tools were used.</li> </ul>
	<i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i>	<ul style="list-style-type: none"> <li>After every 10<sup>th</sup> assay a standard of known grade was assayed. At the completion of the assaying the results of the standards were assessed to determine if any sample or assay bias could be detected.</li> </ul>
<b>Verification of sampling and assaying</b>	<i>The verification of significant intersections by either independent or alternative company personnel.</i>	<ul style="list-style-type: none"> <li>Senior Pantera personnel verified the assay results.</li> </ul>
	<i>The use of twinned holes.</i>	<ul style="list-style-type: none"> <li>No drilling was performed.</li> </ul>
	<i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i>	<ul style="list-style-type: none"> <li>All the assay data was electronically transferred to the companies database.</li> </ul>
	<i>Discuss any adjustment to assay data.</i>	<ul style="list-style-type: none"> <li>Assay data has not been adjusted.</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Location of data points</b>	<i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i>	<ul style="list-style-type: none"> <li>All rock chip samples were recorded by the field geologist using a Garmin 65s handheld GPS. Accuracy is assumed to be +/- 2m in x, y and z.</li> </ul>
	<i>Specification of the grid system used.</i>	<ul style="list-style-type: none"> <li>GDA94 MGA Zone 51 as the grid system.</li> </ul>
	<i>Quality and adequacy of topographic control.</i>	<ul style="list-style-type: none"> <li>No topographic control was used.</li> </ul>
<b>Data spacing and distribution</b>	<i>Data spacing for reporting of Exploration Results.</i>	<ul style="list-style-type: none"> <li>The data spacing is appropriate for Exploration Results.</li> </ul>
	<i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied</i>	<ul style="list-style-type: none"> <li>No Resource Estimation has been conducted.</li> </ul>
	<i>Whether sample compositing has been applied.</i>	<ul style="list-style-type: none"> <li>No sample compositing has been applied.</li> </ul>
<b>Orientation of data in relation to geological structure</b>	<i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i>	<ul style="list-style-type: none"> <li>It is not known if the orientation of rock chip sampling at Weelarrana has created a sampling bias. The results of the rock chip sampling should be considered indicative of the surface manganese and silver-gold mineralisation.</li> </ul>
	<i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</i>	<ul style="list-style-type: none"> <li>No drilling was performed.</li> </ul>
<b>Sample security</b>	<i>The measures taken to ensure sample security.</i>	<ul style="list-style-type: none"> <li>The samples were hand carried by contractors from Weelarrana to Perth and then hand carried and delivered to the Intertek in Maddington.</li> </ul>
<b>Audits or reviews</b>	<i>The results of any audits or reviews of sampling techniques and data.</i>	<ul style="list-style-type: none"> <li>The company has not performed an audit of sampling technique or data</li> </ul>

## Section 2 Reporting of Exploration Results

Criteria in this section apply to all succeeding sections

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<p><i>Type, reference name/number, location and ownership including <b>agreements</b> or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</i></p> <p><i>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</i></p>	<ul style="list-style-type: none"> <li>The Weelarrana tenements consist of five granted and two applications covering approximately 958 sq. km. All of these tenements fall on pastoral stations and have native title agreements in place. Two tenement fall partially within the Jigalong Aboriginal Reserve for which a Mine Entry Permit will need to be issued to access the portions of the tenement within the reserve. Beau Resources retains a 2% Gross Value Royalty for all minerals, metals and products recovered and sold from within the tenement boundary of E 52/3878.</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Exploration done by other parties</b>	<i>Acknowledgment and appraisal of exploration by other parties.</i>	<ul style="list-style-type: none"> <li>Most of the past exploration work within the Weelarrana Project area including soil and rock chip sampling, Auger drilling and RAB drilling has been conducted by Pilbara Manganese, Laconia Resources, Shaw River Resources, Hannans Reward and Sipa Resources.</li> <li>The reports are available on the West Australian Mines Department WAMEX open file library.</li> </ul>
<b>Geology</b>	<i>Deposit type, geological setting and style of mineralisation.</i>	<ul style="list-style-type: none"> <li>The Weelarrana Project covers a portion of the Mesoproterozoic Bangemall Basin with the project sitting entirely within the Bangemall Group including sandstone/quartzite/conglomerate of the Calyie Sandstone and shale/argillite units of the Ilgarari, Backdoor and Balfour Formations which are known Mn mineralisation hosts.</li> <li>Manganese mineralisation within the area is strataform and primary in deposition with supergene enrichment and occurs within bedded argillite of the Ilgarari Formation which outcrops through the centre of the project area. Manganese mineralisation appears to be preferentially developed at the contact between the Calyie Formation and Ilgarari Siltstone within the project area.</li> </ul>
<b>Drillhole Information</b>	<ul style="list-style-type: none"> <li><i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drillholes:</i> <ul style="list-style-type: none"> <li><i>easting and northing of the drillhole collar</i></li> <li><i>elevation or RL (elevation above sea level in metres) of the drillhole collar</i></li> <li><i>dip and azimuth of the hole</i></li> <li><i>down hole length and interception depth hole length.</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>There has been no recorded drilling for Manganese within E52/4071.</li> </ul>
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li><i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</i></li> </ul>	<ul style="list-style-type: none"> <li>Rock chip samples are reported as whole rock percentages. No cut off grades have been applied.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li><i>If the geometry of the mineralisation with respect to the drillhole angle is known, its nature should be reported.</i></li> <li><i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').</i></li> </ul>	<ul style="list-style-type: none"> <li>No drilling for manganese has been performed on E52/4071.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li><i>Appropriate maps and sections (with scales)</i></li> </ul>	<ul style="list-style-type: none"> <li>Rock chip sample location and assay</li> </ul>

Criteria	JORC Code explanation	Commentary
	<i>and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i>	grades are shown.
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>The report has been prepared to highlight the main targets and positive drillhole observations and rock chip results based on current and past exploration within the project areas. Not all exploration results are shown for practical purposes.</li> </ul>
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Exploration work to date within the Weelarrna Project area has largely been of a preliminary or reconnaissance nature. The company is aware of regional scale aeromagnetic surveys and geological mapping program, soil sampling and wide spaced RAB drilling undertaken by past explorers and has access to versions of the data that is available in reports and has assessed most of this data.</li> </ul>
<b>Further work</b>	<ul style="list-style-type: none"> <li>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> </ul>	<ul style="list-style-type: none"> <li>Near future exploration plans for Weelarrana are discussed in the release.</li> </ul>