LANTHANEIN RESOURCES

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14 December 2022

# High Grade REE and Niobium Confirmed at Lyons

- **Over 1km strike length of economic TREO mineralisation intersected and remains open**
- **Extremely high Neodymium and Praseodymium grades make up to 55% of Total Rare Earth Oxides (TREO), more than 3 times the world average[1]**
- **Significant Niobium intersections on margins of Lyons Magnetic Intrusive Complex, related to carbonatites under cover to be drill tested in Q1, 2023**
- **Widths of main ironstone REE mineralisation intersected at Lyons prospects are 1 – 5m thick, analogous to Hastings Technology Metals main REE deposits Simons Find, Frasers and Bald Hill ~2.5km away[1]. Significant intercepts include;**
  - **LYRC047: 5m at 0.69% TREO from 20m, <u>including 2m at 1.06% TREO (41% NdPr:TREO) from 21m</u>**
  - **LYRC036: 3m at 0.82% TREO from 30m, <u>including 1m at 1.67% TREO (55% NdPr:TREO) from 31m</u>**
  - **LYRC018: 3m at 0.57% TREO from 6m, <u>including 1m at 1.11% TREO (51% NdPr:TREO) and 0.79% $Nb_2O_5$ from 8m</u>**
  - **LYRC039: <u>1m at 1.01% TREO (53% NdPr: TREO) from 49m</u>**
  - **LYRC025: <u>1m at 0.71% TREO (47% NdPr:TREO) and 1.20% $Nb_2O_5$ from 34m</u>**
- **Carbonatite targets and kilometre scale potential ironstones undercover still to be drill tested**
- **Further assay results expected over December and January**

Mr Brian Thomas, Lanthanein Technical Director commented "The high grade REE results returned in drilling has exceeded our expectations, demonstrating economic REE mineralisation from outcrop extending over 1km strike at Lyons 12 and 13, with high grade REE mineralisation remaining open at depth and along strike. We are extremely pleased with the exceptionally high NdPr component, more than 3 times the world average, giving these ironstones of significant economic value."

"In under a year since acquiring the Lyons project we have discovered multiple outcropping ironstones and completed the first ever drill program on the tenement, confirming that outcropping ironstones are mineralised with REE at multiple prospects and remain open at depth and along strike. With significant drill programs planned for 2023, we are well positioned to continue to build on our discoveries made to date and hopefully add further new discoveries. We are yet to drill test

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multiple targets such as the large-scale ferrocarbonatite targets. We were recently awarded a $200,000 government EIS funding support, and plan to test the very interesting geophysical targets under shallow cover that extend over multiple kilometres mirroring Dreadnought Resources ironstone and carbonatite discoveries at Yin and Sabre."

"The encouraging results from Lyons 27 opens up the northwest area of the tenement, with recent field sampling identifying additional outcropping ironstones along strike. There are an exciting pipeline of drill targets for 2023 and we look forward to continuing to prove up the Gascoyne region's significance as a major Australian REE producing region alongside Dreadnought and Hastings Technology Metals."

**Lanthanein Resources Ltd** (ASX: LNR) (**Lanthanein** or the **Company**) is pleased to announce assay results from the recent drilling completed at the Lyons Rare Earths Project in Western Australia (**Lyons Project**). The drill program targeted high-grade rare earth mineralisation discovered at the outcropping ironstones at Lyons 11, 12, 13 and 27 (Figures 6 and 7).

Significant drill programs are planned for 2023 to step out and infill known REE mineralisation for resource estimation in H2, 2023. Geophysical review of magnetic and radiometric surveys flown by the Company has highlighted multiple areas of interest under shallow cover, yet to be tested. The highest priority targets are the high magnetic curvilinear trends which show a similarity to Dreadnought Resources Yin and Sabre discoveries. The Company recently received $200,000 in funding from the Department of Mines Industry Regulation and Safety (DMIRS) to investigate potential for large tonnage REE carbonatites similar to Lynas Corporation's Mount Weld deposit in Western Australia.

Assay results will continue to be received over December and January with approximately 70% of results received at present.

**RC Drilling Assay Results (LYRC001 to LYRC053):**

The Company's recent maiden drilling program (refer to ASX Announcement dated 21 October 2022) completed a total of 53 Reverse Circulation drillholes (Table 2) for 3,510m drilled, at an average depth of 66m.

Significant intersections (Table 1) at the Lyons 12 and 13 prospects (Figure 1) include:

- LYRC036: 3m at 0.82% TREO from 30m, including 1m at 1.67% TREO (55% NdPr:TREO) from 31m (Figure 2)
- LYRC018: 3m at 0.57% TREO from 6m, including 1m at 1.11% TREO (51% NdPr:TREO) and 0.79% $Nb_2O_5$ from 8m (Figure 3)
- LYRC039: 1m at 1.01% TREO (53% NdPr: TREO) from 49m (Figure 4)
- LYRC025: 1m at 0.71% TREO (47% NdPr:TREO) and 1.20% $Nb_2O_5$ from 34m

Significant intersections (Table 1) at the Lyons 27 prospect (Figure 7 and 8) include:

- LYRC047: 5m at 0.69% TREO from 20m, including 2m at 1.06% TREO (41% NdPr:TREO) from 21m (Figure 6)
- LYRC048: 2m at 0.22% TREO (43% NdPr:TREO)
- LYRC045: 1m at 0.21% TREO (38% NdPr:TREO)
- Assay results are still pending for 5 of the six holes drilled at Lyons 27 (Table 2)

Potential remains for further discoveries of ironstones and carbonatites (Figures 5, 6) within the Company's tenure where no historical REE exploration has occurred.

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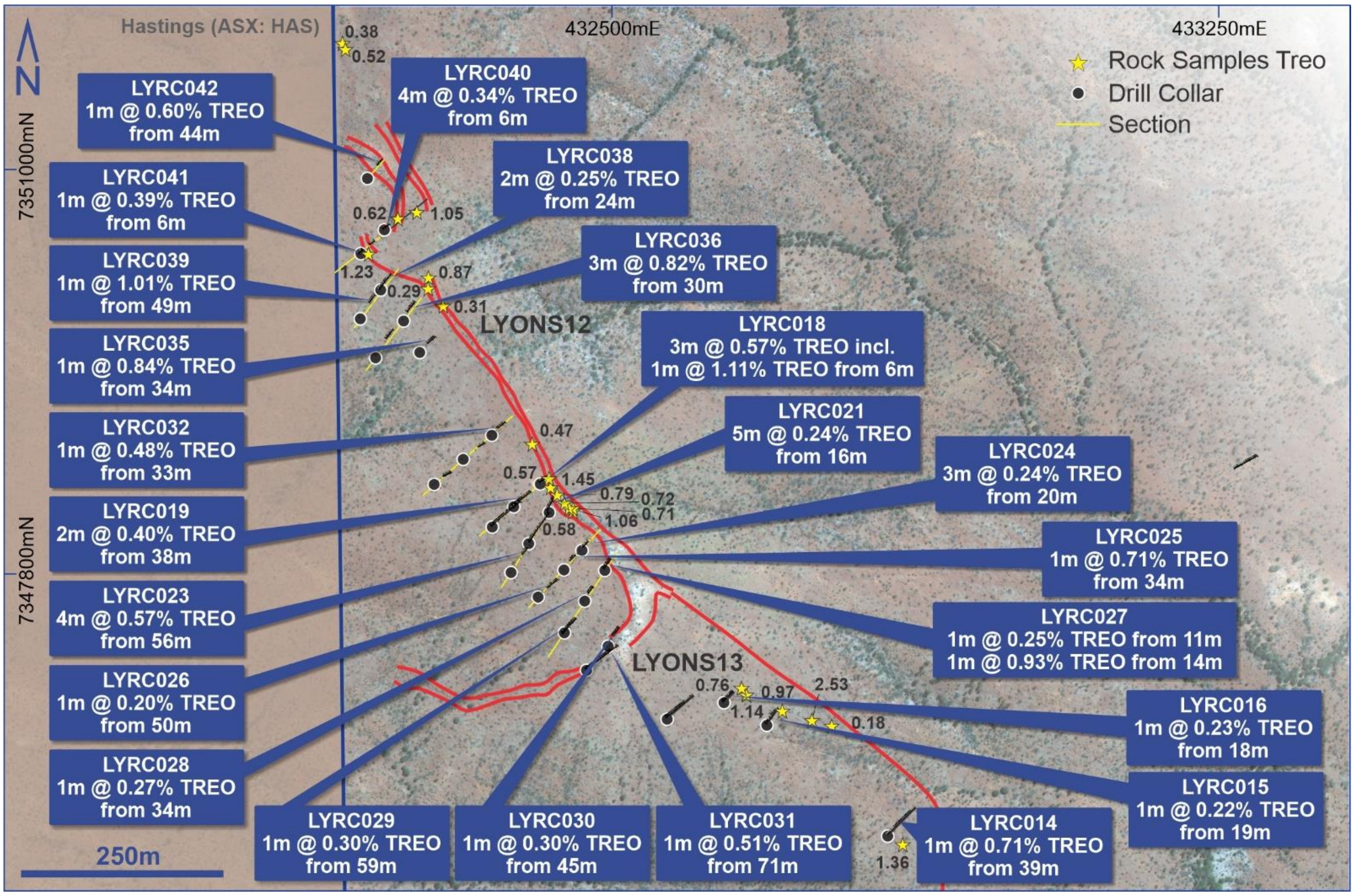


*Figure 1. Plan View of the Lyons 12 and 13 Drillholes Identifying REE over 1km of Strike Length at Depth*

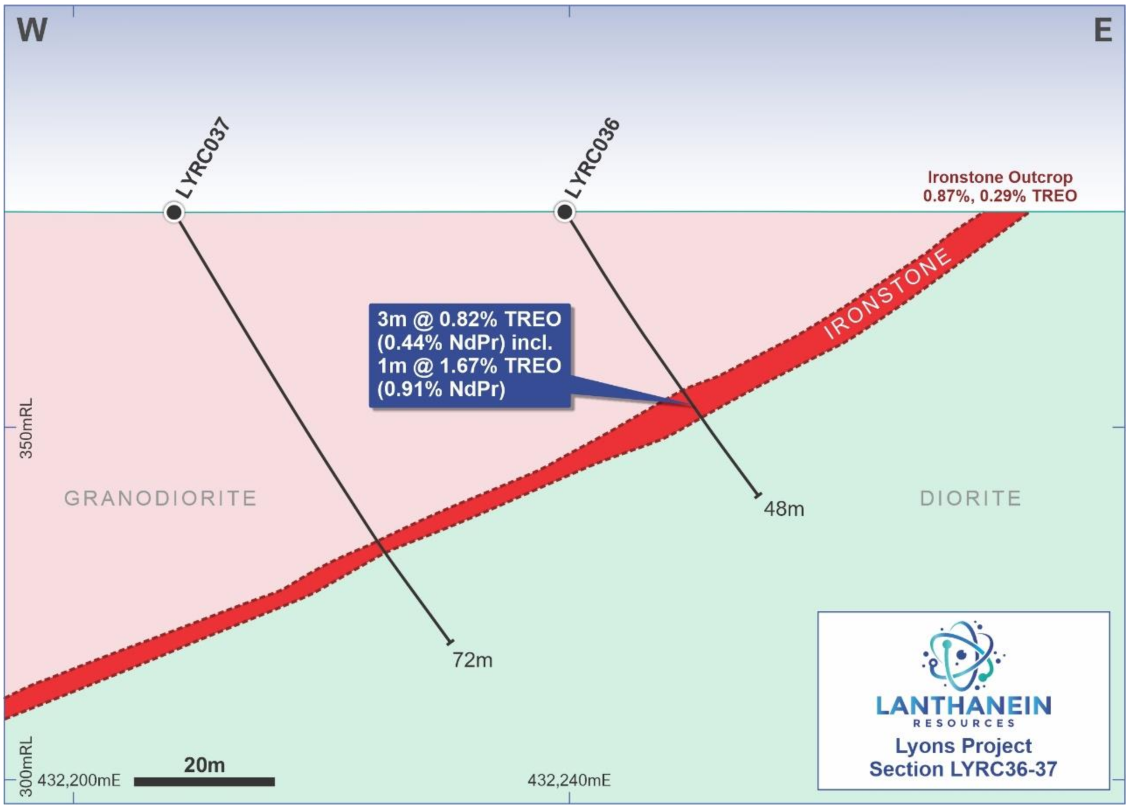


*Figure 2. Cross Section LYRC36-37 at Lyons13 Project (NB: assays pending for LYRC037)*

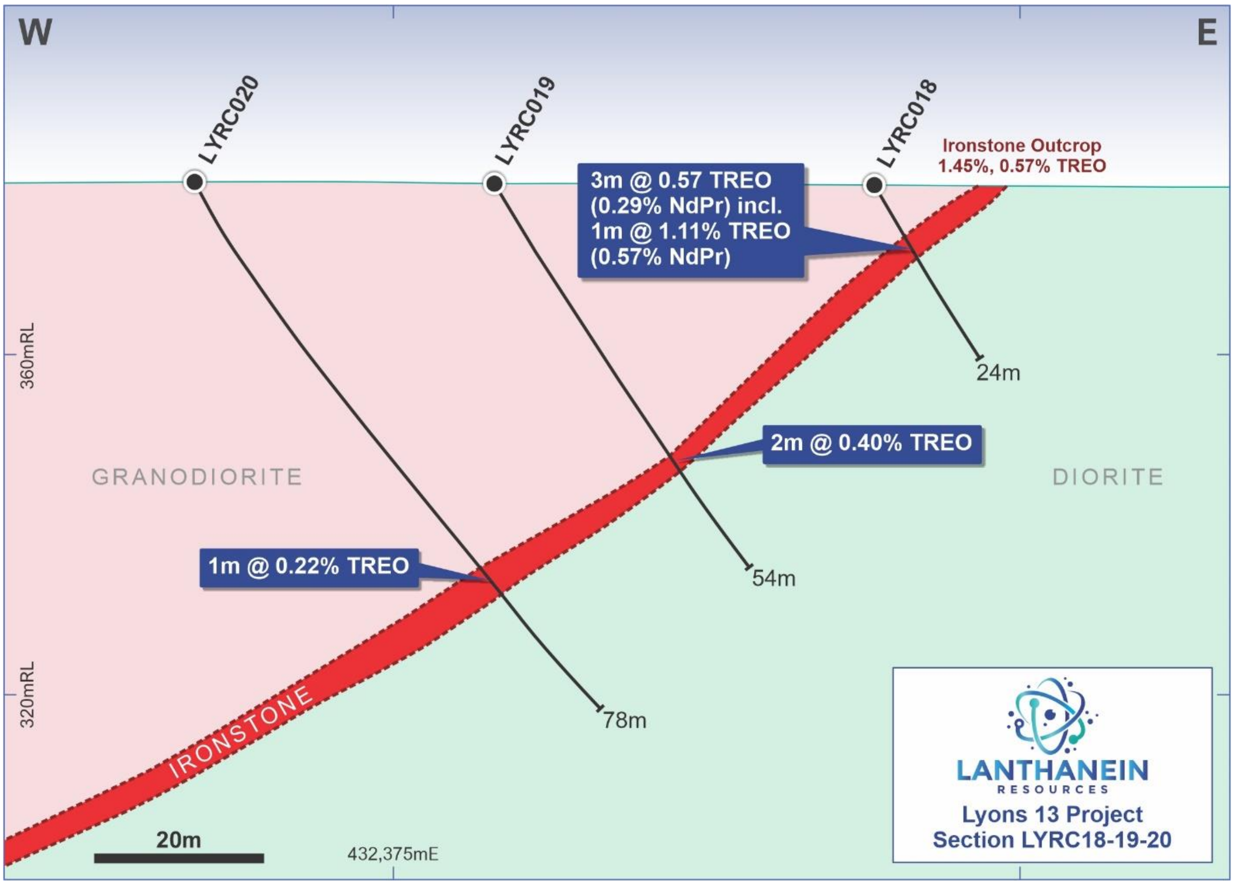


*Figure 3. Cross Section LYRC18-19-20 at Lyons13*

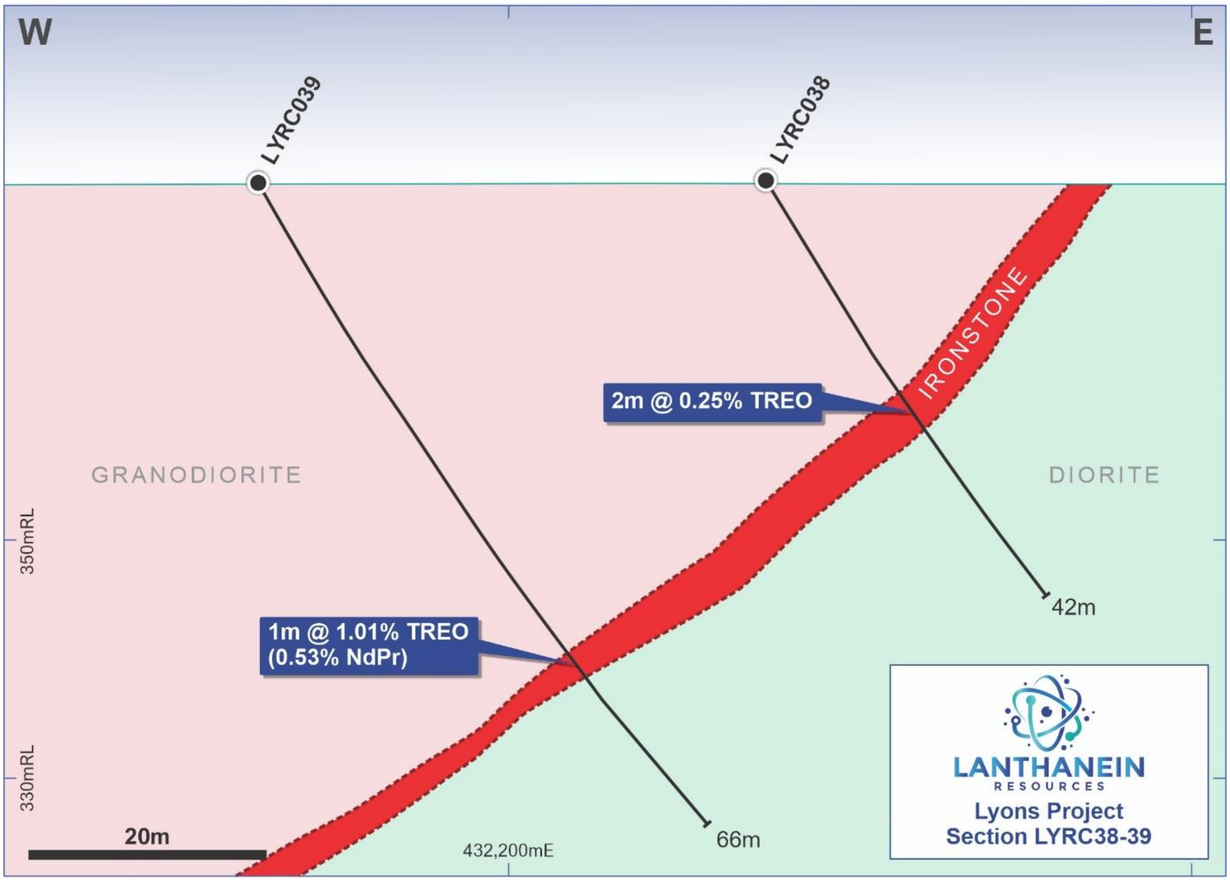


*Figure 4. Cross Section LYRC38-39 at the Intersection at Lyons12*

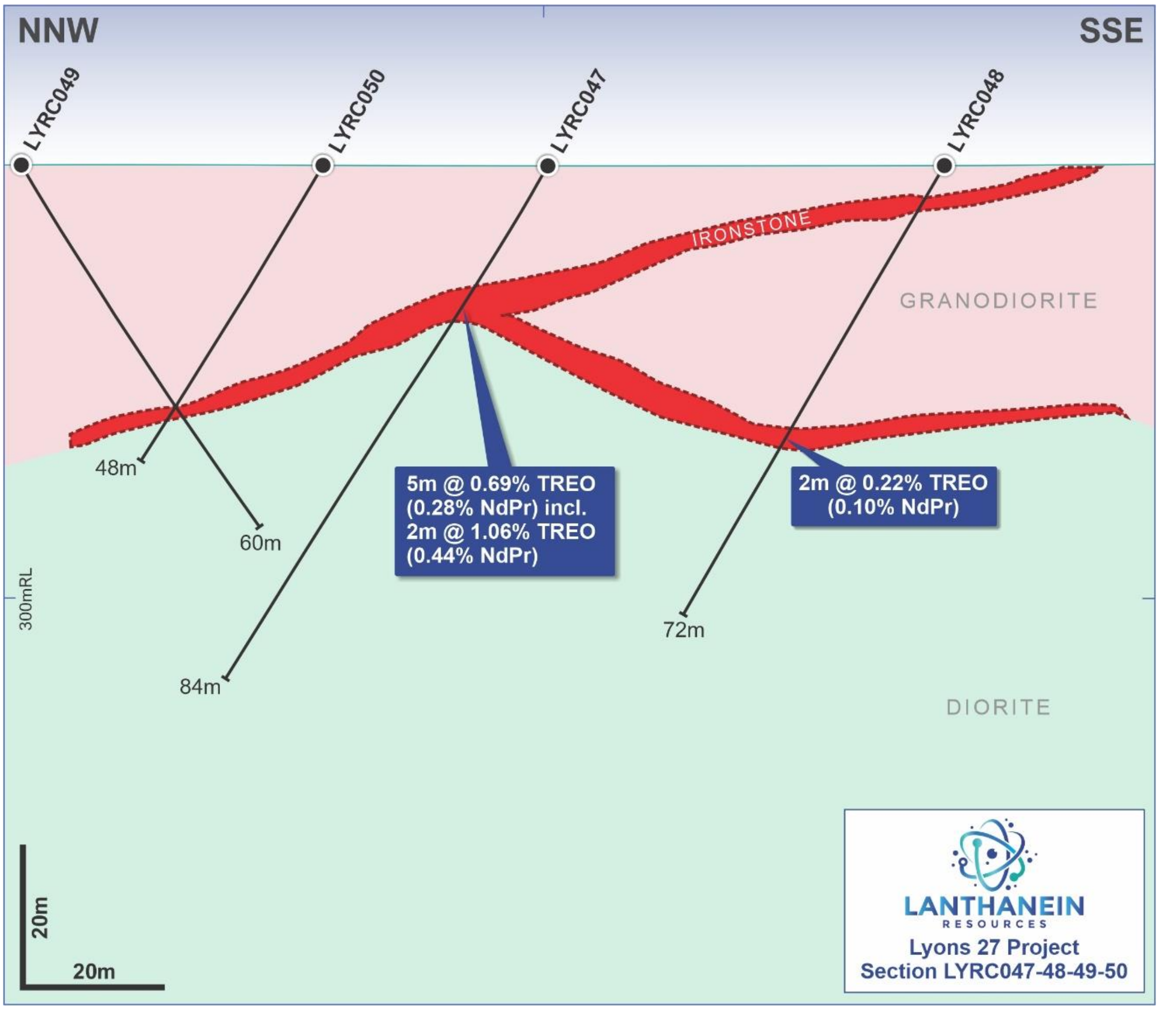


*Figure 5. Cross Section LYRC47-48-49-50 at Lyons27*

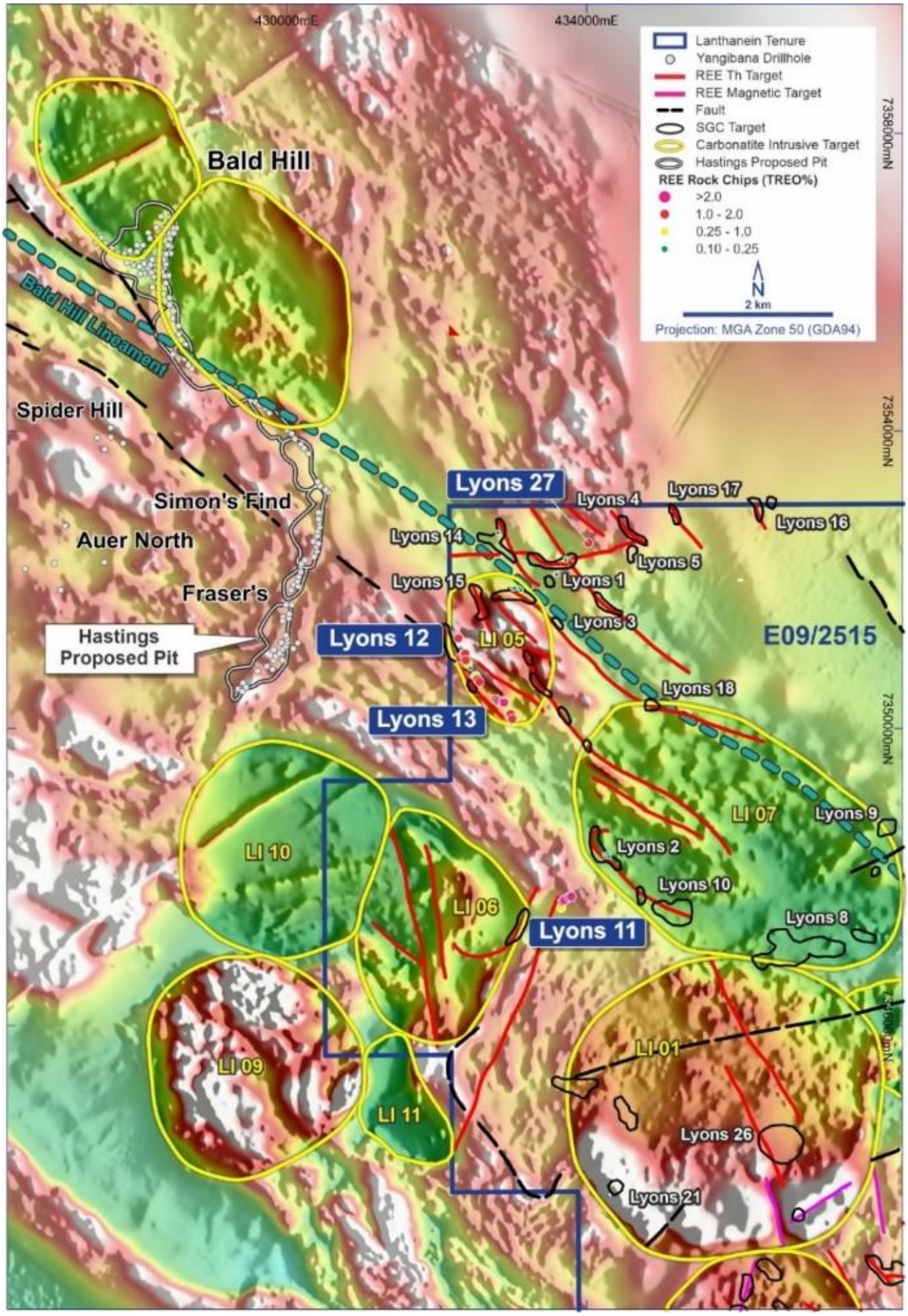


*Figure 6. Interpreted intrusives with RTPVD1 filtered magnetics imagery, highlighting relationship with rare earth mineralisation at Hastings, and target areas on Lanthanein's Lyons Project.*

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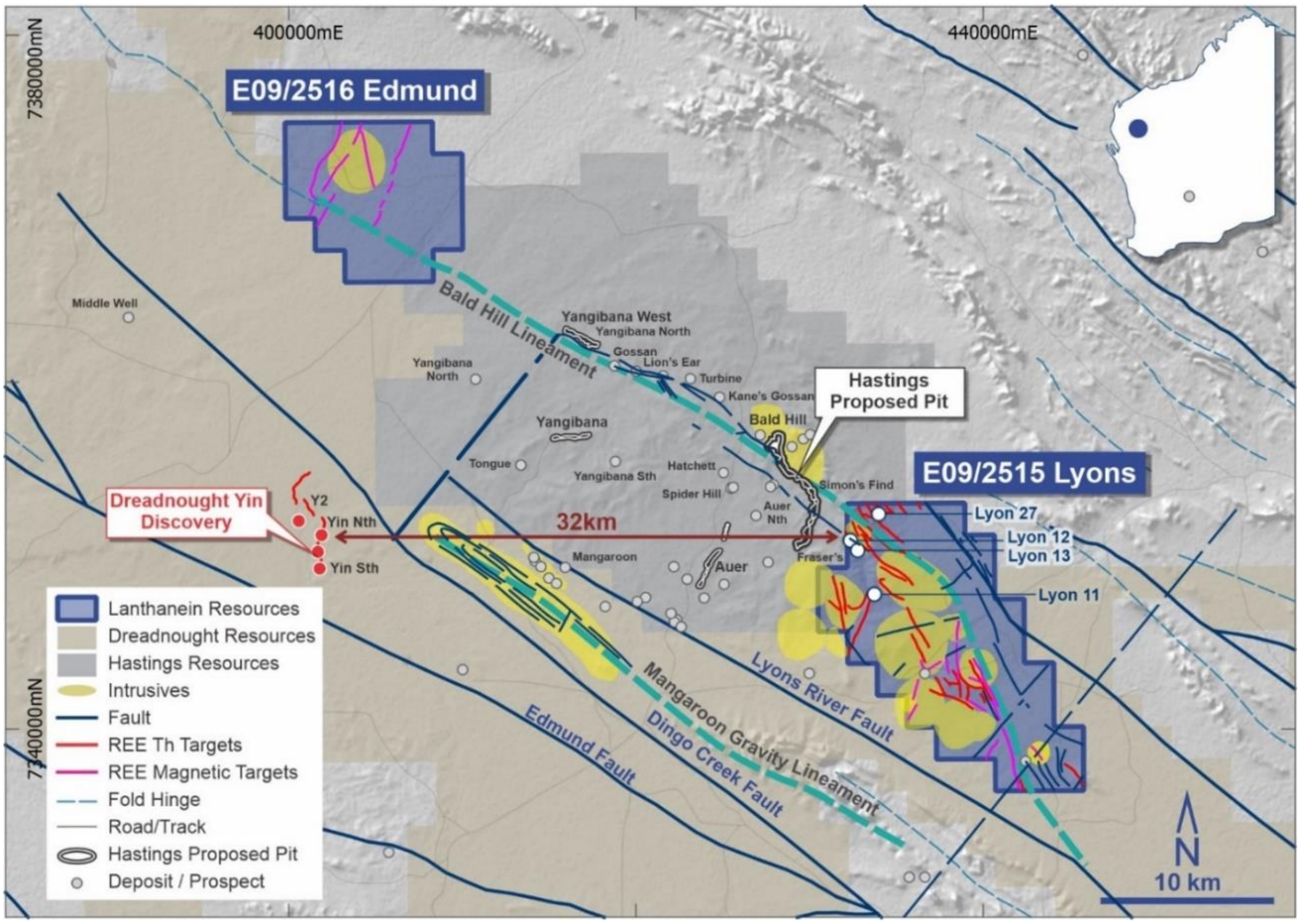


*Figure 7. Lanthanein Resources Lyons and Edmund Projects located within close proximity of Dreadnought Resources Yin discovery and Hastings Technology Metals Yangibana REE mine.*

## Niobium Overview [4]

Niobium (Nb) is a ductile refractory metal that is highly resistant to heat and wear. Like tantalum, it is resistant to corrosion owing to the formation of a surface oxide layer.

Approximately 90% of niobium use is attributed to the steel industry, predominantly as a micro alloy with iron. The addition of small, relatively cheap, amounts of niobium (much less than 1%) significantly increases the strength and decreases the weight of steel products. This results in more economic, beneficial products for use in the construction industry, in gas and oil pipelines, and in the automotive industry where weight savings result in increased performance and fuel reduction.

Niobium, along with other refractory elements such as tantalum, is also used in nickel and nickeliron superalloys, particularly for applications requiring strength and heat resistance. Uses for such superalloys include turbine blades in jet engines within the aeronautic industry, and gas turbines in the energy industry.

Niobium becomes a superconductor at very low temperatures. When alloyed with titanium (NbTi) or tin ($Nb_3Sn$), it produces the superconducting magnets used in magnetic resonance imaging (MRI) scanners, nuclear magnetic resonance (NMR) equipment and particle accelerators such as the Large Hadron Collider at CERN (The European Organization for Nuclear Research).

Niobium is one of a suite of commodities identified by the Australian Government as critical minerals, i.e., minerals (or elements) considered vital for the well-being of the world's economies, yet whose supply may be at risk of disruption. Niobium is essential for advanced technology.

**-ENDS-**

This announcement has been authorised for release by the Directors of the Company.

For additional information please visit our website at www.lanthanein.com

**LANTHANEIN RESOURCES LTD**

The information referred to in this announcement relates to the following sources:

[1] Hastings Technology Metals Ltd, COMBINED GROUP REPORT C265/2008 For the period: 1st December 2014 to the 30th November 2015 YANGIBANA PROJECT (WAMEX A107803)
ASX.HAS: 5 May 2021 "Yangibana Project updated Measured and Indicated Resource tonnes up by 54%"
b07ebf9d-03c.pdf (investi.com.au). The HAS Resource estimate comprises 4.9Mt @1.01% TREO in the Measured category, 16.24Mt @0.95% TREO Indicated and 6.27Mt @0.99% TREO Inferred.
ASX.DRE: 28 July 2022 "Assays Confirm Yin as a High Grade Rare Earth Discovery"
5a699d6e-eab.pdf (investi.com.au)

[4] Geoscience Australia, https://www.ga.gov.au/scientific-topics/minerals/mineral-resources-and-advice/australian-resource-reviews/niobium

The Company confirms that it is not aware of any new information or data that materially affects the information in the original reports, and that the format and context in which the Competent Person's findings are presented have not been materially modified from the original reports.

**Competent Person's Statement**
The information in this document that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr. Thomas Langley who is a member of the Australian Institute of Geoscientists (MAIG) and a member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Mr. Thomas Langley is a consultant of Lanthanein Resources Limited, and is a shareholder, however Mr. Thomas Langley believes this shareholding does not create a conflict of interest, and Mr. Langley has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Langley consents to the inclusion in this presentation of the matters based on his information in the form and context in which it appears.

**Competent Person's Statement**
The information in this report that relates to Geophysical Exploration Results is based on information compiled by Peter Swiridiuk - Member of the Aust. Inst. of Geoscientists. Peter Swiridiuk is a Technical Consultant and Non-Executive Director for Lanthanein Resources. Peter Swiridiuk has sufficient experience which is relevant to the type of mineralisation and type of deposit under consideration to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code of Reporting Exploration Results, Mineral Resources and Ore Resources. Peter Swiridiuk consents to the inclusion in the report of the matters based on the information in the form and context in which it appears. Additionally, Mr Swiridiuk confirms that the entity is not aware of any new information or data that materially affects the information contained in the ASX releases referred to in this report.

***Table 1: Significant Intersections > 0.2% TREO with highlighted > 1% TREO, > 1% $Nb_2O_5$***

| Hole ID | From (m) | To (m) | Interval (m) | TREO (%) | $Nd_2O_3+Pr_6O_{11}$ (%) | NdPr:TREO (%) | $Nb_2O_5$ (%) | $ZrO_2$ |
|---|---|---|---|---|---|---|---|---|
| LYRC001 | | | | No Significant Intersection | | 35 | | |
| LYRC002 | 7 | 9 | 2 | 0.38 | 0.13 | 35 | | |
| LYRC003 | | | | No Significant Intersection | | | | |
| LYRC004<br>Incl. | 7<br>7 | 10<br>8 | 3<br>1 | 0.40<br>0.80 | 0.14<br>0.29 | 35<br>36 | | |
| LYRC005 | | | | No Significant Intersection | | | | |
| LYRC006<br>Incl. | 115<br>115 | 117<br>116 | 2<br>1 | 0.75<br>1.23 | 0.29<br>0.48 | 38<br>39 | | |
| LYRC007 | 15 | 17 | 2 | 0.40 | 0.14 | 33 | | |
| LYRC008 | 48 | 50 | 2 | 0.66 | 0.23 | 35 | 0.18 | 0.11 |
| LYRC009 | 90 | 91 | 1 | 0.26 | 0.08 | 31 | | |
| LYRC010 | | | | No Significant Intersection | | | | |
| LYRC011 | | | | No Significant Intersection | | | | |
| LYRC012 | 10 | 11 | 1 | 0.46 | 0.17 | 37 | | |
| LYRC013 | | | | No Significant Intersection | | | | |
| LYRC014 | 39 | 40 | 1 | 0.71 | 0.24 | 34 | | |
| LYRC015 | 19 | 20 | 1 | 0.22 | 0.10 | 46 | 0.25 | |
| LYRC016 | 18 | 19 | 1 | 0.23 | 0.09 | 39 | | |
| LYRC017 | | | | No Significant Intersection | | | | |
| LYRC018<br>Incl. | 6<br>8 | 9<br>9 | 3<br>1 | 0.57<br>1.11 | 0.29<br>0.57 | 48<br>51 | 0.51<br>0.79 | 1.20<br>0.47 |
| LYRC019 | 38 | 40 | 2 | 0.40 | 0.18 | 45 | 0.56 | 0.17 |
| LYRC020 | 58 | 59 | 1 | 0.22 | 0.10 | 46 | 0.88 | 0.24 |
| LYRC021<br>Incl. | 16<br>17 | 21<br>18 | 5<br>1 | 0.24<br>0.59 | 0.10<br>0.28 | 38<br>48 | 0.10<br>0.15 | 0.17<br>0.09 |
| LYRC022 | | | | No Significant Intersection | | | | |
| LYRC023<br>Incl. | 56<br>57 | 60<br>59 | 4<br>2 | 0.57<br>0.98<br>Part Assays Pending | 0.28<br>0.49 | 44<br>48 | 0.40<br>0.64 | |
| LYRC024 | 20 | 23 | 3 | 0.24<br>Part Assays Pending | 0.11 | 44 | 0.11 | 0.40 |
| LYRC025 | 34 | 35 | 1 | 0.71<br>Part Assays Pending | 0.33 | 47 | 1.20 | 0.14 |
| LYRC026 | 50 | 51 | 1 | 0.20<br>Part Assays Pending | 0.08 | 40 | 0.41 | 0.33 |
| LYRC027<br>And. | 11<br>14 | 12<br>15 | 1<br>1 | 0.25<br>0.93 | 0.12<br>0.42 | 48<br>45 | <br>0.55 | <br>0.67 |
| LYRC028 | 34 | 35 | 1 | 0.27<br>Part Assays Pending | 0.11 | 41 | 0.24 | 0.16 |
| LYRC029 | 59 | 60 | 1 | 0.3 | 0.14 | 47 | 0.81 | 0.37 |
| LYRC030 | 45 | 46 | 1 | 0.3<br>Part Assays Pending | 0.13 | 43 | 0.08 | 0.17 |
| LYRC031 | 71 | 72 | 1 | 0.51 | 0.22 | 43 | 0.83 | |
| LYRC032 | 33 | 34 | 1 | 0.48<br>Part Assays Pending | 0.24 | 50 | 0.41 | 1.01 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| LYRC033 | | | | Part Assays Pending | | | | |
| LYRC034 | | | | Part Assays Pending | | | | |
| LYRC035 | 34 | 35 | 1 | 0.84<br>Part Assays Pending | 0.43 | 51 | 0.71 | 0.21 |
| LYRC036<br>Incl. | 30<br>31 | 33<br>32 | 3<br>1 | 0.82<br>1.67<br>Part Assays Pending | 0.44<br>0.91 | 53<br>55 | 0.21 | 0.31 |
| LYRC037 | | | | Part Assays Pending | | | | |
| LYRC038 | 24 | 26 | 2 | 0.25 | 0.12 | 49 | 0.19 | 0.28 |
| LYRC039 | 49 | 50 | 1 | 1.01<br>Part Assays Pending | 0.53 | 53 | 0.43 | |
| LYRC040 | 6 | 10 | 4 | 0.34<br>Part Assays Pending | 0.17 | 46 | 0.38 | 1.12 |
| LYRC041 | 6 | 7 | 1 | 0.39<br>Part Assays Pending | 0.21 | 54 | 0.16 | 1.24 |
| LYRC042 | 44 | 45 | 1 | 0.60<br>Part Assays Pending | 0.32 | 54 | 0.79 | 2.06 |
| LYRC043<br>LYRC044 | | | | Assays Pending<br>Assays Pending | | | | |
| LYRC045 | 30 | 31 | 1 | 0.21<br>Part Assays Pending | 0.08 | 38 | | |
| LYRC046 | | | | No Significant Intersection<br>Part Assays Pending | | | | |
| LYRC047<br>Incl. | 20<br>21 | 25<br>23 | 5<br>2 | 0.69<br>1.06<br>Part Assays Pending | 0.28<br>0.44 | 40<br>41 | | |
| LYRC048 | 42 | 44 | 2 | 0.22<br>Part Assays Pending | 0.10 | 43 | | |
| LYRC049 | | | | Assays Pending | | | | |
| LYRC050 | | | | No Significant Intersection | | | | |
| LYRC051 | | | | No Significant Intersection | | | | |
| LYRC052 | | | | No Significant Intersection | | | | |
| LYRC053 | | | | No Significant Intersection | | | | |

***Table 2: Drill Collar Data (GDA94 MGAz50)***

| Hole ID | Easting | Northing | Dip | Azimuth | EOH | Type | Prospect |
|---|---|---|---|---|---|---|---|
| LYRC001 | 433562 | 7347720 | -60 | 130 | 132 | RC | Lyons 11 |
| LYRC002 | 433589 | 7347700 | -60 | 128 | 84 | RC | |
| LYRC003 | 433600 | 7347773 | -60 | 134 | 138 | RC | |
| LYRC004 | 433642 | 7347745 | -60 | 132 | 42 | RC | |
| LYRC005 | 433582 | 7347798 | -60 | 134 | 162 | RC | |
| LYRC006 | 433546 | 7347830 | -60 | 131 | 162 | RC | |
| LYRC007 | 433670 | 7347762 | -60 | 148 | 42 | RC | |
| LYRC008 | 433655 | 7347799 | -60 | 148 | 72 | RC | |
| LYRC009 | 433631 | 7347783 | -60 | 148 | 102 | RC | |
| LYRC010 | 433779 | 7347784 | -60 | 164 | 36 | RC | |
| LYRC011 | 433764 | 7347819 | -60 | 164 | 60 | RC | |
| LYRC012 | 433862 | 7347802 | -60 | 160 | 36 | RC | |
| LYRC013 | 433842 | 7347849 | -60 | 160 | 84 | RC | |

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| Hole ID | Easting | Northing | Dip | Azimuth | EOH | Type | Prospect |
|---|---|---|---|---|---|---|---|
| LYRC014 | 432841 | 7350177 | -60 | 45 | 84 | RC | Lyons 13 |
| LYRC015 | 432691 | 7350314 | -60 | 36 | 48 | RC | |
| LYRC016 | 432637 | 7350341 | -60 | 43 | 36 | RC | |
| LYRC017 | 432567 | 7350322 | -60 | 50 | 78 | RC | |
| LYRC018 | 432410 | 7350613 | -60 | 60 | 24 | RC | Lyons 12 |
| LYRC019 | 432377 | 7350583 | -60 | 50 | 54 | RC | |
| LYRC020 | 432351 | 7350559 | -60 | 50 | 78 | RC | |
| LYRC021 | 432420 | 7350578 | -60 | 26 | 36 | RC | |
| LYRC022 | 432398 | 7350539 | -60 | 32 | 78 | RC | |
| LYRC023 | 432373 | 7350502 | -60 | 36 | 72 | RC | |
| LYRC024 | 432461 | 7350529 | -60 | 42 | 36 | RC | |
| LYRC025 | 432439 | 7350506 | -60 | 42 | 48 | RC | |
| LYRC026 | 432406 | 7350471 | -60 | 50 | 66 | RC | |
| LYRC027 | 432490 | 7350506 | -60 | 34 | 30 | RC | |
| LYRC028 | 432464 | 7350466 | -60 | 35 | 42 | RC | |
| LYRC029 | 432439 | 7350426 | -60 | 40 | 78 | RC | |
| LYRC030 | 432493 | 7350411 | -60 | 35 | 66 | RC | |
| LYRC031 | 432468 | 7350381 | -60 | 50 | 84 | RC | |
| LYRC032 | 432349 | 7350671 | -60 | 48 | 48 | RC | |
| LYRC033 | 432314 | 7350642 | -60 | 54 | 66 | RC | |
| LYRC034 | 432278 | 7350611 | -80 | 50 | 108 | RC | |
| LYRC035 | 432262 | 7350776 | -60 | 50 | 48 | RC | |
| LYRC036 | 432241 | 7350815 | -60 | 34 | 48 | RC | |
| LYRC037 | 432207 | 7350771 | -60 | 36 | 72 | RC | |
| LYRC038 | 432213 | 7350852 | -60 | 36 | 42 | RC | |
| LYRC039 | 432187 | 7350818 | -60 | 36 | 66 | RC | |
| LYRC040 | 432217 | 7350926 | -60 | 53 | 48 | RC | Lyons 12 |
| LYRC041 | 432187 | 7350896 | -60 | 52 | 60 | RC | |
| LYRC042 | 432197 | 7350991 | -60 | 40 | 54 | RC | |
| LYRC043 | 433463 | 7351984 | -60 | 66 | 84 | RC | Lyons 3 |
| LYRC044 | 433704 | 7352230 | -60 | 211 | 54 | RC | |
| LYRC045 | 434034 | 7352497 | -60 | 245 | 42 | RC | Lyons 27 |
| LYRC046 | 434021 | 7352435 | -60 | 243 | 84 | RC | |
| LYRC047 | 433891 | 7352593 | -60 | 228 | 84 | RC | |
| LYRC048 | 433930 | 7352632 | -60 | 228 | 72 | RC | |
| LYRC049 | 433835 | 7352546 | -60 | 45 | 60 | RC | |
| LYRC050 | 433864 | 7352576 | -60 | 225 | 48 | RC | |
| LYRC051 | 433700 | 7350034 | -60 | 74 | 42 | RC | Lyon_P2 |
| LYRC052 | 433269 | 7350630 | -60 | 62 | 60 | RC | Lyon_P3 |
| LYRC053 | 435602 | 7348619 | -60 | 35 | 30 | RC | Lyons 28 |

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## JORC Code, 2012 Edition – Table 1 report template

### *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.*<br>• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*<br>• *Aspects of the determination of mineralisation that are Material to the Public Report.*<br>• *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.* | Reverse Circulation (RC) drilling was undertaken to produce samples for assaying.<br><br>Two sampling techniques were utilised for this program, 1m metre splits directly from the rig sampling system for each metre and 3m composite sampling from the spoil piles. Samples submitted to the laboratory were determined by the site geologist.<br><br>**1m Splits**<br><br>From every metre drilled a 2-3km samples (split) was sub-sampled into a calico bag via a Metzke cone splitter from each metre of drilling.<br><br>**3m Composites**<br><br>All remaining spoil from the sampling system was collected in buckets in rows adjacent to the rig. An aluminium scoop was used to then sub-sample each spoil pile to create a 2-3kg 3m composite sample in a calico bag. Only at Lyons 11 prospect as a 3m composite collected.<br><br>All samples are submitted to ALS Laboratories in Perth for determination of Rare Earth Oxides by Lithium Borate Fusion XRF (ALS Method ME-XRF30).<br><br>**Rock Chips**<br><br>• Rock Chips were collected by Gascoyne Geological Services Geologist and submitted for analysis. Rock chips are random, subject to bias and often unrepresentative for the typical widths required for economic consideration. They are by nature difficult to duplicate with any acceptable form of precision or accuracy.<br>• Rock chips have been collected by Gascoyne Geological Services to assist in characterising different lithologies, alterations and expressions of mineralisation. In many instances, several rock chips were collected from a single location to assist with characterising and understanding the different lithologies, alterations and expressions of mineralisation present at the locality.<br>• Rock chips were submitted to ALS Laboratories in Perth for determination of Rare Earth Oxides |

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| | | by Lithium Borate Fusion XRF (ALS Method ME-XRF30). |
| *Drilling techniques* | • *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).* | **RC Drilling**<br><br>Topdrill undertook the program utlising a Drill Rigs Australia track mounted Schramm T685WS drill rig with additional air from an auxillary compressor and booster. Bit size was 5 ¾ inch. |
| *Drill sample recovery* | • *Method of recording and assessing core and chip sample recoveries and results assessed.*<br>• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*<br>• *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.* | **RC Drilling**<br><br>Drilling was undertaken using a 'best practise' approach to achieve maximum sample recovery and quality through the mineralised zones.<br><br>Best practise sampling procedure included: suitable usage of dust suppression, suitable shroud, lifting off bottom between each metre, cleaning of sampling equipment, ensuring a dry sample and suitable supervision by the supervising geologist to ensure good sample quality.<br><br>At this stage, no known bias occurs between sample recovery and grade. |
| *Logging* | • *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*<br>• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*<br>• *The total length and percentage of the relevant intersections logged.* | RC chips were logged by a qualified geologist with sufficient experience in the geological terrane and relevant styles of mineralisation using an industry standard logging system which could eventually be utilised within a Mineral Resource Estimation.<br><br>Lithology, mineralisation, alteration, veining, weathering and structure were all recorded digitally.<br><br>Chips were washed each metre and stored in chip trays for preservation and future reference.<br><br>RC pulp material is also analysed on the rig by pXRF, scintillometer and magnetic susceptibility meter to assist with logging and the identification of mineralisation.<br><br>Logging is qualitative, quantitative or semi-quantitative in nature. |
| *Sub-sampling techniques and sample preparation* | • *If core, whether cut or sawn and whether quarter, half or all core taken.*<br>• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*<br>• *For all sample types, the nature, quality* | **RC Drilling**<br><br>From every metre drilled, a 2-3kg sample (split) was sub-sampled into a calico bag via a Metzke cone splitter. |

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| | *and appropriateness of the sample preparation technique.*<br>• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*<br>• *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.*<br>• *Whether sample sizes are appropriate to the grain size of the material being sampled.* | QAQC in the form of duplicates and CRM's (OREAS Standards) were inserted through the ore zones at a rate of 1:50 samples. Additionally, within mineralised zones, a standard and a blank were inserted.<br><br>2-3kg samples are submitted to ALS Laboratories (Perth), oven dried to 105°C and pulverised to 85% passing 75um to produce a 0.66g charge for determination of Rare Earth Oxides by Lithium Borate Fusion XRF (ALS Method ME-XRF30).<br><br>Standard laboratory QAQC is undertaken and monitored.<br><br>**Rock Chips**<br><br>Entire rock chips were submitted to the lab for sample prep and analysis. |
| *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.*<br>• *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.*<br>• *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.* | **Laboratory Analysis**<br>Lithium Borate fusion is considered a total digest and Method ME-XRF30 is appropriate for REE determination.<br><br>Standard laboratory QAQC is undertaken and monitored by the laboratory and by the company upon assay result receival.<br><br>**Rock Chips**<br><br>• All samples were submitted to ALS Laboratories in Wangara, Perth where 1-3kg rock chips samples were crushed so that >70% of material passes through -6mm, the sample is then pulverised to >85% passing 75 micron.<br>• A 66-gram aliquot of pulverised sample is fused with 12:22 lithium borate flux containing an oxidizing agent, and poured to form a fused disk. The resultant disk is then analysed by XRF spectrometry specifically for Rare Earths (ALS Method ME-XRF30)<br>• Lithium borate fusion is considered a total digest and Method ME-XRF30 is appropriate for REE determination.<br>• No standards, duplicates or blanks submitted with rock chips.<br>Airborne geophysical data including magnetics and radiometrics (eK, eTh, eU) were collected by |

| Criteria | JORC Code explanation | Commentary |
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| | | MagSpec Airborne Surveys. The survey was flown with a Cessna 206 aircraft. Magnetic data was collected from a G-823A cesium vapour magnetometer using a 50m line spacing and 30m sensor height. Radiometric data was collected from an RSI RS-500 gamma-ray spectrometer of 32L Crystal Volume flown at 30m sensor height and 50m line spacing. All readings (X,Y,Z) were within a 2m accuracy. Traverse Line Direction was East-West. |
| *Verification of sampling and assaying* | • *The verification of significant intersections by either independent or alternative company personnel.*<br>• *The use of twinned holes.*<br>• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*<br>• *Discuss any adjustment to assay data.* | **Logging and Sampling**<br><br>Logging and sampling were recorded directly into a digital logging system, verified and eventually stored in an offsite database.<br><br>Significant intersections are inspected by senior company personnel.<br><br>No twinned holes have been drilled at this time.<br><br>No adjustments to any assay data have been undertaken.<br><br>**Rock Chips**<br><br>• Rock chip and geological information is written in field books and coordinates and track data saved from handheld GPSs used in the field.<br>• Gascoyne Geological Services geologist inspected and logged all rock chips.<br>• Field data is entered into excel spreadsheets to be loaded into a database. |
| *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.*<br>• *Specification of the grid system used.*<br>• *Quality and adequacy of topographic control.* | • Collar position was recorded using a Garmin handheld GPS which has an accuracy of +/- 5m.<br>• GDA94 Z50s is the grid format for all xyz data reported.<br>Azimuth and dip of the drill hole was recorded after the completion of the hole using a Reflec Sprint IQ Gyro. A reading was undertaken every $10^{th}$ metre with an accuracy of +/- 1° azimuth and +/- 0.3° dip. |
| *Data spacing and distribution* | • *Data spacing for reporting of Exploration Results.*<br>• *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* | See drill table for hole positions.<br>Data spacing at this stage is not suitable for Mineral Resource Estimation. |

| Criteria | JORC Code explanation | Commentary |
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| | *procedure(s) and classifications applied.*<br>• *Whether sample compositing has been applied.* | |
| *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.*<br>• *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.* | Drilling was undertaken at a near perpendicular angle to the interpreted strike and dip of the ironstone outcrops and modelled magnetic data.<br><br>No sample bias is known at this time. |
| *Sample security* | • *The measures taken to ensure sample security.* | All geochemical samples were collected,<br>bagged, and sealed by Gascoyne Geological Services staff and delivered to Bishops Transport in Carnarvon.<br>Samples were delivered directly to ALS<br>Laboratories in Wangara, Perth by Bishops Transport ex Carnarvon. |
| *Audits or reviews* | • *The results of any audits or reviews of sampling techniques and data.* | The program is continuously reviewed by senior company personnel. |

## *Section 2 Reporting of Exploration Results*

(Criteria in this section apply to all succeeding sections.)

| 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.*<br>• *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.* | Lanthanein Resources Ltd entered into a conditional agreement to acquire all of the shares in Dalkeith Capital Pty Ltd (Dalkeith) which holds two granted exploration licences in the Gascoyne Region of Western Australia. The acquisition was completed on 4 January 2022.<br>• The Gascoyne Project consists of 2 granted Exploration Licenses (E09/2515 and E09/2516).<br>• All tenements are 100% owned by Dalkeith Capital.<br>• The Gascoyne Project covers 2 Native Title<br>Determinations including the Thudgari (WAD6212/1998)<br>and the Combined Thiin-Mah, Warriyangka, Tharrkari and Jiwarli (WAD464/2016).<br>• The Gascoyne Project is located over the following pastoral leases; Edmund, Gifford Creek, and Wanna. |
| *Exploration* | • *Acknowledgment and appraisal of* | • Historical exploration of a sufficiently high standard |

| Criteria | JORC Code explanation | Commentary |
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| *done by other parties* | *exploration by other parties.* | was carried out in the region by a few parties including:<br><br>Hurlston Pty Ltd 1986-1987: WAMEX Report A23584<br>Newmont 1990: WAMEX Report A32886<br>Newcrest 1990: WAMEX Report A36887<br>Desert Energy 2006-2007: WAMEX Reports A78056, A80879 |
| *Geology* | • *Deposit type, geological setting and style of mineralisation.* | • The Gascoyne Project is located within the Gascoyne Province of the greater Capricorn Orogen – the region that records the collision of the Pilbara-Glenburgh Terrane at 2215–2145 Ma (Ophthalmian Orogeny) and eventual collision of Pilbara/Glenburgh and Yilgarn at 2005–1950 Ma (Glenburgh Orogeny), the Gifford Creek Carbonatite Complex (GCCC) intrudes the Durlacher Supersuite (including Yangibana and Pimbyana Granites) and the Pooranoo Metamorphics.<br><br>The c.1360 Ma GCCC is composed of;<br>• ~NW striking Lyons River Sills (calcio-, magnesio- and ferrocarbonatites)<br>• ~NE striking fenite (alteration) veins<br>• Yangibana Ironstones (REE ore bodies)<br>• Magnetite-biotite dykes<br><br>• Carbonatites in the region are thought to have been generated from melting of the Glenburgh Orogen-fertilized mantle during reactivation of structures (e.g. Lyons River Fault) at c. 1370 Ma followed by magma ascent along the same structures.<br>• The Gascoyne Project is prospective for Ferrocarbonatite hosted REEs. |
| *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:*<br>o *easting and northing of the drill hole collar*<br>o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*<br>o *dip and azimuth of the hole*<br>o *down hole length and interception depth*<br>o *hole length.*<br>• *If the exclusion of this information is* | An overview of the drilling program is given within the text within this document. |

| Criteria | JORC Code explanation | Commentary |
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| | *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.*<br>• *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.*<br>• *The assumptions used for any reporting of metal equivalent values should be clearly stated.* | No pXRF readings or metal equivalents are reported. |
| *Relationship between mineralisation widths and intercept lengths* | • *These relationships are particularly important in the reporting of Exploration Results.*<br>• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*<br>• *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').* | Drilling is undertaken close to perpendicular to the dip and strike of the mineralisation.<br><br>The true thickness of the mineralisation intersected in drill holes cannot currently be calculated. |
| *Diagrams* | • *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.* | • Refer to figures within this report. |
| *Balanced reporting* | • *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.* | • The accompanying document is a balanced report with a suitable cautionary note. |
| *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* | • Suitable commentary of the geology encountered are given within the text of this document. |

| Criteria | JORC Code explanation | Commentary |
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| | *results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.* | |
| *Further work* | • *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*<br>• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.* | Additional RC drilling<br><br>Diamond Drilling<br><br>Metallurgical test work<br><br>Resource Modelling |