

# DRILLING COMMENCES TO TEST HIGH-IMPACT IOCG TARGET AT CENTRAL GEORGINA PROJECT, NT

Permitting received, rig mobilised and drilling underway at Leichhardt East



## Key Highlights

- **Diamond drilling has commenced at Leichhardt East.**
- **Leichhardt East is an outstanding Iron Oxide Copper Gold deposit style (IOCG) target:**
  - **Gravity high anomaly identified under cover using novel geophysical modelling.**
  - **'Near-miss' 2022 drill-hole intersected<sup>2</sup> elevated IOCG 'pathfinders' copper, bismuth, silver and high-grade uranium of up to 0.24% U<sub>3</sub>O<sub>8</sub>.**
  - **Prospective structural setting wedged between regional scale faults.**
- **East Tennant region considered highly prospective for IOCG deposits according to Geoscience Australia.**
- **IOCG deposits account for 35% of Australia's domestic copper production.**

Astute Metals NL (ASX: ASE) ("ASE", "Astute" or "the Company") is pleased to advise that it has commenced high-impact exploration diamond drilling at the Leichhardt East Prospect, located within its 100%-owned Georgina Basin IOCG Project in the Northern Territory.

The Leichhardt East prospect is a multi-faceted IOCG prospect, with a number of characteristics that make it a compelling drill target – including modelled highly dense rocks, proximity to a 'near-miss' hole that intersected copper, bismuth, silver and uranium, and a favourable position between two regional-scale faults. The planned 500m hole will be drilled in the coming fortnight.

IOCG deposits are economically attractive and typically large copper-gold deposits that may have other by-products such as uranium or bismuth. Australian examples include Olympic Dam, Prominent Hill and Carrapateena (South Australia), Ernest Henry (Northwest Queensland) and smaller, higher-grade variants at Tennant Creek, such as Juno and Warrego.

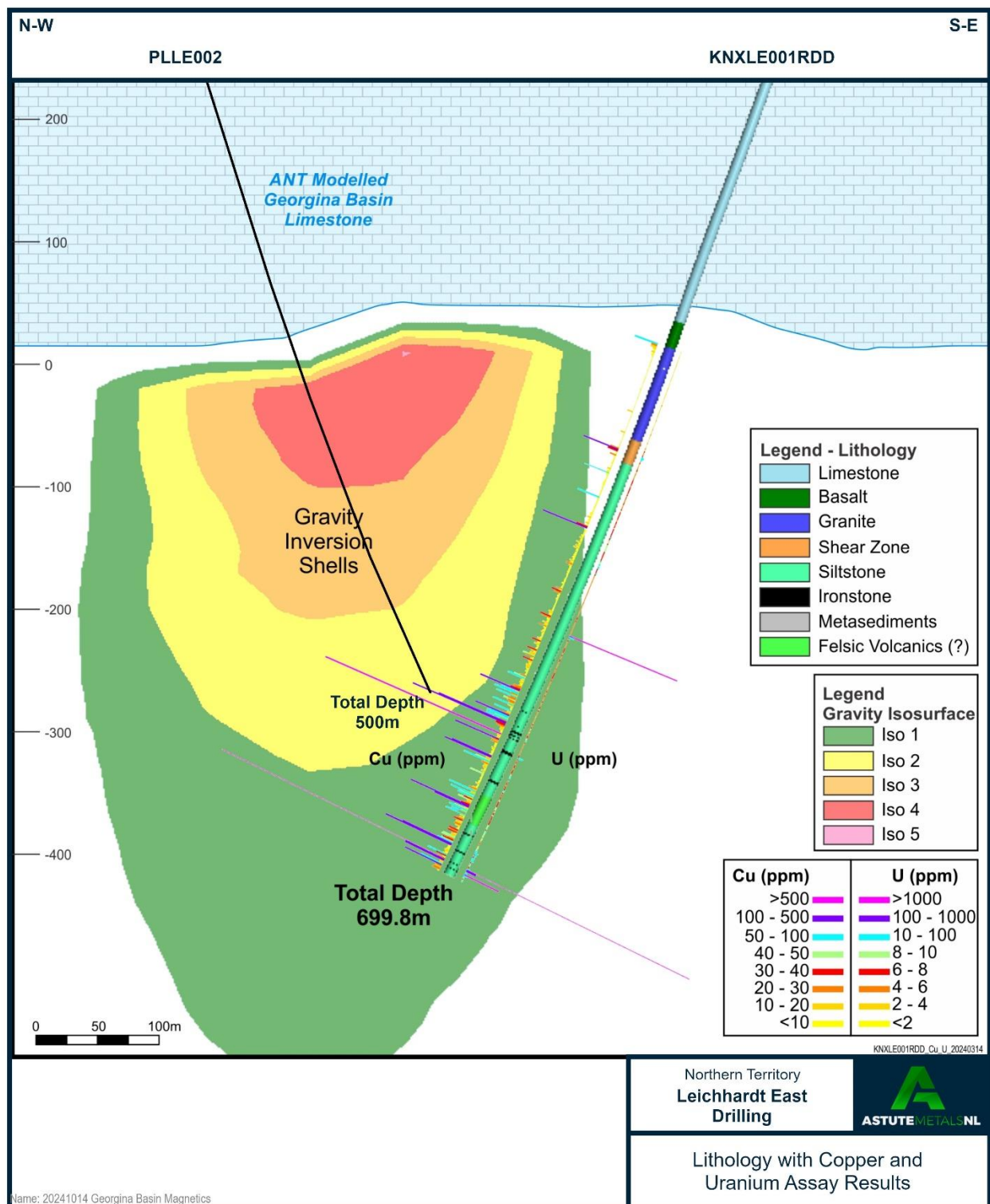
The attractiveness of IOCGs as a deposit class is clear from recent acquisition activity, including the BHP Group Ltd (ASX: BHP) consolidation of operating IOCG assets in South Australia with the acquisition of Oz Minerals in mid-2023 for A\$9.6 billion<sup>9</sup>. Eighteen months prior, Evolution Mining (ASX: EVN) acquired the Ernest Henry mine from Glencore PLC in a late 2021 transaction valued at \$1 billion<sup>10</sup>. The mine had been in operation as open cut and underground for 23 years at the time.

**Astute Chairman, Tony Leibowitz, said:** *"A considerable amount of science and the latest in geophysical modelling and lateral geological thinking has gone into the definition of this compelling IOCG target at Leichhardt East. Now it is down to the team on the ground to drill a 500m diamond hole to evaluate the target."*

*"This represents one of the most compelling discovery opportunities in our portfolio and we are very much looking forward to seeing what the hole will reveal. We will keep the market informed as the hole progresses over the coming days."*

## Background

Previous drilling at Leichhardt East targeted partly-coincident magnetic and gravity isosurfaces that were generated by *unconstrained* inversion modelling. The drill-hole intersected prospective host rocks that exhibit alteration and geochemical anomalism that may be associated with an Iron-Oxide-Copper-Gold (IOCG) style mineralising system, including uranium mineralisation in ironstones, with intervals grading 0.24%  $U_3O_8$  from 689.09–689.41m and 0.11%  $U_3O_8$  from 481.1–481.85m, along with associated elevated copper and bismuth<sup>2</sup>. A complete set of assay results for the Leichhardt East drilling can be found in the original 3 April 2023 ASX release.



**Figure 1.** Constrained gravity isosurfaces, planned (PLLE002) and existing drill-hole at Leichhardt East – Section view

Using data generated from the Ambient Noise Tomography (ANT) geophysical survey conducted mid-2023, consulting group Mitre Geophysics performed a constrained inversion of previously captured gravity survey data, removing the gravitational effects of the overlying limestone cover to produce a more accurate model for where prospective gravity (density) anomalies reside in the underlying basement.

The inversion of the residual gravity response resulted in a model covering an 850 x 500m area, with a density of 3.5 – 3.7g.cc, which is consistent with that of mineralised rocks from iron-oxide copper-gold (IOCG) deposits such as Carrapateena<sup>1</sup>. Nearby Astute drill-hole KNXLE001RDD, intersected narrow slivers of ironstone which were mineralised with respect to anomalous levels of copper, bismuth, silver and uranium<sup>2</sup>. This updated inversion model sits approximately 300m above the mineralised ironstone and therefore represents a compelling target for drill testing (See Figure 1).

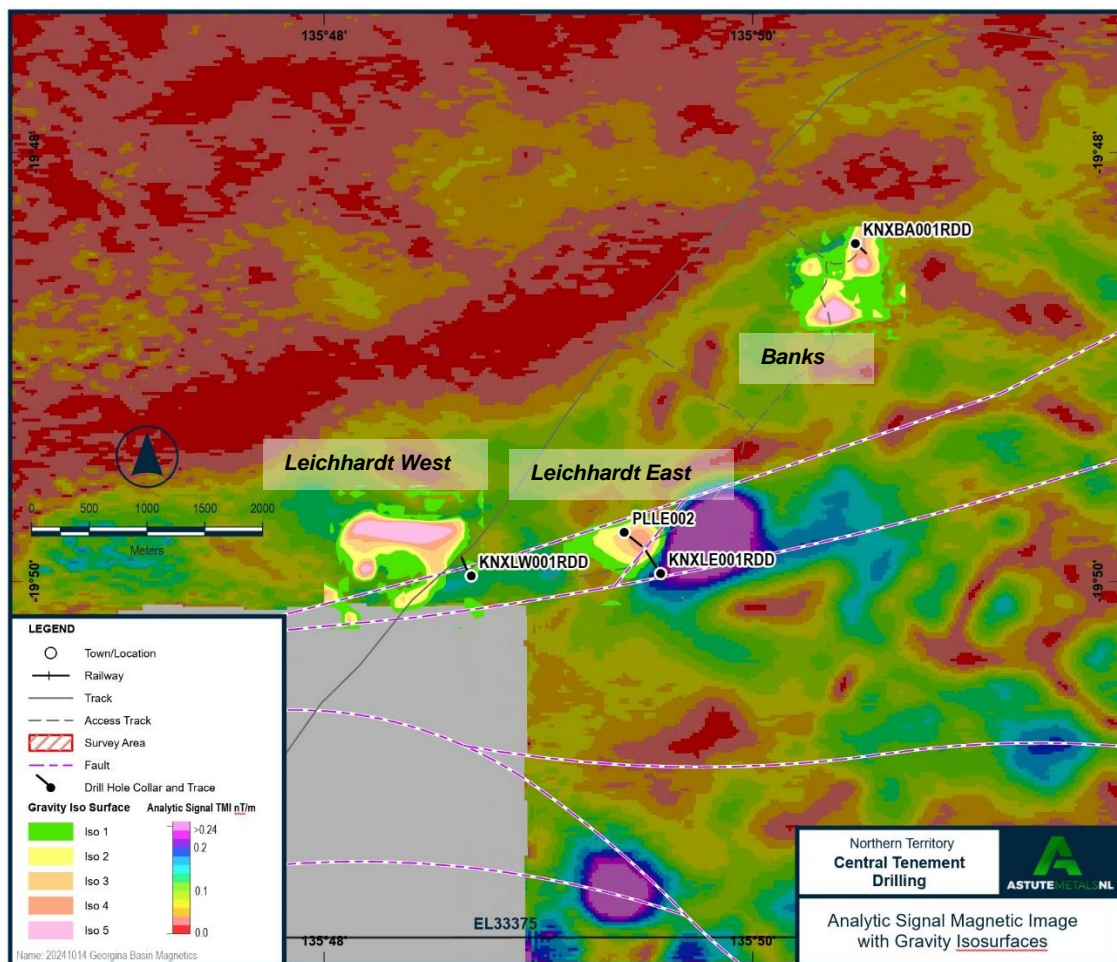
### Leichhardt East a Multi-faceted IOCG Target

The Leichhardt East target has a number of characteristics that reflect excellent IOCG potential. These include modelled highly dense rocks, proximity to a previous “near-miss” hole that intersected copper, bismuth, silver and uranium, and a favourable structural position between two regional-scale faults.

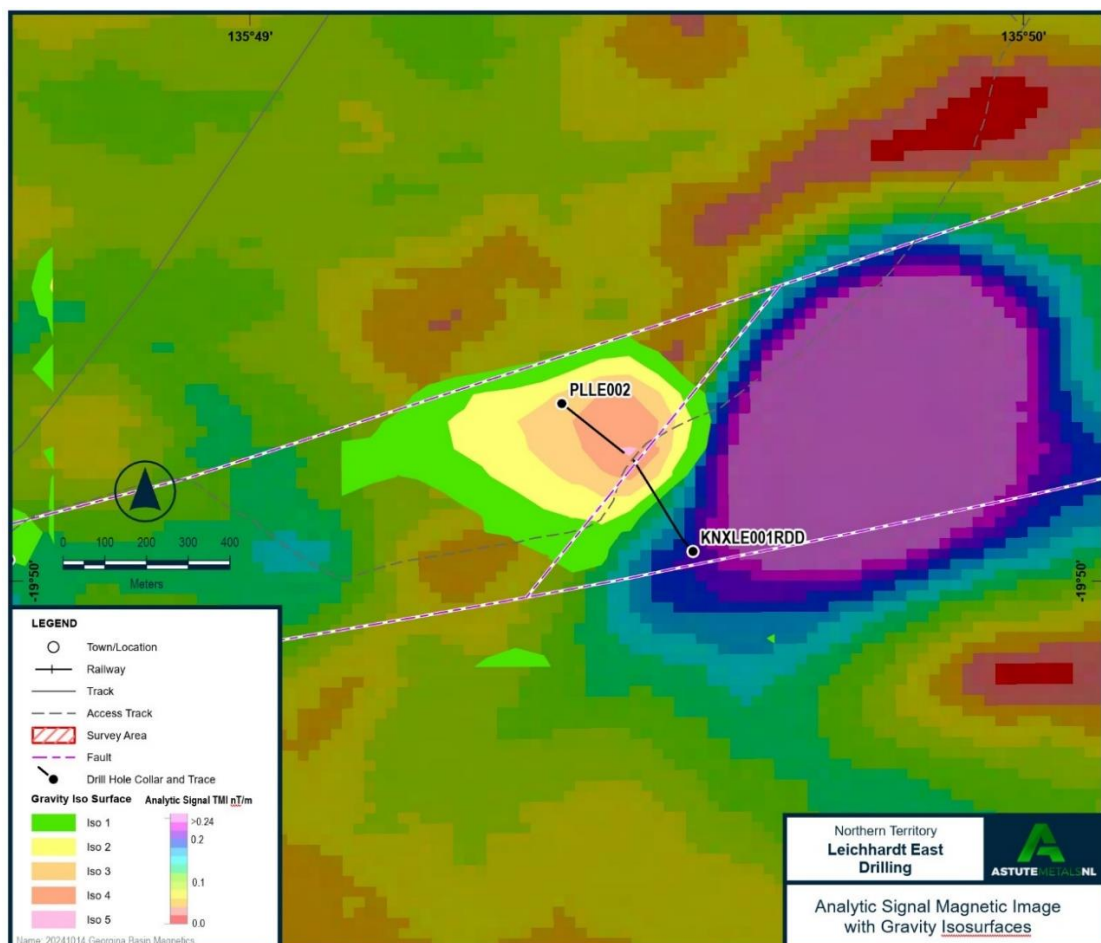
Characteristic	Why is this prospective?
High-density rocks	<p>Most rock-forming minerals have a density/specific gravity of between 2.6 and 3g.cc, while minerals that make up the mineralised part of IOCG deposits have significantly higher densities<sup>5</sup>, such as iron-oxide minerals magnetite (density of 5.18g.cc), hematite (5.26g.cc) and copper-bearing minerals such as chalcopyrite (4.1-4.3g.cc) and bornite (5.06-5.08g.cc).</p> <p>As a result of the increased presence of these dense minerals – in particular iron oxide minerals that typically make up 15–60wt% of mineralised rocks<sup>4</sup> – the rocks that make up IOCG deposits are dense themselves. For example, mineralised rocks at Carrapateena, a South Australian IOCG deposit (Measured Mineral Resource of 130Mt at 1.01% copper, 0.42g/t gold and 4g/t silver)<sup>7</sup>, owned by BHP, have densities ranging from approximately 3.51 – 4.7g.cc<sup>1</sup>.</p>
Previous ‘near-miss’ drill hole KNXLE001RDD intersected copper, bismuth, silver and uranium <sup>2</sup> (Figure 1)	Copper is the main ore metal for IOCG style deposits, with uranium a potential by-product, such is produced at Olympic Dam. Bismuth, silver and uranium are considered ‘pathfinder’ elements that may occur in lower concentrations in the halo or ‘edges’ of an IOCG mineralising system.
Previous drilling intersected numerous thin ironstones, some of which were mineralised <sup>2</sup> (Figure 1)	Ironstones host copper and gold mineralisation in IOCG deposits from the nearby Tennant Creek inlier, located approximately 175km west of the Leichhardt East prospect <sup>11</sup> . The presence of mineralised ironstones at Leichhardt East is an indication that ore-forming processes are operating in the area.
Petrographical analysis of previous drill core identified martitisation (hematite alteration after magnetite) <sup>11</sup>	The alteration reaction, whereby magnetite is oxidised to hematite, is common in IOCG systems. Examples include Olympic Dam <sup>12</sup> , Oak Dam <sup>13</sup> and some of the Tennant Creek deposits such as the high-grade gold -rich deposit Juno <sup>14</sup> .
Hosted in Warramunga Formation equivalent rocks	The Warramunga formation is the rock formation that hosts the Tennant Creek IOCG deposits <sup>11</sup> . The presence of equivalent host rocks at Leichhardt East indicates the potential to host a Tennant Creek-style IOCG deposit.
Situated between two regional-scale faults (Figure 2)	Faults are interpreted to act as conduits for fluids that transport metal-rich fluids and, as such, are a necessary ingredient to form an IOCG deposit.

**Table 1.** Leichhardt East target characteristics and why they are considered prospective.





**Figure 2.** Plan view of all three modelled prospects (Leichhardt East and West, Banks) drill holes and faults over Analytic Signal magnetic imagery at the Georgina IOCG Project.



**Figure 3.** Constrained gravity isosurfaces, planned (PLLE002) and prior drill-holes, faults and magnetics at Leichhardt East.

### Planned Drill Details

The Leichhardt East target will be tested with a single 500m diamond drill hole, targeting the core of the modelled gravity (density) target. Drilling of the current hole is expected to be completed in the coming fortnight.

Plan ID	Easting (GDA94)	Northing (GDA94)	Dip (°)	Azimuth (°)	Depth (m)
PLLE002	586225	7807175	-70	130	500

**Table 2.** Planned drill-hole details.



**Figure 4.** DDH1 drill rig set up at Leichhardt East.

### Other Drill Targets

In addition to the modelling work that identified Leichhardt East, the Company has identified additional off-hole drill targets at the nearby Banks and Leichhardt West prospects<sup>8</sup>. Similar to Leichhardt East, both of these targets have the presence of modelled dense rocks and geochemical anomalism in nearby holes, drilled by the previous project owner Greenvale Energy Ltd (ASX: GRV). Further drill testing is warranted at both prospects.

The Company remains operationally ready to conduct additional drilling at these prospects should the results at Leichhardt East provide validation of its novel geophysical modelling approach for target generation in this highly prospective part of the Georgina IOCG Project.



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- 1 Vella, L., Emerson, D., 2009 'Carrapateena: physical properties of a new iron-oxide copper-gold deposit'  
2 ASX: ARO 3 April 2023 'Significant polymetallic anomalism intersected at Georgina IOC Project, NT'  
3 ASX: ASE 3 August 2023 'Commencement of Geophysics Survey at Georgina IOCG Project'  
4 Skirrow, R.G., 2022 'Iron oxide copper-gold (IOCG) deposits – A review (part 1): Settings, mineralogy, ore geochemistry and classification  
5 AusIMM, Mineral Densities - <https://www.ausimm.com/globalassets/insights-and-resources/minerals-processing-toolbox/mineraldens.pdf>  
6 ASX: ARO 17 April 2023 'AGES Presentation – Georgina Basin'  
7 ASX: BHP 'Annual Report 2023'  
8 ASX: ASE 19 March 2024 'Additional High Priority Targets Identified-Georgina Project'  
9 ASX: BHP <https://www.bhp.com/news/media-centre/releases/2023/05/completion-of-oz-minerals-acquisition>  
10 ASX: EVN 17 November 2021 'Evolution Secures Full Ownership Of Ernest Henry'  
11 ASX: ASE 17 April 2024 AGES Presentation – Ambient Noise Tomography Constrained Gravity Inversions at East Tennant  
12 Ray, G.E and Lefebure, D.V., 1999, A Synopsis of Iron Oxide ± Cu ± Au ± P±REE Deposits of the Candelaria-Kiruna-Olympic Dam Family,  
13 Davidson, D.J et al., 2007, Characteristics and Origin of the Oak Dam East Breccia-Hosted, Iron Oxide CuU(Au) Deposit: Olympic  
Dam Region, Gawler Craton, South Australia, Economic Geology v. 102 pp 1471-1498  
14 Skirrow, R.G., 2019, A shear-hosted Au-Cu-Bi metallogenic event at ~1660 Ma in the Tennant Creek goldfield (northern Australia)  
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## Authorisation

This announcement has been authorised for release by the Board of Astute.

## More Information

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## Competent Person

The information in this report is based on information compiled by Mr Matthew Healy, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM Member number 303597). Mr Healy is a full-time employee of Astute Metals NL and is eligible to participate in a Loan Funded Share incentive plan of the Company. Mr Healy 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 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Healy consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.