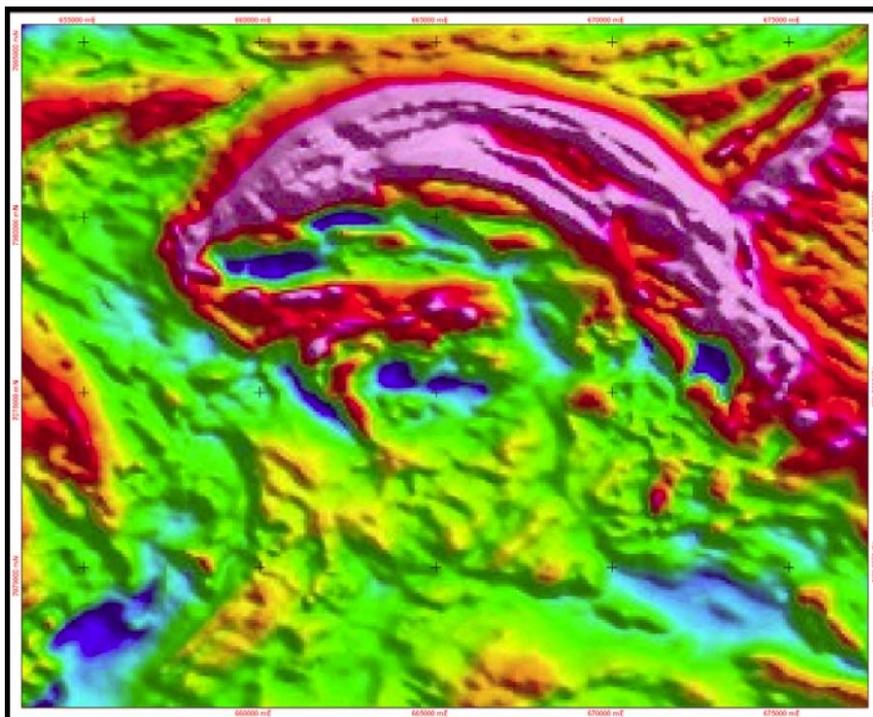


## ASX ANNOUNCEMENT

18 June 2014



### **Caroline Nickel - Copper Project Update - Musgrave Project, South Australia**

PepinNini Minerals (ASX: PNN) is pleased to announce the details of three high-priority Nickel Sulphide (Ni-S) prospects identified within the Company's 100% owned Caroline Project in the central Musgrave Region of South Australia.

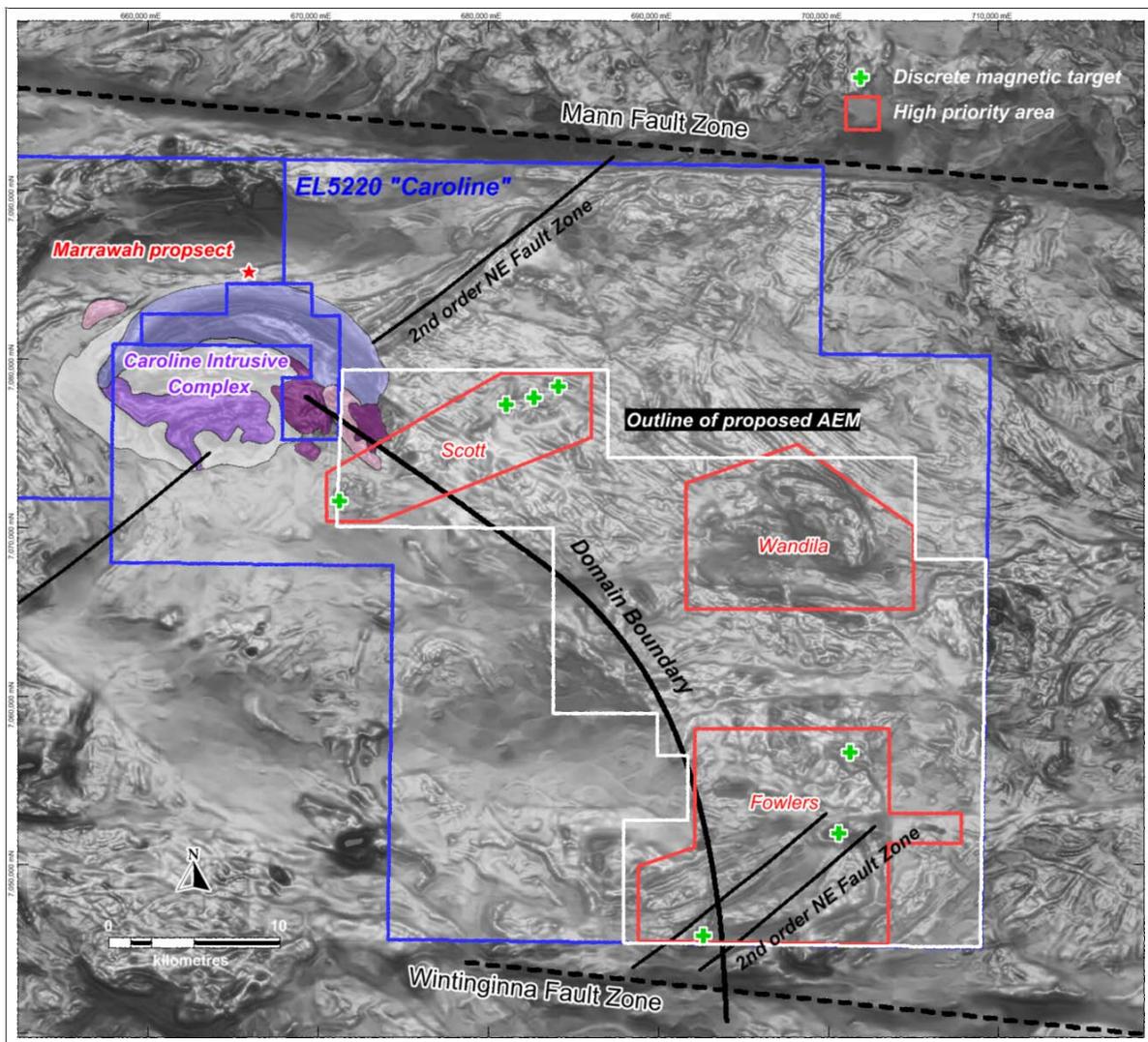
The key findings of the recent area selection studies are as follows:

- Three Ni-S prospects named Scott, Fowlers and Wandila have been identified within the Caroline Project.
- Prospects are located along a prominent south-east trending domain boundary and within intersections of key east-west (Wintinginna FZ) and north-east trending structural lineaments.
- PepinNini will be targeting Ni-S mineralisation associated with north-west to north-east plunging mafic feeder dykes termed chonoliths, analogous to the geological setting of the Nebo-Babel deposits that host significant Nickel-Copper mineralisation in the West Musgrave Region.

- Seven discrete magnetic ‘bulls eye’ targets have been identified near intersections of major structures and gravity lineaments and highlights the potential for chonoliths in the project area
- The presence of Ni-Cu massive sulphides within the project area will be investigated through a collaborative geological and geophysical research project with the Minerals Down Under (MDU) Flagship of the CSIRO, involving the acquisition and analysis of airborne electromagnetic survey data.

Commenting on the results of recent area selection studies, PepinNini’s Managing Director, Rebecca Holland Kennedy stated:

“The identification of robust Ni-S prospects within Caroline is a significant move forward for the Company’s Greenfields Musgrave Ni-Cu Project. These positive interpretations highlight the prospectivity of a region that has no existing airborne EM coverage and no historical exploration. We look forward to working alongside the CSIRO and utilizing technical innovation to provide rapid target delineation in high priority areas”

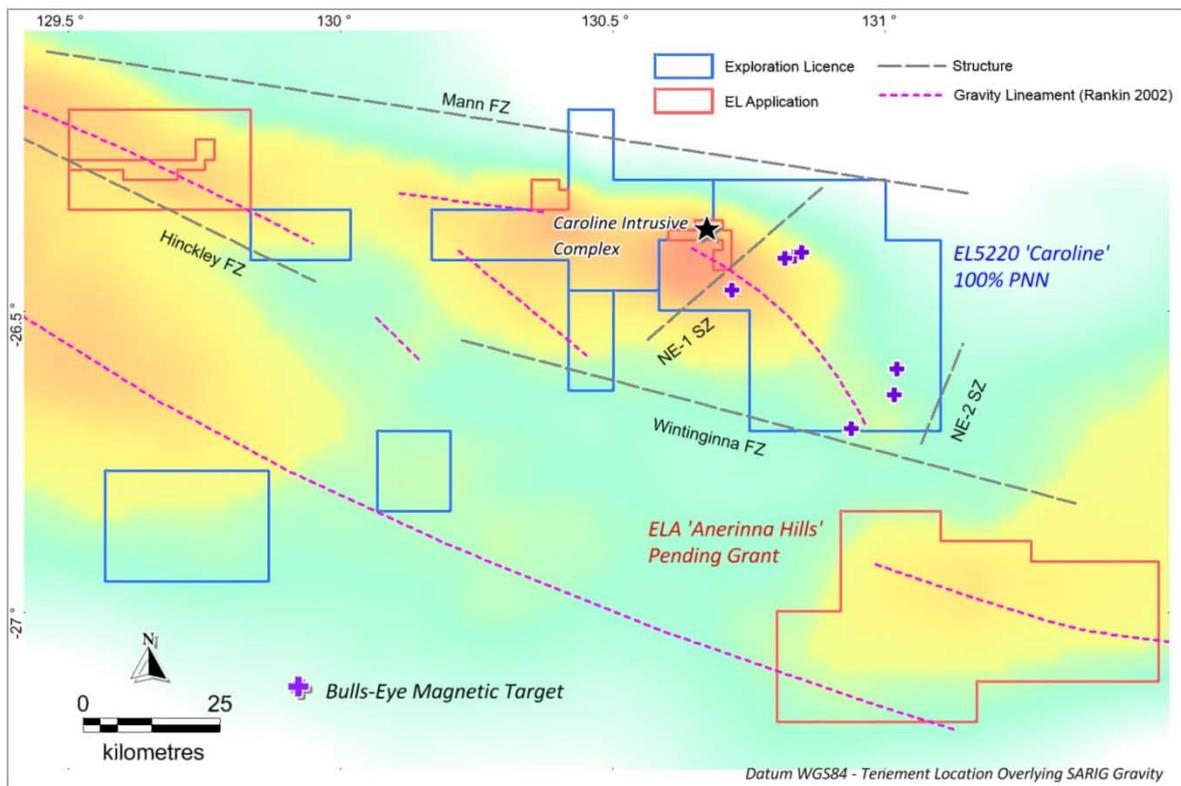


**Figure 1:** Location of Nickel Sulphide (Ni-S) geological prospects within PepinNini’s Caroline Ni-Cu Project, central Musgrave Region of South Australia. Ni-S prospects are located favourably near the intersections of east-west crustal lineaments and a south-east trending curvilinear domain boundary. The identification of discrete magnetic targets within north-east structures highlights the potential for mafic feeder dykes (chonoliths) within the project area. The presence of massive Ni-S will be investigated through a large airborne electromagnetic survey planned for Q4 2014.

## Exploration Strategy

The mineral potential of PepinNini’s Musgrave tenements was assessed through interpretation of the distribution of long-lived crustal structures and location of major magmatic centers. This is an important consideration for area-selection studies as major Ni-Cu deposits occur where mafic magma, sourced by a deep seated mafic plume, ascends through abundant trans-lithospheric structures.

For the Caroline and Anerinna Hills Projects, the spatial distribution of prospective ‘Giles’ age mafic rocks can be inferred by two separate south-east and east-southeast trending gravity lineaments (Figure 2). The intersections of these lineaments with east trending primary structures, such as the Wintinginna FZ, and north-east trending secondary shear zones define interesting exploration targets.



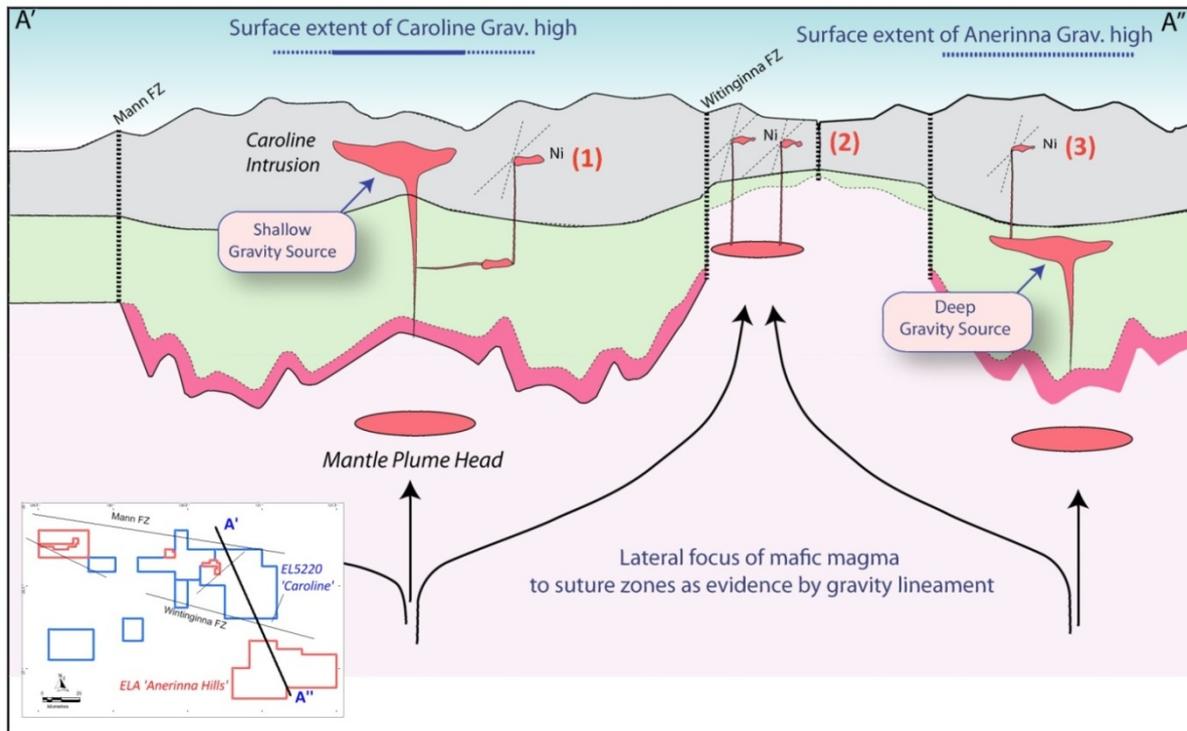
**Figure 2** Location of major gravity (pseudo-colour image courtesy of DMITRE) and structural lineaments within the Caroline and Anerinna Hills projects, central Musgrave Region of South Australia.

The conceptual model devised for ‘Caroline’ and ‘Anerinna Hills’ evoke three Ni-Cu prospectivity options, which includes 1) Nebo-Babel style mineralisation in feeder dykes to the Caroline Intrusion, 2) structurally controlled mineralisation associated with mafic magmatism channelled laterally into the Wintinginna FZ, and 3) Jinchuan-style mineralisation hosted in superjacent (stratigraphically above) mafic dykes replenished by a deeply buried mafic source. This relationship is shown schematically in Figure 3. Results of the geophysical surveys, sampling, and mapping are awaited and will be reported June-July 2014.

In addition, interpretation of aeromagnetic data has highlighted a number of discrete magnetic “bulls-eye” anomalies (Figure 1-2) within the Scott and Fowlers Prospects. Such features are intriguing given the association of magmatic Ni-Cu systems within vertical pipe-like intrusions containing magnetic iron-oxides such as magnetite. This model is supported by the recent discovery of the Marrawah magmatic system, where drill testing intercepted mixed sulphides

bearing anomalous copper and nickel within an ultramafic dyke proximal to the Caroline Intrusion (PepinNini ASX release 16th of October, 2013).

The Wandila prospect hosts an 8km long curvilinear magnetic feature located near the intersection of an east-west trending fault and prominent NW magnetic fabric. The unit is intriguing given the magnetic similarities it shares with the elliptical, layered Caroline intrusion.



**Figure 3:** Schematic cross-section through PepinNini's Caroline and Anerinna Hills project showing the location of major mafic magmatism (gravity) in relation to deep crustal structures (magnetics). PepinNini is targeting 1) Nebo-Babel style mineralisation in feeder dykes to the Caroline Intrusion, 2) structurally controlled mineralisation associated with mafic magmatism channelled laterally into the Witinginna FZ, and 3) Jinchuan-style mineralisation hosted in superjacent (stratigraphically above) mafic dykes replenished by a deeply buried mafic source.

## Work Program

PepinNini proposes a staged exploration to advance the Company's grassroots Caroline Ni-Cu Project.

Phase 1 target generation activities will be underpinned by an approximately 2500 line kilometer airborne electromagnetic (EM) survey over high priority areas. The survey will be coordinated by the CSIRO, who will also be involved in their analysis, and will provide rapid delineation of conductivity targets that could represent accumulations of Ni-Cu enriched massive sulphide.

PepinNini is currently working to finalise the specification of the survey and it is anticipated that the survey will be complete during Q4 2014.

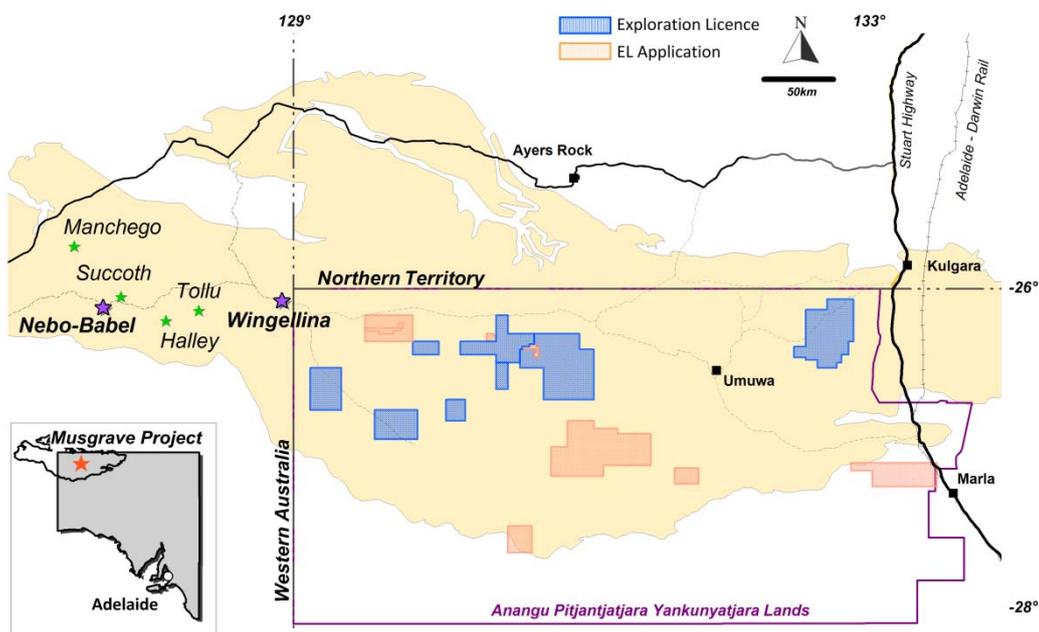
Phase 2 target refinement and prioritisation will include follow-up ground electromagnetic surveys over high priority airborne EM conductive targets. Ground EM will provide better constraints on the size and geometries of conductive plate models and facilitate drill testing. PepinNini will also deploy the Company's vacuum rig to undertake top-of-basement geochemical sampling to investigate the fertility of mafic phases within the project area.

Phase 3 will involve systematic drill testing of high-priority geochemical and conductivity using the Company's diamond drill rig and self-contained field camp.

## About CSIRO - Minerals Down Under

The Minerals Down Under Flagship was established by the CSIRO in 2007 to provide options for the longer term viability, health and legacy of the mineral resources sector in Australia.

CSIRO has a long history and track record for innovation in the minerals industry. Building on this history, Minerals Down Under, with the support of its partners, provides a national platform to focus Australian research at scale and across the breadth of the innovation system. This enables a focus on the key challenges facing the minerals industry in Australia and the ability to build links to the global market place for Australian innovation. The Flagship goal is to deliver science and technology options for the discovery and efficient development of Australia's mineral resource endowment that lead to \$1 trillion in-situ value by 2030 and enable flow-on benefits to the wider national economy.



**Figure 4:** Location of PepinNini Minerals Exploration Licences with the central Musgrave Region, South Australia

## Musgrave Province Project

PepinNini is exploring for world-class nickel sulphide deposits in the Musgrave, Province, South Australia. The Musgrave Project comprises seven 100% owned tenements (3 exploration licences and 4 exploration licence applications) covering 8,222 km<sup>2</sup>, and three Joint Venture tenements with Rio Tinto Exploration covering 1,387 km<sup>2</sup> (PepinNini earning 51%).

The Company is targeting Voisey's Bay style and scale Nickel-Copper deposits in 'Giles Complex' ultramafic-mafic rocks. The mineral potential of this region was established by the discovery of the Nebo-Babel deposits (446mt @ 0.33% Ni, 0.35% Cu) by Western Mining Corporation in 2000, where the discovery hole intersected 26.55m @ 2.45% Ni, 1.78% Cu, 0.74g/t PGE (Cassini Resources, ASX announcement 3 April 2014).

Systematic exploration undertaken by PepinNini has identified massive magmatic sulphides within 'Giles Complex' rocks with concentrations of up to 0.7% Cu and 0.3% Ni intercepted within the Marcus Intrusion. (ASX announcement 30 April 2008)

The Company conducts proven cost effective exploration through company owned and operated drilling equipment.

*The information in this report that relates to Exploration Results and Mineral Resources is based on information compiled by Phil Clifford BSc MAusIMM. Phil Clifford is the Technical Director of PepinNini Minerals Limited and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration 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". Phil Clifford consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. This information was prepared and first disclosed under JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported.*

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**Note:** Additional information on PepinNini Minerals Limited can be found on the website:  
[www.pepinnini.com.au](http://www.pepinnini.com.au)