

ASX: PNN

The logo for Pepininni Minerals Limited features the company name in a bold, white, sans-serif font. The word 'Pepininni' is on the top line, and 'Minerals Limited' is on the bottom line. A thin orange circle is drawn around the 'Pepininni' text. The background of the slide is a landscape with a blue sky, white clouds, and a dark, rocky terrain in the foreground.

# Pepininni Minerals Limited

**INVESTOR PRESENTATION**

Exploring and developing key demand-driven mineral resources | February 2022

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The information in this presentation that relates to the kaolin project has been prepared with information compiled by Mr Steven Cooper, FAusIMM. He is the Australian Exploration Manager and a full-time employee of the Company. Steven Cooper has sufficient experience 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'. Steven Cooper consents to the inclusion in the announcement of the matters based on her information in the form and context in which it appears.

The information in this presentation on the Musgrave Project and on the Santa Ines Project was prepared with information compiled and/or thoroughly reviewed by Phil Clifford, MAusIMM. Phil Clifford has sufficient experience 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 presentation of the matters based on his information in the form and context in which it appears.

The information in this presentation on the Salta Project was prepared with information compiled by Marcela Casini, MAusIMM. Marcela Casini has sufficient experience 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". Marcela Casini consents to the inclusion in the report of the matters based on her information in the form and context in which it appears.

The information contained herein that relates to progress of laboratory test work and study development related activities from the Salta Project have been directed by Marcelo Bravo. He is a Chemical Engineer and managing partner of Ad-Infinitem Spa. with over 25 years experience and he is a Member of the Chilean Mining Commission (register 0412) and has sufficient experience which is relevant to the activity which they are undertaking to qualify as a Competent Persons as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Bravo consents to the inclusion of his name in the matters based on the information in the form and context in which it appears.

# Corporate Overview

<b>TICKER</b> <b>ASX: PNN</b>	<b>SHARES ON ISSUE</b> <b>~61.075M</b>	<b>OPTIONS</b> <b>~12.24M</b> varying exercise prices & expiry dates	<b>MARKET CAPITALISATION</b> <b>~A\$30.54M</b> @ \$0.50	<b>CASH</b> <b>~A\$5.45M</b> @ 31 December 2021
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**PNN: 12 MONTH SHARE PRICE [SHARE PRICE RANGE: 0.787 – 0.22]**



### SHAREHOLDING DETAILS (from 2021 Annual Report)

Number of shareholders	3,407
Top 20 Shareholders	~36%

### DIRECTORS

Stephen Ross	Non Executive Chairman
Mena Habib	Executive Director
James Moses	Non Executive Director
David Turvey	Non Executive Director

# PepinNini Minerals **Project Locations**

DIVERSE PORTFOLIO OF QUALITY PROJECTS IN HIGH-VALUE COMMODITIES



## **Musgrave Project** **Nickel-Copper-Cobalt**

- Major large-scale Ni-Cu-Co sulphide exploration play
- Highly prospective tenure in under-explored region
- Active Farm-in JV with Rio Tinto

## **Eyre Peninsula Project** **Kaolin-Halloysite**

- Located in a globally significant kaolin-halloysite precinct
- Three Exploration Licences covering 1,413km<sup>2</sup>
- Hosts known kaolin mineralisation – drilling to commence

## **Salta Project** **Lithium-Brine**

- Strategically located in the Salta Province, northwest Argentina.
- Situated within the 'Lithium Triangle' which holds 65% of the world's lithium
- Existing JORC Resource with expansion potential

## **Santa Ines Project** **Copper-Gold**

- Four mining leases covering 61.4km<sup>2</sup>, north-west Argentina
- Potential, large-scale, porphyry Cu-Au opportunity
- Strategically located in similar geological setting as BHP's world-class Escondida Copper-Gold Mine

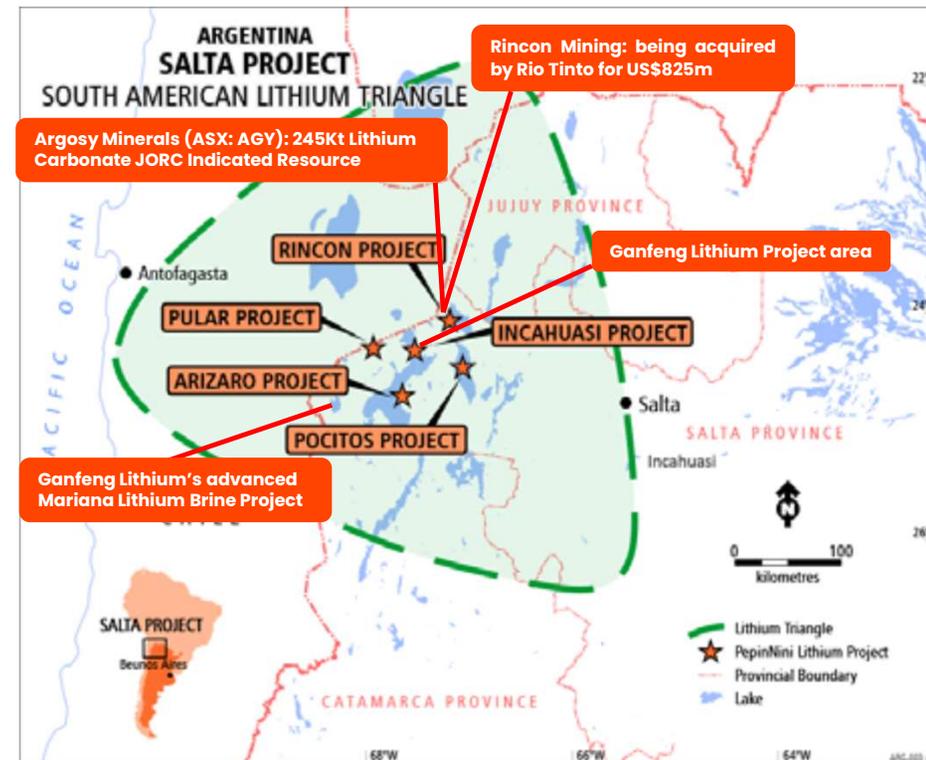
# SALTA LITHIUM-BRINE PROJECT, ARGENTINA

Strategic asset in South America's lithium triangle -  
hosts 65% of the world's lithium



## Salta Lithium-Brine Project: Project Overview

- ▶ **100%-owned** via PNN's wholly-owned Argentine subsidiary, PepinNini SA
- ▶ Comprises **7 mining leases** (minas) situated within **5 dried salt lakes (salares)**, covering 147.07 km<sup>2</sup>
- ▶ **Strategically located** in the high Puna region of the Andes Mountains, in Salta Province northwest Argentina.
- ▶ **Situated within the 'Lithium Triangle'** of Argentina, Chile and Bolivia – **holds 65% of the world's lithium**
- ▶ **3 key factors combine to concentrate and enrich lithium** as lithium salt in the region's salares;
  - ❖ High elevation and geothermally active
  - ❖ High evaporation rates; and
  - ❖ Low precipitation
- ▶ **Existing JORC 2012 Resource<sup>1</sup>:**
  - ❖ Total of 239,000t Lithium Carbonate Equivalent (LCE) from 2 salares – 63% Measured, Indicated & Inferred, grades up to 313mg/l Lithium



Salta Lithium-Brine Project location map – showing project's 5 salares

<sup>1</sup>ASX announcements, 27 June 2018 and 23 January 2019

# Brine Blending Program: Potential ‘Game-Changer’ for Salta Project

Company’s core immediate-term focus at the Salta Project – final results will help determine potential development pathways and monetisation opportunities



Rincon and Incahuasi Salares location map

## Aim

- ▶ Program is **blending the different chemical properties of lithium brines** from the **Incahuasi and Rincon salares at the Salta Project**
- ▶ Aims to **deliver a higher lithium concentration with low deleterious elements and high lithium recoveries from the concentrated blended brine**, than the lithium concentration of the individual salares

## Methodology

- ▶ Program **commenced May 2021** and has **progressively assessed the level of lithium concentration from the blended brines** as they evaporate over time
- ▶ Brine was **collected from trenches at Incahuasi salar** and from **monitoring wells at Rincon salar**
- ▶ **Total of 4,000 litres of brine** then transported to **testing ponds in Chile**, in an environment similar to the Salta Project

# Brine Blending Program: Results Deliver High-Grade Li Concentrate

- ▶ Program has **delivered excellent results to date**
- ▶ **After eight weeks testing:** blended brine lithium-ion concentration of 8,500 mg/kg recorded - **14 times that of the Incahuasi brine** and **7 times that of the Rincon brine**<sup>1</sup>
- ▶ For comparison, Allkem’s (ASX: AKE) nearby Olaroz Project concentrate to 7,000 mg/kg<sup>2</sup>
- ▶ Latest test results, December 2021: produced **exceptionally high mixed brine concentrate**<sup>3</sup>;
  - ❖ **very high 5.2% lithium concentrate (52,200 mg/kg)** achieved from evaporation of blended brine;
  - ❖ **very low loss of lithium to sulphate contaminant** residue precipitates i.e., **high Li recovery**; and
  - ❖ **low contaminants** (Ca, Mg, SO<sub>4</sub>) in concentrated Li brine.
- ▶ This result is highly significant, and **compares very favourably with other lithium companies in the region**

Element & Parameter	Symbol	Unit	Blended Brine 17 December 2021
Lithium	Li	%	5.22
Sodium	Na	%	0.096
Potassium	K	%	0.324
Magnesium	Mg	%	1.52
Calcium	Ca	%	0.198
Sulphate	SO <sub>4</sub>	%	0.023
Chloride	Cl	%	31.29
Boron	B	%	0.463
Density		gram / cc	1.275

Table: Laboratory Analysis: Concentrated Blended Brine, 17 December 2021

<sup>1</sup>ASX announcement 22 September 2021    <sup>2</sup>ASX announcement 1 April 2011    <sup>3</sup>ASX announcement, 20 January 2022

# Brine Blending: The Process



Brine collection at Incahuasi Salar



Brine collection at Rincon Salar



Relative density of brine measured



Brine containers sealed for transport



Concentrated brine harvested for mixing



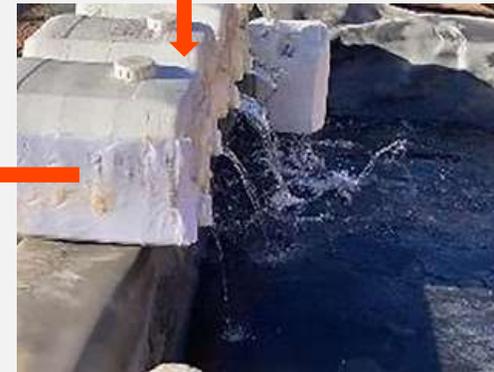
Incahuasi Concentrated brine



Rincon concentrated brine



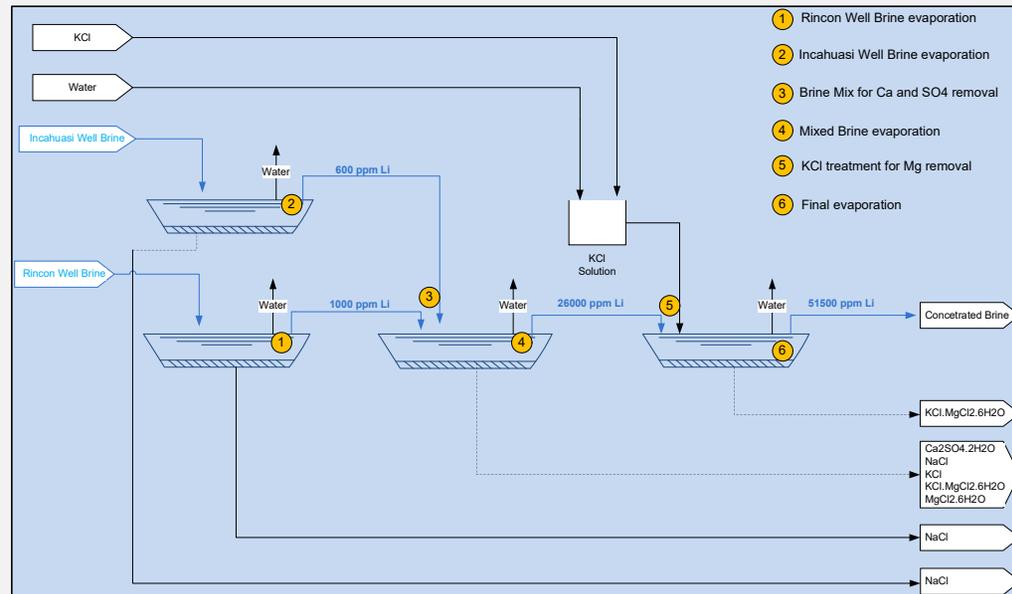
Evaporation underway



brine poured into prepared ponds with plastic liners

# Salta Lithium-Brine Project: Next Steps

- ▶ Lithium consultants, Ad-Infinitem Spa, to **complete brine-blending work and final report - due Q1, CY22**
- ▶ **Technical-economic analysis on the cost/benefits of brine-blending** and determine the scope of bulk brine sampling for bench-scale production of lithium carbonate (LIC)
- ▶ Drilling and sampling to **define JORC lithium-brine resource at the Incahuasi salar**
- ▶ **Preliminary Evaluation Assessment or Scoping Study** to determine viability of pilot-scale and full-scale LIC production
- ▶ **Assess M&A and other potential corporate opportunities** for the Project



Brine-Blending Evaporation Process Flowsheet, December 2021

# EYRE PENINSULA KAOLIN-HALLOYSITE PROJECT, SOUTH AUSTRALIA

First phase of drilling to commence Q1, 2022

# Eyre Peninsula Kaolin-Halloysite Project: Project Overview

- ▶ **A core exploration asset** for PepinNini – Project consists of **three Exploration Licences** (EL6677, EL6681 and EL6689) covering a **total area of 1,413km<sup>2</sup>**
- ▶ **Strategically located adjacent to Andromeda Metals' (ASX: ADN) Kaolin-Halloysite Projects** on western side of the Eyre Peninsula
- ▶ Project **hosts known kaolin mineralisation** and geophysical studies have highlighted **other target areas which appear prospective for kaolin**
- ▶ **Work undertaken and ongoing**
  - ❖ Field reconnaissance, and sampling/mapping programs
  - ❖ Satellite imagery analysis and review of historic exploration results
  - ❖ **Definition of priority drill targets**
  - ❖ Land access agreements
  - ❖ Community engagements

**Despite the kaolin prospectivity, the Project has yet to be systematically explored for kaolin. This combination of under explored tenure and prospectivity presents an excellent exploration opportunity which PepinNini plans to maximise**



Eyre Peninsula Kaolin-Halloysite Project location map

# Eyre Peninsula Kaolin-Halloysite Project: **First-Phase of Drilling**



Sampling sites and samples from the Eyre Peninsula Kaolin-Halloysite Project

- ▶ First phase drilling **due to commence February 2022** and is expected to take 8 eight weeks – **all approvals are in place**
- ▶ Up to **130 aircore holes for a total of 7,800m** at priority targets at **all three Exploration Licences** – average drill depth 60m
- ▶ Targets identified from historical exploration including geophysics
- ▶ Program designed to **test depth and extent plus mineralogy of known and targeted kaolin occurrences**
- ▶ **Priority drill target:**
  - ❖ An area **west of Kapinnie (in EL6689) hosts a significant historical kaolin zone** – target has been mapped; and an
  - ❖ historic discovery of snow-white kaolin estimated at **greater than 7m thickness at a depth of 6.1m** reported at this site<sup>1</sup>
- ▶ Drilling to commence at this target in southern area of the Project then progress to EL6677, and then to EL6681 to the north
- ▶ **pXRF analysis** and ‘whiteness’ measurement **to be done onsite to provide rapid confirmation of kaolin content and quality**
- ▶ Laboratory assay results to be released when available – subject to results, **2<sup>nd</sup> phase drilling is planned to further expand the kaolin footprint and test new target areas**

<sup>1</sup> Dickinson, 1943, SA Mining Review 78

# Kaolin and Halloysite Uses

## Kaolin

- ▶ **Industrial clay**, referred to as 'China Clay', widely **used in many everyday products; paper, rubber, paint, ceramics and fiberglass, plus cosmetics and pharmaceuticals**
- ▶ High-grade kaolin **usage is expanding in the cosmetic industry** and is a factor in the market growth - the absorbent properties of kaolin have led to widespread adoption in the cosmetics industry
- ▶ Conversion of **kaolin into high-purity alumina (HPA) is a potential emerging market** – R&D is currently underway on a **number of technological applications including lithium-ion batteries** where it helps deliver improved safety and performance
- ▶ **Kaolin price:** ~A\$300/tonne and kaolin/halloysite hybrid ~A\$500–A\$1,000/tonne
- ▶ Demand forecast to grow with the **global kaolin market estimated to be worth A\$8.65b by 2027** – expected to grow at a compound annual growth rate (CAGR) of 3.5% from 2020 to 2027<sup>1</sup>

## Halloysite

- ▶ **Kaolin type composed of tiny hollow nanotubes** – high surface area to weight ratio, high porosity & differential charge capabilities between inner and outer surfaces have potential to make it **highly suitable in high-tech processes and end-uses**
- ▶ **Nano-technology and green-technology emerging uses include** – carbon capture and conversion, hydrogen storage, water remediation, batteries, supercapacitors, drug delivery, tissue engineering, cancer and stem cells isolation & bioimaging
- ▶ **Halloysite price:** ~up to US\$5,000/tonne – is a scarcity of large, commercial halloysite deposits

<sup>1</sup>Grand View Research, Inc

# SANTA INES COPPER-GOLD PROJECT, ARGENTINA

Strategically-located, potential large-scale exploration asset



# Santa Ines Copper-Gold Project: Project Overview

- ▶ **100%-owned** via PNN's wholly-owned Argentine subsidiary, PepinNini SA
- ▶ Consists of **four mining leases covering 61.4km<sup>2</sup>** in north-west Argentina
- ▶ Represents a **potential, large-scale, porphyry copper-gold opportunity**
- ▶ **Strategically located;**
  - ❖ **same geological setting as BHP's world-class Escondida Copper-Gold Mine** 80km to the north-west in Chile; and
  - ❖ **40km south-west of First Quantum's Taca Taca Cu-Au-Mo Project**



Santa Ines Copper-Gold Project location map, north-west Argentina

## Agreement with Ganfeng Lithium

- ❑ PepinNini has an agreement with Ganfeng Lithium for a pipeline Gangfeng plans to build to carry lithium brine from its Mariana Project that will pass through the Santa Ines Project
- ❑ Under the agreement PepinNini and Ganfeng have carried out an IP geophysical survey over the proposed pipeline route across the Santa Ines Project, to identify the presence of any copper-gold exploration targets over the pipeline route in PepinNini's project area - no priority exploration targets were identified over the proposed pipeline route
- ❑ The agreement highlights the positive working relationships between lithium companies in the region and PNN's ability to work collaboratively with its peer in the region to maximise the value of its lithium and copper-gold assets

# Santa Ines Copper-Gold Project: **Large-Scale Porphyry Exploration Opportunity**

- ▶ Previous sampling programs confirmed the presence of **high-grade copper and gold mineralisation**
  - ❖ **High-grade surface samples** from historic workings; **21.7% Copper**, 0.91g/t Gold and 34.9g/t Silver
  - ❖ **Subsequent surface sampling**; 3.25% Copper, 0.8g/t gold, 12.5g/t Silver and 91.1ppm Molybdenum
- ▶ Company is assessing plans for a maiden drilling program
- ▶ **Plans previously announced for a two-hole drilling program** at two priority targets
  - ❖ Target 1: historic Santa Ines Mine copper-iron-gold workings at depth; and
  - ❖ Target 2: a significant magnetic anomaly 300m south of the Santa Ines Mine
- ▶ **PepinNini is currently assessing plans to potentially expand this first phase of drilling**



Santa Ines Sample: 21.7% Cu, 0.91g/t Au



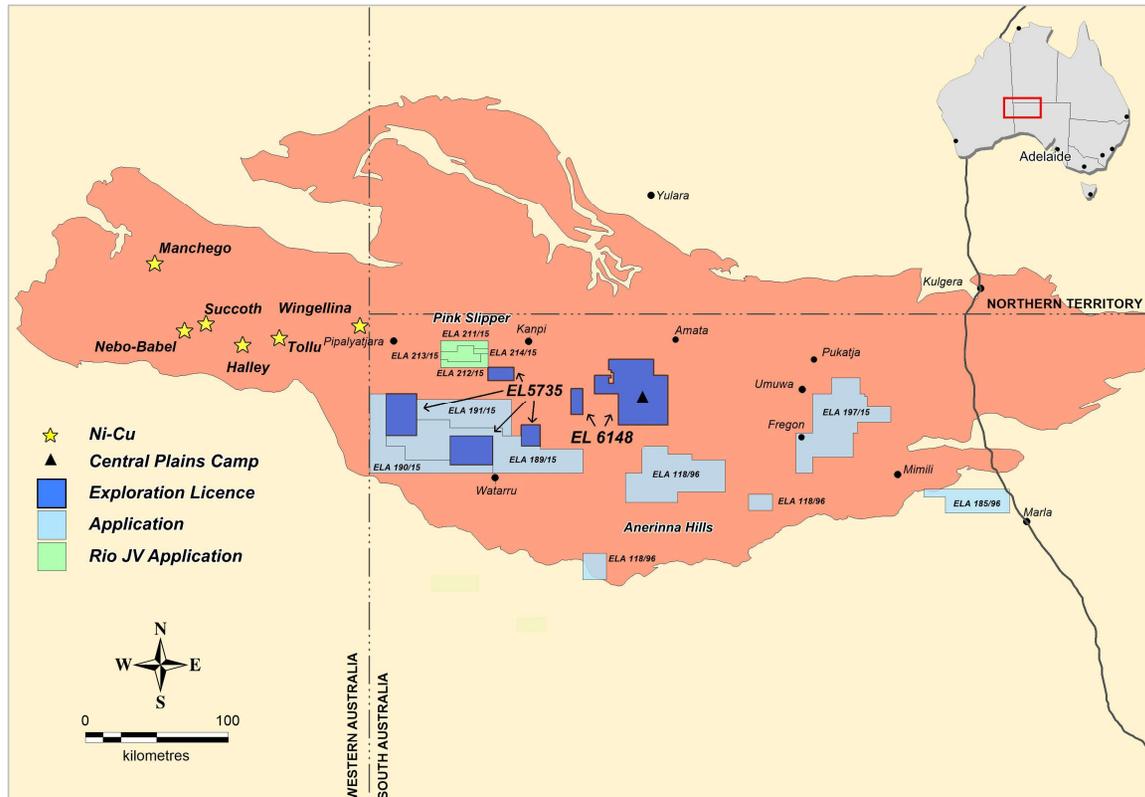
Santa Ines Sample: 13.7% Cu, 0.17g/t

# MUSGRAVE NICKEL-COPPER-COBALT PROJECT, SOUTH AUSTRALIA

Large, strategic landholding in major under-explored minerals province



# Musgrave Ni-Cu-Co Project: Project Overview



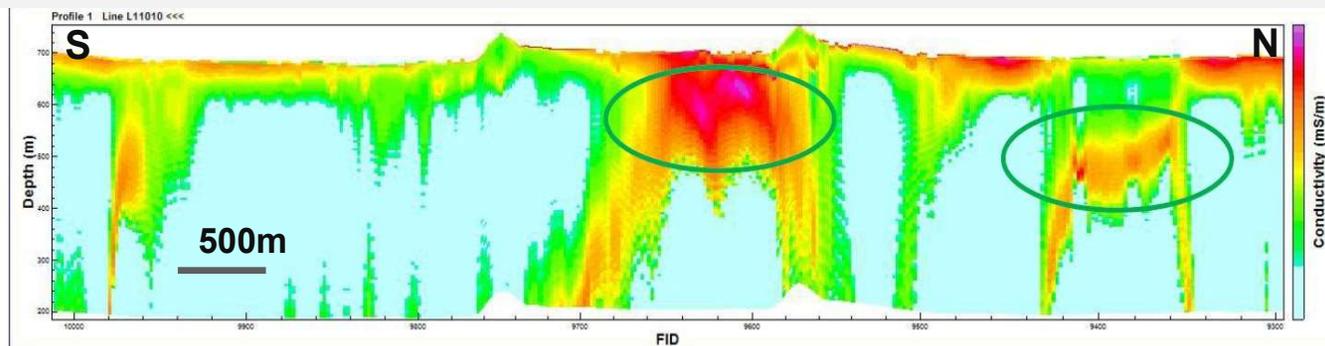
Musgrave Nickel-Copper-Cobalt Project location map, north-west South Australia

- ▶ **100% owned - targeting magmatic Ni-Cu-Co sulphide discoveries**
- ▶ Located in the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands **in the Musgrave province of north-west South Australia**
- ▶ **Project comprises;**
  - ❖ 2 granted ELs and 8 ELAs over 14,003km<sup>2</sup>
  - ❖ Farm-in JV with Rio Tinto - 4 ELAs over 615km<sup>2</sup> covering the priority Pink Slipper target
- ▶ **Highly prospective project area in under-explored region**
- ▶ **Similar geological setting to Oz Minerals major Nebo Babel Ni-Cu Project** in the West Australian Musgrave
- ▶ PNN has **extensive track record at the Project**
  - ❖ 24,474m - 83 cored holes drilled, 12,252 samples analysed
  - ❖ 41,258m - 4,195 Geochem non-core holes drilled
- ▶ **PNN owned drilling equipment & camp**

## Pink Slipper JV with Rio Tinto: **Potential Tier-1 Exploration Target**

The Pink Slipper target is a bedrock anomaly coincident with the base of a large ultramafic intrusion with the potential to host sulphide accumulation – equivalent interpreted model to Vale’s Tier-1 Voisey’s Bay Nickel Project in Canada and the Nova-Bollinger nickel discoveries in WA’s Fraser Ranges

- ▶ The Pink Slipper is the core target in the Musgrave Project area
- ▶ Under the Farm-in JV with Rio Tinto PepinNini is earning up to a 51% interest in the Project
- ▶ Pink Slipper anomaly first recorded by airborne electromagnetic (AEM) survey flown by Rio Tinto in 1999–2000
- ▶ Pink Slipper Anomaly confirmed and redefined by AEMs conducted by CSIRO and Rio Tinto in 2019
- ▶ PepinNini continues to work with the APY traditional owners to negotiate an Exploration Deed for the Pink Slipper and other targets within the Project
- ▶ An Exploration Deed with the traditional owners is a pre-requisite for the granting of Exploration Licences (ELs), and the commencement of on-ground exploration
- ▶ Is a company priority to drill test the Pink Slipper anomaly as soon as access is agreed



Pink Slipper geophysical anomaly confirmed and refined by Spectrem AEM flown by CSIRO in 2019

## **PepinNini Minerals Investment Highlights**

- ▶ **Portfolio of quality, strategically-located projects in key, demand-driven commodities**
- ▶ **Projects leveraged to exploration success;**
  - ❖ **First phase of drilling to commence at Eyre Peninsula Kaolin-Halloysite Project**
  - ❖ **Brine blending program at Salta Lithium project delivering high-grade lithium concentrate**
  - ❖ **Drilling planned at Santa Ines Copper-Gold Project**
- ▶ **Strong upcoming news-flow and share price catalysts**
- ▶ **Strong balance sheet and tight capital structure**
- ▶ **Refreshed and restructured board, and supportive shareholders**
- ▶ **M&A and other potential corporate opportunities to 'add value' for all Projects**

# INDICATIVE NEWSFLOW AND NEXT STEPS

## **Salta Lithium-Brine Project**

- ▶ Completion of brine-blending program and final report
- ▶ Drilling and sampling to define JORC lithium-brine resource at the Incahuasi salar
- ▶ Preliminary Evaluation Assessment / Scoping Study

## **Eyre Peninsula Kaolin-Halloysite Project**

- ▶ First-phase of drilling and results
- ▶ Expand land access agreement coverage
- ▶ Second-phase of drilling (subject to results)

## **Santa Ines Copper-Gold Project**

- ▶ First-phase of drilling and results
- ▶ Second-phase of drilling (subject to results)

## **Musgrave Nickel-Copper-Cobalt Project**

- ▶ Consultation with APY People for Exploration Deed for Pink Slipper and other targets
- ▶ Exploration Deed for Pink Slipper
- ▶ Grant of Exploration Licence and commencement of on-ground exploration

Newsflow items are indicative only and maybe subject to change.



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