# TNG LIMITED

**ASX Code: TNG**

## *Advancing Mount Peake to production and exploration update on the Mount Hardy copper project*

***NTGS AGES 2013 Conference Presentation, 19th March 2013, Alice Springs NT***


***Kim Grey - Exploration Manager***

***Tony Hadley – Mount Peake Project Director***

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## Competent Person's Statement

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by Paul Burton who is a Member of The Australasian Institute of Mining and Metallurgy and a Director of TNG Limited. Paul Burton has sufficient experience 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Paul Burton consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to Mineral Resources is based on information compiled by Jeremy Peters who is a Member of The Australasian Institute of Mining and Metallurgy and a full time employee of Snowden Mining Industry Consultants Pty Ltd. Jeremy Peters has sufficient experience 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Jeremy Peters consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Mr Damian Connelly, MAAusIMM, Chartered Processional (MET), tMMICA, MSME, MSAIMM was responsible for the preparation of the metallurgical test work results reported herein. Mr Connelly has sufficient experience to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of the Exploration Results, Mineral Resources and Ore Reserves. Mr Connelly consents to the inclusion in the report of the matters based on his information in the form and context in which is appears.

# Talk Outline

- TNG Overview
- Exploration at Mount Hardy
- Mount Peake
  - Geology
  - Resource update

    Kim Grey
  - Feasibility progress
  - Metallurgical/Process plant

    Tony Hadley

# Key Assets

**TNG's extensive Australian mineral portfolio encompasses :**

- **Mount Peake (*Feasibility*), 10,000 sq km of highly prospective Fe-V-Ti and Cu exploration tenements**
- **Copper projects at Mount Hardy, McArthur River, Sandover, and Walabanba**
- **A bauxite project on Melville Island (*JV with Rio Tinto*)**
- **Manbarrum Zinc Project in WA (*JV with KBL Mining – moving to production*).**

# Corporate Overview

| Key Corporate and Financial Data | |
|---|---|
| ASX code: | TNG |
| Market capitalisation:<br>(at 12c) | $51M |
| Shares on issue: | 426M |
| Cash:<br>(at 31 Dec) | $7.2M |

| Major Shareholders | |
|---|---|
| Ao-Zhong International Mineral Resources | 14.59% |
| Aosu Investment & Development Co | 14.02% |
| WWB Investments P/L | 6.51% |
| *(Directors hold approximately 17% of issued capital)* | |

| Board of Directors | |
|---|---|
| Jianrong Xu | Chairman |
| Paul Burton | Managing Director |
| Neil Biddle | Non-executive Director |
| Stuart Crow | Non-executive Director |
| Rex Turkington | Non-executive Director |
| Zhigang Wang | Non-executive Director |

**THE VISION:**
**to build a diversified Australian resources company focused on supplying key strategic metals to Chinese and world markets from our extensive portfolio of mineral projects in the Northern Territory.**

# World-Class Partners

- ✓ **$13.4M strategic investment** from China's ECE and Wanlong groups completed May 2012
- ✓ Secures key cooperation to **de-risk and accelerate** Mount Peake Strategic Metals development
- ✓ Access to Chinese **finance, EPCM, off-take**
- ✓ **Strategic partnership**
- ✓ **Non-exclusive** – maintains strategic flexibility

**ECE:**

- *Major Chinese mineral exploration, development and mining group*
- *Over 5,000 employees, has discovered +160 deposits in China worth more than $10 billion*

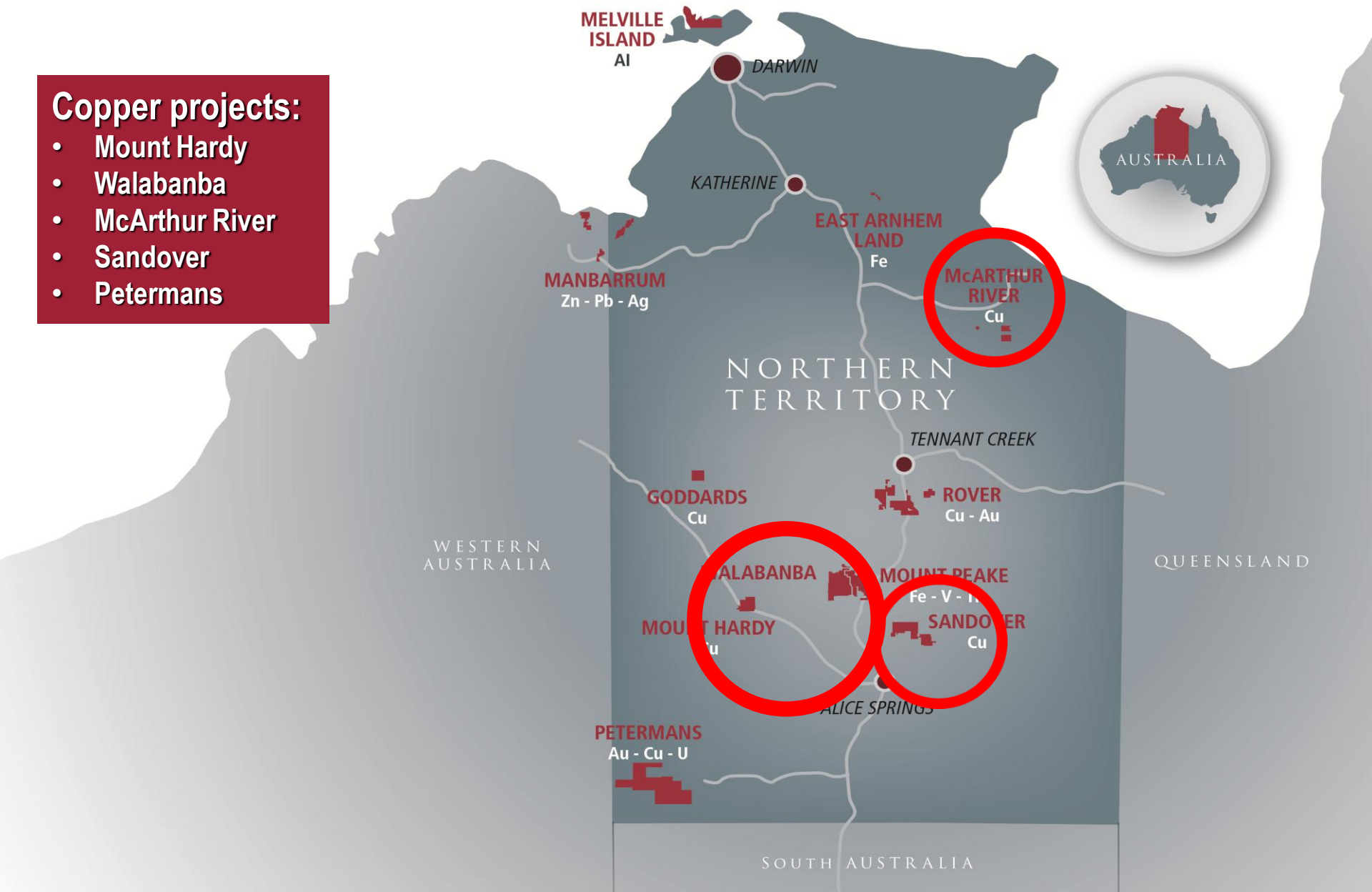
**WANLONG GROUP:**

- *High technology electronics*
- *Potential final product end-user*

# Key Copper Assets

**Copper projects:**

- Mount Hardy
- Walabanba
- McArthur River
- Sandover
- Petermans

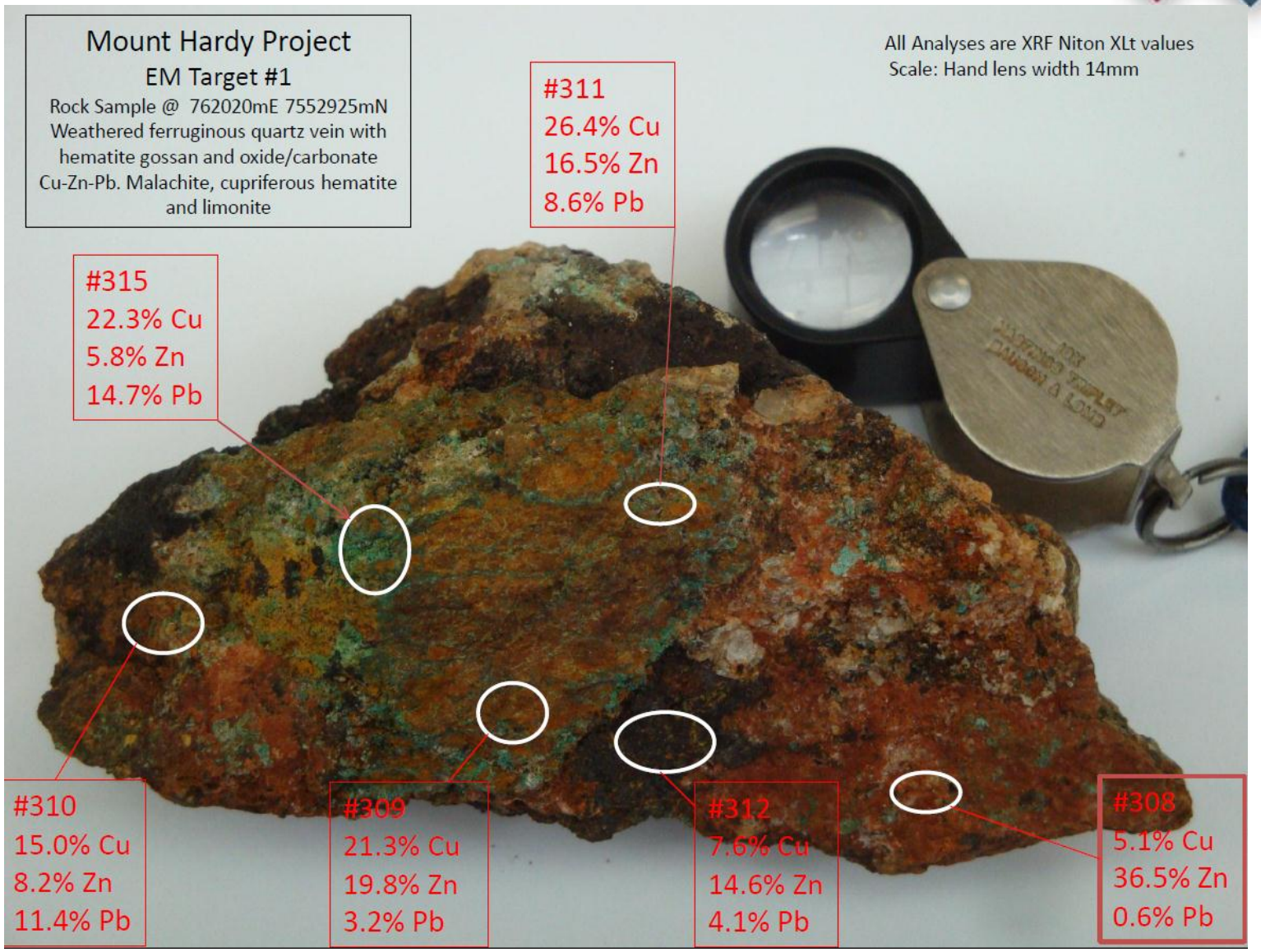


# Mount Hardy Project: Rapid Progress

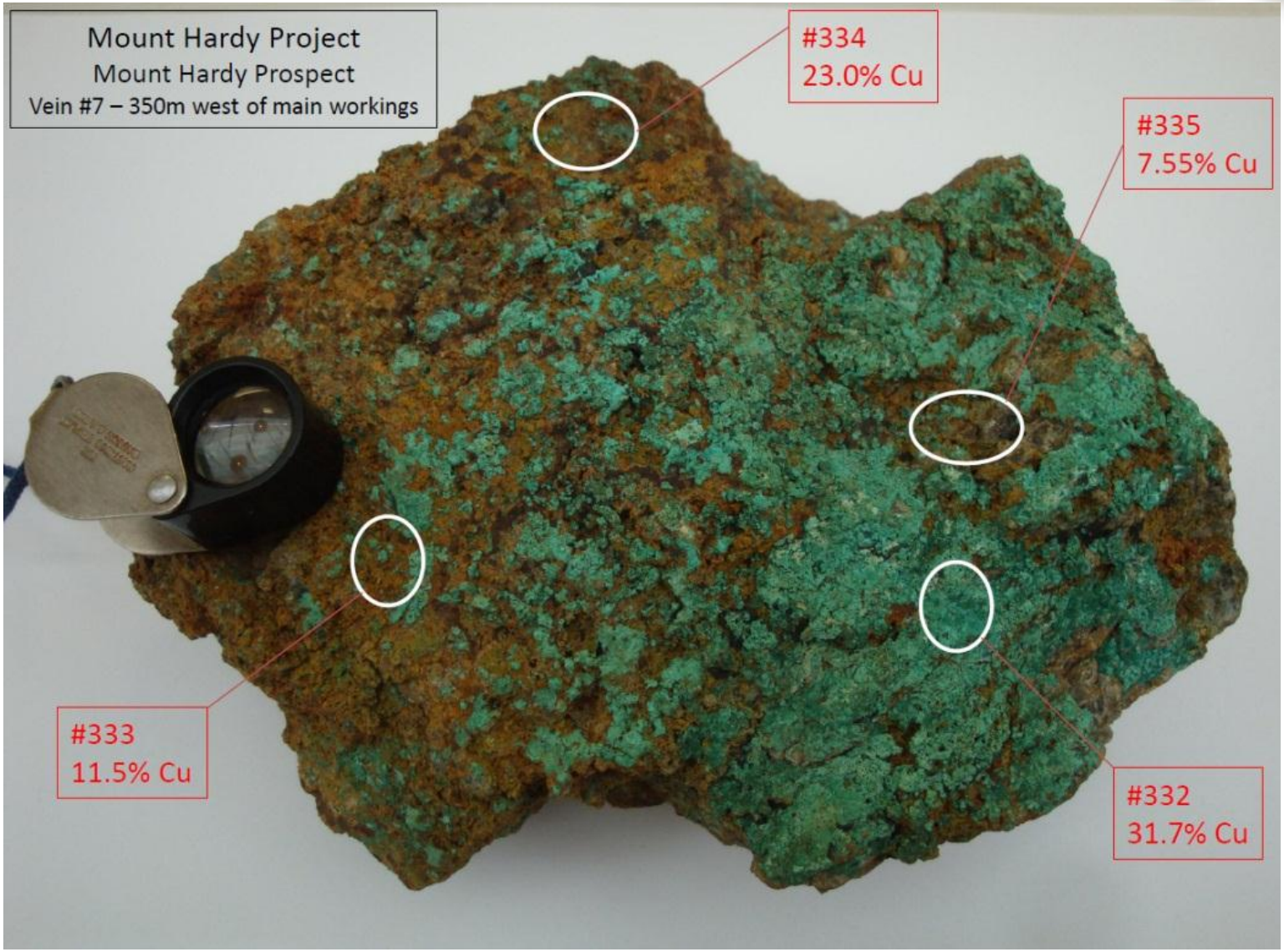
## July to December 2012

- ✓ Project tenure grown to three granted ELs
- ✓ 900 line km HELITEM survey flown
- ✓ 23 EM anomalies outlined
  - ✓ Cluster of anomalies over the Mount Hardy copper field
- ✓ Ground EM on strongest six HELITEM targets
  - ✓ Outlined conductor plates on four targets
- ✓ Mapping and sampling in eight areas, outlined Mount Hardy and Browns prospects with strong surface Cu (Zn, Pb) mineralization
- ✓ Coincident surface anomalism and EM conductor zones at three target areas
- ✓ BMR drilling at Mount Hardy geologically logged and sampled
- ✓ RC drilling in November targeting EM conductor plates
  - ✓ Four EM targets tested
- ✓ Demonstrated success in locating buried sulphide bodies

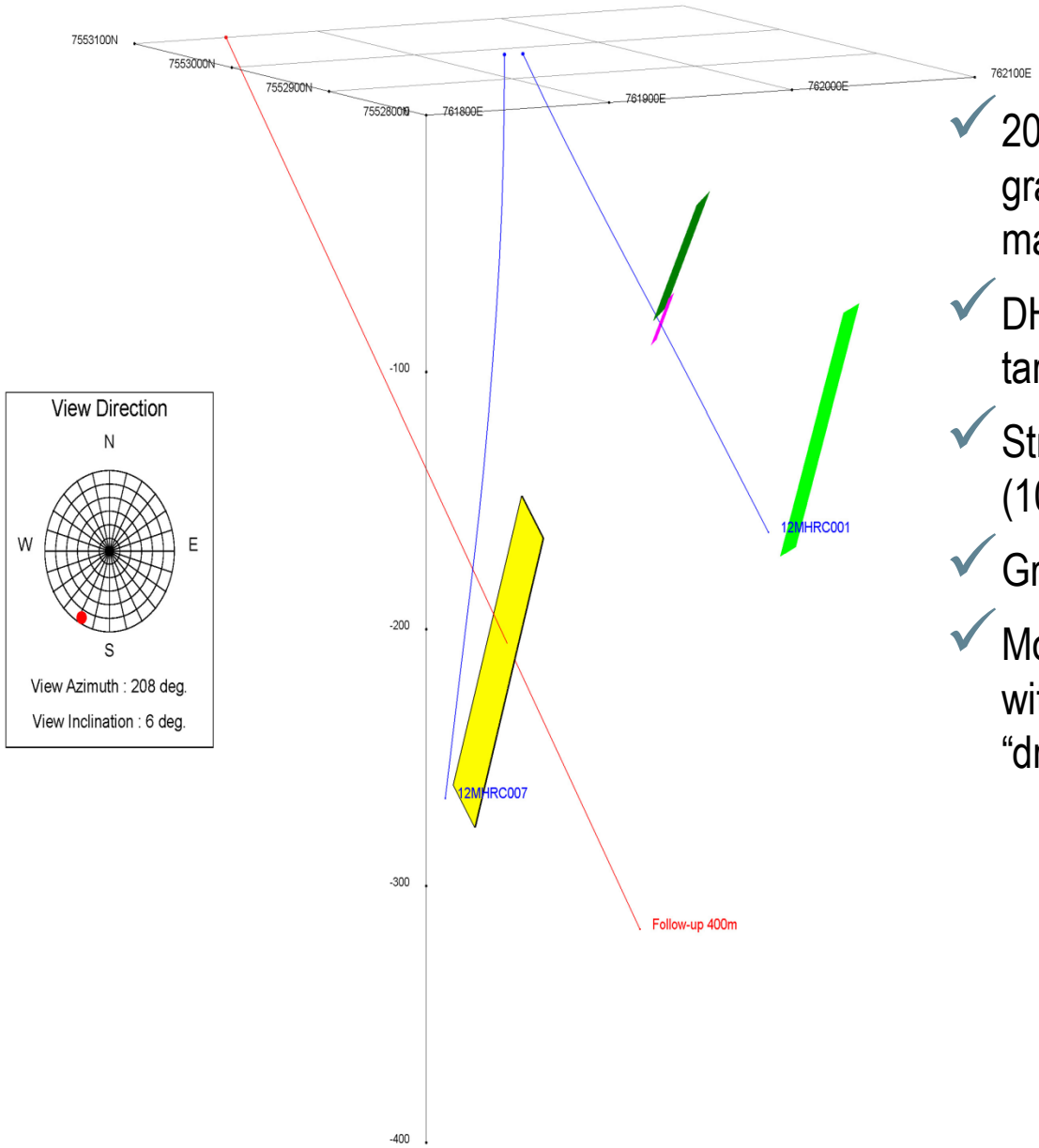
# Mount Hardy Project: Visible Copper



# Mount Hardy Project: Extensive Copper



# Mount Hardy RC Results




- ✓ 2012 RC drilling confirms copper grades below supergene oxide material
- ✓ DHEM on 2012 RC holes outlines targets warranting further drill testing
- ✓ Strong conductors outlined (1000 to 2000 Siemens)
- ✓ Gravity and IP surveys completed
- ✓ Mount Hardy and Browns prospects with existing workings, high grades and “drill ready” targets

DRILLING IN PROGRESS

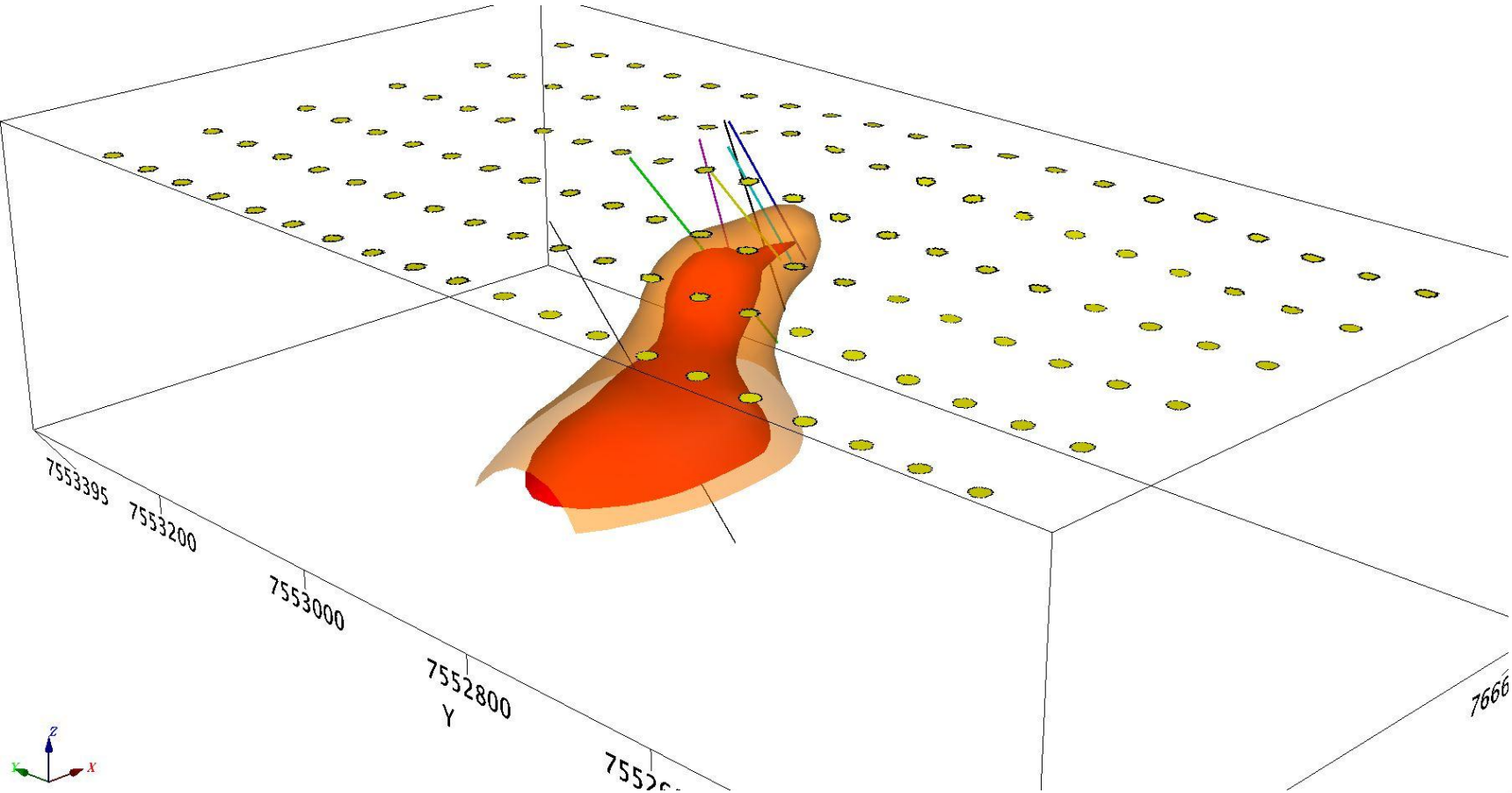
# Mount Hardy Project

## 2013 Work

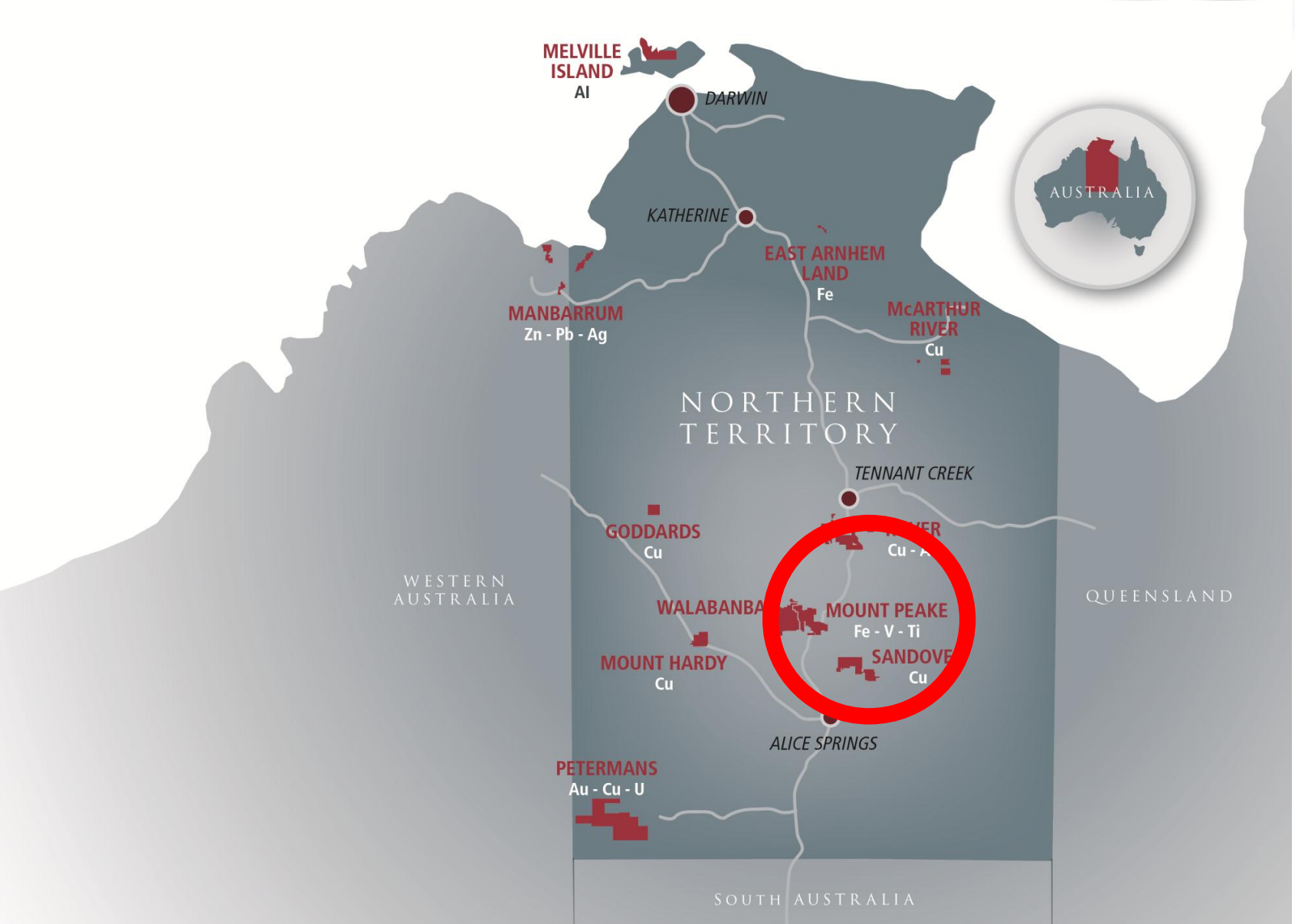
- ✓ Gravity survey
  - ✓ Highlighted mineralized structural corridor at Mount Hardy
  - ✓ Gravity highs to be followed up
- ✓ IP survey completed
  - ✓ Interpretation ongoing
  - ✓ Strong conductor outlined at Mount Hardy
- ✓ Diamond drilling commenced
  - ✓ +2000 metres on five targets
  - ✓ Drilling: EM Targets 1, 2, and 4, Mount Hardy and Browns

# Mount Hardy Project – IP Imagery

- ✓ IP survey has defined a strong conductor, coincident with surface anomalism
- ✓ Over 500 metres long, shallow west plunging and open at depth and to the west
- ✓ Drill testing in progress!

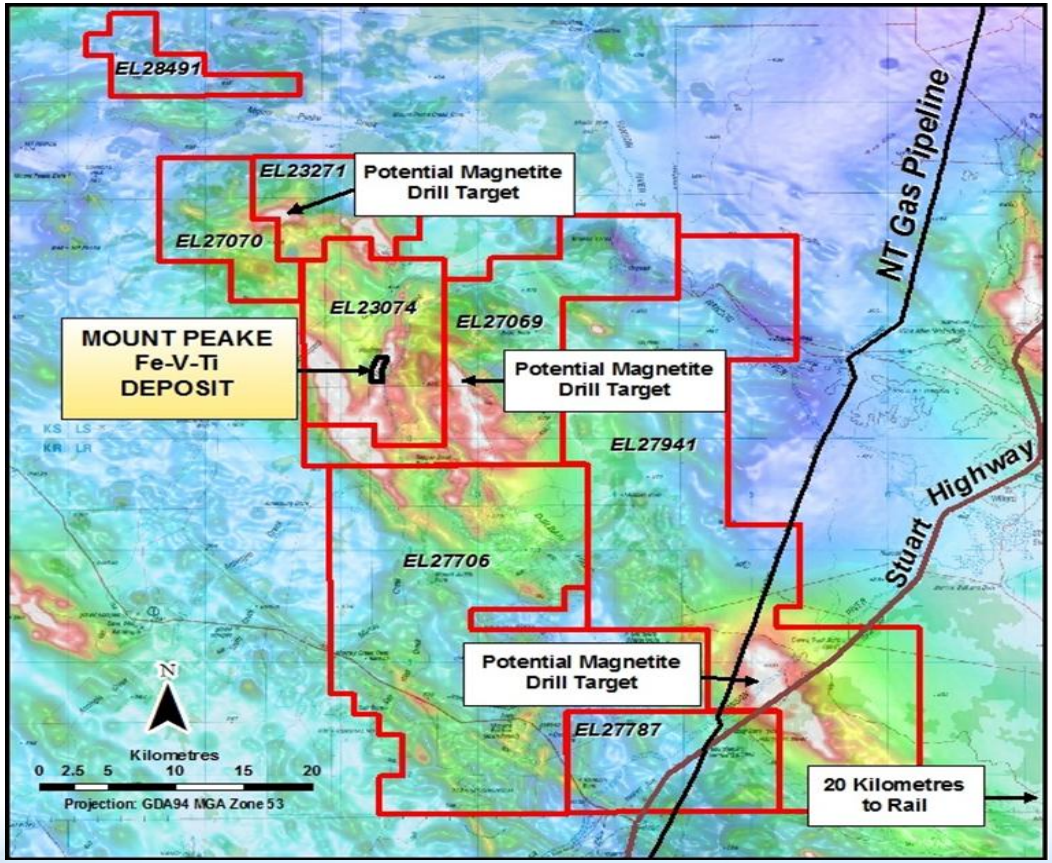


# Mount Peake V-Ti-Fe Resource



# Flagship Asset: Mount Peake

Strategic metals: **Vanadium**, **Titanium** and **Iron**



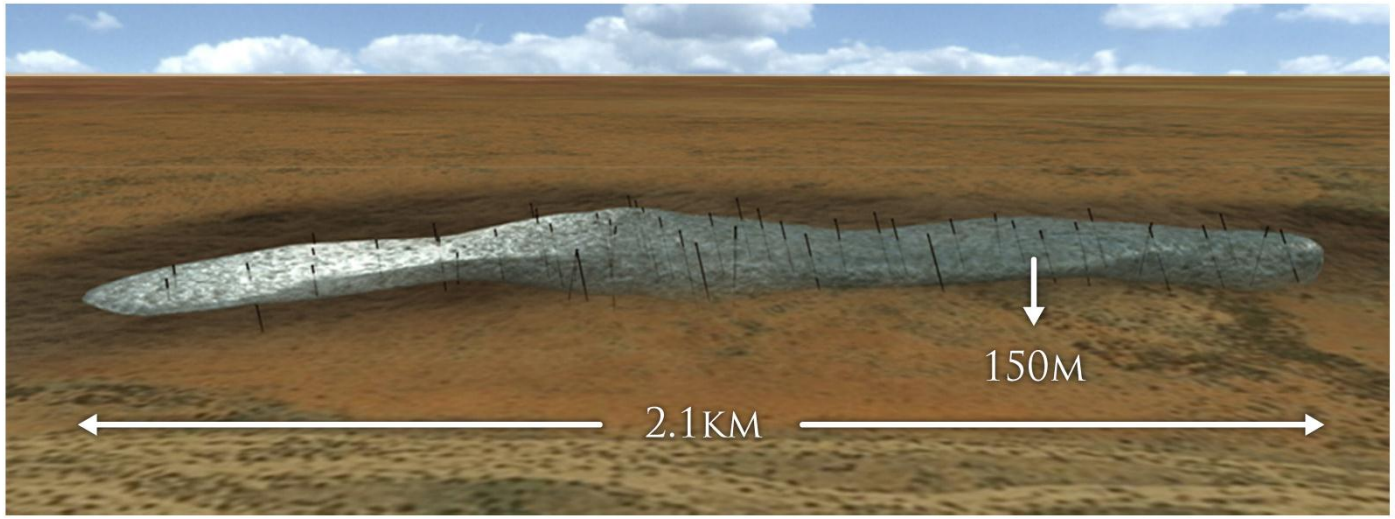

- ✓ **100%-owned, 2,000km$^2$** leases
- ✓ Close to key infrastructure: **road**, **rail** and **gas**
- ✓ Direct rail access to **Darwin Port**
- ✓ **Large, shallow resource** (160Mt)
- ✓ Exploration Target = **500-700Mt***
- ✓ PFS completed
- ✓ PFS results show robust project
- ✓ Definitive FS commenced
- ✓ Delivery late 2013

** Exploration Target of 500-700Mt with a grade range of 0.2-0.4% $V_2O_5$, 5-8% $TiO_2$, and 25-35% Fe. The potential quantity and grade is conceptual in nature. There has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.*

# Mount Peake Resource

**Shallow large-scale resource underpins long-life project**
**PFS July 2012, resource drilling Dec Qtr 2012**
**Resource update March 2013, economic evaluation later 2013**

| Category | Tonnes (Mt) | $V_2O_5$% | $TiO_2$% | Fe% | $Al_2O_3$% | $SiO_2$% |
|---|---|---|---|---|---|---|
| Measured | 118 | 0.29 | 5.48 | 23.64 | 8.18 | 32.81 |
| Indicated | 20 | 0.28 | 5.33 | 22.05 | 9.09 | 33.98 |
| Inferred | 22 | 0.22 | 4.41 | 19.06 | 10.38 | 37.79 |
| TOTAL | 160 | 0.28 | 5.31 | 22.81 | 8.60 | 33.64 |

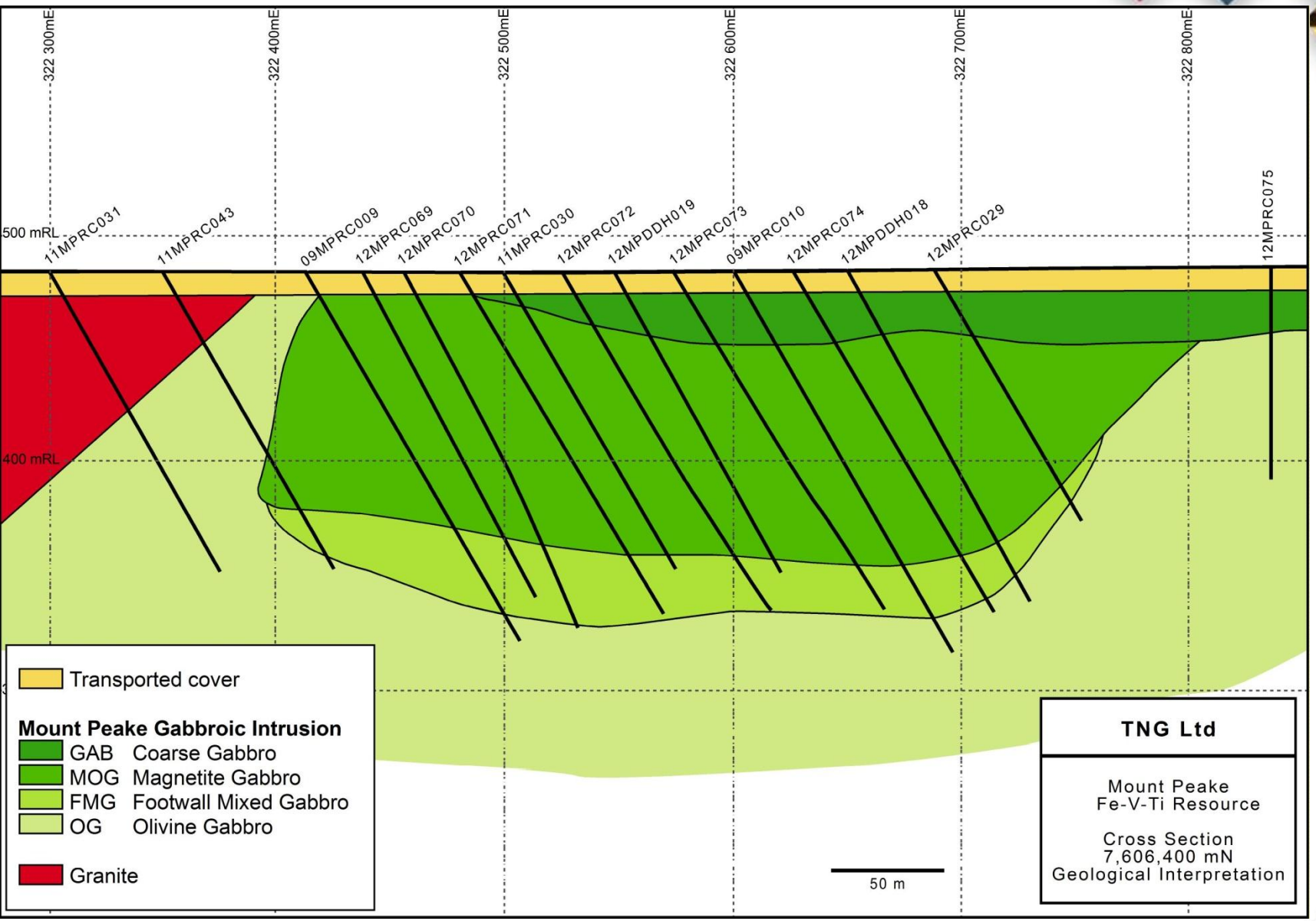


# Mount Peake Resource

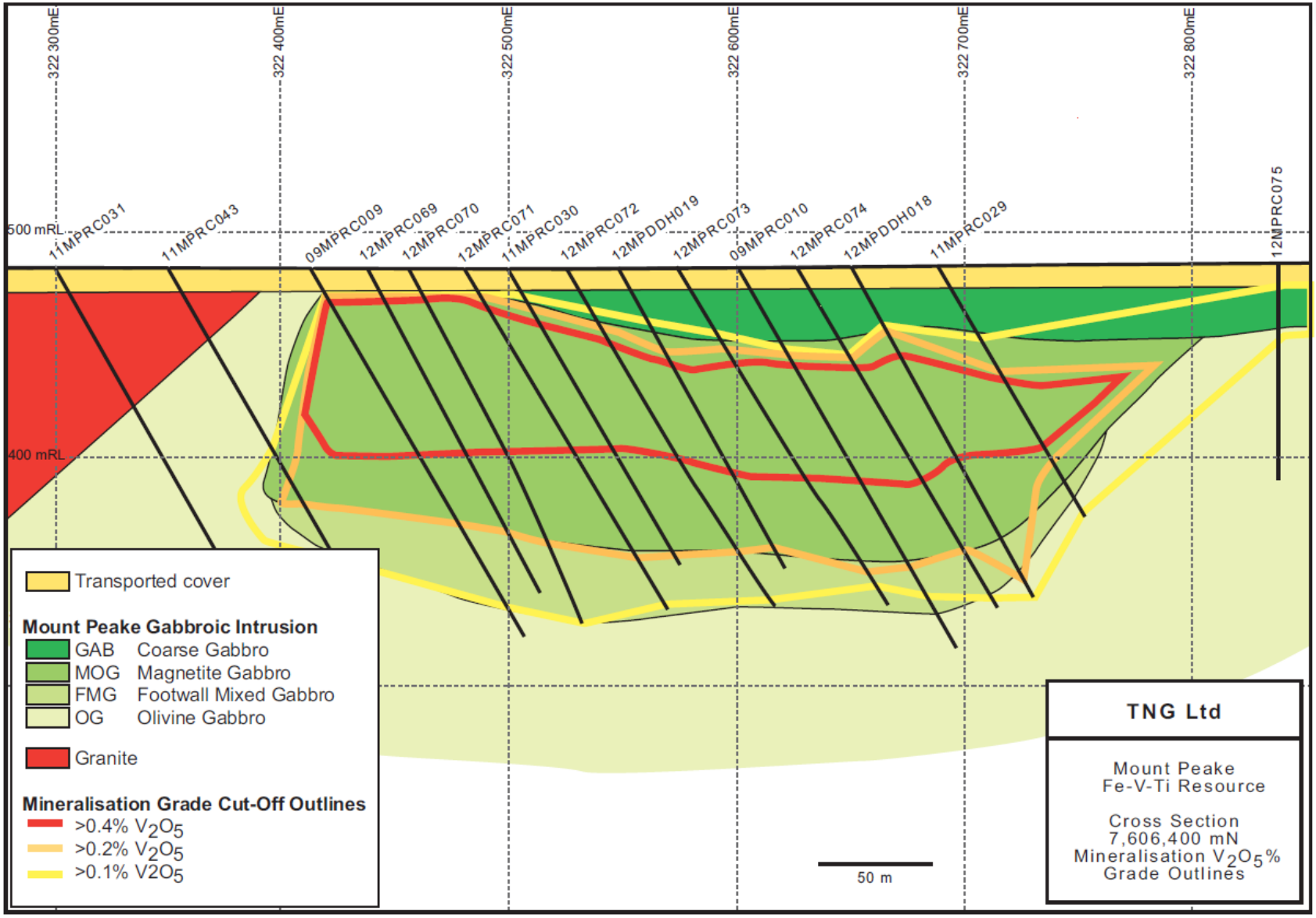
## Geological Setting

- ✓ Gabbroic sill hosted orebody which intrudes Neoproterozoic Georgina Basin sediments (Central Mt Stuart Formation, 560Ma)
- ✓ Inferred Cambrian age (510Ma Kalkarindji LIP event)
- ✓ Gabbroic sills over 10x20km, and regionally over 100km
- ✓ At Mount Peake the sill is 250 metres thick with the deposit near the top
- ✓ Ore host is magnetite olivine gabbro
- ✓ Cumulate Magnetite to >40% hosts V and Ti
- ✓ Dimensions – 2000m x 400m x 150m
- ✓ Shallow cover and overburden - low stripping ratio
- ✓ High grade ore near surface – Improved economics/payback
- ✓ Thick consistent orebody – bulk mining

# Mount Peake Geology

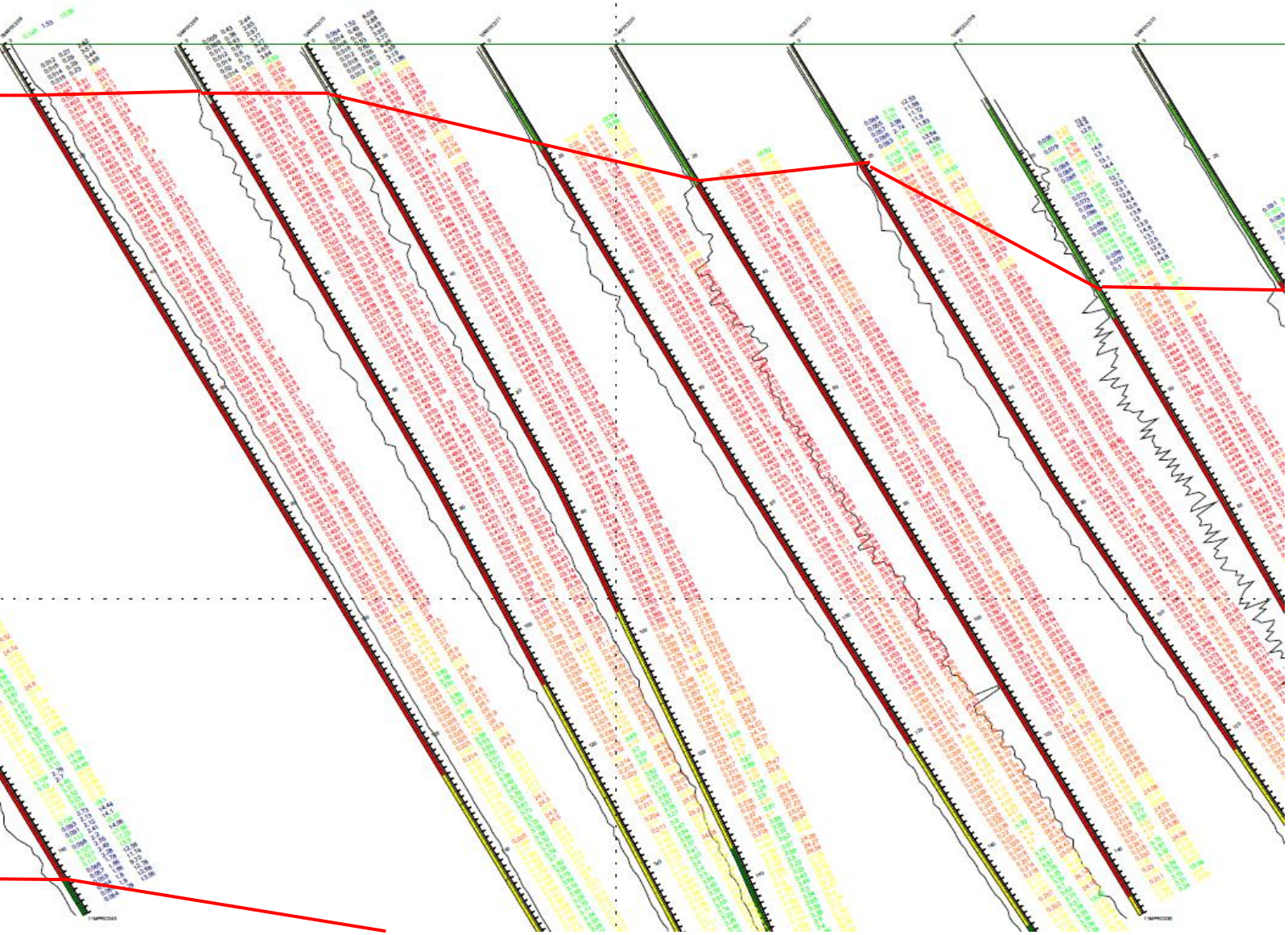


# Mount Peake Grade Outlines



# Mount Peake: Consistent Grade

- ✓ Section detail. RED >0.3% $V_2O_5$, >7% $TiO_2$, >30% Fe



# Pre-Feasibility: Key Outcomes

## Key Physicals

- Total material mined: 147.9Mt
- Total waste movement: 72Mt
- Total ore mined: 75.9Mt
- Strip ratio: 0.95
- Mine life: 20 years
- Processing rate: 2.5Mtpa, increasing to 5Mtpa in year 4

## Key Financial Outcomes

- Total revenue (LOM): A$13.6 billion
- Operating cash flow (LOM): A$7.53 billion
- Net cash flow (LOM): A$6.78 billion
- Pre-production capital: A$563M*
- Total operating costs: A$75.50/t of plant feed**
- NPV: A$2.65 billion
- Net annual cash flow: A$339M
- IRR pre-tax: 38.7%

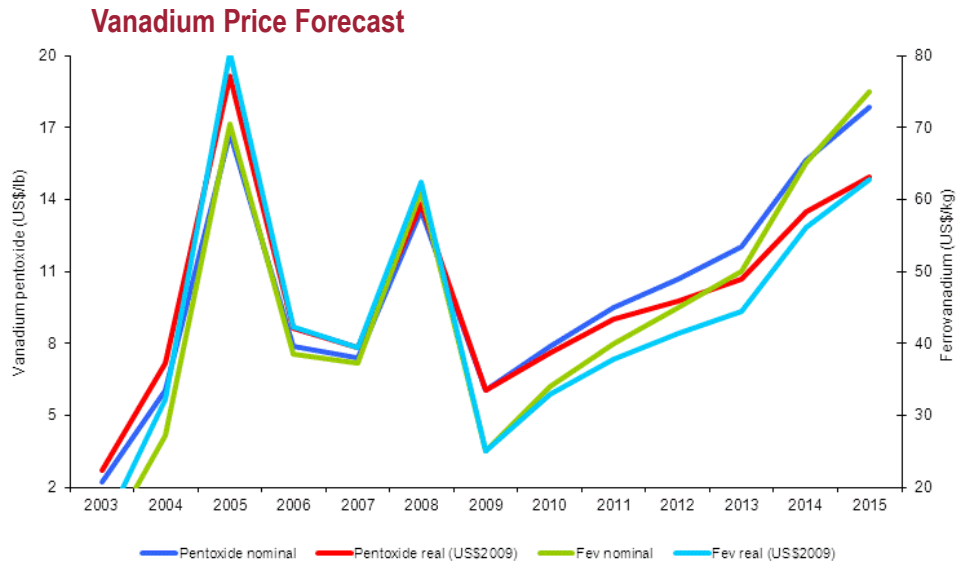
| Total Metal Production | Tonnes |
|---|---|
| $V_2O_5$ | 236,000 |
| $TiO_2$ | 5,822,000 |
| $Fe_2O_3$ | 17,400,000 |

| Average Concentrate Grade | |
|---|---|
| $V_2O_5$ | 1.2% |
| $TiO_2$ | 18% |
| Fe | 55% |

| Metal Purity | |
|---|---|
| $V_2O_5$ | 99% |
| $TiO_2$ | 55% |
| $Fe_2O_3$ | 99.9% |

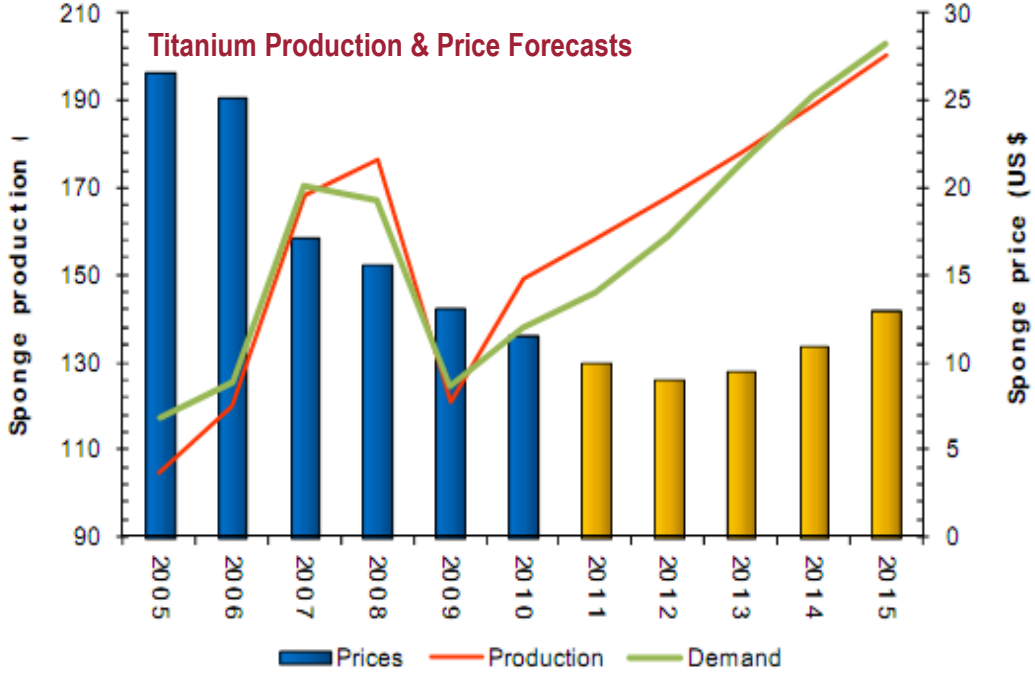
** including all infrastructure*
*** including mining, processing, transport & royalties*

# Strategic Metals Set For Growth




The outlook for vanadium and titanium prices is strong:

- *Strong continued growth in demand from high-tech steels*
- *New opportunities in medical products, industrial and vehicle battery markets*



*Source: Roskill*

# Vanadium: The Critical Element

## Steel

- ✓ Rebar & structured beams
- ✓ High speed tools and surgical steels

## Aerospace and Defence

- ✓ Titanium vanadium alloys for all high-technology metals aircraft, missiles, personnel transports, etc

## Chemicals and Pollution Control

- ✓ Production of synthetic rubber, polyester, fibreglass, sulfuric acid, etc
- ✓ Critical component of catalytic converters to remove sulphur dioxide and other pollutants

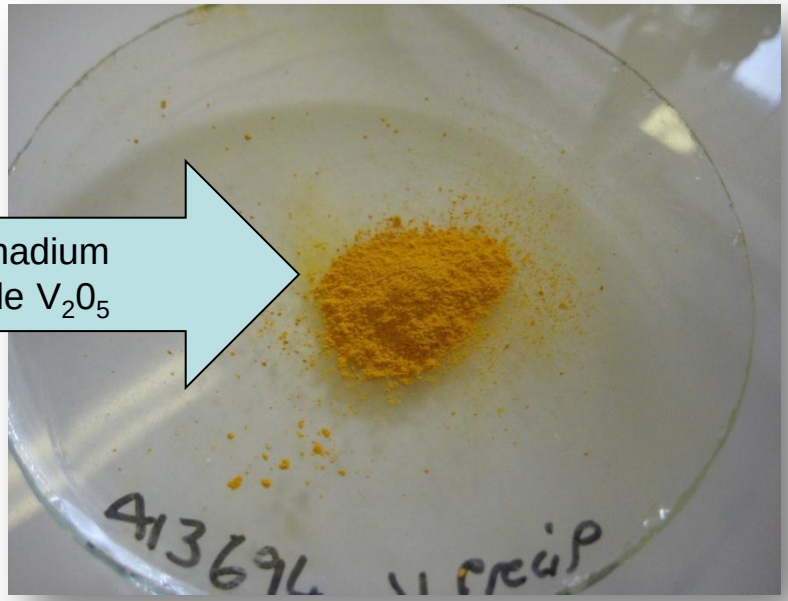
## Energy Store – THE SLEEPING GIANT

- ✓ The grid scale Vanadium Flow Battery
- ✓ Lithium Vanadium Batteries for electric vehicles

# TIVAN™: TNG's Competitive Advantage

- ✓ Patented hydrometallurgical process – extracts vanadium, titanium and iron
- ✓ Pilot plant test work shows high recoveries and purities:
  - **>99% $V_20_5$** (+80% recovery)
  - 99.9**% $Fe_20_3$ (69.2% Fe)** (80% recovery)
  - **>55% $Ti0_2$** (+75% recovery)
- ✓ **Reduced OPEX and CAPEX by 50%**

# TIVAN™: Commercial Products



99% Vanadium Pentoxide $V_20_5$

99.9% Iron Oxide
69.2% Fe

| Total Metal Production | Tonnes |
|---|---|
| $V_2O_5$ | 236,000 |
| $TiO_2$ | 5,822,000 |
| $Fe_2O_3$ | 17,400,000 |

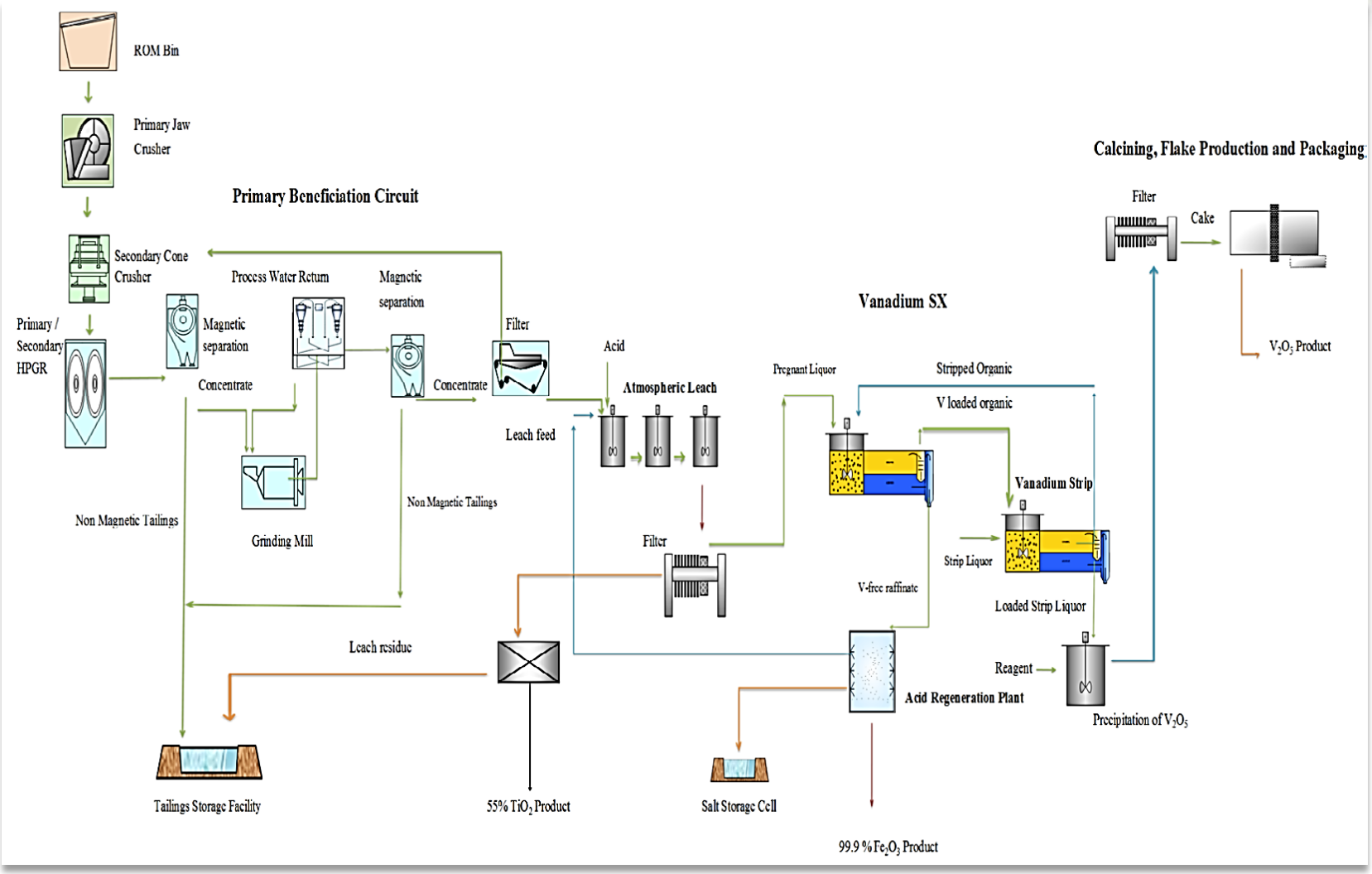
| Average Concentrate Grade | |
|---|---|
| $V_2O_5$ | 1.2% |
| $TiO_2$ | 18% |
| Fe | 55% |

| Metal Purity | |
|---|---|
| $V_2O_5$ | 99% |
| $TiO_2$ | 55% |
| $Fe_2O_3$ | 99.9% |

# Mount Peake Project – Development Update

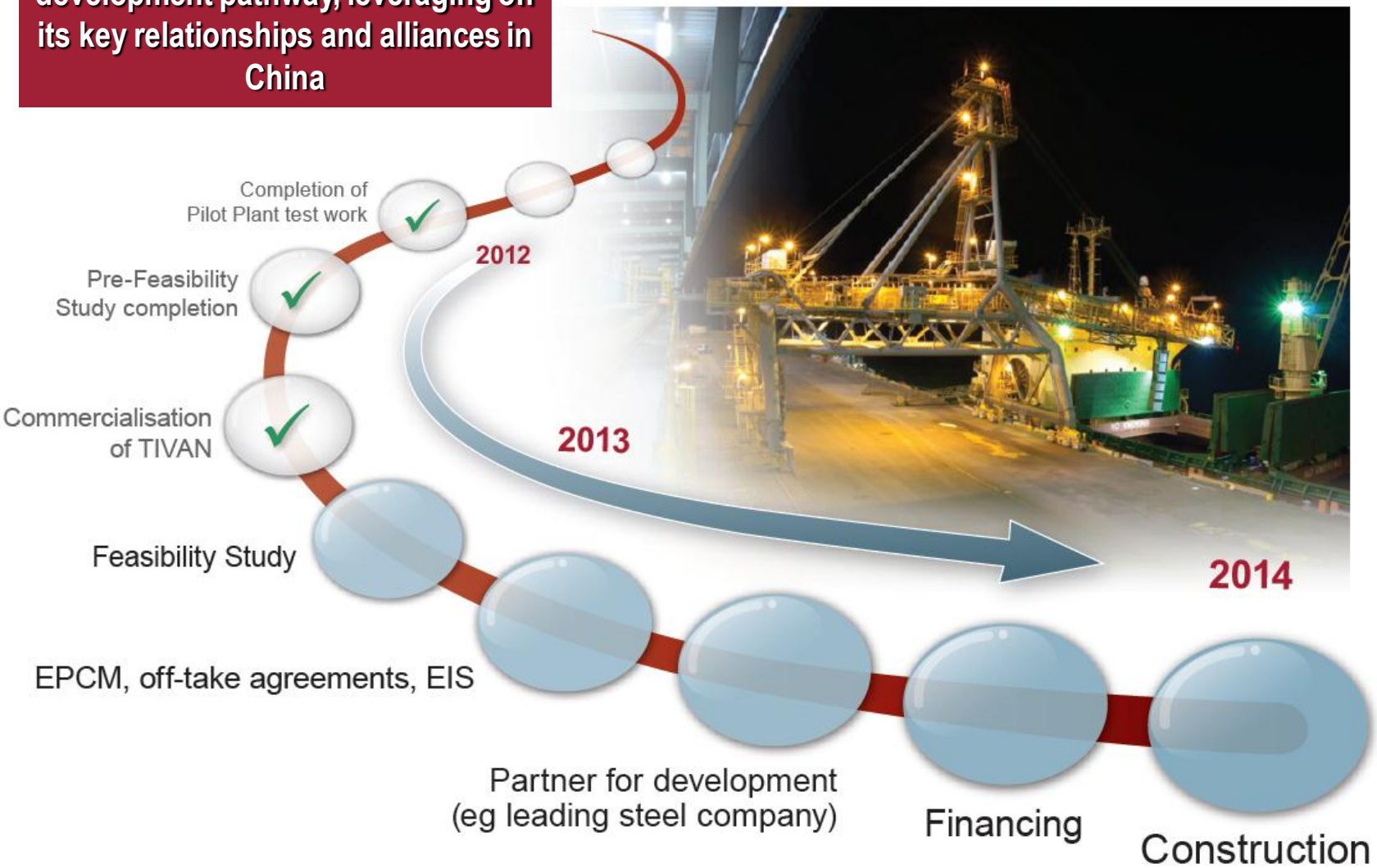
- ✓ MOU signed with rail operator Genesee & Wyoming Australia Pty Ltd in October 2012
- ✓ Appointment of Project Director – November 2012
- ✓ Appointment of GHD to undertake EIS – January 2013
- ✓ Appointment of Arccon Mining Services to manage the Definitive Feasibility Study – February 2013
- ✓ Agreement signed with CSIRO for TIVAN in February 2013 for pilot plant trial commencing in July 2013
- ✓ Bench top optimisation testwork commenced in January 2013 and is progressing well
- ✓ HOA signed with Darwin Port Corporation in January 2013 to negotiate land and facilities by TNG at East Arm Wharf
- ✓ Major boost to Mount Peake project economics in February 2013, 40% increase in NPV to 2.65 Billion, 22% increase in pre-tax IRR from 31.8% to 38.7% and LOM revenues increased from 11.8 Billion to 13.6 Billion
- ✓ Mount Peake Resource Upgraded to 118Mt Measured in March 2013
- ✓ MOU signed with rail operator Genesee & Wyoming Australia Pty Ltd in October 2012

# TIVAN Process



# Mount Peake: Project Realisation

**TNG has outlined a clear development pathway, leveraging off its key relationships and alliances in China**



# Project Delivery

- ✓ Strategic Chinese partners secured
- ✓ Off-take and EPCM (Engineering, Procurement & Construction Management) discussions commenced
- ✓ Marketing and sales of products discussion commenced

**The next steps…**

- Finalise processing plant options – include final location for the hydrometallurgical plant
- Complete Definitive Feasibility Study by December 2013
- Complete Environmental Impact Statement by Q1 2014
- Secure partner for EPCM
- Secure long-term sales contracts

# TNG Summary

- ✓ **Mineral-asset rich** project portfolio in NT
- ✓ Developing world-class ***Vanadium-Titanium* Project**
- ✓ **Major Chinese investors / partners**
- ✓ Robust project: **LOM revenue of $13.6B**
- ✓ **Experienced management** team
- ✓ **TIVAN™ process:** competitive advantage
- ✓ Outlook for **strategic metals** strong
- ✓ **Huge upside** to resource potential – 500-700Mt*
- ✓ **Major copper exploration portfolio**: drilling underway
- ✓ **Well-funded** for growth

** Exploration Target of 500-700Mt with a grade range of 0.2-0.4% $V_2O_5$, 5-8% $TiO_2$, and 25-35% Fe. The potential quantity and grade is conceptual in nature. There has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.*

# Appendix – Background Data

**Exploration Targets:**
The potential quantity and grade in any reference to exploration targets and resource potential is conceptual in nature. There has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.

**Pre-Feasibility Study:**
Reference to the PFS is to the ASX announcement of July 2012, which was prepared based on the Company's presently delineated mineral resource estimate. Any investment decision should be considered based on this information.

**Key assumptions of PFS include:**

- Operating costs and pit slope angles related to mining estimated to a Pre-Feasibility Study level (±25%)
- $V_2O_5$ price of US$20,305/tonne (> 90% grade)
- $TiO_2$ price of US$400/tonne (> 55% grade)
- $Fe_2O_3$ price of US$200/tonne (> 69% grade)
- Royalty rate of 2.5% per tonne of plant feed
- Discount rate of 8%
- AUD$/US$ exchange rate of 1 US$ = 1AUD$

**Nett Annual Cash Flow:**
Is defined as the average discounted cash flow per annum after all CAPEX (pre-strip CAPEX, initial CAPEX, and expansion CAPEX) has been deducted, but ignores cost or source of capital, hedging, tax, depreciation, rehabilitation and salvage.