



5 October 2018

Adrian Smythe  
Manager, Listing Compliance  
Australian Securities Exchange  
20 Bridge Street  
Sydney, NSW 2000

### INVESTOR PRESENTATION

Dear Sir,

It has come to the Company's attention that the Investor Presentation released to the market on 4 October 2018 contained an error on page 7 – Global Opportunities High Purity Alumina. The correct In-Situ Resource for ADN's Carey's Well deposit is 23.9Mt and not 12.7Mt as previously shown.

Consequently the Investor Presentation is re-released to correctly report the In-Situ Resource tonnage.

Yours faithfully

A handwritten signature in black ink, appearing to read "James Marsh", written over a light grey circular watermark.

James Marsh  
Managing Director

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METALS

**Halloysite/Kaolin  
& High Purity  
Alumina  
Development  
Opportunity**

October 2018

ASX:ADN

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# DISCLAIMER

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## **Competent Person’s Statement**

The information in this presentation that relates to Exploration Targets, Exploration Results, Mineral Resources or Ore Reserves is based on information provided by H&SC Pty Ltd and Minotaur Exploration and previously released to the ASX. It is compiled by Rhoderick Grivas, a Competent Person, who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Grivas is Chairman of Andromeda Metals. Mr Grivas 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 Grivas consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

# Experienced Board & Management

## Rhod Grivas *Non-Executive Chairman*

- Geologist with 30 years experience
- 18 years of corporate/board experience
- Previously taken projects from exploration to production
- Ex MD of Dioro Exploration - South Kal/Frogs Leg Mines
- Chair of Golden Mile Resources (ASX.G88)

## James Marsh *Managing Director*

- Over 30 years experience including 15 years with Imerys – world's largest industrial minerals company
- Specialised in all aspects of the kaolin industry
- Previous first hand experience with the Poochera Project
- A qualified industrial chemist
- Wide experience in R&D, product development, operations and marketing/sales throughout Asia and Europe

## Nick Harding *Executive Director*

- Accountant and company secretary with +30 years mining experience
- Extensive experience in commercial and resource project management including 5 years as CFO for Olympic Dam

## Andrew Shearer *Non Executive Director*

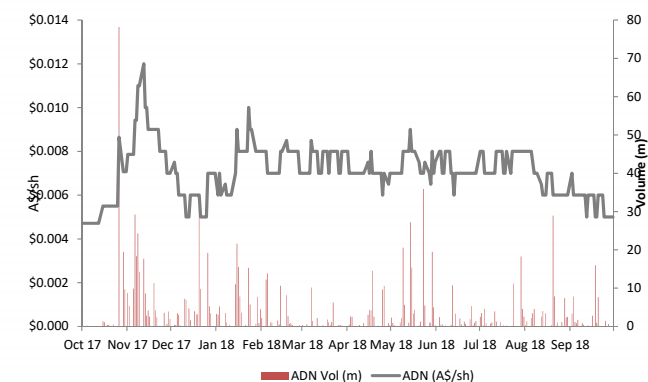
- Geologist/geophysicist with 23 years experience in the mining and finance industries
- Currently a resources analyst
- NED with Northern Cobalt (ASX:N27)

### CAPITAL STRUCTURE (30 September 2018)

Shares on Issue	1,079,361,560
Listed Options (\$0.012/sh, exp 30/11/2020 )	486,280,451
Unlisted options (\$0.015/sh, exp 31/03/2019)	2,476,507
Cash (30/09/2018)	\$1.77m
Market Capitalisation	\$5.4m

### Top 5 Shareholders (30 September 2018)

Buratu Pty Limited (Connolly Super Fund A/C)	12.88%
John & Shaun McDonald (Southland Snipe SF A/C)	4.52%
Vulture Fish Pty Ltd	3.31%
J Moody Nominees Pty Ltd (The Moody Super Fund A/C)	2.96%
Edward Garnet Bunn	2.13%



# The Andromeda Transformation

- JV with Minotaur Exploration to acquire the Poochera HPA/Halloysite-Kaolin Project in South Australia
- Poochera contains the **World Class** halloysite-kaolin Carey's Well Deposit:
  - ❑ JORC 2012 Resource of 23.9Mt<sup>1</sup>
  - ❑ Significantly larger with higher purity than peer projects
  - ❑ JV includes the Camel Lake high purity halloysite deposit
- Testwork proved a **high purity alumina (HPA)** feedstock capability of 99.99% (4N)
- Testing in progress targeting a 99.999% (5N) alumina product
- Indicative **off-take agreements in place** from Chinese ceramics companies for >200,000t/pa of processed halloysite-kaolin product
- EOI for minimum 200,000t/pa of raw ore from Chinese processing plant
- Estimated short 1-3 year timeframe to bring Carey's Well into production with a projected **lengthy mine life**
- Significant new opportunities emerging for Halloysite Nanotechnology applications

<sup>1</sup> ASX Release 22/9/18 Minerals Resource Update for the Poochera Project

Demand for HPA  
growing at  
**28%pa**



# Poochera

## Project Overview

### Defined Resource at Carey's Well

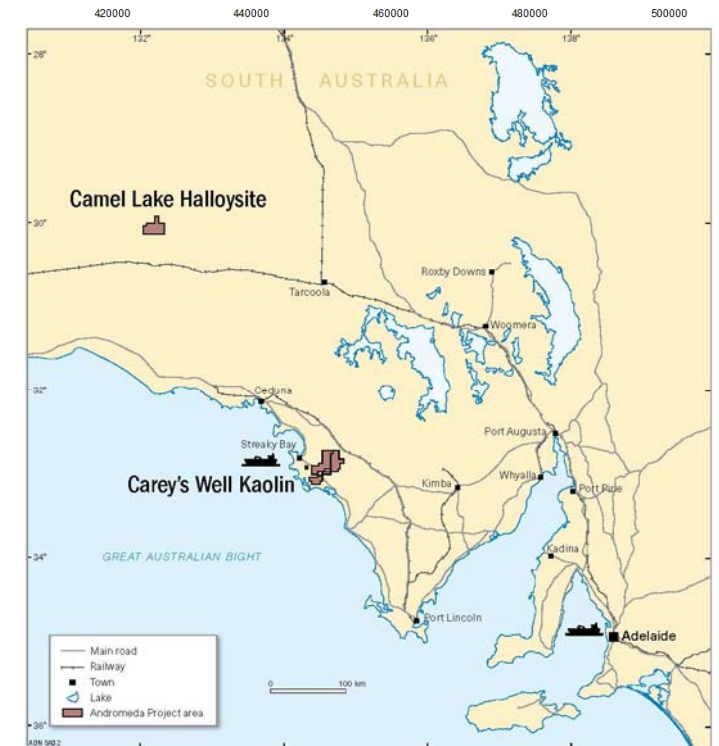
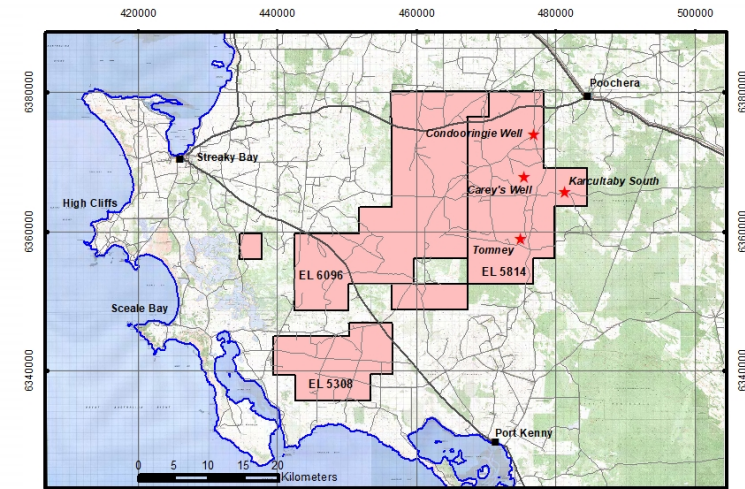
- One of the world's largest deposits of its type

### Extensive Testwork Completed

- Resource drilling
- Bulk sampling
- Pilot plant processing
- High Purity Alumina analysis

### Infrastructure

- Adjacent to Streaky Bay, SA
- Highway access to ports at Ceduna and Lucky Bay
- Tenements located on freehold land (sheep/wheat)
- Simple dry quarrying type extraction process





# What is Halloysite Kaolin?

## A Rare and Valuable form of Kaolin

### Main Mature Established Markets

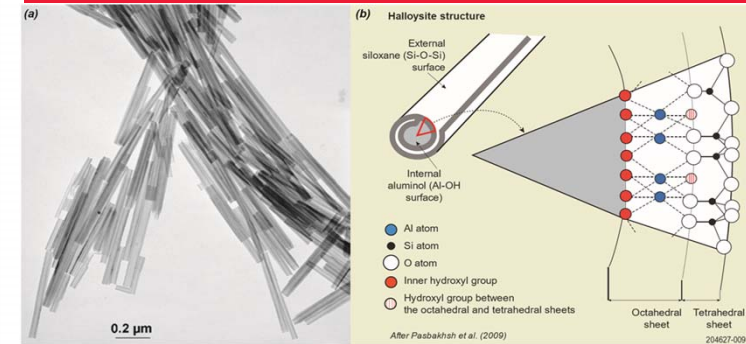
- Ceramics - Valued product for high-quality porcelain (Approx.\$500 - \$1000/t)
- Catalysts – Superior catalyst for Fluid Catalytic Cracking (FCC) which is a crucial process in petroleum refineries (up to \$800/t)

### New and Emerging Markets

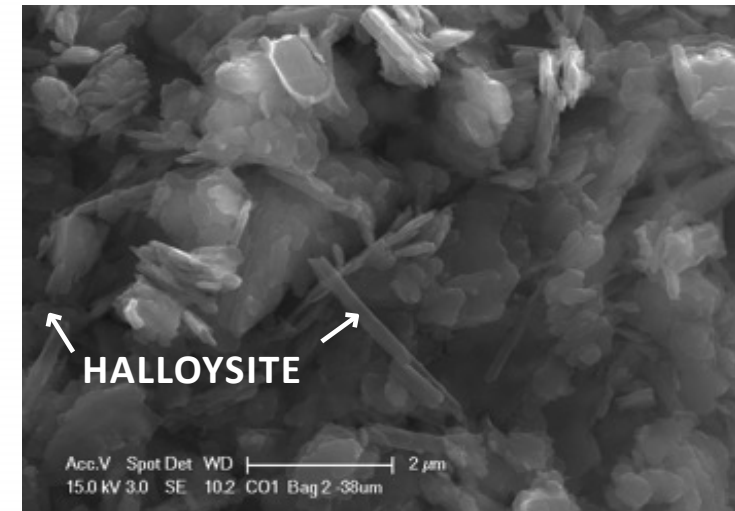
- Carbon Capture: nanotube technology
- Batteries, superconductors and water purification: carbon nanostructures
- HPA Production
- Remediation
- Carriers: biocides, pesticides and medicines
- Coatings: flame retardants and nucleating agents

The Carey's Well material is a naturally occurring hybrid blend of halloysite and kaolin that can be mined and dry-processed at site, or wet-processed at a secondary location

Halloysite is a rare 'tubular shaped' derivative of kaolin that has a wide variety of industrial uses



Carey's Well Halloysite Kaolin Hybrid Product



# Global Opportunities

## High Purity Alumina

*The ability for Carey's Well to produce high purity 4N or even 5N HPA represents a very significant opportunity for development*

- Traditional HPA manufacturing is very high cost using refined aluminum metal feed
- The new kaolin feed production process can reduce costs by more than half
- Being developed by new entrants Altech Chemicals (ATC), FYI Resources (FYI) and Hill End Gold (HEG)
- Halloysite Kaolin from Carey's Well is high purity feed reaching 4N in one purification stage instead of the usual minimum of two
- The acquisition has the potential to position Andromeda with the lowest Market Capitalisation, highest tonnage and grade resource in the Australian HPA market

	Type	Mkt Cap (A\$m)	In-Situ Resource (Mt)	Mass yield (%)*	Al <sub>2</sub> O <sub>3</sub> (%)*	Fe <sub>2</sub> O <sub>3</sub> (%)*	TiO <sub>2</sub> (%)*
Andromeda Metals (ADN)	Kaolin	6	23.9	49%	37.0%	0.56%	0.45%
Hill End Gold (HEG)	Kaolin	11	3.68	43%	34.7%	1.6%	1.12%
FYI Resources (FYI)**	Kaolin	18	9.6		23%	0.80%	
Altech Chemicals (ATC)	Kaolin	83	12.7		29.5%	0.70%	0.45%
Collerina Cobalt (CLL)	Lateritic	67					

\* Note the various grades reported by the companies are based on different mesh sizes in particular FYI -45um, ATC -300um, HEG 63um & ADN -45um.

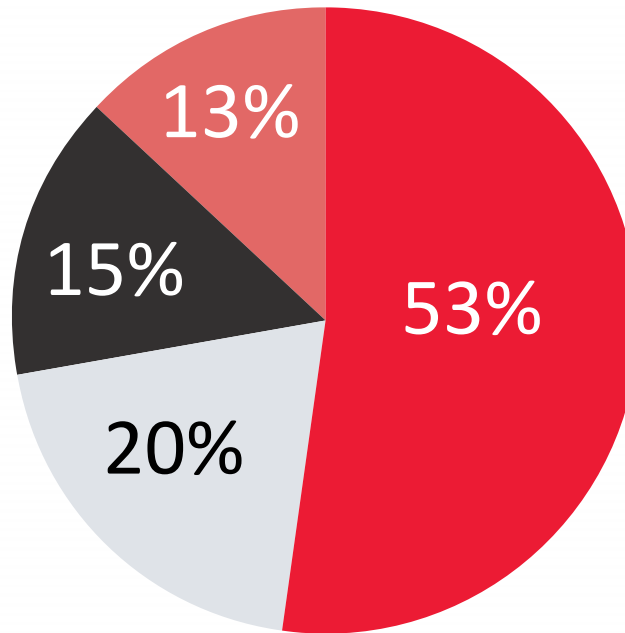
\*\* Reported grades for FYI are based on ICP assay methodology versus XRF for other companies, therefore not shown on this table



# High Purity Alumina (HPA)

- High Purity Alumina (HPA) is aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) powder with a purity equal or greater than 99.99%
- HPA demand is experiencing dramatic growth due to its extensive use in today's high-performance electronic devices and electric vehicles, with market analysts forecasts for annual growth rate well above 20%
- HPA pricing escalates significantly based on purity levels

4N HPA CONSUMPTION BY APPLICATION (2016)



- Other include:**
- LED
  - SEMICONDUCTOR
  - PHOSPHOR
  - OTHER
  - Sapphire glass for smart phone screens - high growth
  - Lithium ion battery separator coatings - high growth
  - Optical windows
  - Lenses
  - Watch glasses

PRODUCT	PURITY	PRICE (US\$/t)
3N HPA	99.9%	\$6,000
4N HPA	99.99%	\$23,000
5N HPA	99.999%	\$50,000

- 4N HPA is the largest sector of the HPA market
- Current global 4N HPA market demand is ~26ktpa<sup>2</sup>
- This is expected to increase to 125ktpa<sup>3</sup> by 2025 driven demand in LED lights, speciality glass and lithium batteries

<sup>2,3</sup> Ursatall Data Collection High Purity Alumina Industry Market Report May 2018

# Global Opportunities

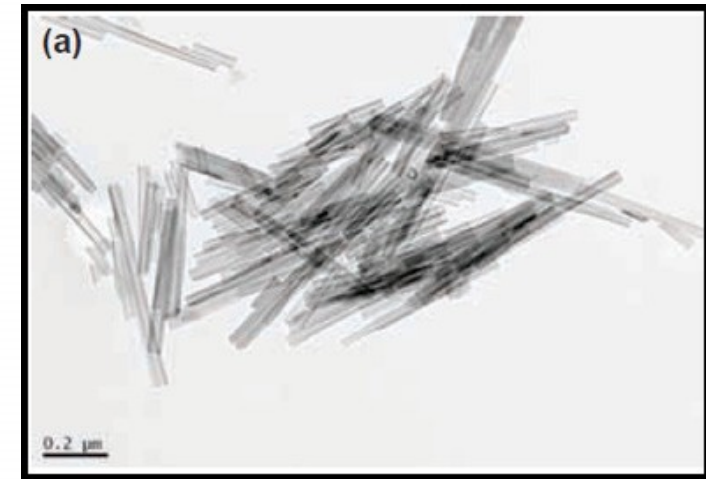
## Nanotechnology Applications

The Global Innovative Center for Advanced Nanomaterials (GICAN) industry hub at the University of Newcastle is already finding excellent results with Carey's Well halloysite kaolin in nanotube technology research

Application research areas include:

- Low cost replacement for expensive carbon nanotubes – water purification
- Production of carbon nano-structures – battery and super capacitor performance improvements
- Carbon dioxide capture, storage and conversion to fuel
- Micro-containers - delivery of drugs, biocides and other active agents

Pure Halloysite



This new research of halloysite nanotubes for use in technologies such as CO<sub>2</sub> capture/conversion, super capacitance, water purification and battery application represents an enormous opportunity with unlimited blue sky potential

# Carey's Well

## Pathway to Production

### Bulk Sampling

- Extract approx. 200t for full-scale commercial processing trials (wet and dry)
- Use product for full-scale commercial application trials
- Lock in legally binding agreements for DSO and processed material

### Key Actions

- Characterise the halloysite component of the resource
- Complete Feasibility Study
- Complete all studies to obtain a Mining Licence
- Complete HPA testwork for 5N product
- Market to the petroleum industry for catalyst cracking
- Collaborate with University of Newcastle to advance nanotechnology application opportunities
- Commence direct shipping ore business
- Contract toll production of fully refined product



## Investment Summary

- The Poochera Halloysite Kaolin Project gives Andromeda an advanced project capable of being advanced rapidly through to operation
- The project comprises a globally significant resource of high quality product with a lengthy mine life
- The price of halloysite kaolin is forecast to increase by 10% p.a. and global demand exceeds supply
- Significant new opportunities emerging for High Purity Alumina and Halloysite Nanotechnology applications
- DSO business with a number of potential customers provides early cashflow opportunities
- Indicative offtake agreements with ceramic manufacturers adds support for potential high margin revenues generation

*Example photo of kaolin mineralisation, not from the Poochera Project*



# CONTACT DETAILS

## **James Marsh**

Managing Director

## **Nick Harding**

Executive Director

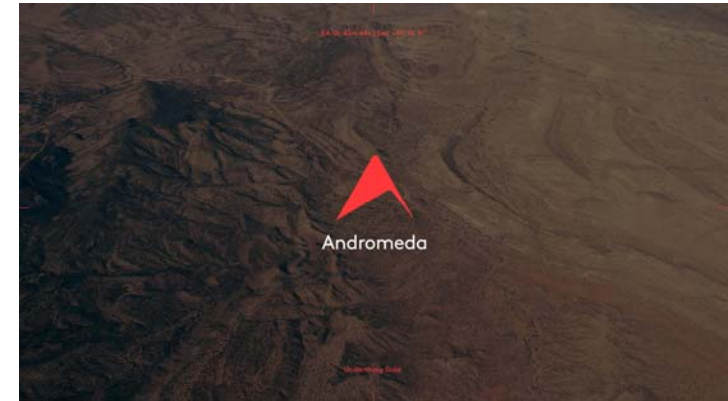
### Address:

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Unley, South Australia

P: 08 8271 0600

[info@andromet.com.au](mailto:info@andromet.com.au)





# APPENDICES



# FARMIN DEAL PROPOSALS

Deal delivers Andromeda a cost effective entry into the HPA/Halloysite sector

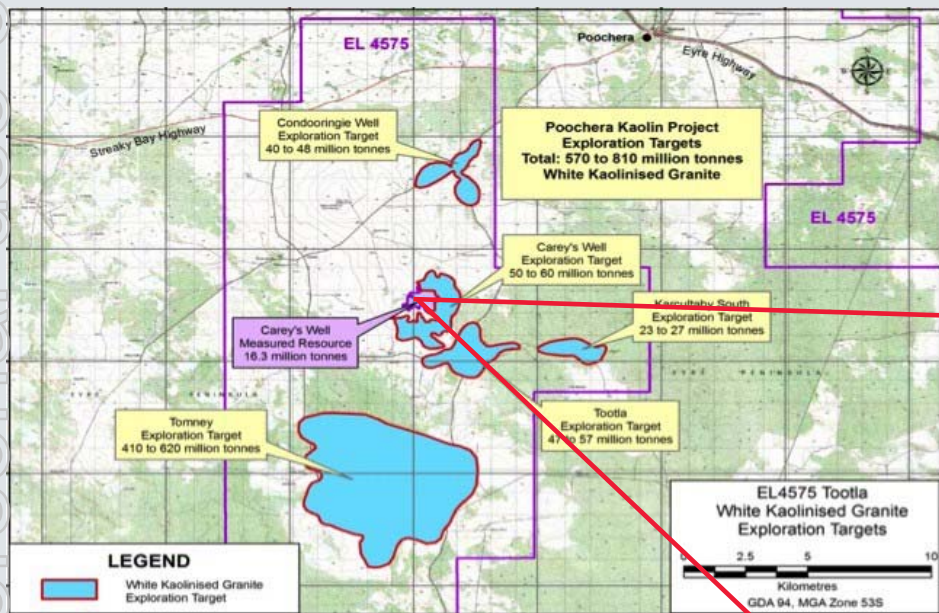
## HOA TERMS

Minimum Spend within 9 months	\$400,000
Spend to achieve 51%	\$3m within 2 years
Spend to achieve additional 24%	\$3m within 3 years
75% on Decision To Mine (DTM)	

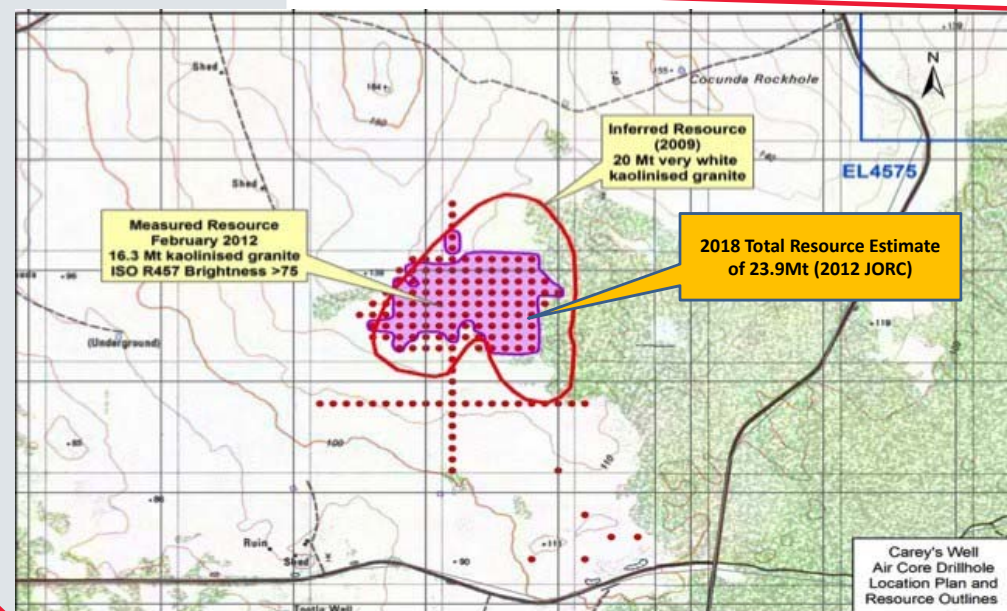
Shared risk/reward on both projects while limiting shareholder dilution



# POOCHERA PROJECT & CAREY'S WELL DEPOSIT



JORC 2012 Resource Estimate 23.9Mt of “bright white” kaolinised granite using an ISO Brightness R457 cut-off of 75 for minus 45 micron kaolin product



The Carey's Well kaolin Mineral Resource Estimate, and the supporting Exploration Data was published by Andromeda Metals on 22<sup>nd</sup> August 2018 in accordance with the JORC Code 2012

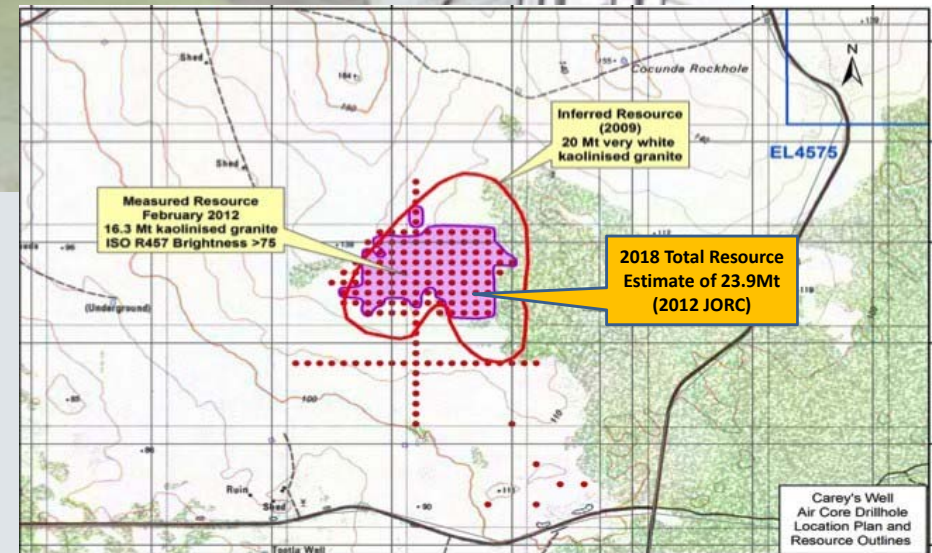
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# Carey's Well

## Ready to Go

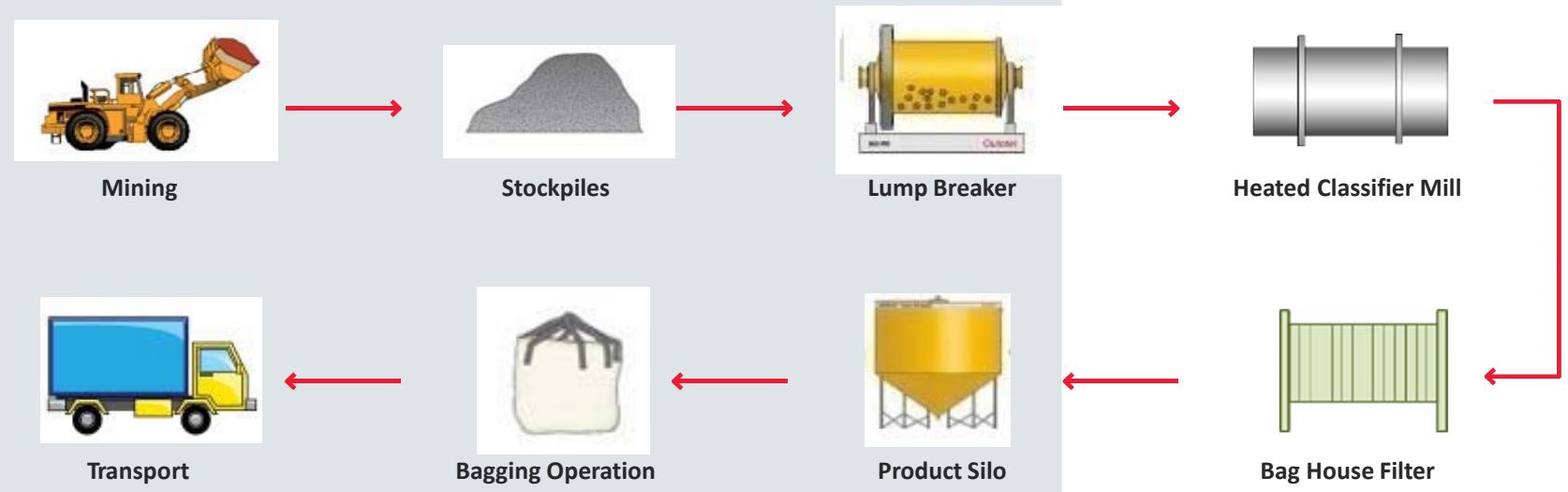
- Minotaur spent in excess \$5M on geology and product development
- Pilot plant work demonstrated recovery of ~ 75% kaolin for semi-refined (dry processed) product.
- A range of halloysite/kaolinite product blends developed and technically approved by customers
- Commercially viable logistics options for shipment of bulk products
- Baseline environmental study showed no impediments to mine approval
- Technical approvals with end users and indicative offtake agreements signed for over 200,000tpa of fully processed product

### Streaky Bay Pilot Plant



# CAREY WELL: PROCESS FLOWSHEET

- Simple low cost operation
- Short construction time
- Rapid entry to market
- Perfect for resource and location





# SIMPLIFIED HPA PRODUCTION ROUTE



Bauxite Mining



Bauxite feedstock  
(~30% Al)



Alumina Refinery



Smelter grade alumina  
(~99.5% Al)



Smelter grade alumina  
(~99.5% Al)



Aluminium metal

Traditional multi-stage process route using refined aluminium metal

VERSUS

Simplified route using kaolin



Aluminium metal



Kaolin Mining



HPA Process Plant



High Purity Alumina  
(~99.99% Al)

# Camel Lake Halloysite Deposit

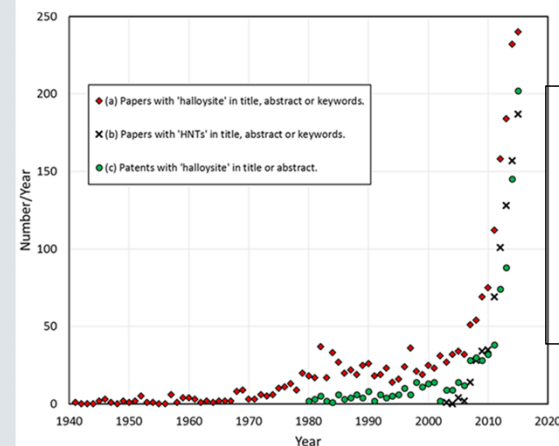
- Pure halloysite is extremely rare in the world
- Current market value up to US\$3000/t
- Only one genuine commercial operation with reducing output due to quality and limited reserves
- World experts believe that Camel Lake is of the highest purity and uniformity
- Recent nanoscience and nanotechnology technologies have opened up numerous opportunities

## Applications Include:

- Nanocomposites with polymers
- Targeted drug delivery and/or the extraction of cancer cells from circulation through the body
- Nanotemplating – production of carbon nanostructures for battery and superconductor optimisation
- Functionalization with chemical and biochemical agents - agriculture, cosmetics and environmental remediation
- Capture, storage and conversion of gases – e.g. CO<sub>2</sub> to fuel
- Environmental and bio-sensors
- Water purification

Since 2005, the number of patents has virtually equaled the number of papers on HNTs

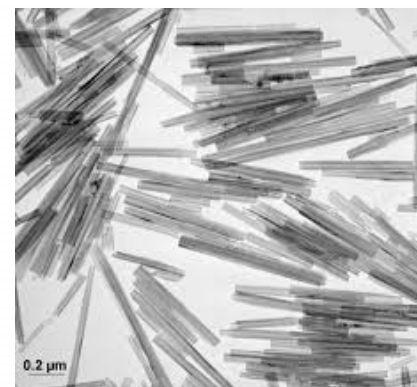
Halloysite is readily translated into important new technologies – much greater than any other clay mineral



Exponential increase in studies and patents aimed at applications of halloysite nanotubes (HNTs)



Halloysite Deposit Very Close to Surface



Micrograph of High Purity Camel Lake Halloysite

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Thank You