

Managing Directors Address

The background of the slide is a high-resolution image of the Andromeda Galaxy (M31), showing its characteristic spiral structure with bright yellow and orange star-forming regions and numerous blue stars scattered throughout the dark cosmic space.

***Andromeda Metals***  
***A New Direction in Industrial Minerals***

ASX:ADN



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# Outline

1. The Andromeda transformation
2. The Poochera Project
3. Geology, drilling and defined resource
4. Kaolin and halloysite mineral properties
5. Product and Target Markets
6. Marketing & offtake agreements
7. Bulk sampling and processing trials
8. Existing Infrastructure
9. Prefeasibility Study
  - Resource model update
  - Mine Plan
  - Processing Options
  - Transport and Logistics Options
10. Project schedule



# The Andromeda Transformation

## Vision

- A sustainable industrial minerals company providing shareholders with risk managed discovery, development and mining opportunities

## Project Development Focus

- Poochera Halloysite-Kaolin Project JV with Minotaur Exploration to acquire the project in South Australia

## Exploration Portfolio

- Projects covering 6,102 km<sup>2</sup> within 22 exploration licences located in South Australia, Queensland, Western Australia and the Northern Territory

## Other Projects – minimising holding costs and maximising value

- Drummond – JV with Evolution Mining
- Moonta – JV negotiations at advanced stage
- Wudinna – JV with Lady Alice Mines
- Rover – Seeking JV
- Pilbara – Native Title agreements being negotiated

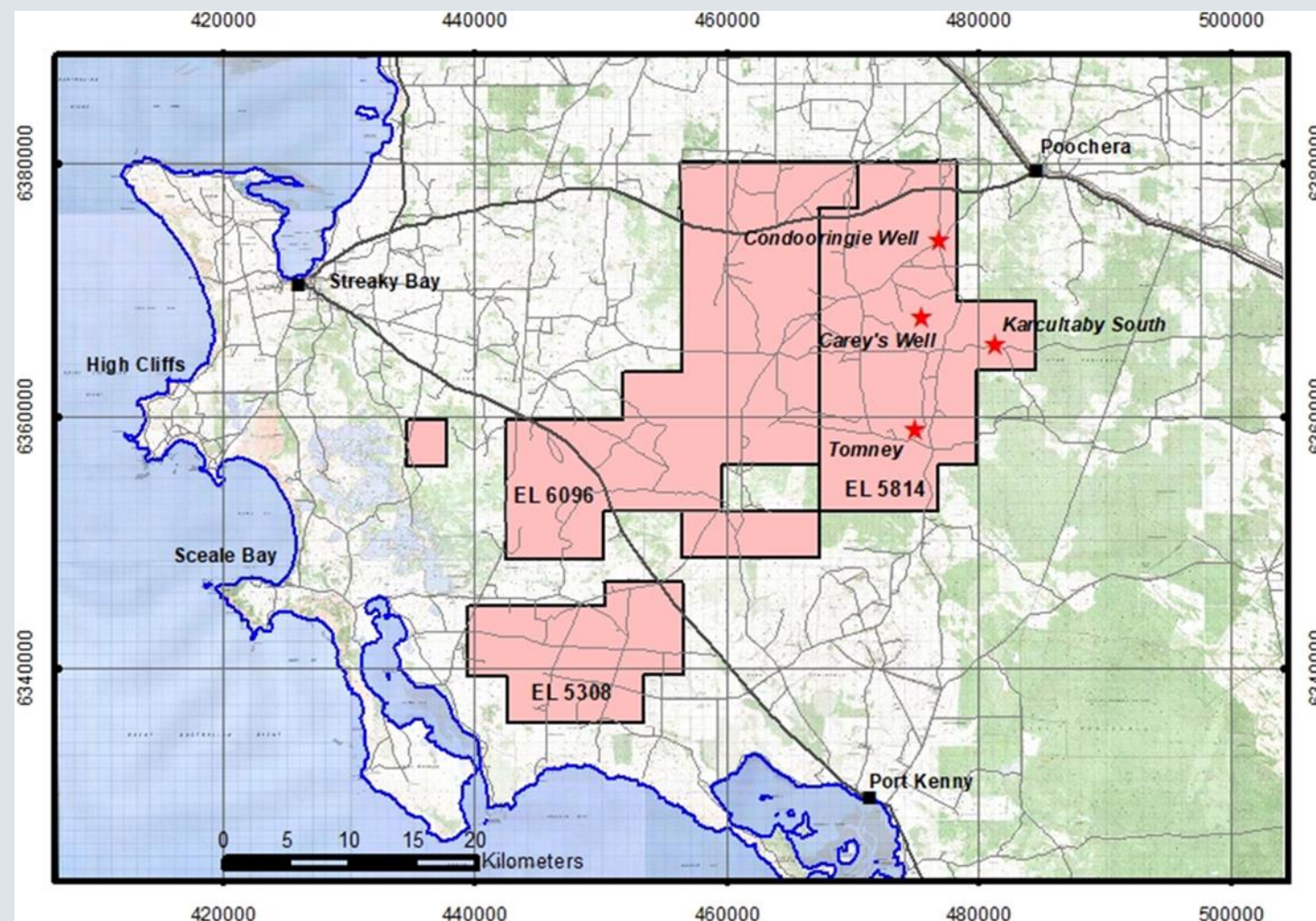




# Poochera Project

## Overview

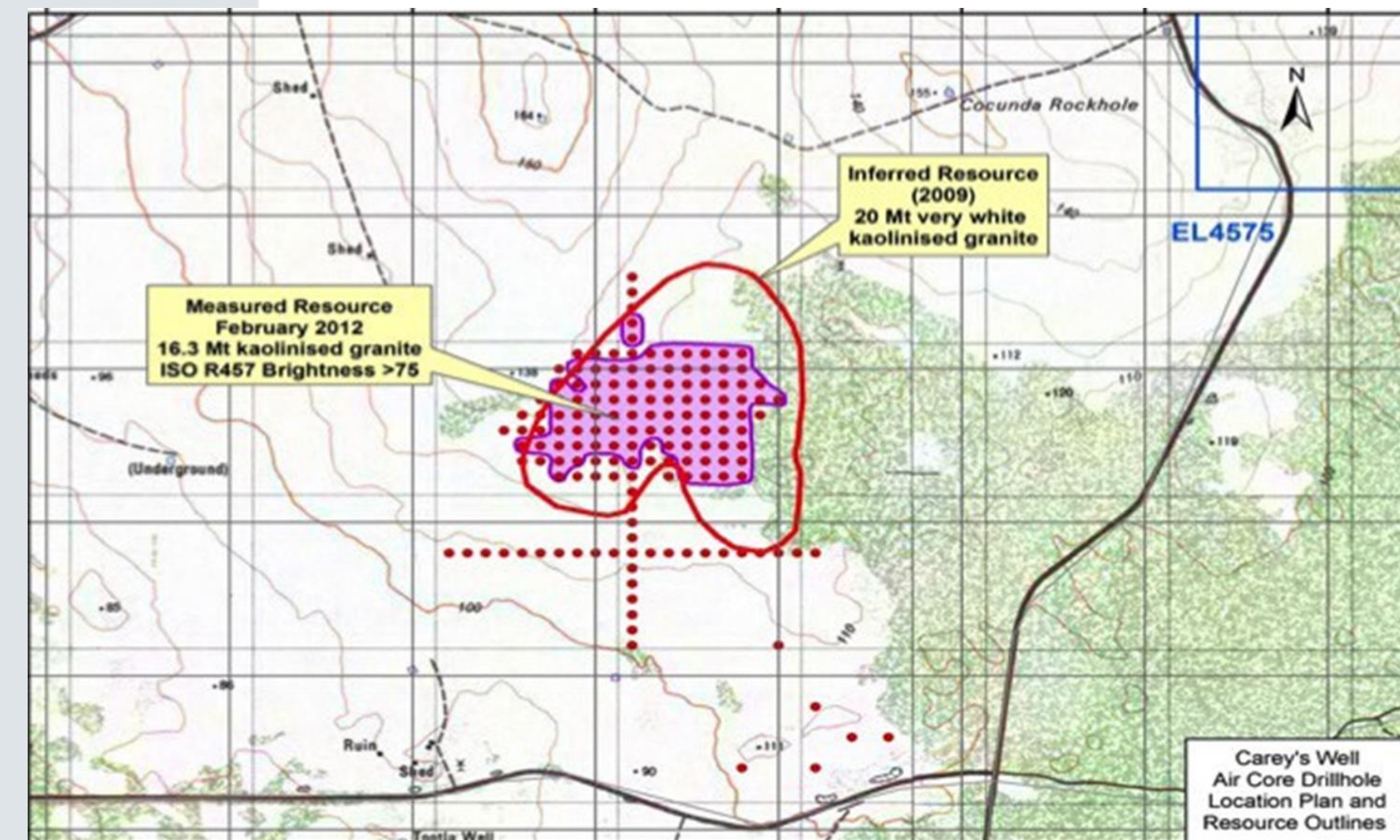
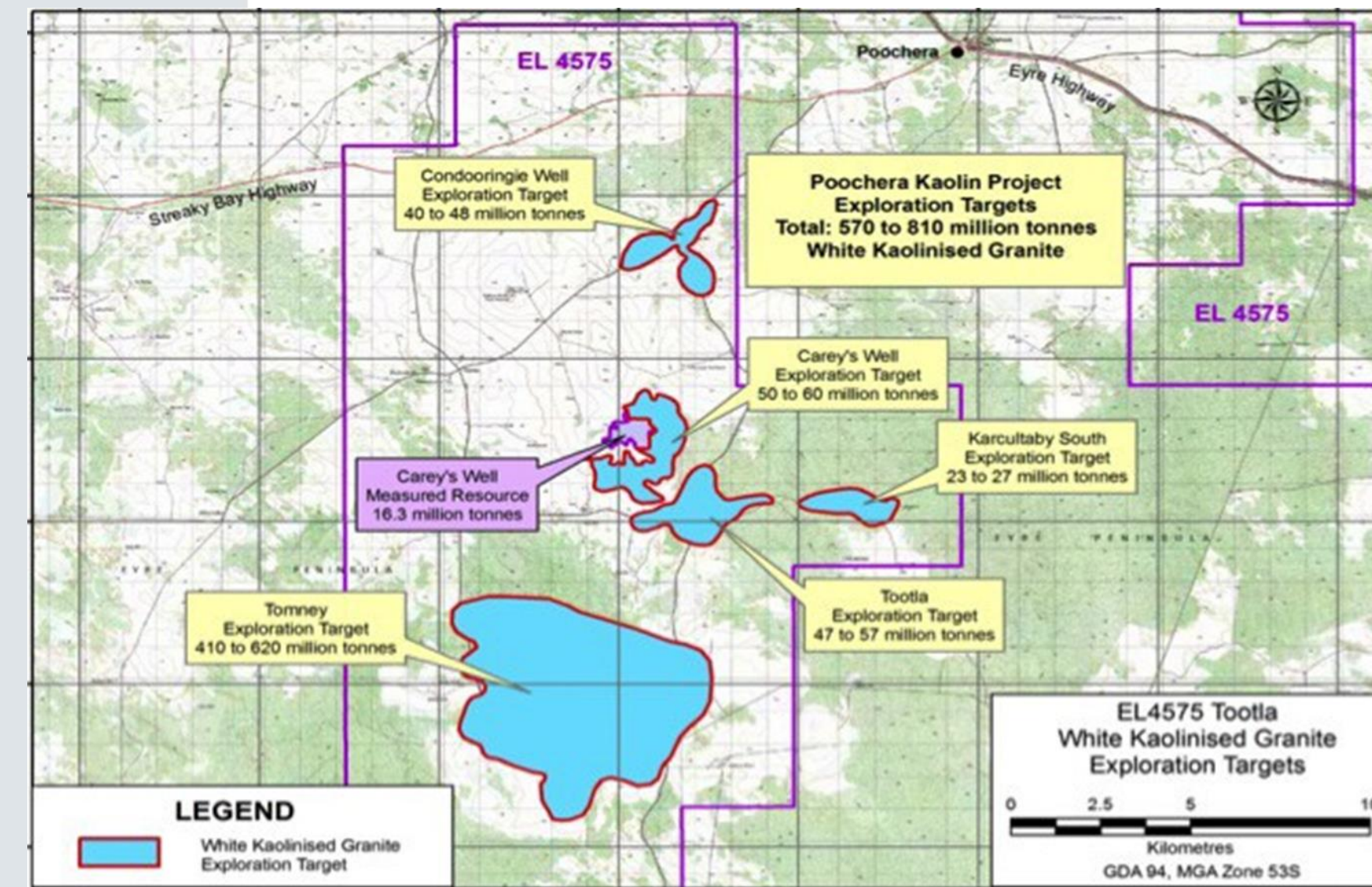
- **World class** halloysite-kaolin Carey's Well Deposit
- Estimated **short timeframe** to production
- **Long mine life**
- Indicative **off-take agreements** in place with Chinese companies (>200,000 tpa)
- Chinese kaolin processors and end users to run commercial scale approvals
- Testwork proved a 99.99% (4N) **High Purity Alumina** (HPA) feedstock
- Opportunities in emerging for **halloysite nanotechnology** applications





# Defined Resource

- JORC 2012 Resource estimate for Carey's Well
- 23.9Mt of “bright white” kaolinised granite
- ISO Brightness R457 cut-off of 75 for minus 45 micron kaolin product
- Published by Andromeda Metals 22<sup>nd</sup> August 2018

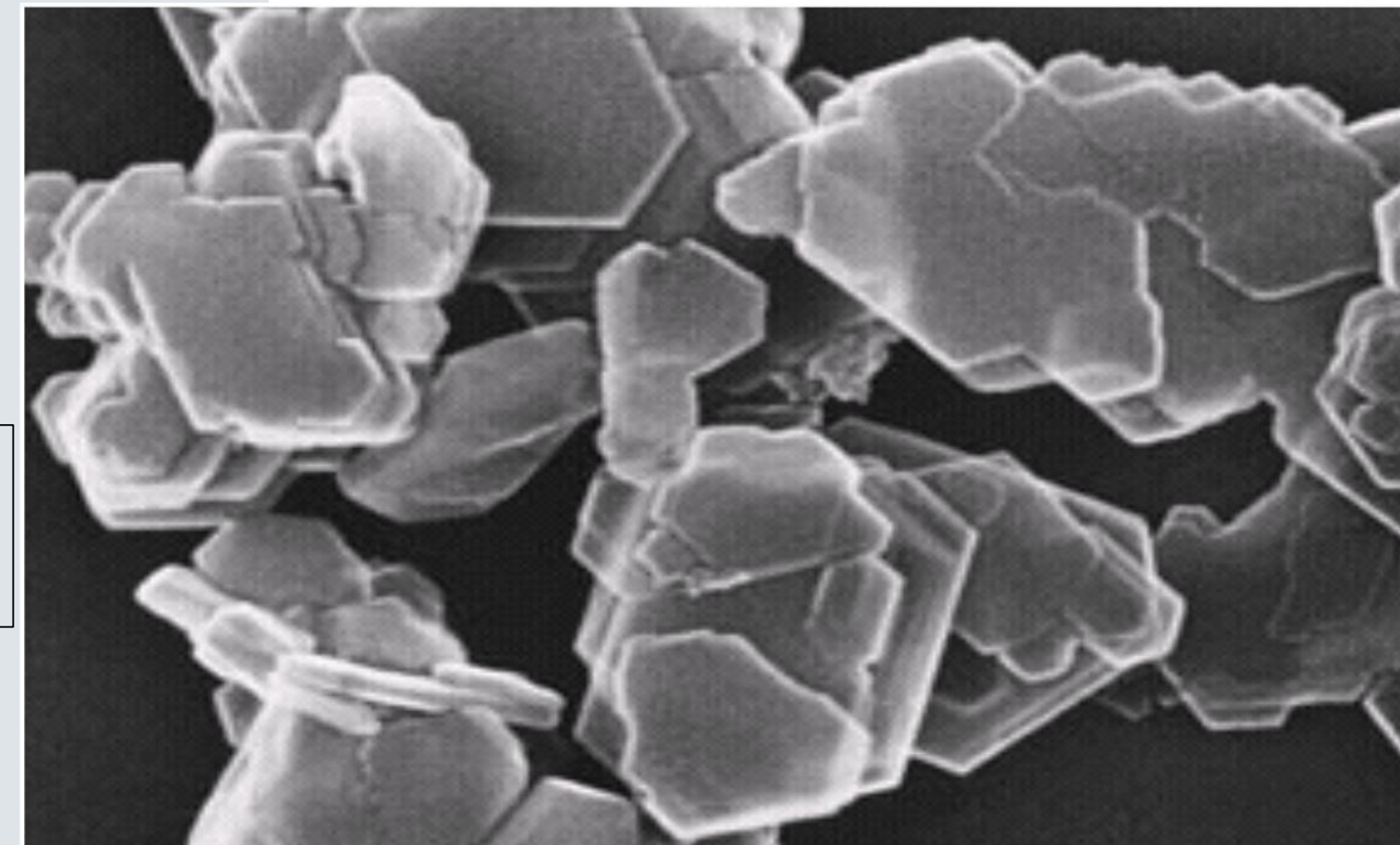




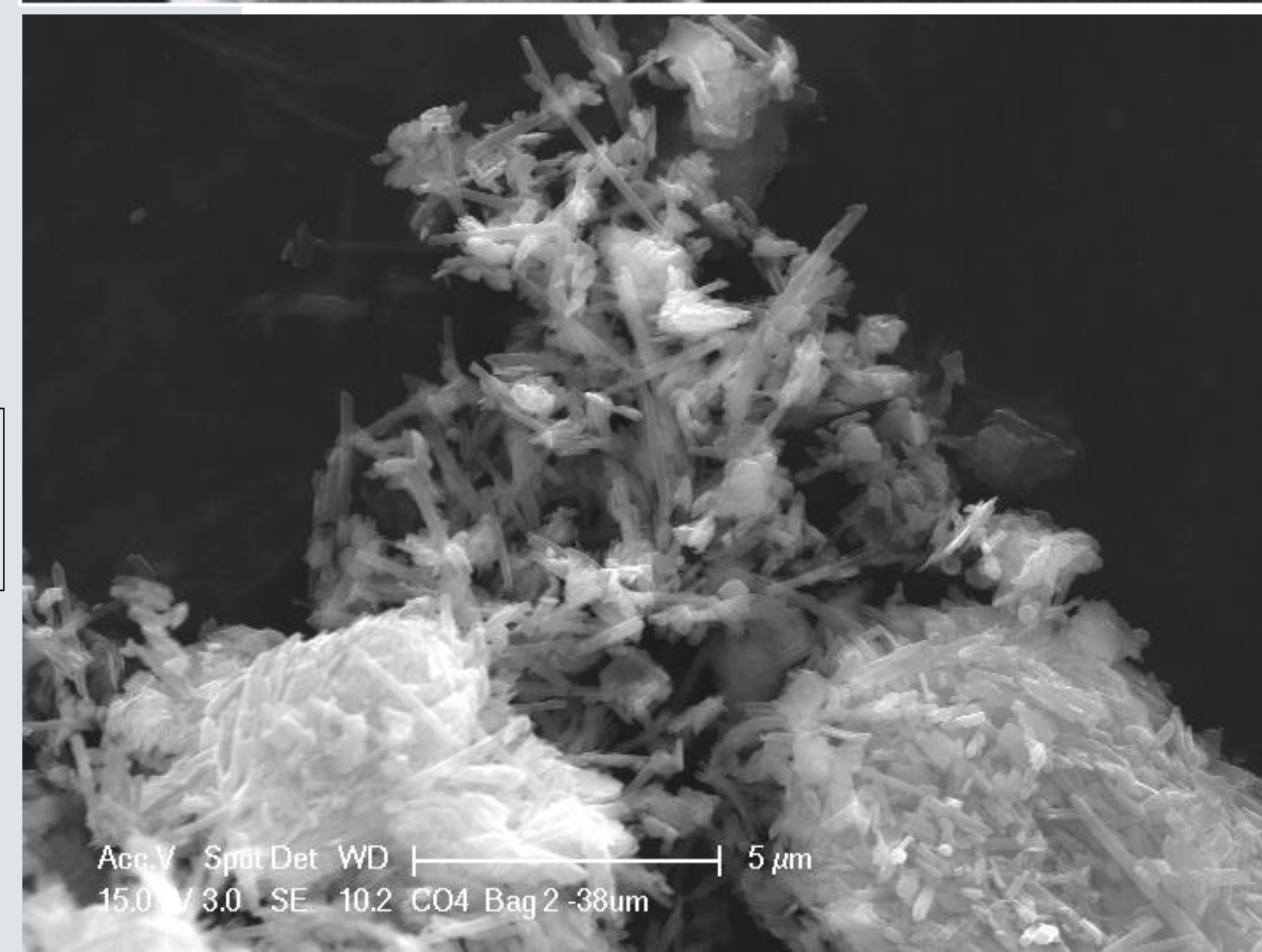
# Mineral Properties

<b>Main Constituent:</b>	Kaolinite & Halloysite
<b>Minor:</b>	Mica, Quartz, Feldspar
<b>Aspect Ratio:</b>	8/1 - 100/1
<b>Average:</b>	20/1
<b>Specific Gravity:</b>	2.6
<b>Refractive Index:</b>	1.56
<b>MOH Hardness:</b>	2.5

Typical Kaolin with  
Plate-Like Structure  
( $\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$ )



Carey's Well  
Halloysite Kaolin  
Hybrid Product

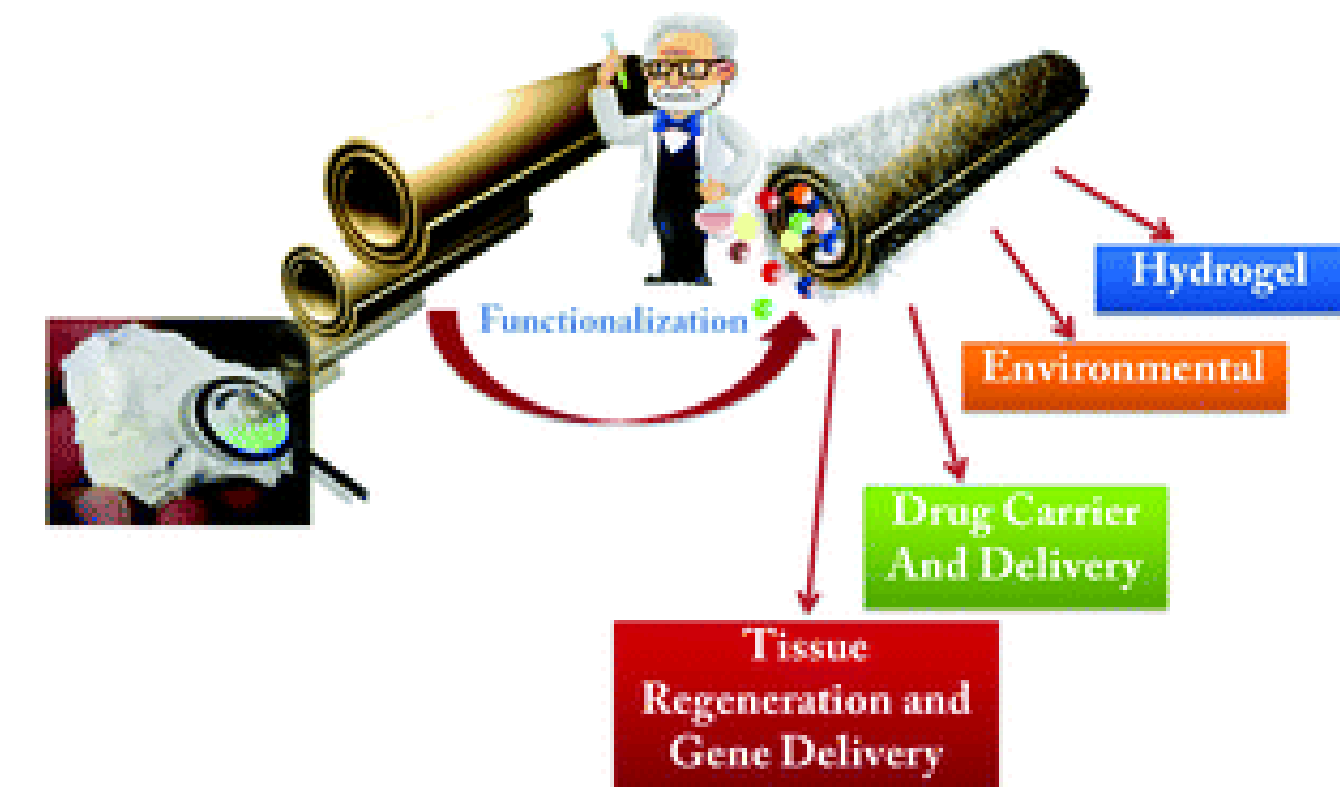
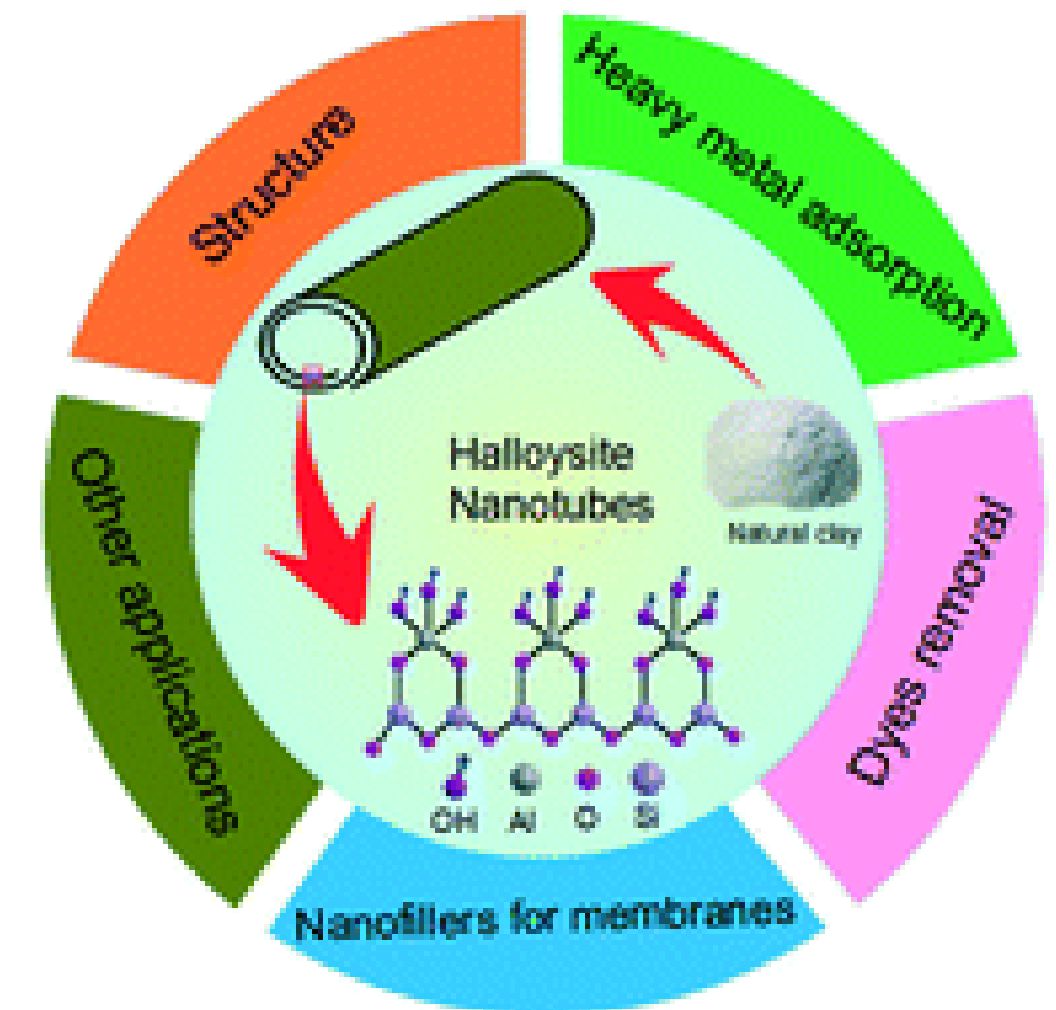
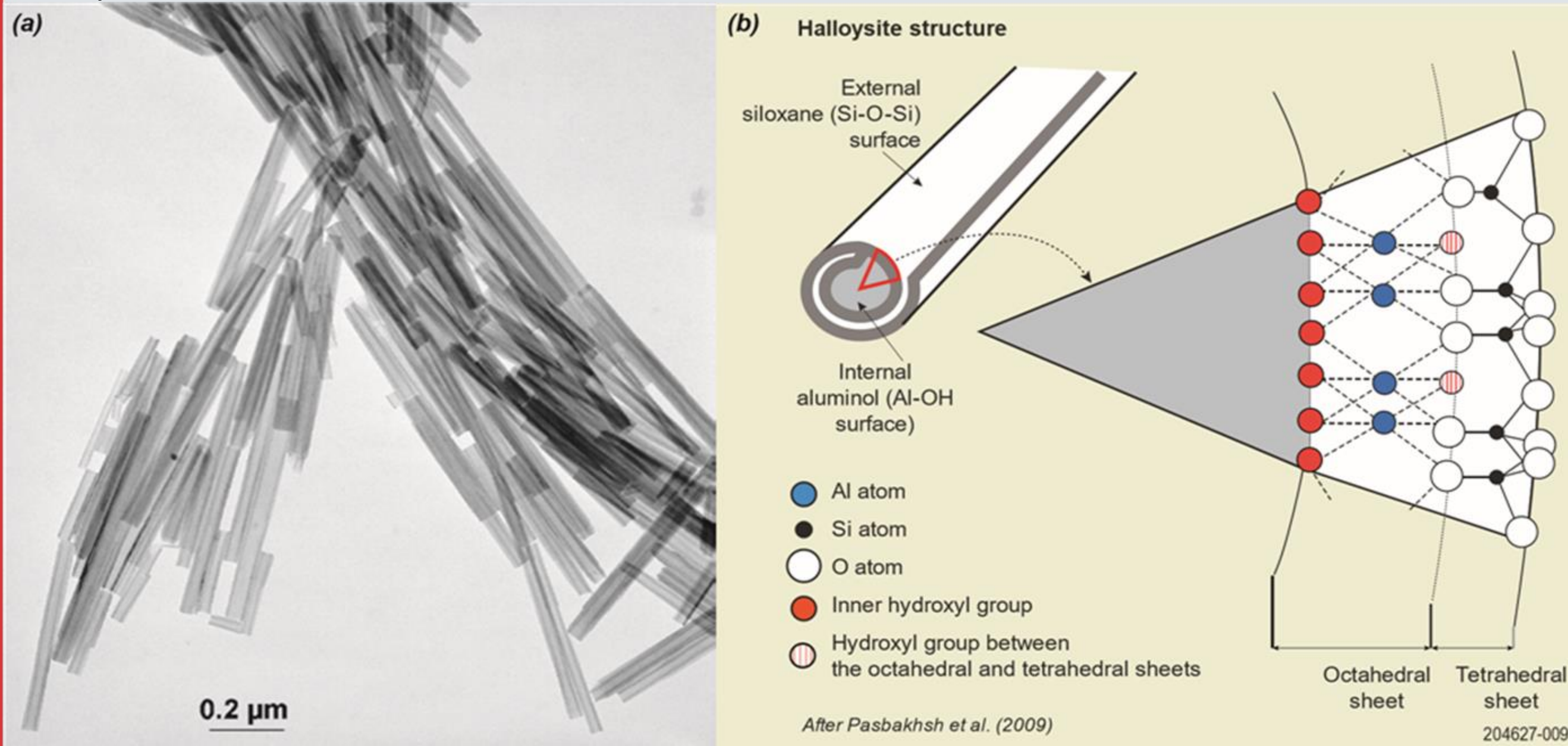




# Halloysite

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

Halloysite Kaolin with Tubular Structure





# Product & Target Markets

for the halloysite kaolin market

## Main Mature Established Markets

- Ceramics - for high-quality porcelain (Approx.\$500 - \$1000/t)
- Catalysts - for Fluid Catalytic Cracking (FCC) in petroleum refineries (up to \$800/t)

## New and Emerging Markets

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

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





# Marketing Strategy

## Opportunities

- Significant and increasing demand for:
  - Direct Shipping Ore
  - Beneficiated ore
- Market to petrochemical industry - catalytic cracking
- Premium HPA feedstock

## Technical Approval

- High quality ceramic customers



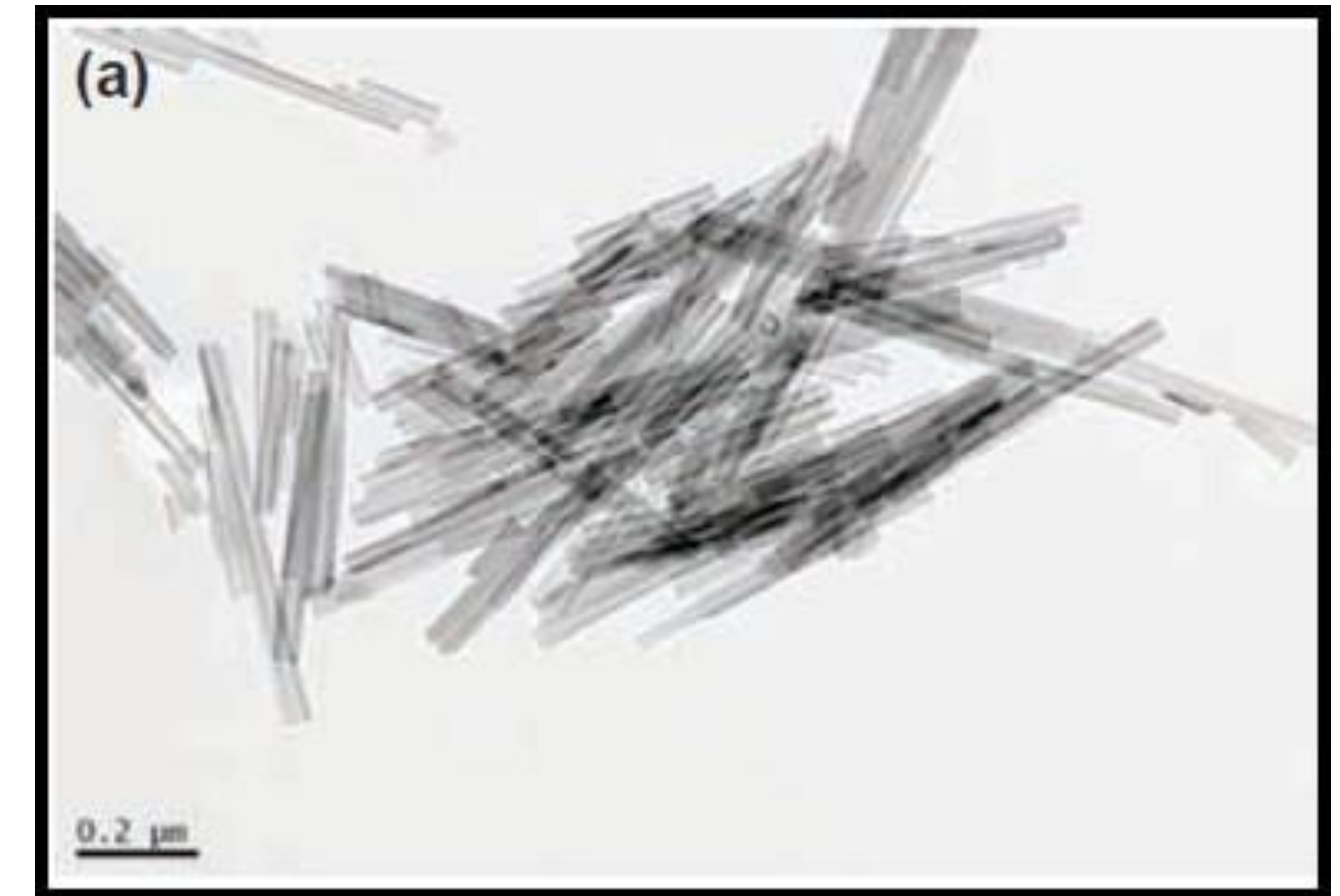


# Nanotechnology Applications

The Global Innovative Center for Advanced Nanomaterials (GICAN) industry hub at the University of Newcastle is using Carey's Well halloysite in nanotube (HNT) technology research.

## Emerging Applications:

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



Pure Halloysite



# Bulk Sampling & Processing Trials

## Bulk Sampling

- 200t bulk sample taken in October 2018

## Commercial Processing Trials

- Full scale dry processing – December 2018
- Full scale wet processing – Q1 2019
- Full-scale commercial application trials – ceramics
- HPA testwork

## Commercial Agreements

- Legally binding agreements following outcomes of PFS



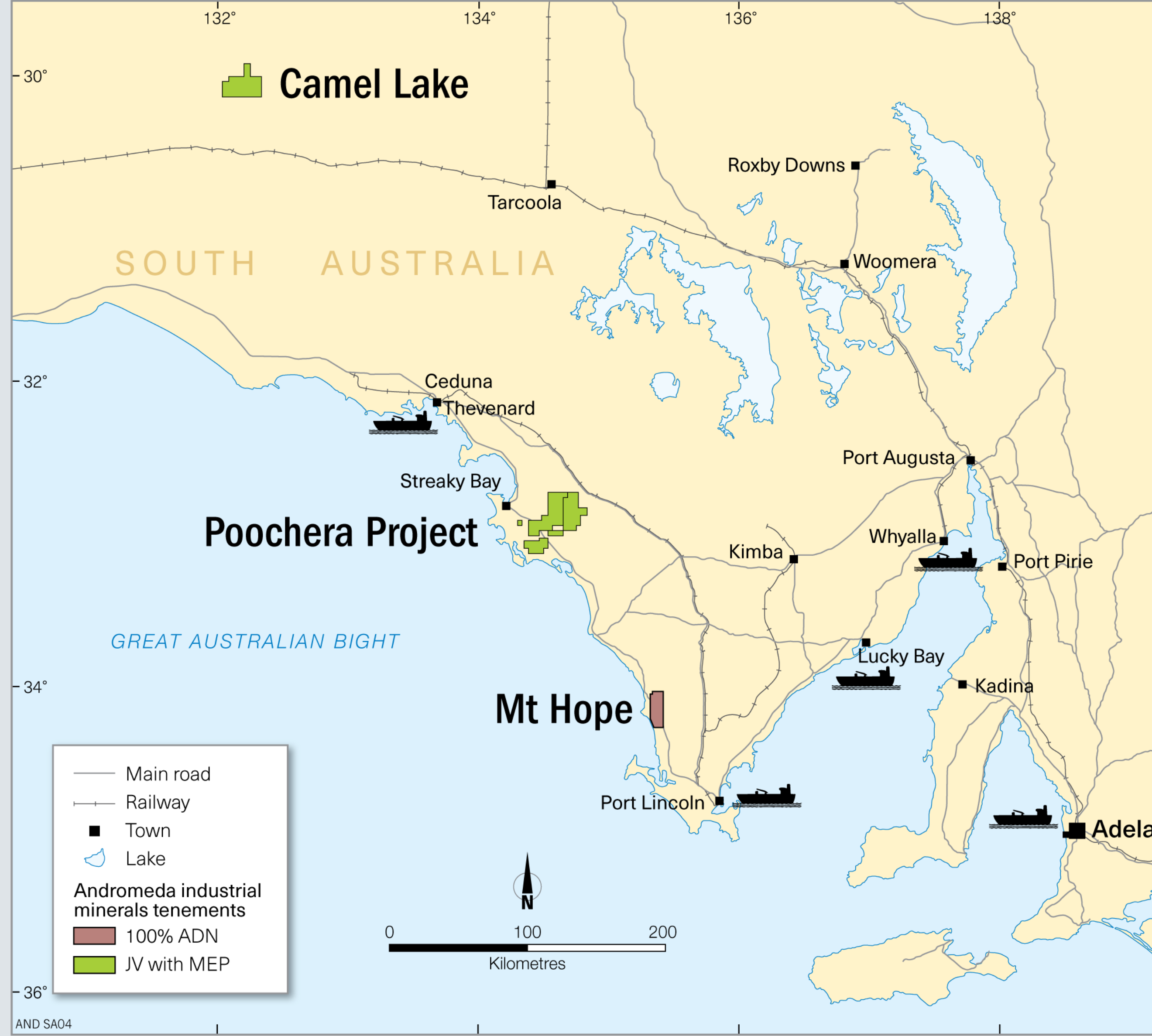
Bulk Sampling at  
Carey's Well





# Existing Infrastructure

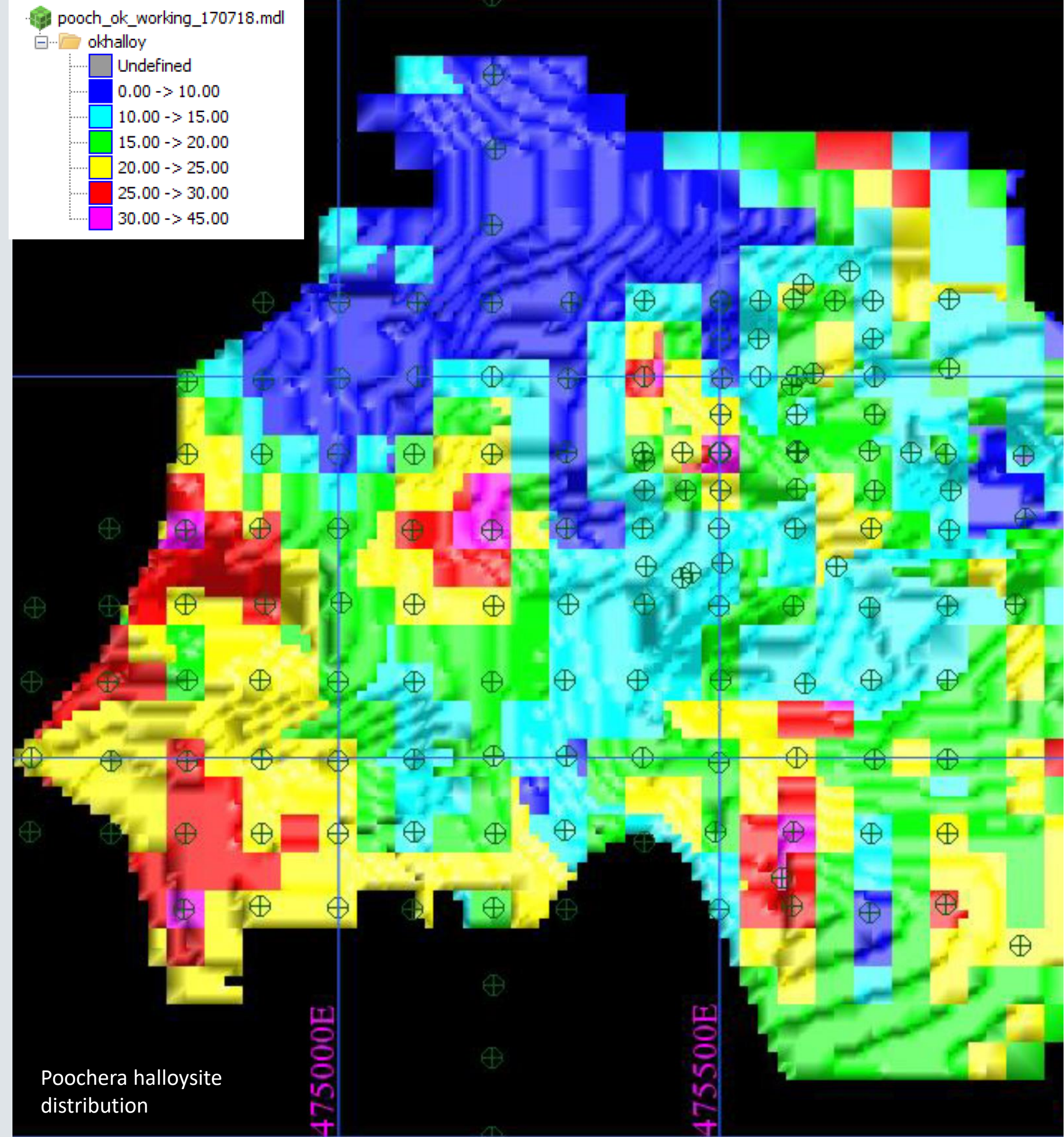
- Adjacent to Streaky Bay, SA
- Highway access to ports at Ceduna, Lucky Bay and Port Lincoln
- Multiple port options on Eyre Peninsula





# Prefeasibility Study Resource Model

- Characterise the halloysite component of the resource
- Resource model update
- Exploration drilling of high purity halloysite regions at Poochera and Mt Hope





# Prefeasibility Study

## Mine Plan

- Open cut quarry
- Low stripping ratio
- Campaign mining using contractors
- Stockpile at site and/or near port facility
- Pit backfill and progressive mine rehabilitation



Typical Dry Mining Kaolin Operation

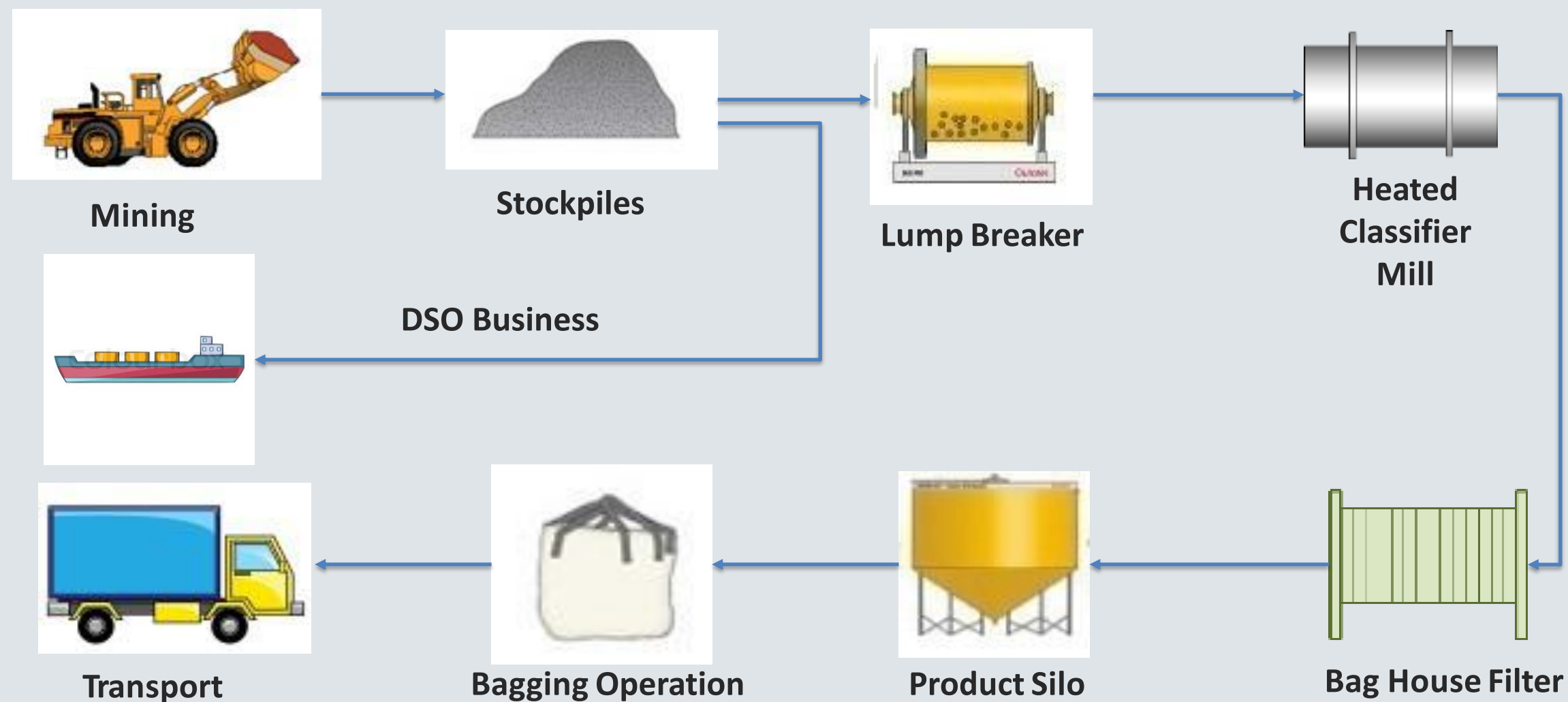




# Prefeasibility Study

## Processing Options

- Commence direct shipping ore business
- Second stage production plan to remove 50% waste (sand)
- Transport cost reduced by half
- Potential to give a market ready product with much higher value
- Contract toll production of fully refined product for export business



Streaky Bay Pilot Plant



# Prefeasibility Study

## Transport & Logistics Study

### Prefeasibility study report to detail

- Options considered (5 have been identified)
- Risk assessment and evaluation
- Recommend preferred option
- CAPEX and OPEX estimates
- Define regulatory approvals





# Project Schedule

- Update scoping study ~Q1 2019
- Prefeasibility study ~Q2 2019
- Prepare Mining Lease Application (MLA) ~Q3 2019
- ML Grant ~Q4 2019
- Commence operations 2020





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# Thank You