## MINED LAND REHABILITATION A journey through Queensland and beyond

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# OUTLINE

#### The context

- The journey
- The issues

The next step





North Stradbroke Island

- Jibbinbar
- Eromanga
- Mount Morgan
- Bowen Basin
- Kidston
- Weipa
- Gove



### **Research Programs**

Ecosystems and revegetation

Mine wastes management

 Mine closure and post-mining land uses





























## ARSENIC REFINING PLANT

on brickworks




































































































#### Longtom Soil Replacement Trial

Soil Replaced: December 1990 Regenerated: December 1990

NO VEHICLE ACCESS DO NOT BULLDOZE































# **RESEARCH ISSUES**

#### Prevention and minimisation of problems

### Containment/remediation/rehabilitation

# Sustainability and planning for closure





## **Measuring sustainability**

- Tolerable conditions for growth
- Species composition
- Nutrient cycling
- Reproductive capacity
- Resilience to disturbance








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#### **Risks to sustainability**

- Some aspects relating to the long term sustainability of rehabilitated native ecosystems are still not well understood
- However, risks relating to long-term sustainability can be reduced by using well designed monitoring and research programs to understand ecosystem function, processes and likely successional trends

#### **Closure risks**

 A significant risk associated with minesite rehabilitation is the question of completion criteria – will the regulators and broader community accept defined (revegetation) standards as part of an overall mine closure plan (and agree to lease relinguishment)?

## **Completion criteria**

- Need to determine when rehabilitation successful or complete
- Need to be grounded on ecological principles
- Combination of attributes at different levels of scale are necessary
- Need to be developed within the context of the post-mining land use



## **Reducing uncertainty**

- Varied success can be attributed to the variability of the rehabilitation 'quality'
- Rehabilitation meeting criteria in one location may fail a short distance away (independent of the monitoring approach)
- So,.. there remains 'uncertainty'

Can we model, or predict, or put a probability on, or quantify, that uncertainty? and hence understand the risk

### The problem

- Rehabilitation quality is spatially variable
- Variability creates uncertainty in rehabilitation sign-off
- Industry wants greater certainty
- Regulators are risk averse: 'Who wears the cost if it goes bad?'

### An approach

- Quantify the uncertainty (*ie.* probability of 'success') to assist in sign-off decisionmaking
- Model spatial variation in key soil properties and establishment parameters
- Link soil variation and establishment parameters to long-term vegetation performance



















# Centre for Mined Land Rehabilitation







