Irrigated Agriculture in the Pilbara
Synergies with the Mining Industry

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Regional Perspective

• As high quality, above water table ore bodies are depleted, development of below water table deposits is increasing – significant volumes of surplus water are produced during this process

• Rio Tinto is developing alternate uses for surplus water as part of an over-all water management strategy

• Irrigated agriculture is seen as an option towards management of this mining by-product

• Agricultural projects are therefore primarily integrated surplus water managements projects to facilitate BWT mining – yet are able to maximise the inherent value of water for positive economic, social and environmental outcomes. This is a paradigm shift from conventional surface discharge

• In the immediate term, agriculture has the capacity to improve the economics of the Rio Tinto pastoral leases, assist in drought-proofing operations, and provide large volumes of Pilbara-based hay for regional use and potential export
Regional Location
The Mine

• Located 45 km east of Tom Price in the Pilbara region of Western Australia
• Adjacent to Karijini National Park
• Commissioned in 1994
• Produces Marra Mamba lump and fines for Rio Tinto’s Pilbara Blend
• July 2010, approval received for Phase 2 - extending the existing pit below water table
• Extends mine life to approximately 2030
The Concept (more than 30 options considered)
Hamersley Agricultural Project (HAP)

- 16 pivots for cropping
- 1 small pivot for native seed production
- 3 Gl dam
- Irrigation capacity up to 85Ml/day
- Clearing began in May 2012
- Seeding commenced in Oct 2012
- First harvest Jan 2013
Production

- Agronomy is based on the Martinez Open Hydroponics Technique (MOHT)
- Maximum growth rates of 26 kg/mm/ha of Eta
- Currently growing Rhodes grass for hay production – although winter temperatures reduce yield considerably
- Trialling Forage oats as a winter crop
Infrastructure

• 900mm main line
• Each pivot delivers 13.5mm in a 24 hour rotation
• Pivots are 800m in diameter (50 hectares)
• Primary fertigation is via peristaltic pumps proportional to total flow
• Secondary fertigation is necessary
Cropping Strategy

- Project is water supply-driven – not crop demand-driven
- Rhodes grass is a robust crop, easy to cultivate, has a high water uptake, produces reasonable fodder – but goes dormant in winter
- Growing oats over winter to improve yields
- Planning for Lucerne production
Nammuldi Agricultural Project (NAP)

- Still being commissioned - 19 pivots for cropping
- Seeding commenced in April 2014
- Rhodes grass will be sown initially with possible Lucerne and Forage oats as future options to explore
- Planning to explore options for a stand & graze cattle trial
The Challenges

- Environmental
  - Crop options
  - Nutrient balance

- Distance from markets

- Acceptance of change for pastoralists/rangelands

- Mine life is generally around 20 - 30 yrs
  - Reliability of water supply

- Climate
Marandoo
Hamersley Agricultural Project
What Does This Mean for Food Production?

• Potential for agricultural production, although several hurdles currently exist
  o Lack of transport infrastructure/distance from markets
  o Limited regional port facilities
  o High capital and operational costs
  o Need for long term water supplies – mines have finite lives

• In the Pilbara, irrigated fodder/enhancement of the beef industry may be an option in the medium term
  o Pastoralism already well established, but limited rangeland carrying capacities
  o Relatively small herd size and seasonality can’t support expansion
  o Pastoral industry largely doing what its always done – option for intensification

• Rio Tinto projects are enablers for mining development – but are developing operating models for future diversification

• Regulatory and other authorities are taking increasing interest in irrigated agriculture potential in the Pilbara
End