NORM and the Northern Territory of Australia

Peter Waggitt
Darwin NT - Australia
NORM and the NT

• A long history, starting with Uranium
  • Early “green minerals”
  • Rum Jungle
  • South Alligator Valley
  • Nabarlek, Jabiluka and Ranger
  • Modern exploration

• Rare Earths
• Phosphates
• Mineral sands
• Oil and gas
Uranium

• Long history in NT – but, variable environmental performance
  • Rum Jungle – notorious for impacts in Finnis River; third remediation campaign underway
  • South Alligator Valley mines – no remediation initially; cleaned up 2006-7
  • Nabarlek: high grade (then) 10 year life 1980-89; closure 1996/6; remediation ongoing
  • Ranger: longest lived U mine in Australia; 125,000+ t produced since 1980; now commencing remediation with closure required by 2026
  • Jabiluka: no development, site being remediated
• Major issues relate to residue and waste rock disposal

No radiological impacts discovered at any site; sites monitored, especially for workers and environment at Ranger and Jabiluka
Residue disposal

Nabarlek

Ranger Pit 1
Rare earths
No active mines but a lot of exploration and one advanced development

Arafura Resources – Nolans Bore project
- Very large resource at Aileron, 135 km north of Alice Springs
- 23 year mine life @ 293,000 tpa concentrate (13,343 tpa TREO)
- Includes NdPr* oxide 4,300+ tpa and Phosphoric acid 135,808 tpa
- Initial processing and waste disposal at site
- Definitive Feasibility Study completed, government approvals secured
- Actively seeking finance as NT agreement, water licence and Mineral Lease all to come by late 2019
- Earlier plans to recover U now shelved

Charley Creek project
- Crossland Strategic metals, 110 km NW Alice Springs
- Alluvial deposit over 100+ sq km up to 17 m thick
- REE up to 30 m depth; heavy REE dominate; drilling ongoing

*Neodymium-Praseodymium
Phosphate

No operating mines but three significant deposits located

• Verdant Minerals
  • Amaroo 1.2 bn t phosphate over 40 km strike
  • Significant associated deposits at Amaroo South and Rockhole
  • Low U levels suggest few on-site RP issues in mining
  • Considering on-site beneficiation/processing

• Avenira Limited
  • Measured and indicated resources 300Mt @ 18.2% P₂O₅ (10% cut off)
  • Inferred Resource 542Mt @ 18% P₂O₅
  • Potential to develop superphosphoric acid.
  • Currently awaiting validation of the IHP Process.
Mineral sands

• Deposits on the Tiwi Islands to the north of Darwin
• Two projects completed and a third prospect awaits development
• Concentrate exported
• Small production but no significant RP issues recorded
• Spirals cleaned and re-used for garnet project
Oil and Gas

- Onshore oil and gas production is currently small but larger scale “unconventional” gas prospects are being investigated.
- Darwin is an offshore supply base and so NORM residue disposal has been an issue at times.
- Some offshore disposal in old, dry wells.
- Two onshore LNG plants.
Summary

- NT has a long history and relationship with NORM, mostly uranium mining
- Other active NORM projects include mineral sands, oil and gas
- Prospects for REE and phosphates
- Few RP issues at mines and in processing at Uranium sites
- Proposed downstream processing plans will require careful scrutiny to ensure NORM residues are managed appropriately
- Expansion of mining for battery metals may introduce new NORM concerns over time, especially with downstream processing
- Residue management and disposal is the primary concern
Thank you