

# Innovation in drilling and borehole geophysics with application to under cover exploration

## Andrew Bailey, CEO

# MinEx CRC in summary

- Industry led research focussed on more productive, safer and environmentally friendly exploration methods for under cover exploration
- Including new technologies for drilling and data collection using geophysical, seismic, downhole analytical and 3-d modelling improvements

45 participants over 10 years contributing:

- \$42M industry and \$50M Federal cash
- \$50M non-staff in-kind
- \$78M staff-in-kind
- ~100 researchers, 38 Post-grads

Industry led, with no lead university

- More efficient exploration knowledge, drilling technologies and data usage
- Safety and environmental factors
- Data to inform decisions
- 4 years of successful projects to date

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Majors, METS and Survey Participants



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DRILLING  
*Setting the Standard*



Geological Survey of  
Western Australia



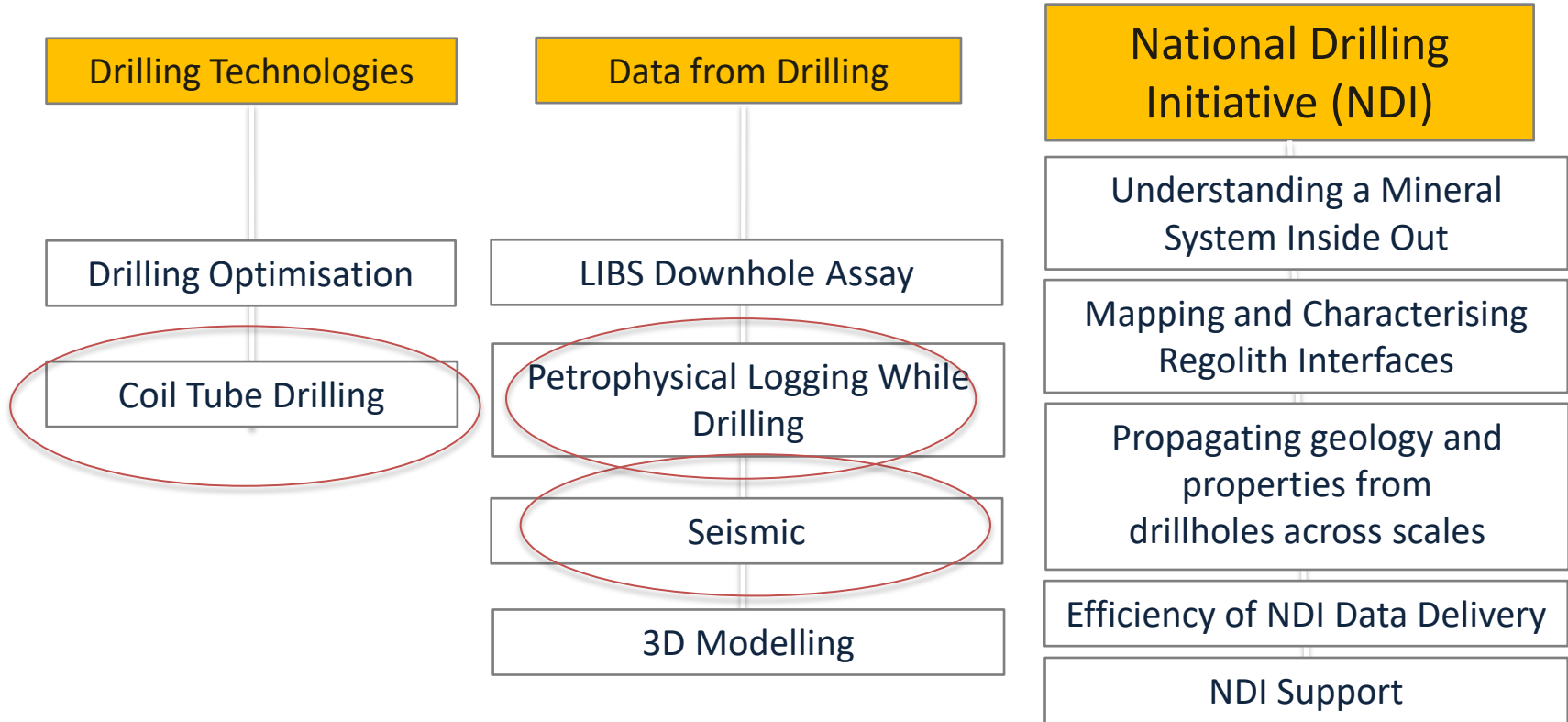
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## Research Participants and Affiliates



# MinEx Projects



# Coil Tube Drilling

MinEx has developed a Coil Tube Rig with the ability to drill multiple holes with safety, cost, and environmental benefits

Four key outcomes:

- Sample integrity equivalent to Diamond Drilling
- Downhole positioning & Sensing
- Downhole Steering
- 1000m depth capability

The system comprises drill rig and Hydraulic Processing System (HPS)



# 500m Capacity Coil Tube Rig





1000m CT rig  
and coil cross  
section





# Hydraulic Processing System

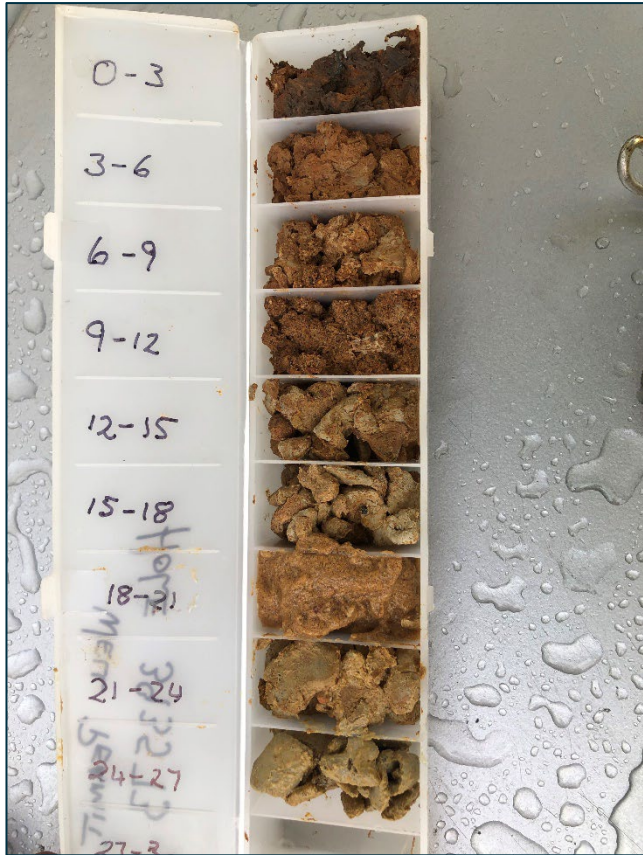


# South Australia NDI

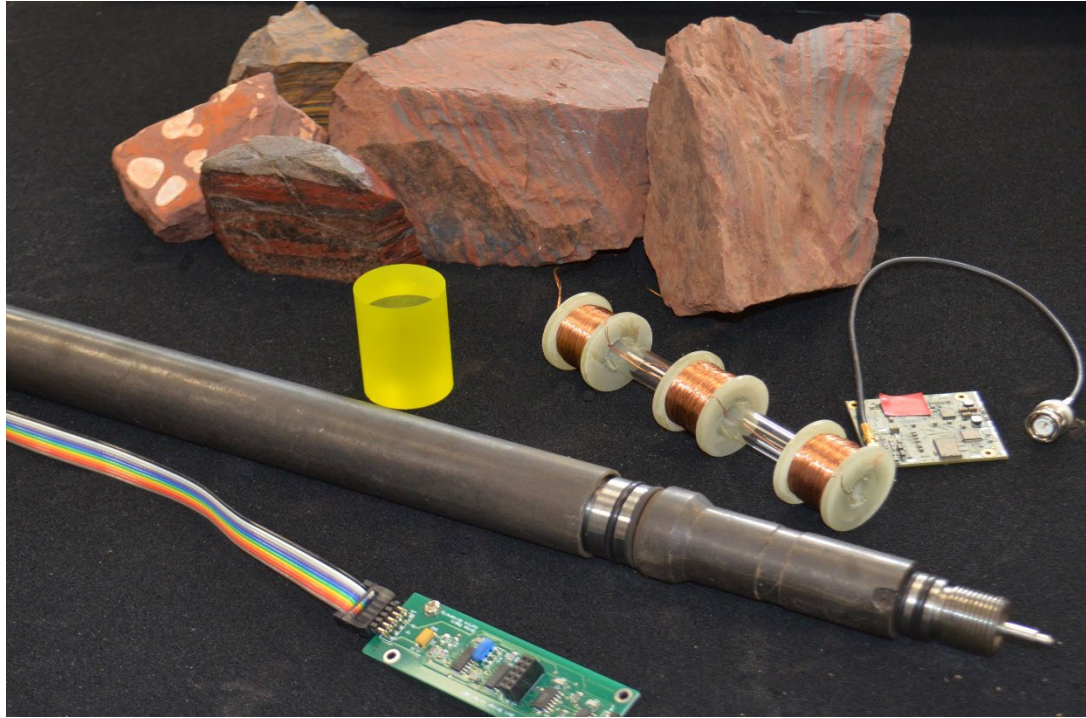


August 2021

# CT chips and core

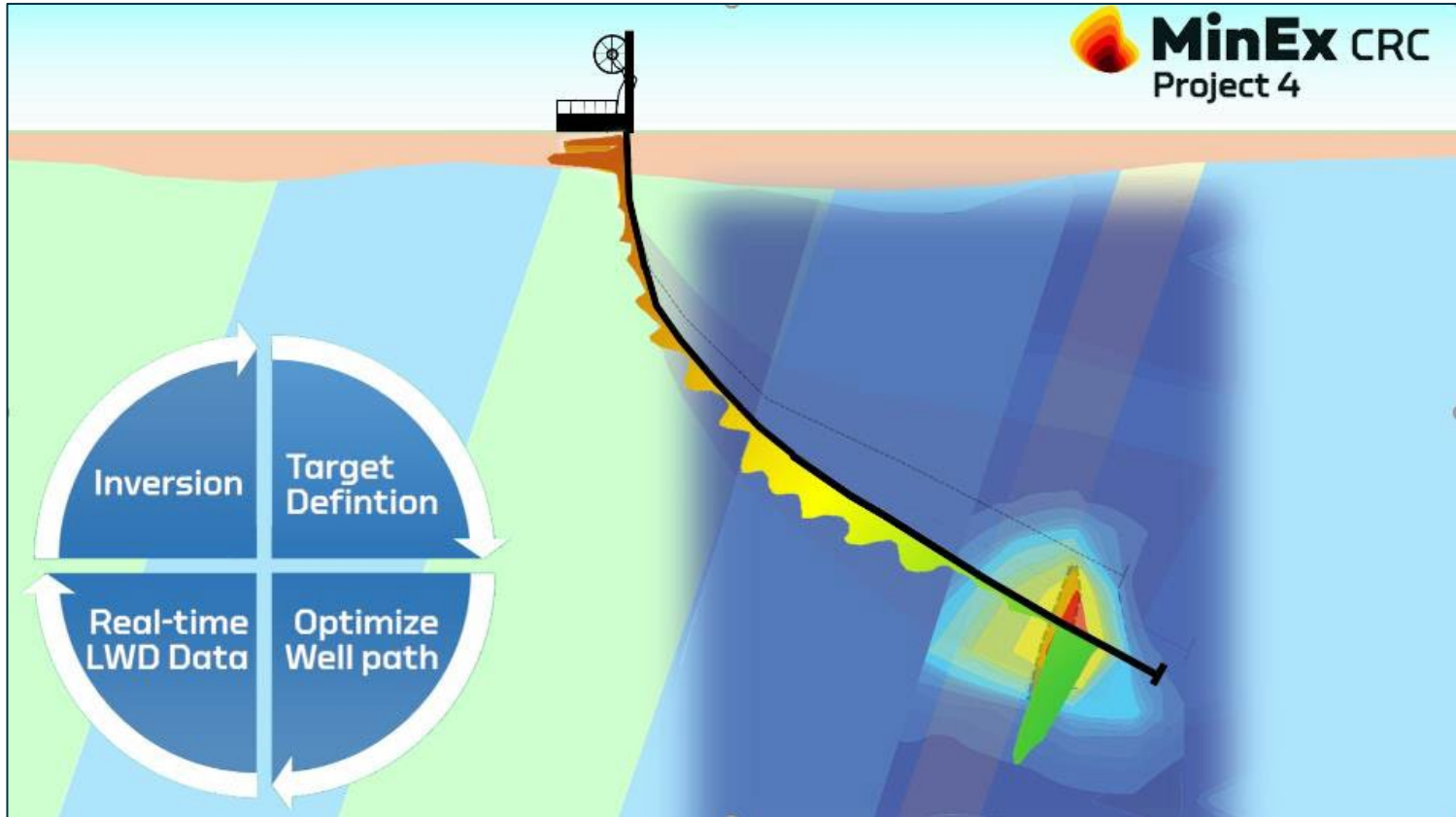


# Geophysics During Drilling



- Real time subsurface sensing and imaging for steering during Coil Tube drilling
- Natural gamma and EM sensors, and more
- Ideally suited to CT drilling because power and comms are available down the hole.

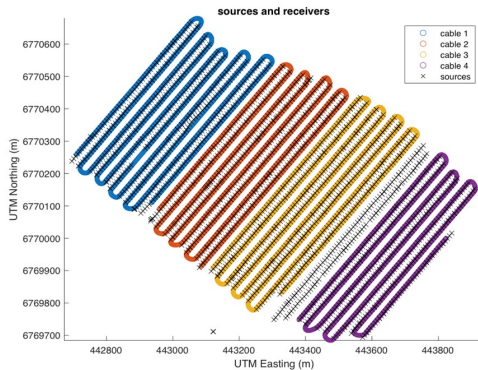
# Petrophysics for Mineral Discovery during Drilling



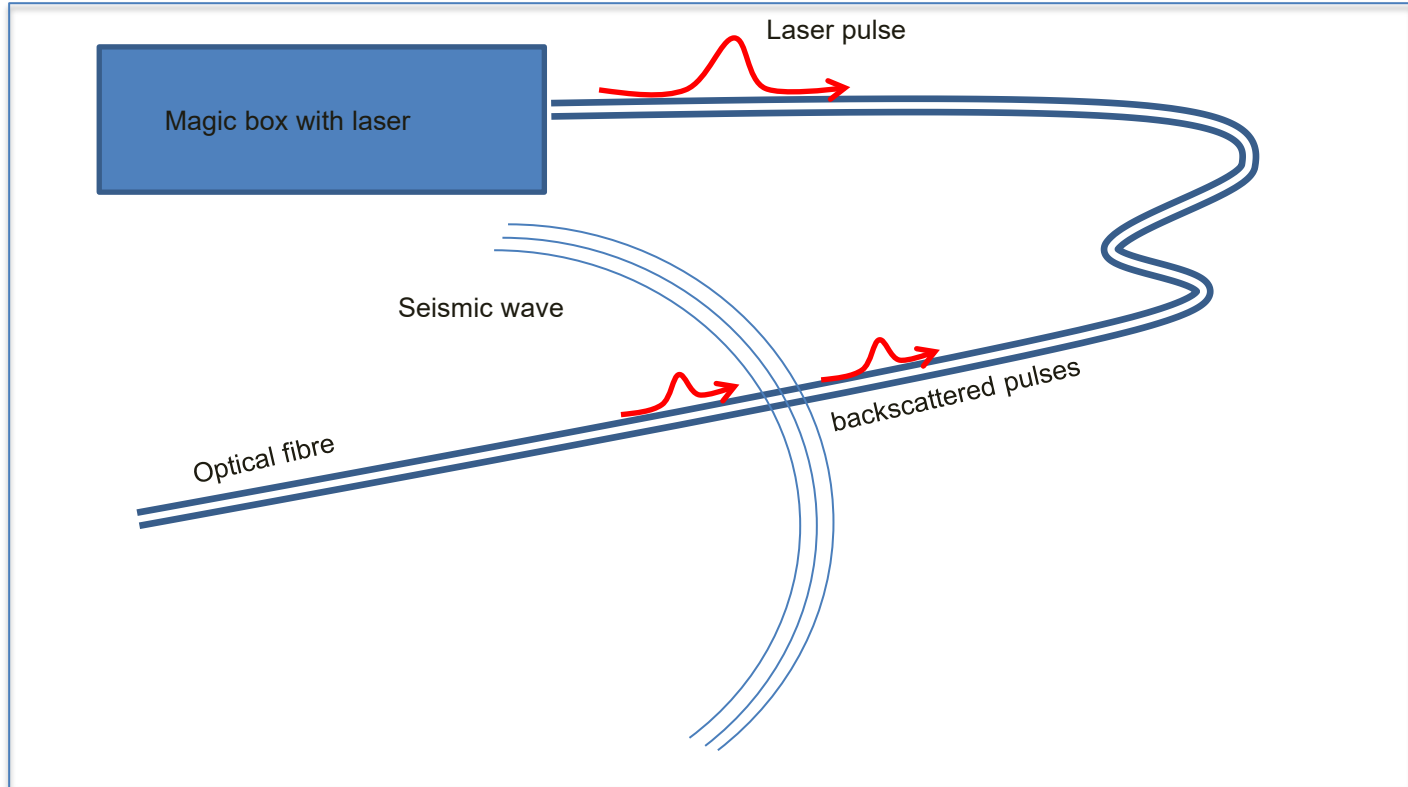
# Seismic in the Drilling Workflow



- Reduced borehole seismic survey costs and reduced drilling
- Seismic sensors on surface and in boreholes to continuously update a subsurface geological model
- Borehole sensor comparison and 3D virtual mine framework completed, with fibre-optic tests successful in various environments



# Modelling of DAS response

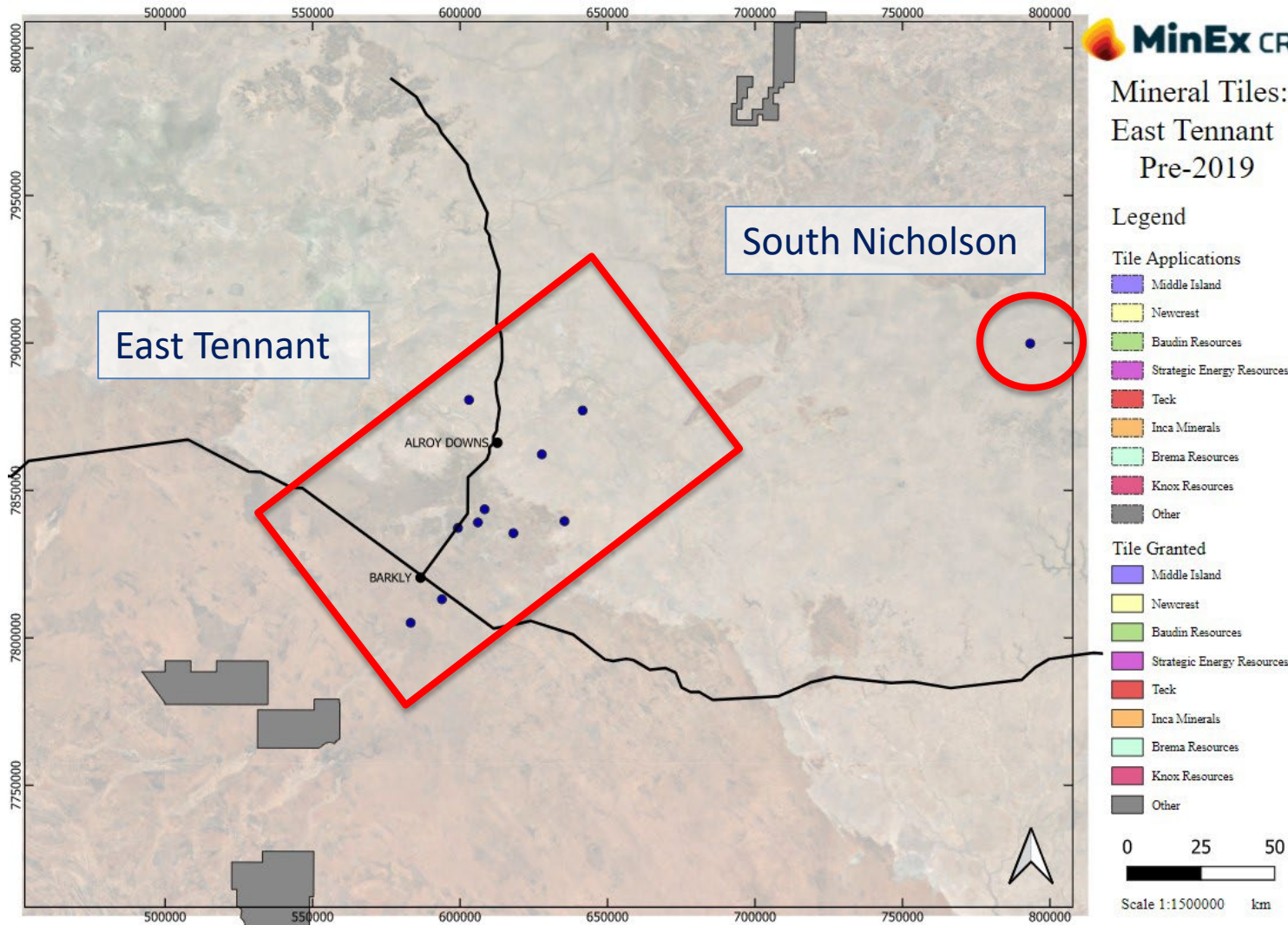


Ongoing innovation  
across seven major  
projects leading to  
improved undercover  
exploration

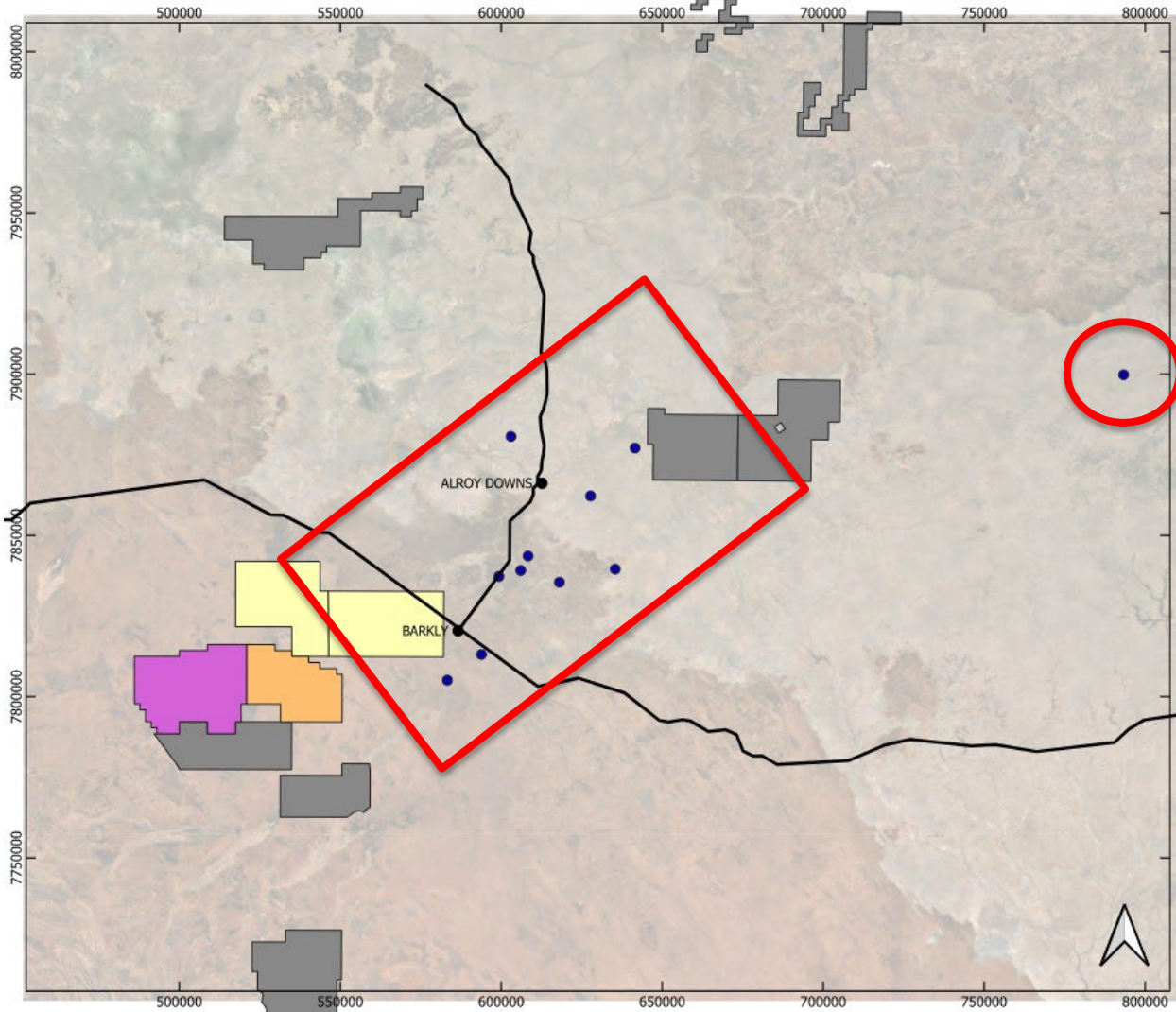




# Mineral Tiles: East Tennant Pre-2019



# Mineral Tiles: East Tennant 2019



## Legend

### Tile Applications

- Middle Island
- Newcrest
- Baudin Resources
- Strategic Energy Resources
- Teck
- Inca Minerals
- Brema Resources
- Knox Resources
- Other

### Tile Granted

- Middle Island
- Newcrest
- Baudin Resources
- Strategic Energy Resources
- Teck
- Inca Minerals
- Brema Resources
- Knox Resources
- Other

0 25 50



Scale 1:1500000 km

# Mineral Tiles: East Tennant 2020

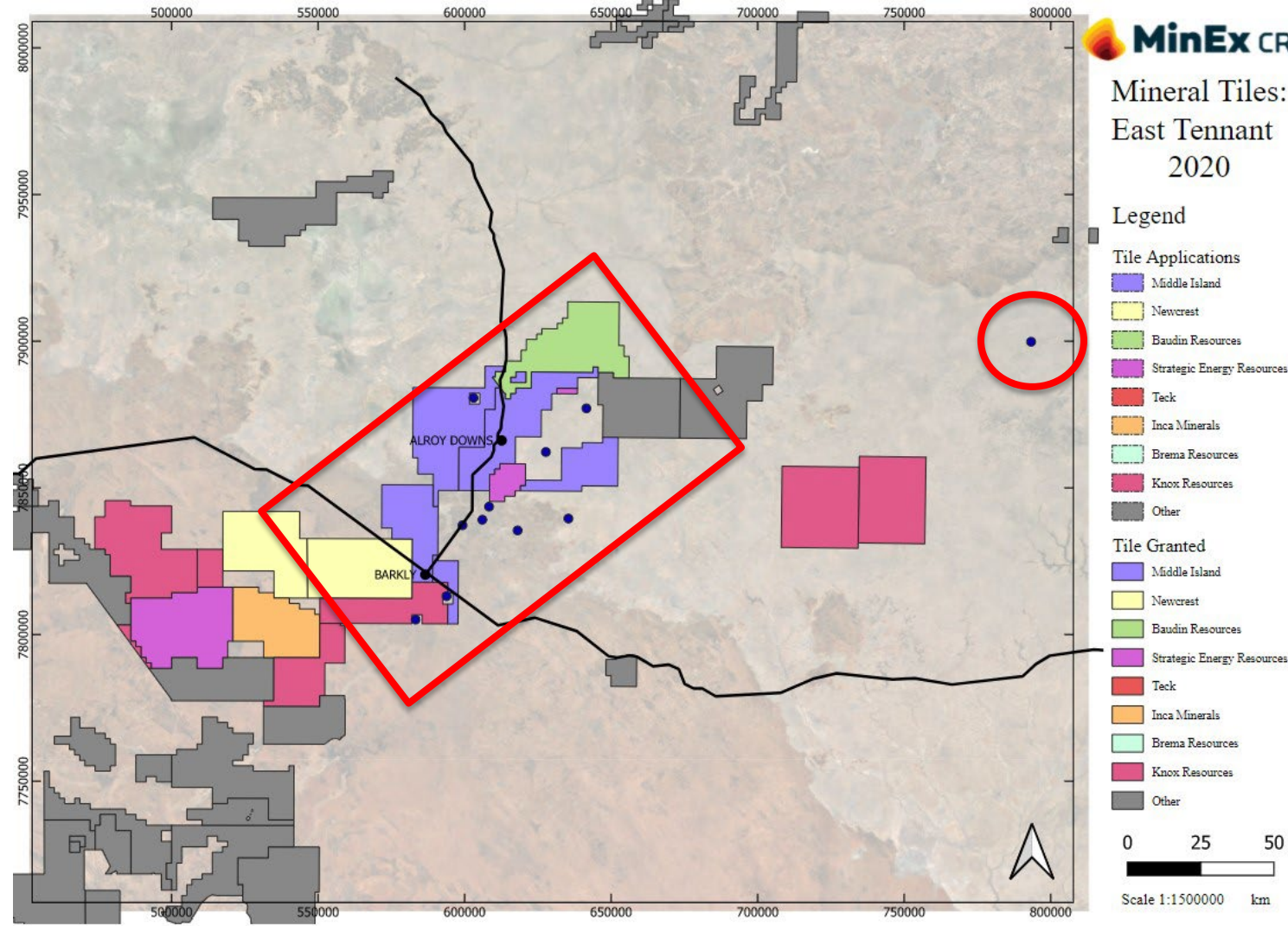
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# Mineral Tiles: East Tennant 2021

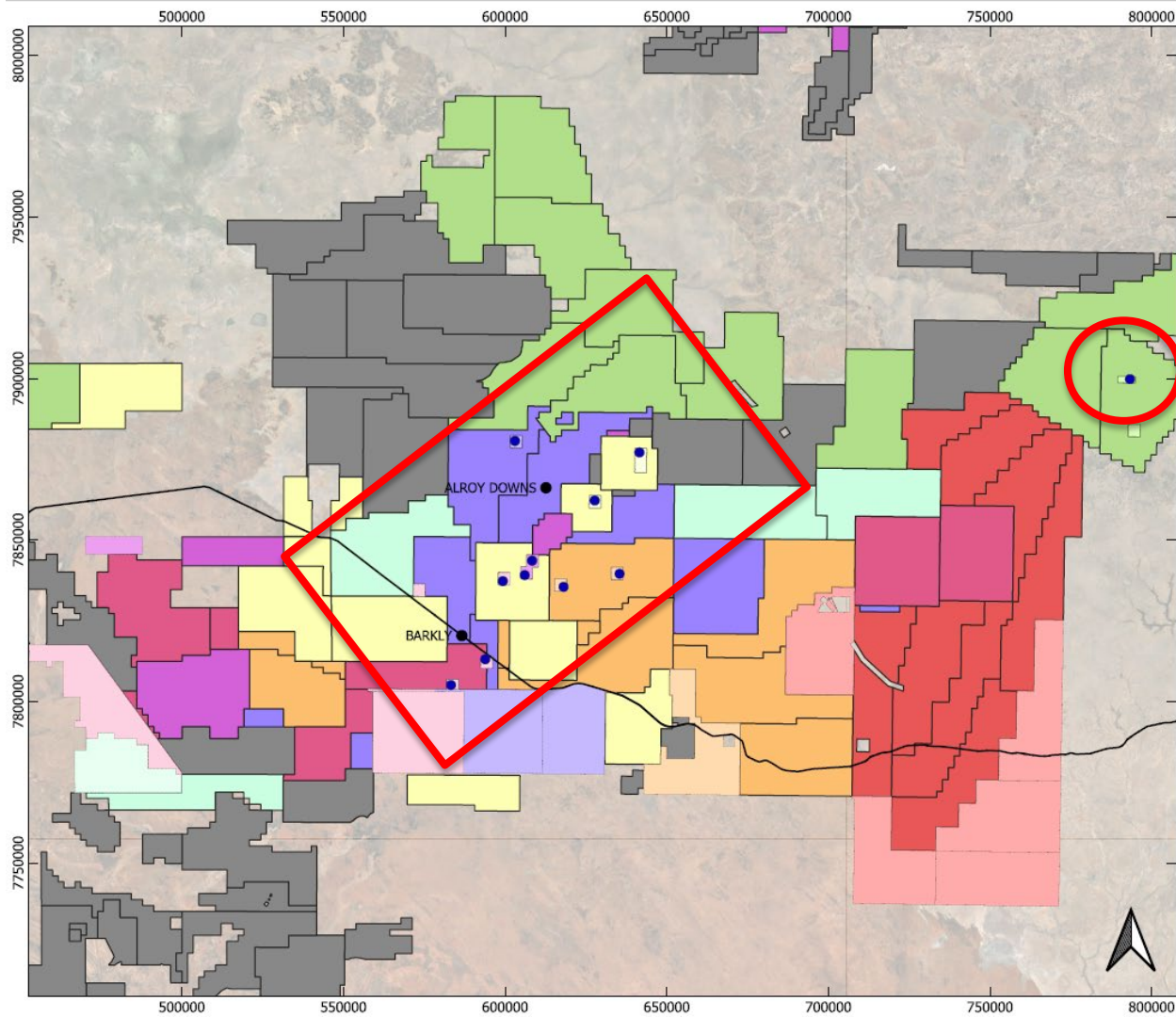
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0 25 50

Scale 1:1500000 km



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