

# MinEx CRC and the National Drilling Initiative



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**MinEx CRC**  
**John Ralston Chair of Mineral and**  
**Resources Engineering, UniSA**

# OUR SPONSORS

## Majors, METS and Survey Participants



**BHP**



**Rio Tinto**



**MiKAY DRILLING**  
*Setting the Standard*



Geological Survey of  
Western Australia



Government  
of South Australia  
Department for  
Energy and Mining



Australian Government  
Geoscience Australia

# OUR SPONSORS

## Research Participants and Affiliates



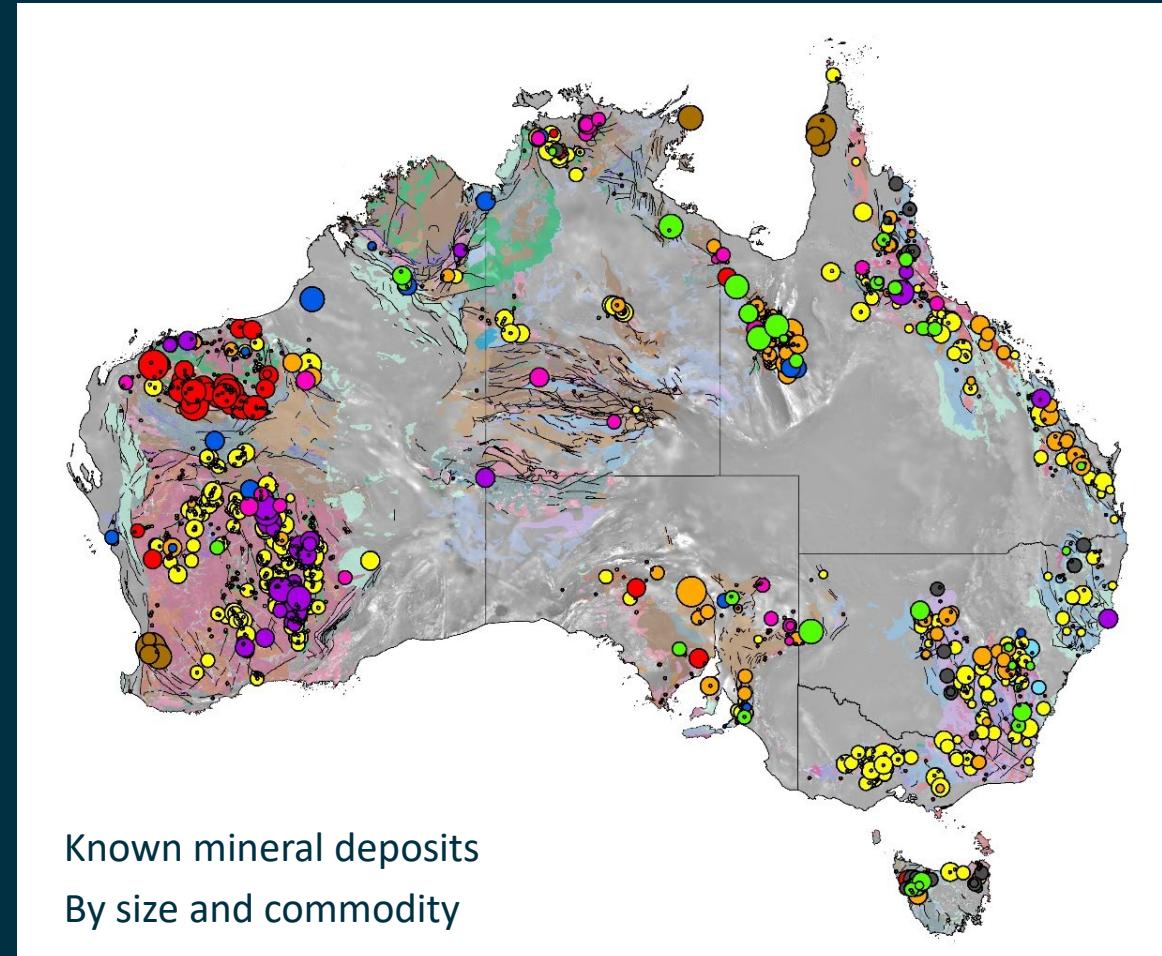
INCA MINERALS LTD





MinEx CRC

# Why aren't we finding deposits under cover?





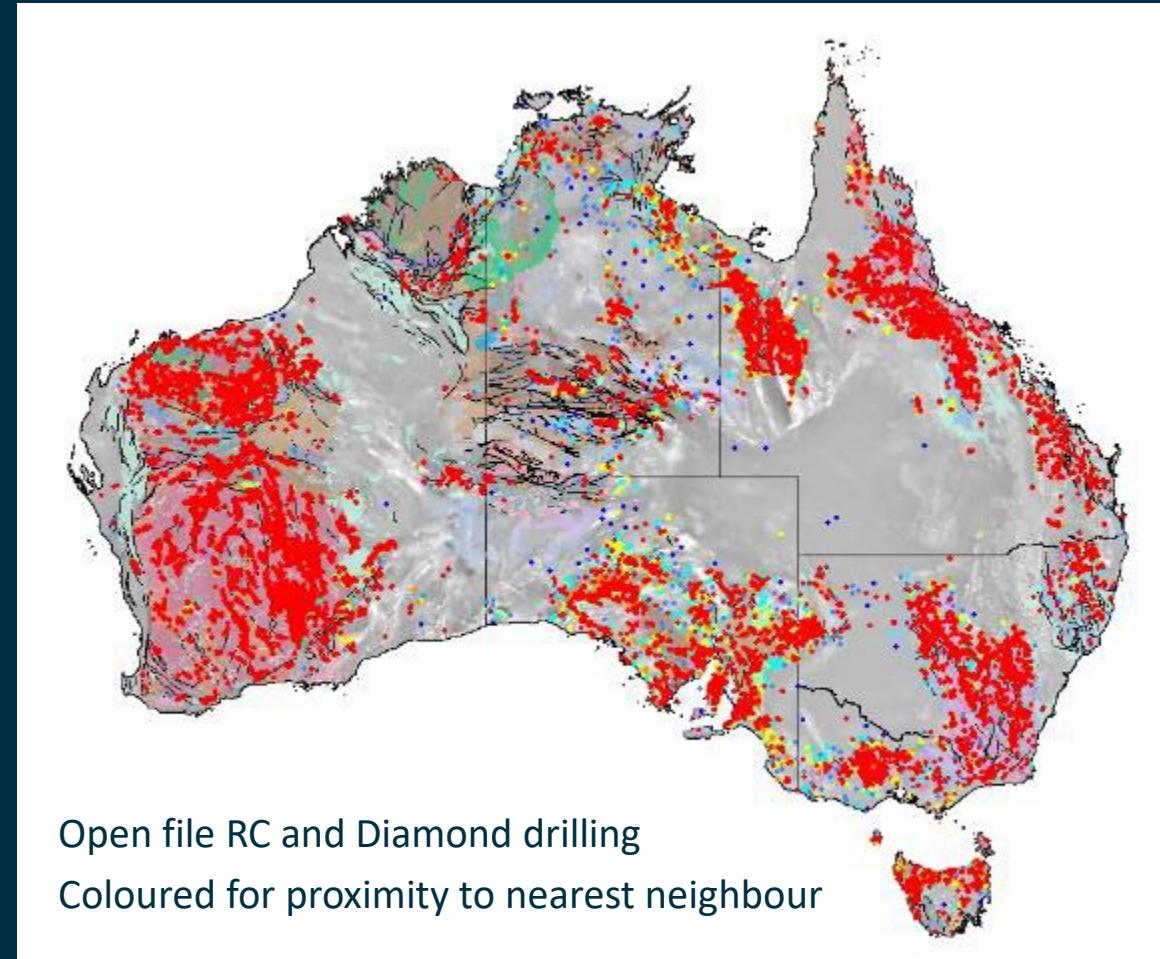
MinEx CRC

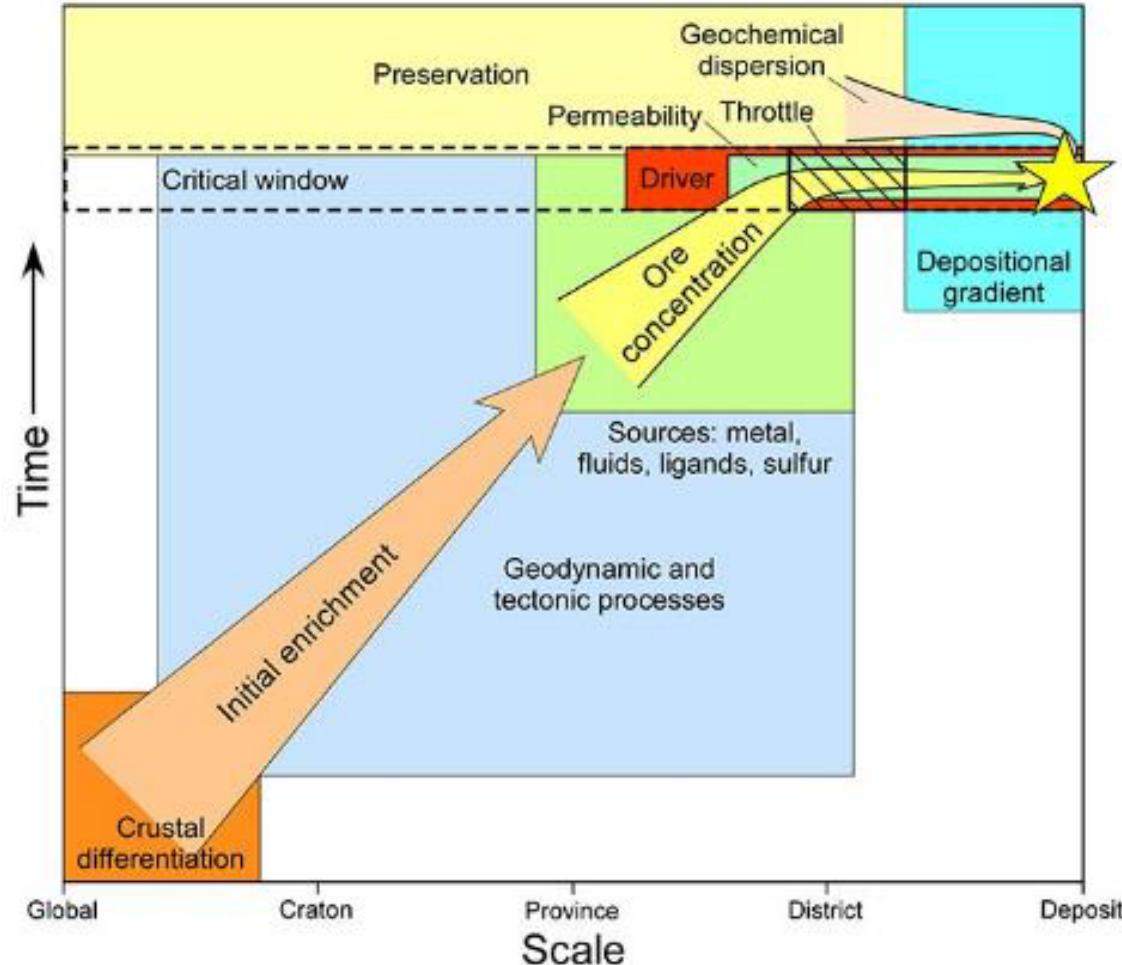
Because we  
haven't looked  
there

Sparse data = no  
prediction

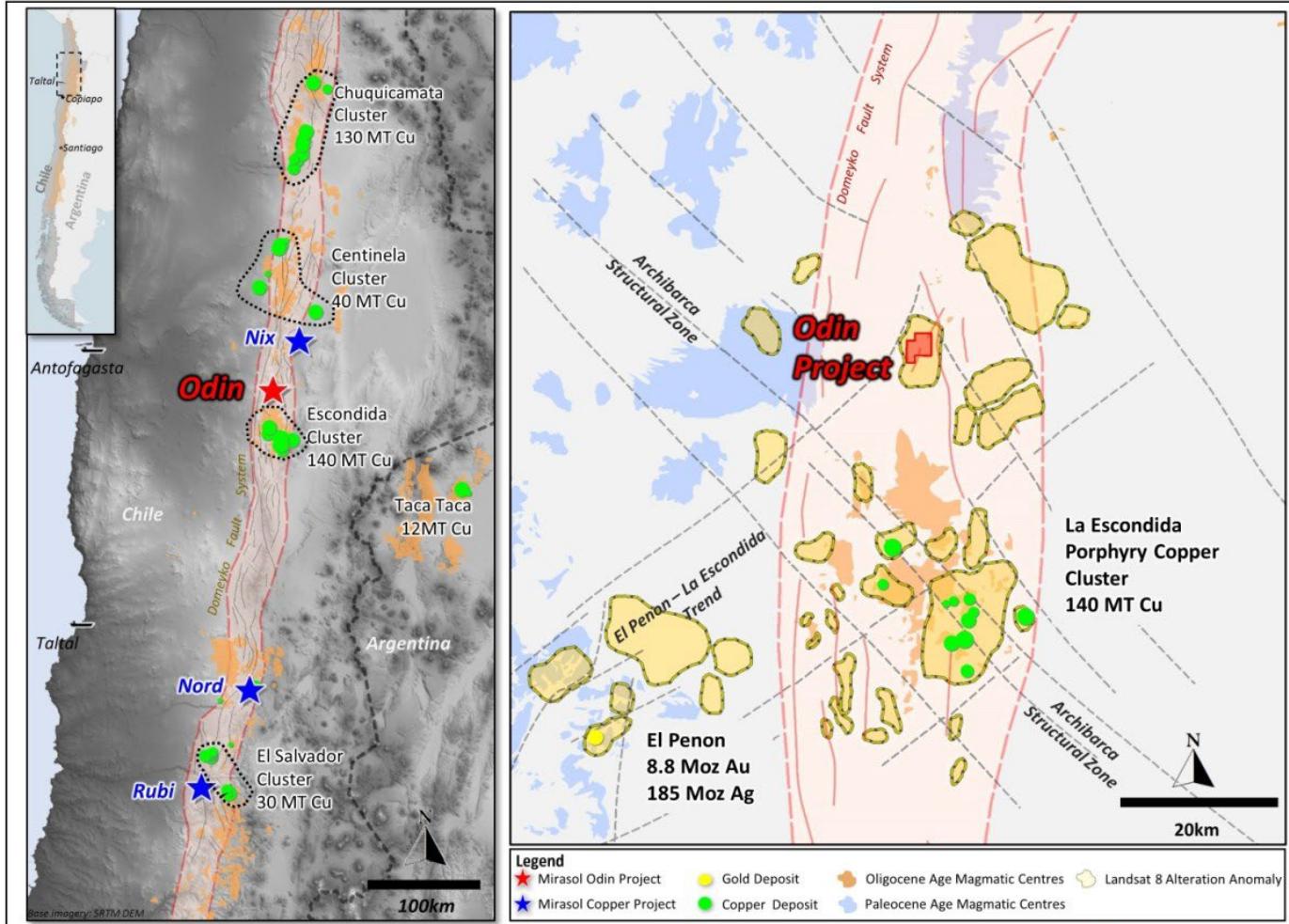
$n = 714,876$

$n(\text{WA}) = 559,456$





## Mineral Systems Paradigm

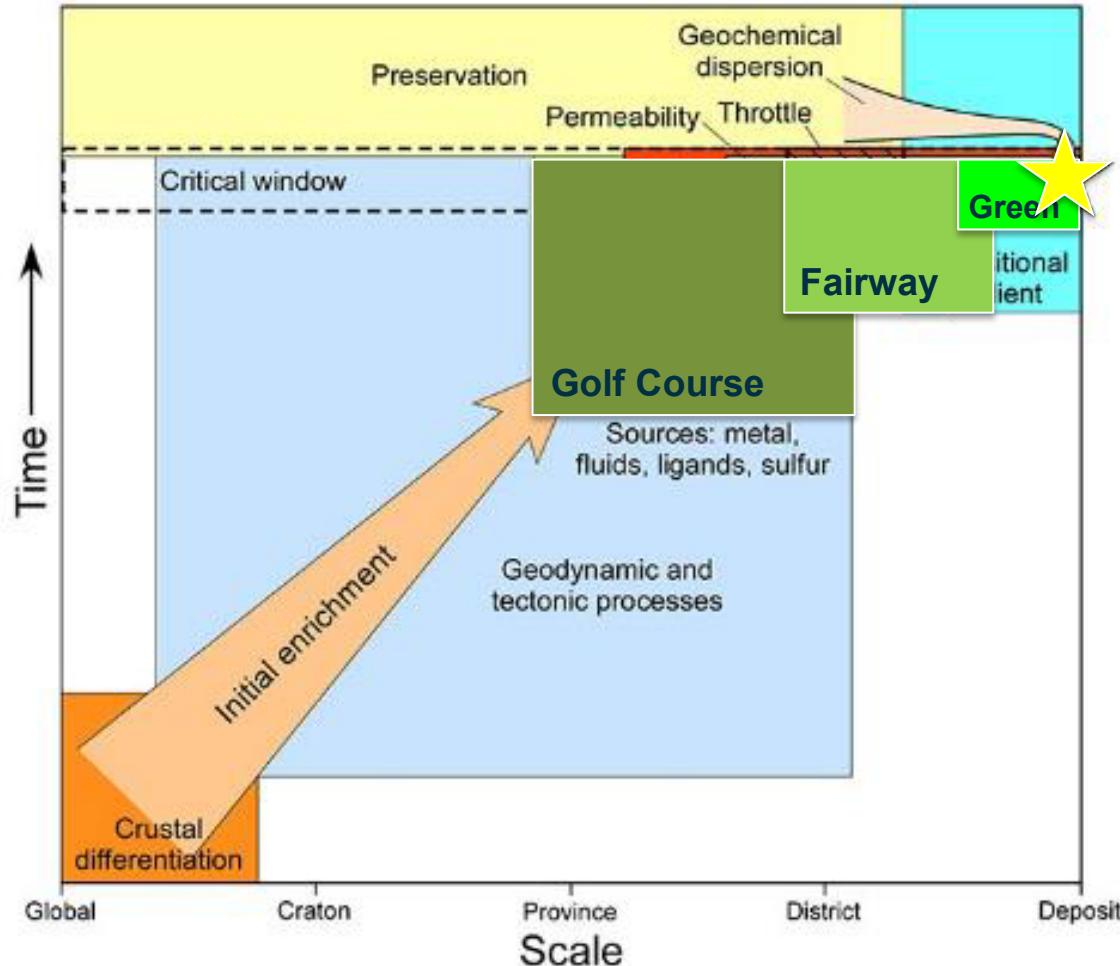


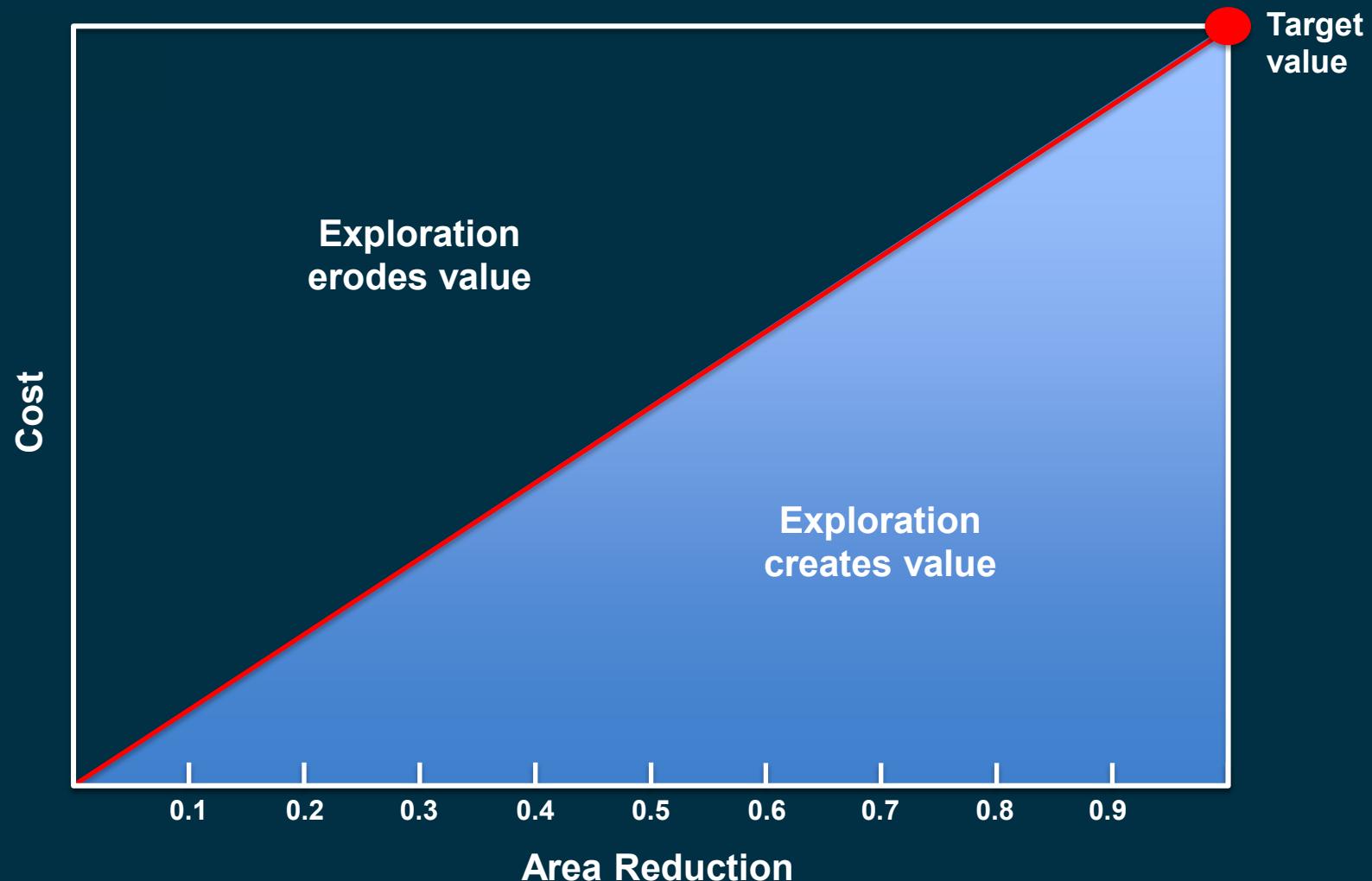
[https://mirasolresources.com/site/assets/files/3793/nr170302\\_fig1\\_prophyrycopperbelt-1.jpg](https://mirasolresources.com/site/assets/files/3793/nr170302_fig1_prophyrycopperbelt-1.jpg)

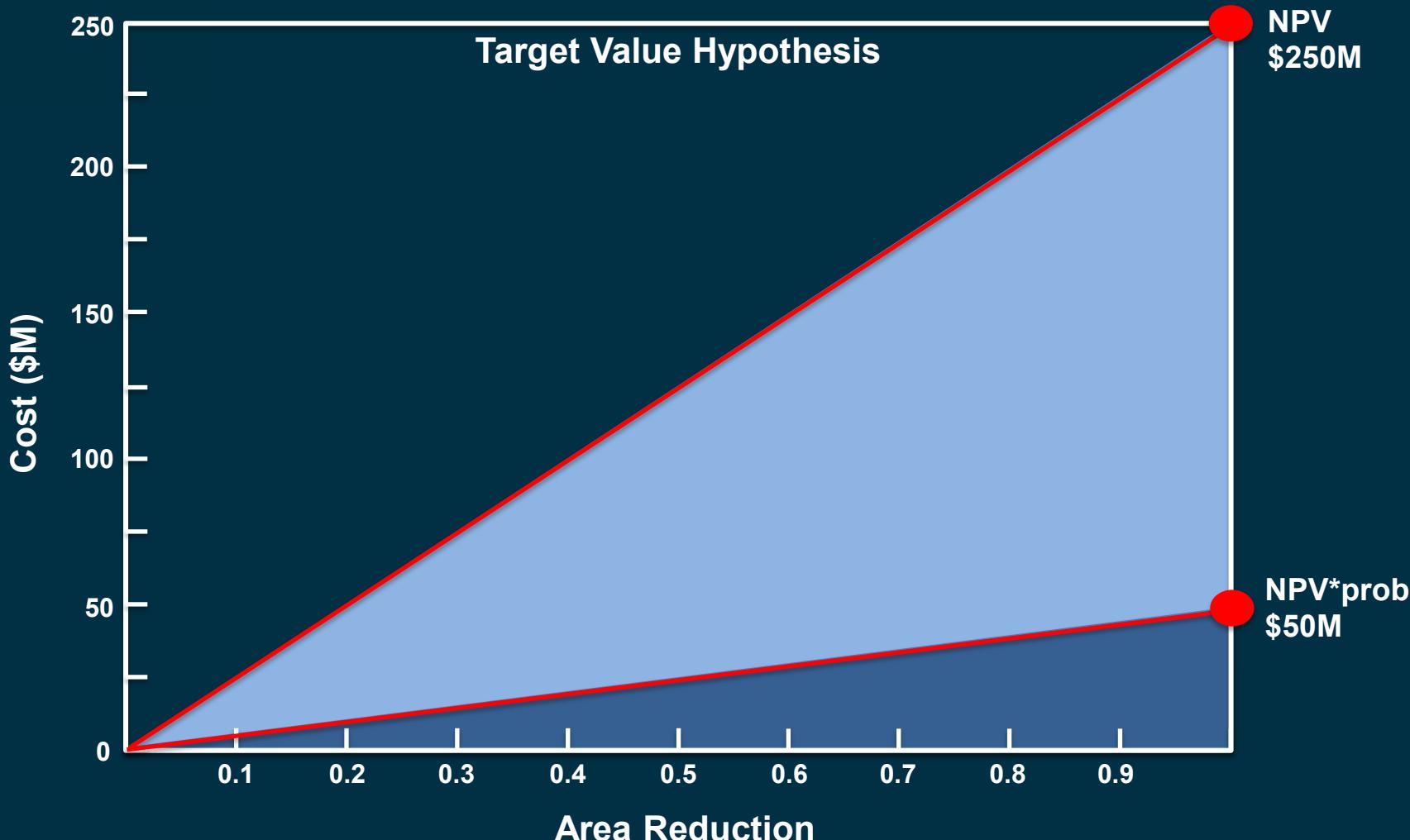
Figure 1: Northern Chile Oligocene Porphyry Copper Belt and the Geological Setting of the Odin Copper Project. March 2017.

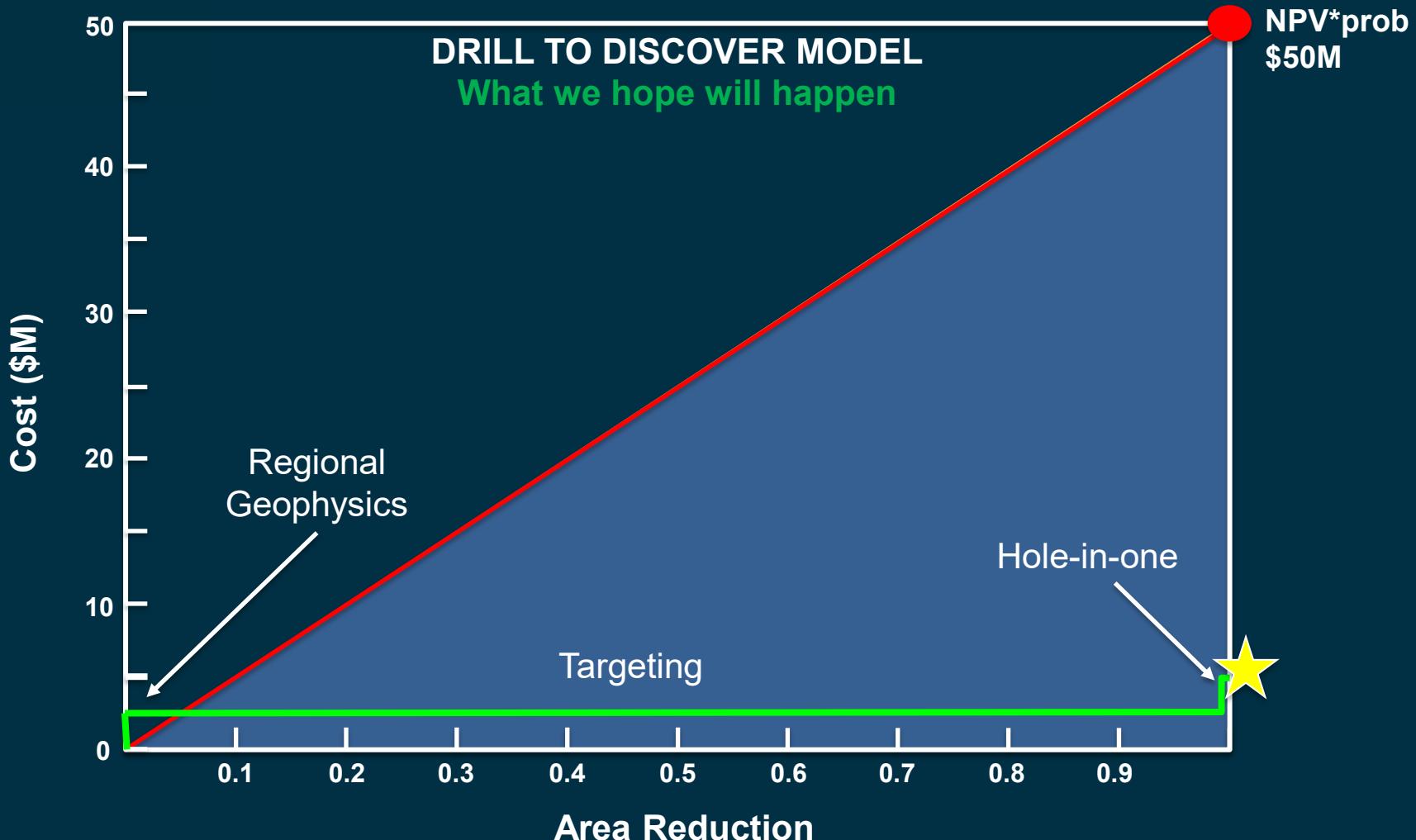


## Mineral Systems Paradigm





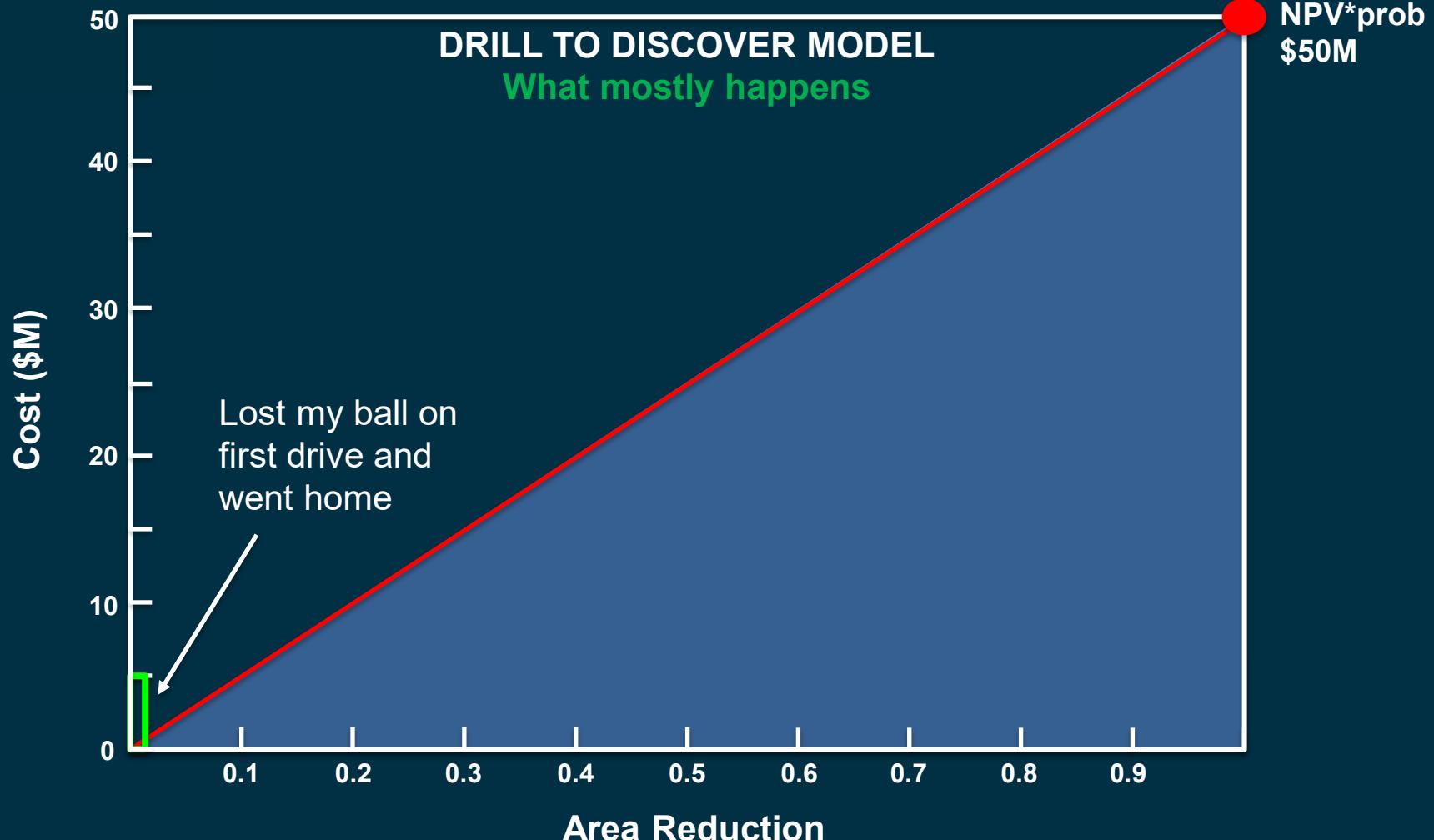


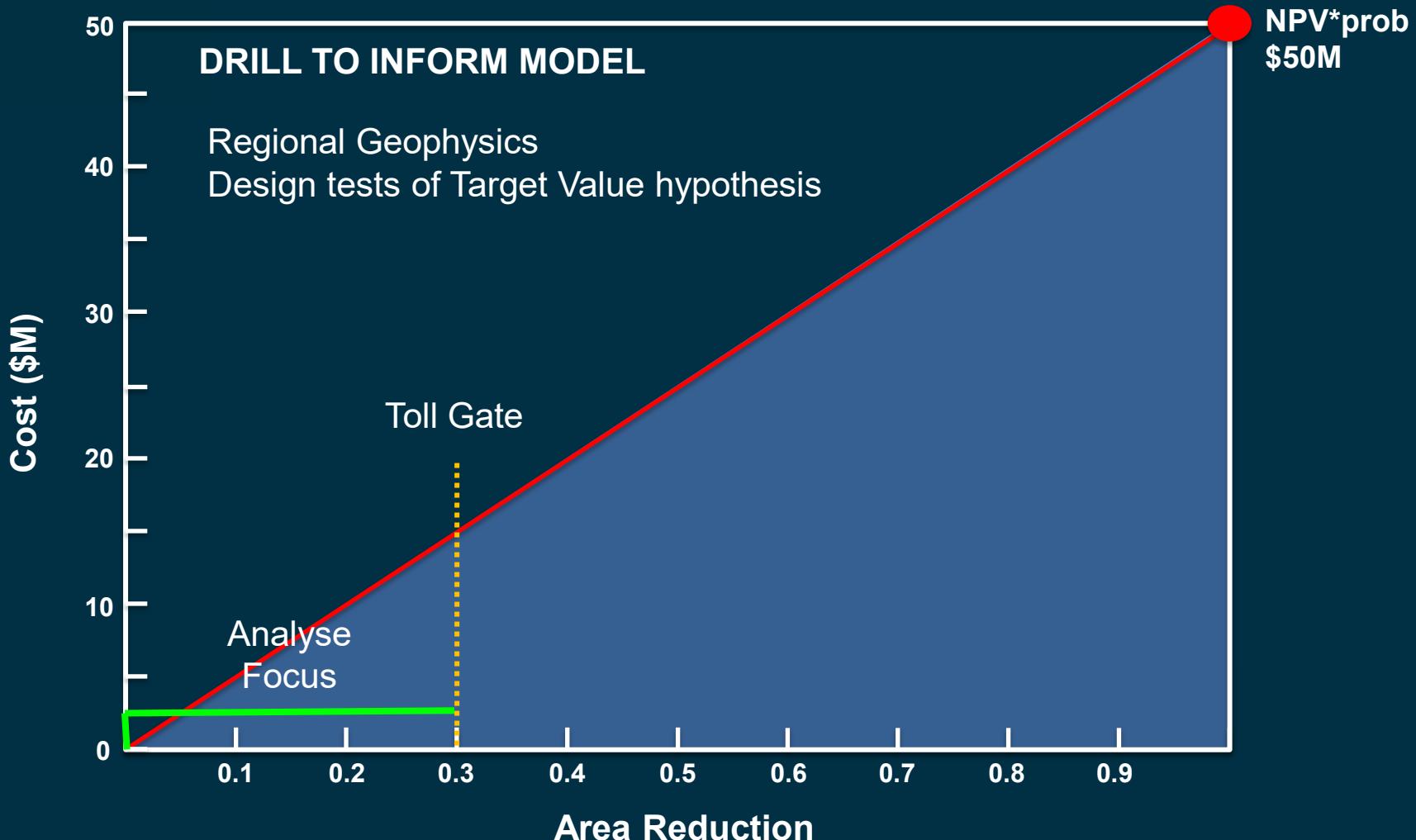


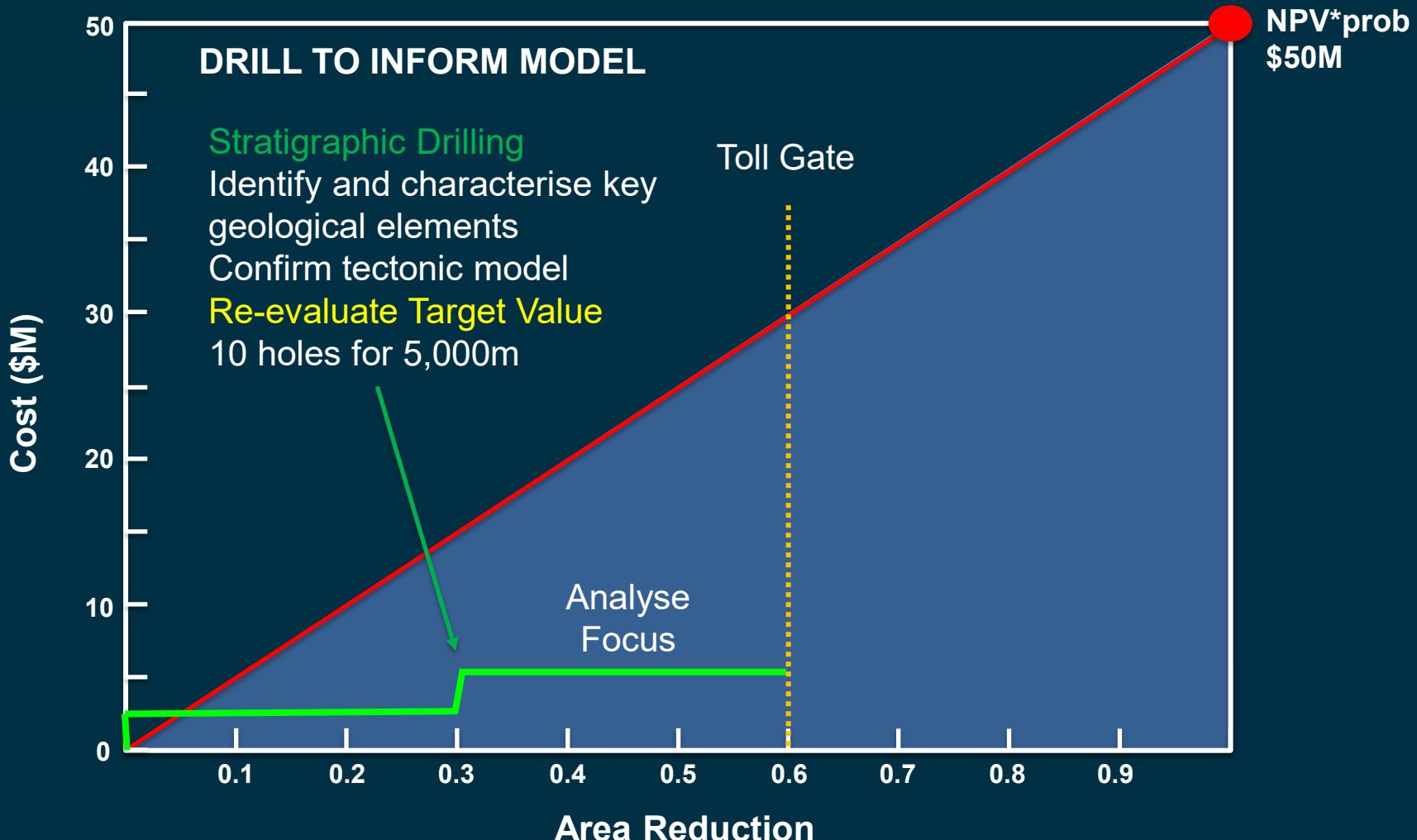
NPV\*prob  
\$50M

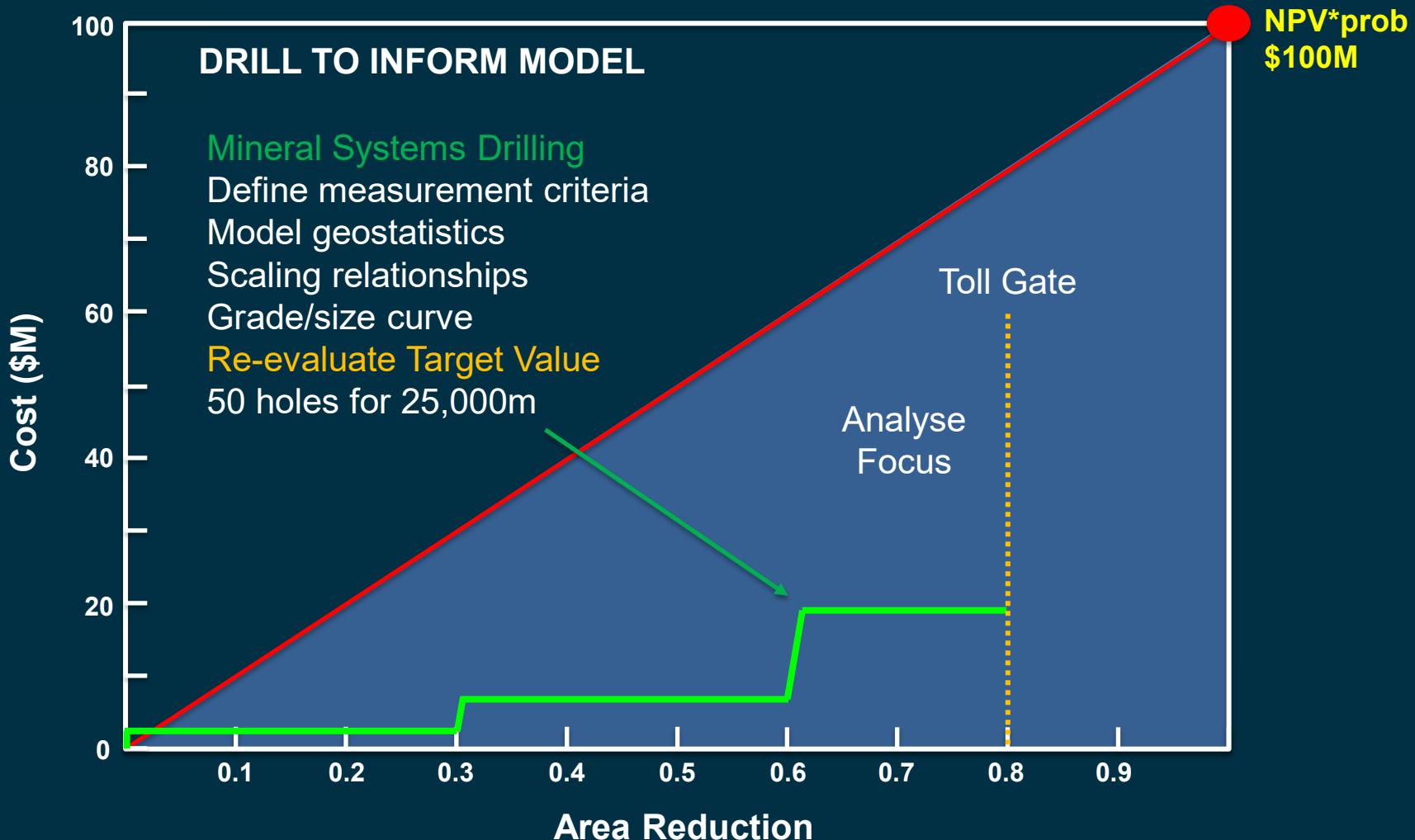
## DRILL TO DISCOVER MODEL

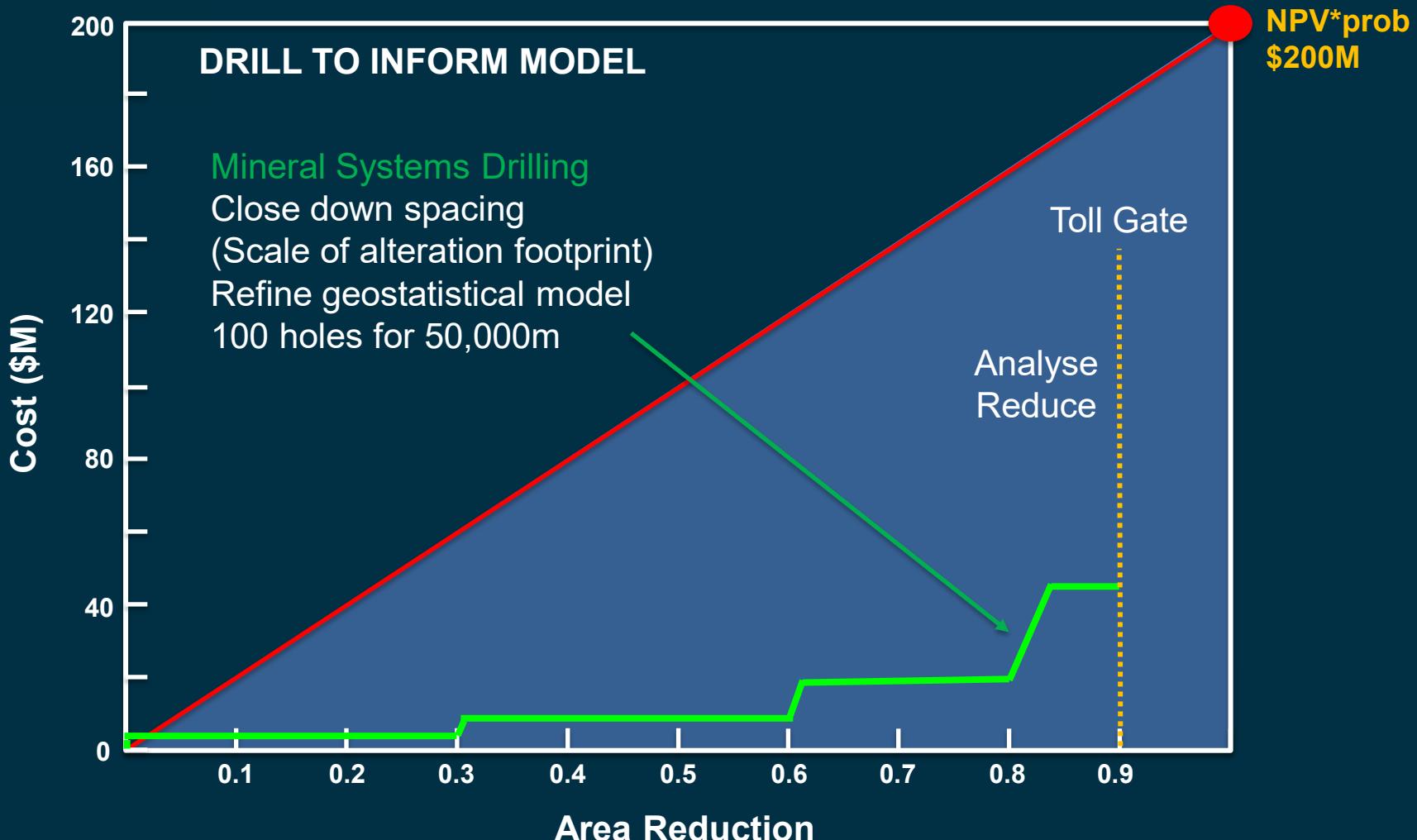
### What mostly happens

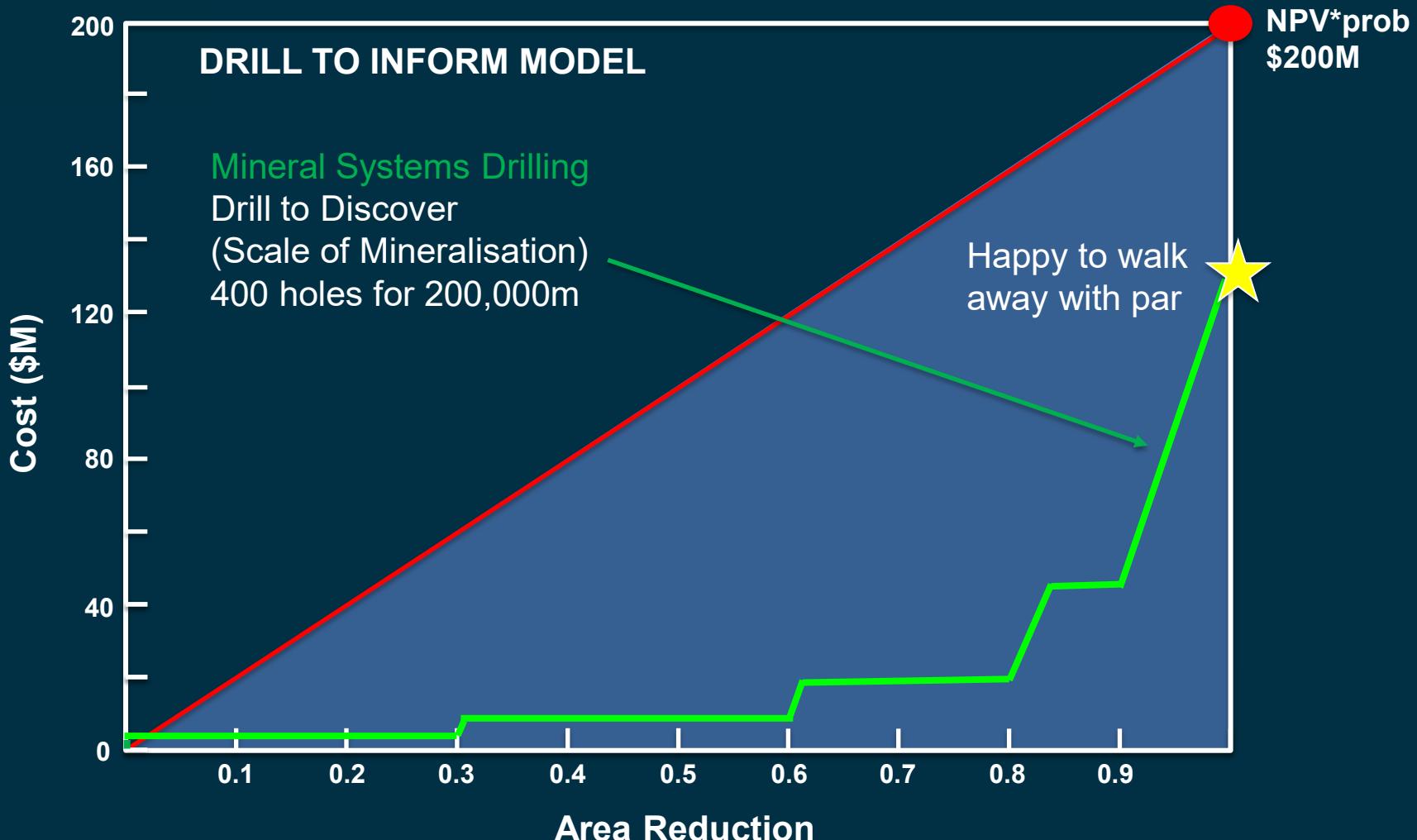


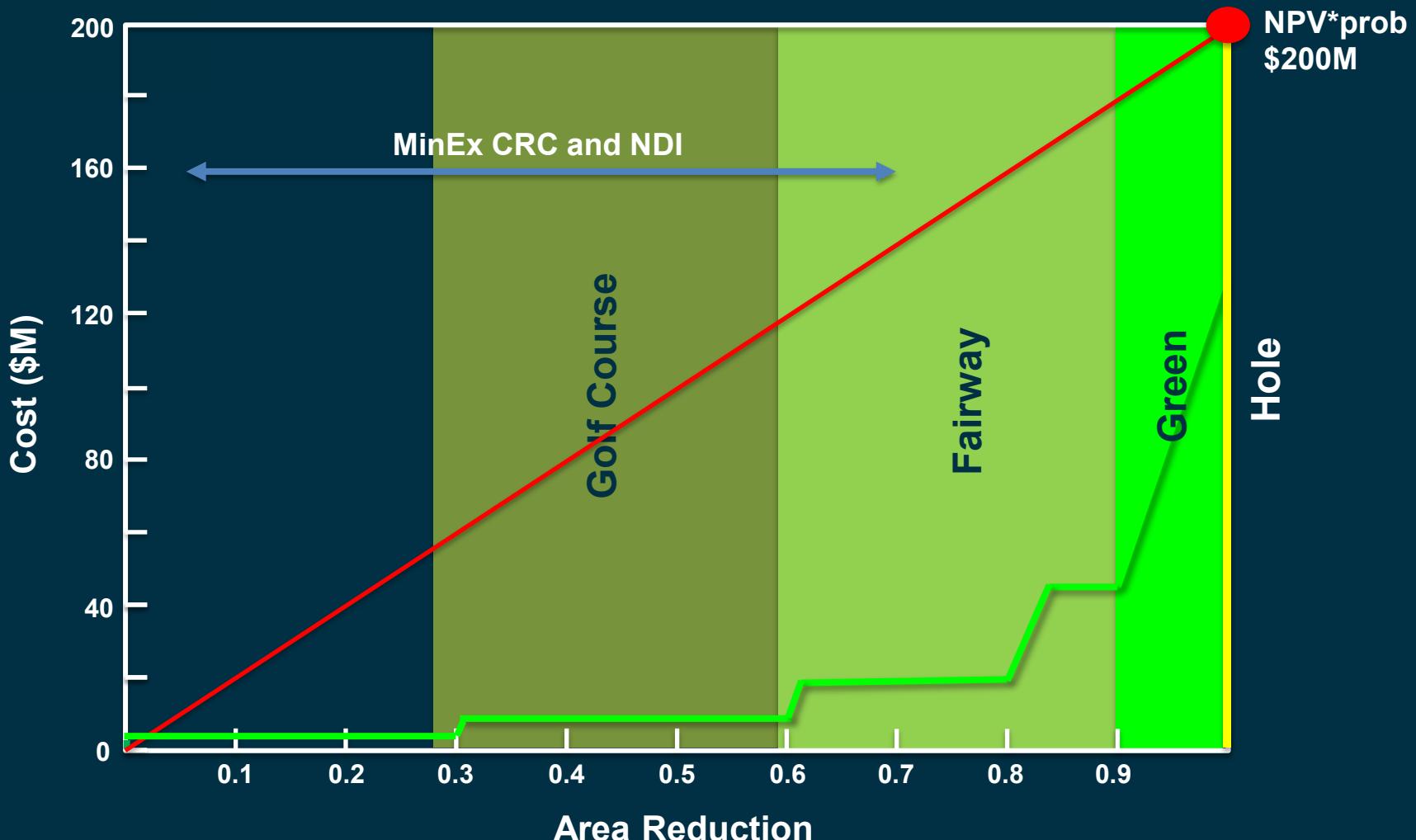


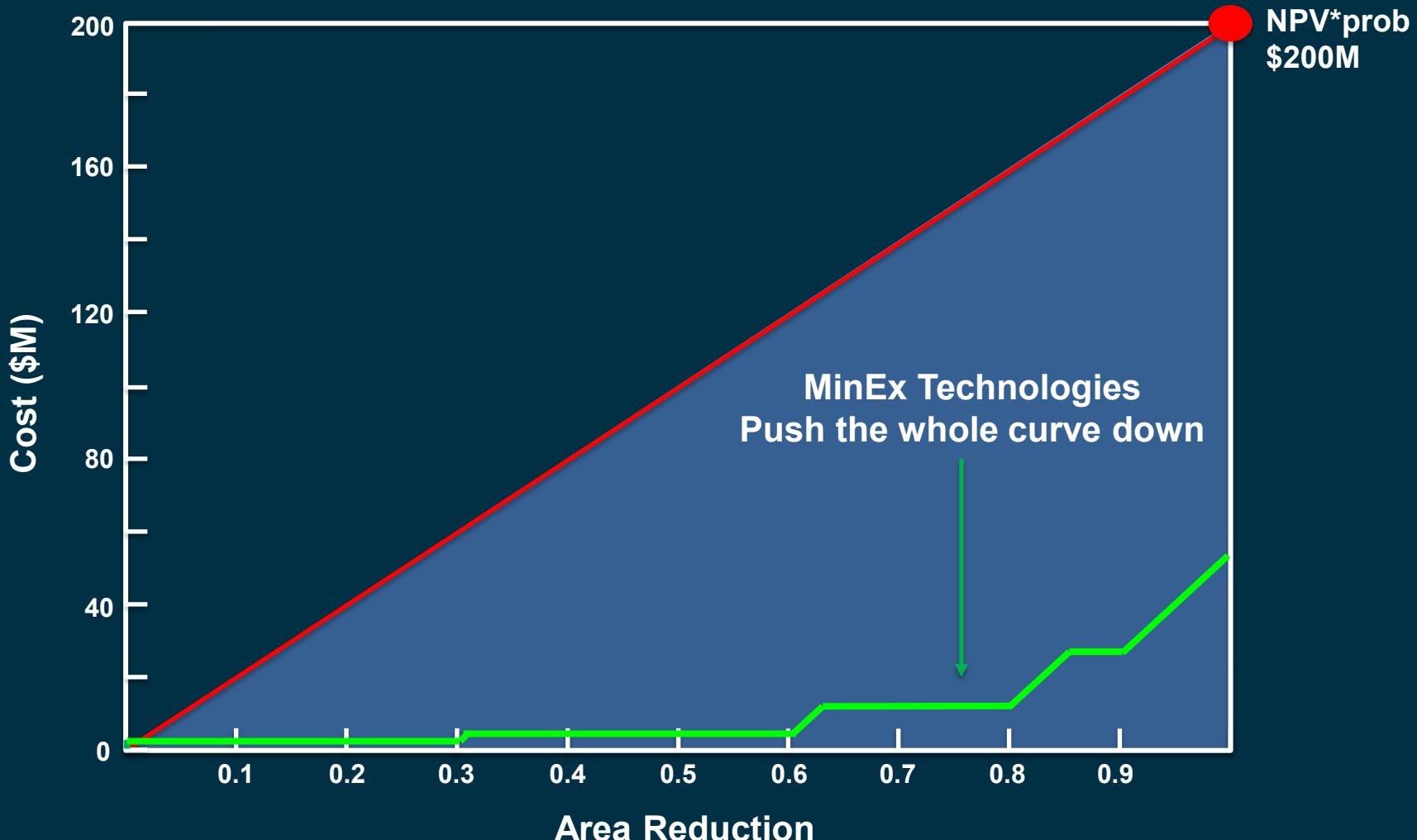




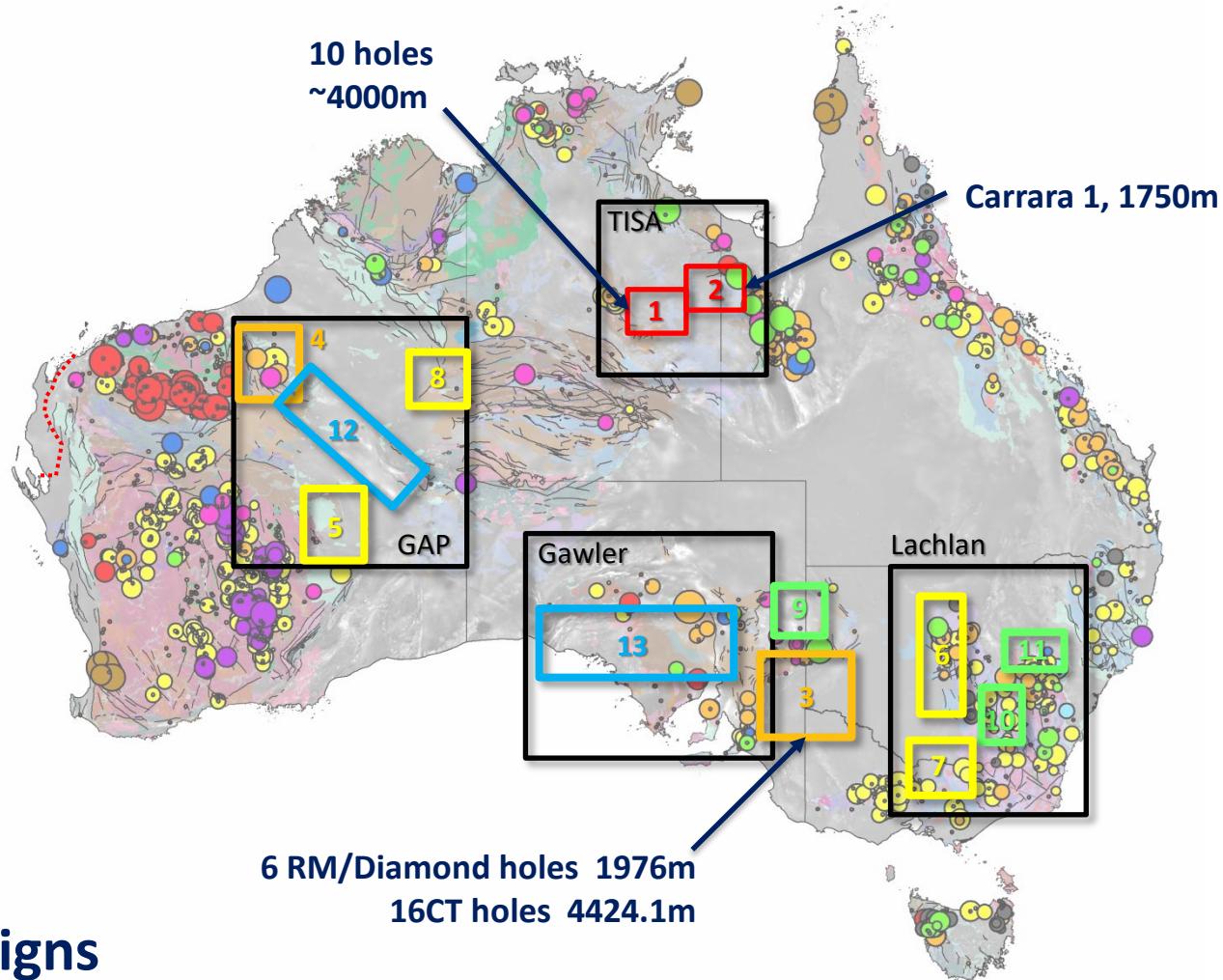








1. East Tennant	2020
2. South Nicholson	2020
3. Delamerian South	2021
Delamerian North	2022
Delamerian Margins	2023
4. Patterson	2022
5. Far East Yilgarn	2023
6. South Cobar	2023
North Cobar	2023
7. Tabberaberran	2024
8. West Arunta	2024
9. Mundi	2024
10. Forbes	2025
11. Dubbo	
12. The Ridge	??
13. Fowler-Flinders	??

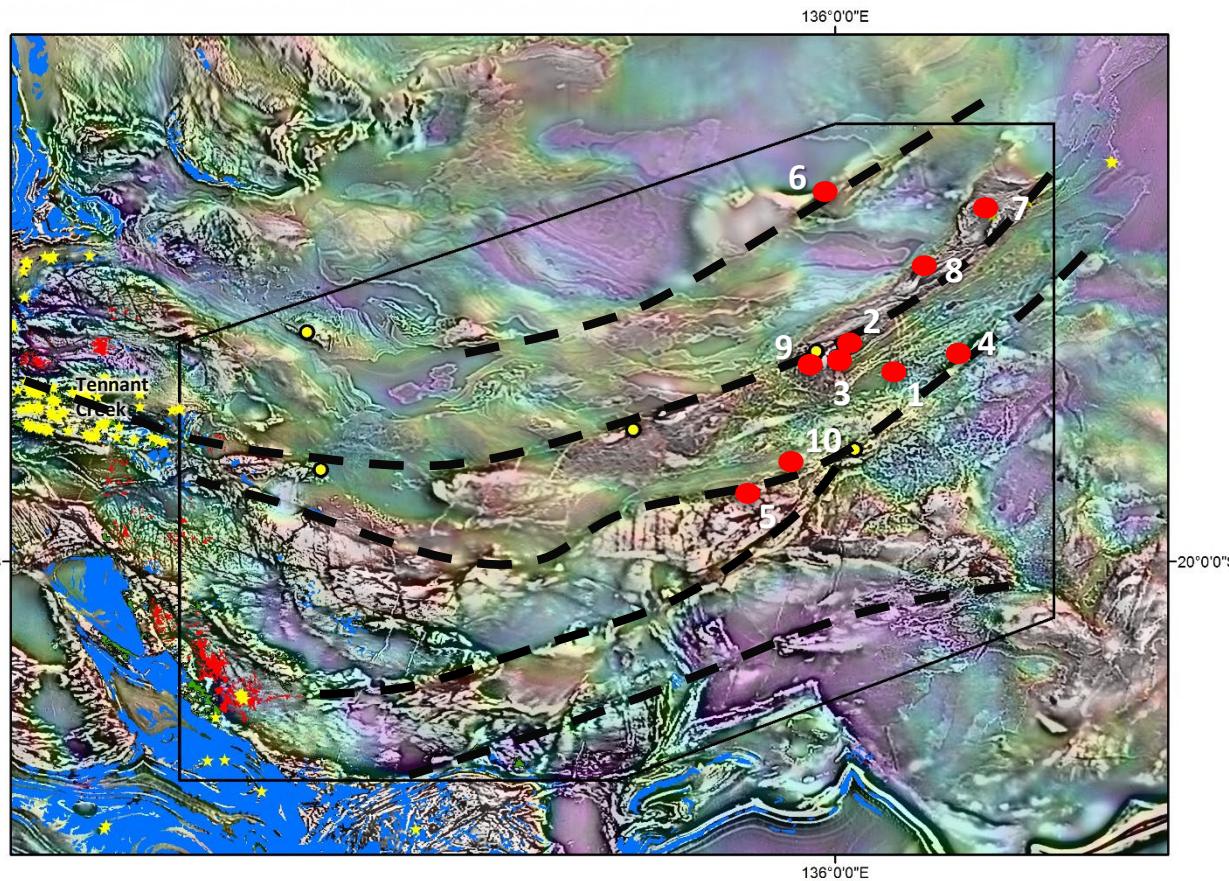


## NDI Drilling Campaigns

## East Tennant Rationale

Does prospective  
Paleoproterozoic geology  
(Tennant Creek, Mt Isa)  
continue under cover ?

- █ 1840-1790 Ma stratigraphy
- ★ Mineral Occurrence
- Tennant Cr Suite
- 'Warramunga' Fm (~1865-1855Ma)
- — Interpretated fault



From A.Clarke et al. (2019) 'East Tennant': New Insights, Gabfest

# East Tennant

# 10 holes for 3968.6m

**1344.8m RC  
2623.8m Diamond**

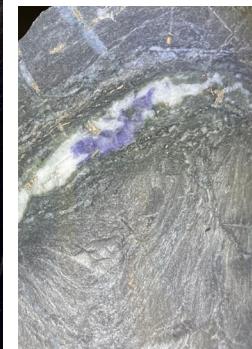




NDIBK03



NDIBK04

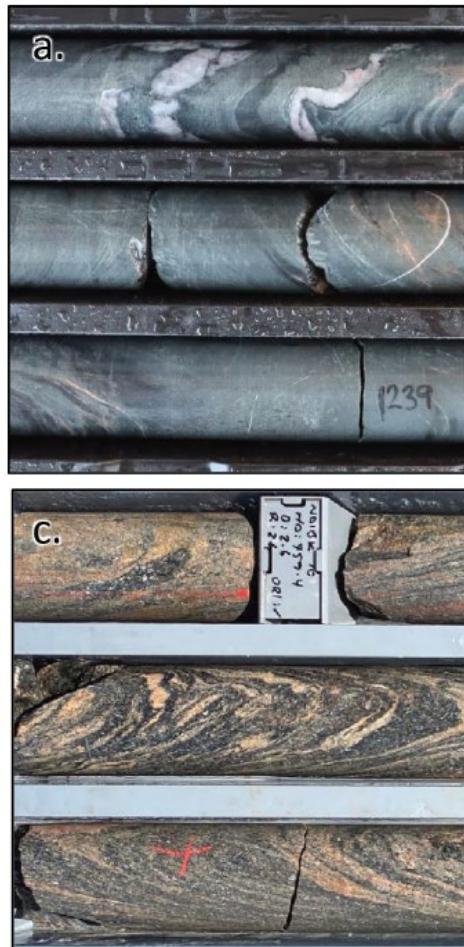


NDIBK07

### Warramunga Formation

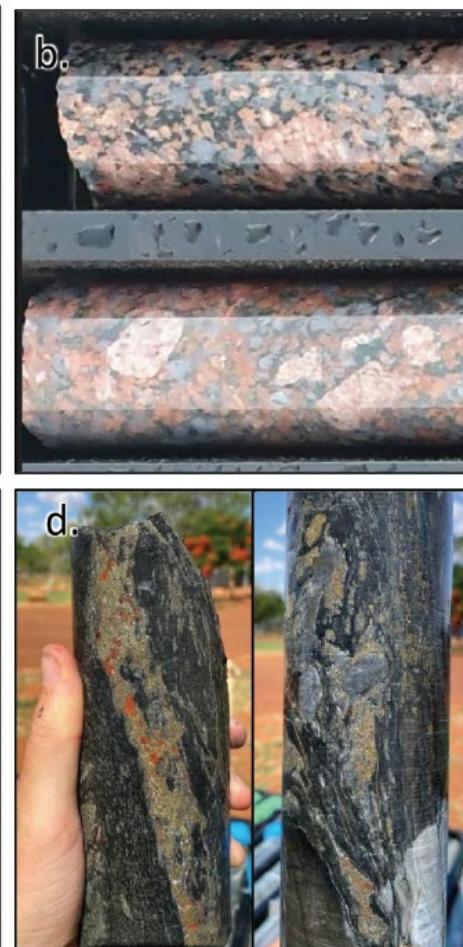
SHRIMP Max Dep Ages
$1863.4 \pm 3.8$
$1873.6 \pm 6.1$
$1871.1 \pm 3.8$
$1894.2 \pm 3.4$
$1969.0 \pm 10$
$1872.0 \pm 3.7$
$1867.5 \pm 4.8$
$1844.6 \pm 3.9$
$1596.0 \pm 5$
$1652.0 \pm 5$

NDIBK02



NDIBK10

NDIBK05



NDIBK04

### SHRIMP Magmatic Ages

$1853.4 \pm 4.8$
$1848.6 \pm 4.3$
$1846.9 \pm 4.5$
$1846.1 \pm 4.8$
$1839.9 \pm 3.8$
$1851.6 \pm 7.5$
$1854.2 \pm 5.3$
$1870.6 \pm 3.8$

### Tennant Creek Suite

myUni | MinEx | https:// | Delain | New T | NDI D | Nation | Nation | Nation | Produ | East T | NDI C | +

portal.ga.gov.au/persona/minexcrc

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MinEx CRC National Drilling Initiative

About Layers Location Search Data & Publications

Tools Clip Map Narrator

1000 km

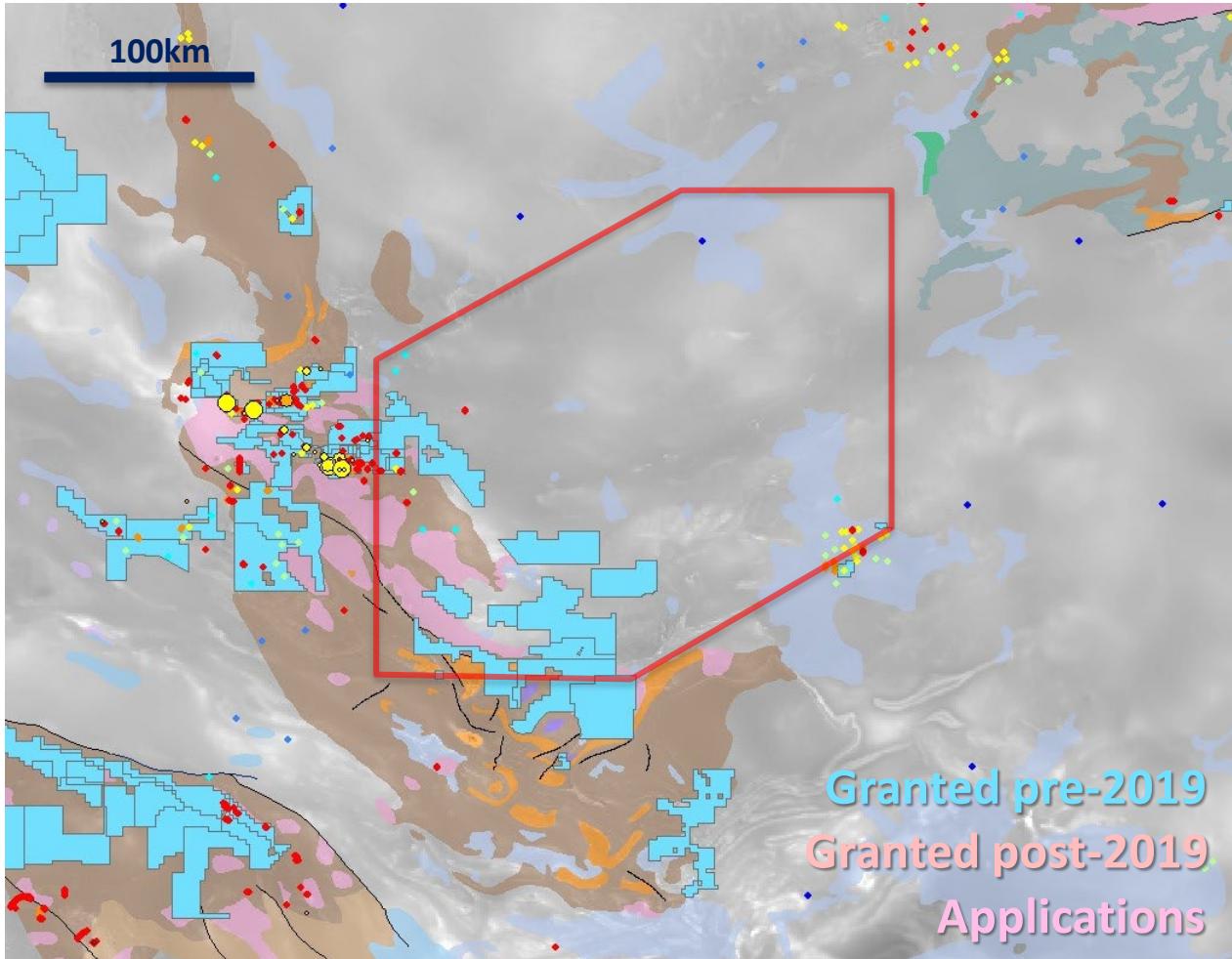
167.95, -37.71

Contact us Copyright Disclaimer Privacy Provide Feedback Chat

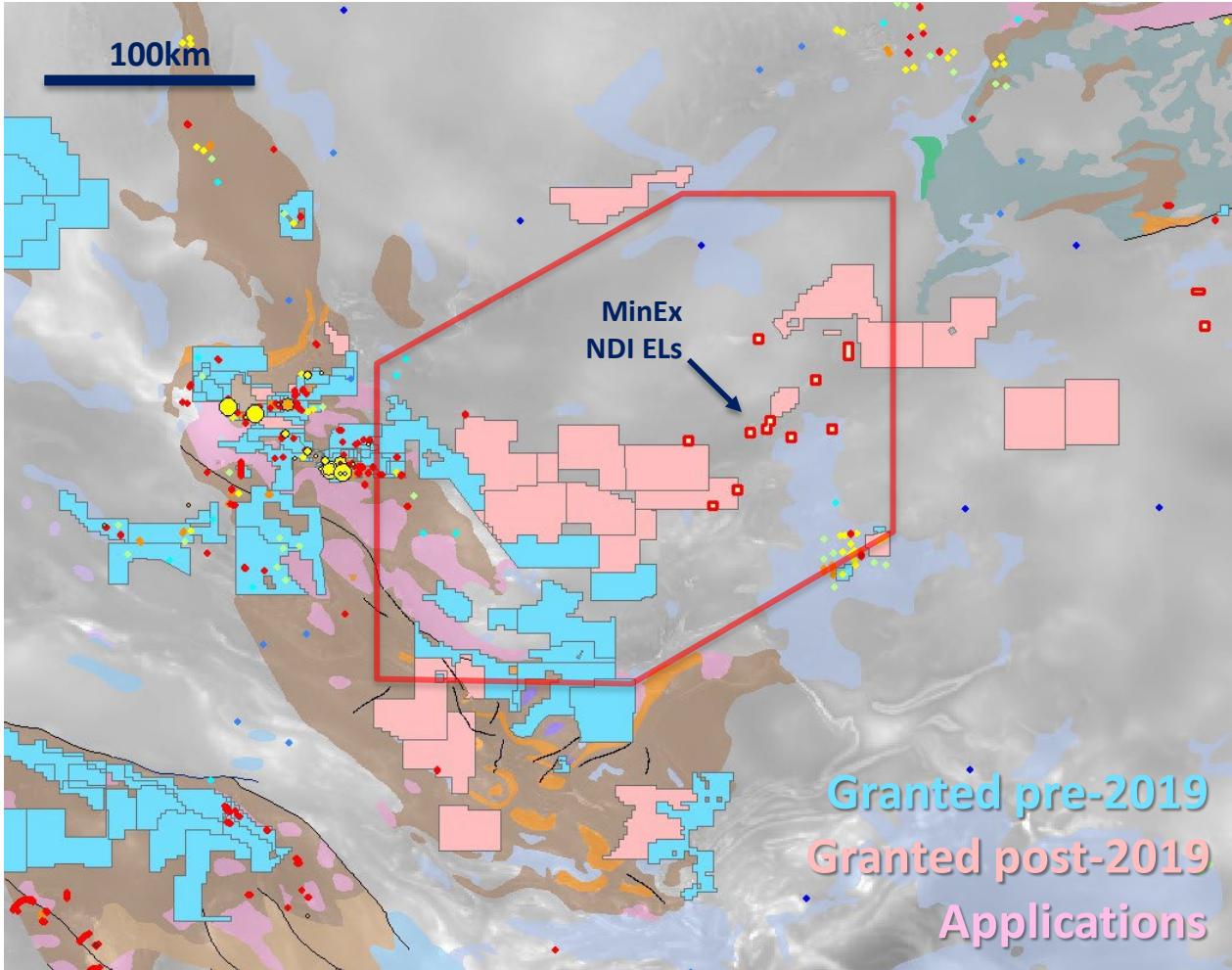
Type here to search

A detailed map of the southern Pacific Ocean and parts of Australia and New Zealand. The map shows the coastline of Australia with state and territory labels: Northern Territory, Western Australia, South Australia, New South Wales, and Victoria. Major cities like Jakarta, Bandung, Perth, Sydney, Melbourne, and Auckland are marked. The Indian Ocean and Coral Sea are to the west and east respectively. An inset map in the bottom right corner shows the location of the main map area. A scale bar indicates 1000 km. A legend at the bottom left includes icons for information, layers, location search, and data publications. A navigation bar at the top includes links for About, Layers, Location Search, Data & Publications, Tools, Clip, and Map Narrator. A status bar at the bottom right shows coordinates (167.95, -37.71) and the date (24/03/2022). A 'Chat' button is also present in the bottom right corner."/>

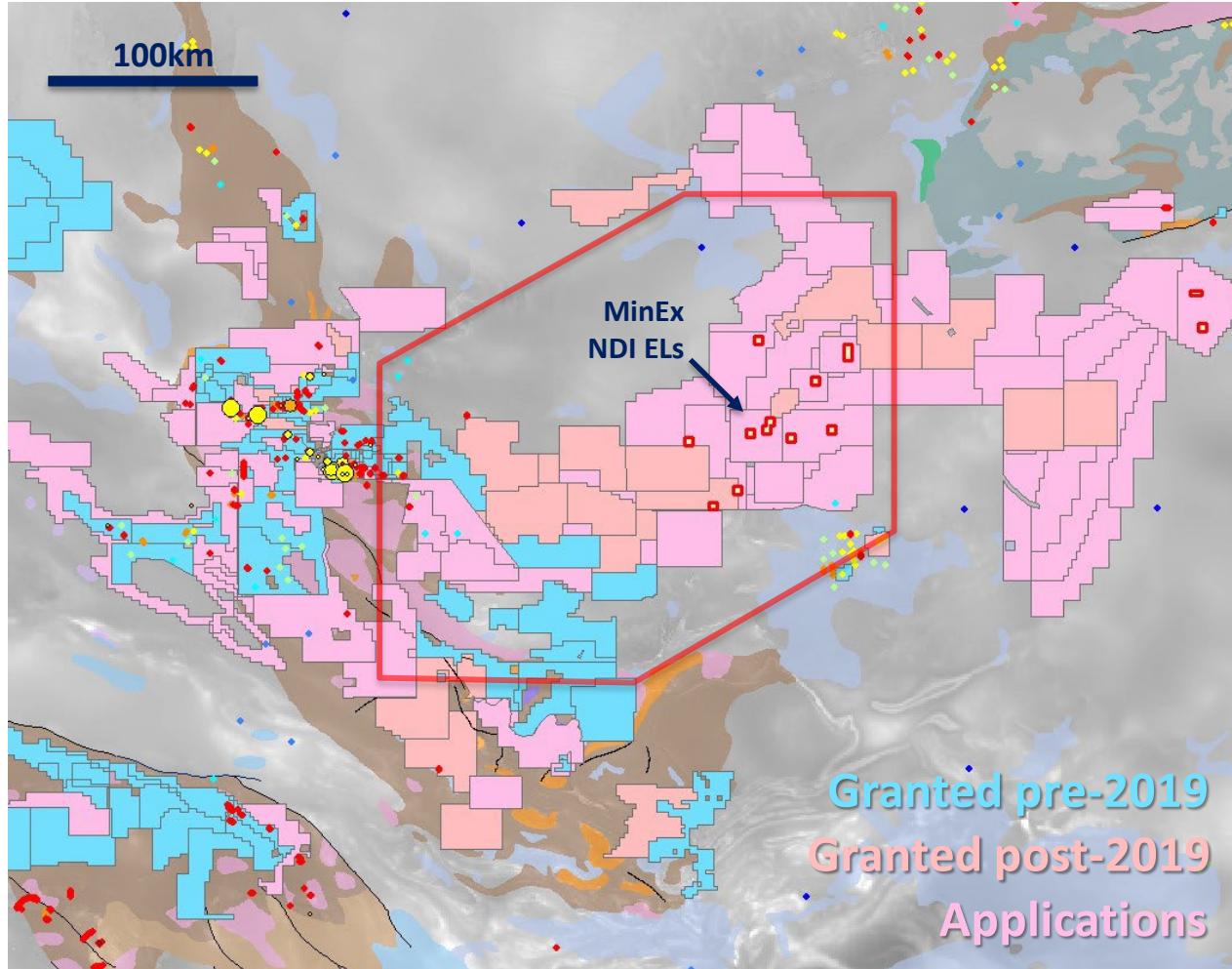
## East Tennant NDI area



## East Tenant NDI area



## East Tenant NDI area



# Delamerian

22 holes for 6400.1m

4424.1m CT (16 holes)

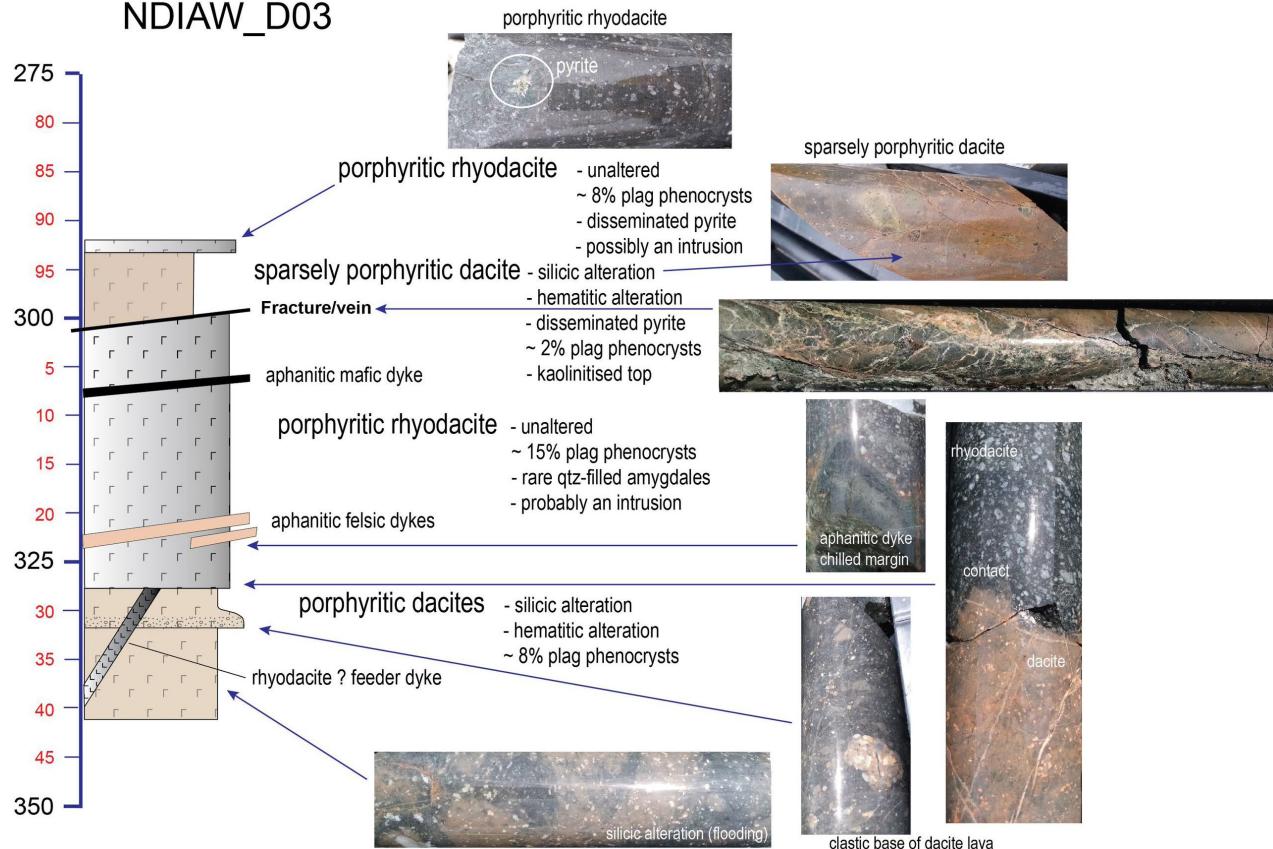
1654.3m Rotary Mud

321.8m Diamond (6 holes)





NDIAW\_01

**NDIAW\_D03**


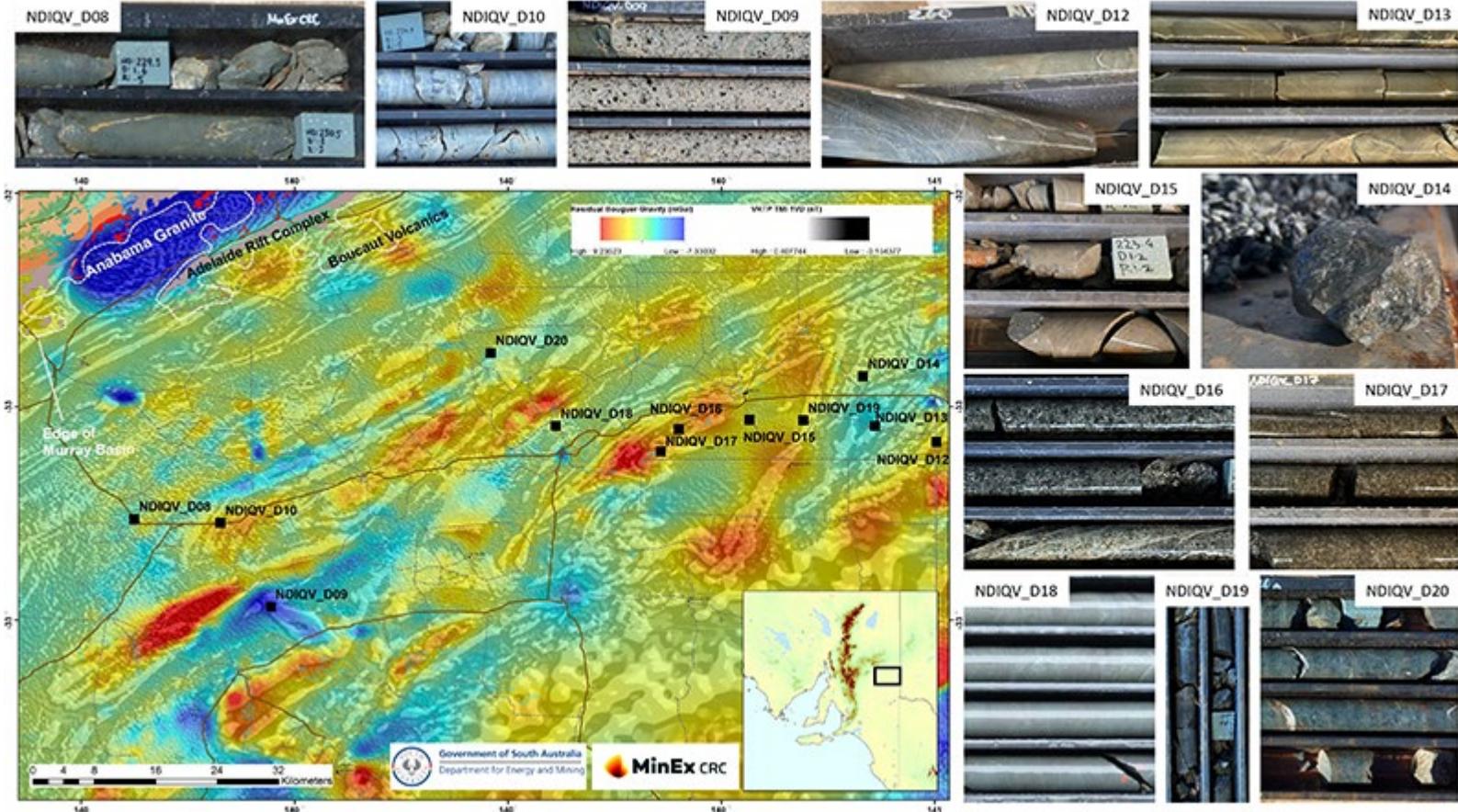
CT Cuttings  
NDIAW\_06\_CT



NDIW\_04\_CT



NDIQV\_09\_CT





# South Australian Drilling Atlas

## Delamerian National Drilling Initiative

The Geological Survey of South Australia has partnered with the MinEx CRC to undertake a National Drilling Initiative project on the under explored Delamerian Orogen.

This project includes a geoscientific drilling program and allied research to understand the geology and mineral potential of both the Delamerian basement and overlying Murray Basin cover.

The National Drilling Initiative looks to drill multiple holes around Australia to map the regional geology and architecture and define the potential for mineral systems in 3D.

Within South Australia drilling will take place in the Cambrian-Ordovician Delamerian Orogen in the east of the state.

Until now exploration for base and precious metals within the Delamerian basement has been focused along the western margin of the Murray Basin. This project will provide new constraints on the geological setting, deformational history, thickness of cover and prospective mineral systems of the basement beneath the Murray Basin.

## Reference Links

[Delamerian National Drilling Initiative \(NDI\)](#)



6 of 6 rows 0 marked 10 columns Planned - Alawoona



Type here to search



9:17 AM ENG 24/03/2022





# South Australian Drilling Atlas

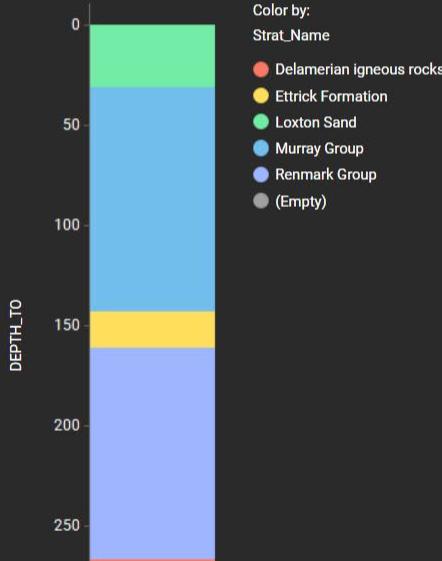


**Government of South Australia**  
Department for Energy and Mining

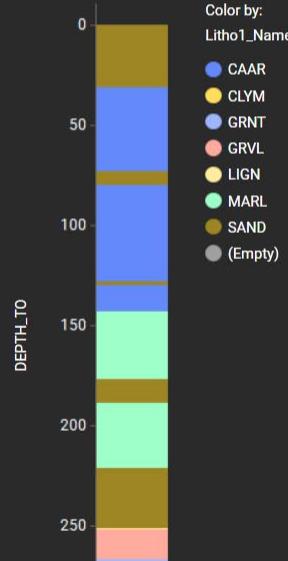
### I would like would like to view:

- Project Information
  - Downhole Geology
  - pXRF Geochemistry
  - MagSus and Gamma
  - Regional Geology
  - Data Relationships

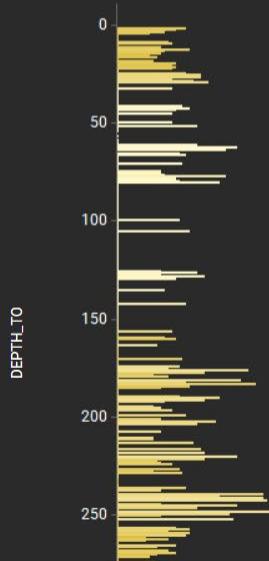
## Stratigraphy



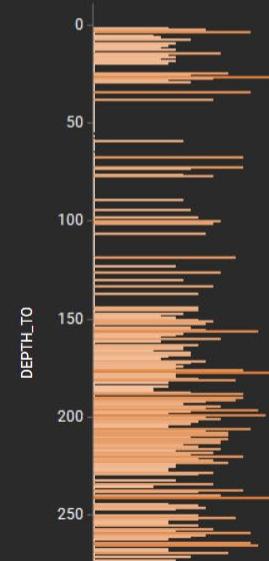
## Lithology Major



### Th Concentration ppm



Cu Concentration ppm



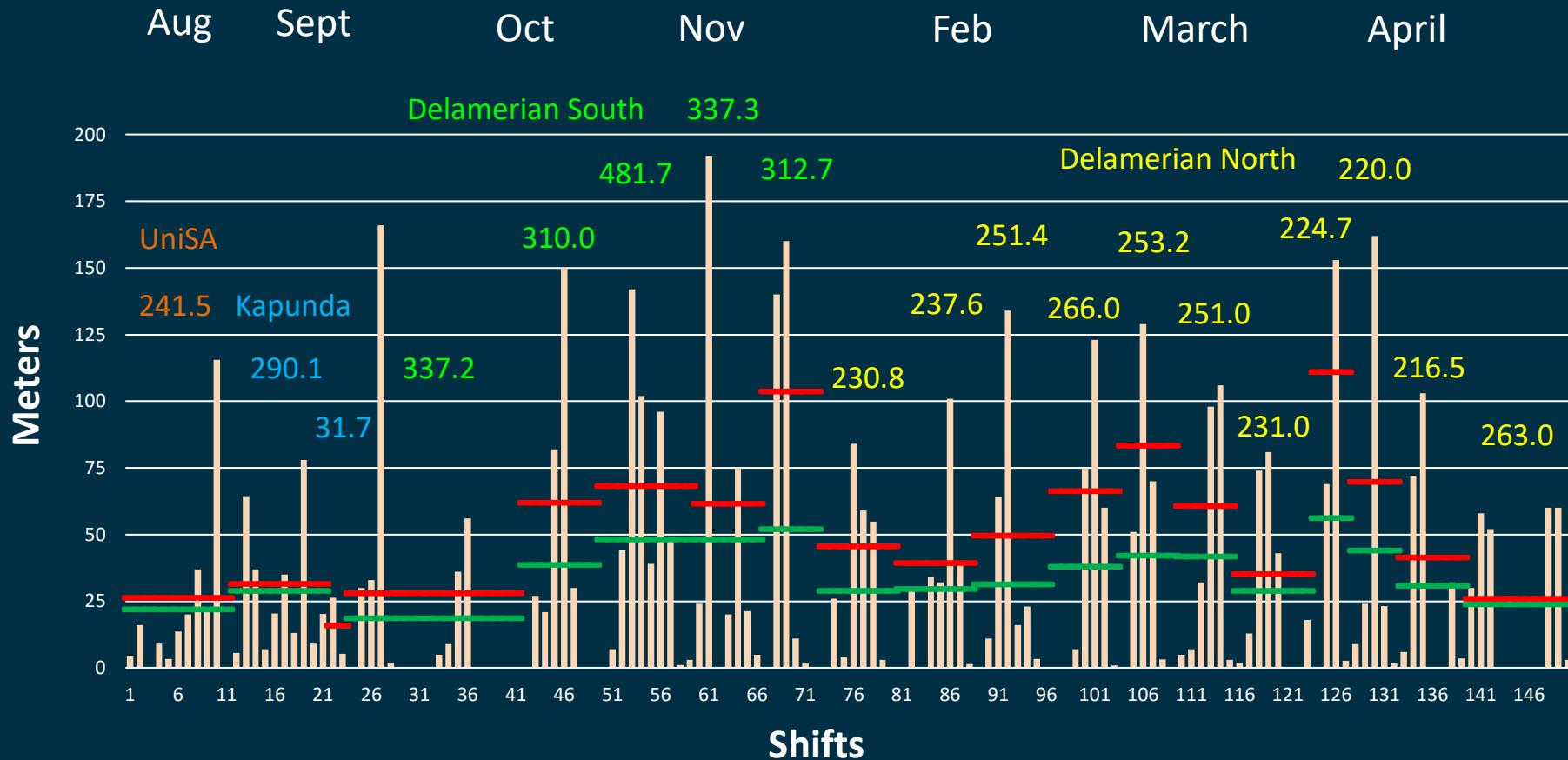
### I am interested in:

Show me details for Drill Hole:

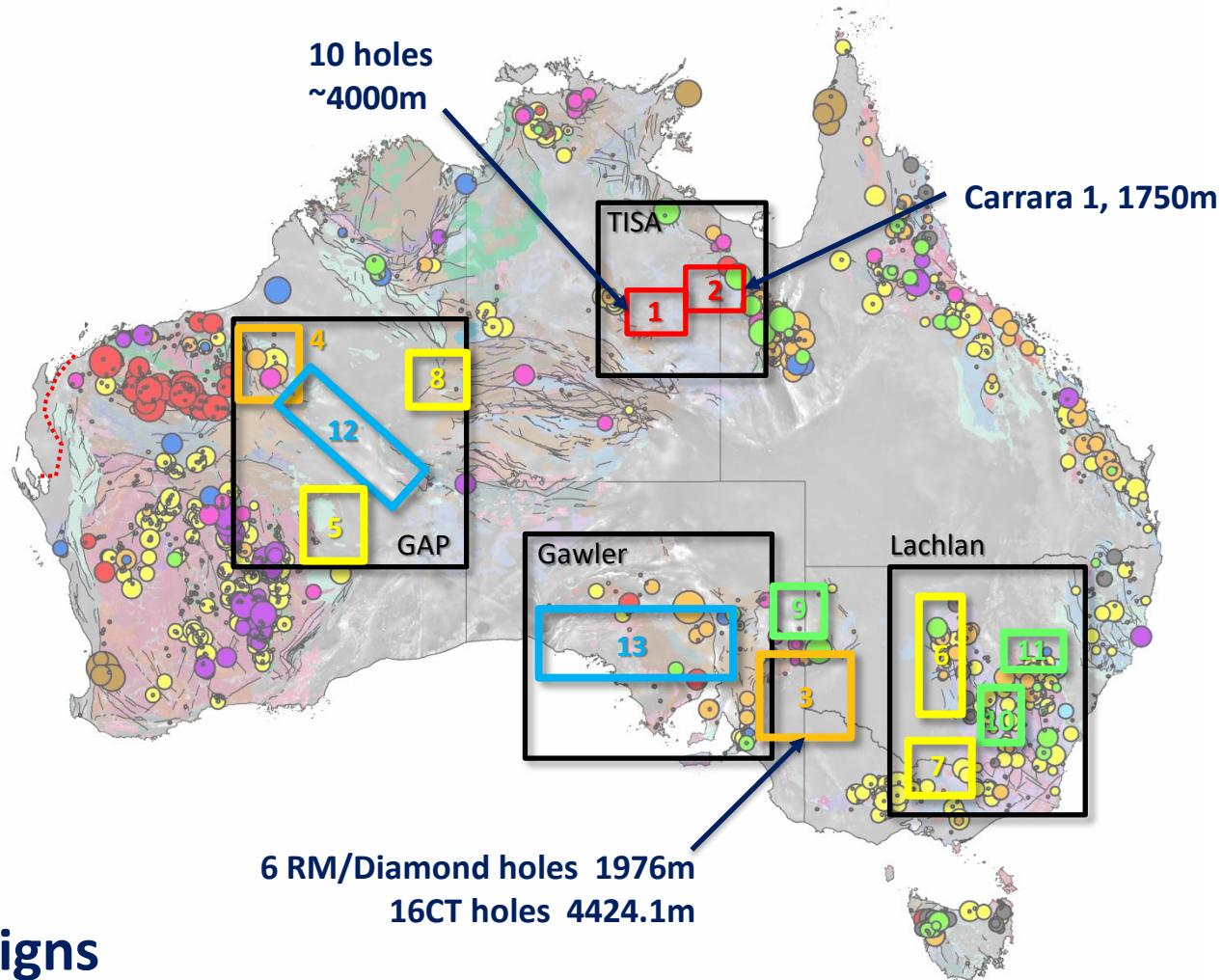
Type to search in list

- NDIAW\_D01
- NDIAW\_D01\_CT
- NDIAW\_D02
- NDIAW\_D02\_CT
- NDIAW\_D03
- NDIAW\_D04\_CT
- NDIAW\_D04\_CT\_80

# 19 holes for 4987.4m



1. East Tennant	2020
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## NDI Drilling Campaigns

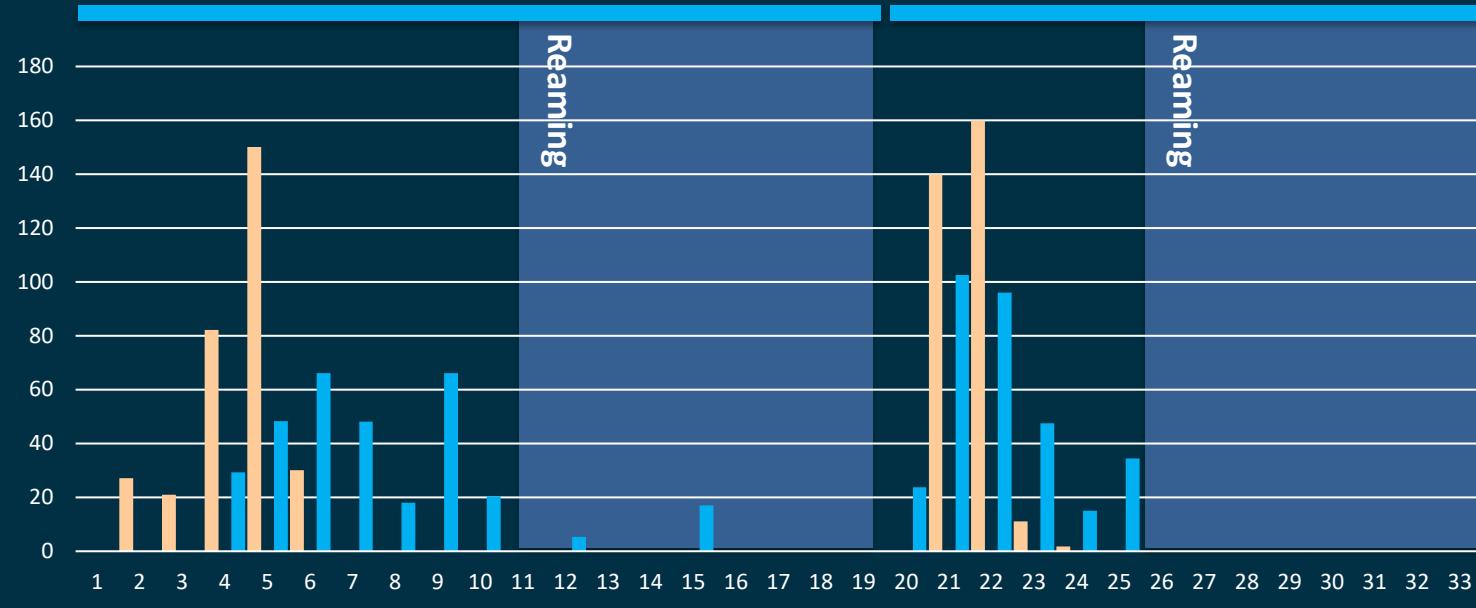




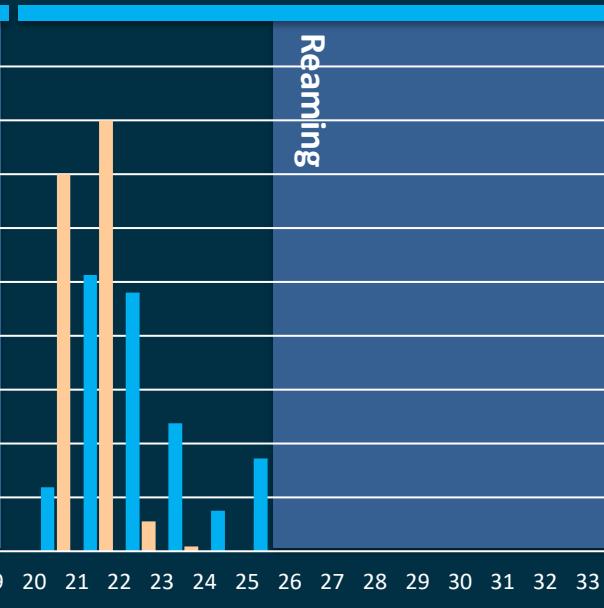
[minexcrc.com.au](http://minexcrc.com.au)

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NDIAW\_D01 318.2m 19 shifts

NDIAW\_D01\_CT  
310.0m 8 shifts

NDIAW\_D02 319.1m 14 shifts

NDIAW\_D02\_CT  
312.2m 6 shifts