Simpson Desert

Australian Government
Geoscience Australia

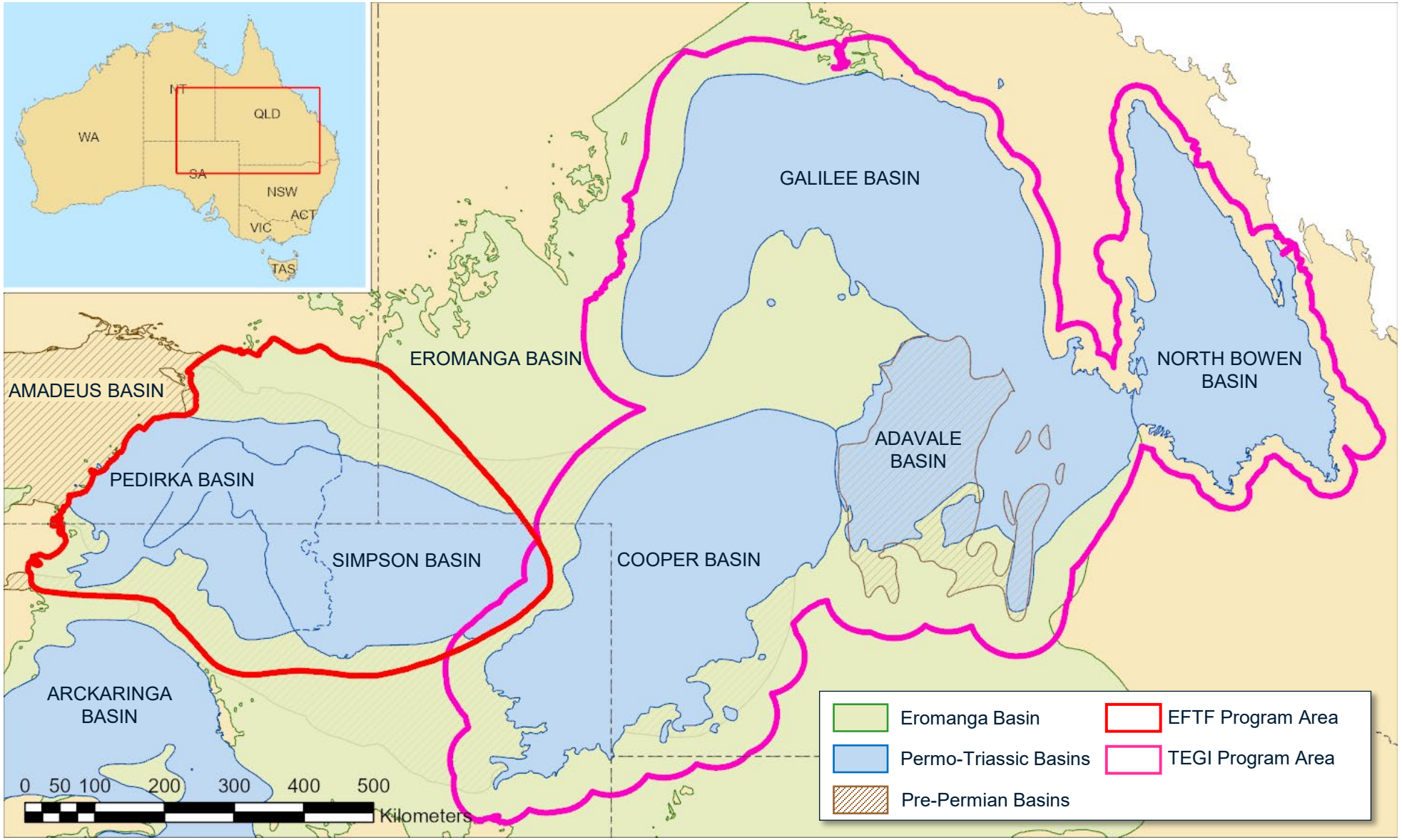
Exploring for the Future

Resource Assessment of the Pedirka, Simpson and western Eromanga basins

Geoscience Australia: Jeremy Iwanec & Tom Bernecker

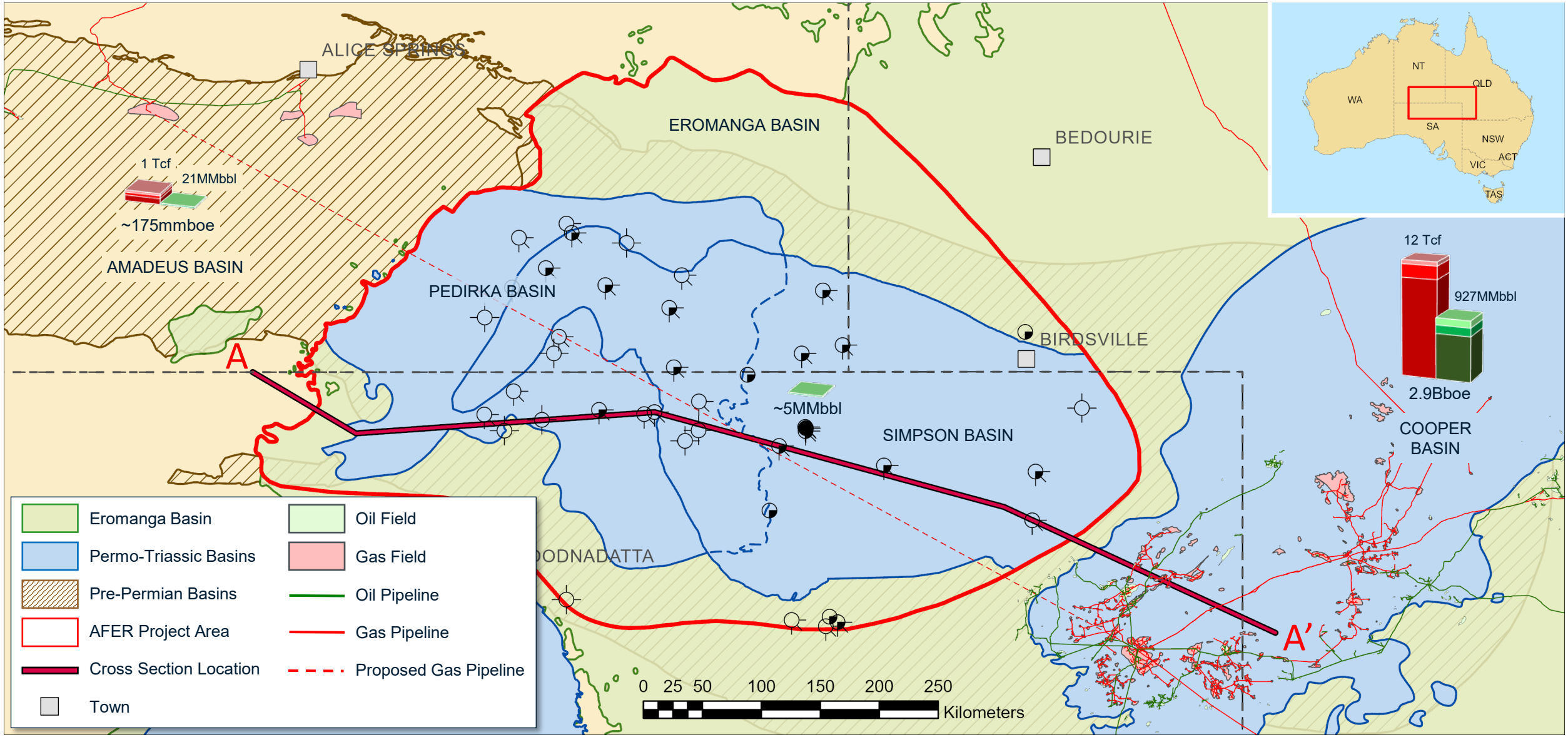
South Australian Department for Energy & Mining: Paul Strong

Geoscience Australia's Resource Assessment Programs

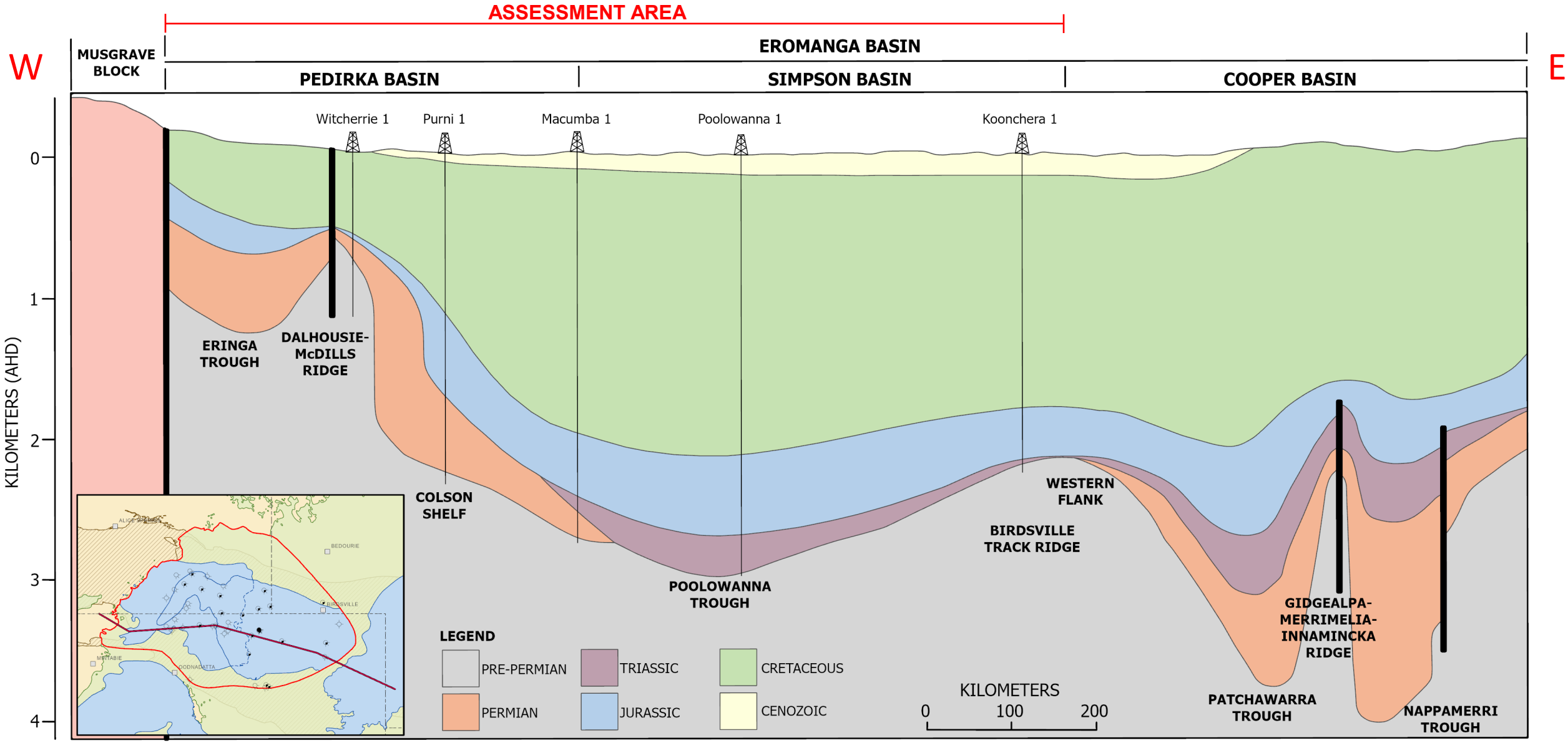


- Regional-scale programs to assess the prospectivity and data/knowledge gaps of stacked basins for multiple resources, including:
  - Hydrocarbons (conventional & unconventional)
  - Geological storage of CO_2
  - Hydrogen
  - Groundwater
- Programs:
  - **TEGI Program** – Trusted Environmental and Geological Information
  - **EFTF Program** – Exploring for the Future Program:
    - **AFER Project** – Australia's Future Energy Resources

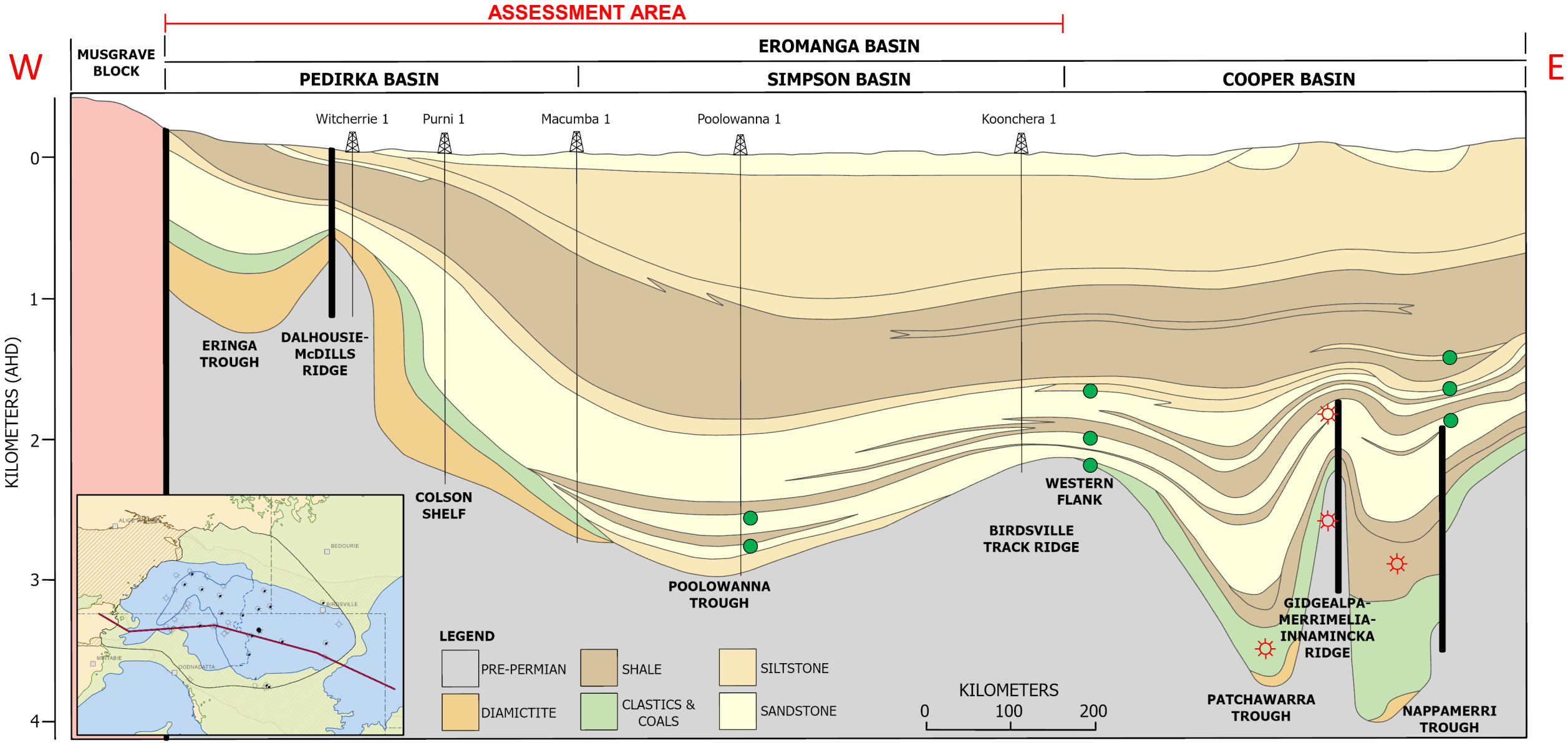
Location



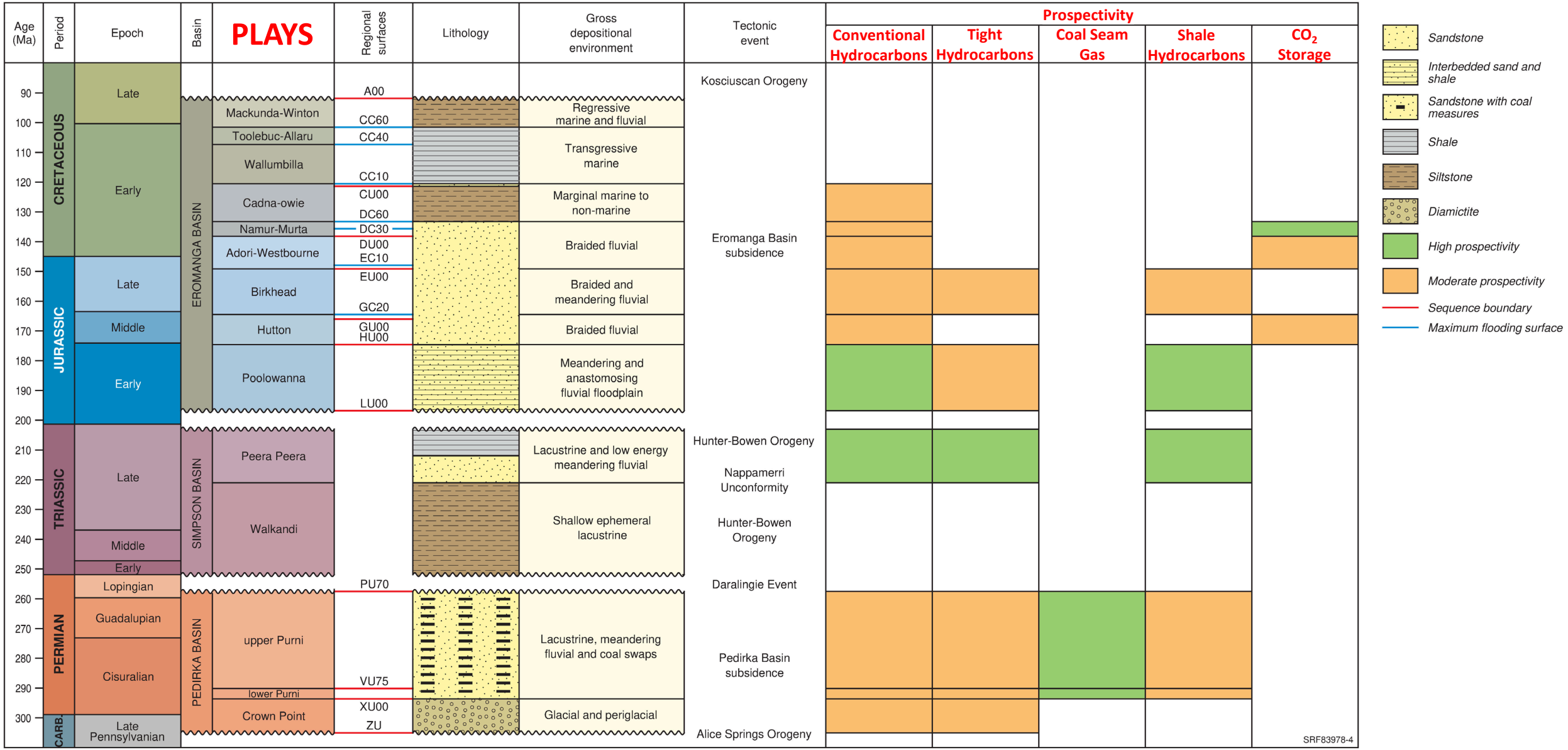
Regional Cross Section by Age



Regional Cross Section by Lithology



Stratigraphy



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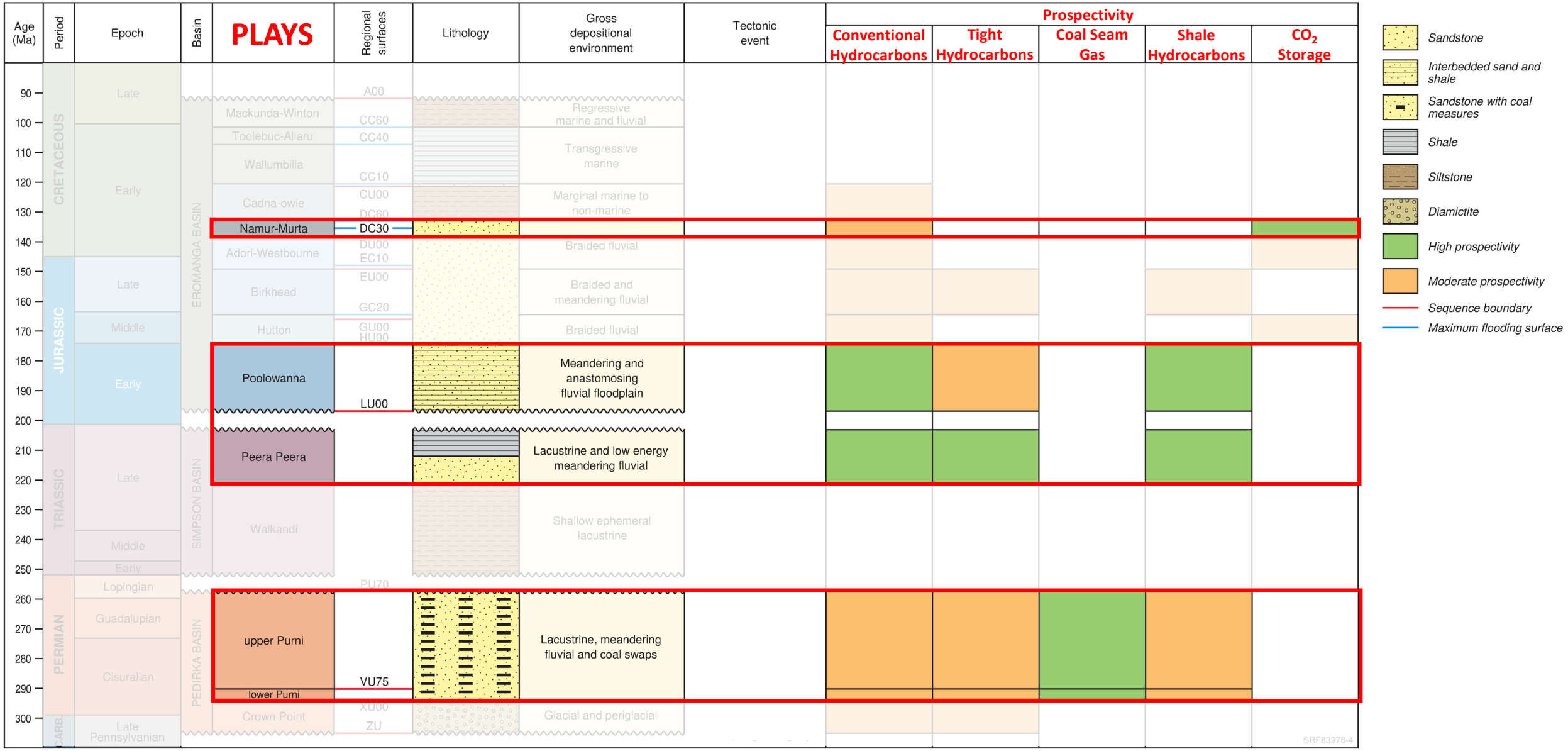
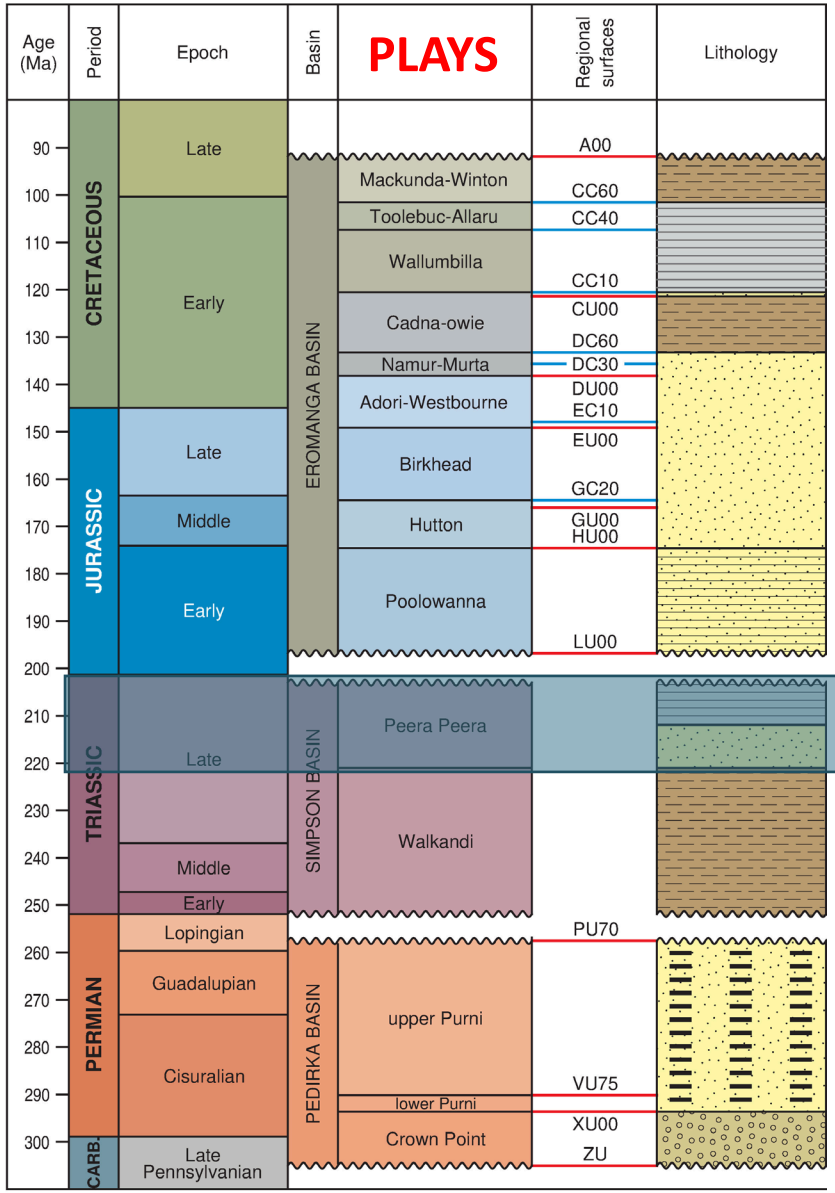
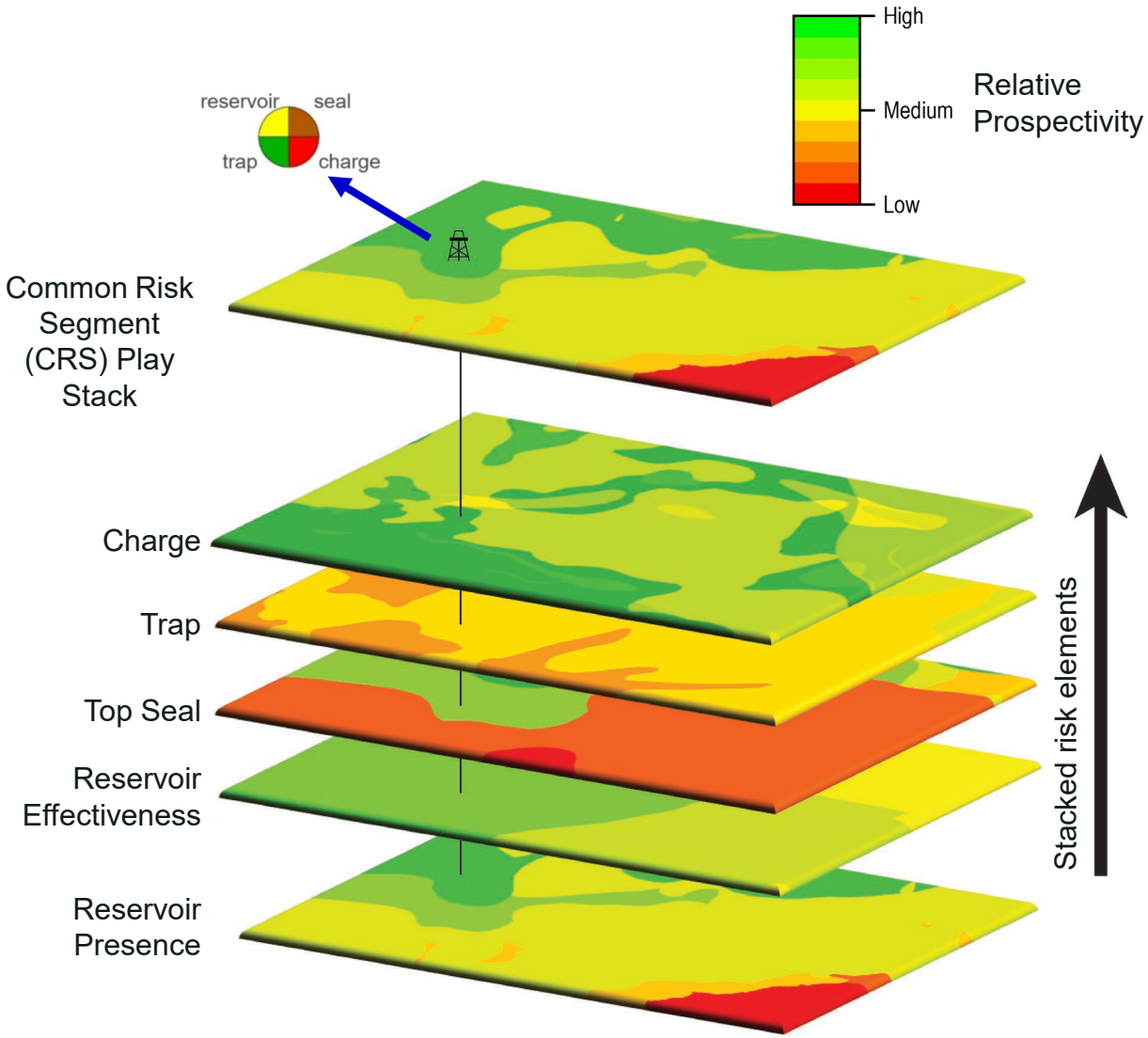


Play Based Resource Assessment





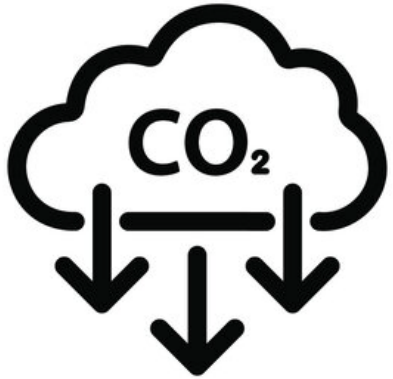
- Systematic assessment of multiple resources for each play interval using a set of criteria to address the relative prospectivity of the key elements associated with each resource
- Composite play stack maps generated through spatial analysis (stacking) of all play risk elements

Assessed Energy Resource Elements

Unconventional Hydrocarbons
(Tight & Shale hydrocarbons, CSG)

Distribution of quality, continuity & potential producibility

- Unit Thickness
- Quality
- Continuity
- Maturity
- Formation Pressure
- Reservoir Effectiveness



Geological Storage CO_2

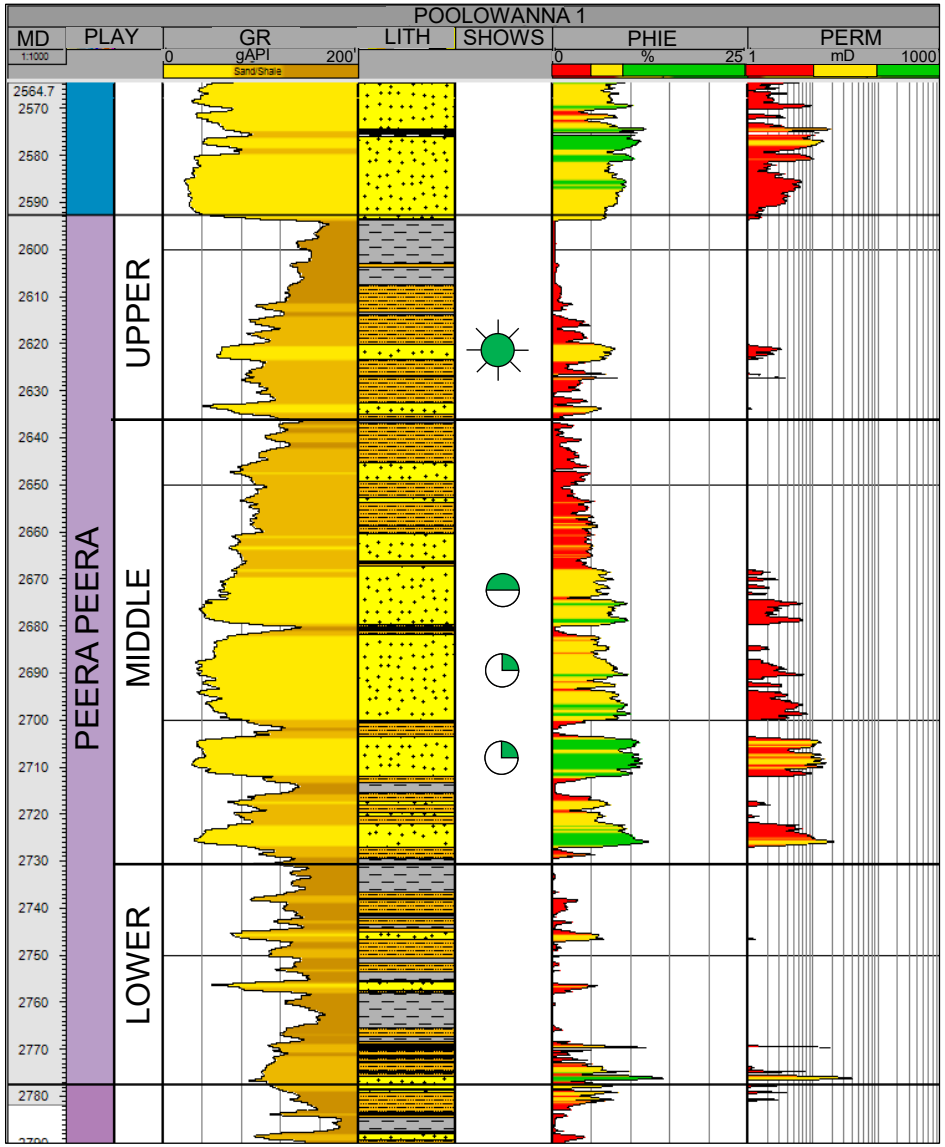
Permanent containment systems that are capable of maintaining commercial injection rates

Storage Capacity:
- Depth
- Pressure
- Porosity

Injectivity:
- Thickness
- Permeability

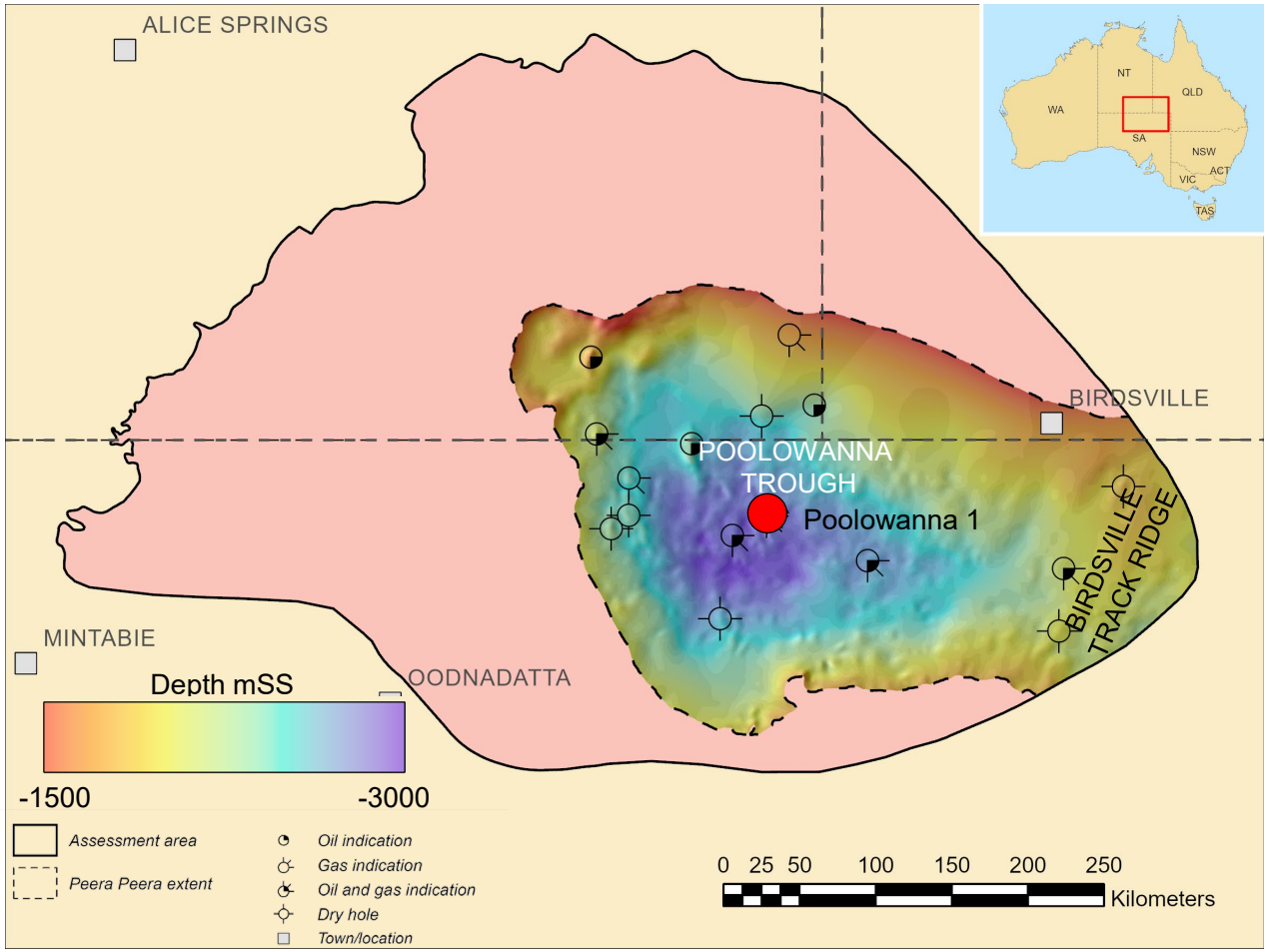
Containment:
- Top Seal Thickness
- Structural Complexity

Peera Peera (Triassic) Play

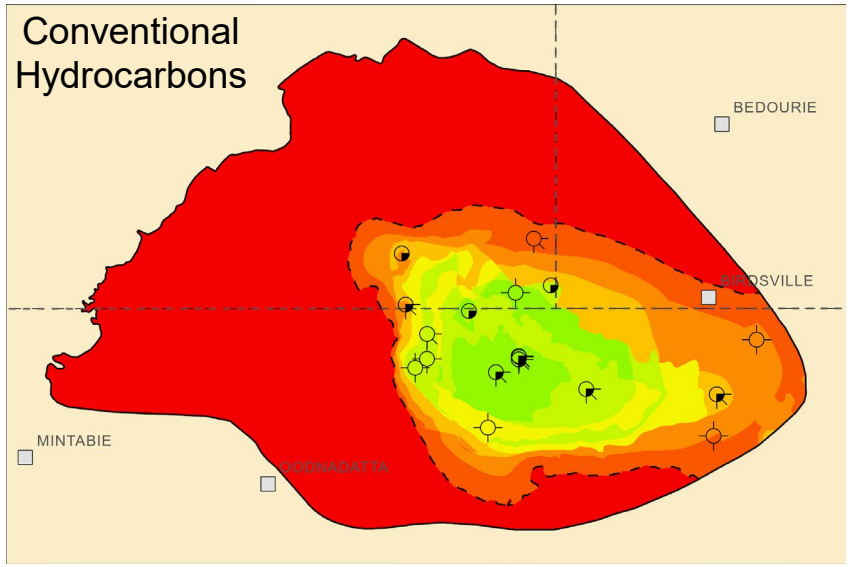


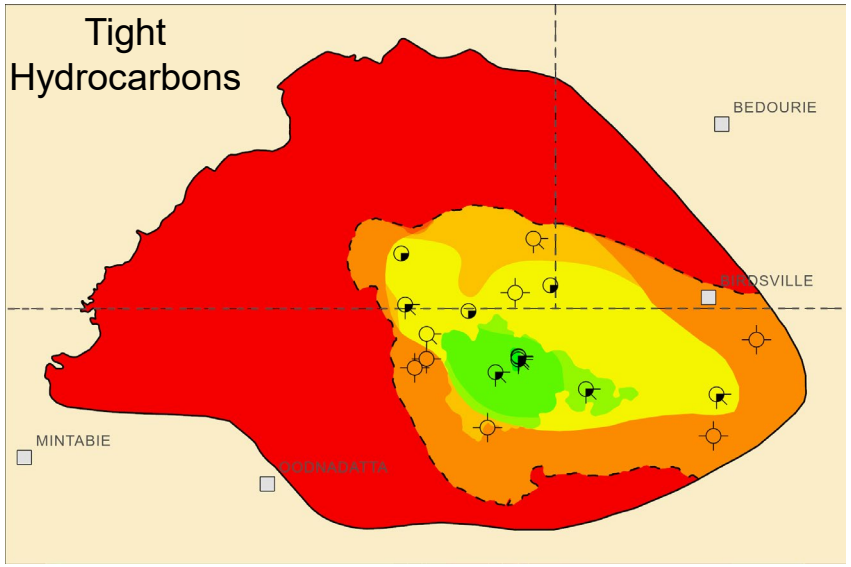
DST INTERVAL

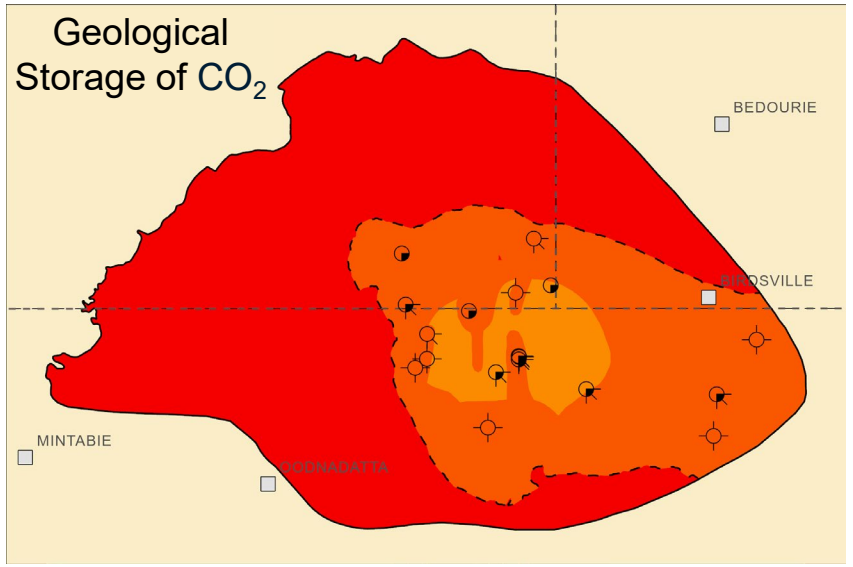
Top Triassic Depth Map

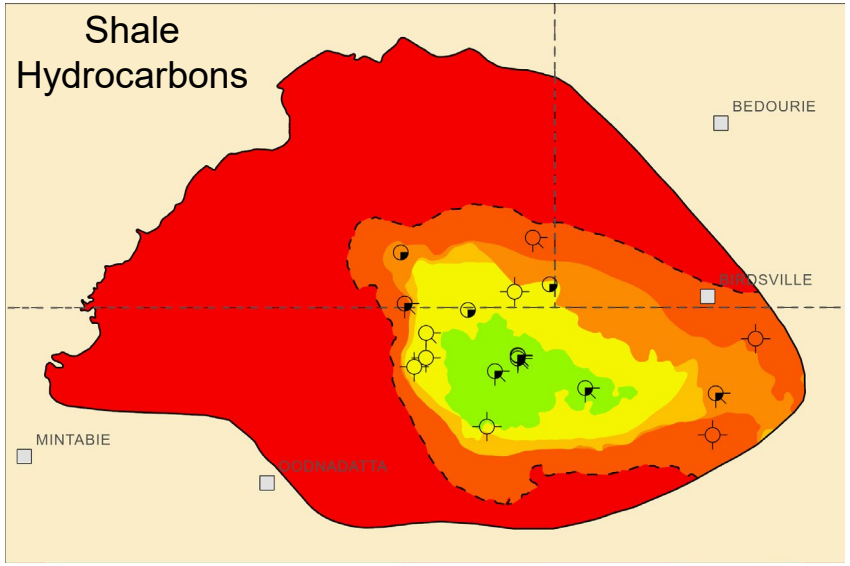


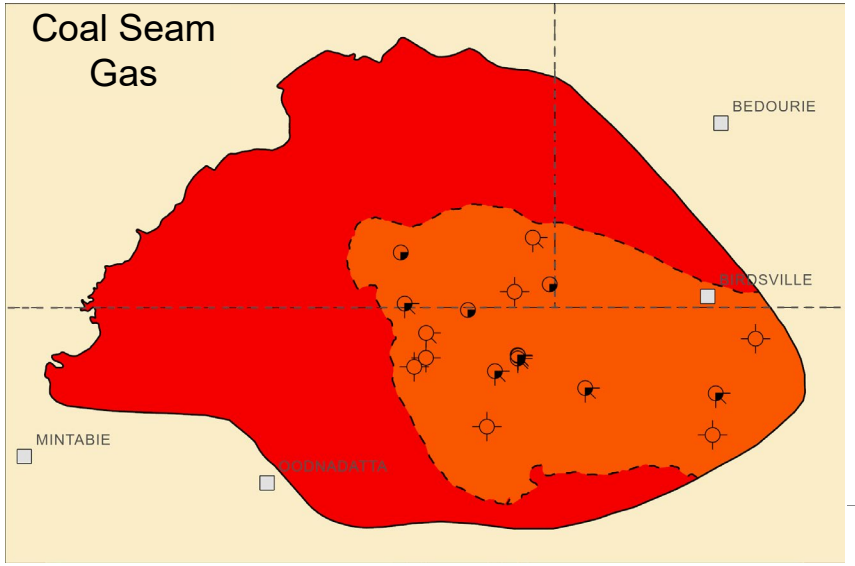
Peera Peera (Triassic) Play Assessment Results











Play stack prospectivity

Low — Medium — High

Assessment area

Peera Peera extent

Oil indication

Gas indication

Oil and gas indication

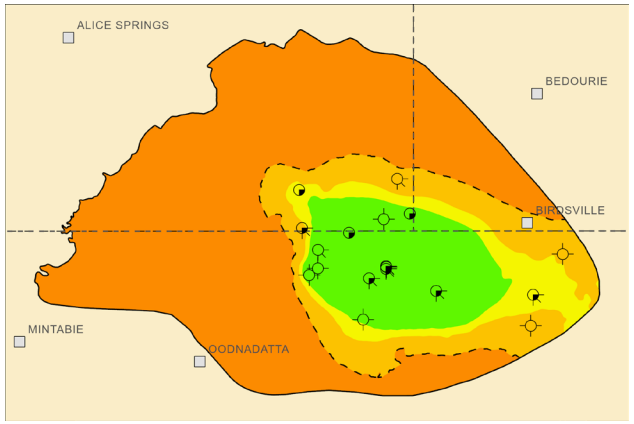
Dry hole

Town/location

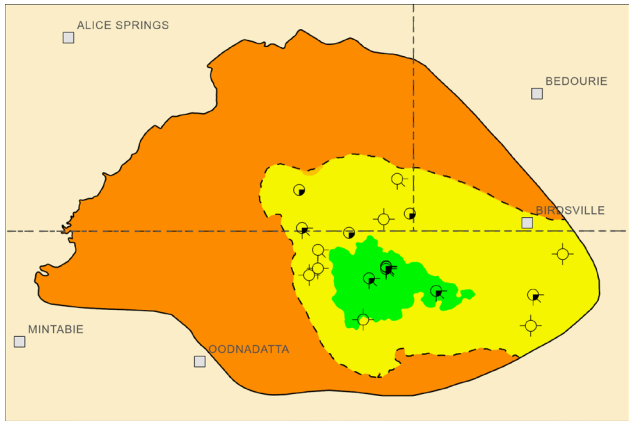
Peera Peera Shale Hydrocarbons

Shale Hydrocarbon Assessed Elements

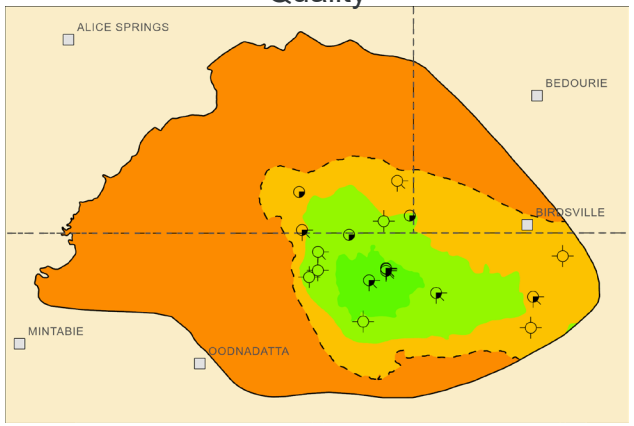
Thickness



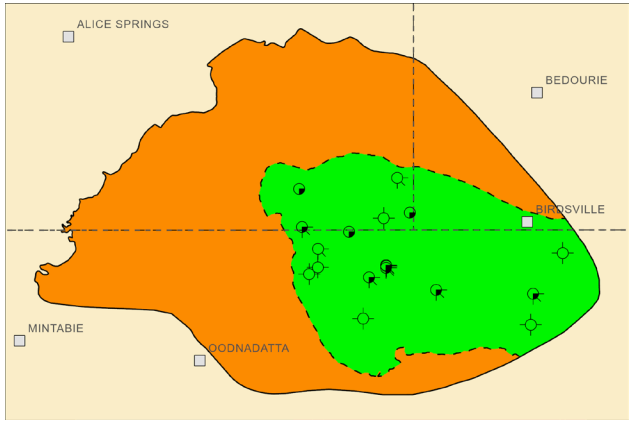
Depth



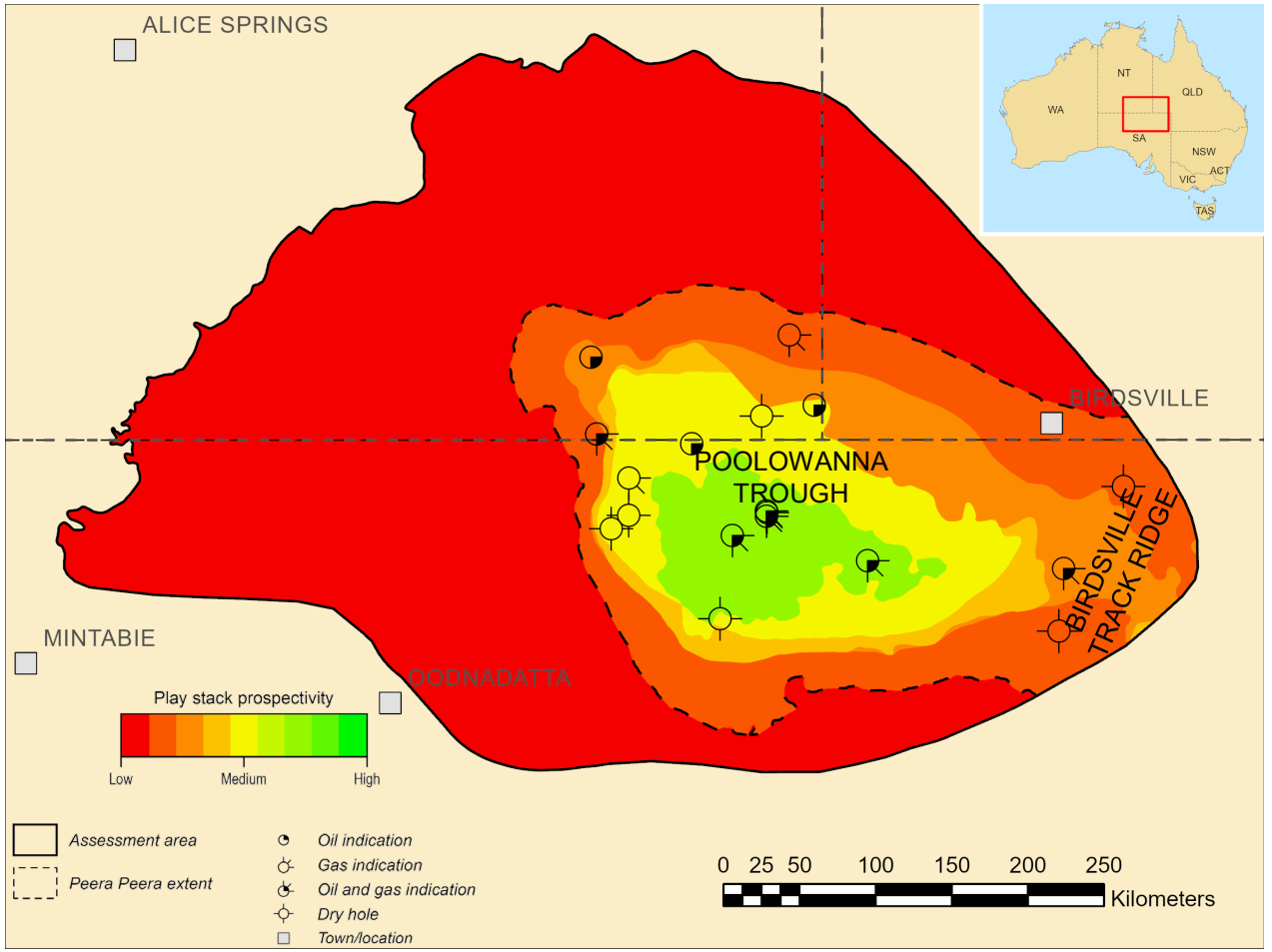
Quality



Effectiveness

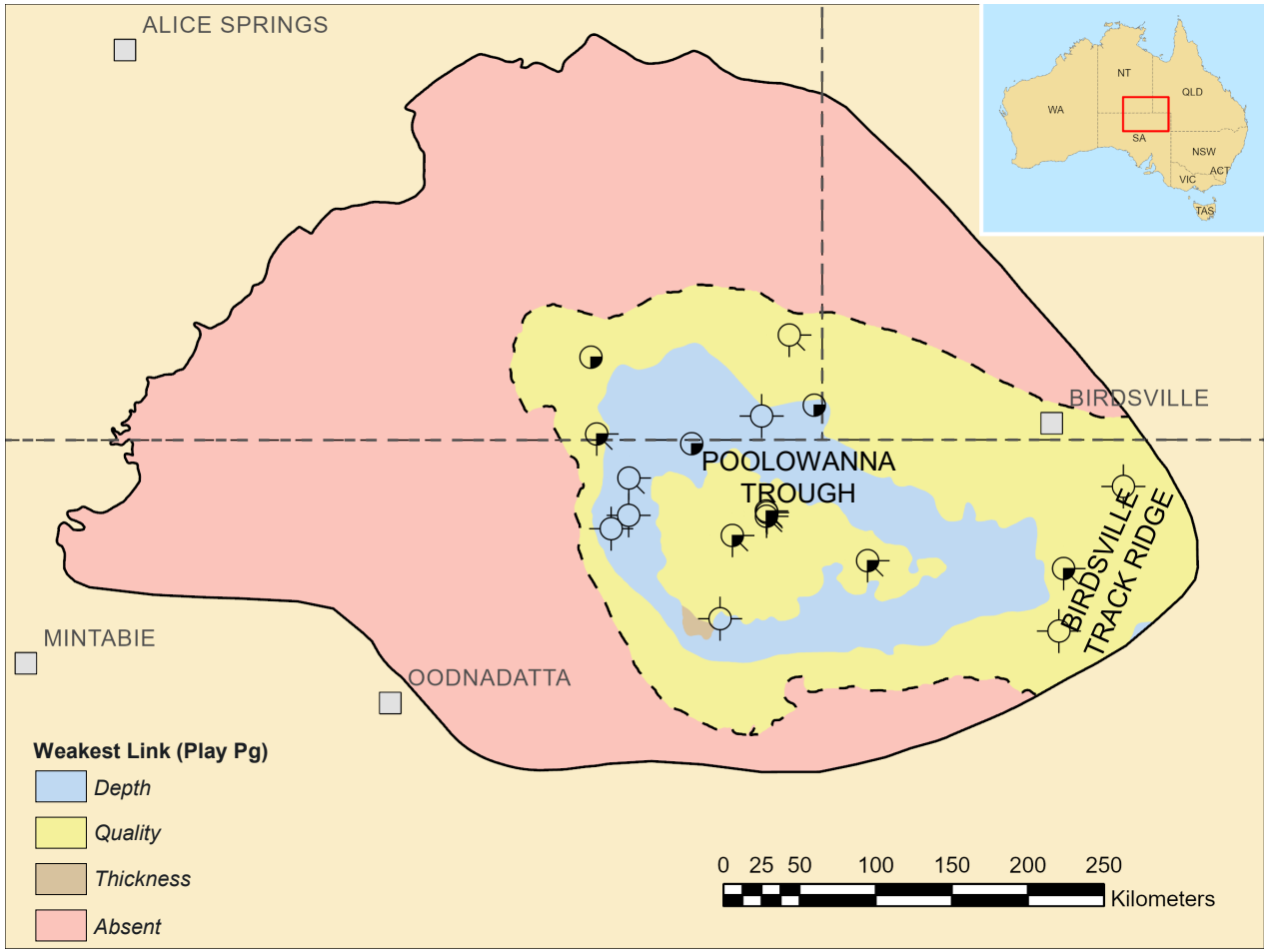


Play Level Composite Risk Segment (CRS) Map



Peera Peera Shale Hydrocarbons

Weakest Link Map



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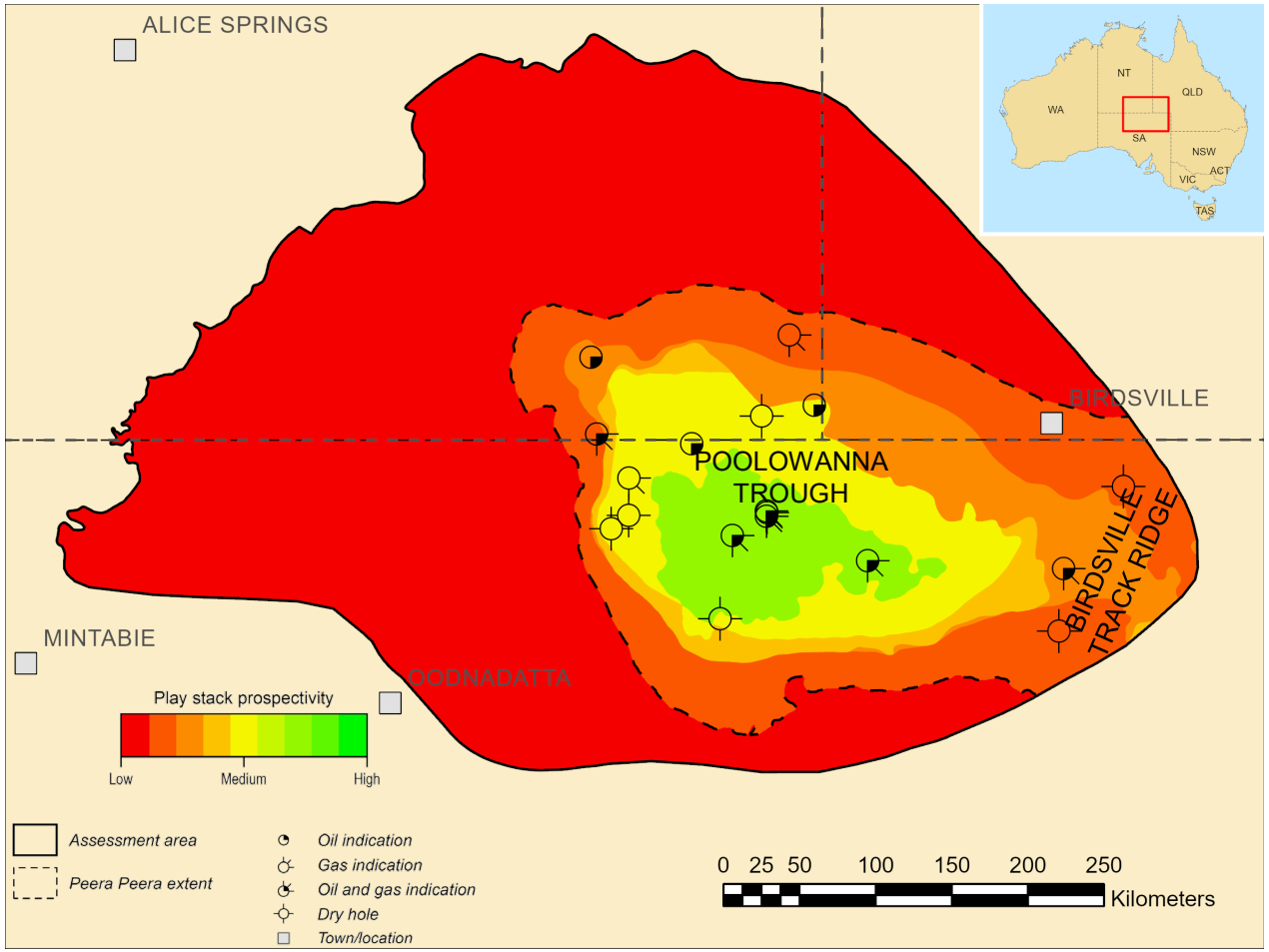
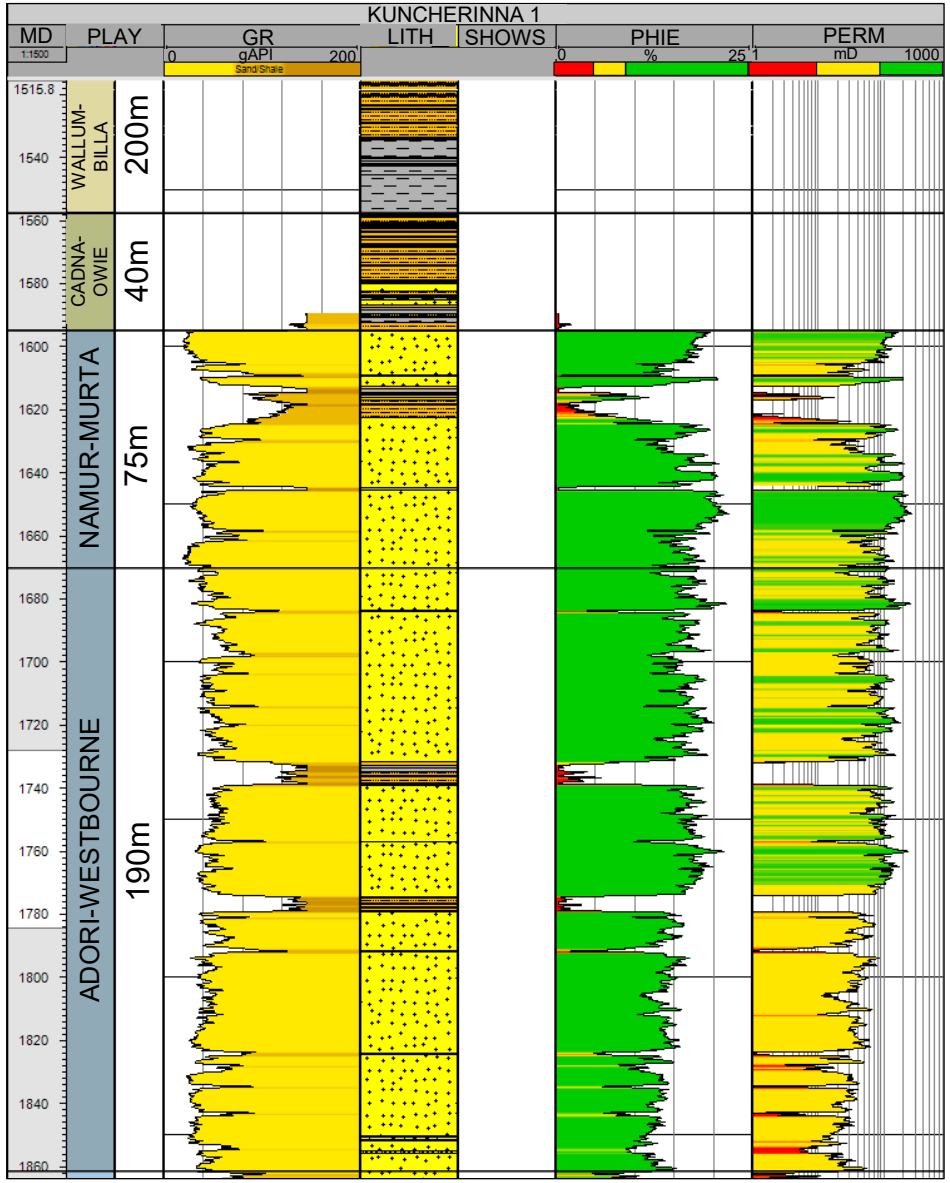
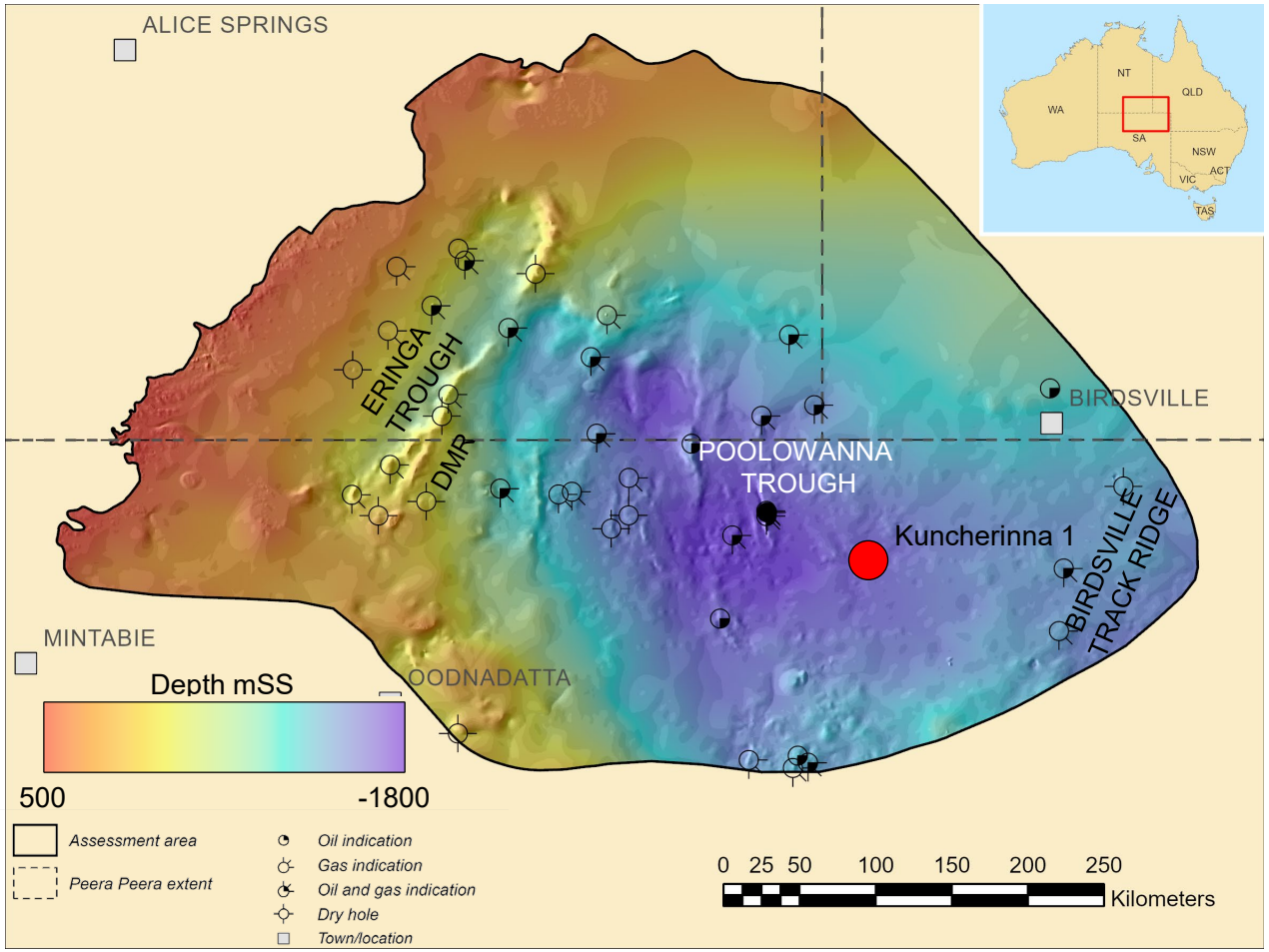


Namur-Murta (Early Cretaceous) Play



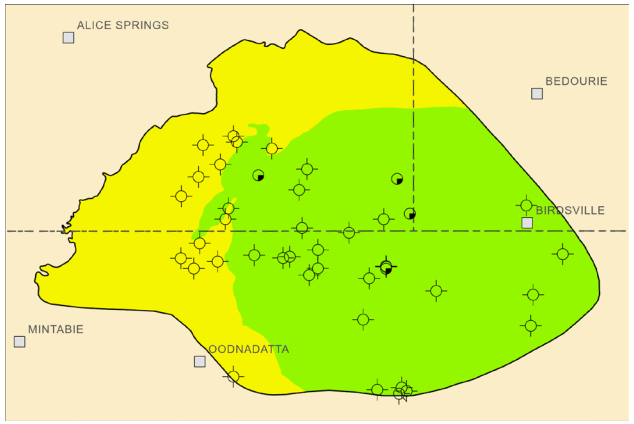
Top Namur-Murta Play Depth Map



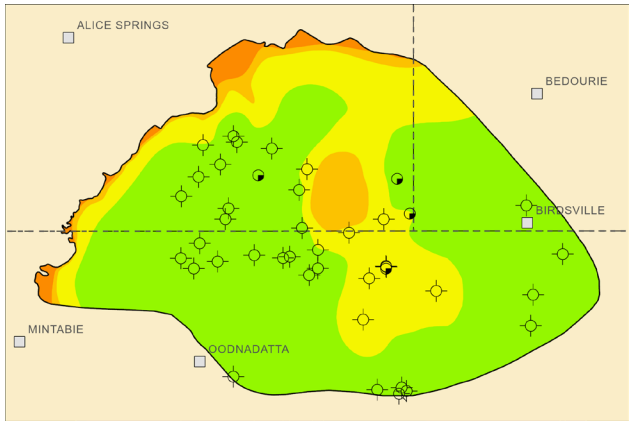
Namur-Murta Geological Storage of CO_2 (GCS) Potential

GCS Assessed Elements

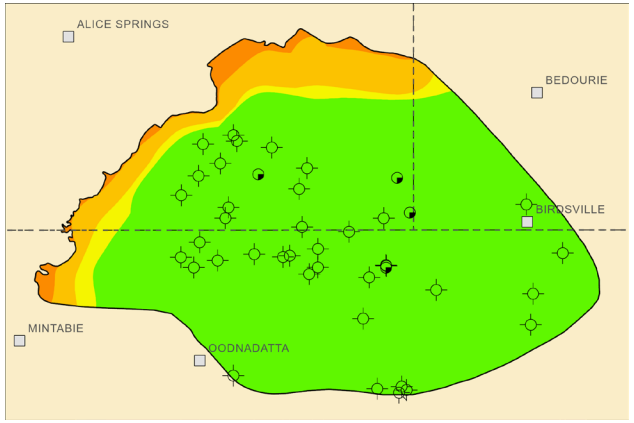
Storage Efficiency



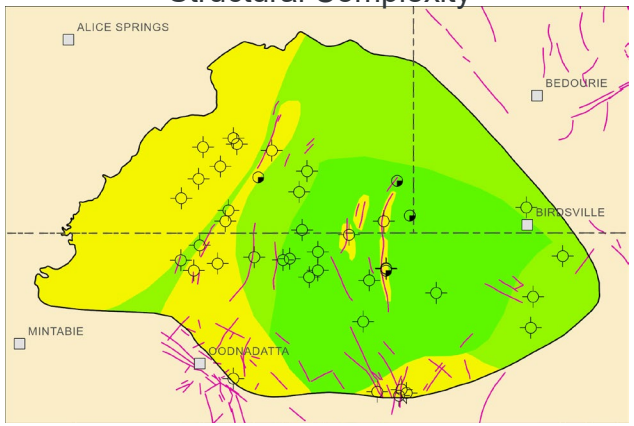
Injectivity



Seal



Structural Complexity



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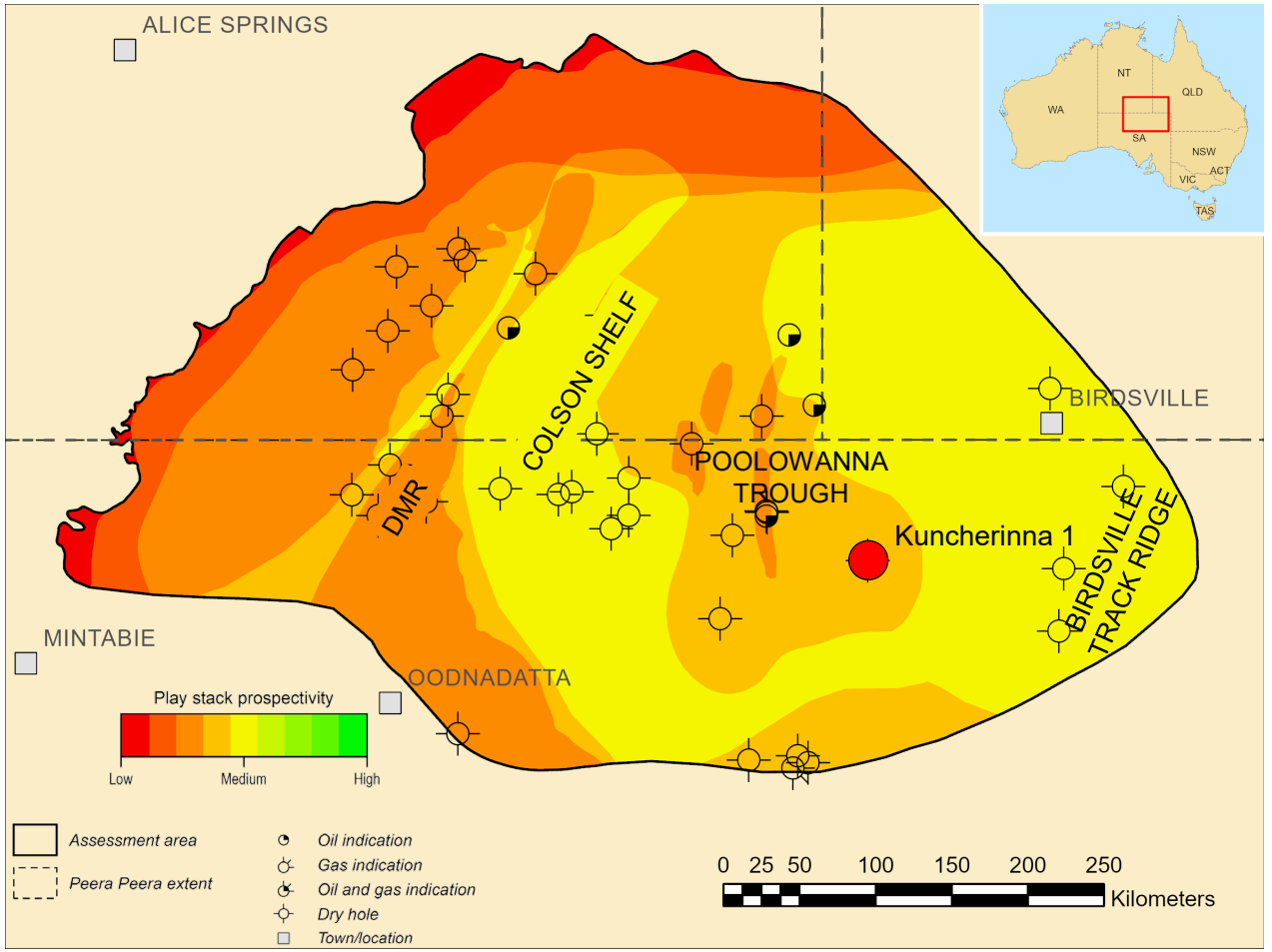
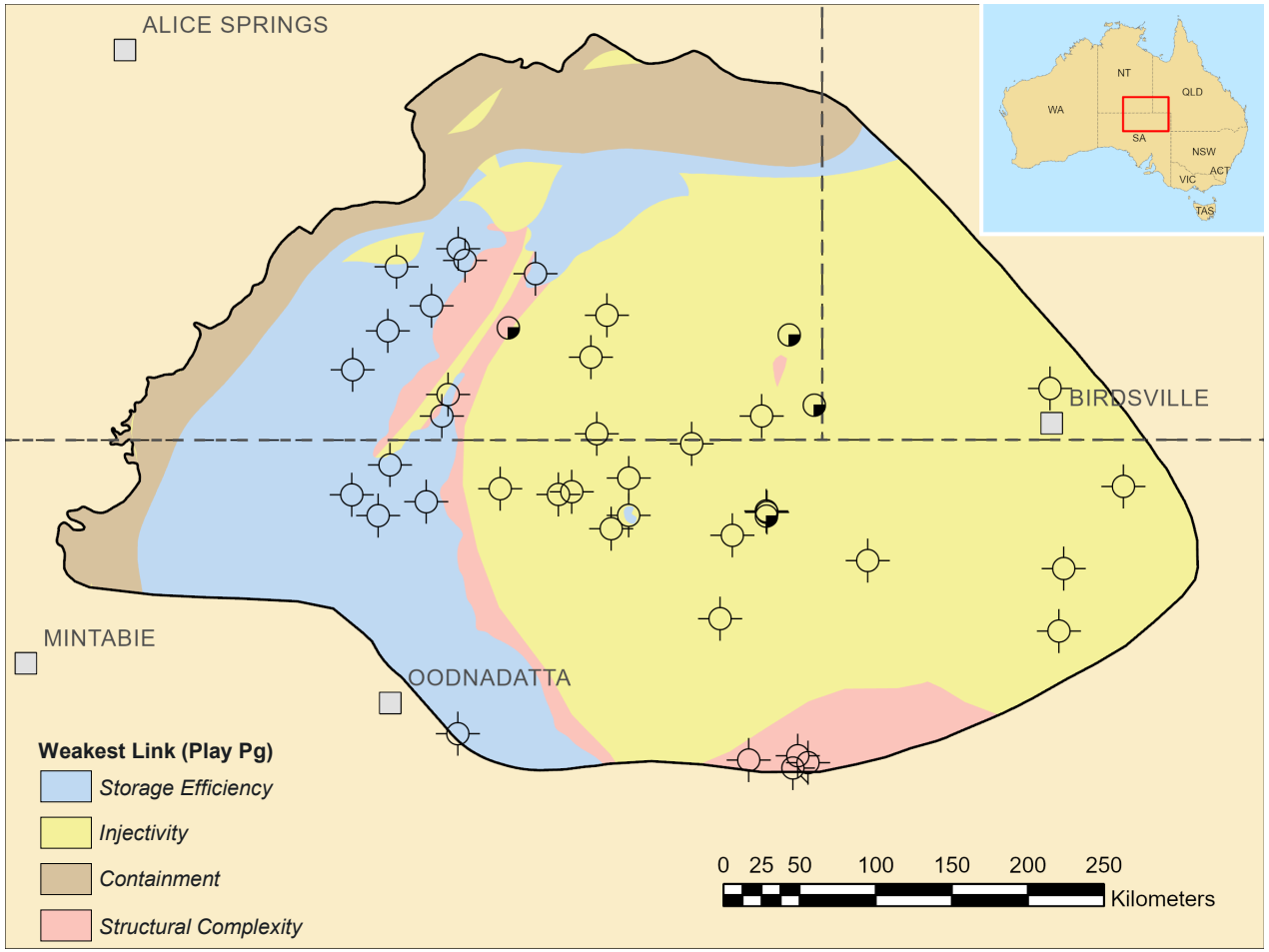


Namur-Murta Geological Storage of CO2

Weakest Link Map



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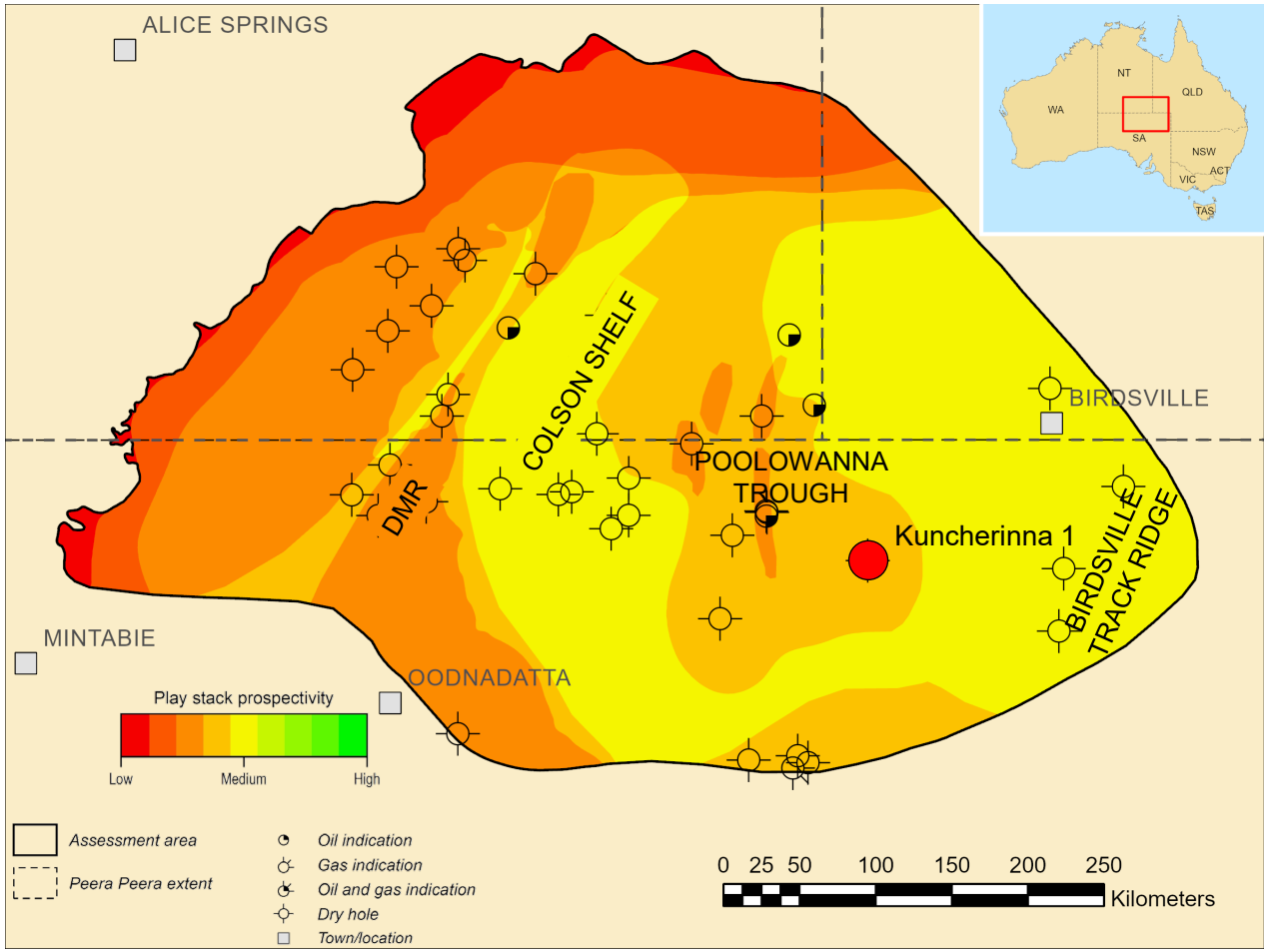
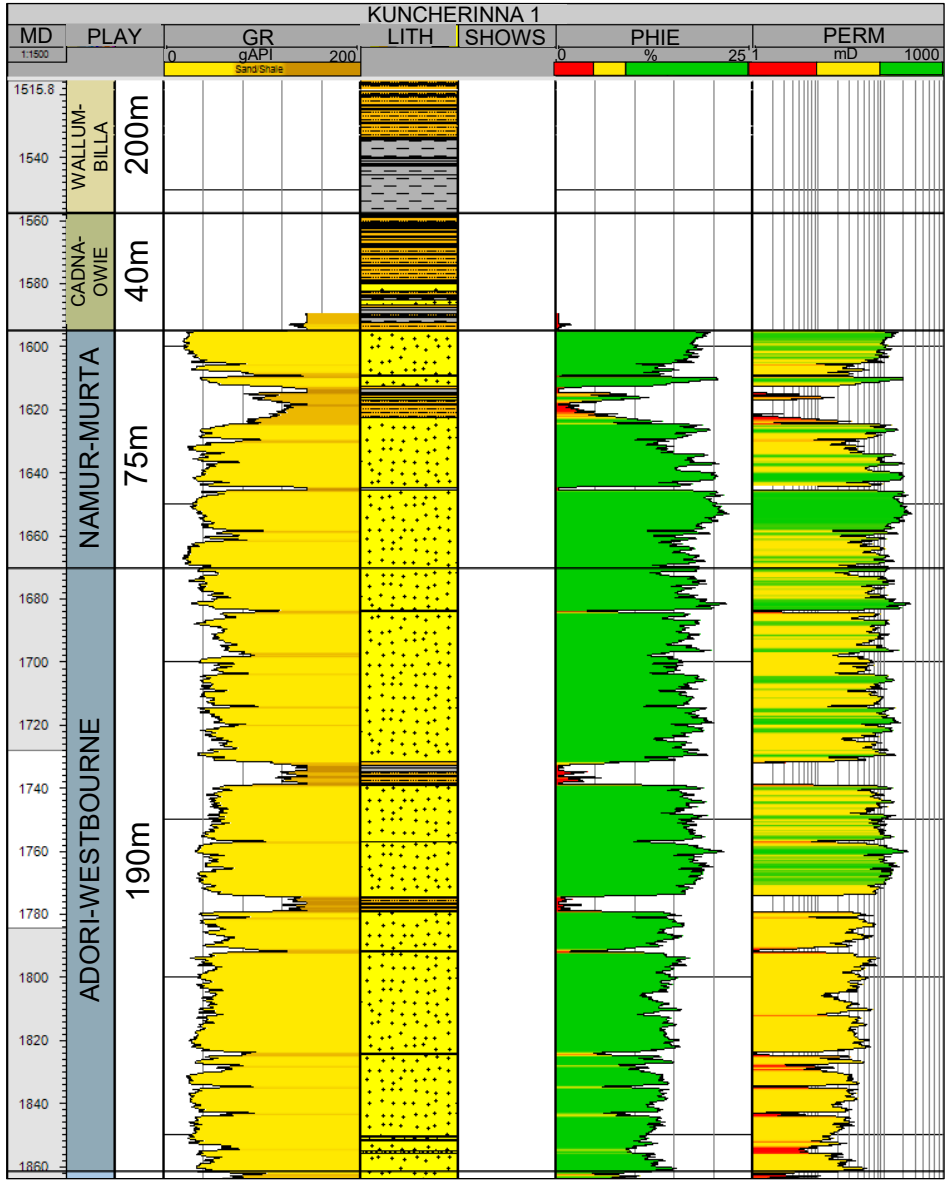
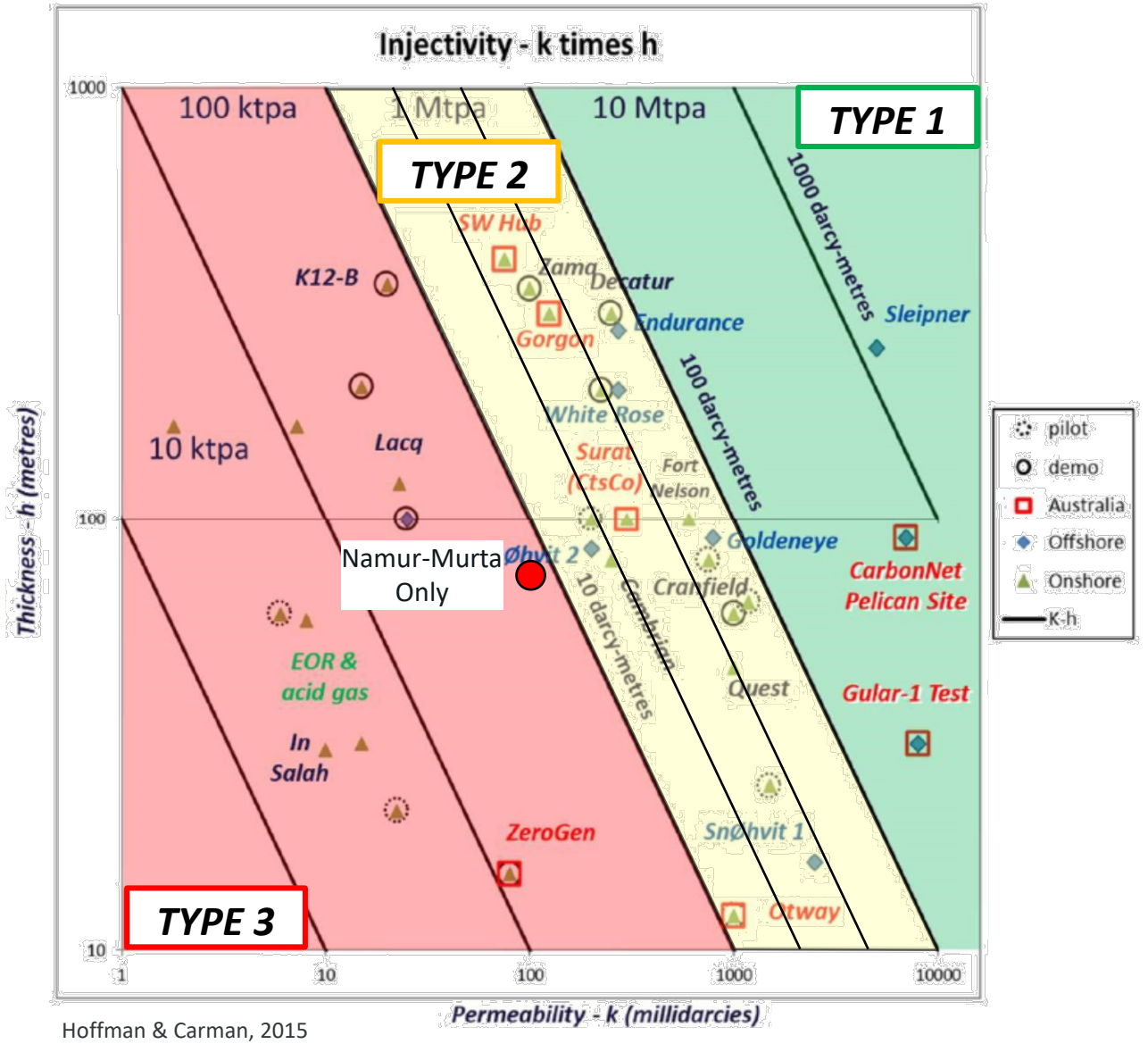


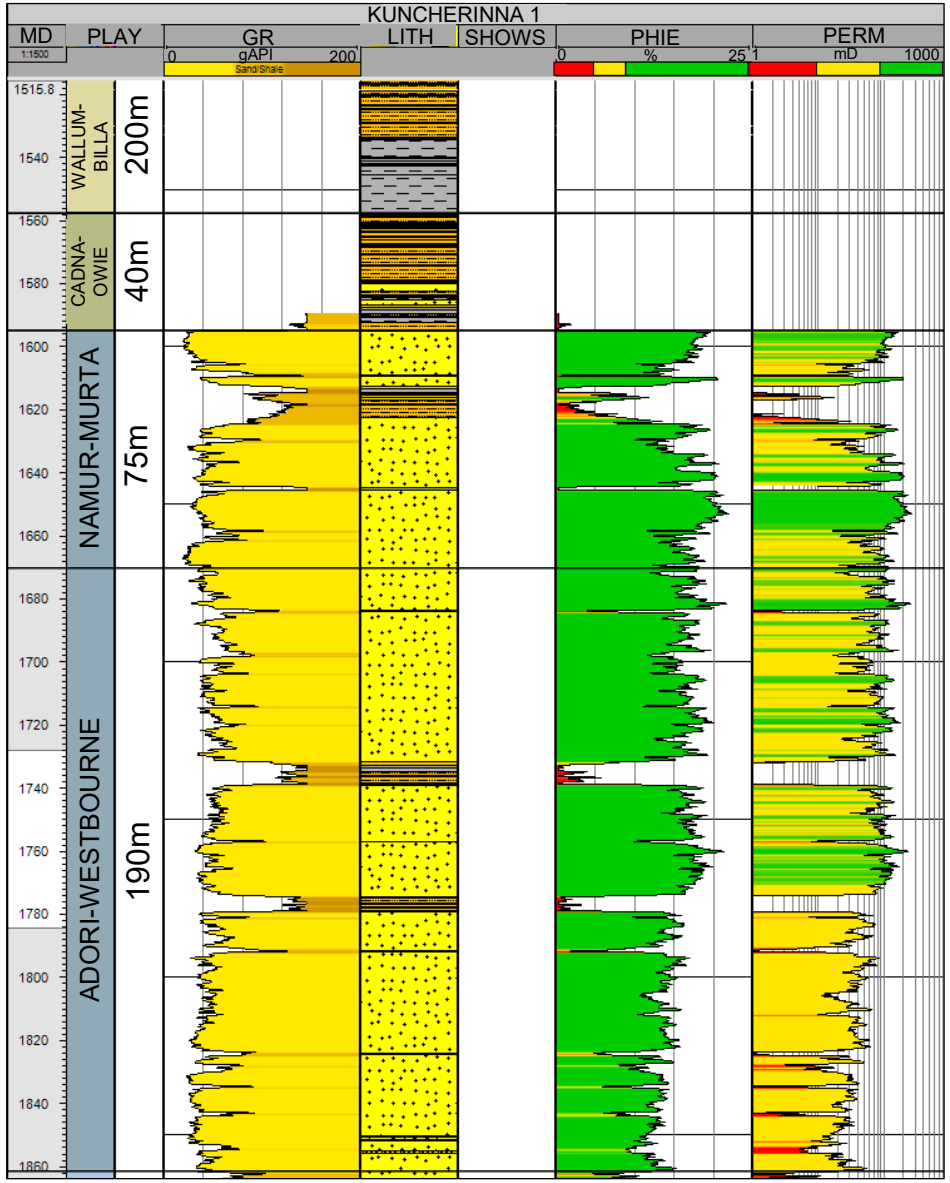
Stacked Namur-Murta & Adori-Westbourne Plays

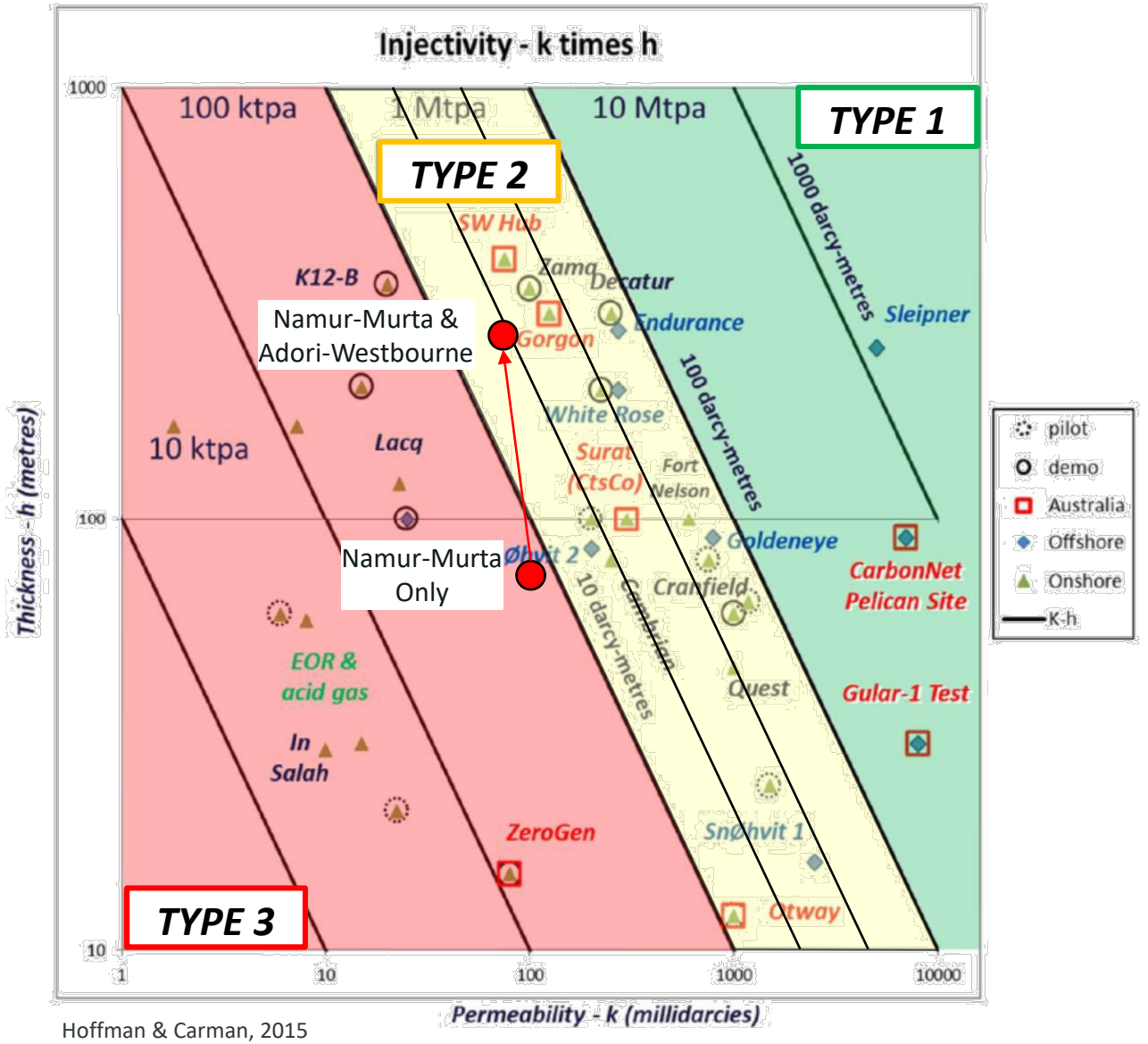




Hoffman & Carman, 2015

Stacked Namur-Murta & Adori-Westbourne Plays





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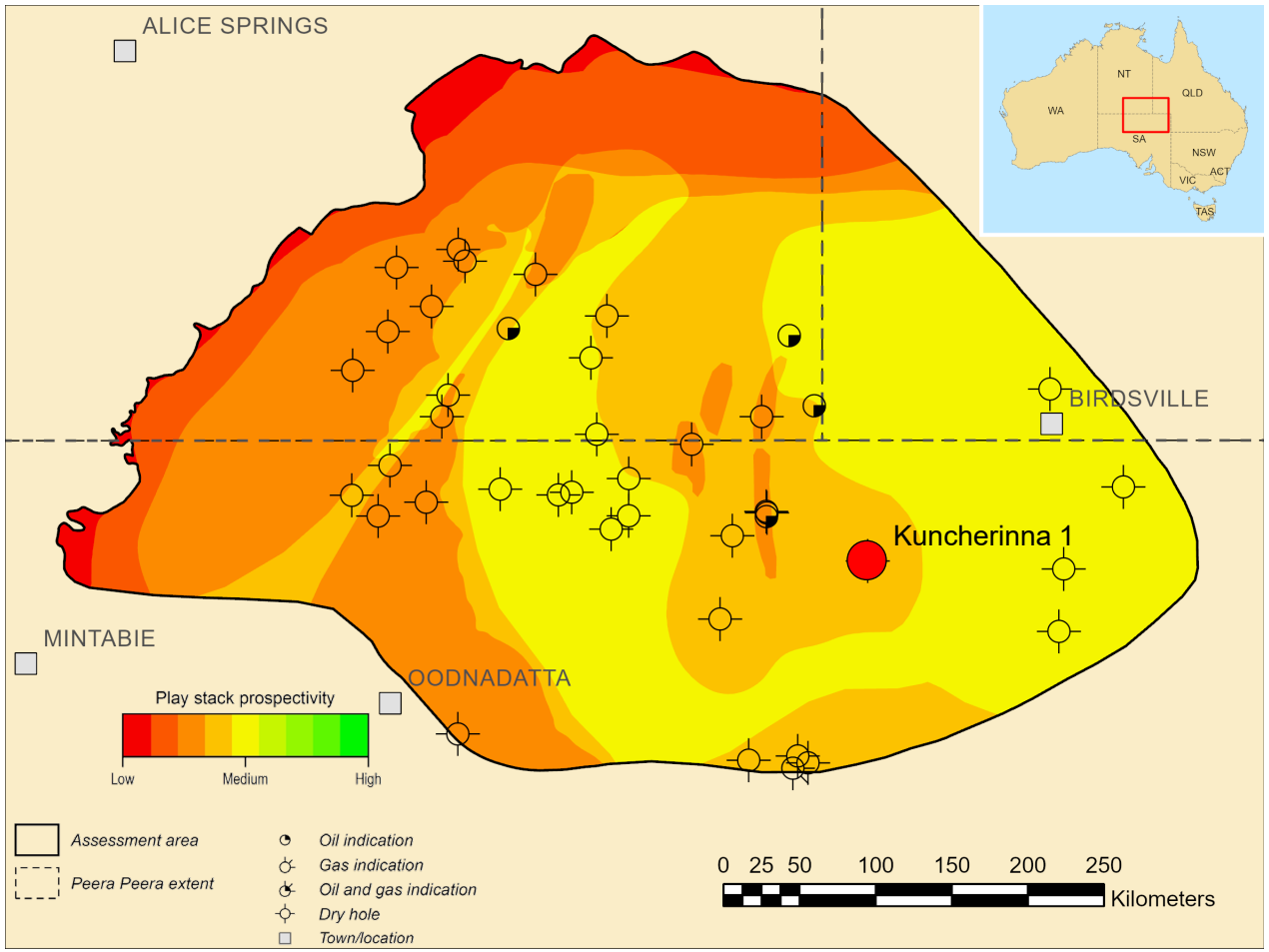
Stacked Namur-Murta & Adori-Westbourne GCS Potential

Namur-Murta CRS Map



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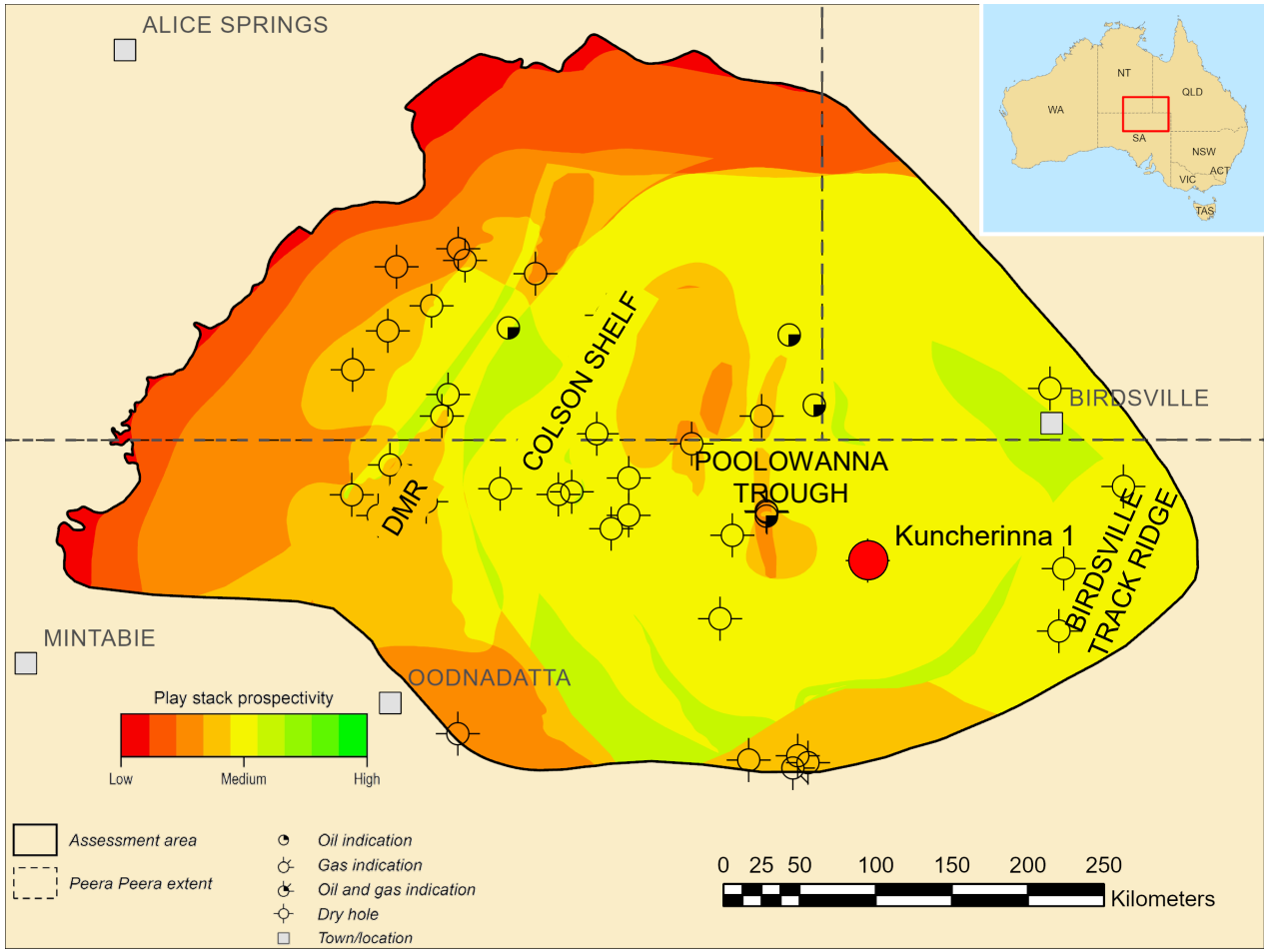

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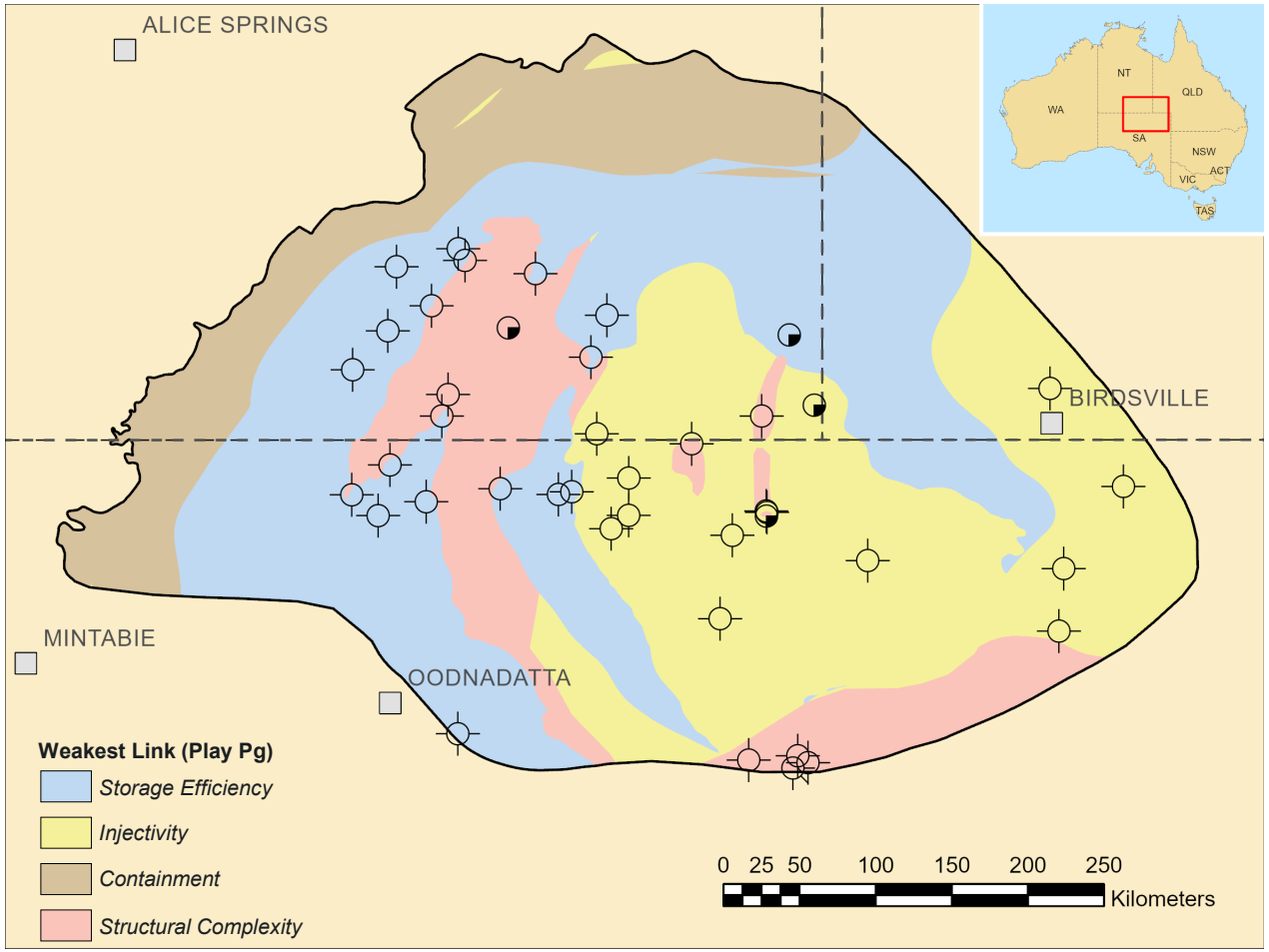

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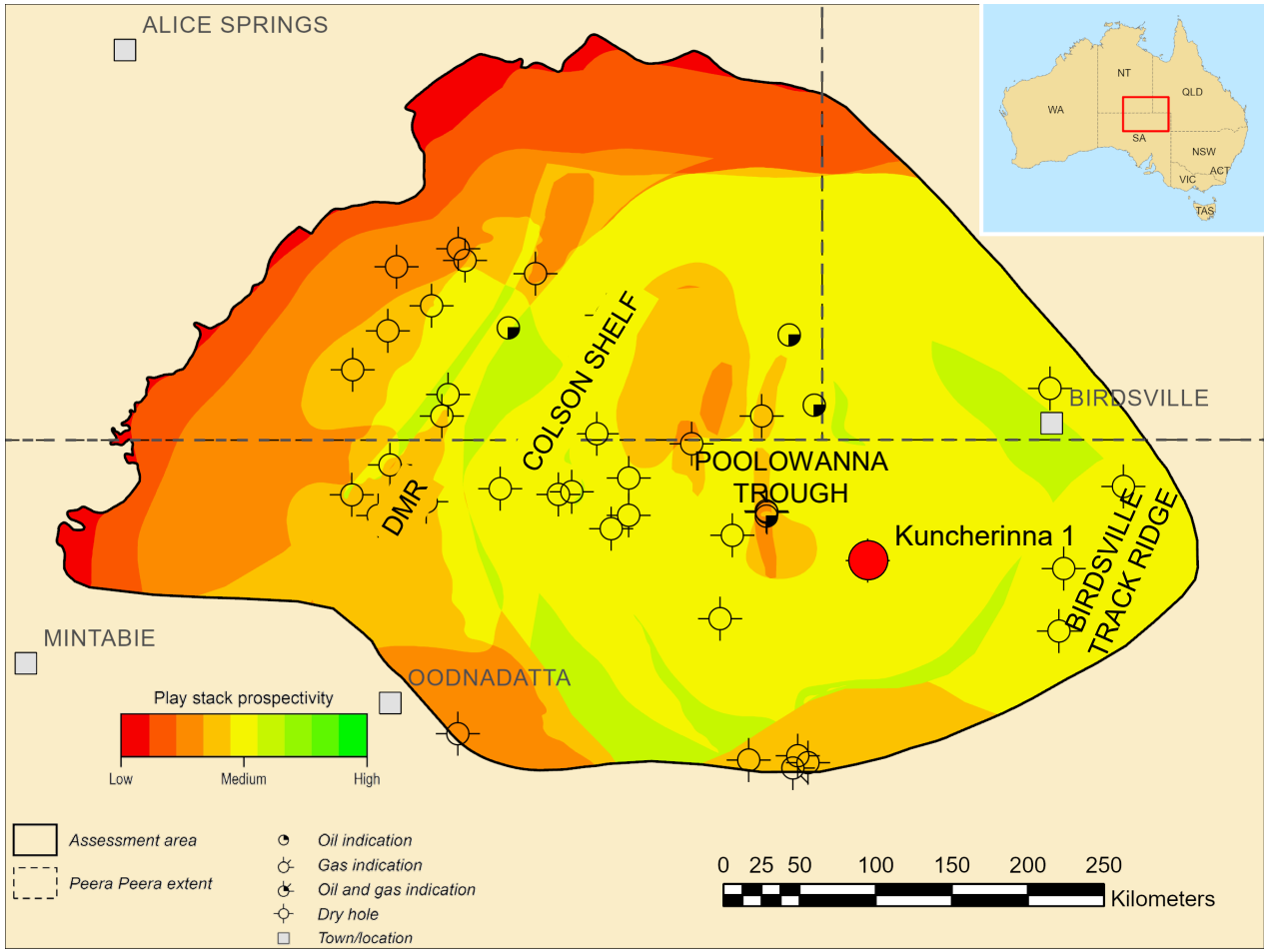

Conclusion

- Multiple sediment hosted energy resources present within a basin
- CRS mapping can be used to evaluate a variety of different resources and identify sweet spots for exploration
- CRS results are driven by elements and metrics used to assess different resources
- Play based exploration approach pivotal to building an understanding of a basin and its petroleum systems and defining core metrics for CRS work

Next Steps

- Qualitative assessment data package available end 2023
- Quantitative assessment fact sheets June 2024

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Exploring for the Future
minerals | energy | groundwater

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Acknowledgments

Barry Bradshaw & David Lund (Geoscience Australia)

Darren Ferdinando (now at Talon Energy Ltd), Mitch Furnass (now at ExxonMobil Australia) & Robin O'Leary (now at Armour Energy)

Further information

Visit our team at the Australian Government booth, 93
EFTF Program: https://www.ga.gov.au/eftf