

UNCONVENTIONAL GAS PROSPECTIVITY CASE STUDY

ConocoPhillips

Cooper Basin, Australia

AWT DISCIPLINES

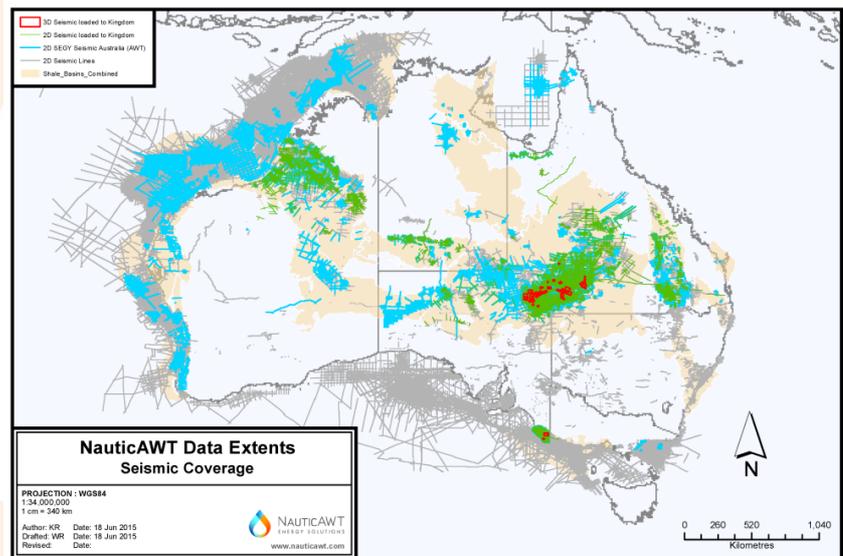
Geology
Geophysics
Reservoir Engineering
Petrophysics
Project management

PROJECT BACKGROUND

AWT was contracted to provide an assessment of the unconventional gas prospectivity within Queensland, this review included the following plays: Permian Tight Gas Play: (Toolachee and Patchawarra), Shale Gas review (Toolebuc Fm) and Deep CSG (Permian Coals). AWT was also requested to supply database of public information for Cooper Basin and overlying Eromanga Basin wells, focussing on gas areas first Patchawarra Trough, Napamerri Trough, Arunta Trough, Skipton Trough etc. and intervening high areas.

Location:

Cooper Basin, Australia



AWT WORKSCOPE

AWT holds a large amount of data in Kingdom, ESRI databases, Petrosys and on the AWT file server. ArcMap is used to query and display the data available in any area of interest. Data packs would be quickly created covering a particular area of interest to include any of the information AWT has collated and interpreted, ConocoPhillips requested the following information:

- Digital well logs
- Digital seismic
- Well Test data
- Geochem Reports
- Infrastructure Data
- Production Data
- Available Core data
- Any other relevant exploration data

Additionally for each of the plays AWT would establish reservoir parameters, reservoir thickness (gross and net sands) and depth over surrounding permits, possible bypassed pay and column heights, cross-sections. An estimate of in-place hydrocarbon volumes would also be undertaken along with a review of key well results, including brief dry-hole analysis, which includes DSTs, recoveries, WCR log analysis, petrology where available and CO2 content.

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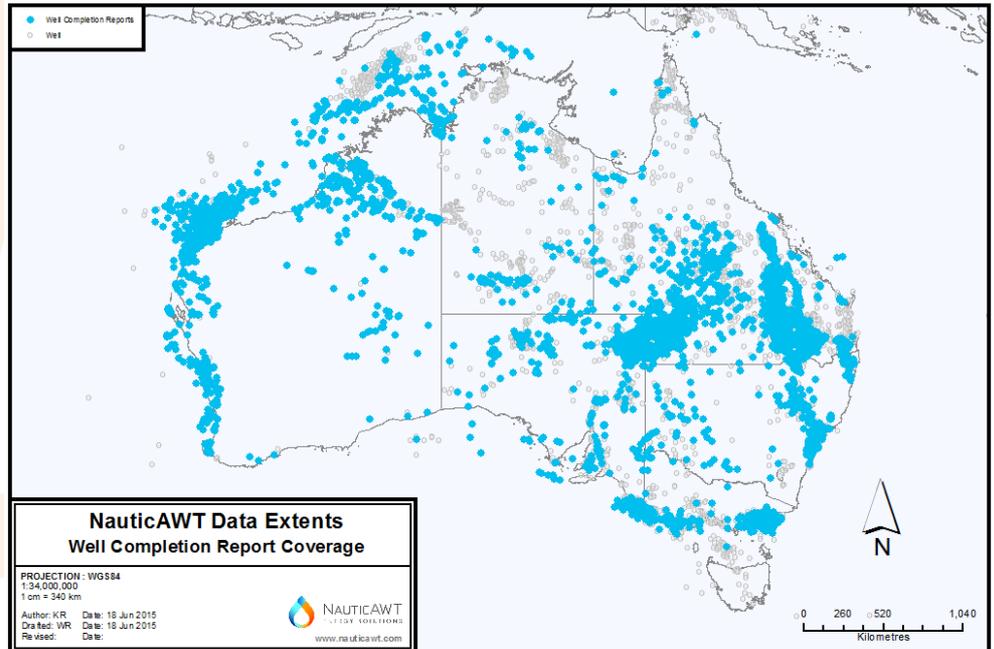
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AWT VALUE ADDED

Based on the review of data an assessment of based on elevated resistivity readings in wells within the Data Area have shown the potential for a tight gas component within the Permian section in the Cooper Basin. Tight gas sands are defined as those between subsea depths of 2,700 m and 2,800 m.

A lowest-known-water has been established, and together with a gas-productive depth of source maturity and inferred gas-saturated sandstone reservoirs, volumes of in-place gas have been estimated. Petrological studies conclude that primary causes of low permeability and porosity in Permian reservoirs are quartz cementation and occlusion by clays (authigenic and allogenic). Also a correlation between gross tight gas sand thickness, petrologically identified clay and calculated V shale content is apparent.

Wells were plugged and abandoned, most likely due to inferences of tight reservoir, and therefore, at time of drilling, non-economic productivity. With current day fracture stimulation technologies, drilling techniques and gas prices, the drilling and associated production of gas from such plays may be economically viable.

AWT provide further recommendations which included:

- Additional detailed petrophysical analyses, in particular to better define effective porosity and permeability values
- Study of petrological and petrophysical analyses to assess producibility and deliverability
- Source generative potential of coals by investigating geochemical details from WCRs, this could also include maturity vs location and depth relationship and peak vs current day generation and entrapment
- Commercialisation Opportunities:
 - resource estimates (risked)
 - completion methodologies of tight sands
 - associated economics
- Application of current fracturing and drilling techniques