Santos Exploration in the Northern Territory
Insights into the Geology of the Amadeus and McArthur basins from New Seismic Data

AGES Conference
March 2014
Santos Exploration in the Northern Territory

2012 was a pivotal year for Santos within onshore Australia, expanding its Exploration acreage by adding nearly 90,000 square kilometres across 2 basins.

- Santos operated Mereenie Field in Amadeus Basin since 1993
- 63,650 km² across 8 Exploration Permits and 2 Retention Leases in Amadeus Basin with Central Petroleum
- 25,400 km² across 3 Exploration Permits in McArthur Basin with Tamboran Resources
- Exploring for both conventional and unconventional plays
Santos Exploration in the Northern Territory

Frontier exploration – 2013 highly successful seismic acquisition campaign revealing promising results for further exploration in both basins

- Limited or no previous seismic existed in the majority of areas targeted by the 2013 acquisition programs
  - OT Downs Sub-basin in McArthur – no data
  - Southern Amadeus – sparse datasets
- 500 km of seismic data within EP 161 in the McArthur Basin
- 1,800 km of regional seismic data across 7 Permits in the Amadeus
Amadeus Basin Exploration
2013 Seismic Acquisition
Amadeus Basin Overview

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Ambrose et al., 2012

Bouger Gravity

PALAEZOIC FOLD & THRUST BELT

CENTRAL HIGH

SOUTHERN MARGIN

NORTHERN MARGIN

PROTEROZOIC FOLD & THRUST BELT

Bouger Gravity
Amadeus Seismic Acquisition 2013

Phase 1 Reconnaissance Seismic Revealing basin architecture, salt tectonics and large structural leads

- 1,800 km of regional seismic data across 7 Permits
- First regional data to be acquired across the southern part of the basin
- Data quality is good in most areas, except where shallow salt present (salt diapirism)
- Following the analysis Santos has the option to acquire 1,000+ km of infill seismic data during the latter half of 2014
Amadeus Seismic Acquisition 2013

An example of the excellent imaging of the complex salt-related structuring.
Amadeus Seismic Acquisition 2013

An example of the excellent imaging of the complex salt-related structuring.

Southwest

Murphy-1

Northeast

10 km
Large structures emerging from new regional dataset. This example shows significant closure updip of the old discovery well Magee-1.
New regional seismic is imaging the complexity of the deeper structuring under shallow post-salt folds... old exploration wells were not located optimally.
McArthur Basin – EP161 OT Downs
2013 Seismic Acquisition
McArthur Basin Overview

Extensive, high TOC, mature, marine source rock reservoirs within the Mesoproterozoic Roper Group of the McArthur Basin.

- Early rift basin with later compressional (transpressional) Structures
- Upper Roper Group marine shales for unconventional prospectivity
- No heritage seismic data over OT Downs Sub-basin
- The area was highgraded based on the gravity low response
Prior to 2013, no seismic existed across OT Downs …

New Seismic was targeted based on the Gravity low

Acquired data confirms extension of Beetaloo Sub-basin

Very promising results from initial seismic

- Good continuity across small jump tie correlation
- Confidence that the prospective Beetaloo sub-basin stratigraphy extends and expands into Santos-Tamboraran acreage within EP 161
Excellent imaging on the new seismic data has revealed continuous Roper Group sediments preserved across OT Downs Sub-basin.
EP161 OT Downs
Dip Line
Preliminary Stack

Highly prospective unconventional play with continuous undeformed shale intervals.
Conclusions
Amadeus & McArthur Basins
Seismic Operations
Local Employment
Pastoralist

Local Employment

- 2013 Amadeus Seismic survey provided 4 employment opportunities with Santos seismic operations at Southern Amadeus
  - CLC conducted a recruitment campaign with Traditional Owner groups and three opportunities were taken up.

- Further opportunities are anticipated on future seismic and drilling operations and associated activities in the Northern Territory
  - including engaging local / Indigenous contracting companies where possible and Santos seismic contractor Terrex re-engaging local employees on future seismic campaigns

Pastoralists

- Successful engagement with landholders
  - 1,800 km Southern Amadeus regional seismic survey spanned multiple properties, with landholders approving access for seismic acquisitions activities
  - 500 km McArthur seismic survey also covered multiple properties, with the landholders granted access

Establishing successful working relationships with landholders and providing local employment opportunities with exploration operational activity.
Conclusions

**Operations**

- Santos is dedicated to ensuring safe and sustainable operations, including close community engagement, in the ongoing exploration of frontier petroleum plays in Amadeus and McArthur Basins.

**Amadeus Basin**

- High quality imaging of a section dominated by a thick, mobile Neoproterozoic salt sequence.
- Demonstrated thick section below base Cambrian with complex tectonics into southern margin Proterozoic foldbelt.
- Confidence in our petroleum prospectivity models - all elements are present: charge, structure, seals, potential reservoirs.
- Next steps is to complete the drilling of the Mt Kitty well, and delineate leads and play concepts that have emerged from the 2013 regional seismic.

**McArthur Basin**

- New seismic has proven the extension of the Beetaloo Sub-Basin eastwards.
- Prospective Kyalla and Velkerri shales will be targeted with drilling later this year.