Todd Energy
North Taranaki Graben farm-in opportunity

Dr I. Brewer
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Todd Energy – natural gas producer in New Zealand

- Generates ~30% of NZ’s hydrocarbons
- 3 Operated and 1 non-operated fields:
  - McKee 100%
  - Mangahewa 100% - currently drilling phase 2 of Field Redevelopment
  - Kapuni 100%
  - Pohokura 26% (Offshore)
- Recently divested minority interests in the offshore Maui and Maari fields
- 4 Exploration permits
- The North Taranaki Graben is the focus of this presentation
North Taranaki Graben farm-in opportunity

Opportunity to invest in a potential cluster development in the North Taranaki Basin:

- The Nimitz permit has two shelfal prospects with a P50 0.5 Tcf of gas condensate in each. Todd 50% and Beach 50%

- Karewa is P50 210 Bcf of discovered gas. 100% Todd. The discovery is very attractive as a tie back to any Nimitz development

- Todd and Beach are looking to farm down 1/3rd of an exploration well in Nimitz at realistic terms

- Todd is considering farming-down a portion of the Karewa discovery to help progress exploration and appraisal of the North Taranaki Graben

- With the April 2017 NZ ban on new offshore exploration permits, this is a good opportunity to provide gas to a future supply-constrained market
Nimitz Permit

- Todd 50% (Operator) and Beach 50%
- Commit to well by April 2020
- Drill well by April 2021 in current Work Programme
- Two prospects with material volumes at shelf water depths
- Pg 15% - 17%
- Evaluated as gas condensate, but could be oil

<table>
<thead>
<tr>
<th>Prospect</th>
<th>Recoverable Gas (Bcf)</th>
<th>Recoverable Condensate (MMbbl)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>P10</td>
</tr>
<tr>
<td>Kokako</td>
<td>500</td>
<td>960</td>
</tr>
<tr>
<td>Korimako</td>
<td>684</td>
<td>1,341</td>
</tr>
</tbody>
</table>

- Prior wells are “shallow commitment wells” but have thermogenic shows
Structural setting

- Kokako prospect is three-way dip and fault bounded trap
Structural setting

- Kokako prospect is three-way dip and fault bounded trap
- Trap formed by large offset normal fault
- 3100 m bml with 360 m of closure
- Covered by 3D seismic

- Korimako is similar and provides running room along structural strike to the north
Reservoir – basin floor fan sands

- Tangaroa Formation: Late Eocene basin-floor fan sands
- ~200 m thickness
- Clean, quartzose sandstone
- Porosities 13 - 22%
- Average permeabilities 83 mD
- Net:Gross 50 to 85%

![Diagram of reservoir and basin floor fan sands](image)
Charge – thermogenic shows in shallow wells

- Mid Cretaceous Taniwha Formation coastal plain coals and coaly mudstones deposited in syn-rift setting
- ~1000 m thick sequence underlies prospects
- Co-expulsion of oil and gas: most likely gas-condensate but could be oil
- Charge modelling indicates late stage burial and maturity
- Fetch area includes large kitchen to south
- Oil and gas shows in shallow wells in the permit
Seal – well developed marine marls

- Tikorangi Formation Oligocene carbonates and marls
- Seal unit > 50 m thick across basin
- Gas column height potential 80 - 250 m from MICP
- Seal considered low risk
- Overpressures across northern Taranaki Basin below Oligocene
- Velocity analysis indicates overpressure at Kokako Prospect
• With a NZ$6 /GJ gas price assumption the P50 NPV10 = NZ$0.5 bln
Undeveloped Karewa gas discovery ~ 25 km south of Kokako

• Todd 100%
• Discovered by Karewa-1
• Recoverable P50 ~207 Bcf
• NPV10 = 0 gas price of NZ $8 – 10 /GJ required for stand-alone conventional platform development
• Worth incremental cashflow of > NZ $390 mm in Nimitz success case as a tie back development
• Requires appraisal well to establish flow rates and test overlying NFE
Karewa Discovery - geological elements

**Reservoir**
- Pliocene Mangaa Fm basin-floor fan sand sequence
- 10 - 30 m reservoir thickness within structural closure
- Clean, quartzose sandstone:
  - Porosities 20 - 25%
  - Permeability 30 - 200 mD
  - Net:Gross 86 - 96%

**Charge**
- Biogenically-derived
- Dry gas > 97% methane
- Structurally conformable amplitude anomaly delineates main gas accumulation
- Nine overlying NFE prospects defined by structurally-conformable seismic amplitudes

**Seal**
- Intra-formational Mangaa Fm shale seals
- Seal overlying Karewa gas accumulation retains 95 m gas column
- Additional NFE prospects < 50 m column height

**Structure**
- Four-way dip trap on 3D seismic
- Crests in NW and south require two wells for drainage
- 95 metres of structural closure
- Spill point at 1930 mSS
**Summary – North Taranaki Graben**

- Todd and Beach are looking to jointly farm down 1/3rd of an exploration well in Nimitz at realistic terms.
- Todd is considering farming-down a portion of the Karewa discovery to help progress exploration and appraisal of the North Taranaki Graben.
- Interested parties should visit the Todd poster presentation for more information.
- Seeking offers by 4Q 2019.

Please contact: ibrewer@toddenergy.co.nz