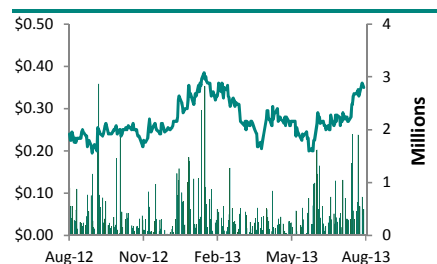


28 August 2013

## Speculative Buy

Price (A\$)	0.35
Fair Value (A\$)	0.74
Ticker	AJQ-AU
Market cap (A\$m)	105.0
Estimated cash (A\$m)	37.1
2P reserves + 2C resources (MMboe)	1.1
<b>Shares in issue</b>	
Basic (m)	300.0
Fully diluted (m)	300.8
<b>52-week</b>	
High (A\$)	0.400
Low (A\$)	0.185
3m-avg daily vol (000)	483
3m-avg daily val (A\$000)	137
<b>Top shareholders (%)</b>	
DGR Global	25.0
JP Morgan	12.7
Oz Management	11.7
Philip McNamara	1.2
Nicholas Mather	0.9
Total	51.5
<b>Management</b>	
Nicholas Mather	E CHR
Robbert de Weijer	CEO
Ray Johnson	GM E&P
Luke Titus	Chief Geo

### Share Price Performance (A\$)



*RFC Ambrian acts as Agency Broker to this company*

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# Armour Energy

## A Protective Investment

Armour Energy is an unconventional petroleum exploration company whose main assets are its north Australian permits, covering 33m acres. Unrisked mean prospective resources in just three of the tenements were independently assessed in March 2012 to be 41Tcf of gas and 2.2Bbbl of condensate.

We are increasing our Armour Energy fair value estimate slightly to A\$0.74/share from A\$0.67/share. We maintain our SPECULATIVE BUY recommendation.

We believe Armour's valuation is compelling. Given Armour's huge acreage and prospective resource base (and that it has discovered conventional gas in the Glyde Sub-basin and confirmed the presence of tight gas at Cow Lagoon and shale gas within the Lawn Hill Shale), we believe that it is being severely undervalued by the market. It is currently trading on an EV/acre multiple of US\$1.83/acre. Twenty industry farm-ins over the last three years had a weighted average EV/acre valuation multiple of ~US\$23/acre.

Armour's multiple strengths seem to be being overlooked by the market. These include:

- *A dynamic Board and management team*, with a strong track record of developing resource companies from scratch into large take-out targets (eg, Arrow Energy & Bow Energy).
- *Resource upside* from appraisal of the 16 permits other than the three currently independently assessed tenements.
- *Armour has signed a Heads of Agreement (HOA) with APA Group* to work together to facilitate the transportation of gas from Armour's northern Australian gas projects to various markets in Mount Isa, Sydney and Queensland.
- *Isa Superbasin and McArthur Basin drilling and completion costs should be substantially cheaper* than those of the Cooper Basin due to shallower target formations that will require lower fracture pressures.

The multi-stage hydro-fracturing and flow testing of the Egilabria-2 lateral well could provide the catalyst for a substantial stock re-rating. This lateral well is designed to test whether the Lawn Hill Shale can generate 'commercial' gas flow rates in ATP 1087P. The well has already been drilled and is awaiting completion, with flow test results expected in the next couple of months.

Our target price is estimated by multiplying Armour's net acreage (where it has independently assessed prospective resources) by a US\$100/acre multiple. Should the Egilabria-2 DW1 lateral well demonstrate clearly commercial flow rates, we would increase this multiple significantly towards that paid by Chevron in its recent Cooper Basin farm-in (US\$900/acre). At US\$900/acre, Armour's ATP 1087P Lawn Hill Shale acreage would be worth US\$1.5bn (or A\$5.66/share).

## Investment Case

We believe Armour Energy is significantly undervalued

We maintain Armour Energy as a SPECULATIVE BUY and are increasing our fair value estimate slightly to A\$0.74/share. We believe Armour Energy is significantly undervalued despite its potential huge resource base. In March 2012 MBA Petroleum Consultants estimated that just three of the permits contained unrisks mean prospective resources of 41Tcf of gas and 2.2Bbbl of condensate. Armour has booked 6Bcf of 2C contingent conventional gas resources for its 2012 Glyde-1 discovery. In April 2013 DeGolyer and MacNaughton estimated that 23 similar conventional gas prospects in the Batten Trough in the McArthur Basin had 264.4Bcf (or 322PJ) of unrisks mean prospective resources in Coxco Dolomite reservoirs. Armour has also booked 100Bcf of mean prospective tight gas resources at Cow Lagoon in EP 176. Regardless of all the above potential, the company trades on an EV/acre multiple of just US\$1.83/acre. This makes it by far the cheapest stock among its peers. The weighted average EV/acre multiple that was paid by industry in 20 Australian unconventional petroleum farm-ins over the last two years was US\$23/acre.

Flow testing the Egilabria-2 well could provide a significant catalyst for the stock

An important catalyst in the next few weeks to months should be the results of the flow testing of the multi-stage, hydro-fractured Egilabria-2 DW1 lateral well. The Egilabria-2 vertical well was drilled in ATP 1087P, Queensland, to test the potential of the Lawn Hill Shale at this location. It spud in May 2013 and reached a total depth of 1,900m in July. While in the Lawn Shale the well was shut-in for an hour to test for gas build up, resulting in a gas flare that burned approximately 3-4m long for around a minute. Armour also experienced significant gas influx at 1,098m and 1,519m while tripping in and out of the drill hole. In July 2013 the Egilabria-2 DW1 lateral well was side-tracked from the Egilabria-2 vertical well at 1,300m to target the 137m thick Lawn Hill Shale Formation. It has been drilled to give a 568m lateral section. Haliburton Energy has been contracted to perform an eight-stage hydraulic fracture stimulation (planned for the beginning of September). Flow back and testing are planned to occur in September/October. The flow rate from this well should give a good indication of the viability of commercial production from shale gas targets in the South Nicholson Basin and Isa Superbasin.

Armour has a strong, experienced, dynamic and well-motivated Board and management team

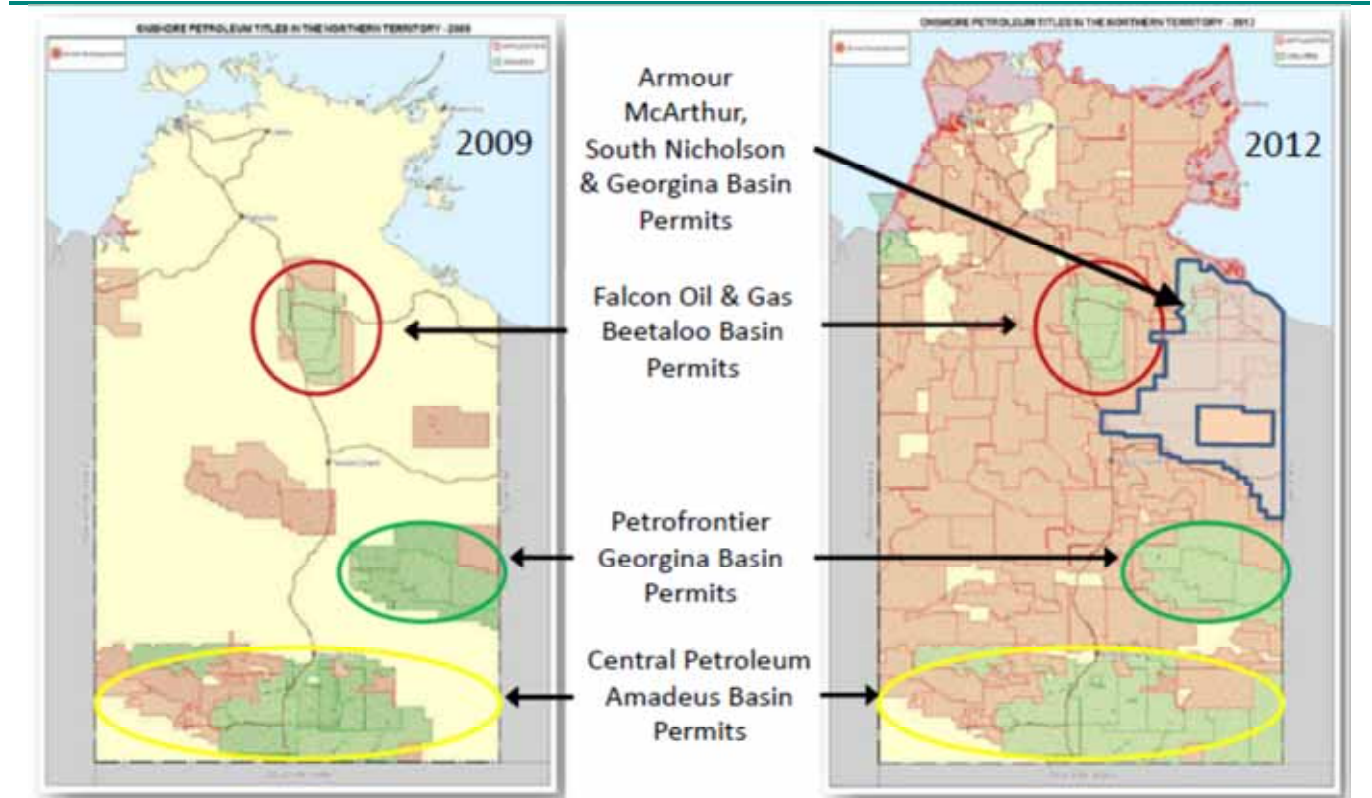
For junior oil companies, we believe that a strong, experienced, dynamic and well-motivated Board and management team is at least as important as the assets the company owns. Strong managements can overcome many challenges that would beat weaker ones. Experienced and dynamic management will adjust the focus of the company to better capture the changing opportunities available over time. We see these traits in the track records of both the Executive Chairman (Nicholas Mather) and Chief Executive Officer (Robbert de Weijer).

Nicholas Mather was a founder/co-founder of three energy companies that were taken out at substantial premiums to their IPO prices: Arrow Energy, Bow Energy and Waratah Coal. We believe that many of the challenges these companies faced (proving up a potentially large unconventional resource base and planning/developing channels to get the resource to market profitably) are similar to those that Armour faces. Robbert de Weijer was previously the Chief Operating Officer of Arrow Energy Ltd, a coal seam gas company acquired by Shell in 2010. Whilst at Arrow Mr de Weijer was instrumental in the company achieving substantial reserve upgrades and increasing gas production. Mr de Weijer's most recent role was as CEO (Australia) for Dart Energy Ltd, an unconventional gas exploration and production company.

Armour has successfully implemented the first part of its smart strategy

Armour used its early-mover advantage to secure 100% ownership of a large contiguous tenement area in Northern Territory (NT) and Queensland (QLD) at low cost, by obtaining exploration permits long before any petroleum resources were proved to be commercial. Figure 91 shows that practically all NT exploration permits are now under application, so any company wishing to gain exposure to petroleum plays in the region will now have to farm in. Armour has also farmed into two Victorian permits. These should provide it with some diversification benefits, including the ability to create year-round newsflow (the weather in NT and QLD will likely only allow drilling for half the year).

Figure 91: Northern Territory Granted and Application Petroleum Exploration Permits in 2009 and 2012



Source: Falcon Oil & Gas, RFC Ambrian estimates

Heads of Agreement (HOA) signed to facilitate the transportation of gas from Armour’s northern Australian gas projects to various markets in Mt Isa, Sydney and Queensland

In June 2013 Armour signed a Heads of Agreement (HOA) with APA Group to work together to facilitate the ultimate transportation of up to 330PJ of gas pa from Armour’s northern Australian gas projects to various markets in Mount Isa, Sydney and Queensland. Pipeline construction by APA would be conditional on a number of key milestones being met by both Armour and APA, including certification by Armour of sufficient gas resources, completion of conditional gas sales contracts and securing production licences and project development funding.

The next step is to add value to its acreage through appraisal/exploration

The next step is to add value to its acreage through appraisal and exploration. Management now aims to increase the value of its acreage by proving up the resource base. Flow testing of the Egilabria-2 DW1 lateral well is an important part of this process. Once value has been added to its acreage, Armour management may farm out some of its interest in it for the carry of future exploration, appraisal and development costs. Management has historically designed smart work programmes that combined the exploration for conventional petroleum fields with the exploration and appraisal of the unconventional resources, and we expect this to continue.

We believe there is further resource upside to be reported by Armour

Armour's Batten Trough drilling costs are likely to be substantially lower than those of the Cooper Basin

Armour Energy's main permits are located within areas that are primarily used for livestock grazing

Fair value breakdown

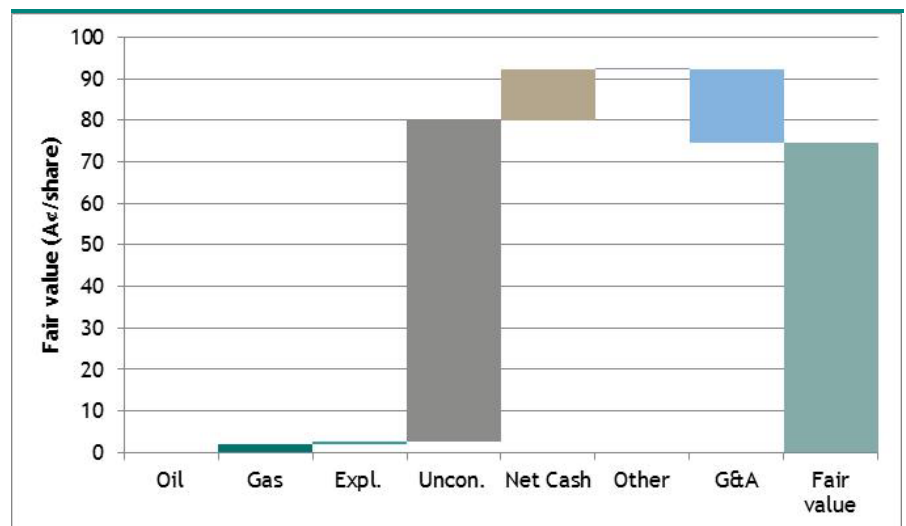
We believe there remains huge resource upside to be reported in Armour's acreage; it has only had the resources of three of its 19 permits independently assessed. Armour's prospective resources could increase substantially as other permits are explored and appraised in more detail.

We estimate that Armour's unconventional drilling costs are likely to be US\$3-4m less than peer group operators in the Cooper Basin Nappamerri Trough (ie, US\$5-6m/horizontal fractured well in the Batten Trough and South Nicholson Basin vs. US\$8-10m/well in the Nappamerri Trough). This is because the Barney Creek and Lawn Hill formations that Armour is targeting are only 1.5-2.5km deep rather than the 3-4km deep REM shales in the Cooper Basin Nappamerri Trough. Batten Trough and South Nicholson Basin carbon dioxide gas removal costs are also likely to be lower than those of Cooper Basin shale gas. The carbon dioxide content of the Barney Creek and Lawn Hill shales gases are negligible, based on drilling results to date. Cooper Basin shale gas is more mature and has carbon dioxide levels that range from 10-30% (average 15%).

Armour Energy's permits are located within areas that are not prime cropping land, and are primarily used for livestock grazing. The company's NT and QLD exploration permits are located within a low population density area, implying that drilling and testing activities should have a minimal impact on regional population centres.

We estimate the fair value of Armour's shares at A\$74.1. In our view, the vast majority of Armour's value is due to its unconventional acreage. We have valued Armour's South Nicholson Basin acreage by multiplying the 1.7m acres that MBA Consultants assessed were prospective in ATP 1087 by a US\$100/acre multiple. This multiple reflects the early stage of the appraisal programme. Should the Egilabria-2 DW1 lateral well demonstrate clearly commercial flow rates, we would increase this multiple significantly towards that paid by Chevron in its recent Cooper Basin farm-in (US\$900/acre). At US\$900/acre, Armour's ATP 1087P Lawn Hill shale acreage would be worth US\$1.5bn (or A\$5.66/share).

Figure 92: Armour Energy Fair Value Breakdown



Source: RFC Ambrian estimates

## Risks

Armour Energy is subject to the usual risks that a junior upstream petroleum exploration and production company faces. These include: geological/technical, political/regulatory, commercial, operational, capital access, weather related and environmental.

A key risk that is more specific to Armour is that it may not be able to discover sufficient commercial gas reserves to justify building pipelines to major markets, potentially leaving the gas stranded. However, should Armour discover only relatively small amounts of conventional gas, we believe these could be successfully marketed to local mines. Armour is planning a three-well FY14 Glyde Sub-basin conventional gas exploration programme, and some of the planned exploration wells might not be successful.

Unconventional petroleum production is yet to be proved commercial in Australia. Should petroleum prices and flow rates from unconventional wells not be sufficient to give an economic return on the investment, Australia's unconventional resources will not be developed.

In August 2012 the Victorian Government issued a moratorium on fracture stimulation; this has delayed the exploration and exploitation of unconventional resources that would require this technique. Armour's direct interests in Victorian licences (and its investment in Lakes Oil and its option over PRL 2) are affected by this ban. We believe that Gippsland Basin tight gas resources are substantial and could be highly profitable over the coming years as East Coast gas prices rise. For this to happen, the moratorium on fracture stimulation will need to be lifted.

## Management

Nicholas Mather – Executive  
Chairman

Mr Mather has been involved in the junior resource sector for 30 years. He is Managing Director and co-founder of DGR Global, and was co-founder of Arrow Energy, where he served as Executive Director until 2004. He was also founder and Chairman of Waratah Coal until December 2008. He was co-founder and Non-executive Director of Bow Energy until its takeover by Arrow Energy in January 2012 for A\$550m.

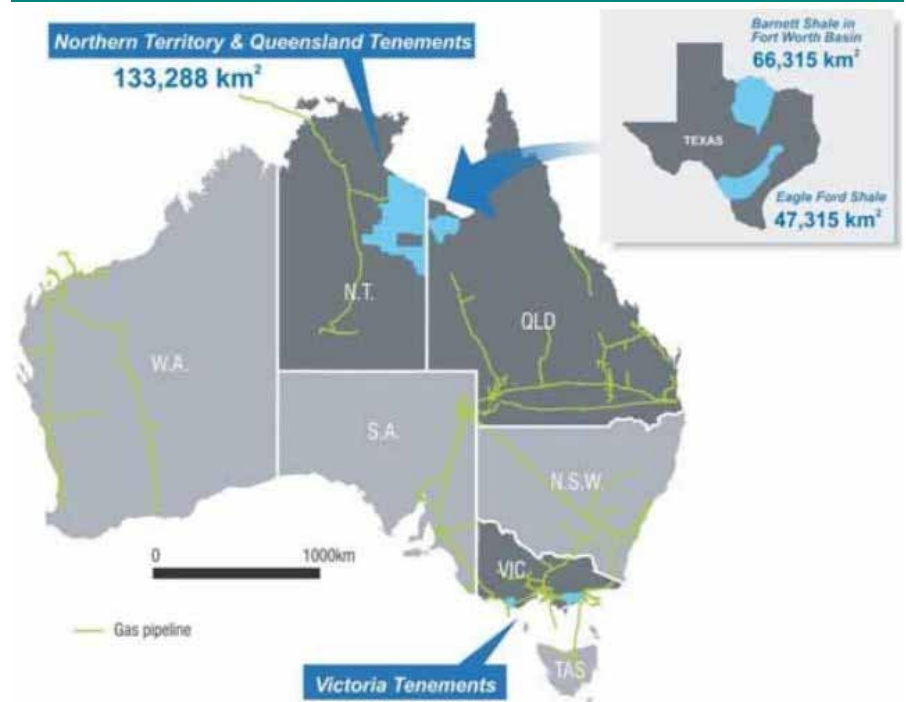
Robbert de Weijer – Chief  
Executive Officer

Mr de Weijer is an international oil and gas executive experienced in high volume field operations at both exploration and development stages. Mr de Weijer's early career was with Shell International and culminated in him managing Shell's North Sea assets. He was previously the Chief Operating Officer of Arrow Energy Ltd, a coal seam gas company acquired by Shell in 2010. Whilst at Arrow Mr de Weijer was instrumental in the company achieving substantial reserves upgrades and increasing gas production. Mr de Weijer's most recent role was as CEO (Australia) for Dart Energy Ltd, an unconventional gas exploration and production company. Robbert joined Armour Energy as CEO in July 2013 to drive the company's project and corporate development initiatives.

## Operations

Armour has large acreage (a net 33.35m acres) in three Australian states: Northern Territory, Queensland and Victoria. We believe its acreage combines both high-impact potential conventional and unconventional oil and gas opportunities.

Figure 93: Armour Energy Assets in Australia



Source: Armour Energy

### Northern Territory and Queensland

Armour's Northern Territory and Queensland acreage is contiguous, covering 133,288km<sup>2</sup> across multiple sedimentary basins. Armour's acreage is roughly twice the size of the Barnett Shale in Texas, US. In the Northern Territory Armour has been granted four tenements, EP 171 and EP 176 (granted June 2011), EP 174 and EP 190 (granted November 2012), and has thirteen permits under application, pending grant. In Queensland it has been granted ATP 1087 and is the preferred tenderer on ATP 1107.

In March 2012 MBA Petroleum Consultants estimated that three of these tenements (EP 171, EP 176 and ATP 1087P) had combined unrisksed mean prospective unconventional resources of 41Tcf of gas and 2.2Bbbl of liquids. Since then Armour management has identified further substantial possible unconventional resources in the Riversleigh Formation in ATP 1087.

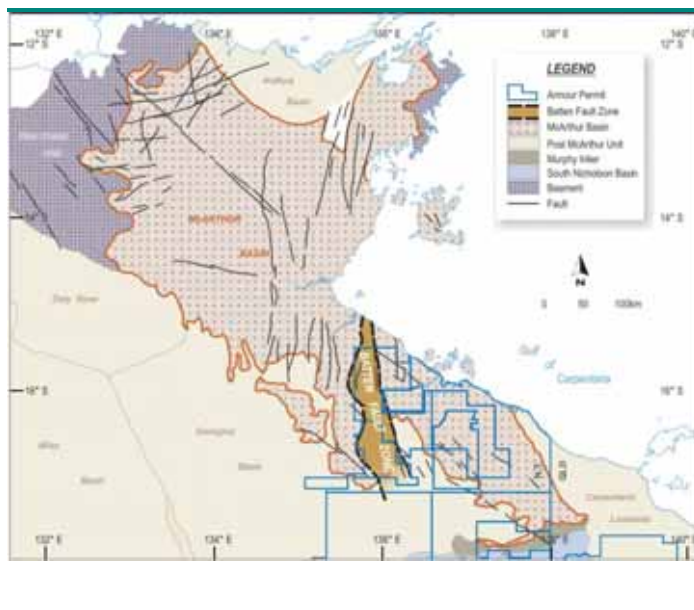
In April 2013 DeGolyer and MacNaughton estimated that 23 conventional gas prospects in the Batten Trough, McArthur Basin, had 264.4Bcf (or 322PJ) of unrisksed mean prospective resources in Coxco Dolomite reservoirs. It also estimated that conventional gas 2C contingent resources from the Glyde-1 target area were 6.0Bcf (or 7.4PJ) of gas. Armour management believes that there are additional conventional oil and gas resources in ATP 1087.

**Northern Territory –Southern McArthur Basin Geology**

The McArthur Basin covers 180,000km<sup>2</sup> and overlies the eastern edge of the north Australian Craton. It is divided both tectonically and geographically into southern and northern basins, bisected by the Urupunga Fault Zone. The most northerly of Armour’s permits, EP 171, 173, 176, 190 & 193, lie in the southern McArthur Basin. This Sub-basin contains approximately 12km of middle Proterozoic flat-lying to gently folded sediments. These were deposited in shallow to deep water environments, dominated by the north-trending half grabens of the Batten Fault Zone.

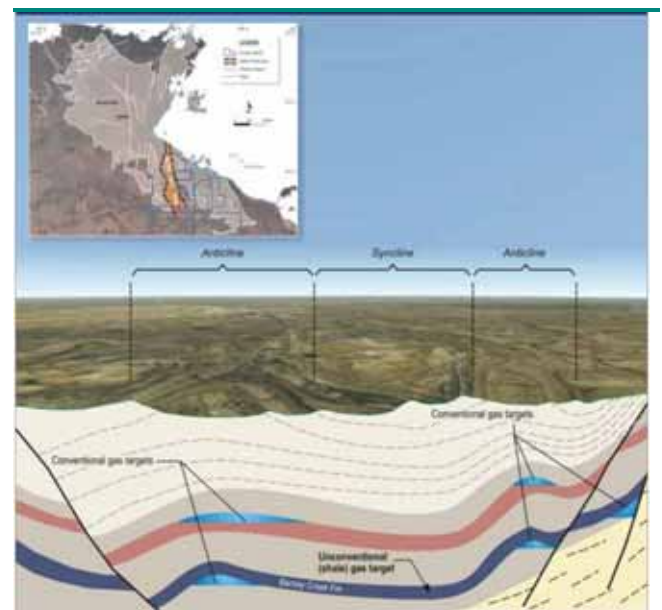
This area contains a very thick sequence of carbonaceous siltstone, known as the Barney Creek Formation. We believe this formation is likely to be the main hydrocarbon source rock, seal and shale play in the basin. It is a marine source rock and has an average TOC of ~2% and Type I kerogens. MBA Consultants believes that it is dry gas mature and wet gas mature within much of the Batten Trough. It may even be early oil mature at or close to the surface in some areas. The Barney Creek Formation is regionally extensive and up to 400m thick. There could be other potential source rocks in the Lynott and Reward formations.

Figure 94: Overview of the McArthur Basin



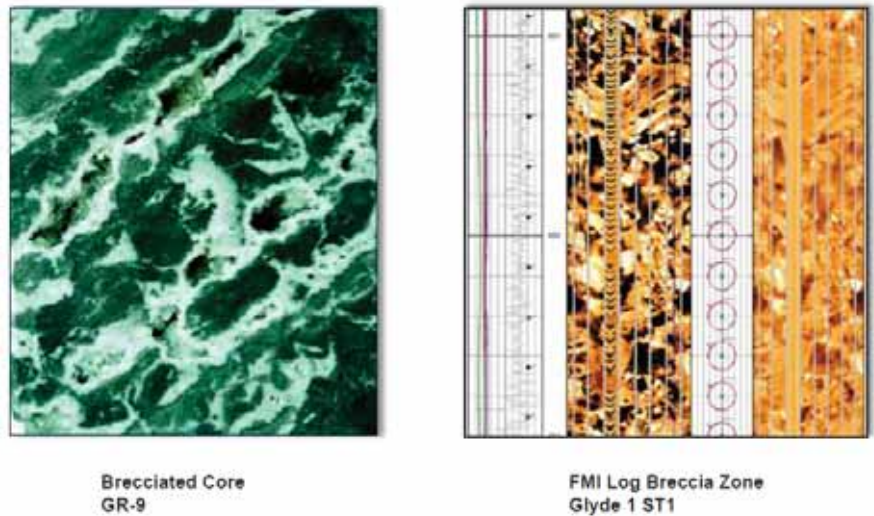
Source: Armour Energy

Figure 95: Cross Section of the Batten Trough



Source: Armour Energy

Armour considers the most prospective conventional reservoir within EP 171 and 176 to be the Coxco Dolomite due to the likelihood of secondary vuggy porosity development and brecciation. The permeability in the Coxco Dolomite is potentially formed by brecciation and fracturing along faults. Adjacent to the margin of the Batten Fault Zone is the Glyde Sub-basin, which is a fault-bounded depocentre. It is in the Coxco Dolomite within this sub-basin where Armour made its conventional Glyde-1 ST1 lateral well gas discovery in August 2012. Management considers the trapping mechanism to be analogous to the Trenton-Black River Formation trapping found at the Albion-Scipio Field in the Michigan Basin, US. Cores from this well and Amoco’s GR9 well show the brecciation (see Figure 96). Another potential conventional objective is the Reward Dolomite Formation.

**Figure 96: GR-9 and Glyde-1 ST1 Coxco Dolomite Cores**


Source: Armour Energy

#### Queensland –Georgina and South Nicholson Basins’ Geology

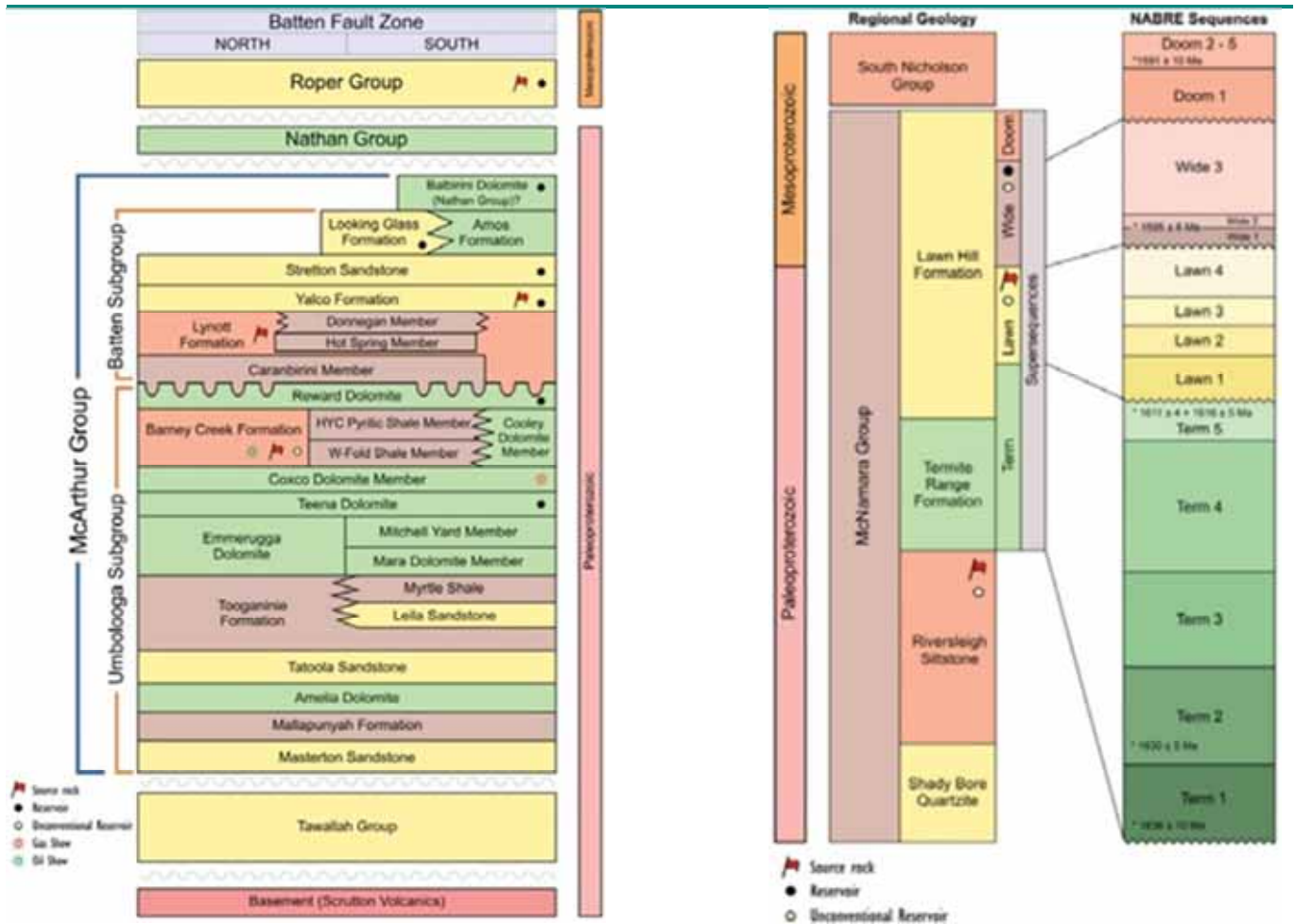
Armour’s ATP 1087 tenement covers parts of the Georgina and South Nicholson basins. The Georgina Basin is a 330,000k<sup>2</sup> intracratonic sedimentary basin. It unconformably overlies the McArthur and South Nicholson basins and the Lawn Hill Platform. The South Nicholson Basin unconformably overlies the Lawn Hill Platform. The Northern Lawn Hill Platform comprises an area of approximately 16,000km<sup>2</sup>. Thick packages of Proterozoic strata outcrop in the region, although large areas are covered by younger strata. Armour considers potential shale gas source rock/reservoirs within these basins to be:

- Shale within the Lawn Hill Formation
- Riversleigh shale/siltstone sequences

In particular, Armour has identified potential shale gas plays in the Wide and Lawn supersequences of the Lawn Hill Formation, and within the River Supersequence of the Riversleigh Sandstone, both members of the McNamara Group. These are aerially extensive, thick (250m) and range in depth from 300m to over 1,900m. They both contain some sections with TOC (2.5-7.0%) sufficient for valid source rock potential. They have a range of porosity of 7-11%, and MBA Consultants estimates that they have reached a level of thermal maturity for dry gas generation.



Figure 97: McArthur Basin and South Nicholson Basin Stratigraphy



Source: Armour Energy

## Victoria

In Victoria Armour owns 18.6% of the share capital of Lakes Oil on a fully diluted basis, farmed into both PEP 169 and PEP 166, and has an option to buy interests in PRL 2.

### PEP 166

PEP 166 covers 1,751km<sup>2</sup> of the Onshore Gippsland Basin, where in addition to its stake in Lakes, Armour holds a 25% interest earned by funding the Holdgate-1 well. It has a right to earn up to 51% by drilling an additional well, or alternatively expending A\$4.75m on exploration. The main targets are the extensive gas resource in the Strzelecki Group and oil in the Rintoul Creek Sandstone.

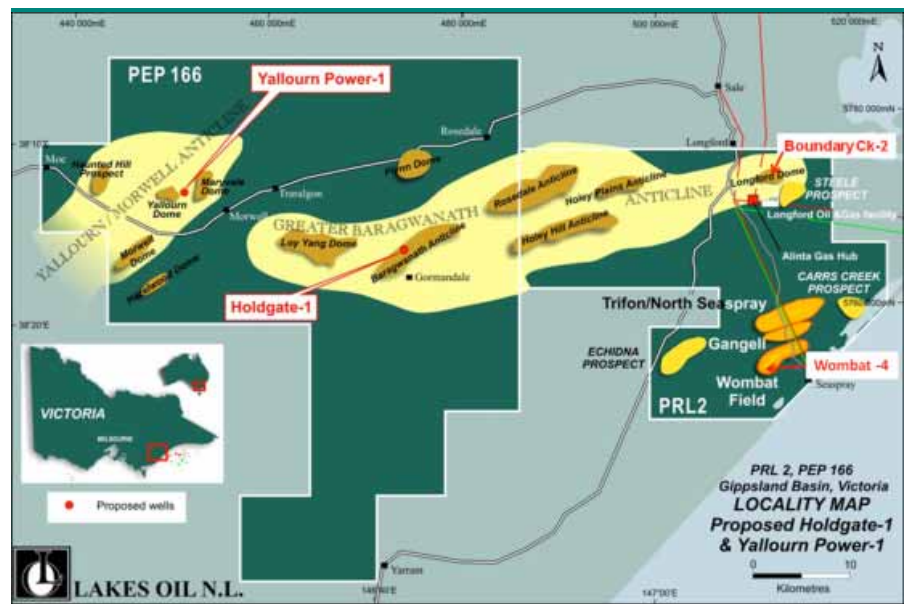
### PRL 2

PRL 2 is in the Onshore Gippsland Basin. Armour has bought an option to acquire 50% of Lakes Oil's interest in the Trifon and Gangell block in PRL 2 and a 25% interest in the balance of PRL 2 for a total of A\$30m. PRL 2 is considered prospective for unconventional gas. Gaffney, Cline and Associates have estimated 1.68Tcf of contingent resource within the Strzelecki Group in PRL 2.

### PEP 169

Armour has a 51% interest in PEP 169, which covers 1,133km<sup>2</sup> in the Otway Basin. PEP 169 hosts the 2012 Moreys-1 gas and condensate discovery and the Otway-1 target.

Figure 98: Map of PEP 166 and PRL 2



Source: Lakes Oil

### The Gippsland and Otway Basin Geology

The Gippsland Basin is a late Jurassic to Cenozoic, east-west trending basin on the south-east margin of Victoria’s continental shelf. Covering about 46,000km<sup>2</sup>, about two-thirds of the basin lies offshore in shallow water of less than 200m. Hydrocarbons are predominantly sourced from the Upper Cretaceous to Early Tertiary Latrobe Group, which is Type II-III kerogen, organic-rich, coastal plain shales and coal. Sediment thickness reaches over 7.5km.

Rifting began in the Early Cretaceous, in association with the continental break up of Gondwana, resulting in a system of grabens and half-grabens. Compressional tectonism from the Late Eocene caused a series of anticlines, which have trapped oil and gas accumulations. The basin is also considered highly prospective for onshore unconventional gas. The Strzelecki Group sediments within the onshore and offshore Gippsland Basin have the potential to generate significant quantities of dry gas. The Strzelecki Group appears to have broadly similar source rock quality to its temporal equivalent, the proven gas-generating Eumeralla Formation in the Otway Basin. Gas held in onshore fields, such as Wombat, was likely generated from the Strzelecki Group.

The Gippsland is one of the most prolific and mature hydrocarbon provinces. The first big Australian oil discovery was credited to the onshore Gippsland Basin in 1924, when a water well, Lake Bunga-1, encountered a 15m oil column. More than 90% of current production is associated with the Gippsland Basin Joint Venture, a 50/50 JV between BHP and ExxonMobil Australia. Hydrocarbons are produced from a series of fields, including Barracouta, Snapper and Marlin, and brought through a network of pipelines to the onshore processing facilities near Longford.

The Otway Basin covers an area of 150,000km<sup>2</sup>, 80% of which lies offshore. Onshore it spreads across both South Australia and Victoria. The basin was formed in the Mesozoic during the break up of Gondwana, and the separation of Antarctica and Australia. It is filled with Late Jurassic to Recent sediments. There are two key sedimentary sequence targets for petroleum exploration: the Crayfish Sub-group and Casterton Formation.

## Unconventional Targets

### Queensland

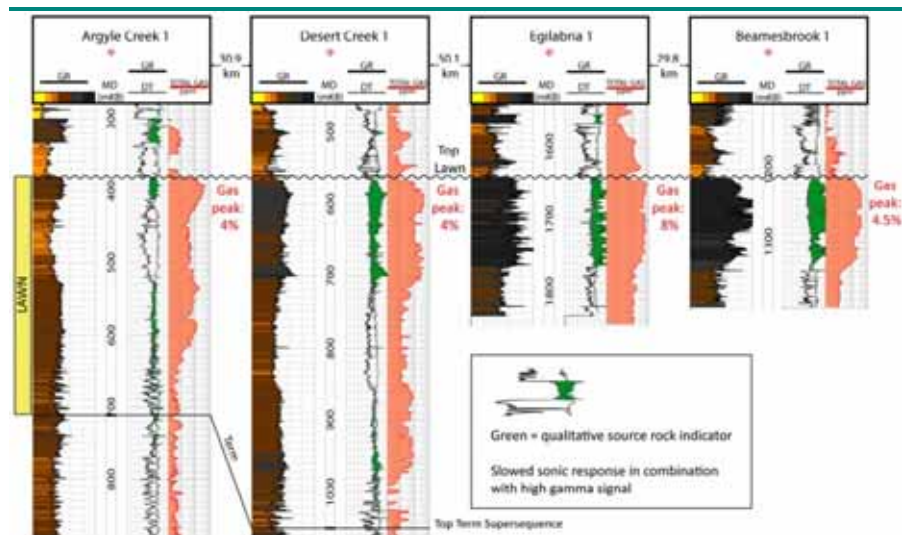
Armour has identified potential shale gas plays in the Wide and Lawn Supersequences of the Lawn Hill Formation and within the River Supersequence of the Riversleigh Sandstone, both members of the McNamara Group.

In March 2012 MBA Consultants estimated that ATP 1087 had unrisksed mean prospective unconventional resources of 22.5Tcf of gas and 242MMbbls of liquids in the Lawn Supersequence. P50 volumes were used in conjunction with the P50 area to calculate a prospective resource of 3.24Bcf/km<sup>2</sup> for the Lawn Supersequence. More recently, Armour management identified a secondary unconventional shale gas target within the Riversleigh Shale. The Riversleigh Shale has recorded significant gas shows of up to 2.5% on mud logs in the Argyle Creek-1 and Desert Creek-1 wells in the western areas of ATP 1087. Management estimates that the Riversleigh Shale may have 18Tcf of gas-in-place. Armour has just completed a 3,000km<sup>2</sup> airborne geophysical survey across western ATP 1087 to complement the reprocessed seismic over the eastern part of the licence.

### Comalco wells of the 1990s

In the 1990s Comalco drilled four wells across the extended Lawn Hill and Riversleigh gas exploration fairway: Argyle Creek-1, Desert Creek-1, Egilabria-1 and Beamesbrook-1. These wells all encountered good gas shows, from the Lawn Shale interval, with up to 8% gas recorded in mud logs during drilling Egilabria-1. The wells, in conjunction with more than 1,100km of existing seismic data, delineated a Lawn Shale exploration target area of approximately 1,400km<sup>2</sup> within the eastern part of the licence. Additional prospectivity has been identified in the underlying Riversleigh Shale that extends a gas exploration fairway of an additional 6,000km<sup>2</sup> to the west across ATP 1087 and south into ATP 1107.

Figure 99: West to East Stratigraphic Section of the Lawn Hill Pay Zone Across ATP 1087



Source: Armour Energy

### Egilabria-2 vertical well

- ATP 1087 (Armour: 100%)

Armour was granted this permit in December 2012. It has already undertaken a reprocessing of a majority of the 1,100km vintage seismic lines and re-analysed the Comalco well log data. The Egilabria-2 vertical well was the first well of the 2013 drilling campaign. It is located in the eastern area of ATP 1087, near the historic Egilabria-1 well drilled by Comalco in 1992. It spud in May 2013 and reached a total depth of 1,900m in July. While in the Lawn Hill Shale the well was shut-in for an hour to test for gas build up, resulting in a gas flare that burned approximately 3-4m long for around a minute. Armour also experienced significant gas influx at 1,098m and 1,519m while tripping in and out of the drill hole.

### Egilabria-2 DW1 lateral well

In July 2013 the Egilabria-2 DW1 lateral well was side-tracked from the Egilabria-2 vertical well at 1,300m to target the 137m thick Lawn Hill Shale Formation. It was drilled to give a 568m lateral section. Haliburton Energy has then been contracted to perform an eight-stage hydraulic fracture stimulation (planned for the beginning of September). Flow back and testing are planned to occur in September/October. The flow rate from this well should give a good indication of the viability of commercial production from shale gas targets in the South Nicholson and Isa super-basins. After this Armour plans to drill the Egilabria-4, to test the aerial extent of the play. The Egilabria-4 well will drill into the Riversleigh Shale, and also test a potential conventional pinch-out oil and gas play at the base of the Mesozoic Carpentaria Basin.

### Northern Territory

The Barney Creek Formation is the primary target for a shale gas play in the southern McArthur Basin. It is regionally extensive, thick, with an average 2% TOC concentration and oil-prone organic matter type. The shale is finely interbedded, with high dolomitic and silt components, providing favourable conditions for large volumes of gas to be held in pore spaces. The rocks are also likely to be well suited to fracture stimulation. In March 2012 MBA Consultants estimated that this shale gas play in EP 171 and EP 176 had unrisksed mean prospective resources of 18.6Tcf of gas and 1,962MMbbl of associated liquids.

**Table 54: Shale Gas Prospective Resources within Barney Creek Shale Gas Play, EP 171, EP 176, Northern Territory**

Area	Gas mean volume (Tcf)	Condensate mean volume (MMbbl)
EP171 - dry gas	0.1	2
EP171 - wet gas	11.1	1,257
EP176 - dry gas	1.2	14
EP176 - wet gas	6.1	690
<b>Total</b>	<b>18.6</b>	<b>1,962</b>

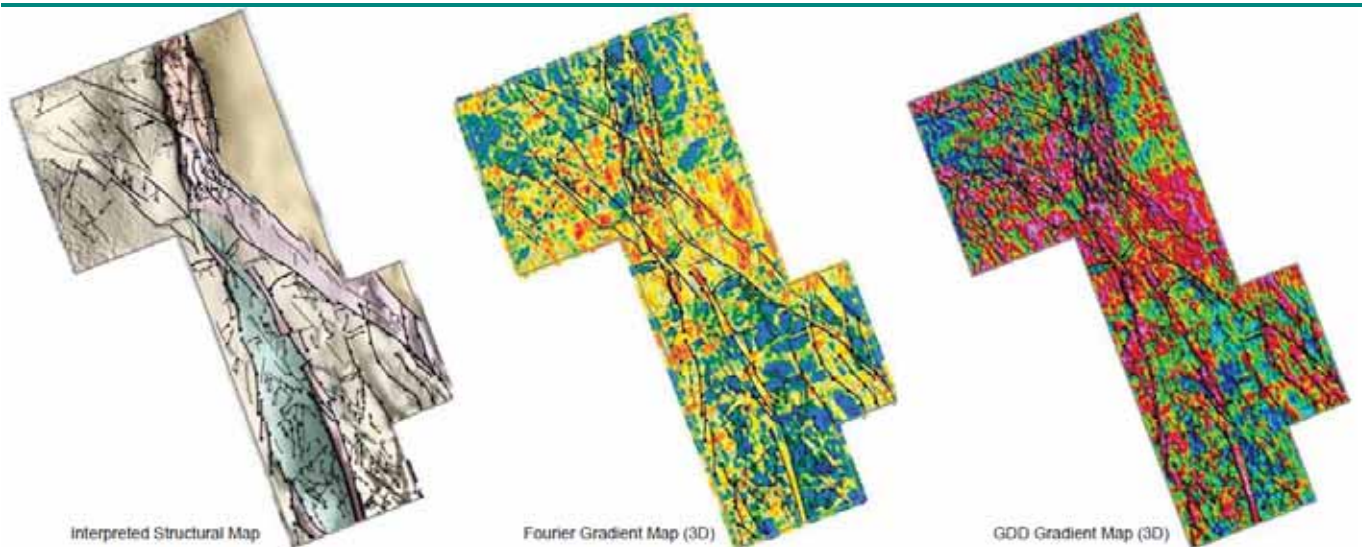
Source: MBA Consultants 2012

### Cow Lagoon-1

In June 2012 Armour drilled the Cow Lagoon-1 well. Its location was identified based on surface mapping and seismic interpretation of the 2002 seismic line 02GA-BT1. The well was designed primarily to test the gas potential of the Coxco Dolomite and (secondarily) the shale gas potential of the Barney Creek Formation. The Cow Lagoon-1 well demonstrated a large potential unconventional gas resource in the greater Cow Lagoon area. Significant gas shows while drilling the Lynott Formation and Reward Dolomite showed that source rock is not an issue at this location, and that valid hydrocarbon traps were present. The results of the analysis of the cores and cuttings taken during drilling should shed further light on why the gas was tight. Management estimates that the Greater Cow Lagoon structure holds an unrisksed mean prospective resource of ~100Bcf of gas in the Lynott and Reward Formations.

In early January 2013 a 1,642km<sup>2</sup> gravity gradiometer, magnetic and digital terrain survey was shot over selected parts of the Glyde and Myrtle Sub-basins within permits EPs 171, 176 and 190. The survey aimed to identify sub-surface structures similar to the Glyde-1 ST1 discovery. These surveys, when combined with surface mapping, have allowed Armour to high grade targets for further investigation with 2D seismic and drilling. Armour has recently completed a 3,000km<sup>2</sup> airborne survey over the western portion ATP 1087 in North Queensland to delineate multiple play types, including conventional, Lawn Hill Shale and Riversleigh Shale targets.

Figure 100: Glyde and Myrtle Basins: Structural Map and Airborne Gravity and Magnetic Survey Results



Source: Armour Energy

■ EP 171 (Armour: 100%)

This permit was granted in June 2011 for a five-year term. It covers 3,473km<sup>2</sup> in the McArthur Basin. Armour has drilled two vertical wells and one lateral well so far on this permit, and each vertical well was designed to test both conventional and unconventional targets.

Glyde-1 and Glyde-1 ST1 wells

The Glyde-1 well was spud on 27 July 2012. The well location was 300m west of the 1979 mineral well GR9, which flowed gas for six months before being shut in. It was drilled to a total depth of 698m. It intersected a continuous vertical section of 132m of highly carbonaceous, gas-charged Barney Creek Shale, before intersecting the Coxco Dolomite. Unlike Kilgour North-1, no water was encountered during the drilling. During logging numerous open natural fractures were observed on resistivity imaging tools.

Figure 101: Glyde-1 ST1 Lateral Well Flare



Source: Armour Energy

To assess how the natural fracturing in the Coxco Dolomite and Barney Creek Shale Formation could be potentially utilised to provide commercial production from lateral wells, a highly deviated lateral well was drilled. The Glyde-1 ST1 lateral well commenced from a vertical depth of 280m, and was deviated through a 250m vertical radius to a near horizontal inclination, from where it passed the GR9 well. It was terminated at a measured depth of 840m, with the well oriented close to a horizontal trajectory at a vertical depth of some 500m.

The Glyde-1 ST1 well encountered gas-bearing formations from 648-810m measured depth. Flow testing confirmed a rate of 3.33MMcfd equivalent, at 125psi pressure after ten minutes on a 64/64 inch choke. Analysis of the drilling and flow testing data, along with mineral hole data collected by Amoco during the late 1970s to early 1980s, indicated that the Glyde-1 ST1 lateral well penetrated part of a covered fault-bounded structural high. A resource estimate of the Glyde-1 lateral well was completed to analyse the contingent gas resource potential of the Coxco Formation at this location. In April 2013 DeGolyer and MacNaughton estimated that conventional gas 2C contingent resources from the Glyde-1 target area were 6.0Bcf (or 7.4PJ).

#### Kilgour North-1 well

Spud on 23 June 2012, Kilgour North-1 was drilled to 1,046m, with two water-bearing zones intersected in the Lynott and Reward formations at 350m and 750m depth. The well was logged and cased to reduce water inflow, which was compromising the air drilling operations. Drilling recommenced to 1,142m, where another water inflow zone was intersected. Drilling was suspended on 17 July, with the well available for re-entry as required. The well did encounter gas and oil shows, indicating primary charge of these reservoirs. However, it appears that subsequent water inflows have flushed out and oxidised the hydrocarbons in most of the intervals (although some remained charged with methane).

- EP 176 (Armour: 100%)

This permit was granted in June 2011 for a five-year term. It covers 8,032km<sup>2</sup>. The permit area includes the McArthur River zinc mine. The Batten Trough is the principal geologic structure in this permit.

#### Cow Lagoon-1

The Cow Lagoon-1 well was identified based on surface mapping and seismic interpretation of the 2002 seismic line 02GA-BT1. It spud on 9 May 2012, and was drilled to 1,804m. The Barney Creek Formation was encountered at 1,245m, and a 65m shale section in the formation was penetrated. It discovered gas flows and shows in the Lynott and Reward formations between 295-1,560m on the Cow Lagoon West Anticline. There are further four-way dip closed leads nearby at Cow Lagoon East and Cow Lagoon West, Dunganminnie East and Dunganminnie West.

- EP 174 & EP 190 (Armour: 100%)

Armour was granted these licences in December 2012. Armour has already undertaken sub-surface studies, and an airborne gravity gradiometer and magnetics survey to identify potential structures similar to the Glyde-1 discovery.

Three new conventional prospects – Catfish Hole, Lamont Pass and Matheson Creek – have been added to the target list.

- The Catfish Hole anticline covers 11km<sup>2</sup>, and was penetrated by the Amoco 82-6 wellbore to 300m. Oil was discovered in the Stretton Sandstone and Yalco Formations.
- The 11km<sup>2</sup> double-plunging Lamont Pass anticline has never been tested. Both structures are close to the Emu Fault, where the Barney Creek Shale can be greater than 900m thick, and on-trend with the Greater Coxco Field.
- The Matheson Creek prospect is unexplored. It is on the eastern side of the Emu Fault, where the Barney Creek Shale has not been tested. This overturned double-plunging anticline covers 15km<sup>2</sup>, adjacent to the major Calvert Hills Fault. It is expected to have a similar stratigraphic section to Cow Lagoon-1.

## Victoria

We believe that the Lower Strzelecki Group and Rintoul Creek Formation are prospective for both conventional and unconventional tight gas and oil resources. There are prospective tight gas plays in the Strzelecki Group sands, alongside potential shale gas and oil from the lower Strzelecki Group and Rintoul Creek Formation. Known oil seepages occur from the Rintoul Creek Formation, associated with dark organic rich shales.

- PEP 166 (Armour: 25%)

### Holdgate-1

Armour funded the Holdgate-1 well (total cost A\$4.25m), which allowed it to earn a 25% interest in PEP 166. It spud on 20 May 2012, 28km south east of Yallourn North-1A. The well had gas readings typical of a tight gas well across large intervals of the Strzelecki Group. We believe that hydraulic-fracture stimulation will be required to determine if this PEP 166 tight gas discovery could become commercial.

### Yallourn North-1A

In March 2011 Lakes Oil drilled a core-hole (Yallourn North-1A) along the northern margin of the Gippsland Basin, searching for Early Cretaceous black coals. It found instead the Early Cretaceous Rintoul Creek Formation, below the normal Strzelecki Group sediments, and which proved to contain carbonaceous shales and coals that are in the oil generation window and may have good potential for shale oil generation.

### Yallourn Power-1

The Yallourn Power-1 stratigraphic corehole was spud in December 2012, 7km to the south of Yallourn North-1A, near the Yallourn Power Station. It was drilled to a depth of 1,200m to determine the extent, thickness and prospectivity of the Rintoul Creek Formation oil play identified in Yallourn North-1A. The cores obtained consisted predominantly of black grey to dark grey shales and mudstones with some brecciated zones and quartz/calcite veining. Background gas levels (up to 75 units) were observed throughout the drilling. The well confirmed that there is a thick Early Cretaceous sequence at this location.

- PEP 169 (Armour: 51%)

The Moreys prospect is a tilted fault block, straddling the border between licences PEP 168 and 169, along a WNW trending hydrocarbon fairway. The primary target was the Late Cretaceous Waarre C sands, with secondary targets in the overlying Flaxman Formation and underlying Eumeralla Formation.

### Moreys-1 well

Armour funded the Moreys-1 well (total cost A\$2.5m), which earned it a 51% interest in PEP 169. The well spud on 20 April 2012 and was drilled to a total depth of 2,300m. It was targeting a conventional Waarre C sands gas field, but instead discovered a tight gas and condensate field in the upper Eumeralla Formation. Multiple tight gas sands were encountered, with the best zone being the interval between 1,985.5-1,995.5m. The drill stem test conducted over this interval flowed gas to the surface before fading out. Condensate was recovered upon reverse circulation. We believe that hydraulic-fracture stimulation will be required to determine if this tight wet gas discovery could become commercial.

### Otway-1

Armour plans to drill the Otway-1 well in PEP 169, north of Port Campbell in Western Victoria. The well is located beside Origin Energy's Iona Gas Plant. It is targeting commercial gas flows from multiple targets including the Pretty Hills, Waarre and Eumeralla Formations.

- PRL 2 (Armour: option over 50% of Lakes Oil interest in the block)

We believe there is significant upside potential from the development of unconventional tight gas reservoirs in the Strzelecki Group in PRL 2. It is considered prospective for unconventional gas. In 2008 Gaffney, Cline and Associates estimated that 2C contingent recoverable resources of the Wombat and Greater Trifon fields are 683Bcf of gas.

#### Wombat-2 well

Originally drilled and fracture stimulated in 2004, the Wombat-2 well flowed at a sustainable rate of 680Mcfpd. In 2009 Lakes Oil re-entered the well and performed a larger fracture stimulation using 155,000lb of proppant (the original stimulation used 74,000lb proppant). The well then had an initial flow rate of 4.3MMcfd. This flow rate decreased and stabilised at 1.3MMcfd flowing through a ½" choke.

#### Wombat-3

The Wombat-3 well was drilled and fracture stimulated in 2005. As well as discovering tight gas, oil was found; it flowed from a natural fracture at 2,106m, which Lakes Oil management believes to be sourced from the from the deeper Rintoul Creek Formation. Eight barrels of 39° API were recovered.

#### Wombat-4 well

Drilled in 2009, the Wombat-4 well was declared a tight gas discovery, with 27 potential tight gas zones identified over a 1,400-2,500m section of the Strzelecki Group. The next step in PRL 2's work programme is planned to be the re-entering, hydraulic-fracturing and flow testing of this well once the moratorium on hydraulic-fracturing is lifted by the Victorian State Government.

#### Boundary Creek-2

The Boundary Creek-2 well was drilled on the Longford Dome to a total depth of 2,341m in October 2005. Continuous gas readings were recorded throughout the Strzelecki Group from 227-2,341m. The plan is to re-enter, to perform a hydraulic-fracture and to flow test this well once the moratorium on hydraulic-fracturing is lifted in Victoria.

## Conventional Targets

### Northern Territory

A joint venture between Amoco Minerals and Kennecott Exploration drilled nine shallow wells (200-1,000m deep) in the Glyde region in 1979. Mineral well GR9 had live oil and flared for six months at an estimated rate of 300Mcfpd before being shut in. It was this result that led Armour to drill its Glyde-1 ST1 well in August 2012.

#### The Glyde-1 ST1 lateral well showed there is a working petroleum system in the Glyde Sub-basin

We believe that the Glyde-1 ST1 lateral well gas discovery shows that Armour has a working petroleum system (source rock, reservoir, trap and seal, timing and migration) in the Glyde Sub-basin. Armour management believes that the Barney Creek Formation acted as both a source rock and seal to the adjacent (below) Coxco Dolomite reservoir. The Glyde-1 ST1 lateral well had an initial flow rate of 3.3MMcfd of gas.

Each well in Armour's 2012 drilling programme was designed to test both conventional and unconventional targets. With the 2012 conventional gas discovery within the Coxco Dolomite of the Glyde Sub-basin, Armour's 2013 Northern Territory work programme is focusing on discovering and proving up a substantial conventional gas resource. The targets for the Coxco Dolomite in EPs 171, 176 and 190 within the Batten Trough are located in the Glyde Sub-basin, the Myrtle Sub-basin to the south of the McArthur River Mine, and to the north in the Caranbirini area. These targets are based on further surface geological studies and the extensive geophysical survey (5,000km<sup>2</sup> of aero-magnetics and gravity data), indicating targets with the same geophysical and geological characteristics as the gas accumulation discovered by Armour in the Glyde-1 ST1 well.



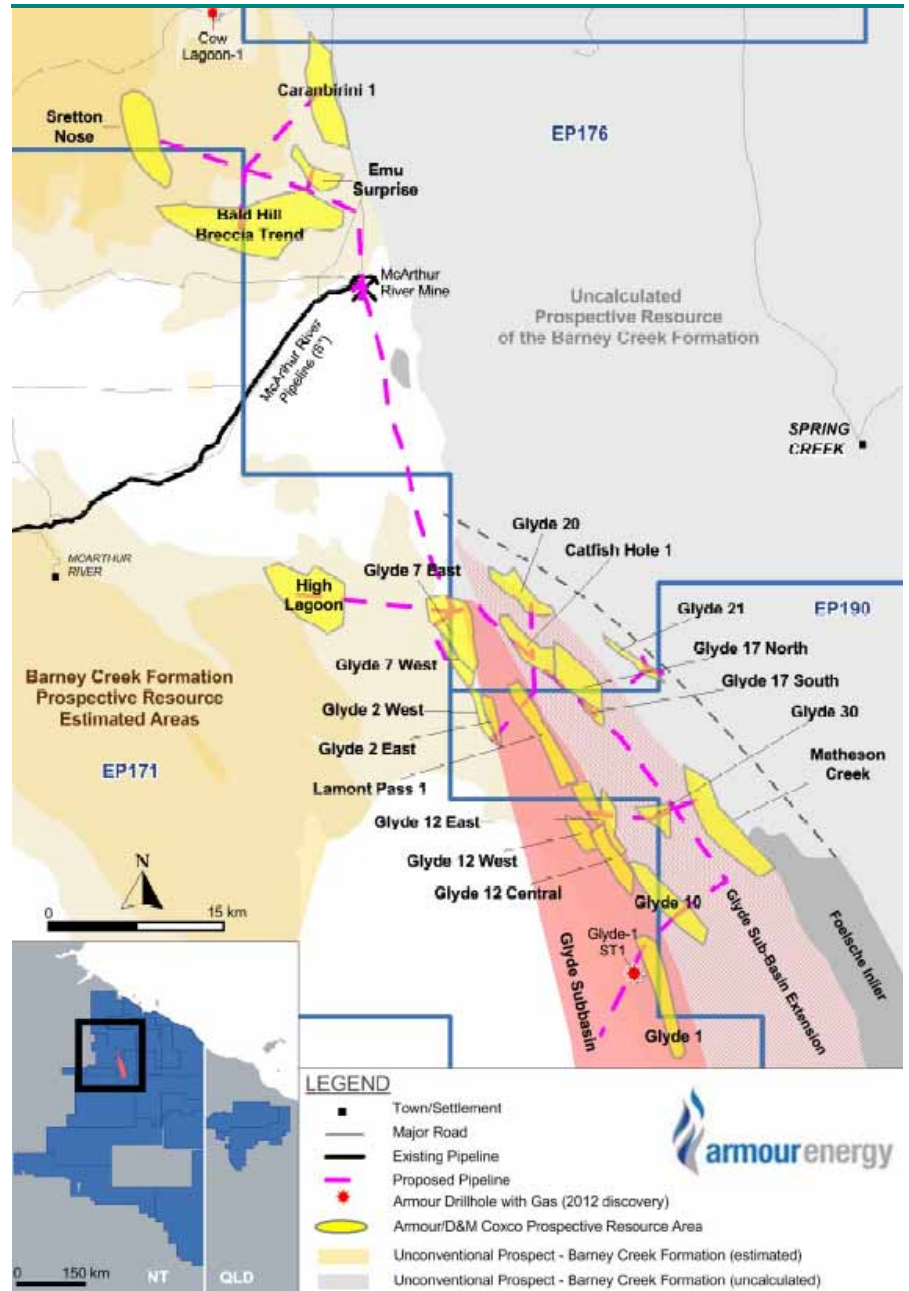
DeGolyer and MacNaughton estimated 23 conventional gas prospects had 264.4Bcf of unrisked mean prospective gas resources

Work programme

In April 2013 DeGolyer and MacNaughton estimated that 23 conventional gas prospects in the Batten Trough, McArthur Basin, had 264.4Bcf (or 322PJ) of unrisked mean prospective resources in Coxco Dolomite reservoirs. It also estimated that conventional gas 2C contingent resources from the Glyde-1 target area were 6.0Bcf (or 7.4PJ).

Armour plans to drill three conventional wells in the Glyde and Myrtle sub-basins by the end of this year (Matheson Creek-1, Lamont Pass-1 and Glyde Central-1) to further prove up its conventional gas reserves.

Figure 102: Conventional Targets in Northern Territory Licences



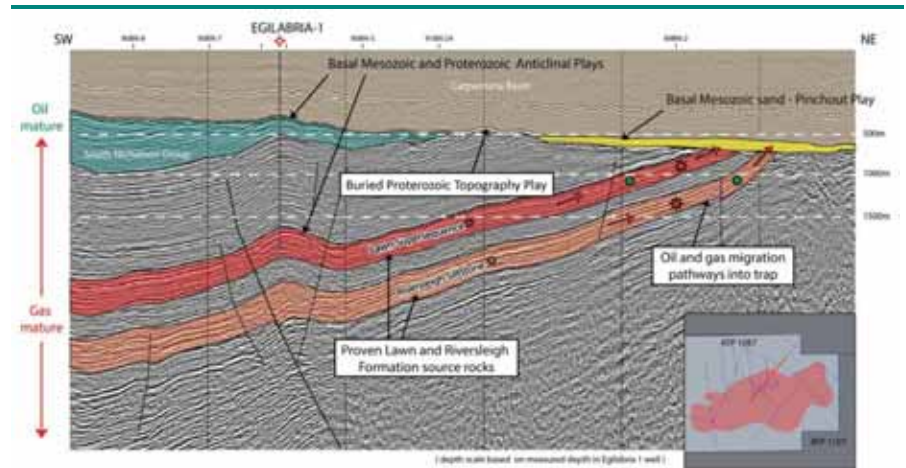
Source: Armour Energy

Queensland

Armour management believes that ATP 1087 has significant conventional oil and gas potential. It has identified several types of potential plays. There is potential for conventional accumulations along the western part of the basin, within sandstone and conglomerate reservoirs of the Wide Supersequence. Hydrocarbon charge would come from the McNamara Group. Conventional plays include structural and stratigraphic traps, along the flanks of the basin, as sands pinch out on to the Murphy Inlier. It points to a similar play type in the Cooper Basin, where the oil fairways are around the edge of the basin. It believes that both Mesozoic and Proterozoic anticlinal oil/gas plays are possible. It also considers Proterozoic buried topography oil/gas plays are possible.

Management’s preliminary estimate of the potential size of the conventional resource base in ATP 1087 is 137MMbbl of oil and 1.8Tcf of gas. We think that only the drilling of several of these conventional leads will allow a proper determination of this permit’s conventional prospectivity. However, given the different play types, it should be possible to drill wells that pass through stacked conventional targets and that can also test the unconventional targets in this permit.

Figure 103: Interpreted Seismic Line 89BN-6 with Play Types



Source: Armour Energy

## Valuation

We estimate that the current fair value of Armour's share price is A\$0.74/share, which is 112% above its A\$0.35 price on 28 August 2013. We outline our key assumptions behind this NAV-based fair value estimate below.

### Key NAV Assumptions

#### For Our Current Fair Value Estimate

- We have used Armour's discovered net 2C contingent gas resources of 6Bcf (1MMboe) in its Glyde gas field.
- We have used a US\$8.64/boe NAV estimate for Glyde Basin 2C contingent gas resources. This is based on our model that assumes:
  - flat well netback gas prices of US\$5/GJ (US\$30/boe);
  - finding costs of US\$3/boe and development costs of US\$5/boe;
  - operating costs of US\$1.8/boe; and
  - a 10% state royalty rate.
- We have assumed a FY14 conventional gas work programme costing A\$6m (three wells), as per Armour management guidance.
- We have valued Armour's South Nicholson Basin acreage by multiplying the 1.7m acres that MBA Consultants assessed were prospective in ATP 1087 by a US\$100/acre multiple. This multiple reflects the early stage of the appraisal programme. Should Armour's Egilabria-2 DW1 flow tests, planned in the next month or so, show highly commercial flow rates/EURs, we would increase this multiple dramatically.
- We have valued Armour's McArthur Basin interest by multiplying the 1.0m acres that MBA Consultants assessed were prospective by a US\$40/acre multiple. This multiple reflects the early stage of the appraisal programme.
- We have conservatively given no value to the other ~30m net acres that Armour has rights over.
- Armour had cash of A\$37.1m at 30 June 2013.
- We estimated the value of Armour's G&A expense by annualising the addition of its 1H13 G&A expense (US\$2.0m), and putting the result over our real 7.5% discount rate (roughly equivalent to a nominal 10% discount rate).
- Other assumptions can be seen in Table 55.

**Table 55: Armour Energy Estimated Net Asset Value per Share**

Reserves/Resources	Net Oil and Gas (MMboe)	NPV (US\$/boe)	Unrisked NPV (US\$m)	Pg (%)	Pd (%)	Risked NPV (US\$m)	Risked NPV (A¢/share)
<i>Glyde Sub-basin</i>							
Gas 2P reserves	-	14.29	-	100%	100%	-	0.0
Gas 2C resources	1.0	8.64	9	100%	50%	4	1.6
<b>Total Gas</b>	<b>1.0</b>		<b>9</b>			<b>4</b>	<b>1.6</b>
<i>FY14 Work Programme</i>							
Glyde Basin gas exploration	5.3	8.64	46	30%	50%	7	2.6
Work Programme	5.3		46			7	2.6
<b>Total Above</b>	<b>6.3</b>		<b>55</b>			<b>11</b>	<b>4.2</b>
<i>Unconventional Business</i>							
South Nicholson Basin						172	63.4
McArthur Basin						38	14.1
<b>Total Above</b>						<b>221</b>	<b>81.7</b>
<i>Other Value adjustments</i>							
Jun13 net cash						33	12.3
FY14 Exploration expenditure						(6)	(2.2)
Capitalised G&A cost						(48)	(17.7)
Options						-	0.0
<b>Armour Total fully diluted NAV</b>						<b>201</b>	<b>74.1</b>
Current issued shares							300.0
Options							0.8
<b>Current fully diluted shares</b>							<b>300.8</b>

Source: Company data, RFC Ambrian estimates

## Acreeage and Resource Multiples

Our fair value would place Armour on an EV/acre multiple of US\$5/acre. In 2012 MBA Consultants assessed that Armour had net best estimate (P50) prospective resources of 41Tcf of gas and 2.2Bbbl of liquids (roughly 9Bboe in total) in the Barney Creek and Lawn Hill shales across three of its permits. Our fair value estimate would place Armour on an EV/prospective resource multiple of US\$0.02/boe based on this assessment.

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