Breakaway Research

# Real Energy Corporation Ltd (RLE)

## *Flow Rate Tests the Key to Commercial Production*

October 2018

**Oil & Gas Team**
**Stephen Bartrop,** Research Manager

**www.breakawayresearch.com**

### Company Information

| ASX Code | RLE |
|---|---|
| Share Price (A$) | A$0.091 |
| Ord Shares/ Perf rights (M) | 301.6 |
| Bonus options (M) | 39.7 |
| Placement options (M) | 22.8 |
| **Market Cap** | **A$27M** |
| Opts-RLEOA (12c,15/4/19) | A$ 0.027 |
| Opts-RLEOB (14c,30/9/20) | A$0.027 |
| **Market Cap (fully diluted)** | **A$29M** |
| Cash (Current estimate) | A$2m |
| Total Debt | A$0.0m |
| **Enterprise Value** | **A$27M** |

### Directors

| | |
|---|---|
| Chairman | Lan Nguyen |
| Managing Director | Scott Brown |
| Director (Non-Exec) | John Wardman |

### Significant Shareholders

| | |
|---|---|
| Managing Director | 8.74% |
| Chairman | 6.80% |
| Sino Portfolio International | 5.74% |

*Source: Company*

### Company Details

| | |
|---|---|
| Address | Level 3, 32 Walker St, North Sydney NSW |
| Phone | +61 02 9955 4008 |
| Web | www.realenergy.com.au |

### One Year Price Chart


*Source: ASX*

*Recommendation:* BUY

*Key Points*

- ***Real Energy has completed drilling at its flagship Cooper Basin Windorah trough acreage, at Tamarama #2 and #3, and a critical flow test phase is underway. Positive flow rates could trigger a commercial development in 2019, catapult RLE from explorer to producer and drive a share price re-rating.***
- ***RLE has achieved many pre-development objectives:***
  - ***4 wells drilled to date all encountered gas reservoir and two flowed gas to surface on test last year.***
  - ***DeGolyer & MacNaugton estimate a prospective resource of 13.7 Tcf in place, with 5483 Bcf recoverable. Contingent resources are 276 Bcf of 2C and 672 Bcf of 3C.***
  - ***A binding agreement was signed on 15 October 2018 with the Santos JV for gas processing and transportation enabling RLE's connection to the eastern gas market.***
  - ***A gas-sale MOU with Weston Energy for 15 PJ over 5 years, including a provision for a pre-payment of A$6M is in place providing initial revenue opportunity.***
- ***A gas flow-rate testing program is underway:***
  - ***Tamarama 2 & 3, step-outs either side of Tamaram1 were successfully drilled and stimulated in 3Q this year, and confirmed lateral extent of the gas zones.***
  - ***Flow testing has commenced on both wells. RLE's reservoir models predict flow rates of >3 mmcfd are achievable.***
  - ***If test rates confirm this, then we expect RLE to tie the existing wells into the Santos infrastructure and begin commercial production in 2019.***
  - ***Following drilling and testing, cash reserves will have depleted and additional funds will be required for development. Options include farm-down of equity, gas pre-payment, equity issuance or early option exercise.***
- ***There is a gas shortage in eastern Australia, and prices are expected to move higher in 2019. RLE is well placed to supply this market and has processing and gas sale agreements already in place.***
- ***RLE is the smallest of peers trying to commercialize gas and offers the greatest leverage in the event of success. EV/resource multiples are lower than peers and DCF modeling of small scale production generates a valuation of 41c .***

*RLE has made significant progress its Windorah gas project and is at an important juncture, with a move to commercial production dependent on test results expected within weeks. Breakaway Research has a* ***buy recommendation*** *on Real Energy and a revised price target of* ***41cps.***

## *Investment case: the cheapest of peers focused on east coast gas markets*

RLE is the smallest by way of market capitalisation of several companies trying to develop gas for supply into the gas-short eastern Australia market. It has a very large prospective and contingent gas resource in its 100% owned and operated acreage in the "Windorah Trough". If this gas can be exploited commercially, then there is multi-fold share price upside.

| | Prospective | 2P | 3P |
|---|---|---|---|
| Bcf | 5,483 | 276 | 672 |

*Figure 1. Prospective reserves and contingent gas resources. Source: Real Energy*

The Windorah Trough is favourably located in the Northern Cooper Basin. It is surrounded by gas fields and gas gathering & process infrastructure owned by Santos and other operators.

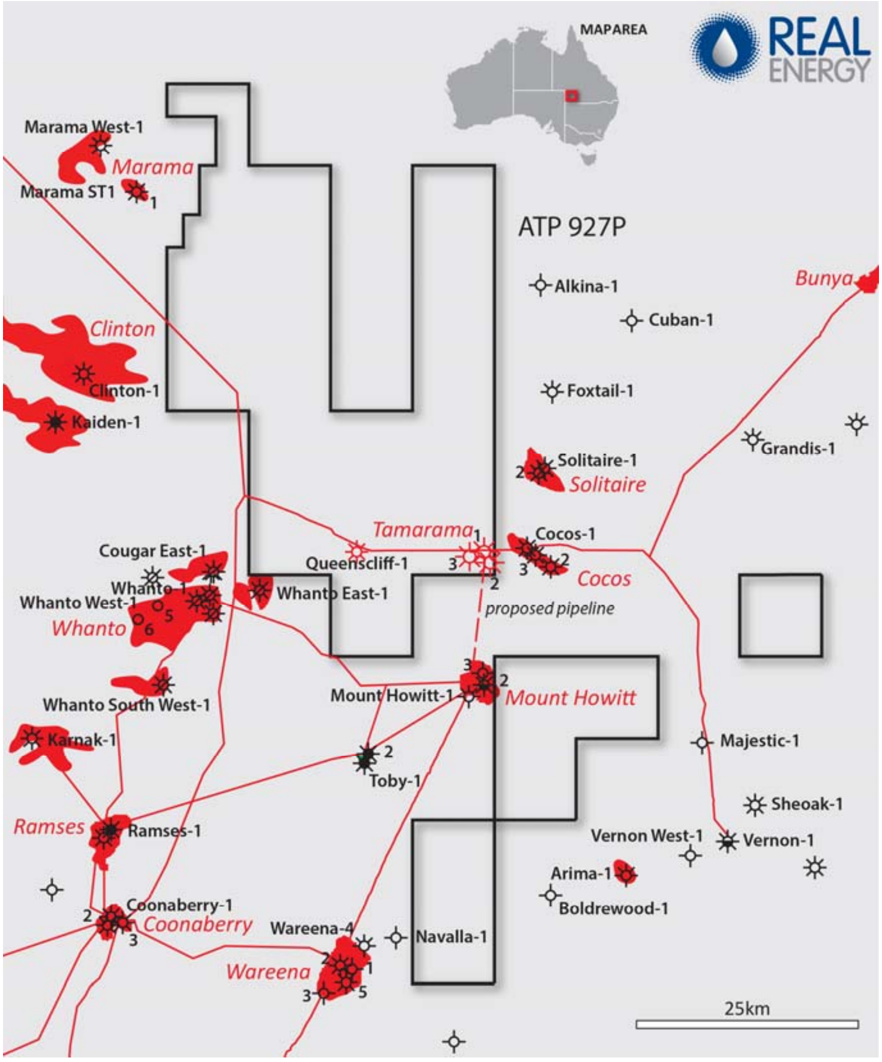


*Figure 2. Location of Windorah Trough project. Source: Real Energy Investor presentation to Good Oil Conference, September 2018*

In the past three years, RLE have invested ~$26M into understanding what is required to commercialise gas, by drilling 4 wells, confirming the geology, testing two wells, with another two to follow, and putting in place gas processing and customer agreements. Thus, there is a lot of de-risking to date.

The one remaining hurdle to jump before the company can move to a commercial project, is demonstrating that development wells can flow gas at commercial rates over a sustained period. Test results are expected in +/- a month from two wells, T2 and T3. If these wells flow at rates of ~3mmcfd on test, then the case for a commercial project becomes very strong.



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### *Revised valuation: from 32c to 41c*

We have increased our valuation from 32c in our last report to 41c. Refer to later sections for details, but in summary, the project has moved forward and been partially de-risked since the last report. More wells have been drilled, knowledge has been gained and a binding gas processing agreement delivered.

In addition, domestic gas markets have continued to strengthen. LNG volumes have had to been diverted south in order to meet the immediate market, but that has not stopped gas prices at the various city gates trending higher to the A$9-10/GJ range. Coincidentally, global oil and LNG prices have moved higher, and ultimately will flow back to domestic prices. In 2019, it's likely that domestic gas prices will rise further, into the teens. Hence the market conditions for RLE's gas have improved.

Due to the progress made we have revised our valuation methodology, away from peer-group related resource multiples, to cash flow modelling. We think a commercial project leading to cash flows is now greater than a 50% probability. Well flow rates are a key variable as outlined in this report, and will be informed in coming weeks

### *Testing at Tamarama #2 and #3 underway. Results expected within a month*

RLE has been developing it Windorah gas project since 2014 and has now drilled 4 wells and tested 2 wells.

- Following the encouraging gas intersections and test results achieved in 2017 at Tamarama 1, and the previous well Queenscliff 1, RLE drilled Tamarama 2 and Tamarama 3 in mid-2018. These wells were drilled on time and budget and without incident. T2 was located ~800m SW of T1, and T3 was located 500m NW of T1.
- These wells incorporated learnings from T1 and were specifically designed to intersect the prospective gas sands in an orientation more favourable to achieving high flow rates. Both wells intersected the targeted reservoir as planned.
- In September 2018, both wells were successfully stimulated using Halliburton services.
- The wells are currently preparing for flow-back tests, designed to recover the drilling and stimulation fluids, and this is expected to take +/- 1 month, after which gas rates are anticipated.
- RLE's predictive models are for flow rates of >3 mmcfd. Based on our analysis, these would be sufficient for commercial production.

### *Next step to commerciality: Pilot production.*

- The Tamarama#1, #2 and #3 wells have been completed as producer wells, and after the current testing phase, could be fast tracked into production in 2019. Flow rates in total from the three wells are likely to be modest, but will provide useful early cash-flow, along with reservoir performance data to optimise subsequent development phases.
- On October 15 2018, RLE signed a binding processing agreement with Santos Cooper Basin JV to process the gas. RLE need to construct a flow-line to tie-in to the Santos-operated Mount Howitt gas line, which is located 13 km to the south. From there, gas flows to the Santos plant at Ballera for processing to sales quality and compression to enter high pressure pipelines. From Ballera, gas can be directed into SA and NSW via Moomba, or directed east to the LNG hub at Wallumbillah or Brisbane.
- The processing agreement is for RLE to supply "raw" gas which is not of sales quality but avoids the capex that RLE would otherwise require to process the gas.
- RLE already has a gas customer for these small early volumes, although the agreement is not binding at this time. In 2017, RLE entered a Memorandum of Understanding (MoU) with Weston Energy for 15PJ of gas over 5 years, equating to 3PJ p.a. Three wells producing 2-3 TJ/d could reach this volume. Figure 3 tabulates indicative annual production and revenues for a possible


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pilot production, along with other up-scaled phases as discussed later in this report.

Key pilot phase assumptions are:

- Pilot Stage incremental capex of A$8M including ~$5m for the tie-in pipeline. This is not a big undertaking and could be completed within 6 months following plans and approvals.
- Gas production of 2.5 TJ/dwell, from 3 wells for an annual total of ~2.7 PJ p.a.
- Delivered gas price of A$9/GJ
- Santos tolls of A$3/GJ and high pressure pipeline charges of A$1.5/GJ.
- Cash operating costs of $2m p.a. to run the field.

The financial results for a successful pilot are modest, and sub-scale but are important in a number of ways. The incremental capex required to achieve this is small, and within RLE's current financial capability. All that is needed is to hook-up the wells and build the 14 km flow-line to Mt Howitt. The early cash-flows could be re-deployed into drilling more wells and alleviating the need for ongoing equity issuance. Figure 3 show indicative returns from a pilot production phase.

What is more valuable from a pilot phase, is the geological and reservoir data that extended production and well monitoring brings. Large-scale, long term production would require multiple wells and optimal well design and location would be critical drivers of capex and project returns.

| **Field model** | | **Pilot** | **Phase 2** | **Phase 3** |
|---|---|---|---|---|
| Number of wells | | 3 | 9 | 50 |
| Production / well | TJ/d | 2.5 | 2.5 | 2.5 |
| Production - TJ/d | TJ/d | 7.5 | 22.5 | 125 |
| Annual production | PJ p.a. | 2.7 | 8.2 | 45.6 |
| Selling price (hub) | A$/GJ | 9 | 9 | 9 |
| Gross revenue | A$M | 25 | 74 | 411 |
| Processing costs (@3$/GJ) | A$M | 8 | 25 | 91 |
| Pipeline charges ($1.5/GJ) | A$M | 4 | 12 | 68 |
| Field opex | A$M | 2 | 5 | 50 |
| Royalty | A$M | 2.3 | 6.9 | 36.1 |
| EBITDAX | A$M | 8 | 25 | 165 |
| *EBITDAX/Sales margin* | *%* | *33%* | *34%* | *40%* |
| Incremental capex | A$M | 10 | 50 | 450 |
| Cum capex | A$M | 40 | 80 | 480 |

*Figure 3. Indicative economics of each development stage Source: RLE guidance on volumes, Breakaway estimates of costs and revenues*

## *Other considerations*

There are benefits in RLE's 100% ownership and operatorship, and there is a locational advantage in the western Queensland location.

RLE can adapt the project to what-ever scale best suits the gas market, and best suits its own financial capacity, in contrast to say, an offshore project, where the capex may be very large and up front.

In addition, the development location in western Queensland imposes fewer constraints compared to other parts of the country where various drilling bans or moratoria exist. Queensland is open for business and even though the location is quite remote, the terrain is flat and open and equipment can be mobilised using public roads. Service providers and contractors can be mobilised from Moomba to the west, or Roma to the east.



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### *After pilot production: Phase 2 and 3.*

If a pilot project succeeds, then RLE conceive two further phases, Phase 2 and Phase 3.

- Phase 2 would require another 6 Tamarama development wells
- Production target 20 TJ/d from 9 wells in total or ~2.5TJ/d from each well.
- The additional wells and surface facilities capex are estimated by Breakaway to be $50M. We assume the field architecture is to produce and gather raw gas and twin the existing pipe to Mt Howitt.
- There is some economy of scale but we assume RLE continues to pay process tolls as per the pilot phase

Phase 2 is still a small project and would deliver approximately 8 PJ p.a but if high gas prices can be captured then the revenue and field cash-flows start to look quite attractive in context to RLE's low market value. The additional capital costs are likely to be relatively modest, for additional wells, in-field gathering and higher capacity pipe to Mt Howitt.

RLE would need additional funds but there options which are outlined later, which we think RLE could deploy to enable a phase 2 development without resort to a large and dilutive equity issue, and as a result we adopt Phase 2 as our base case for the purpose of establishing a DCF value.

### *Larger scale: Phase 3.*

Phase three conceives a much larger project, which would require more than 50 wells delivering ~600PJ over +12 years. This would require a conversion of 83% of 3C reserves to 2C, not assuming that the 3C figure expands with move appraisal, and represents the limit of what is achievable based on current data.

A large scale plant would require additional large capex for a full scale gas processing and compression plant, to enable RLE to deliver sales quality gas straight into the high pressure network. This would be necessary for economic and practical reason.

The economic benefit would be to eliminate Santos JV process tolls. The practical limit is that a development of this scale would produce volumes beyond the capacity of Santos' nearby gathering system, triggering development of a lot more pipeline infrastructure. Other assumptions in a phase 3 are:

- Full field development of ATP927 as a tier one gas project targeting >100TJ/d.
- 50 wells, gross capex >$450M
- NPV ~$560M (or $1.50/sh on an undiluted basis)

As to be expected, the value outcome is quite large, but at this time any large scale project is speculative and is necessarily preceded by successful Pilot and Phase 2 projects.

It would also require the booking of substantial proven and probable reserves, and many more wells than those required to support the pilot of phase 2. We do not assume a phase 3 at this time in our valuation analysis as it is dependent on precedent phases.

### *Base case DCF valuation: 41 cps for a Phase 2 (9 well ) project*

We have developed detailed cash flow models for Pilot phase, Phase 2.

The field net cash flow profiles are shown in figure 4 on an un-risked basis and are gross, assuming that RLE retain 100% of the acreage.

We assume all capex is upfront, where-as in reality, it's likely that wells will be drilled as and when production needs to ramp up, thus potentially staging the capex out over a number of years. After field development the ongoing cash requirement is modest, for field operations, and royalties.


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This is quite unlike peers producing gas from coal seams, which require ongoing capex for drilling year-in, year out. If RLE perfect the well engineering design then we should not expect to see ongoing field work to keep wells flowing. A key geological risk is how long production wells remain on plateau, and when depletion sets in, the rate of depletion.

Once depletion begins then production rates will drop and further wells may be required to maintain output. A key variable is the requirement, if any, for additional wells as the fields age, but in any event this is likely to be some years from now and production history over time will inform this.

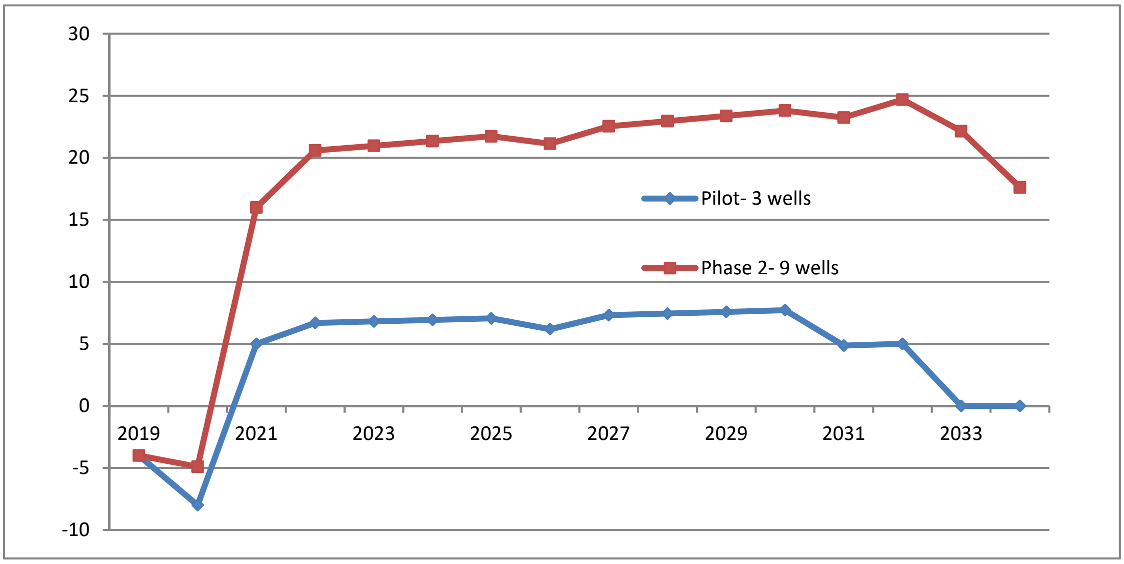


*Figure 4.Breakaway financial models for a pilot and Phase 2 project.*

## *Financials: RLE are frugal but will need funds for development*

RLE have been very frugal in spending over the past few years, managing the drilling of four wells and testing on two in a remote region, as well as paying for all overheads, for a cumulative investment of <$28M. All of this was funded from equity finance.

| **Real Energy financial results (A$M)** | | | | | | |
|---|---|---|---|---|---|---|
| **Year to June** | **2014** | **2015** | **2016** | **2017** | **2018** | **Cum Total** |
| Operating cashflow | -0.67 | -0.46 | 5.86 | 0.54 | -1.47 | 3.8 |
| Capex | 1.12 | -13.3 | -3.53 | -3.59 | -4.27 | -23.6 |
| Equity issue & other | 8.81 | 4.7 | 2.41 | 1.86 | 2.2 | 20.0 |
| Cash at year end | 12.7 | 3.7 | 8.7 | 7.5 | 4.0 | |
| Total assets | 14.9 | 23.6 | 25.9 | 27 | 27.8 | |

*Figure 5: Key annual financial statistics, from RLE annual reports.*

We estimate that after the current drilling and testing phase Real Energy's cash position will deplete to <$2M, which isn't enough to undertake development activity in 2019.

Thus, RLE will need to raise capital to undertake field activity in 2019. Funding options include:

- Equity issuance. To date, RLE has funded all its activity with equity, on a just-as-needed basis which is to be expected given the risky nature of exploration and appraisal.
- Monetisation of its 100% owned assets via a farm-out. We think at some point, RLE's assets may become attractive or strategic to other gas industry participants which could pave the way for RLE to sell part of its acreage, in return for a carry through development.
- Gas resource / resource pre-payment. The offtake MOU signed with Weston Energy announced by RLE on 17 July 2017 includes a provision for prepayment of A$6M to assist in funding the project development.


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- Bank debt. Should RLE put in place all the necessary agreements to underwrite the sale of its gas then it's possible the future that conventional bank debt, or quasi debt from mezzanine providers could become available.
- Early option exercise. There are 39.69M "Bonus options" exercisable on or before 15 April 2019, at an exercise price of 12c. There are 22.775M "Placement options" exercisable on or before 30 September 2020, at a price of 14c. Exercise of all these options would add $8M to cash, but presumes options are "in-the-money". Our 41c valuation assumes dilution for options exercise.

### *Risks: what could go wrong from here*

There are geological and engineering risks which will be better informed following the testing phase.

It's possible that test rates are below that needed for commerciality, in which case the company may need to drill and test more wells to better understand well design (drilling & completion), or try and look for "sweet spots" in order to achieve higher rates. For example, we have seen peers in other regions contemplate extended reach horizontal wells, and this remains an option for RLE if flow rates are low, with the offset being that such wells are more expensive.

Water production in tandem with the gas is possible, and this happened at T1. It is theorised that this water is from coal seams, which were unintentionally stimulated. If so, then in time, the coal could be de-watered, or sealed off, but all this would require costly well intervention. Dealing with the water is either an engineering issue, which is fixable, or a consequence of the geology, which would be harder to address. It usually takes a number of wells to get the engineering right.

The reservoirs that RLE is targeting are thick, but very low permeability and interbedded with coals and other fine grained clastics. Flow rates from unstimulated vertical wells will never be high enough for commercial production. Sophisticated drilling, stimulation and production techniques are necessary, and are being applied, but this comes at a cost. There is a flow rate and capex trade off in all of this, and it may require more knowledge, more wells and more time to achieve the predicted outcomes

## *Valuation and size in context with peers. RLE is the smallest*

Real energy is the smallest compared to peers by way of market capitalisation and while some reasons can be found to explain the gap, the key point is the potential for a re-rating in the event its Windorah gas project succeeds. Figure 6 shows RLE market capitalisation compared to its peers.

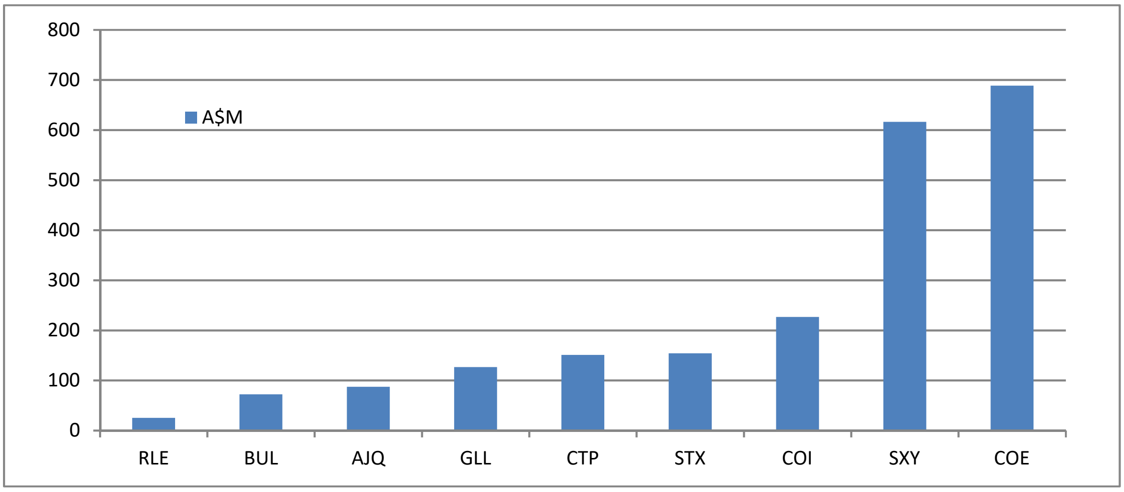


*Figure 6: Market capitalization of domestic gas peers*

Real Energy does not have reserves at present, and its resources are contingent on demonstration that they are commercial. We expect testing to resolve commerciality and there are risks, but we note that all of the peers are also pursuing gas exploration, appraisal and commercialisation in unconventional geologies, some very remote from infrastructure. Comet Ridge, Strike Energy and Galilee Energy are all



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active in CSM appraisal and only one has reserves (Comet Ridge) but all have been materially re-rated this year. Blue Energy has reserves but is not actively drilling at this time. It seems to us, that the market better understands the steps leading up to successful production from CSG, in contrast to RLE's basin centred gas geology. The inclusion of Senex and Cooper Energy in comparison shows the uplift that is possible if commercial production can be achieved. Figure 7 shows a ranking smaller peer 2C and 3C contingent resources.

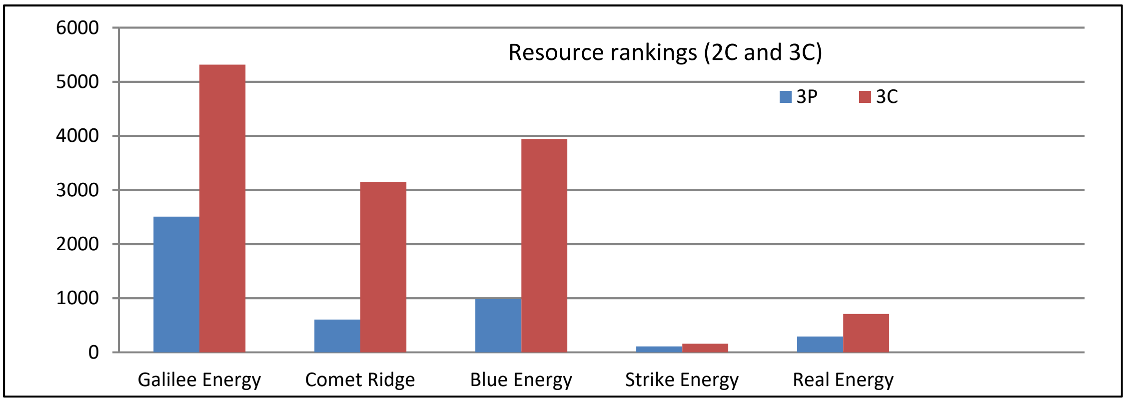


*Figure 7: Resource rankings. Source: Breakaway Research.*

Of the peers, Real Energy is most similar to Strike Energy, which also has no reserves. Strike is trading at EV/2C of A$1.41/GJ and EV/3C of A$0.97/GJ, and has a market cap of $157M.

| Peer group EV/GJ | | | | | | | |
|---|---|---|---|---|---|---|---|
| A$ | RLE | GLL | BUL | COI | CTP | STX | Av |
| EV/2C | 0.09 | 0.05 | 0.07 | 0.39 | 1.05 | 1.41 | 0.18 |
| EV/3C | 0.04 | 0.02 | 0.02 | 0.07 | na | 0.97 | 0.06 |

*Figure 8: Selected peer valuation comparisons (Source: Breakaway Research). Excludes TX which skews the data set*

Based on EV/2C and EV/3C averages for BUL, COI, GLL and CTP, is 18c/GJ and 6c/GJ respectively. At our price target, RLE has an EV of A$150M on a fully diluted basis, which is similar in scale to Strike Energy, Galilee & Comet Ridge.

## *Peer Group: not as many as there used to be*

Figure 9 shows EV and reserves and resources for companies which we think are relevant peers. The list of participants has shrunk considerably over the years due to mergers, low oil prices and other market factors. It presents investors with a very limited choice and of the peers listed here, RLE offers the greatest leverage if it can progress from exploration to production

| Company | Price | EV | 2C | 3C | EV/2P | EV/3P | EV/2C | EV/3C |
|---|---|---|---|---|---|---|---|---|
| **Comet Ridge (COI)** | | | | | | | | |
| Total | 0.35 | **235** | 605 | 3150 | **1.36** | **0.63** | **0.39** | **0.075** |
| **Blue Energy (BUL)** | | | | | | | | |
| Total | 0.065 | **72** | 984 | 3942 | **1.02** | **0.24** | **0.07** | **0.02** |
| **Galilee Energy (GLL)** | 0.645 | **127** | 2508 | 5314 | | | **0.05** | **0.02** |
| **Senex (SXY)** | | | | | | | | |
| Total- Pje | 0.47 | **616** | 31 | 0 | **0.93** | | **19.8** | |
| **Central Petroleum (CTP)** | | | | | | | | |
| Amadeus Basin | 0.14 | **151** | 144 | | **1.14** | | **1.05** | |
| **Cooper Energy (COE)** | | | | | | | | |
| Total | 0.462 | **689** | 158 | 266 | **2.26** | **1.80** | **4.36** | **2.59** |
| **Strike Energy (STX)** | | | | | | | | |
| Southern Cooper Basin | 0.14 | **154** | 109 | 159 | | | **1.41** | **0.97** |
| **Real Energy (RLE)** | | | | | | | | |
| Qld- Eromanga basin | 0.09 | **25** | 291 | 709 | | | **0.086** | **0.035** |
| **Armour Energy (AJQ)** | | | | | | | | |
| Kincora Gas field | 0.10 | **87** | 0 | 0 | **1.22** | **0.45** | | |
| **Volume average** | | **754** | **4223** | **12299** | | | **0.179** | **0.061** |

*Figure 9. Australian gas exploration and production companies considered to be peers of Real Energy (Source: Company 3B statements, most recent reserve and resource reports (converted into PJ Gas equivalent at 1.055PJ per Bcf, 6PJ per BOE). Share prices at EOT October 19, 2018*



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### *Why is the stock apparently under-valued?*

There are reasons to explain the discount to peers and low market value.

- RLE is a "single asset" company, dependent on the success of the Windorah trough project. There are no other assets to support asset valuation, should flow rates be uneconomic. Frankly we doubt low rates from one or two tests would scuttle the project, as RLE would likely seek to drill more wells and gain more data, but this all costs money and investor confidence would likely diminish.
- Testing of the Tamarama#1 well while establishing gas flows to surface, was accompanied by water that killed the flow, which leads to the question, was it the geology or the drilling-completion that produced the water ? Testing on T2 & T3 is designed to address this.
- Lack of financial headroom to move into a larger development. RLE will need funds to undertake development activity in 2019, and so all of the funding options outlined here will need to considered and resolved. Despite very encouraging results to date, RLE has had to work hard to attract equity capital and the most recent issue was done at a steep discount to the prevailing market.
- The "basin centred gas play" (BCG) is unique in Australia because no other company has attempted to exploit this type of geology to date. In our experience, it is analogous to the exploitation of coal seam gas rocks over 15 years ago. The first companies to attempt CSG in Australia were shunned by the investment community. Not one learned academic or market commentator predicted what was to come. Today, production from coal seam gas fields dominates eastern Australian production. It can take a long time to over-turn accepted geological norms and RLE will have to do this.
- The equity market is ascribing no value to RLE's ~5Tcf of prospective resources, which could be converted to 3C or 2C. We note that some peers report multi-Tcf resources (eg GLL, COI) which are attracting value, and relative to these companies, RLE has a smaller 2C/3C and hence a lower value

## *Market Backdrop: Australian East Coast gas markets and prices*

Industry conditions are positive for new entrant gas producers and RLE is well positioned given its strategic location near existing infrastructure. High prices brought on by LNG exports since early 2015, and depletion of key fields, have been well documented in the financial and mainstream media. Political and consumer groups are in a state of panic about adequacy of supply.

There is increasing risk of Governmental or regulatory interference, to affect an increase in domestic supply, or limit prices. These may appease pressure groups and consumers, but will do little to stimulate longer term supply, as that requires investment and it requires that providers of risk capital to RLE and peers, have confidence that the gas market "will be there". Gas markets trends are supportive of new supply entrants such as RLE. There are twin drivers, volume and global oil (and LNG) prices.

### *The volume effect: markets will remain tight*

The most recent AEMO Victorian Gas Planning Report, shows the impact of rapid depletion from the existing conventional fields offshore Victoria, specifically the Beach Energy operated fields off western Victoria, and the Esso-BHP fields offshore from Gippsland.

In summary, these fields supplied 435 PJ in 2017. That is 70% of the east coast domestic demand of 640 PJ, with the balance coming from Santos operated Cooper Basin fields (90 PJ) and the Queensland Coal Seam Gas (CSG) fields (115 PJ).

By 2022, the AEMO forecast that the fields offshore Victoria will deplete to 187 PJ. That is a 57% drop in 4 years. It is driven by steep decline from Beach-operated Otway and BassGas fields, and Esso-BHP fields, and only partially offset by the planned Sole gas development in 2019. Onshore in South Australia, the Santos operated Cooper Basin fields are mature and partially committed to supply GLNG. There is a very large gap between expected levels of demand, and available supply in the current year and this will



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continue to widen. Figure 10.

In response to Government pressure, LNG exporters have diverted volumes south, to meet the immediate market. However this is just a quick fix. For example, in its latest quarterly report, Santos disclosed that GLNG output was 4.6 MTPA, compared to its post start-up peak of 6.1 MTPA in 4Q 2017. Notably, its key field supplying this plant, Fairview, is in decline and 20% off its peak reached just last year. This is a worrying trend for the GLNG partners, that have another 17 years of export contracts to fulfil. It lends further evidence to the belief that the LNG exporters dependent on coal seam gas fields have over-committed and if so, will not be able to meet both domestic and export market obligations.

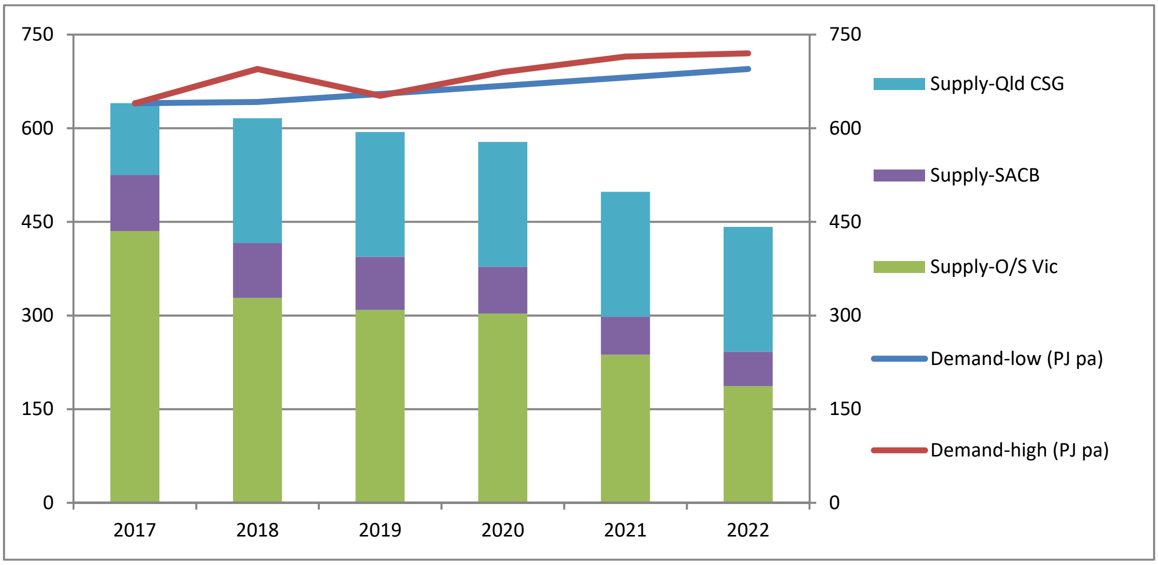


*Figure 10: East Coast gas supply and demand (Source: AEMO 29 March 2018)*

## *The price effects: oil prices will drive local prices higher*

Before the advent of LNG exports, the domestic gas market was well supplied and contract gas prices were <$4/GJ. Two years ago, prices were in the $7-9/GJ range and were considered high, in context to where the price had been a year prior. Now prices are routinely $9-11/GJ, (figure 11) and the ACCC which requires reports from market participants for any transactions >1 PJ, shows that the "market" price for gas in 2019 is >A$9.50/GJ

Our view is that domestic gas prices will go higher after 2018, driven by (1) rising oil prices, and the flow-on to regional LNG prices and (2) linkages to the domestic gas market, via LNG exports and domestic net-backs, and the potential for LNG imports.

The export of LNG and the potential for imports will strengthen the links between export gas prices, and domestic prices. That linkage is now irreversible, and, driving both will be oil prices. During the oil boom of 2010-2014, regional LNG prices were US$18-19/mmbtu (equivalent to ~A$25/GJ) but at that time, domestic consumers in Australia were shielded as the east coast was well supplied and LNG exports had not commenced. The consumer will not be so fortunate this time as oil prices continue to rebound from the 2014 crash. LNG prices are oil-linked, and will follow oil prices higher, and this will percolate back to Australia and be reflected in the net-back price. At the current domestic gas prices, there is still a very large step-up to the -LNG export / import price.

At the current Brent oil price of US$80/bbl, the LNG equivalent price is around US$11/GJ, which in A$ terms is >$15/GJ.



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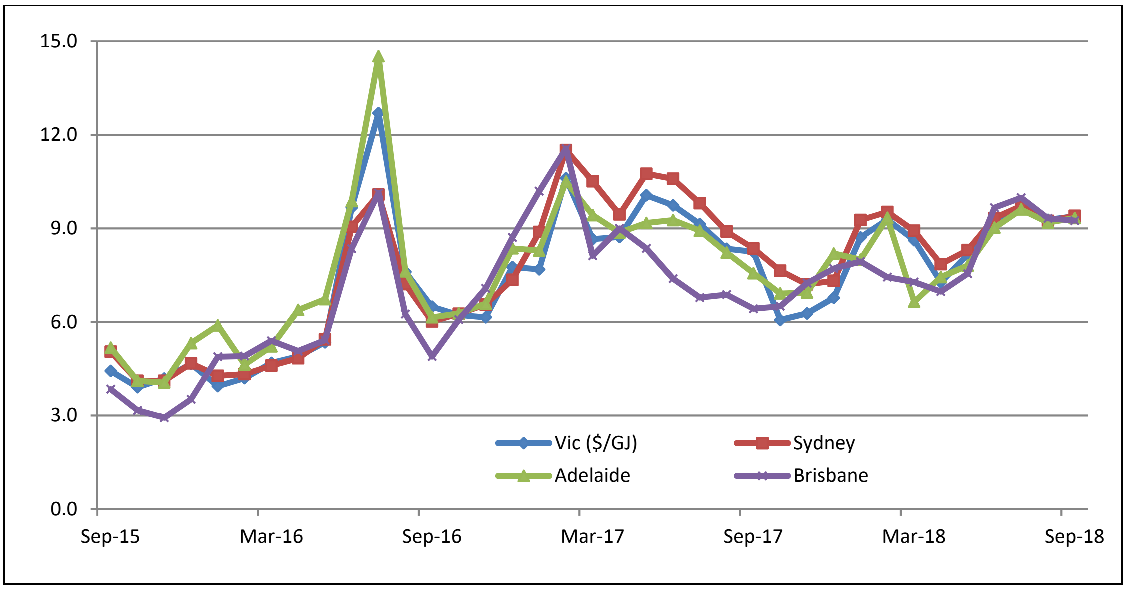


*Figure 11. Monthly average gas price, in A$/GJ, delivered to "City gates" (i.e before entering low pressure distribution networks)*

## *Geological backdrop: Basin centred gas*

RLE is a cheap option on potential commercial development of a very large contingent gas resource in the northern Cooper Basin. It has two large permits, 100% owned which are prospective for gas trapped stratigraphically in the basin's trough, a so called "Basin centred gas play" (BCG).

### *What is Basin Centred Gas (BCG)?*

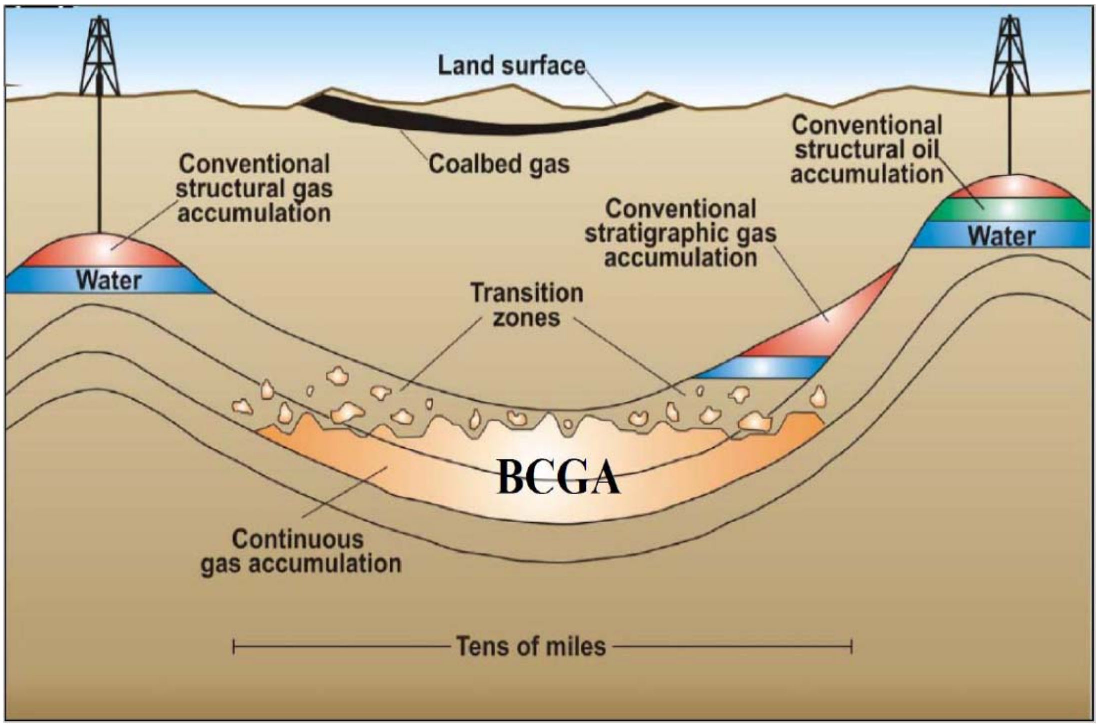


*Figure 12: Schematic representation of basin centred gas (Source: RLE investor presentation)*

BCG plays can be laterally extensive and can hold vast resources. Figure 12 shows a schematic. In RLE's ATP927 permit, the estimate of gas-in-place is 13.7 Tcf, with a prospective recoverable resource of 5.5 Tcf. These are very large figures. The flow rates recorded have enabled RLE to book contingent gas resources of 276 Bcf (2C) and 672 Bcf (3C). The question to resolve is how much gas can be produced commercially. For this, RLE needs to establish flow rates high enough, and keep well costs low enough in order to book reserves.



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Basin-centred gas is unconventional in the sense that the gas is trapped stratigraphically in tight sandstones. It requires over-pressure to drive out the gas, and commonly, artificial stimulation is required to enhance permeability and aid commercial flow rates.

Basin centred gas is just another form of unconventional geology that was once considered too hard to exploit commercially, but Increasingly around the world and in particular the USA, production companies are successfully exploiting geologies that were once considered "too hard". Production from low permeability sandstones and shales has been successful in the USA. Attempts to migrate this success to Australia in the Cooper basin from 2011-2014 made some pioneering advances but high costs due to remote location, and a collapsing oil price stalled the activity after 2014. More recently, industry participants eagerly await the removal of fraccing bans in the NT to pave the way to exploiting large reserves of liquids rich shale rocks.

RLE's permits ATP927P and ATP1194PA are in the northern Cooper Basin. There are conventional gas fields in adjacent permits, gas-gathering systems, and major processing centres at Moomba and Ballera that can pipe gas to eastern markets. Ballera has a capacity of 150TJ/d and is serving fields that are now largely depleted. RLE has been able to take advantage of this. Since listing in 2013, RLE has targeted this acreage to test its geological thesis and drilled 4 wells, Tamarama 1,2 &3 and Queenscliff, validating the BCG model. This is shown schematically in Figure 13. The success to date validates RLE's geological model and demonstrated gas flows to surface. The key to reserve booking, and future development success are use of optimal drilling, completion, and stimulation to maximise gas flow rates, dealing with associated water production if any, and keeping well costs low

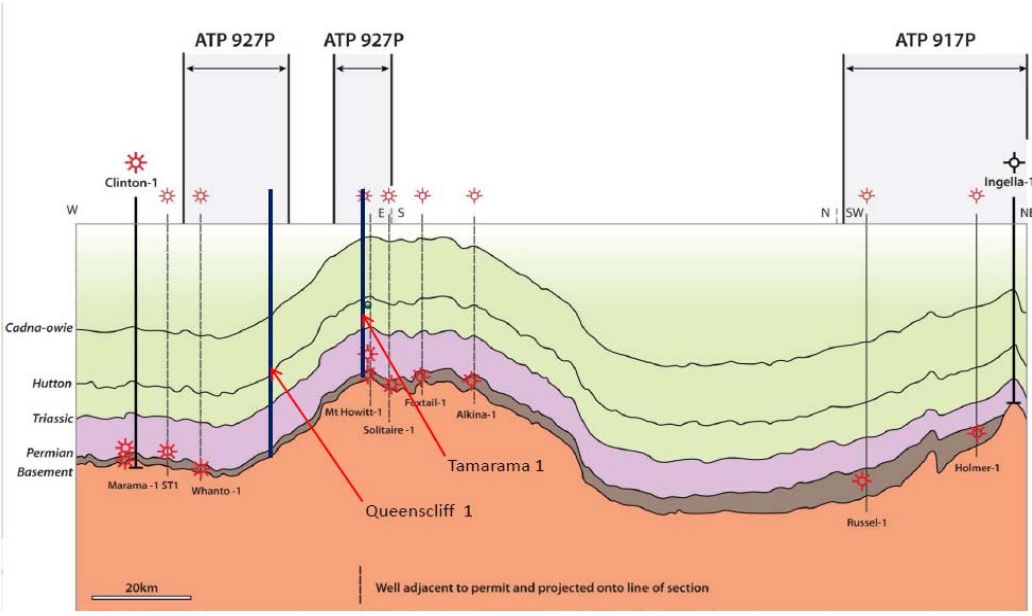


*Figure 13: Real Energy permits and wells relative to other wells in region (Source: RLE investor presentation)*

## *Geology of the Windorah trough*

Stratigraphy of the Windorah trough contains numerous thick Jurassic, Cretaceous, Permian and Triassic sandstones, interbedded by gas-rich coals, finer grain sediments and sealing shales.

These sequences are well understood in the Cooper Basin, with over 3000 well penetrations. In RLE's permit, the target objectives are the Patchawarra and Toolachee sandstones which are 3,000m deep in the centre of the trough, and around 2,000m deep on the basin edge, in contrast, the shale rocks in the centre of the Nappamerri trough, were between 4,000m and 5,000m.


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Figure 14 shows the stratigraphic sequence from west to east. Commercial gas discoveries are in conventional structural traps, at Wareena, Whanto, Cocos, Solitaire and Mount Howitt. These wells produced gas at commercial rates from sands in the Toolachee and Permian, from conventional 4-way dip closed or fault dependent traps. Reservoir quality is variable with porosities typically 10-15% evidencing good reservoir. The highest flow rate recorded from the Toolachee is 11.4 mmcfd from Wareena #1, 25km to the south. Several other wells have recorded rates in the 3-7 mmcfd range. There are numerous coal seams and finer grained sediments which are water bearing and are sources of water influx if not avoided during the completion and fraccing processes. $CO_2$ levels in all these reservoirs is moderate, generally in the 10-12% range at Tamarama and Queenscliff.

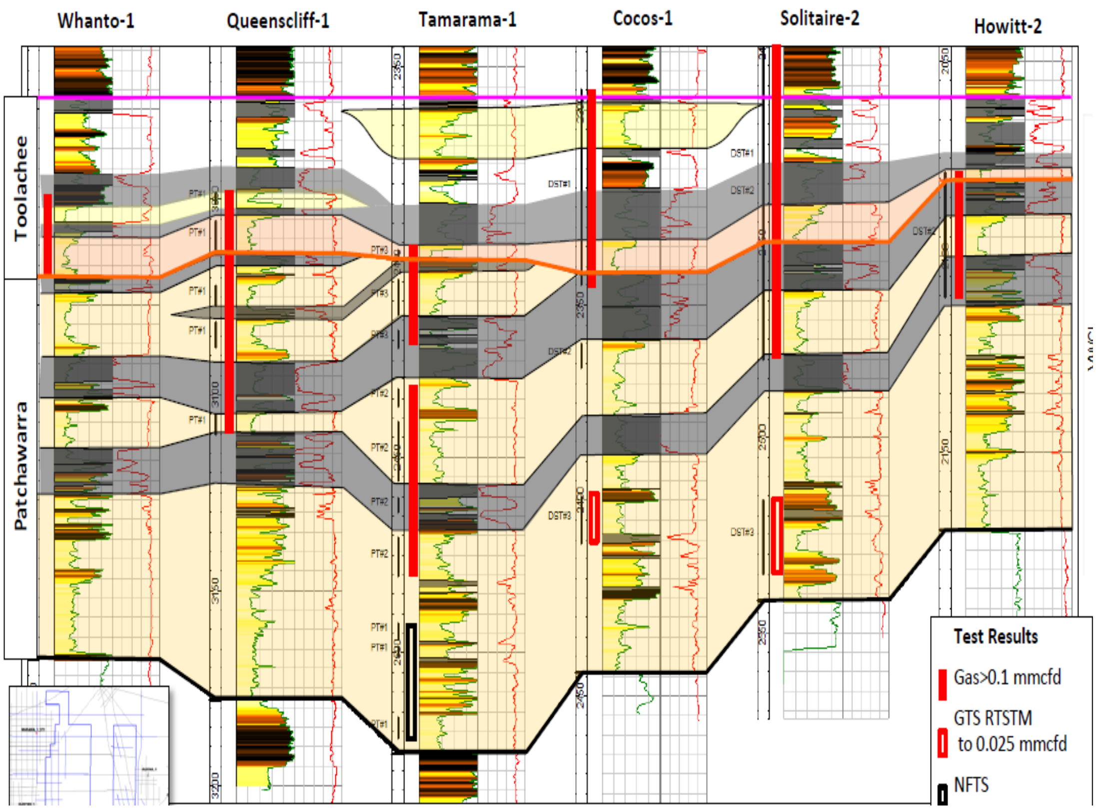


*Figure 14" Well sections in the Windorah Trough ( Source: RLE investor material)*

## Recap of early exploration results, and the lead up to drilling of T2 and T3

Tamarama#1 was the first well drilled outside of any seismically defined closure, to test the basin centred gas concept, targeting the Permian aged Toolachee and Patchawarra sandstone reservoirs

Tamarama#1 was drilled in September 2014 to a total depth of 2574m and encountered 87m of net pay in total, 21m in the Toolachee and 66m in the Permian. Based on this result, the well was cased and suspended for future testing and the company proceeded with drilling of the second well.

Queenscliff#1 was completed in the fourth quarter of 2014, and reached a total depth of 3129m. The well is 688m down-dip from Tamarama 1. It encountered 36m of gas bearing reservoir in the Permian-aged Toolache objective, and 37m in the Patchawarra. The schematic shows the structural setting of Queenscliff, outside of structural highs. A 27m interval of lower Toolachee-upper Patchawarra formation was perforated, and on test achieved a flow of 0.2 mmcfd to surface, through a small, 16/64 inch choke. While this rate is not high enough to be commercial, the result is significant in that the reservoirs were not stimulated. Following this result the test equipment was mobilised to Tamarama1 for flow rate testing.



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Testing commenced in early 2015. Initially a 30m interval of the upper Patchawarra was perforated, and flowed gas to surface through a 12/64 inch choke at 0.3 mmcfd. A test of the lower Patchawarra did not flow, and it was theorised the reservoir was tight and would need stimulation. In the Toolachee, 16m was perforated and flowed at 0.46 mmcfd on test, through a 16/64 inch choke. Gas samples were analysed for Co2 and ranged 7-9%.

Based on the encouraging flow of gas to surface it was decided to proceed with a fracture stimulation program. In 2016 Halliburton services were engaged and a 5 stage fracture stimulation was carried out in late 2016. Flow testing the various zones took place during the first half of 2017, and delivered gas flow rates which were variable and peaked at 2 mmcfd. The rates were accompanied by water production which was not expected. From post-test analysis of the water and re-assessment of the completion and stimulation design, RLE theorises that the accompanying water is most likely coming from coal seams which were unintentionally stimulated.

*Figure 15: Flow rate from T1 test.*

### Key learnings from the test results on Queenscliff# 1 and Tamarama#1 are:

1. Both wells were vertical wells and not optimally engineered for achieving maximum flows from tight reservoirs. T2 and T3 were deviated wells, drilled directionally in order to maximise the results from any stimulation program.

2. Water production is not desirable and avoidable with careful design and execution of the stimulation program, and in particular, limiting the fracture pattern to the sandstone reservoirs and staying well clear of the coal seams.



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# Board and Management

The board and management team has previously worked together at Mosaic Oil (MOS:ASX) which was taken over by AGL in 2011, following success in discovering and commercializing oil and gas discoveries predominantly in the Surat Basin.  Ex Mosaic team members include Lan Nguyen, Scott Brown, Terry Russell, and Xinjin Wang.

## Director and Executive Backgrounds

### *Lan Nguyen - Non-Executive Chairman, appointed*

Mr Lan Nguyen holds a Bachelor of Science (mining engineer-geologist) degree majoring in petroleum exploration from the Institute of Oil and Chemistry, Baku, Azerbaijan, and a Master of Science degree in petroleum geology from the University of New England, Australia. He is a member of the Petroleum Exploration Society of Australia (PESA), the American Association of Petroleum Geologists (AAPG) and the Society of Petroleum Engineers (SPE).

Lan is a professional petroleum geologist and engineer with over 25 years of experience in petroleum exploration, development and production in Australia and internationally including 15 years at Mosaic Oil N.L. ('Mosaic'), an ASX listed petroleum exploration and production company, where he played a leading role, initially in technical and middle management positions and in the last 4 years, as Managing Director, in transforming Mosaic from a speculative petroleum explorer to a successful petroleum exploration and production company with growing production revenues, petroleum reserves/resources and profitability. Lan is credited with the discovery and development of many oil and gas fields in the Surat-Bowen Basins through his innovative introduction of various exploration, drilling and completion technologies to Australia.

Lan is currently a principal/director of Tanvinh Resources Pty Ltd and Latradanick Holdings Pty Ltd, which provide services to energy and resources companies in Australia and Asia-Pacific region.

### *Scott Brown – Managing Director, appointed*

Mr Scott Brown holds a Bachelor of Business and a Master of Commerce and is a member of the Institute of Chartered Accountants and the Petroleum Exploration Society of Australia (PESA).

Scott is the Chief Executive Officer and co-founder of Real Energy Corporation Limited. Prior to this, he was the Chief Financial Officer of Mosaic Oil NL (ASX: MOS), a listed petroleum production and exploration company with an extensive range of oil and gas production and exploration permits in Queensland, New Zealand and offshore WA. He is also a non-executive director of Kairiki Energy Limited (ASX:KIK) and Oriental Technologies Investment Limited (ASX:OTI).

During his time with Mosaic, he was involved in the acquisition of production properties and the growth of its business and profitability. He was instrumental in putting together a Scheme of Arrangement with AGL Energy Ltd to acquire Mosaic for consideration of $142 Million.

Scott has an extensive background in finance and the management of public companies including guiding numerous companies through the listing process. Prior to Mosaic Oil NL, Scott was Finance Director of Objective Corporation Limited ('Objective'), an enterprise content management (ECM) software company that established itself as one of the leaders in the ECM market.

Scott was also formerly the Chief Financial Officer and Company Secretary with a number of public companies including Turnbull & Partners Limited, Allegiance Mining NL, FTR Holdings Limited and Garratt's Limited. Scott also worked at accounting firms, Ernst Young and KPMG



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*John Wardman, Non-executive Director, appointed 6 September 2018*

Mr Wardman holds a Bachelor of Economics (Macquarie University, Sydney) and is a Fellow of the Australian Institute of Company Directors (FAICD). He is highly regarded and respected in the Australian stockbroking and wealth management sector and has 35 years experience working in the small resources and energy sectors

He currently is a Senior investment Advisor in the wealth management industry having previously spent 13 years with Macquarie Private Wealth, and prior to that Hartleys Ltd. John is also Chairman of the ASX-listed Shine Metals Ltd. His contacts and network.

*Terry Russell, Consulting Exploration Manager*

Terry Russell is a geologist with over 26 years experience working in the oil and gas industry. He has a B.Sc. (Hons) from Victoria University of Wellington, and a PhD from University of New England. Terry was formerly the Exploration Manager of Mosaic Oil NL, with responsibility for the planning and execution of the company's exploration and development program. Prior to this, he was most recently employed as Manager Geoscience for Swift Energy New Zealand Ltd. As well as having extensive experience in onshore and offshore Australian basins, he has also worked on a range of international projects, principally in New Zealand, the United States, Argentin and Tunisia. He is a member of PESA and AAPG.

*James Dingle, Drilling Supervisor*

James has practical experience in both field operations and engineering design in a broad range of drilling, completion and production operations across conventional and unconventional (CBM/CSG & tight gas/oil reservoirs). He has extensive experience with coal seam gas drilling, completion & production operations, conventional & underbalanced drilling & completion operations, horizontal/multi-lateral drilling & completion operations and high pressure-high temperature drilling operations in many countries including Australia, Indonesia, UK, Ukraine, Turkmenistan, Russia, and Romania.

*Dr Xingjin Wang, Senior Reservoir Engineering Consultant*

Dr Wang holds a PhD degree from University of New South Wales in Petroleum Engineering and has over 20 years' international experience in petroleum exploration and production applications. He specialises in reservoir simulation, well test analysis, production performance analysis and reservoir characterisation. Prior to running his own consulting company, Austar Gas, Xingjin was General Manager (Engineering) of Arrow Energy Ltd before Arrow was taken over by PetroChina and Shell. He has extensive tight sand, shale gas and Coal Bed Methane experience in the major basins of Australia, Russia, China, Indonesia and India. As an experienced reservoir engineer, he had worked for RISC, Mosaic Oil N.L., Sinopex and Arrow Energy.



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**Analyst Verification**

I, **Stephen Bartrop**, as the Research Manager, hereby certify that the views expressed in this research accurately reflect our personal views about the subject securities or issuers and no part of analyst compensation is directly or indirectly related to the inclusion of specific recommendations or views in this research.

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