**Status Update on recommendations from Roadmap for Unconventional Gas Projects in South Australia**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Issue</th>
<th>Progress since last report</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Provide appropriate licences and licence conditions</td>
<td>Holders of PRLs and PPLs with minimum expenditure requirements given timely commercial flexibility</td>
</tr>
</tbody>
</table>

The price fell again to below A$70 per barrel in August-September 2016, so the flexibility will be extended to (at least) the end of 2016.

This recognizes a lower level of certainty that full-cycle development investment will reappear sufficient to underpin ongoing exploration and appraisal investment.

| #2 | Commission fit-for-purpose training facilities | The State’s largest oil and gas producers Santos, Beach Energy and Senex Energy have cooperated with the State Government and TAFE SA to establish an Onshore Petroleum Centre of Excellence (OPCE) training facility at Tonsley, co-located with the new State Core Library. The facility provides a fully immersive simulated oil and gas production environment to be used for technical training, including safety, environmental and sustainable operational principles and key maintenance activities. Pilot training commenced in November 2014. The official opening and training was undertaken in February 2015. Fluid flow facilities for training were added in May 2015. Gas flow (using air) training equipment will become fully operational in 2015 |

The MPO-led oil and gas supplier’s study of tour shale gas facilities in the USA in 2014 and a second tour was undertaken in 1Q 2015. The 2014 tour outcomes include: new stand-over rig services, propped fracturing trials, gua growing trials and the establishment of valuable engineering network ties into the US market. The 1Q 2015 tour will further foster local content in supply chains for the upstream petroleum industry in the State, nationally, and prospectively, world-wide. Details of the 2015 supplier tour will be published in the next MEJA Journal in 2015.

| #3, #5, #7, #8 and #2 | Protect water resources | A fully independent report on water use for the upstream petroleum operations has been commissioned by DSD. The research agency for this review of existing information is the National Centre for Groundwater Research and Training. The CSIRO and the Office of Water Science have agreed to peer review this study ahead of its publication. Insights into this research will be provided at the Roundtable meeting on 25 September 2016 |

DSD has commissioned an independent study entitled Hydrogeological Risk Assessment - Oil and Gas Development - South East. The draft is undergoing peer review by the National Centre for Groundwater Research and Training (NGRAT) and is expected to be released in 2015/16. Roundtable Working Group #8 will form and focus on sharing information

An independent University of Adelaide review has been commissioned to confirm leading (effective) practical risk management for well integrity, including cementing practices – and will identify gaps in peer reviewed studies, if any. Researchers are: Teryl Bennett, Phil Visintin, Mohamed Ali Sadakathu and Dusan Loenic

DSD has sponsored ASTE conference in September 2015

| #4 | Make fracture stimulation data transparently available | Update since last report 15 August 2015 - 78 wells have been fractured stimulated with 1977 stages (zones) in South Australia - all safely without detrimental impacts. This includes fracture stimulation in 795 wells in the Cooper Basin, one well in the Avoca Basin and 2 wells in the Officer Basin. The extents of perforated intervals have been compiled from existing databases. An online display of fracture stimulated zones position relative to aquifers will be developed. (Annex 1)

- Stop Drilling subsidies
- Greater transparency to operations
- Fit for purpose
- Clarify oil and gas and risk management (with reliable simulation data)
- Commission fit for purpose training facilities in relation to CNG for available. 2 people to fly, load & unload. First 50t model doesn’t need air str

Commission fit for purpose training facilities in relation to CNG for available. 2 people to fly, load & unload. First 50t model doesn’t need air str


| #8, #9, #74 and #114 | Bolster understanding with (reliable information) on hazards and risk management | Continue to update answers to Frequently Asked Questions (FAQs) for historical and potential upstream petroleum operations the South East (Bight Basin) since March 2014. This is done to inform the public, overall. See: DSD’s Key Points and FAQ - Petroleum in Unconventional Reservoirs in the South East in South Australia: http://www.petroleum.statedevelopment.sa.gov.au/__data/assets/pdf_file/0003/101994FAQ__South_East_Gas_and_Oil_in_Unconventional_06.12.2015.pdf

A White Paper: South Australian Natural Resource Committees to provide input on the fracture stimulation in the South East of SA

Continue to participate in regional fora that enable information sharing. Key focus on the SE of the State

Integrate Working Group #8 – for sharing information – its web-page will have links to trustworthy, peer-reviewed literature and trustworthy rebuhts to unsupported claims

Cooperate with the Commonwealth’s Oil, Gas and Energy Resources Industry Growth Centre

Support for ATSE’s 2015 International Unconventional Gas Workshop, 22-23 September 2015, and for academic experts to participate in the 29th Sept 15 Roundtable discussions

Research by the National Centre for Groundwater Research and Training to separate fact from myth in regard to protecting water resources under Working Group #3

An independent University of Adelaide review has been commissioned to confirm leading (effective) practical risk management for well integrity, including cementing practices – and will identify gaps in peer reviewed studies, if any. Researchers are: Teryl Bennett, Phil Visintin, Mohamed Ali Sadakathu and Dusan Loenic

Support organizations such as The Nonod Resource (through SDS) and the Conservatory Council (through DENHR) to balance public discourse

Water balancing modeling in the Cooper under Working Group #3

DSD has commissioned an independent study entitled Hydrogeological Risk Assessment - Oil and Gas Development - South East. The draft is undergoing peer review by the National Centre for Groundwater Research and Training

ARCO grant supported research to develop accurate but more cost effective means to measure and monitor fugitive greenhouse gas emissions under Working Group #5

Research to clarify the materiality of emissions from alternative source of greenhouse gas under Working Group #5

Watching brief for relevant research such as the CSIRO’s evaluation of the average fugitive emissions from CSG wells in Qld and NSW being the equivalent to 4 cows. See: http://www.environment.gov.au/energy/RELEASES/20150623/053342/csg_fugitive_emissions

| #7, #8, #9, #15 and #84 | Improve roads to and within the Cooper-Emmangga basins | A project plan to seal the Strzelecki Track has been submitted to Infrastructure Australia. An update will be provided at the 25 Sept 2015 meeting of the Roundtable. For some details – see: See: http://www.dti.sa.gov.au/infrastructure/content/strzelecki_track_upgrade_and_sealing_project

DSD has commissioned an independent study entitled Hydrogeological Risk Assessment - Oil and Gas Development - South East. The draft is undergoing peer review by the National Centre for Groundwater Research and Training

ARCO grant supported research to develop accurate but more cost effective means to measure and monitor fugitive greenhouse gas emissions under Working Group #5

Watching brief for relevant research such as the CSIRO’s evaluation of the average fugitive emissions from CSG wells in Qld and NSW being the equivalent to 4 cows. See: http://www.environment.gov.au/energy/RELEASES/20150623/053342/csg_fugitive_emissions

An update to be provided by GA at the Roundtable meeting on 15 September 2015

| #10, #910 and #112 | Petroleum pipelines fit for demand | Coordinated MOUs with the NT and Qld to underpin consistent, efficient and effective regulation across jurisdictions. Commissioned analysis of optimized pipeline connections from the NT to Eastern Australia (see Attachment 1)

| #88 and #95 | Fit-for-purpose air strips and services in proximity to operations | Special Facilities Licence granted to KJM – Cooper Parks constructed / opened. See: http://www.kjmcontractors.com.au/kjm-cooper-parks


Research will be provided at the Roundtable meeting on 15 September 2015

| #11, #94, #79, #89 and #111 | Greater transparency and competition in the price / terms for wholesale gas and for processing and transport tolls. | Cooperating through CoAG and other bodies – including but not limited to


- Commissioner Core Energy to provide a review of South Australia’s position in gas supply; demand for eastern Australia (Preliminary findings will be released at the Roundtable’s meeting on 29 September 2015)

| #43 | Drilling subsidies | The West Australian State Government offered up to $20 million to underpin multi- well schedule to stimulate the mobilization of drilling rigs and fracture stimulation spreads without industry taking up offers. Rig count has fallen significantly in alignment with the fall in the price for oil, and hence a fall in the price for gas that is benchmarked with the price paid for Brent crude oil

McL agreed with Commonwealth to allow assessment and approval once-for-all under relevant resource and environmental protection legislation

NOPSMEA now manages both safety and environment matters for Commonwealth waters and South Australia is progressing an MoU to enable conferral to NOPSMEA in State marine waters

McL efforts are being implemented in alignment with the concerns of co-regulators in the State

| #1 | Accreditation for one-stop-shops in relation to the EPIC and petroleum resource legislation | Book published in Dec 2014 on using natural gas for transport in Australia


Analysis of CNG for shipping instigated

WG67 will be asked to review opportunities for Hybrid Air Vehicles. As presented to the Roundable in Oct 2014, Variable tonnage capacity air ships with up to 4000 km range are available. 2 people to fly, load & unload. First 50t model doesn’t need air str. Passenger versions could be developed. No issue with flooding
From Oct 2014 discussions #126
Rig count as an indication of activity isn’t easily understood.

The direct correlation between the price for oil and rig counts is well established. Rig count data by Australian jurisdiction are accessible. Correlations between rig counts and the price of Brent crude with ABS-derived oil and gas industry FTE data have been reviewed. Based on this analysis, there is a change of roughly 20 FTEs per US$1 change in the price of Brent crude.

#24 and #25
Syngas to Power and/or Synfuel
PELS have been offered for synthetic gas projects with prospects for power generation
SPLs can be applied for to enable gasification of coal plants
Working Group #7 to address prospects for using gas for transport. See:
[...]

Roundtable Working Group #9 (sharing information) will be launched in September 2015

DSD’s MIPO and the Commonwealth Government’s ICN agencies have worked with BP to create a portal to tenders for services required for its offshore Bight Basin exploration program. Similar will follow for Chevron and Santos/Murphy Bight Basin programs

Rig count as an indication of activity isn’t easily understood.

The direct correlation between the price for oil and rig counts is well established. Rig count data by Australian jurisdiction are accessible. Correlations between rig counts and the price of Brent crude with ABS-derived oil and gas industry FTE data have been reviewed. Based on this analysis, there is a change of roughly 20 FTEs per US$1 change in the price of Brent crude.

Cost curves of developing gas in unconventional reservoirs for SA.

Price parity analysis pose targets for cost per GJ at Moomba gate
Core Energy spreadsheets remain valid – pending new data
Key break-through factors will be:
- The identification of reservoir sweet spots. The funding for a research chair in unconventional reservoir will address this uncertainty.
- Completion efficiency. Baker Hughes say 80% of stages do not flow much.